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Title		
GEOCHEMICAL EVALUATION OF THE 6506/12-7 WELL		
Requested by T.G. Gloppen, LET-K	**Project** Routine geochemistry	
Date 09.03.88	**No. of pages** 24 19 tables 21 figures	**No. of enclosures**

Key words

Abstract

The present report is in accordance with Statoil's requirements for analytical work and reporting within organic geochemistry.

Prepared by

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Text operator

Approved by

9/3-88 T. Meyer

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The total number of analyses performed in this study is as follows:

	NUMBER OF ANALYSES
Headspace and cuttings gas	66
Sample preparation	44
Total organic carbon	50
Pyrolysis	41
Vitrinite reflectance	11
Kerogen type and spore colouration	10
C_{15+} extraction and chromatography	21
Capillary GC - paraffin-naphthenes	24
Capillary GC - aromatics	23
Pyrolysis-GC	10
Carbon isotopes - extract fractions	65
Carbon isotopes - gas	3
Carbon isotopes - kerogen	11
GC-MS biomarker analysis	11
Detailed gasolines analysis	3
Whole oil chromatograms	3
Total extract chromatograms	3
Solvent extractions (core)	13

Numerical data are listed in tables 1 to 19 and presented graphically in figures 1 to 21.

A brief description of the analytical methods employed in this study is enclosed at the back of this report.

GENERAL INFORMATION

Ten (10) copies of this report have been forwarded to T. Meyer, Statoil Stavanger. A copy of the report has been retained by Geochem for future consultation with authorised Statoil personnel.

The remaining material and kerogen slides will be returned to Statoil.

The results of this study are proprietary to Statoil.

INTRODUCTION

This report presents a geochemical evaluation of the Statoil 6506/12-7 well, drilled in offshore Norwegian waters.

The study was designed to:

- evaluate the potential of source rocks in terms of richness, maturity and potential for oil and gas.

- evaluate reservoired hydrocarbons

- evaluate tested fluids and correlate them with those produced from the 6506/12-1 well.

This project was authorised by T. Meyer, Statoil Stavanger, who also specified the analytical format.

ANALYTICAL

A total of two hundred and seven (207) canned samples (including thirty (30) mud samples) were received from the 3530-4840(TD) metres interval and assigned the Geochem job number 1686. Fifteen core samples and three tested fluids were subsequently received and listed under job number 1687 although results from the two jobs have been integrated into one report.

Many of the cans had obliterated markings but the samples were analysed, as far as was possible, in accordance with the telexed specifications of 12/10/87 and 13/11/87. Statoil screened the reservoir rock core samples and after receiving our total extract data selected three (3) samples for total extract GC. This concluded the reservoir rock evaluation.

Poor source rock quality reduced the number of possible SIR GC-MS analyses from 12 to 8 and MRM GC-MS analyses from 8 to 6. Headspace gas isotope ratios were a part of the original specification but insufficient gas could be extracted from many of the cans for this purpose and only 3 of the specified 15 analyses yielded enough gas for methane carbon isotopes analysis. The heavier

gases could not be analysed for the same reason. Small (5 ml) samples of the fluids were received and loss of volatiles prevented a complete analysis of the C_2-C_8 fraction; C_4-C_7 analyses are reported.

Geochem were supplied with well logs for this study and the following information.

TABLE 1
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (Wt. % of Rock)
1687-004	4053.18m	A 98% Shale, carb. fragments, subfissile, mod. hard, non-calc., olive black	5Y2/1	5.76
1686-126	4082m	A 95% Carb. mudstone, blocky, soft, non-calc., olive black	5Y2/1	6.44
		B 5% Shale, fissile to subfissile, mod. hard, non-calc., medium dark grey to medium grey	N4-5	
1686-128	4096m	A 90% Carb. mudstone, as 1686-126A	5Y2/1	6.22,6.12
		B 10% Shale, as 1686-126B	N4-5	
		Abundant cavings		
		Trace red shale		
1686-130	4100m	A 90% Carb. mudstone, as 1686-126A	5Y2/1	6.45
		B 10% Shale, as 1686-126B	N4-5	
		Abundant cavings		
		Minor red mudstone		
1686-131	4109m	A 98% Carb. mudstone, blocky, soft, non-calc., olive black	5Y2/1	6.19
		Trace grey, and red shales		
1686-133	4118m	A 98% Carb, mudstone, as 1686-131A	5Y2/1	6.42
		Minor grey shale		
1686-134	4136m	A 85% Carb. mudstone, as 1686-131A	5Y2/1	6.07
		B 15% Shale, fissile, mod. hard, non-calc., dark olive grey	5Y3/1	1.61
1686-135	4145m	A 98% Shale, fissile, mod. hard, non-calc., dark olive grey to dark grey	5Y3/1-N3	1.26
1686-136	4154m	A 98% Shale, as 1686-135A	5Y3/1-N3	1.58,1.59
		Trace siltstone, lighter shale		
1686-137	4163m	A 98% Shale, fissile, mod. hard, non-calc., dark grey to dark olive grey	N3-5Y3/1	1.01
		Minor red shale, silty mudstone		
1686-138	4172m	A 65% Mudstone, v. sl. silty in part, blocky to subplaty, mod. soft, non-calc., dark olive grey	5Y3/1	1.75
		B 35% Shale, fissile, mod. hard, non-calc., dark grey	N3	1.25
		Significant cavings		
1686-139	4181m	A 80% Shale, as 1686-138B	N3	1.29
		B 20% Mudstone, as 1686-138A	5Y3/1	1.71
		Trace red mudstone		
1686-140	4190m	A 80% Shale, fissile, mod. hard, non-calc., dark grey to dark greenish grey	N3-5G4/1	0.98
		B 20% Mudstone, occ. sl. silty, blocky, mod. soft, non-calc., dark olive grey	5Y3/1	1.62,1.62

Abbreviations = arenaceous, argillaceous, calcareous, Cut, dolomitic, Fluorescence, foraminifera, fossiliferous
Lost Circulation Material, moderately, occasionally, slightly, very

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GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	GSA Colour Code	TOTAL ORGANIC CARBON (Wt. % of Rock)
1686-142	4226m	A 98% Shale, fissile, mod. hard, non-calc., dark grey to medium dark grey Minor lighter shale, red shale	N3-4	1.45
1686-144	4253m	A 98% Shale, as 1686-142A Trace silty mudstone, red shale	N3-4	0.90
1686-145	4271m	A 90% Shale, as 1686-142A	N3-4	1.35
		B 10% Mudstone, sl. silty in part, blocky to subplaty, mod. soft, non-calc., dark olive grey Trace silty mudstone, red shale	5Y3/1	1.09
1686-146	4280m	A 95% Shale, fissile, mod. hard, non-calc., dark grey to dark olive grey	N3-5Y3/1	1.01
		B 5% Mudstone, as 1686-145B Minor red shale	5Y3/1	1.42,1.43
1686-147	4289m	A 98% Shale, fissile, mod. hard, non-calc., dark grey to medium dark grey Trace silty mudstone, red shale	N3-4	1.21
1686-149	4298m	A 98% Shale, fissile, mod. hard, non-calc., dark grey Trace lighter shale	N3	1.65
1686-150	4307m	A 98% Shale, fissile, mod. hard, non-calc., dark grey to dark olive grey	N3-5Y3/1	1.82
1686-151	4316m	A 98% Shale, as 1686-150A	N3-5Y3/1	2.39
1686-152	4325m	A 98% Shale, as 1686-150A	N3-5Y3/1	2.38,2.40
1686-153	4334m	A 98% Shale, fissile, mod. hard, non-calc., dark grey to olive grey	N3-5Y3/1	2.07
1686-154	4348m	A 98% Shale, grading to mudstone (?), fissile to subplaty(?), mod. hard, non-calc., dark grey to dark olive grey	N3-5Y3/1	2.12
1686-155	4352m	A 98% Shale, as 1686-154A	N3-5Y3/1	2.35
1686-156	4361m	A 98% Shale, as 1686-154A	N3-5Y3/1	2.18
1686-157	4370m	A 98% Shale, as 1686-154A	N3-5Y3/1	1.86
1686-158	4379m	A 98% Shale, fissile, mod. hard, non-calc., dark grey to dark olive grey	N3-5Y3/1	1.58,1.48
1686-159	4388m	A 98% Shale, as 1686-158A	N3-5Y3/1	1.26
1687-005	4428.56m	A 98% Sandstone, fine to med. grained, ang. to fairly poorly sorted, micaceous, very light grey	N8	
1687-006	4434.19m	A 98% Sandstone, fine to coarse grained, ang. to subang., fairly poorly sorted, very light grey	N8	
1687-007	4437.00m	A 98% Sandstone, as 1687-006A	N8	

Abbreviations = arenaceous, argillaceous, calcareous, Cut, dolomitic, Fluorescence, foraminifera, fossiliferous
Lost Circulation Material, moderately, occasionally, slightly, very

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GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (Wt. % of Rock)
1686-165	4451m	A 80% Sandstone, gen., unconsol., fine to med. grained, subang. to subround, fairly well sorted, white	N9	
		B 10% Mudstone, subfissile to platy, mod. hard, non-calc., carbonaceous, medium dark grey	N4	0.93
		C 10% Silty mudstone, subfissile to platy, mod. hard, non-calc., micaceous, sl. carbonaceous, olive black	5YR2/1	1.06
1686-168	4460m	A 80% Sandstone, as 1686-165A	N9	
		B 10% Silty mudstone, as 1686-165C	5YR2/1	
		C 10% Mudstone, as 1686-165B	N4	1.60
1687-008	4469.92m	A 98% Shale, fissile, mod. hard, non-calc., occ. carb. flecks, micaceous, greyish black	N2	1.97
1687-009	4471.02m	A 98% Sandstone, fine to coarse grained, ang. to subang., fairly well sorted, very light grey	N8	
1687-010	4475.57m	A 98% Sandstone, v. fine to fine grained, subang., fairly well sorted, Weak milky C, very light grey	N8	
1687-011	4482.86m	A 98% Sandstone, fine to coarse grained, ang. to subang., mod. to fairly poorly sorted, Dull yellow F, Milky C, pale yellowish brown	10YR6/2	
1687-012	4488.50m	A 98% Sandstone, fine to med. grained, ang. to subang., fairly well sorted, Milky C, sl. micaceous, pale orange	10YR7/2	
1687-013	4493.69m	A 98% Sandstone, fine to v. coarse grained, ang. to subang., poorly sorted, Milky C, pale yellowish brown	10YR6/2	
1687-014	4498.67m	A 98% Sandstone, fine to coarse grained, subang. to ang., fairly poorly sorted, Milky C, greyish orange pink	5YR7/2	
1687-015	4501.83m	A 98% Sandstone, fine to med. grained, subang. to ang., fairly poorly sorted, Milky C, greyish orange pink	5YR7/2	
1686-173	4523m	A 95% Sandstone, often unconsol., fine to med. grained, subang. to subround, fairly well sorted, very pale orange to white	10YR8/2-N9	
		B 5% Silty mudstone, sl. carbonaceous, subfissile to platy, mod. hard, non-calc., micaceous, brownish black	5YR2/1	

