COMPANY: Esso WELL/SAMPLE: 25/10-8a LOCATION: Norway

		COMPOUND	PEAK HEIGHT	PEAK AREA
m/z 123	1	ß-C		
m/z 177	2	T		
	3	BL		
	4	dh29		
m/z 191	5	t19		
	6	P20		
	7	t20		
	8	t21		
	9	t22		
	10	t23		
	11	t24		
	12	T24O		
	13	t25		
	14	T24		
	15	t26(1)		
	16	t26(2)		
	17	t28(1)		
	18	t28(2)		
	19	t29(1)		
	20	t29(2)		
	21	t30(1)		
	22	t30(2)		
	23	h27s	Present	Present
	24	h27m	748	3712
	25	B		
	26	h29	795	5088
	27	h29s	443	1742
	28	d30 (X)	311	1012
	29	m29	Present	Present
	30	O		
	31	h30	2707	11672
	32	m30	432	1620
	33	d31S		
	34	d31R		
	35	h31S	804	4206
	36	h31R	720	2638
	37	G	Present	Present
	38	h32S	866	3654
	39	h32R	777	3152
	40	h33S	929	4932

		COMPOUND	PEAK HEIGHT	PEAK AREA
m/z 191	41	h33R	820	3380
	42	h34S	1052	6780
	43	h34R	656	3152
	44	h35S	1703	12328
	45	h35R	1259	9996
m/z 217	46	s27b	1233	5136
	47	r29c	456	3004
	48	s28b	396	2368
	49	s29c	339	2040
	50	s29d	Present	Present
	51	s29e	Present	Present
	52	s29b	1196	8052
m/z 218	53	s27d	303	2036
	54	s27e	338	1752
	55	s28d	328	948
	56	s28e	Present	Present
	57	s29d	385	1902
	58	s29e		
m/z 231	59	4ms30c	613	2317
m/z 232	60	3ms28e		
	61	3ms28f		
	62	4ms28e	312	1176
	63	4ms28f	Present	Present
	64	3ms29e		
	65	3ms29f		
	66	4ms29e		
	67	4ms29f		
	68	3ms30e		
	69	3ms30f		
	70	4ms30e	Present	Present
	71	4ms30f	378	1372
m/z 259	72	r27d	410	1538
	73	r27c	414	1414
	74	r28d(1)	Present	Present
	75	r28d(2)	Present	Present
	76	r28c(1)	Present	Present
	77	r28c(2)	Present	Present
	78	r29d	Present	Present
	79	r29c	Present	Present

SAMPLE DETAILS
WELL/SAMPLE: 25/10-8a
DEPTH: 3135.4m
SAMPLE No: 97H0004
SAMPLE TYPE: Core
COMMENTS:

DEUTERATED STANDARD
COMPOUND:
ION:
CONC, ppm:
PEAK HEIGHT:
PEAK AREA:

TABLE: 5 **Alkane GC-MS data**

COMPANY: Esso

WELL/SAMPLE: 25/10-8a

LOCATION: Norway

TERPANE RATIOS (based on peak areas)	
1: h27s/h27m (Ts/Tm) m/z 191	*
2: m30/h30 m/z 191	0.14
3: m29/h29 m/z 191	*
4: h31S/h31R m/z 191	1.59
5: h32S/h32R m/z 191	1.16
6: (h35S+h35R)/(h31S+h31R) m/z 191	3.26
7: (h35S+h35R)/(h34S+h34R) m/z 191	2.25
8: h29/(h29+h30) m/z 191	0.30
9: B/h30 m/z 191	*
10: G/h30 m/z 191	*
11: O/h30 m/z 191	*
12: BL/h30 m/z 191	*
13: dh29/h30 m/z 191	*
14: d30/h30 (X/h30) m/z 191	0.09
15: (t28+t29)/h30 m/z 191	*
16: t23/h30 m/z 191	*
17: T24/t26 m/z 191	*
18: T24/h30 m/z 191	*
19: T24O/t24 m/z 191	*
20: h30/(s29c+s29d+s29e+s29b) m/z 191,217	1.16

STERANE RATIOS (based on peak areas)	
1: s29c/(s29c+s29b) m/z 217	0.20
2: (s29d+s29e)/(s29c+s29d+s29e+s29b) m/z 217	*
3: s27b/(s27b+s28b+s29b), % 4: s28b/(s27b+s28b+s29b), % 5: s29b/(s27b+s28b+s29b), % m/z 217	33.0 15.2 51.8
6: (s27d,e)/(s27d,e+s28d,e+s29d,e), % 7: (s28d,e)/(s27d,e+s28d,e+s29d,e), % 8: (s29d,e)/(s27d,e+s28d,e+s29d,e), % m/z 218	* * *
9: (r27d,c)/(r27d,c+r28d,c+r29d,c), % 10: (r28d,c)/(r27d,c+r28d,c+r29d,c), % 11: (r29d,c)/(r27d,c+r28d,c+r29d,c), % m/z 259	100.0 * *
12: (s29c,b)/(s29c,b+s29d,e+r29d,c), % 13: (s29d,e)/(s29c,b+s29d,e+r29d,c), % 14: (r29d,c)/(s29c,b+s29d,e+r29d,c), % m/z 217,218,259	* * *
15: 4ms30c/s29b m/z 231,217	0.29
16: (4ms30e+4ms30f)/(s29d+s29e) m/z 232,218	*
17: (3ms30e+3ms30f)/(s29d+s29e) m/z 232,218	*

RELATIVE COMPOUND ABUNDANCES, ppm	
s27b (m/z 217)	
s28b (m/z 217)	
s29b (m/z 217)	
(s27c,d,e,b) (m/z 217)	
h29 (m/z 191)	
h30 (m/z 191)	
P (m/z 178)	
DBT (m/z 184)	
4MDBT (m/z 198)	