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GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (Wt. % of Rock)
1686-179	4568m	A 95% Sandstone, often unconsol., fine grained, subang. to subround, well sorted, white	N9	
		B 5% Shale, carbonaceous, sl. silty, subfissile, mod. hard, non-calc., sl. micaceous, brownish black	5YR2/1	1.65
1686-180	4577m	A 95% Sandstone, as 1686-179A	N9	
		B 5% Shale, as 1686-179B	5YR2/1	1.45
1686-181	4586m	A 95% Sandstone, often unconsol., v. fine to fine grained, subang. to subrounded, well sorted, very pale orange to very light grey	10YR8/2-N8	
		B 5% Shale, carbonaceous, sl. silty in party, fissile, mod. hard, non-calc., micaceous, brownish black	5YR2/1	1.60
1686-182	4595m	A 95% Sandstone, as 1686-181A	10YR8/2-N8	
		B 5% Shale, as 1686-181B	5YR2/1	1.57
1686-183	4604m	A 95% Sandstone, often unconsol., v. fine to fine grained, subang. to subround, well sorted, very pale orange to light grey	10YR8/2-N7	
		B 5% Shale, as 1686-181B	5YR2/1	1.48
1686-184	4613m	A 90% Sandstone, occ. unconsol., v. fine to fine grained, subang. to subround, well sorted, very light grey	N8	
		B 10% Shale, carbonaceous, sl. silty in part, fissile, mod. hard, non-calc., micaceous, brownish black	5YR2/1	1.72
1686-186	4631m	A 90% Sandstone, unconsol. in part, fine to med. grained, subang. to subround, fairly well sorted, very light grey to very pale orange	N8-10YR8/2	
		B 10% Shale, carbonaceous, sl. silty in part, fissile, mod. hard, non-calc., micaceous, brownish black Minor LCM	5YR2/1	2.03
1686-187	4640m	A 90% Sandstone, as 1686-186A	N9-10YR8/2	
		B 10% Shale, as 1686-186B Minor LCM	5YR2/1	1.43,1,45
1686-188	4649m	A 85% Sandstone, as 1686-186A	N9-10YR8/2	
		B 15% Shale, as 1686-186B Trace LCM	5YR2/1	1.58
1686-189	4658m	A 85% Sandstone, fine to med. grained, subang. to subrounded, well sorted, very light grey to very pale orange	N8-10YR8/2	
		B 15% Shale, carbonaceous, rarely sl. silty, fissile, mod. hard, non-calc., sl. micaceous, brownish black	5YR2/1	1.55

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Lost Circulation Material, moderately, occasionally, slightly, very

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ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (Wt. % of Rock)
1686-190	4667m	A 90% Sandstone, as 1686-189A B 10% Shale, as 1686-189B	N8-10YR8/2 5YR2/1	1.84
1687-016	4672.00m	A 98% Sandstone, fine to med. grained, subang. to ang., fairly poorly sorted, with poorly developed argill. laminae, very light grey	N8	
1687-017	4690.93m	A 98% Sandstone, fine to med. grained, subang., fairly poorly sorted, argill. matrix, with occ poorly developed argill. beds, light greenish grey	5GY9/1	
1687-018	4696.29m	A 98% Sandstone, v. fine to fine grained, subang., mod. sorted, argill. matrix, rare poorly developed argill./carb. laminae, light bluish grey	5B7/1	
1686-196	4739m	A 95% Sandstone, often unconsol., med. to coarse grained, subang. to subrounded, mod. to fairly well sorted, very light grey to very pale orange	N8-10YR8/2	
		B 5% Shale, carbonaceous rarely sl. silty, fissile, mod. hard, non-calc., sl. micaceous, brownish black	5YR2/1	
1686-205	4820m	A 95% Sandstone, often unconsol., fine to coarse grained, subang. to subrounded, mod. sorted, very light grey to very pale orange	N8-10YR8/2	
		B 5% Shale, carbonaceous, occ. sl. silty, fissile, mod. hard, non-calc., micaceous, brownish black	5YR2/1	

Abbreviations = arenaceous, argillaceous, calcareous, Cut, dolomitic, Fluorescence, foraminifera, fossiliferous
Lost Circulation Material, moderately, occasionally, slightly, very

TABLE 2A

CONCENTRATION (μL GAS/KG ROCK) OF C_1 - C_7 HYDROCARBONS IN HEAD SPACE GAS

GEOCHEM SAMPLE NUMBER	DEPTH	C_1 Methane	C_2 Ethane	C_3 Propane	iC_4 Isobutane	nC_4 Butane	TOTAL C_1 - C_4	TOTAL C_2 - C_4	% GAS WETNESS	TOTAL C_5 - C_7	$\frac{iC_4}{nC_4}$
1686-062	3533	14239	971	651	170	198	16229	1990	12.3	247	0.86
1686-065	3542	11884	1654	1088	340	216	15182	3298	21.7	230	1.57
1686-067	3551	18040	3638	2847	875	712	26112	8072	30.9	750	1.23
1686-069	3569	37501	7883	6936	2345	2527	57192	19691	34.4	3076	0.93
1686-070	3578	17040	3621	2882	866	1027	25436	8396	33.0	1182	0.84
1686-073	3632	34172	5793	4356	1097	1541	46959	12787	27.2	1648	0.71
1686-074	3650	29697	5631	3890	839	1516	41573	11876	28.6	1535	0.55
1686-078	3665	43109	2407	1713	441	588	48258	5149	10.7	745	0.75
1686-079	3686	24323	1876	1209	213	404	28025	3702	13.2	313	0.53
1686-083	3704	14923	1784	1380	283	441	18811	3888	20.7	416	0.64
1686-086	3722	26246	2448	1777	291	1247	32009	5763	18.0	1655	0.23
1686-089	3731	31241	3430	2136	216	834	37857	6616	17.5	697	0.26
1686-090	3740	14568	2304	1637	189	896	19594	5026	25.7	1550	0.21
1686-091	3758	7518	1249	921	105	383	10176	2658	26.1	306	0.27
1686-092	3785	23445	3689	3175	432	1204	31945	8500	26.6	924	0.36
1686-093	3803	1445	236	215	37	97	2030	585	28.8	193	0.38
1686-094	3812	299	41	80	12	68	500	201	40.2	193	0.18
1686-099	3830	25640	1587	1007	166	442	28842	3202	11.1	439	0.38
1686-105	3848	16574	1795	995	116	407	19887	3313	16.7	329	0.29
1686-108	3866	9055	918	525	69	209	10776	1721	16.0	140	0.33
1686-109	3885	7376	1809	1353	212	617	11367	3991	35.1	718	0.34
1686-111	3902	21452	2555	1145	150	364	25666	4214	16.4	448	0.41
1686-113	3920	16359	789	442	63	177	17830	1471	8.3	262	0.36
1686-114	3965	44683	3389	1334	162	505	50073	5390	10.8	859	0.32
1686-116	3992	37117	11706	5530	808	2513	57674	20557	35.6	2670	0.32
1686-118	4010	2572	798	374	50	167	3961	1389	35.1	537	0.30
1686-119	4035	54272	11590	9684	1161	5571	82278	28006	34.0	14135	0.21
1686-122	4053 MUD	12618	2531	1499	210	1094	17952	5334	29.7	4169	0.19
1686-126	4082	31338	21901	22647	14784	36664	127334	95996	75.4	65316	0.40
1686-128	4096	25200	17242	17940	11573	29015	100970	75770	75.0	52322	0.40

TABLE 2A

CONCENTRATION (μL GAS/KG ROCK) OF C_1 - C_7 HYDROCARBONS IN HEAD SPACE GAS

GEOCHEM SAMPLE NUMBER	DEPTH	C_1 Methane	C_2 Ethane	C_3 Propane	iC_4 Isobutane	nC_4 Butane	TOTAL C_1 - C_4	TOTAL C_2 - C_4	% GAS WETNESS	TOTAL C_5 - C_7	$\frac{iC_4}{nC_4}$
1686-131	4109	44587	29573	29959	20026	44366	168511	123924	73.5	76269	0.45
1686-133	4118	29877	19058	18830	12460	17701	97926	68049	69.5	42598	0.70
1686-136	4154	2760	4327	12421	3197	16229	38934	36174	92.9	28014	0.20
1686-140	4190	31662	20927	19022	3336	14270	89217	57555	64.5	28767	0.23
1686-142	4226	53102	18067	16292	2332	10528	100321	47219	47.1	24876	0.22
1686-144	4253	28434	14194	10821	1337	5791	60577	32143	53.1	15493	0.23
1686-145	4271	31498	22123	14444	1724	5779	75568	44070	58.3	12917	0.30
1686-146	4280	44241	34945	26370	2989	12058	120603	76362	63.3	23026	0.25
1686-149	4298	128941	62259	44698	6041	21791	263730	134789	51.1	41756	0.28
1686-150	4307	47706	25332	17175	2270	8477	100960	53254	52.7	15529	0.27
1686-152	4325	131674	84640	71270	10643	31481	329708	198034	60.1	34994	0.34
1686-154	4348	91991	45645	30369	4085	14144	186234	94243	50.6	19476	0.29
1686-157	4370	24059	13318	9524	1237	2984	51122	27063	52.9	2905	0.41
1686-159	4388	44222	13330	9645	1173	3768	72138	27916	38.7	6754	0.31
1686-161	4406	40767	13878	9010	1373	3445	68473	27706	40.5	6568	0.40
1686-163	4424	31918	16506	9818	736	1594	60572	28654	47.3	2870	0.46
1686-165	4451	24485	13028	5954	750	1921	46138	21653	46.9	5483	0.39
1686-168	4460	20003	11574	6016	932	2083	40608	20605	50.7	5966	0.45
1686-171	4496	173507	79050	28138	3791	7807	292293	118786	40.6	15547	0.49
1686-173	4523	651	551	472	114	247	2035	1384	68.0	2576	0.46
1686-174	4532	20686	9514	5644	937	2089	38870	18184	46.8	5222	0.45
1686-176	4550	9179	2146	827	94	284	12530	3351	26.7	831	0.33
1686-179	4568	9961	2915	1046	90	252	14264	4303	30.2	793	0.36
1686-181	4586	5745	2913	1425	236	346	10665	4920	46.1	576	0.68
1686-183	4604	31455	10225	3334	439	853	46306	14851	32.1	1777	0.51
1686-186	4631	170	127	122	21	116	556	386	69.4	448	0.18
1686-188	4649	84180	22424	9594	1576	3504	121278	37098	30.6	8738	0.45
1686-190	4667	20704	5946	1849	367	671	29537	8833	29.9	2022	0.55
1686-192	4694	69715	23236	9665	1144	3448	107208	37493	35.0	5168	0.33

TABLE 2A

CONCENTRATION (μL GAS/KG ROCK) OF C_1 - C_7 HYDROCARBONS IN HEAD SPACE GAS

GEOCHEM SAMPLE NUMBER	DEPTH	C_1 Methane	C_2 Ethane	C_3 Propane	iC_4 Isobutane	nC_4 Butane	TOTAL C_1 - C_4	TOTAL C_2 - C_4	% GAS WETNESS	TOTAL C_5 - C_7	$\frac{iC_4}{nC_4}$
1686-194	4720	60559	27123	13930	832	2354	104798	44239	42.2	39873	0.35
1686-196	4739	49512	40603	18167	1092	3418	112792	63280	56.1	6375	0.32
1686-198	4757	376	367	191	10	33	977	601	61.5	258	0.30
1686-201	4775	13256	7563	2077	92	198	23186	9930	42.8	394	0.46
1686-204	4793	16585	7896	3945	254	454	29134	12549	43.1	712	0.56
1686-205	4820	6850	3788	2078	150	265	13131	6281	47.8	444	0.57
1686-207	4840	10379	5698	2807	236	342	19462	9083	46.7	571	0.69