AROMATIC RATIOS (based on peak areas)	
1: 2MN/1MN m/z 142	*
2: 26,27DMN/15DMN m/z 156	*
3: 236TMN/146,135TMN m/z 170	*
4: 125TMN/136TMN m/z 170	*
5: 3MBP/2MBP m/z 168	*
6: MPI-1: 1.5*(3MP+2MP)/(P+9MP+1MP) m/z 192,178	*
7: MPI-2: 3*2MP/(P+9MP+1MP) m/z 192,178	*
8: (3MP+2MP)/(3MP+2MP+9MP+1MP) m/z 192	*
9: 2MP/(3MP+2MP+9MP+1MP) m/z 192	*
10: (TA20+TA21)/(TA20+TA21+TA26+TA27+TA28) m/z 231	*
11: TA21/(TA21+TA28R) m/z 231	*
12: TA26S/TA28S m/z 231	*
13: TA27R/TA28R m/z 231	*
14: 4MDBT/1MDBT m/z 198	*
15: 4MDBT/DBT m/z 198,184	*
16: DBT/P m/z 184,178	*

GENERAL SAMPLE DATA
WELL/SAMPLE: 25/10-8a
DEPTH: 3135.4m
SAMPLE No: 97H0004
SAMPLE TYPE: Core

TABLE: 6 Calculated GC-MS ratios

PETROLEUM GEOCHEMICAL EVALUATION OF THE SECTION 1700m TO 2590m OF WELL 25/10-8, NORWEGIAN SECTOR, NORTH SEA

Report No. 7989/Ic

Project No. Ic/GN217

Prepared by:
S Martin

Of:
Robertson Research International Limited
Llandudno, North Wales LL30 1SA, United Kingdom

For:
Esso Norge AS
Postboks 60, N-4033 Forus, Grenseveien 6, Norway

DECEMBER 1997

Robertson

CHAPTER 2

Introduction and Well Data

Petroleum geochemical analyses have been undertaken on cuttings samples and one core sample , between 1700m and 2590m of the 25/10-8 well, drilled offshore Norway. This work has been carried out on behalf of the operator Esso Norge AS. The results of the study are presented in the report.

Samples have been analysed to determine the thermal maturity and source potential of the well. In addition analyses have been undertaken in order to assess the sealing capacity above the Jurassic reservoir and the effective oil column. The well has been drilled with oil-based mud which precludes the effective use of certain detailed geochemical analyses.

Samples have been received in two consignments, the details of which are shown below.

Consignment no.	Sample type	No. of samples	Depth range	Despatched by	Date of receipt	Comments
1	canned cuttings	70	1700m-2652m	Geoquest Norway	15-Apr-97	Instructions awaited
	muds	3	1700m, 2080m, 2518m			
2	core	1	2520.05m	Esso Norge	01-Aug-97	

The contract covering this work is based on Robertson proposal number 96/1c/011 and Esso Norge Service order 3-1-6-8062-00 (for analysis of 25/10-7S well) dated February 1996. This contract has been extended to cover the geochemical work programme for both the 25/10-8 and 25/10-8A wells. The programme for the 25/10-8 well has been carried out under Work order 130057 (drilling permit L867). A copy of the work programme is attached as Appendix 5.

The numbers of analyses carried out for the study are as follows:

Analysis	Number
Sample washing	31
Lithological description	31
Solvent clean up	30
Kerogen preparation	15
Spore colour index	15
Vitrinite reflectivity	16
Total organic carbon (TOC)	26+(15)
Rock-Eval pyrolysis	26
Pyrolysis gas chromatography	4
Airspace gas	14
Airspace gas isotopes	2
Gasoline fraction	2
Alkane gas chromatography-mass spectrometry	2

CHAPTER 3

Results

3.1 SAMPLE PREPARATION

Well 25/10-8 has been drilled using oil-based mud and hence all the samples for analysis are contaminated with this product. Initially the samples were washed in warm water with powder and liquid detergent prior to carrying out visual lithological description. After further sample preparation involving sieving to remove cavings and fine recirculated silt, the samples were crushed for TOC analysis and sent as cuttings for kerogen preparation. The crushed particles were then submitted for non-quantitative solvent extraction to remove absorbed base oil prior to carrying out TOC and pyrolysis. Consequently all analyses (except for airspace gas, gasoline and isotope work) have been carried out on pre-extracted samples.

Examination of pyrolysis production indices indicates that these are generally low which suggests that removal of the oil-based mud has largely been successful. Two samples at 1700m and 1900m have higher production indices of 0.54 and 0.31 respectively, which may indicate that some oil-based mud contamination still remains in these samples, however, the S2 (potential yield) values for these two samples are very low which may tend to exaggerate the production indices.

COMPANY: ESSO WELL: 25/10-8 LOCATION: NORWAY

SAMPLE DEPTH (metres)	n-C_1, %	n-C_2, %	n-C_3, %	i-C_4, %	n-C_4, %	i-C_5, %	n-C_5, %	C_{6+}, %	TOTAL GAS, ppm	WET GAS (C_2-C_4), %	i-C_4/ n-C_4
2260	89.9	4.9	3.3	0.4	0.7	0.1	0.1	0.6	1312	9.3	0.59
2270	68.2	12.0	12.8	2.5	4.5				601	31.8	0.55
2310	94.5	3.7	1.3	0.2	0.3				971	5.5	0.50
2320	90.3	5.1	1.7	0.1	0.3		0.0	2.4	581	7.2	0.29
2350	80.5	9.9	5.0	0.4	0.8	0.1	0.2	3.1	782	16.1	0.48
2360	79.7	11.7	6.0	0.6	1.0	0.1	0.1	0.8	2886	19.2	0.55
2370	72.3	15.8	8.2	0.9	1.7	0.3	0.2	0.6	11581	26.6	0.57
2380	72.7	14.5	8.2	1.0	1.9	0.3	0.3	1.0	8263	25.6	0.55
2390	71.3	16.2	8.5	1.0	1.7	0.3	0.3	0.7	8295	27.4	0.56
2400	74.6	15.0	7.3	0.8	1.4	0.2	0.2	0.5	8646	24.5	0.56
2410	79.0	12.8	5.6	0.5	1.1	0.2	0.2	0.5	5028	20.1	0.46
2420	71.2	16.1	8.8	0.8	1.7	0.3	0.2	0.9	4104	27.5	0.50
2430	77.4	13.9	6.2	0.5	1.1	0.2	0.2	0.5	5355	21.8	0.50
2480	66.6	20.9	10.0	0.8	1.6				8548	33.4	0.51