TABLE 2B

CONCENTRATION (μL GAS/KG ROCK) OF C_1 - C_7 HYDROCARBONS IN CUTTINGS GAS

GEOCHEM SAMPLE NUMBER	DEPTH	C_1 Methane	C_2 Ethane	C_3 Propane	iC_4 Isobutane	nC_4 Butane	TOTAL C_1 - C_4	TOTAL C_2 - C_4	% GAS WETNESS	TOTAL C_5 - C_7	$\frac{iC_4}{nC_4}$
1686-062	3533	6563	911	786	251	307	8818	2255	25.6	486	0.82
1686-065	3542	2023	357	493	166	245	3284	1261	38.4	370	0.68
1686-067	3551	5062	832	1086	393	527	7900	2838	35.9	745	0.75
1686-069	3569	4387	632	953	370	792	7134	2747	38.5	2444	0.47
1686-070	3578	1268	391	546	155	343	2703	1435	53.1	436	0.45
1686-073	3632	8071	1280	1661	409	1328	12749	4678	36.7	2411	0.31
1686-074	3650	9613	1462	1633	409	1473	14590	4977	34.1	2729	0.28
1686-078	3665	5066	391	450	128	410	6445	1379	21.4	1230	0.31
1686-079	3686	9194	951	800	142	521	11608	2414	20.8	1405	0.27
1686-083	3704	4435	515	462	129	457	5998	1563	26.1	555	0.28
1686-086	3722	12834	1489	889	154	589	15955	3121	19.6	665	0.26
1686-089	3731	11383	1352	958	176	786	14655	3272	22.3	831	0.22
1686-090	3740	7323	1093	798	79	419	9712	2389	24.6	499	0.19
1686-091	3758	3961	485	298	86	316	5146	1185	23.0	941	0.27
1686-092	3785	3024	380	710	92	630	4836	1812	37.5	951	0.15
1686-093	3803	1659	255	467	126	396	2903	1244	42.9	633	0.32
1686-094	3812	11465	257	258	41	211	12232	767	6.3	358	0.19
1686-099	3830	12455	480	580	155	508	14178	1723	12.2	1320	0.31
1686-105	3848	19152	1210	1011	109	644	22126	2974	13.4	608	0.17
1686-108	3866	4958	454	450	84	336	6282	1324	21.1	332	0.25
1686-109	3885	17148	1403	807	116	447	19921	2773	13.9	630	0.26
1686-111	3902	3007	372	283	49	264	3975	968	24.4	481	0.19
1686-113	3920	13699	698	421	114	330	15262	1563	10.2	836	0.35
1686-114	3965	6792	645	707	87	474	8705	1913	22.0	1189	0.18
1686-116	3992	15432	4004	3766	757	4099	28058	12626	45.0	5303	0.18
1686-118	4010	7453	2629	2923	688	3059	16752	9299	55.5	3172	0.22
1686-119	4035 MUD	33052	5390	3849	618	3683	46592	13540	29.1	24195	0.17
1686-126	4082	69557	50877	62646	39911	108699	331690	262133	79.0	237666	0.37
1686-128	4096	19607	30568	50415	30731	88055	219376	199769	91.1	199398	0.35

TABLE 2B
CONCENTRATION (μL GAS/KG ROCK) OF C_1 - C_7 HYDROCARBONS IN CUTTINGS GAS

GEOCHEM SAMPLE NUMBER	DEPTH	C_1 Methane	C_2 Ethane	C_3 Propane	iC_4 Isobutane	nC_4 Butane	TOTAL C_1 - C_4	TOTAL C_2 - C_4	% GAS WETNESS	TOTAL C_5 - C_7	$\frac{iC_4}{nC_4}$
1686-131	4109	72846	55011	70542	48349	125955	372703	299857	80.5	290764	0.38
1686-133	4118	43610	52490	78651	30373	137223	342347	298737	87.3	283208	0.22
1686-136	4154	44333	36557	62034	12142	52616	207682	163349	78.7	86348	0.23
1686-140	4190	47984	11904	14487	2855	19098	96328	48344	50.2	92383	0.15
1686-142	4226	20876	5074	7806	2146	12916	48818	27942	57.2	75417	0.17
1686-144	4253	33668	16430	13049	2153	10365	75665	41997	55.5	59971	0.21
1686-145	4271	6174	2686	3063	549	3218	15690	9516	60.7	20411	0.17
1686-146	4280	25232	9988	9140	1365	6536	52261	27029	51.7	30237	0.21
1686-149	4298	95033	23727	34126	7197	41487	201570	106537	52.9	145774	0.17
1686-150	4307	47690	16172	17121	2671	16695	100349	52659	52.5	71776	0.16
1686-152	4325	74371	32515	61138	12555	62930	243509	169138	69.5	127082	0.20
1686-154	4348	110938	31701	29096	3898	19231	194864	83926	43.1	26515	0.20
1686-157	4370	26194	7450	7947	794	5059	47444	21250	44.8	8281	0.16
1686-159	4388	85239	7078	4436	597	2989	100339	15100	15.0	7654	0.20
1686-161	4406	30646	2489	2444	431	1978	37988	7342	19.3	8272	0.22
1686-163	4424	39208	4193	2671	800	1744	48616	9408	19.4	11225	0.46
1686-165	4451	8629	1040	990	208	1042	11909	3280	27.5	6314	0.20
1686-168	4460	17949	6915	3285	583	1523	30255	12306	40.7	7706	0.38
1686-171	4496	7320	6331	4931	1046	2494	22122	14802	66.9	11252	0.42
1686-173	4523	5454	2178	1571	327	971	10501	5047	48.1	6725	0.34
1686-174	4532	1395	812	942	273	724	4146	2751	66.4	5204	0.38
1686-176	4550	5737	1643	699	84	297	8460	2723	32.2	2787	0.28
1686-179	4568	1499	562	412	63	200	2736	1237	45.2	2053	0.31
1686-181	4586	15780	3990	1909	361	839	22879	7099	31.0	4186	0.43
1686-183	4604	3723	1203	807	151	444	6328	2605	41.2	2781	0.34
1686-186	4631	8865	2291	1133	286	717	13292	4427	33.3	4774	0.40
1686-188	4649	5218	18	1673	516	1409	8834	3616	40.9	8235	0.37
1686-190	4667	14197	4083	2032	409	1120	21841	7644	35.0	7579	0.37
1686-192	4694	4804	1587	1801	484	1657	10333	5529	53.5	5186	0.29

TABLE 2B

CONCENTRATION (μL GAS/KG ROCK) OF C_1 - C_7 HYDROCARBONS IN CUTTINGS GAS

GEOCHEM SAMPLE NUMBER	DEPTH	C_1 Methane	C_2 Ethane	C_3 Propane	iC_4 Isobutane	nC_4 Butane	TOTAL C_1 - C_4	TOTAL C_2 - C_4	% GAS WETNESS	TOTAL C_5 - C_7	$\frac{iC_4}{nC_4}$
1686-194	4720	10232	5938	3428	260	878	20736	10504	50.7	3258	0.30
1686-196	4739	3118	1497	1244	117	460	6436	3318	51.6	2894	0.25
1686-198	4757	17221	8984	3360	91	370	30026	12805	42.6	1616	0.25
1686-201	4775	4037	2329	897	45	97	7405	3368	45.5	693	0.46
1686-204	4793	9629	4002	2554	203	392	16780	7151	42.6	1418	0.52
1686-205	4820	2557	1430	1171	102	230	5490	2933	53.4	1079	0.44
1686-207	4840	19986	9350	5193	455	751	35735	15749	44.1	2652	0.61

TABLE 2C
TOTAL CONCENTRATION (μL GAS/KG ROCK) OF C_1 - C_7 HYDROCARBONS (A + B)

GEOCHEM SAMPLE NUMBER	DEPTH	C_1 Methane	C_2 Ethane	C_3 Propane	iC_4 Isobutane	nC_4 Butane	TOTAL C_1 - C_4	TOTAL C_2 - C_4	% GAS WETNESS	TOTAL C_5 - C_7	$\frac{iC_4}{nC_4}$
1686-062	3533	20802	1882	1437	421	505	25047	4245	16.9	734	0.83
1686-065	3542	13907	2011	1581	506	461	18466	4559	24.7	600	1.10
1686-067	3551	23102	4470	3933	1268	1239	34012	10910	32.1	1495	1.02
1686-069	3569	41888	8515	7889	2715	3319	64326	22438	34.9	5520	0.82
1686-070	3578	18308	4012	3428	1021	1370	28139	9831	34.9	1618	0.75
1686-073	3632	42243	7073	6017	1506	2869	59708	17465	29.3	4059	0.52
1686-074	3650	39310	7093	5523	1248	2989	56163	16853	30.0	4264	0.42
1686-078	3665	48175	2798	2163	569	998	54703	6528	11.9	1976	0.57
1686-079	3686	33517	2827	2009	355	925	39633	6116	15.4	1718	0.38
1686-083	3704	19358	2299	1842	412	898	24809	5451	22.0	970	0.46
1686-086	3722	39080	3937	2666	445	1836	47964	8884	18.5	2320	0.24
1686-089	3731	42624	4782	3094	392	1620	52512	9888	18.8	1528	0.24
1686-090	3740	21891	3397	2435	268	1315	29306	7415	25.3	2049	0.20
1686-091	3758	11479	1734	1219	191	699	15322	3843	25.1	1248	0.27
1686-092	3785	26469	4069	3885	524	1834	36781	10312	28.0	1876	0.29
1686-093	3803	3104	491	682	163	493	4933	1829	37.1	826	0.33
1686-094	3812	11764	298	338	53	279	12732	968	7.6	551	0.19
1686-099	3830	38095	2067	1587	321	950	43020	4925	11.4	1758	0.34
1686-105	3848	35726	3005	2006	225	1051	42013	6287	15.0	937	0.21
1686-108	3866	14013	1372	975	153	545	17058	3045	17.9	472	0.28
1686-109	3885	24524	3212	2160	328	1064	31288	6764	21.6	1347	0.31
1686-111	3902	24459	2927	1428	199	628	29641	5182	17.5	929	0.32
1686-113	3920	30058	1487	863	177	507	33092	3034	9.2	1099	0.35
1686-114	3965	51475	4034	2041	249	979	58778	7303	12.4	2048	0.25
1686-116	3992	52549	15710	9296	1565	6612	85732	33183	38.7	7973	0.24
1686-118	4010	10025	3427	3297	738	3226	20713	10688	51.6	3708	0.23
1686-119	4035	87324	16980	13533	1779	9254	128870	41546	32.2	38329	0.19
1686-122	4053 MUD	12618	2531	1499	210	1094	17952	5334	29.7	4169	0.19
1686-126	4082	100895	72778	85293	54695	145363	459024	358129	78.0	302982	0.38
1686-128	4096	44807	47810	68355	42304	117070	320346	275539	86.0	251720	0.36

TABLE 2C
TOTAL CONCENTRATION (μL GAS/KG ROCK) OF C_1 - C_7 HYDROCARBONS (A + B)