TABLE 1 Airspace gas data for canned cuttings samples

COMPANY: ESSO WELL: 25/10-8 LOCATION: NORWAY

SAMPLE DATA						
SAMPLE DEPTH (Mtrs)	2310					
SAMPLE TYPE	Ctgs					

COMPONENTS	GASOLINE RANGE COMPONENT ABUNDANCE (%)					
i-C4	5.751					
n-C4	31.782					
i-C5	1.114					
n-C5	1.379					
2,2,dmb	.109					
cp	.375					
2,3,dmb	.217					
2,mp	1.086					
3,mp	1.931					
n-C6	2.166					
mcp+2,2,dmp	1.569					
2,4,dmp	.291					
benz	1.608					
3,3,dmp	.088					
ch	2.098					
2,mh	2.732					
1,1,dmcp	.200					
3,mh	1.417					
cis,1,3,dmcp	.739					
trans,1,3,dmcp	1.607					
trans,1,2,dmcp+3,ep	1.856					
n-C7	4.176					
mch+cis,1,2,dmcp	8.496					
ecp	1.122					
tol	26.092					

GENERAL DATA						
Total Abundance(ppb)	530					
TOC (% of Rock)						
Abundance at 1% TOC	*					
Alkane Composition	55 20 25					
C7Alkane Composition	16 17 67					
Aromatic Composition	27.70					

RATIOS						
i/n-C4	.18					
i/n-C5	.81					
cp / 2,3,dmb	1.73					
n-C7 / mch	.49					
2,mp / 3,mp	.56					
n-C6 / mcp +2,2,dmp	1.38					
mch / tol	.33					
Late Mature Index	.19					
Aromaticity Index	6.25					
Heptane Index	18.38					
Isoheptane Index	.94					
Kerogen Type Index	15.25					

LEGEND

i - iso	c - cyclo	m - methyl	b - butane	h - hexane	tol - toluene
n - normal	d - di	e - ethyl	p - pentane	benz - benzene	

Alkane Composition - % composition of normal, iso and cyclo alkanes
C7 Alkane Composition - % composition of C7 normal, iso and cyclo alkanes
Aromatic Composition - % composition of Benzene + Toluene
For definition of indices - Late Mature, Aromaticity, Heptane, Isoheptane & Kerogen Type - See Appendix 2

GASOLINE RANGE HYDROCARBON DATA

TABLE : 2

COMPANY: ESSO WELL: 25/10-8 LOCATION: NORWAY

GENERAL DATA			MATURITY DATA		KEROGEN COMPOSITION DATA						
SAMPLE DEPTH (Metres)	SAMPLE TYPE	ANALYSED LITHOLOGY	SPORE COLOUR INDEX	VITR. REFL. R oil av %	% (Visual, from microscopy)			% (Calculated)			
					INERTINITE	VITRINITE	SAPROPEL	INERT	VIT	ALG SAP	WXY SAP
1700	Ctgs	SH, med-dk gy+ 20% MDST, brn-gy+ 20% SH med-dk gy+ mnr MDST, med gy+ tr MDST, yel-gy	2.5-3.0	.36(19)	10	70	20				
1800	Ctgs	SH, med-dk gy+ 20% MDST, brn-gy+ 20% MDST, yel-gy+ mnr MDST, med gy+ tr MDST, med-dk gy	3.0	.32(11)	10	90	Mnr				
1900	Ctgs	MDST, med-dk gy+ 20% SH, brn-gy+ 20% SH, med-lt gy+ 10% SH, med-dk gy+ tr MDST, yel-gy	2.0-2.5	.42(42)	Mnr	90	10				
2000	Ctgs	MDST, med-dk gy+ 20% MDST, brn-gy+ 20% MDST, lt gy+ 10% SH, med-dk gy+ tr SH, yel-gy	2.5	.37(50)	Mnr	70	30				
2060	Ctgs	MDST, med-lt gy+ 20% SH, med-lt gy+ tr SH yel-gy+ tr MDST, med-dk gy	2.0-2.5	.40(30)	65	20	15				
2150	Ctgs	MDST, med-lt gy+ 20% SH, med-lt gy+ 20% LST, wht+ mnr MDST, med-dk gy+ tr MDST, brn-gy	2.5	.40(5)	60	20	20				
2200	Ctgs	MDST, med-lt gy+ 20% SH, med-lt gy+ 20% LST, wht+ mnr MDST, med-dk gy+ tr MDST, brn-gy	2.5-3.0	.45(1)	60	20	20				
2360	Ctgs	LST, wht+ 10% MDST, med-lt gy, calc+ tr MDST, brn-gy	3.0-3.5	.39(16)	30	20	50				
2380	Ctgs	MDST, gy-blk, calc+ 20% LST, wht	3.0	.36(36)	40	10	50				

MATURITY AND KEROGEN COMPOSITION DATA

TABLE : 3A

COMPANY: ESSO WELL: 25/10-8 LOCATION: NORWAY

GENERAL DATA			MATURITY DATA		KEROGEN COMPOSITION DATA						
SAMPLE DEPTH (Metres)	SAMPLE TYPE	ANALYSED LITHOLOGY	SPORE COLOUR INDEX	VITR. REFL. R oil av %	% (Visual, from microscopy)			% (Calculated)			
					INERTINITE	VITRINITE	SAPROPEL	INERT	VIT	ALG SAP	WXY SAP
2410	Ctgs	SH, gy-blk, calc+ 20% LST, wht+ tr SH, med-dk gy, calc	2.5-3.0	.49(4)	40	10	50				
2440	Ctgs	SH, brn-blk+ 20% MDST, med-dk gy+ 20% LST, wht+ tr MDST, brn-gy	3.0	.51(12)	80	10	10				
2450	Ctgs	SH, brn-blk+ 20% MDST, med-dk gy+ 10% LST, wht+ 10% MDST, lt gy+ tr MDST, brn-gy	3.0-3.5	.42(13)	80	10	10				
2470	Ctgs	SH, brn-blk+ 20% MDST, med-dk gy+ 20% LST, wht+ tr MDST, brn-gy	3.5	.41(41)	50	20	30				
2500	Ctgs	SH, brn-blk+ 20% MDST, brn-blk+ 20% MDST, med-dk gy+ mnr MDST, med-lt gy+ tr LST, wht	3.5-4.0	.39(52)	80	10	10				
2520.20	Core	No liths available									
	P	No liths available		.45(49)							
2580	Ctgs	MDST, wht+ 20% SH, lt gy+ 20% MDST, mod red-brn+ tr MDST brn-blk+ tr MDST, lt gy	3.0-3.5 C 4.0-4.5	.49(20)	80	10	10				