GEOCHEM SAMPLE NUMBER	DEPTH	C_1 Methane	C_2 Ethane	C_3 Propane	iC_4 Isobutane	nC_4 Butane	TOTAL C_1 - C_4	TOTAL C_2 - C_4	% GAS WETNESS	TOTAL C_5 - C_7	$\frac{iC_4}{nC_4}$
1686-131	4109	117433	84584	100501	68375	170321	541214	423781	78.3	367033	0.40
1686-133	4118	73487	71548	97481	42833	154924	440273	366786	83.3	325805	0.28
1686-136	4154	47093	40884	74455	15339	68845	246616	199523	80.9	114362	0.22
1686-140	4190	79646	32831	33509	6191	33368	185545	105899	57.1	121150	0.19
1686-142	4226	73978	23141	24098	4478	23444	149139	75161	50.4	100293	0.19
1686-144	4253	62102	30624	23870	3490	16156	136242	74140	54.4	75464	0.22
1686-145	4271	37672	24809	17507	2273	8997	91258	53586	58.7	33328	0.25
1686-146	4280	69473	44933	35510	4354	18594	172864	103391	59.8	53263	0.23
1686-149	4298	223974	85986	78824	13238	63278	465300	241326	51.9	187529	0.21
1686-150	4307	95396	41504	34296	4941	25172	201309	105913	52.6	87305	0.20
1686-152	4325	206045	117155	132408	23198	94411	573217	367172	64.1	162076	0.25
1686-154	4348	202929	77346	59465	7983	33375	381098	178169	46.8	45991	0.24
1686-157	4370	50253	20768	17471	2031	8043	98566	48313	49.0	11186	0.25
1686-159	4388	129461	20408	14081	1770	6757	172477	43016	24.9	14408	0.26
1686-161	4406	71413	16367	11454	1804	5423	106461	35048	32.9	14840	0.33
1686-163	4424	71126	20699	12489	1536	3338	109188	38062	34.9	14095	0.46
1686-165	4451	33114	14068	6944	958	2963	58047	24933	43.0	11797	0.32
1686-168	4460	37952	18489	9301	1515	3606	70863	32911	46.4	13671	0.42
1686-171	4496	180827	85381	33069	4837	10301	314415	133588	42.5	26799	0.47
1686-173	4523	6105	2729	2043	441	1218	12536	6431	51.3	9301	0.36
1686-174	4532	22081	10326	6586	1210	2813	43016	20935	48.7	10425	0.43
1686-176	4550	14916	3789	1526	178	581	20990	6074	28.9	3618	0.31
1686-179	4568	11460	3477	1458	153	452	17000	5540	32.6	2845	0.34
1686-181	4586	21525	6903	3334	597	1185	33544	12019	35.8	4762	0.50
1686-183	4604	35178	11428	4141	590	1297	52634	17456	33.2	4558	0.45
1686-186	4631	9035	2418	1255	307	833	13848	4813	34.8	5222	0.37
1686-188	4649	89398	22442	11267	2092	4913	130112	40714	31.3	16972	0.43
1686-190	4667	34901	10029	3881	776	1791	51378	16477	32.1	9601	0.43
1686-192	4694	74519	24823	11466	1628	5105	117541	43022	36.6	10353	0.32

TABLE 2C

TOTAL CONCENTRATION (μL GAS/KG ROCK) OF C_1 - C_7 HYDROCARBONS (A + B)

GEOCHEM SAMPLE NUMBER	DEPTH	C_1 Methane	C_2 Ethane	C_3 Propane	iC_4 Isobutane	nC_4 Butane	TOTAL C_1 - C_4	TOTAL C_2 - C_4	% GAS WETNESS	TOTAL C_5 - C_7	$\frac{iC_4}{nC_4}$
1686-194	4720	70791	33061	17358	1092	3232	125534	54743	43.6	43131	0.34
1686-196	4739	52630	42100	19411	1209	3878	119228	66598	55.9	9268	0.31
1686-198	4757	17597	9351	3551	101	403	31003	13406	43.2	1875	0.25
1686-201	4775	17293	9892	2974	137	295	30591	13298	43.5	1086	0.46
1686-204	4793	26214	11898	6499	457	846	45914	19700	42.9	2130	0.54
1686-205	4820	9407	5218	3249	252	495	18621	9214	49.5	1523	0.51
1686-207	4840	30365	15048	8000	691	1093	55197	24832	45.0	3223	0.63

TABLE 3a

ROCKEVAL PYROLYSIS DATA

GEOCHEM SAMPLE NUMBER	DEPTH	TOC (%)	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Production INDEX	Hydrogen INDEX	Oxygen INDEX	Tmax (%C)
1686-126A	4082	6.44	5.89	15.49	1.71	0.28	240.5	26.6	439
1686-128A	4096	6.17	3.67	11.11	1.98	0.25	180.1	32.1	435
1686-130A	4100	6.45	4.46	11.56	2.33	0.28	179.2	36.1	432
1686-131A	4109	6.19	4.45	9.82	2.50	0.31	158.6	40.4	433
1686-133A	4118	6.42	4.36	8.34	2.63	0.34	129.9	41.0	434
1686-134A	4136	6.07	2.82	5.58	1.29	0.34	91.9	21.3	434
1686-135A	4145	1.26	0.33	0.16	1.10	0.67	12.7	87.3	379
1686-136A	4154	1.58	0.51	1.00	0.42	0.34	63.3	26.6	444
1686-137A	4163	1.01	0.21	0.21	0.16	0.50	20.8	15.8	434
1686-138A	4172	1.75	0.60	1.87	1.18	0.24	106.9	67.4	443
1686-139A	4181	1.29	0.24	0.42	0.21	0.36	32.6	16.3	440
1686-140A	4190	0.98	0.20	0.25	0.25	0.44	25.5	25.5	444
1686-142A	4226	1.45	0.28	0.37	0.79	0.43	25.5	54.5	416
1686-144A	4253	0.90	0.16	0.19	0.54	0.46	21.1	60.0	445
1686-145A	4271	1.35	0.33	0.68	0.30	0.33	50.4	22.2	447
1686-146A	4280	1.01	0.13	0.24	0.19	0.35	23.8	18.8	447
1686-147A	4289	1.21	0.21	0.75	0.21	0.22	62.0	17.4	449
1686-149A	4298	1.65	0.23	0.17	0.21	0.57	10.3	12.7	424
1686-150A	4307	1.82	0.26	0.24	0.30	0.52	13.2	16.5	384
1686-151A	4316	2.39	0.47	0.92	0.65	0.34	38.5	27.2	446
1686-152A	4325	2.39	0.40	0.37	0.44	0.52	15.5	18.4	381
1686-153A	4334	2.07	0.34	0.34	0.32	0.50	16.4	15.5	428
1686-154A	4348	2.12	0.34	0.63	0.69	0.35	29.7	32.5	440
1686-155A	4352	2.35	0.41	0.50	0.78	0.45	21.3	33.2	442
1686-156A	4361	2.18	0.29	0.35	0.44	0.45	16.1	20.2	436
1686-157A	4370	1.86	0.20	0.29	0.40	0.41	15.6	21.5	441
1686-158A	4379	1.50	0.17	0.19	0.19	0.47	12.7	12.7	376
1686-159A	4388	1.26	0.10	0.11	0.50	0.48	8.7	39.7	394
1686-165B	4451	0.93	0.08	0.28	0.11	0.22	30.1	11.8	440
1686-168B	4460	1.22	0.16	0.76	0.43	0.17	62.3	35.2	458
1686-179B	4568	1.65	0.24	1.59	0.09	0.13	96.4	5.5	457
1686-180B	4577	1.45	0.28	1.15	0.07	0.20	79.3	4.8	458
1686-181B	4586	1.60	0.34	1.70	0.05	0.17	106.2	3.1	454
1686-182B	4595	1.57	0.24	2.24	0.10	0.10	142.7	6.4	453
1686-183B	4604	1.48	0.27	1.14	0.33	0.19	77.0	22.3	458
1686-184B	4613	1.72	0.36	2.12	0.12	0.15	123.3	7.0	454
1686-186B	4631	2.03	0.30	2.02	0.10	0.13	99.5	4.9	458
1686-187B	4640	1.44	0.26	1.30	0.07	0.17	90.3	4.9	457
1686-188B	4649	1.58	0.35	1.34	0.33	0.21	84.8	20.9	456
1686-189B	4658	1.55	0.30	1.22	0.24	0.20	78.7	15.5	458
1686-190B	4667	1.84	0.40	2.15	0.15	0.16	116.8	8.2	454

TABLE 3b

ROCKEVAL PYROLYSIS DATA-CORE SAMPLES

GEOCHEM SAMPLE NUMBER	DEPTH (metres)	S1 (mg/g)	S2 (mg/g)	Tmax (°C)
1687-004	4053.18	11.85	10.40	437
1687-005	4428.56	0.10	0.06	
1687-006	4434.19	0.22	0.06	
1687-007	4437.00	0.30	0.05	
1687-008	4469.92	0.70	2.35	457
1687-009	4471.02	0.04	0.01	
1687-010	4475.57	1.28	0.04	
1687-011	4482.86	0.42	0.04	
1687-012	4488.50	0.77	0.07	
1687-013	4493.69	0.41	0.03	
1687-014	4498.68	0.25	0.04	
1687-015	4501.83	0.56	0.02	
1687-016	4672.00	0.03	0.03	
1687-017	4690.93	0.04	0.03	
1687-018	4496.29	0.03	0.07	

TABLE 4
GAS – OIL INDEX

GEOCHEM SAMPLE NUMBER	DEPTH	DRY GAS	WET GAS	GASOLINES KEROSENES	GAS OIL DISTILLATE	GAS-OIL INDEX
		% C_1	% $C_2 - C_5$	% $C_6 - C_{14}$	% C_{15+}	$\frac{\% C_1 - C_5}{\text{TOTAL}}$
1687-004A	4053.18	17.49	13.72	59.11	9.68	31.21
1686-126A	4082.00	40.05	8.56	41.24	10.15	48.61
1686-128A	4096.00	15.14	13.37	62.25	9.24	28.51
1686-130A	4100.00	12.33	19.42	61.94	6.31	31.75
1686-131A	4109.00	9.75	14.67	62.80	12.78	24.42
1686-133A	4118.00	10.82	14.18	64.47	10.53	25.00
1686-134A	4136.00	22.80	31.39	44.34	1.47	54.19
1686-138A	4172.00	17.28	43.39	39.02	0.31	60.67
1687-008A	4469.92	29.33	19.17	45.31	6.20	48.50
1686-186B	4631.00	29.06	30.03	40.50	0.42	59.08

TABLE 5a

KEROGEN TYPE AND MATURATION

GEOCHEM SAMPLE NUMBER	DEPTH	ORGANIC MATTER DESCRIPTION					THERMAL MATURATION	
		TYPES >35%; 10–35%; <10%	REMARKS	RE-WORKED (%)	PARTICLE SIZE	PRESERV-ATION	THERMAL ALTERATION INDEX	1 – 10 SCALE
Well 6506/12-7								
1687-004	4053.18m	Am;Al*;W-I(-H)	* passing to amorphous	-	F-M/C	F-G	2 to 2+/2+ (??)	5.4(??)
1686-130A	4100m	I*;W-Am*;Al(-H)	differentiation difficult, organic matter commonly of atypical appearance * includes atypical material	-	M	F	-	-
1686-134A	4136m	I-Am*;W;H-Al	* dark, degraded, finely disseminated, poor quality	-	F-M	P-F	2 to 2+(?)	5 (?)
1686-138A	4172m	I;W-Am*;H-Al	* degraded, disseminated, poor quality, H at 2+ and greater	-	F-M	F-G	2 to 2+/2+	5.3
1686-145A	4271m	I;W-Am*;H-Al	* degraded, disseminated, poor quality	-	F-M	P-F	2 to 2+	5
1686-156A	4361m	Am*;I;W-Al-H	* degraded, disseminated, unrecognisable	-	F-M	P-F	2 to 2+(?)	5 (?)
1686-159A	4388m	Am*;-;W-I-H-Al	* atypical, disseminated, unrecognisable, poor quality	-	F	P	2 to 2+(?)	5 (?)
1487-008	4469.92m	-;W-I-Am-H;Al		-	M	G	2 to 2+/2+	5.4
1686-189B	4658m	I-W;Am*;H	* frequently disseminated, not prime quality, cavings	-	M	F	2+	5.5
1686-205B	4820m	-;W-Am-I;H	** abundant caving at 2 to 2+	-	F-M	F-G	2+ (?)**	5.5(?)

L20

Algal, Amorphous, Herbaceous, Inertinite, Resin, Wood

preservation = Poor, Fair, Good size = Fine, Medium, Coarse

TA1 SCALE	1	1 + to 2–	2–	2	2 to 2+	2+ to 3–	3	3+	4	5
1 – 10 SCALE	1	2	3	4	5	6	7	8	9	10

TABLE 5b

KEROGEN COMPOSITION

GEOCHEM SAMPLE NUMBER	DEPTH	VISUAL ESTIMATE (%) AM	AL	H	W	I
1687-004	4051.18	80	10	1	<10	<5
1686-130A	4100	10*	<10	1	15	70*
1686-134A	4136	40*	1	1	10	50
1686-138A	4172	10*	<5	<5	15	70
1686-145A	4271	20*	1	<10	30	45
1686-156A	4361	70*	1	1	<10	20
1686-159A	4388	85*	1	1	<10	<5
1687-008	4469.92	25	1	10	35	30
1686-189B	4658	20*	-	<10	35	40
1686-205B	4820	30	-	<10	30	30

* see kerogen type and maturation table

TABLE 6
VITRINITE REFLECTANCE DATA

GEOCHEM SAMPLE NUMBER	DEPTH	SAMPLE TYPE	AVERAGE REFLECTIVITY Ro (%), (NUMBER OF PARTICLES)			REMARKS
			1	2	3	
Well 6506/12-7						
1687-004A	4053.18m	WR	0.53(11)	0.72(17)	0.92(3)	
1686-130A	4100m	WR	0.55(12)	0.79(8)	0.99(12)	
1686-134A	4136m	WR	0.56(3)	0.85(14)	1.05(3)	
1686-138A	4172m	WR	0.71(2)	0.93(3)	1.07(4)	
1686-145A	4271m	WR	0.55(5)	0.74(4)		
1686-152A	4325m	WR	0.73(2)	1.08(2)		
1686-159A	4388m	WR	0.86(1)			
1687-008A	4469.92m	WR	0.76(6)	0.94(11)	1.09(3)	
1686-189B	4658m	WR	0.72(8)	0.90(9)	1.09(3)	
1686-190B	4667m	KC	0.88(70)			
1686-205A	4820m	WR	0.71(5)	0.89(15)	1.09(4)	

CT—Catch cuttings; CO—core; WR—whole rock; KC—kerogen concentrate. Preferred values underlined. *Reworked

Table 7

METHYL PHENANTHRENE INDEX

SAMPLE NUMBER	DEPTH	(1) % AREA	(1) % HEIGHT	(2) % AREA	(2) % HEIGHT
1686-126A	4082.00	0.53	0.54	0.62	0.58
1686-130A	4100.00	0.48	0.64	0.60	0.58
1686-131A	4109.00	0.48	0.51	0.51	0.52
1686-133A	4118.00	0.65	0.47	0.74	0.45
1686-134A	4136.00	0.58	0.67	0.61	0.63
1686-136A	4154.00	0.57	0.75	0.71	0.73
1686-138A	4172.00	0.51	0.59	0.57	0.58
1686-145A	4271.00	0.57	0.63	0.69	0.59
1686-151A	4316.00	0.64	0.78	0.80	0.93
1686-152A	4325.00	0.61	0.80	0.61	0.87
1686-153A	4334.00	0.68	0.95	0.76	0.84
1686-154A	4348.00	0.62	1.00	0.79	0.91
1686-155A	4352.00	0.65	0.84	0.78	0.94
1686-008A	4469.92	0.66	0.76	0.73	0.75
1686-180B	4577.00	0.53	0.68	0.67	0.70
1686-181B	4586.00	0.71	1.05	0.77	0.97
1686-184B	4613.00	0.66	1.09	0.81	0.95
1686-186B	4631.00	0.11	0.13	0.15	0.11
1686-188B	4649.00	0.67	0.96	0.80	0.89
1686-190B	4667.00	0.72	0.96	0.94	0.86
1686-001	DST-1	0.71	0.95	0.89	0.87
1686-002	DST-2	0.77	1.13	0.83	1.09
1686-003	DST-3	0.82	0.98	0.99	0.91

TABLE 8

THERMAL BITUMEN (%) COMPOSITION

WELL :6506/12-7

SAMPLE NUMBER	DEPTH	% Cx-C5	% C6-C14	% C15+	% C17	ABUNDANCE ppm
1686-126	4082	4.48	51.37	44.15	1.32	5301
1686-128	4096	4.63	51.20	44.18	1.10	3303
1686-130	4100	5.76	56.72	37.52	1.38	4014
1686-131	4109	5.22	53.60	41.18	1.30	4005
1686-133	4118	4.19	68.10	27.70	1.11	3924
1686-134	4136	8.84	71.14	20.02	0.89	2538
1686-008	4469.92	20.78	70.88	8.34	0.58	273
1686-010	4475.57	1.85	17.03	81.12	2.62	629
1686-181	4586	12.53	68.26	19.21	1.01	306
1686-186	4631	17.39	66.69	15.92	0.71	270

TABLE 9a

CONCENTRATION (PPM) OF EXTRACTED C_{15+} MATERIAL IN ROCK

JOB GEOCHEM SAMPLE NUMBER	LITHO	DEPTH	TOTAL EXTRACT	HYDROCARBONS			NON HYDROCARBONS			
				Saturates	Aromatics	TOTAL	Preciptd. Asphaltenes	Eluted NSO's	Non-eluted NSO's	TOTAL
1686-126A		4082	3058	1827	464	2290	159	603	6	768
1686-128A		4096	4312	2607	690	3297	231	779	4	1015
1686-130A		4100	8182	4788	1393	6181	735	1251	15	2001
1686-131A		4109	2808	1582	414	1995	239	565	8	812
1686-133A		4118	4642	2172	923	3094	628	915	4	1547
1686-134A		4136	1900	800	295	1095	169	634	3	805
1686-136A		4154	811	106	34	140	36	634	1	671
1686-138A		4172	1545	582	207	789	148	606	1	755
1686-145A		4271	858	318	98	415	77	365	1	443
1686-151A		4316	697	139	106	245	54	395	3	452
1686-152A		4325	1314	332	191	523	144	644	3	791
1686-153A		4334	877	123	118	241	236	400	1	636
1686-154A		4348	1153	224	212	436	109	604	4	717
[illegible]86-155A		4352	1364	395	331	725	225	412	3	639
[illegible]686-008		4469.92	2201	1792	160	1952	72	174	3	249
1686-180B		4577	5342	1500	508	2008	483	2833	17	3333
1686-181B		4586	3373	1505	514	2019	235	1116	3	1354
1686-184B		4613	1901	908	307	1215	177	503	5	686
1686-186B		4631	3836	1418	766	2184	205	1443	4	1652
1686-188B		4649	1571	765	256	1022	121	425	3	549
1686-190B		4667	3833	1439	626	2065	537	1221	10	1769

S = shale, SS = sandstone, L = limestone, D = dolomite, M = mixed, see Table 1

TABLE 9a

C_{15+} TOTAL EXTRACT (ppm of rock)

SAMPLE NO.	DEPTH (m)	TOTAL EXTRACT (ppm)
1687-005A	4428.56	51
1687-006A	4434.19	106
1687-007A	4437.00	291
1687-009A	4471.02	127
1687-010A	4475.57	168
1687-011A	4482.86	528
1687-012A	4488.50	91
1687-013A	4493.69	154
1687-014A	4498.67	92
1687-015A	4501.83	322
1687-016A	4672.00	144
1687-017A	4690.93	105
1687-018A	4696.29	158

TABLE 9b

COMPOSITION (NORMALISED %) OF C_{15+} MATERIAL

JOB				HYDROCARBONS		NON HYDROCARBONS		
GEOCHEM SAMPLE NUMBER		LITHO	DEPTH	Saturates	Aromatics	Preciptd. Asphaltenes	Eluted NSO's	Non eluted NSO's
1686-126A			4082	59.72	15.16	5.20	19.72	0.20
1686-128A			4096	60.47	15.99	5.37	18.07	0.10
1686-130A			4100	58.52	17.02	8.98	15.29	0.18
1686-131A			4109	56.35	14.73	8.52	20.14	0.27
1686-133A			4118	46.78	19.88	13.53	19.71	0.09
1686-134A			4136	42.12	15.50	8.87	33.35	0.15
1686-136A			4154	13.08	4.23	4.47	78.15	0.08
1686-138A			4172	37.71	13.39	9.60	39.22	0.09
1686-145A			4271	37.02	11.40	8.96	42.49	0.13
1686-151A			4316	19.91	15.19	7.78	56.76	0.37
1686-152A			4325	25.26	14.54	10.97	48.98	0.25
1686-153A			4334	14.01	13.43	26.86	45.60	0.10
1686-154A			4348	19.39	18.38	9.46	52.41	0.36
1686-155A			4352	28.92	24.24	16.46	30.18	0.21
1686-008			4469.92	81.45	7.25	3.25	7.92	0.12
1686-180B			4577	28.08	9.52	9.05	53.04	0.31
1686-181B			4586	44.61	15.25	6.96	33.08	0.10
1686-184B			4613	47.76	16.16	9.34	26.48	0.27
1686-186B			4631	36.97	19.98	5.34	37.61	0.11
1686-188B			4649	48.71	16.32	7.73	27.06	0.17
1686-190B			4667	37.53	16.33	14.02	31.85	0.27
1687-003	DST-3		4474-514	88.91	5.45	1.00	4.16	0.49
1687-002	DST-2		4702-7	87.48	6.74	0.93	4.56	0.29
1687-001	DST-1		4741-48	87.48	6.31	1.26	4.55	0.40

S – shale, SS – sandstone, L – limestone, D – dolomite, M – mixed see Table 1

TABLE 10

SIGNIFICANT RATIOS (%) OF C_{15+} FRACTIONS AND ORGANIC CARBON

JOB / GEOCHEM SAMPLE NUMBER	LITHO	DEPTH	ORGANIC CARBON (wt. %)	HYDROCARBONS / TOTAL EXTRACT	HYDROCARBONS / ORG. CARBON	TOTAL EXTRACT / ORG. CARBON	SATURATES / AROMATICS
1686-126A		4082	4.95	74.88	4.63	6.18	3.94
1686-128A		4096	5.02	76.46	6.57	8.59	3.78
1686-130A		4100	4.66	75.55	13.26	17.56	3.44
1686-131A		4109	5.61	71.08	3.56	5.00	3.83
1686-133A		4118	5.75	66.67	5.38	8.07	2.35
1686-134A		4136	3.34	57.62	3.28	5.69	2.72
1686-136A		4154	1.17	17.30	1.20	6.93	3.09
1686-138A		4172	1.26	51.10	6.26	12.26	2.82
1686-145A		4271	1.11	48.42	3.74	7.73	3.25
1686-151A		4316	2.33	35.09	1.05	2.99	1.31
1686-152A		4325	2.30	39.80	2.27	5.71	1.74
1686-153A		4334	2.08	27.44	1.16	4.22	1.04
1686-154A		4348	2.23	37.78	1.95	5.17	1.06
1686-155A		4352	2.26	53.15	3.21	6.04	1.19
1686-008		4469.92	1.86	88.70	10.49	11.83	11.23
1686-180B		4577	1.40	37.60	14.35	38.15	2.95
1686-181B		4586	1.36	59.87	14.85	24.80	2.92
1686-184B		4613	1.59	63.91	7.64	11.96	2.96
1686-186B		4631	1.54	56.94	14.18	24.91	1.85
1686-188B		4649	1.67	65.03	6.12	9.41	2.98
1686-190B		4667	1.69	53.86	12.22	22.68	2.30

S – shale, SS – sandstone, L – limestone, D – dolomite, M – mixed, see Table 1.