MATURITY AND KEROGEN COMPOSITION DATA

TABLE : 3B

COMPANY: ESSO WELL: 25/10-8 LOCATION: NORWAY

GENERAL DATA			CHEMICAL ANALYSIS DATA										
SAMPLE DEPTH (Metres)	SAMPLE TYPE	ANALYSED LITHOLOGY	TOC % OF ROCK	PYROLYSIS					SOLVENT EXTRACTION/FRACTIONATION				
				Tmax °C	HI	OI	PI	POT.YLD. (ppm)	EXTR. (ppm)	HC (ppm)	EXTR. % OC	HC %oOC	HC %EX	ALK. %HC
1700	Ctgs	SH, med-dk gy+ 20% MDST, brn-gy+ 20% SH, med-dk gy+ mnr MDST, med gy+ tr MDST, yel-gy	.88										
	Ctgs	After extraction	.68	420	43	81	.54	290					
1800	Ctgs	SH, med-dk gy+ 20% MDST, brn-gy+ 20% MDST, yel-gy + mnr MDST, med gy+ tr MDST, med-dk gy	1.25										
	Ctgs	After extraction	.59	407	69	164	.31	410					
1900	Ctgs	MDST, med-dk gy+ 20% SH, brn-gy+ 20% SH, med-lt gy+ 10% SH, med-dk gy+ tr MDST, yel-gy	1.85										
	Ctgs	After extraction	1.01	430	148	50	.04	1490					
2000	Ctgs	MDST, med-dk gy+ 20% MDST, brn-gy+ 20% MDST, lt gy+ 10% SH, med-dk gy + tr SH, yel-gy	2.52										
	Ctgs	After extraction	1.69	427	164	57	.04	2770					
2060	Ctgs	MDST, med-lt gy+ 20% SH, med-lt gy+ tr SH, yel-gy + tr MDST, med-dk gy	1.27										
	Ctgs	After extraction	.46	413	85	263	.11	390					
2150	Ctgs	MDST, med-lt gy+ 20% SH, med-lt gy+ 20% LST, wht + mnr MDST, med-dk gy+ tr MDST, brn-gy	1.06										
	Ctgs	After extraction	.43	400	53	105	.21	230					
2200	Ctgs	MDST, med-lt gy+ 20% SH, med-lt gy+ 20% LST, wht + mnr MDST, med-dk gy+ tr MDST, brn-gy	1.42										
	Ctgs	After extraction	.64	411	61	94	.17	390					
2260	Ctgs	LST, wht+ 20% SH, med-lt gy, calc+ tr SH, med-dk gy	-										
	Ctgs	After extraction	.56	440	232	236	.06	1300					

SUMMARY OF CHEMICAL ANALYSIS DATA

TABLE : 4A

COMPANY: ESSO WELL: 25/10-8 LOCATION: NORWAY

GENERAL DATA			CHEMICAL ANALYSIS DATA											
SAMPLE DEPTH (Metres)	SAMPLE TYPE	ANALYSED LITHOLOGY	TOC % OF ROCK	PYROLYSIS					SOLVENT EXTRACTION/FRACTIONATION					
				Tmax °C	HI	OI	PI	POT.YLD. (ppm)	EXTR. (ppm)	HC (ppm)	EXTR. % OC	HC %OOC	HC %EX	ALK. %HC
2320	Ctgs	LST, wht+ tr SH, med-lt gy, calc	-											
	Ctgs	After extraction	.29	442	493	186	.04	1430						
2350	Ctgs	MDST, wht, calc+ tr MDST brn-gy	-											
	Ctgs	After extraction	.45	434	347	191	.06	1560						
2360	Ctgs	LST, wht+ 10% MDST, med-lt gy, calc+ tr MDST brn-gy	-											
	Ctgs	After extraction	.70	432	456	83	.03	3190						
2370	Ctgs	MDST, brn-gy+ 20% MDST, wht, calc+ tr MDST, med-dk gy	-											
	Ctgs	After extraction	4.05	422	425	16	.01	17220						
2380	Ctgs	MDST, gy-blk, calc+ 20% LST, wht	-											
	Ctgs	After extraction	3.87	422	425	18	.01	16430						
2390	Ctgs	MDST, gy-blk, calc+ 20% LST, wht+ tr SH, med-dk gy, calc	-											
	Ctgs	After extraction	3.39	422	426	21	.01	14440						
2400	Ctgs	MDST, gy-blk, calc+ 20% LST, wht+ tr SH, med-dk gy, calc	-											
	Ctgs	After extraction	3.32	421	428	22	.01	14200						
2410	Ctgs	SH, gy-blk, calc+ 20% LST, wht+ tr SH, med-dk gy, calc	-											
	Ctgs	After extraction	3.15	421	423	22	.01	13330						
2420	Ctgs	MDST, gy-blk, calc+ 20% SH, med-dk gy, calc+ 10% LST, wht	-											
	Ctgs	After extraction	3.38	420	432	27	.01	14600						
2430	Ctgs	MDST, gy-blk, calc+ 20% MDST, med-dk gy, calc+ 10% LST, wht	-											
	Ctgs	After extraction	3.13	420	424	32	.01	13260						
2440	Ctgs	SH, brn-blk+ 20% MDST, med-dk gy+ 20% LST, wht + tr MDST, brn-gy	3.65											
	Ctgs	After extraction	2.74	423	453	20	.02	12420						

SUMMARY OF CHEMICAL ANALYSIS DATA

TABLE : 4B

COMPANY: ESSO WELL: 25/10-8 LOCATION: NORWAY

GENERAL DATA			CHEMICAL ANALYSIS DATA										
SAMPLE DEPTH (Metres)	SAMPLE TYPE	ANALYSED LITHOLOGY	TOC % OF ROCK	PYROLYSIS					SOLVENT EXTRACTION/FRACTIONATION				
				Tmax °C	HI	OI	PI	POT.YLD. (ppm)	EXTR. (ppm)	HC (ppm)	EXTR. % OC	HC %oOC	HC %EX	ALK. %HC
2450	Ctgs	SH, brn-blk+ 20% MDST, med-dk gy+ 10% LST, wht + 10% MDST, lt gy+ tr MDST, brn-gy	4.10										
	Ctgs	After extraction	3.05	425	429	18	.01	13070					
2470	Ctgs	SH, brn-blk+ 20% MDST, med-dk gy+ 20% LST, wht + tr MDST, brn-gy	4.29										
	Ctgs	After extraction	3.44	426	380	18	.01	13080					
2490	Ctgs	SH, brn-blk+ 20% MDST, med-dk gy+ 20% SH, med-lt gy+ mnr LST, wht + tr MDST, brn-blk	5.10										
	Ctgs	After extraction	4.22	429	302	13	.02	12760					
2500	Ctgs	SH, brn-blk+ 20% MDST, brn-blk+ 20% MDST, med-dk gy+ mnr MDST, med-lt gy+ tr LST, wht	5.70										
	Ctgs	After extraction	4.43	428	317	14	.02	14040					
2570	Ctgs	MDST, wht+ 20% MDST, lt gy+ tr MDST, mod red-brn+ tr MDST, brn-blk	.86										
	Ctgs	After extraction	.34	433	335	221	.03	1140					
2580	Ctgs	MDST, wht+ 20% SH, lt gy + 20% MDST, mod red-brn + tr MDST, brn-blk+ tr MDST, lt gy	.84										
	Ctgs	After extraction	.38	435	303	250	.02	1150					
2590	Ctgs	MDST, wht+ 20% MDST, mod red-brn+ 20% MDST, pal red-brn+ 10% SH, lt gy+ tr MDST, brn-blk	.82										
	Ctgs	After extraction	.40	437	270	168	.02	1080					

SUMMARY OF CHEMICAL ANALYSIS DATA

TABLE : 4C

COMPANY: ESSO WELL: 25/10-8 LOCATION: NORWAY

GENERAL DATA			CHEMICAL ANALYSIS DATA								
SAMPLE DEPTH (Metres)	SAMPLE TYPE	ANALYSED LITHOLOGY	TOC % OF ROCK	PYROLYSIS							
				S1 (ppm)	S2 (ppm)	S3 (ppm)	HI	OI	PI	Tmax °C	S2/S3
1700	Ctgs	SH, med-dk gy+ 20% MDST, brn-gy+ 20% SH, med-dk gy+ mnr MDST, med gy+ tr MDST, yel-gy	.88								
	Ctgs	After extraction	.68	340	290	550	43	81	.54	420	.53
1800	Ctgs	SH, med-dk gy+ 20% MDST, brn-gy+ 20% MDST, yel-gy+ mnr MDST, med gy+ tr MDST, med-dk gy	1.25								
	Ctgs	After extraction	.59	180	410	970	69	164	.31	407	.42
1900	Ctgs	MDST, med-dk gy+ 20% SH, brn-gy+ 20% SH, med-lt gy+ 10% SH, med-dk gy+ tr MDST, yel-gy	1.85								
	Ctgs	After extraction	1.01	60	1490	510	148	50	.04	430	2.92
2000	Ctgs	MDST, med-dk gy+ 20% MDST, brn-gy+ 20% MDST, lt gy+ 10% SH, med-dk gy+ tr SH, yel-gy	2.52								
	Ctgs	After extraction	1.69	120	2770	970	164	57	.04	427	2.86
2060	Ctgs	MDST, med-lt gy+ 20% SH, med-lt gy+ tr SH, yel-gy+ tr MDST, med-dk gy	1.27								
	Ctgs	After extraction	.46	50	390	1210	85	263	.11	413	.32
2150	Ctgs	MDST, med-lt gy+ 20% SH, med-lt gy+ 20% LST, wht+ mnr MDST, med-dk gy+ tr MDST, brn-gy	1.06								
	Ctgs	After extraction	.43	60	230	450	53	105	.21	400	.51
2200	Ctgs	MDST, med-lt gy+ 20% SH, med-lt gy+ 20% LST, wht+ mnr MDST, med-dk gy+ tr MDST, brn-gy	1.42								
	Ctgs	After extraction	.64	80	390	600	61	94	.17	411	.65
2260	Ctgs	LST, wht+ 20% SH, med-lt gy, calc+ tr SH, med-dk gy									
	Ctgs	After extraction	.56	80	1300	1320	232	236	.06	440	.98
2320	Ctgs	LST, wht+ tr SH, med-lt gy, calc									