TABLE 11

COMPOSITION (NORMALISED %) OF C_{15+} SATURATE (PARAFFIN – NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	126A	128A	130A	131A	133A
DEPTH	4082	4096	4100	4109	4118
SAMPLE TYPE					
nC15	13.46	13.06	14.75	13.55	10.68
nC16	12.10	13.16	14.43	12.31	10.28
nC17	10.65	12.78	14.21	11.38	10.44
nC18	10.36	9.70	10.38	8.89	9.24
nC19	8.81	8.93	9.51	9.00	8.76
nC20	7.94	7.49	7.65	7.34	7.81
nC21	6.39	7.30	6.12	6.20	6.69
nC22	5.91	5.38	5.68	4.76	5.98
nC23	4.74	3.94	3.50	4.24	5.18
nC24	4.55	4.51	3.83	4.03	5.34
nC25	2.90	3.46	2.51	3.21	3.82
nC26	2.61	2.50	1.64	3.52	3.35
nC27	1.94	1.92	1.42	2.48	2.79
nC28	1.84	1.34	0.98	2.28	2.31
nC29	1.36	1.44	0.98	1.65	2.23
nC30	1.26	0.86	0.55	1.55	1.51
nC31	0.87	0.86	0.55	1.03	1.20
nC32	0.68	0.48	0.44	0.93	0.72
nC33	0.58	0.38	0.33	0.62	0.64
nC34	0.58	0.29	0.33	0.62	0.64
nC35	0.48	0.19	0.22	0.41	0.40
Paraffin	46.01	49.15	49.78	51.68	44.42
Isoprenoid	4.99	5.52	6.69	6.63	4.60
Naphthene	49.00	45.33	43.53	41.69	50.97
CPI 1 Index	0.92	1.02	0.92	0.96	0.96
CPI 2 Index	0.90	1.16	1.15	0.87	1.04
CPI 3 Index	0.87	1.00	1.08	0.86	0.99
Prist/Phytane	0.96	1.02	0.98	1.34	1.36
Prist/nC17	0.50	0.44	0.47	0.65	0.57
Phytane/nC18	0.53	0.57	0.65	0.62	0.47

$$\text{C.P.I. } 1 = \frac{1}{2}\left(\frac{C21+C23+C25+C27}{C20+C22+C24+C26} + \frac{C21+C23+C25+C27}{C22+C24+C26+C28}\right)$$

$$\text{C.P.I. } 2 = \frac{1}{2}\left(\frac{C25+C27+C29+C31}{C24+C26+C28+C30} + \frac{C25+C27+C29+C31}{C26+C28+C30+C32}\right)$$

$$\text{C.P.I. } 3 = \frac{2x\ (C27)}{C26+C28}$$

Job Number : 1686

CT – ditch cuttings **CO**– core **SWC** – sidewall core

TABLE 11

COMPOSITION (NORMALISED %) OF C_{15+} SATURATE (PARAFFIN – NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	134A	136A	138A	145A	151A
DEPTH	4136	4154	4172	4271	4316
SAMPLE TYPE					
nC15	4.64	0.11	7.43	7.55	16.98
nC16	7.73	1.79	7.66	7.41	13.07
nC17	8.11	7.47	7.90	7.12	10.70
nC18	9.58	14.10	8.02	8.85	11.88
nC19	7.81	11.78	7.90	7.91	9.51
nC20	8.81	11.47	7.25	7.91	6.96
nC21	8.35	9.36	6.12	7.99	5.09
nC22	7.88	8.00	7.07	7.34	4.58
nC23	7.03	6.21	6.71	6.98	4.24
nC24	6.18	6.10	6.24	5.90	3.40
nC25	5.33	4.94	5.35	5.04	2.89
nC26	4.64	4.21	4.87	4.24	2.55
nC27	3.63	3.37	4.10	3.53	2.38
nC28	2.40	3.26	3.33	3.09	1.70
nC29	2.78	2.63	3.39	2.81	1.19
nC30	1.31	1.79	2.02	1.94	0.85
nC31	1.31	1.37	1.66	1.44	0.85
nC32	0.85	0.74	0.89	0.86	0.51
nC33	0.54	0.63	0.89	0.86	0.34
nC34	0.62	0.42	0.71	0.72	0.25
nC35	0.46	0.26	0.48	0.50	0.08
Paraffin	40.81	43.63	50.80	45.56	62.53
Isoprenoid	3.69	4.04	2.72	2.65	3.50
Naphthene	55.50	52.33	46.48	51.79	33.97
CPI 1 Index	1.02	0.95	0.96	1.03	1.01
CPI 2 Index	1.16	1.02	1.09	1.05	1.08
CPI 3 Index	1.03	0.90	1.00	0.96	1.12
Prist/Phytane	1.25	0.76	2.21	0.98	2.00
Prist/nC17	0.62	0.54	0.47	0.40	0.35
Phytane/nC18	0.42	0.37	0.21	0.33	0.16

$$C.P.I.\ 1 = \frac{1}{2}\left(\frac{C21+C23+C25+C27}{C20+C22+C24+C26} + \frac{C21+C23+C25+C27}{C22+C24+C26+C28}\right)$$

$$C.P.I.\ 2 = \frac{1}{2}\left(\frac{C25+C27+C29+C31}{C24+C26+C28+C30} + \frac{C25+C27+C29+C31}{C26+C28+C30+C32}\right)$$

$$C.P.I.\ 3 = \frac{2x\ (C27)}{C26+C28}$$

Job Number : 1686

CT – ditch cuttings **CO**– core **SWC** – sidewall core

TABLE 11

COMPOSITION (NORMALISED %) OF C_{15+} SATURATE (PARAFFIN – NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	152A	153A	154B	155A	1687-008A
DEPTH	4325	4334	4348	4352	4469
SAMPLE TYPE					
nC15	13.24	0.04	10.20	17.36	6.83
nC16	11.27	0.47	10.74	12.37	6.32
nC17	9.30	3.58	10.65	9.99	6.04
nC18	10.14	8.49	11.80	10.23	4.97
nC19	7.89	7.94	9.76	7.85	4.57
nC20	6.62	9.58	8.87	6.42	3.73
nC21	5.63	8.72	7.45	5.23	3.39
nC22	5.63	8.56	6.83	4.99	2.60
nC23	5.21	7.86	4.88	4.28	2.82
nC24	4.79	7.24	4.17	4.04	3.84
nC25	4.23	7.01	3.19	3.57	5.76
nC26	3.80	5.92	2.84	3.33	8.19
nC27	3.10	5.45	2.40	2.38	7.91
nC28	2.68	4.90	1.60	2.14	8.02
nC29	2.25	4.83	1.42	1.90	7.96
nC30	1.41	2.88	0.89	1.19	5.53
nC31	0.99	2.80	0.80	0.95	4.69
nC32	0.56	1.32	0.53	0.48	2.94
nC33	0.56	1.17	0.44	0.48	1.92
nC34	0.42	0.78	0.27	0.48	1.24
nC35	0.28	0.47	0.27	0.36	0.73
Paraffin	46.83	44.72	60.72	52.60	77.88
Isoprenoid	3.03	1.67	5.87	4.88	1.01
Naphthene	50.13	53.61	33.41	42.53	21.11
CPI 1 Index	0.97	1.01	0.98	0.94	0.98
CPI 2 Index	1.04	1.15	1.08	1.03	1.05
CPI 3 Index	0.96	1.01	1.08	0.87	0.98
Prist/Phytane	1.71	0.71	1.79	1.60	2.29
Prist/nC17	0.44	0.43	0.58	0.57	0.15
Phytane/nC18	0.24	0.26	0.29	0.35	0.08

$$\text{C.P.I. } 1 = \frac{1}{2}\,\frac{C21+C23+C25+C27}{C20+C22+C24+C26} + \frac{C21+C23+C25+C27}{C22+C24+C26+C28}$$

Job Number : 1686

$$\text{C.P.I. } 2 = \frac{1}{2}\,\frac{C25+C27+C29+C31}{C24+C26+C28+C30} + \frac{C25+C27+C29+C31}{C26+C28+C30+C32}$$

$$\text{C.P.I. } 3 = \frac{2x\ (C27)}{C26+C28}$$

CT – ditch cuttings **CO**– core **SWC** – sidewall core

TABLE 11

COMPOSITION (NORMALISED %) OF C_{15+} SATURATE (PARAFFIN – NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	180B	181B	184B	186B	188B
DEPTH	4577	4586	4613	4631	4649
SAMPLE TYPE					
nC15	7.10	8.04	9.99	11.51	9.19
nC16	7.92	7.64	9.84	10.44	8.44
nC17	9.39	8.04	10.53	9.81	8.63
nC18	11.10	9.38	10.46	10.97	8.63
nC19	8.98	9.05	9.68	9.28	8.26
nC20	9.14	8.38	8.52	7.67	7.50
nC21	8.16	7.57	7.75	7.23	6.69
nC22	7.18	6.97	6.51	6.78	6.44
nC23	6.37	7.04	5.89	5.89	5.94
nC24	5.31	5.50	4.57	4.64	5.75
nC25	4.33	5.50	3.64	4.01	4.94
nC26	2.86	4.09	2.79	3.03	4.00
nC27	2.45	3.69	2.48	2.50	3.69
nC28	4.33	2.68	1.94	2.14	3.00
nC29	1.80	2.21	1.55	1.34	2.56
nC30	0.98	1.47	1.08	0.89	2.00
nC31	0.98	1.01	0.93	0.71	1.50
nC32	0.41	0.60	0.62	0.36	0.94
nC33	0.49	0.47	0.46	0.36	0.75
nC34	0.33	0.40	0.39	0.18	0.69
nC35	0.41	0.27	0.39	0.27	0.44
Paraffin	50.70	60.11	64.39	51.56	63.58
Isoprenoid	2.11	1.21	1.70	1.52	1.43
Naphthene	47.19	38.68	33.92	46.92	34.99
CPI 1 Index	0.98	1.10	1.07	1.03	1.00
CPI 2 Index	0.91	1.15	1.08	1.07	1.07
CPI 3 Index	0.68	1.09	1.05	0.97	1.05
Prist/Phytane	1.68	2.00	1.83	1.75	1.77
Prist/nC17	0.28	0.17	0.16	0.19	0.17
Phytane/nC18	0.14	0.07	0.09	0.10	0.09

$$\text{C.P.I. } 1 = \frac{1}{2}\,\frac{C21+C23+C25+C27}{C20+C22+C24+C26} + \frac{C21+C23+C25+C27}{C22+C24+C26+C28}$$

$$\text{C.P.I. } 2 = \frac{1}{2}\,\frac{C25+C27+C29+C31}{C24+C26+C28+C30} + \frac{C25+C27+C29+C31}{C26+C28+C30+C32}$$

$$\text{C.P.I. } 3 = \frac{2x\ (C27)}{C26+C28}$$

Job Number : 1686

CT – ditch cuttings **CO**– core **SWC** – sidewall core

TABLE 11

COMPOSITION (NORMALISED %) OF C_{15+} SATURATE (PARAFFIN – NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	190A
DEPTH	4667
SAMPLE TYPE	
nC15	3.13
nC16	4.60
nC17	5.66
nC18	7.91
nC19	7.37
nC20	7.55
nC21	7.08
nC22	7.43
nC23	7.14
nC24	6.90
nC25	6.90
nC26	5.60
nC27	5.19
nC28	4.54
nC29	4.13
nC30	2.65
nC31	2.12
nC32	1.12
nC33	1.30
nC34	1.00
nC35	0.65
Paraffin	49.68
Isoprenoid	1.08
Naphthene	49.24
CPI 1 Index	1.02
CPI 2 Index	1.12
CPI 3 Index	1.02
Prist/Phytane	1.64
Prist/nC17	0.24
Phytane/nC18	0.10

$$\text{C.P.I. } 1 = \frac{1}{2}\,\frac{C21+C23+C25+C27}{C20+C22+C24+C26} + \frac{C21+C23+C25+C27}{C22+C24+C26+C28}$$

$$\text{C.P.I. } 2 = \frac{1}{2}\,\frac{C25+C27+C29+C31}{C24+C26+C28+C30} + \frac{C25+C27+C29+C31}{C26+C28+C30+C32}$$