ORGANIC CARBON AND ROCK-EVAL PYROLYSIS DATA

TABLE : 5 A

COMPANY: ESSO WELL: 25/10-8 LOCATION: NORWAY

GENERAL DATA			CHEMICAL ANALYSIS DATA								
SAMPLE DEPTH (Metres)	SAMPLE TYPE	ANALYSED LITHOLOGY	TOC % OF ROCK	PYROLYSIS							
				S1 (ppm)	S2 (ppm)	S3 (ppm)	HI	OI	PI	Tmax °C	S2/S3
2320	Ctgs	After extraction	.29	60	1430	540	493	186	.04	442	2.65
2350	Ctgs	MDST, wht, calc+ tr MDST, brn-gy									
	Ctgs	After extraction	.45	100	1560	860	347	191	.06	434	1.81
2360	Ctgs	LST, wht+ 10% MDST, med-lt gy, calc+ tr MDST, brn-gy									
	Ctgs	After extraction	.70	100	3190	580	456	83	.03	432	5.50
2370	Ctgs	MDST, brn-gy+ 20% MDST, wht, calc+ tr MDST, med-dk gy									
	Ctgs	After extraction	4.05	190	17220	660	425	16	.01	422	26.09
2380	Ctgs	MDST, gy-blk, calc+ 20% LST, wht									
	Ctgs	After extraction	3.87	220	16430	690	425	18	.01	422	23.81
2390	Ctgs	MDST, gy-blk, calc+ 20% LST, wht+ tr SH, med-dk gy, calc									
	Ctgs	After extraction	3.39	190	14440	710	426	21	.01	422	20.34
2400	Ctgs	MDST, gy-blk, calc+ 20% LST, wht+ tr SH, med-dk gy, calc									
	Ctgs	After extraction	3.32	160	14200	720	428	22	.01	421	19.72
2410	Ctgs	SH, gy-blk, calc+ 20% LST, wht + tr SH, med-dk gy, calc									
	Ctgs	After extraction	3.15	160	13330	700	423	22	.01	421	19.04
2420	Ctgs	MDST, gy-blk, calc+ 20% SH, med-dk gy, calc+ 10% LST, wht									
	Ctgs	After extraction	3.38	130	14600	910	432	27	.01	420	16.04
2430	Ctgs	MDST, gy-blk, calc+ 20% MDST, med-dk gy, calc+ 10% LST, wht									
	Ctgs	After extraction	3.13	160	13260	1000	424	32	.01	420	13.26
2440	Ctgs	SH, brn-blk+ 20% MDST, med-dk gy+ 20% LST, wht+ tr MDST, brn-gy	3.65								
	Ctgs	After extraction	2.74	210	12420	560	453	20	.02	423	22.18
2450	Ctgs	SH, brn-blk+ 20% MDST, med-dk gy+ 10% LST, wht+ 10% MDST, lt gy+ tr MDST, brn-gy	4.10								
	Ctgs	After extraction	3.05	190	13070	560	429	18	.01	425	23.34
2470	Ctgs	SH, brn-blk+ 20% MDST, med-dk gy+ 20% LST, wht+ tr MDST, brn-gy	4.29								
	Ctgs	After extraction	3.44	180	13080	630	380	18	.01	426	20.76

ORGANIC CARBON AND ROCK-EVAL PYROLYSIS DATA

TABLE : 5B

COMPANY: ESSO WELL: 25/10-8 LOCATION: NORWAY

GENERAL DATA			CHEMICAL ANALYSIS DATA								
SAMPLE DEPTH (Metres)	SAMPLE TYPE	ANALYSED LITHOLOGY	TOC % OF ROCK	PYROLYSIS							
				S1 (ppm)	S2 (ppm)	S3 (ppm)	HI	OI	PI	Tmax °C	S2/S3
2490	Ctgs	SH, brn-blk+ 20% MDST, med-dk gy+ 20% SH, med-lt gy+ mnr LST, wht+ tr MDST, brn-blk	5.10								
	Ctgs	After extraction	4.22	250	12760	530	302	13	.02	429	24.08
2500	Ctgs	SH, brn-blk+ 20% MDST, brn-blk + 20% MDST, med-dk gy+ mnr MDST, med-lt gy+ tr LST, wht	5.70								
	Ctgs	After extraction	4.43	230	14040	630	317	14	.02	428	22.29
2570	Ctgs	MDST, wht+ 20% MDST, lt gy+ tr MDST, mod red-brn+ tr MDST, brn-blk	.86								
	Ctgs	After extraction	.34	30	1140	750	335	221	.03	433	1.52
2580	Ctgs	MDST, wht+ 20% SH, lt gy+ 20% MDST, mod red-brn+ tr MDST, brn-blk+ tr MDST, lt gy	.84								
	Ctgs	After extraction	.38	20	1150	950	303	250	.02	435	1.21
2590	Ctgs	MDST, wht+ 20% MDST, mod red-brn+ 20% MDST, pal red-brn+ 10% SH, lt gy+ tr MDST, brn-blk	.82								
	Ctgs	After extraction	.40	20	1080	670	270	168	.02	437	1.61
2653		TD									

ORGANIC CARBON AND ROCK-EVAL PYROLYSIS DATA

TABLE : 5C

COMPANY: Esso WELL/SAMPLE: 25/10-8 LOCATION: Norwegian North Sea

		COMPOUND	PEAK HEIGHT	PEAK AREA
m/z 123	1	ß-C		
m/z 177	2	T		
	3	BL		
	4	dh29		
m/z 191	5	t19		
	6	P20		
	7	t20	2181	8816
	8	t21	819	2860
	9	t22	Present	
	10	t23	361	1694
	11	t24		
	12	T24O		
	13	t25		
	14	T24		
	15	t26(1)		
	16	t26(2)		
	17	t28(1)		
	18	t28(2)		
	19	t29(1)		
	20	t29(2)		
	21	t30(1)		
	22	t30(2)		
	23	h27s	484	1588
	24	h27m	790	4460
	25	B	307	1256
	26	h29	1171	6788
	27	h29s		
	28	d30 (X)	Present	
	29	m29	Present	
	30	O		
	31	h30	1965	9912
	32	m30	413	2384
	33	d31S		
	34	d31R		
	35	h31S	760	3560
	36	h31R	546	1898
	37	G		
	38	h32S	456	1954
	39	h32R	342	892
	40	h33S	306	1306

		COMPOUND	PEAK HEIGHT	PEAK AREA
m/z 191	41	h33R	306	1555
	42	h34S		
	43	h34R		
	44	h35S		
	45	h35R		
m/z 217	46	s27b	558	2826
	47	r29c	Present	
	48	s28b	269	1150
	49	s29c	461	1045
	50	s29d	Present	
	51	s29e	Present	
	52	s29b	474	2565
m/z 218	53	s27d	267	1696
	54	s27e	313	1096
	55	s28d	296	1664
	56	s28e	Present	
	57	s29d	364	2772
	58	s29e		
m/z 231	59	4ms30c		
m/z 232	60	3ms28e		
	61	3ms28f		
	62	4ms28e		
	63	4ms28f		
	64	3ms29e		
	65	3ms29f		
	66	4ms29e		
	67	4ms29f		
	68	3ms30e		
	69	3ms30f		
	70	4ms30e		
	71	4ms30f		
m/z 259	72	r27d		
	73	r27c		
	74	r28d(1)		
	75	r28d(2)		
	76	r28c(1)		
	77	r28c(2)		
	78	r29d		
	79	r29c		

SAMPLE DETAILS
WELL/SAMPLE: 25/10-8
DEPTH: 2380m
SAMPLE No: 97D132
SAMPLE TYPE: Cuttings
COMMENTS:

DEUTERATED STANDARD
COMPOUND:
ION:
CONC, ppm:
PEAK HEIGHT:
PEAK AREA:

TABLE: 6.1 Alkane GC-MS data

COMPANY: Esso WELL/SAMPLE: 25/10-8 LOCATION: Norwegian North Sea

	COMPOUND		PEAK HEIGHT	PEAK AREA
m/z 123	1	ß-C		
m/z 177	2	T		
	3	BL		
	4	dh29		
m/z 191	5	t19		
	6	P20		
	7	t20	1286	6752
	8	t21	479	2594
	9	t22	Present	
	10	t23	Present	
	11	t24		
	12	T24O		
	13	t25		
	14	T24		
	15	t26(1)		
	16	t26(2)		
	17	t28(1)		
	18	t28(2)		
	19	t29(1)		
	20	t29(2)		
	21	t30(1)		
	22	t30(2)		
	23	h27s	Present	
	24	h27m	578	2704
	25	B	985	5092
	26	h29	893	4756
	27	h29s	353	972
	28	d30 (X)	Present	
	29	m29	Present	
	30	O		
	31	h30	1187	6044
	32	m30	251	1422
	33	d31S		
	34	d31R		
	35	h31S	545	1952
	36	h31R	306	1262
	37	G		
	38	h32S	308	2520
	39	h32R	320	2028
	40	h33S	271	1800

	COMPOUND		PEAK HEIGHT	PEAK AREA
m/z 191	41	h33R	297	2206
	42	h34S		
	43	h34R		
	44	h35S		
	45	h35R		
m/z 217	46	s27b	308	2018
	47	r29c	Present	
	48	s28b	Present	
	49	s29c	Present	
	50	s29d	300	3178
	51	s29e		
	52	s29b		
m/z 218	53	s27d		
	54	s27e		
	55	s28d		
	56	s28e		
	57	s29d		
	58	s29e		
m/z 231	59	4ms30c		
m/z 232	60	3ms28e		
	61	3ms28f		
	62	4ms28e		
	63	4ms28f		
	64	3ms29e		
	65	3ms29f		
	66	4ms29e		
	67	4ms29f		
	68	3ms30e		
	69	3ms30f		
	70	4ms30e		
	71	4ms30f		
m/z 259	72	r27d		
	73	r27c		
	74	r28d(1)		
	75	r28d(2)		
	76	r28c(1)		
	77	r28c(2)		
	78	r29d		
	79	r29c		

SAMPLE DETAILS
WELL/SAMPLE: 25/10-8
DEPTH: 2490m
SAMPLE No: 97D143
SAMPLE TYPE: Cuttings
COMMENTS:

DEUTERATED STANDARD
COMPOUND:
ION:
CONC, ppm:
PEAK HEIGHT:
PEAK AREA:

TABLE: 6.2 Alkane GC-MS data

COMPANY: Esso WELL/SAMPLE: 25/10-8 LOCATION: Norwegian North Sea

TERPANE RATIOS (based on peak areas)	
1: h27s/h27m (Ts/Tm) m/z 191	0.36
2: m30/h30 m/z 191	0.24
3: m29/h29 m/z 191	*
4: h31S/h31R m/z 191	1.88
5: h32S/h32R m/z 191	2.19
6: (h35S+h35R)/(h31S+h31R) m/z 191	*
7: (h35S+h35R)/(h34S+h34R) m/z 191	*
8: h29/(h29+h30) m/z 191	0 41
9: B/h30 m/z 191	0.13
10: G/h30 m/z 191	*
11: O/h30 m/z 191	*
12: BL/h30 m/z 191	*
13: dh29/h30 m/z 191	*
14: d30/h30 (X/h30) m/z 191	*
15: (t28+t29)/h30 m/z 191	*
16: t23/h30 m/z 191	0.17
17: T24/t26 m/z 191	*
18: T24/h30 m/z 191	*
19: T24O/t24 m/z 191	*
20: h30/(s29c+s29d+s29e+s29b) m/z 191,217	*

STERANE RATIOS (based on peak areas)	
1: s29c/(s29c+s29b) m/z 217	0.29
2: (s29d+s29e)/(s29c+s29d+s29e+s29b) m/z 217	*
3: s27b/(s27b+s28b+s29b), % 4: s28b/(s27b+s28b+s29b), % 5: s29b/(s27b+s28b+s29b), % m/z 217	43.2 17.6 39.2
6: (s27d,e)/(s27d,e+s28d,e+s29d,e), % 7: (s28d,e)/(s27d,e+s28d,e+s29d,e), % 8: (s29d,e)/(s27d,e+s28d,e+s29d,e), % m/z 218	* * *
9: (r27d,c)/(r27d,c+r28d,c+r29d,c), % 10: (r28d,c)/(r27d,c+r28d,c+r29d,c), % 11: (r29d,c)/(r27d,c+r28d,c+r29d,c), % m/z 259	* * *
12: (s29c,b)/(s29c,b+s29d,e+r29d,c), % 13: (s29d,e)/(s29c,b+s29d,e+r29d,c), % 14: (r29d,c)/(s29c,b+s29d,e+r29d,c), % m/z 217,218,259	* * *
15: 4ms30c/s29b m/z 231,217	*
16: (4ms30e+4ms30f)/(s29d+s29e) m/z 232,218	*
17: (3ms30e+3ms30f)/(s29d+s29e) m/z 232,218	*

RELATIVE COMPOUND ABUNDANCES, ppm	
s27b (m/z 217)	
s28b (m/z 217)	
s29b (m/z 217)	
(s27c,d,e,b) (m/z 217)	
h29 (m/z 191)	
h30 (m/z 191)	
P (m/z 178)	
DBT (m/z 184)	
4MDBT (m/z 198)	