$$\text{C.P.I. } 3 = \frac{2x\ (C27)}{C26+C28}$$

Job Number : 1686

CT – ditch cuttings **CO**– core **SWC** – sidewall core

TABLE 11

COMPOSITION (NORMALISED %) OF C_{15+} SATURATE (PARAFFIN – NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	001	002	003
DEPTH	4741-4748	4702-4707	4474-4514
SAMPLE TYPE	DST1	DST2	DST3
nC15	10.01	11.29	11.74
nC16	9.34	10.35	11.37
nC17	8.90	8.56	10.25
nC18	7.86	8.75	9.69
nC19	7.86	7.71	8.57
nC20	7.93	7.43	8.20
nC21	6.60	6.21	7.46
nC22	5.86	6.30	5.87
nC23	5.19	5.08	5.22
nC24	4.89	5.27	4.38
nC25	4.67	4.14	4.01
nC26	4.23	3.67	3.73
nC27	4.08	3.39	2.70
nC28	3.63	3.10	1.77
nC29	2.74	2.82	1.68
nC30	2.15	1.69	1.21
nC31	1.48	1.60	0.84
nC32	0.96	1.03	0.47
nC33	0.74	0.75	0.37
nC34	0.59	0.56	0.28
nC35	0.30	0.28	0.19
Paraffin	49.74	53.74	64.48
Isoprenoid	5.64	6.57	7.87
Naphthene	44.62	39.69	27.64
CPI 1 Index	1.00	0.93	1.05
CPI 2 Index	1.03	1.06	1.06
CPI 3 Index	1.04	1.00	0.98
Prist/Phytane	1.55	1.45	1.52
Prist/nC17	0.77	0.85	0.72
Phytane/nC18	0.57	0.57	0.50

$$\text{C.P.I. } 1 = \frac{1}{2}\left(\frac{C21+C23+C25+C27}{C20+C22+C24+C26} + \frac{C21+C23+C25+C27}{C22+C24+C26+C28}\right)$$

$$\text{C.P.I. } 2 = \frac{1}{2}\left(\frac{C25+C27+C29+C31}{C24+C26+C28+C30} + \frac{C25+C27+C29+C31}{C26+C28+C30+C32}\right)$$

$$\text{C.P.I. } 3 = \frac{2x\ (C27)}{C26+C28}$$

Job Number : 1687

CT – ditch cuttings **CO**– core **SWC** – sidewall core

NBS 22 STANDARD	

TABLE 12
CARBON ISOTOPE COMPOSITIONS (°/oo, PDB)

GEOCHEM SAMPLE NUMBER	DEPTH	TOTAL EXTRACT WHOLE OIL	SATURATES	AROMATICS	NSO	ASPHALTENES	KEROGEN	METHANE GAS
1686-121	4044m							-35.86*
1687-004A	4053.18m						-29.75	
1686-126A	4082m	-29.55	-30.50	-29.73	-29.51	-29.26	-28.72	
1686-128A	4096m	-29.73	-30.44	-29.23	-29.26	-28.91	-28.01	
1686-130A	4100m	-29.33	-29.72	-28.89	-28.58	-28.65	-27.34	
1686-131A	4109m	-28.88	-29.02	-28.32	-27.88	-27.81	-26.93	
1686-131								-41.55
1686-133A	4118m	-28.20	-28.65	-27.62	-27.26	-27.18	-26.43	
1686-134A	4136m	-27.52	-28.35	-26.89	-27.56	-25.69	-24.35	
1686-138A	4172m	-27.35	-27.33	-26.52	-27.16	-26.58	-25.67	
1686-141	4200m							-42.33
1687-008A	4469.92m	-28.91	-28.76	-27.89	-27.80	-26.98*	-26.36	
1687-003	4474-4514m	-28.79	-29.15	-27.21	-30.51	-28.91		
1686-181B	4586m	-27.02*	-27.85	-26.70	-27.50	-26.56	-25.61	
1686-186B	4631m	-26.60*	-28.12	-26.84	-31.07	-26.32	-25.64	
1687-002	4702-7m	-28.66	-28.94	-27.39	-28.79	-28.57		
1687-001	4741-48m	-28.66	-28.73	-26.99	-30.98	-28.27		

* SMALL SAMPLE

TABLE 13
BIOMARKER MOLECULAR RATIOS

GEOCHEM SAMPLE NUMBER	SAMPLE DEPTH/ IDENTITY	SAMPLE TYPE	STERANES (m/z 217, 218)				TERPANES (m/z 191, 177)					
			$C_{29}\ \frac{\alpha\alpha\alpha\ 20S\ [Q]}{\alpha\alpha\alpha\ 20R\ [T]}$	$C_{29}\ \frac{\alpha\beta\beta\ 20R\ [R]}{\alpha\alpha\alpha\ 20R\ [T]}$	$C_{27}\ \frac{20SDIAST\ [A]}{20RDIAST\ [B]}$	$\frac{C_{27}\ \beta\beta}{C_{29}\ \beta\beta}(218)$	$\frac{Tm\ [B]}{Ts\ [A]}$	$\frac{C_{29},\ 17\alpha\text{-}NH\ [C]}{[C] + C_{30},\ 17\alpha\text{-}H\ [E]}$	$C_{29}\ \frac{NM\ [D]}{[D] + NH\ [C]}$	$\frac{28,30\text{-}BNH\ [Z]}{[Z] + C_{29},\ 17\text{-}NH\ [C]}$	$\frac{28,30\text{-}BNH\ [Z]}{[Z] + 25,28,30\text{-}TNH\ (177)}$	$C_{31}\ \frac{20S\ [G]}{[G] + 20R\ [H]}$ %
1686-126	4082m		1.50	1.34	1.77	1.30	0.41	0.17	0.19			54%
1686-130	4100m		0.90	1.54	1.96	1.42	0.56	0.31				67%
1686-133	4118m		0.97	1.53	1.63	1.15	0.77	0.36				49%
1686-134	4136m		1.44	2.83	1.05	1.00	1.09	0.42	0.11			58%
1686-152	4325m		0.85	2.07	1.48	0.90	2.31	0.35	0.23			60%
1686-155	4352m		0.95	1.72	1.25	0.86	1.31	0.41	0.07			49%
1686-181	4586m		0.56	0.75	1.32	0.91	1.7	0.34	0.15			50%
1686-186	4631m		1.57	1.24	1.28	1.00	1.87	0.52				52%

[A] etc. REFERS TO IDENTIFICATION ON APPROPRIATE MASS FRAGMENTOGRAM **DIAST** – DIASTERANES **H** – HOPANE **NH** – NORHOPANE **BNH** – BISNORHOPANE

CT – ditch cuttings **CO** – core **SWC** – sidewall core **TNH** – TRISNORHOPANE **NM** – NORMORETANE

TABLE 14

Triterpane Peak Areas (SIR)

M/Z 191

SAMPLE NO	A	B	Z	C	C_1	X	D	E	F	G	H
1686-126	1161	478	-	504	863	478	121	2480	531	1064	899
1686-130	1817	1025	-	1464	1215	989	-	3187	649	1223	590
1686-133	1729	1338	-	2593	1531	1267	-	4601	-	1938	1988
1686-134	443	485	-	1446	352	370	189	1961	-	903	651
1686-152	658	1521	-	2781	1891	911	804	5129	681	3089	2020
1686-155	470	619	-	1125	475	290	92	1603	319	717	725
1686-181	200	345	-	484	126	238	85	939	228	202	197
1686-186	70	131	-	253	-	55	-	233	28	116	105

SAMPLE NO	I	J	J^1	K	K^1	L	L^1	M	M^1
1686-126	1028	1028	588	736	406	516	233	372	226
1686-130	-	1151	804	748	568	-	-	-	-
1686-133	-	1152	1095	834	810	467	304	-	-
1686-134	-	628	277	517	543	429	267	-	-
1686-152	-	1320	1044	1233	916	1427	539	-	-
1686-155	-	588	504	291	217	414	108	-	-
1686-181	-	357	160	-	-	-	-	-	-
1686-186	-	114	65	-	-	-	-	-	-

TABLE 14

Sterane Peak Areas (SIR)

M/Z 217

SAMPLE NO	A	B	C	D	E	F	G	H	I	J	K
1686-126	1616	911	438	-	-	-	357	922	386	182	576
1686-130	2385	1217	577	-	-	-	941	1999	769	361	1048
1686-133	1508	925	417	-	-	-	550	1646	270	558	1299
1686-134	491	465	223	-	-	-	212	578	-	227	346
1686-152	2208	1491	480	-	-	-	1197	3067	500	1348	1528
1686-155	473	377	183	-	-	-	274	450	109	171	291
1686-181	287	217	96	-	-	-	102	231	71	117	163
1686-186	87	68	21	-	-	-	94	83	42	66	63

SAMPLE NO	L	M	N	O	P	Q	R	S	T
1686-126	-	491	305	137	255	450	403	417	300
1686-130	-	655	1085	318	366	355	608	425	393
1686-133	-	548	363	384	328	448	709	565	462
1686-134	-	262	143	92	92	170	334	195	118
1686-152	-	1177	777	303	515	652	1580	1076	762
1686-155	-	217	221	133	104	145	262	146	152
1686-181	-	145	72	106	54	76	103	67	136
1686-186	-	51	21	20	32	52	41	40	33

TABLE 14

Sterane Peak Areas (SIR)

M/Z 218

SAMPLE NO	A&B	C&D	E&F
1686-126	1052	773	806
1686-130	1594	1240	1120
1686-133	1638	1177	1418
1686-134	508	391	507
1686-152	2239	1614	2476
1686-155	421	495	488
1686-181	269	207	296
1686-186	101	83	101

TABLE 14a

Triterpane Peak Heights (SIR)

M/Z 191

SAMPLE NO	A	B	Z	C	C_1	X	D	E	F	G	H	I	J	J^1	K	K^1	L	L^1	M	M^1
1686-126	121	52	-	92	110	55	17	253	57	121	97	-	124	73	79	56	51	35	32	29
1686-130	180	100	-	150	108	108	-	273	77	107	71	-	138	77	82	54	-	-	-	-
1686-133	170	118	-	296	187	115	-	451	-	199	192	60	137	116	113	91	57	49	48	37
1686-134	48	54	-	134	-	53	27	197	-	85	55	-	66	39	42	44	42	28	-	-
1686-152	93	156	-	274	175	74	88	447	82	309	162	-	134	122	135	103	159	62	-	-
1686-155	52	57	-	107	64	37	16	196	42	83	73	-	61	57	46	30	35	21	-	-
1686-181	25	42	-	45	-	23	13	116	32	31	31	-	45	23	-	-	-	-	-	-
1686-186	8	16	-	26	-	7	32	5	13	14	-	-	13	11	-	-	-	-	-	-

TABLE 14a

Sterane Peak Heights (SIR)

M/Z 217

SAMPLE NO	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1686-126	181	114	44	-	-	63	59	104	47	37	78	-	62	39	21	31	33	40	44	38
1686-130	231	121	70	-	-	135	101	190	90	56	109	-	114	67	-	42	58	65	58	47
1686-133	207	115	61	-	-	57	59	169	-	59	113	-	62	52	43	39	53	63	67	59
1686-134	65	57	27	-	-	31	22	69	-	22	39	-	31	22	17	15	20	38	24	17
1686-153	240	169	66	-	-	83	99	308	-	155	152	-	117	86	-	56	64	143	113	88
1686-156	62	46	24	-	-	18	30	54	15	18	36	-	29	26	18	12	17	28	22	16
1686-181	39	24	11	-	-	15	17	27	13	14	17	-	18	8	10	8	12	16	13	12
1686-186	13	8	4	-	-	4	9	9	5	5	7	-	6	4	3	4	6	5	4	5

TABLE 14a

Sterane Peak Heights (SIR)

M/Z 218

SAMPLE NO	A&B	C&D	E&F
1686-126	68	50	54
1686-130	78	59	55
1686-133	97	58	71
1686-134	35	26	33
1686-152	160	95	125
1686-155	32	26	31
1686-181	16	13	17
1686-186			

TABLE 15
BIOMARKER MOLECULAR RATIOS (MRM)