AROMATIC RATIOS (based on peak areas)	
1: 2MN/1MN m/z 142	*
2: 26,27DMN/15DMN m/z 156	*
3: 236TMN/146,135TMN m/z 170	*
4: 125TMN/136TMN m/z 170	*
5: 3MBP/2MBP m/z 168	*
6: MPI-1: 1.5*(3MP+2MP)/(P+9MP+1MP) m/z 192,178	*
7: MPI-2: 3*2MP/(P+9MP+1MP) m/z 192,178	*
8: (3MP+2MP)/(3MP+2MP+9MP+1MP) m/z 192	*
9: 2MP/(3MP+2MP+9MP+1MP) m/z 192	*
10: (TA20+TA21)/(TA20+TA21+TA26+TA27+TA28) m/z 231	*
11: TA21/(TA21+TA28R) m/z 231	*
12: TA26S/TA28S m/z 231	*
13: TA27R/TA28R m/z 231	*
14: 4MDBT/1MDBT m/z 198	*
15: 4MDBT/DBT m/z 198,184	*
16: DBT/P m/z 184,178	*

GENERAL SAMPLE DATA
WELL/SAMPLE: 25/10-8
DEPTH: 2380m
SAMPLE No: 97D132
SAMPLE TYPE: Cuttings

TABLE: 7.1 **Calculated GC-MS ratios**

COMPANY: Esso WELL/SAMPLE: 25/10-8 LOCATION: Norwegian North Sea

TERPANE RATIOS (based on peak areas)	
1: h27s/h27m (Ts/Tm) m/z 191	*
2: m30/h30 m/z 191	0.24
3: m29/h29 m/z 191	*
4: h31S/h31R m/z 191	1.55
5: h32S/h32R m/z 191	1.24
6: (h35S+h35R)/(h31S+h31R) m/z 191	*
7: (h35S+h35R)/(h34S+h34R) m/z 191	*
8: h29/(h29+h30) m/z 191	0.44
9: B/h30 m/z 191	0.84
10: G/h30 m/z 191	*
11: O/h30 m/z 191	*
12: BL/h30 m/z 191	*
13: dh29/h30 m/z 191	*
14: d30/h30 (X/h30) m/z 191	*
15: (t28+t29)/h30 m/z 191	*
16: t23/h30 m/z 191	*
17: T24/t26 m/z 191	*
18: T24/h30 m/z 191	*
19: T24O/t24 m/z 191	*
20: h30/(s29c+s29d+s29e+s29b) m/z 191,217	*

STERANE RATIOS (based on peak areas)	
1: s29c/(s29c+s29b) m/z 217	*
2: (s29d+s29e)/(s29c+s29d+s29e+s29b) m/z 217	*
3: s27b/(s27b+s28b+s29b), % 4: s28b/(s27b+s28b+s29b), % 5: s29b/(s27b+s28b+s29b), % m/z 217	* * *
6: (s27d,e)/(s27d,e+s28d,e+s29d,e), % 7: (s28d,e)/(s27d,e+s28d,e+s29d,e), % 8: (s29d,e)/(s27d,e+s28d,e+s29d,e), % m/z 218	* * *
9: (r27d,c)/(r27d,c+r28d,c+r29d,c), % 10: (r28d,c)/(r27d,c+r28d,c+r29d,c), % 11: (r29d,c)/(r27d,c+r28d,c+r29d,c), % m/z 259	* * *
12: (s29c,b)/(s29c,b+s29d,e+r29d,c), % 13: (s29d,e)/(s29c,b+s29d,e+r29d,c), % 14: (r29d,c)/(s29c,b+s29d,e+r29d,c), % m/z 217,218,259	* * *
15: 4ms30c/s29b m/z 231,217	*
16: (4ms30e+4ms30f)/(s29d+s29e) m/z 232,218	*
17: (3ms30e+3ms30f)/(s29d+s29e) m/z 232,218	*

RELATIVE COMPOUND ABUNDANCES, ppm	
s27b (m/z 217)	
s28b (m/z 217)	
s29b (m/z 217)	
(s27c,d,e,b) (m/z 217)	
h29 (m/z 191)	
h30 (m/z 191)	
P (m/z 178)	
DBT (m/z 184)	
4MDBT (m/z 198)	

AROMATIC RATIOS (based on peak areas)	
1: 2MN/1MN m/z 142	*
2: 26,27DMN/15DMN m/z 156	*
3: 236TMN/146,135TMN m/z 170	*
4: 125TMN/136TMN m/z 170	*
5: 3MBP/2MBP m/z 168	*
6: MPI-1: 1.5*(3MP+2MP)/(P+9MP+1MP) m/z 192,178	*
7: MPI-2: 3*2MP/(P+9MP+1MP) m/z 192,178	*
8: (3MP+2MP)/(3MP+2MP+9MP+1MP) m/z 192	*
9: 2MP/(3MP+2MP+9MP+1MP) m/z 192	*
10: (TA20+TA21)/(TA20+TA21+TA26+TA27+TA28) m/z 231	*
11: TA21/(TA21+TA28R) m/z 231	*
12: TA26S/TA28S m/z 231	*
13: TA27R/TA28R m/z 231	*
14: 4MDBT/1MDBT m/z 198	*
15: 4MDBT/DBT m/z 198,184	*
16: DBT/P m/z 184,178	*

GENERAL SAMPLE DATA
WELL/SAMPLE: 25/10-8
DEPTH: 2490m
SAMPLE No: 97D143
SAMPLE TYPE: Cuttings

TABLE: 7.2 **Calculated GC-MS ratios**

SAMPLE DEPTH (METRES)	δ^{13}C (methane)	δ^{13}C (ethane)	NOTES
2270	-30	Insufficient sample	Small sample, data may not be reliable
2310	-35.46	Insufficient sample	
2350	-41.4	Insufficient sample	Only sufficient sample to run once no repeats
2370	-38.9	Insufficient sample	Only sufficient sample to run once no repeats
2480	-35.03	Insufficient sample	

TABLE :8 CARBON ISOTOPE DATA (METHANE)