GEOCHEM SAMPLE NUMBER	SAMPLE DEPTH/ IDENTITY	SAMPLE TYPE	STERANES (m/z 217, 218)				TERPANES (m/z 191, 177)					
			$C_{29}\ \frac{\alpha\alpha\alpha\ 20S\ [Q]}{\alpha\alpha\alpha\ 20R\ [T]}$	$C_{29}\ \frac{\alpha\beta\beta\ 20R\ [R]}{\alpha\alpha\alpha\ 20R\ [T]}$	$C_{27}\ \frac{20SDIAST\ [A]}{20RDIAST\ [B]}$	$\frac{C_{27}\ \beta\beta}{C_{29}\ \beta\beta}$ (218)	$\frac{Tm\ [B]}{Ts\ [A]}$	$\frac{C_{29'}\ 17\alpha\text{-NH}\ [C]}{[C] + C_{30'}\ 17\alpha\text{-H}\ [E]}$	$C_{29}\ \frac{NM\ [D]}{[D] + NH\ [C]}$	$\frac{28,30\text{-BNH}\ [Z]}{[Z] + C_{29'}\ 17\text{-NH}\ [C]}$	$\frac{28,30\text{-BNH}\ [Z]}{[Z] + 25,28,30\text{-TNH}\ (177)}$	$C_{31}\ \frac{20S\ [G]}{[G] + 20R\ [H]}$ %
1686-126	4082m		1.10	1.60	1.57		0.10	0.22		0.31		63%
1686-130	4100m		0.91	1.90	1.50		0.10	0.18		0.37		61%
1686-133	4118m		1.14	2.13	1.51		0.16	0.28				57%
1686-152	4325m		0.80	1.69	1.56		0.59	0.45	0.12	0.11		54%
1686-155	4352m		0.71	1.36	1.53		0.55	0.36	0.10			55%
1686-181	4586m		0.56	1.29	1.52		0.73	0.34	0.15			51%
1687-003	4474-4514m		1.55	2.91	1.56		0.20	0.32		0.32		60%
1687-002	4702-4707m		1.79	2.35	1.51		0.25	0.36		0.24		55%
1687-001	4741-4748m		1.35	1.87	1.42		0.21	0.42		0.24		57%

[A] etc. REFERS TO IDENTIFICATION ON APPROPRIATE MASS FRAGMENTOGRAM **DIAST** – DIASTERANES **H** – HOPANE **NH** – NORHOPANE **BNH** – BISNORHOPANE

CT – ditch cuttings **CO** – core **SWC** – sidewall core **TNH** – TRISNORHOPANE **NM** – NORMORETANE

TABLE 16

Sterane Peak Areas (MRM)

SAMPLE NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1686-126	8349	5302	1337	1052	1249	1590	1503	1187	3106	4007	1482	1503	726	1620	1154	672
1686-130	7319	4858	1384	1174	951	1351	1178	820	3423	3601	1377	1291	413	1170	966	591
1686-133	7284	4812	1364	982	915	1241	898	847	2963	3338	1242	1348	392	1213	948	395

SAMPLE NO	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1686-126	3670	2554	1146	269	755	1101	1307	687	1349	936	430	293	279	358	555	267
1686-130	3596	2496	1058	306	541	1130	1008	595	1046	667	360	173	200	265	356	209
1686-131	4154	2477	1218	261	625	1165	1176	545	1009	732	356	144	153	237	265	161

TABLE 16

Sterane Peak Areas (MRM)

SAMPLE NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1686-152	1000	641	160	284	321	268	212	342	367	493	123	174	97	280	190	154
1686-155	1059	693	179	313	225	234	186	256	409	540	163	216	67	211	149	143
1686-181	440	289	89	147	206	117	110	233	146	216	80	90	60	87	61	87

SAMPLE NO	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1686-152	548	459	160	146	182	385	275	227	110	63	45	36	18	67	52	42
1686-155	543	428	178	92	139	267	244	196	143	98	43	34	24	37	46	52
1686-181	240	176	85	62	65	150	121	116	-	-	-	-	-	-	-	-

TABLE 16

Sterane Peak Areas (MRM)

SAMPLE NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1687-001	4026	2831	596	797	664	916	702	613	1847	2393	722	813	402	839	668	410
1687-002	1860	1231	253	528	323	441	322	281	749	1080	333	391	197	374	289	159
1687-003	4124	2641	526	663	599	768	560	472	1456	2026	572	611	246	638	489	308

SAMPLE NO	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1687-001	2917	2582	800	404	691	959	1107	512	632	525	191	113	165	196	310	132
1687-002	1202	1080	373	290	323	423	511	180	277	227	104	43	71	129	129	59
1687-003	2313	1820	595	231	421	790	606	271	629	503	161	80	106	222	163	106

Table 16

Triterpane Peak Areas (MRM)

M/Z 191

SAMPLE NO	A	B	Z	C	C_1	X	D	E	F	G	H
1686-126	3851	397	554	1198	1651	962	-	4281	-	1820	1075
1686-130	2740	293	412	680	1499	873	-	3043	-	1331	835
1686-133	3785	624	-	1933	2174	1969	-	4860	-	1910	1416
1686-152	434	259	102	842	190	204	113	1032	-	420	348
1686-155	501	276	-	627	373	225	75	1098	-	489	398
1686-181	155	114	-	198	143	86	35	373	-	132	127
1687-001	1080	229	242	757	722	600	-	1032	-	433	320
1687-002	556	142	134	411	449	278	-	735	-	282	225
1687-003	1089	223	277	571	589	437	-	1198	-	460	302

SAMPLE NO	I	J	J^1	K	K^1	L	L^1	M	M^1
1686-126	-	1169	907	666	385	351	221	283	210
1686-130	-	971	732	594	313	268	147	247	136
1686-133	-	1318	1003	700	425	383	219	291	157
1686-152	-	231	174	131	99	70	45	24	12
1686-155	-	268	199	143	92	84	37	50	25
1686-181	-	83	56	-	-	-	-	-	-
1687-001	-	258	206	166	103	79	55	49	27
1687-002	-	168	133	101	67	69	44	45	12
1687-003	-	264	200	162	95	84	54	57	29

Table 16a

Sterane Peak Heights (MRM)

SAMPLE NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1686-126	753	592	157	126	118	179	148	120	353	284	124	131	54	149	137	68
1686-130	751	571	169	144	98	140	119	85	363	289	117	128	54	124	99	61
1686-133	722	562	150	119	87	116	107	82	327	245	113	124	52	110	95	50

SAMPLE NO	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1686-126	332	245	116	41	62	114	124	59	130	92	48	30	29	54	57	35
1681-130	360	263	121	48	65	107	114	61	104	78	41	23	23	41	46	25
1686-133	415	270	137	44	73	114	112	58	95	75	39	18	22	26	34	20

Table 16a

Sterane Peak Heights (MRM)

SAMPLE NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1686-152	125	82	21	37	37	36	29	44	52	40	14	19	16	35	26	17
1686-155	141	93	27	37	27	29	23	32	59	46	18	20	7	27	18	18
1686-181	63	40	12	17	23	15	13	28	19	19	7	9	9	12	10	10

SAMPLE NO	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1686-152	65	48	22	17	21	33	34	28	11	11	6	6	4	6	7	6
1686-155	64	51	22	11	17	28	27	22	16	12	5	7	4	5	8	6
1686-181	28	20	12	7	10	14	16	13	-	-	-	-	-	-	-	-

Table 16a

Sterane Peak Heights (MRM)

SAMPLE NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1687-001	465	351	88	124	82	106	89	70	204	184	67	73	39	95	85	40
1687-002	217	152	37	65	35	47	42	34	90	84	28	33	16	46	34	19
1687-003	496	328	84	94	66	89	79	55	188	165	63	58	24	67	58	29

SAMPLE NO	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1687-001	310	249	96	46	65	114	114	65	63	52	21	14	17	30	28	16
1687-002	134	114	46	29	35	52	54	23	28	19	15	8	9	15	15	8
1687-003	249	184	76	27	42	72	81	38	65	46	19	13	12	24	22	15

Table 16

Triterpane Peak Heights (MRM)

M/Z 191

SAMPLE NO	A	B	Z	C	C_1	X	D	E	F	G	H
1686-126	3851	397	554	1198	1651	962	-	4281	-	1820	1075
1686-130	2740	293	412	680	1499	873	-	3043	-	1331	835
1686-133	3785	624	-	1933	2174	1969	-	4860	-	1910	1416
1686-152	434	259	102	842	190	204	113	1032	-	420	348
1686-155	501	276	-	627	373	225	75	1098	-	489	398
1686-181	155	114	-	198	143	86	35	373	-	132	127
1687-001	1080	229	242	757	722	600	-	1032	-	433	320
1687-002	556	142	134	411	449	278	-	735	-	282	225
1687-003	1089	223	277	571	589	437	-	1198	-	460	302

SAMPLE NO	I	J	J^1	K	K^1	L	L^1	M	M^1
1686-126	-	1169	907	666	385	351	221	283	210
1686-130	-	971	732	594	313	268	147	247	136
1686-133	-	1318	1003	700	425	383	219	291	157
1686-152	-	231	174	131	99	70	45	24	12
1686-155	-	268	199	143	92	84	37	50	25
1686-181	-	83	56	-	-	-	-	-	-
1687-001	-	258	206	166	103	79	55	49	27
1687-002	-	168	133	101	67	69	44	45	12
1687-003	-	264	200	162	95	84	54	57	29

Table 17

Sterane Peak Areas (MRM)

SAMPLE NO	C_{27}	C_{28}	C_{29}	C_{30}
1686-126	31583	23926	18478	7830
1686-130	26479	22676	15829	7029
1686-133	26255	20745	18119	6270
1686-152	4464	4218	3427	840
1686-155	4640	4280	3233	1024
1686-181	2220	1724	1581	
1687-001	17402	14576	13536	4146
1687-002	7915	6244	5838	2040
1687-003	15393	11058	10314	3880

C_{30} Sterane Index

	$\frac{C_{30}}{C_{27} - C_{30}}$
1686-126	0.0957
1686-130	0.0976
1686-133	0.0878
1686-152	0.0649
1686-155	0.0777
1686-181	-
1687-001	0.0885
1687-002	0.0926
1687-003	0.0955

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TABLE 18

DETAILED GASOLINE (C4-C7) ANALYSIS

GEOCHEM SAMPLE NUMBER	001	002	003
DEPTH	4741-4748	4702-4707	4474-4514
	DST-1	DST-2	DST-3
isobutane	0.98	1.99	0.63
n-butane	5.75	8.88	2.83
isopentane	7.09	9.01	3.35
n-pentane	10.66	11.58	4.03
2,2-dimethylB	0.22	0.25	0.24
cyclopentane(CP)	1.88	1.94	2.10
2,3-dimethylB	0.00	0.00	0.00
2-methylP	5.65	5.82	4.21
3-methylP	3.21	3.28	3.44
n-hexane	10.15	9.69	7.08
methylCP(MCP)	5.84	4.87	5.90
2,2-dimethylP	0.44	0.42	0.26
2,4-dimethylP	0.00	0.00	0.00
2,2,3-trimethylB	0.00	0.00	0.00
benzene	3.01	3.76	4.44
cyclohexane(CH)	8.52	6.99	8.63
3,3-dimethylP	0.00	0.00	0.00
1,1-dimethylCP	0.00	0.00	0.00
2-methylH	3.61	3.29	5.50
2,3-dimethylP	0.00	0.00	0.00
3-methylH	2.45	2.28	4.02
1,c,3-dimethylCP	0.82	0.67	1.36
1,t,3-dimethylCP	0.71	0.60	1.11
1,t,2-dimethylCP	1.84	1.53	2.73
3-ethylP	0.00	0.00	0.00
n-heptane	7.59	6.48	11.47
methylCH(MCH)	11.93	9.19	14.49
1,c,2-dimethylCP	0.00	0.00	0.00
toluene	7.65	7.49	12.19
nC7/C7nap x100	49.59	54.06	58.22
MCP/Bz	1.94	1.30	1.33
MH/DMCP	1.80	2.00	1.83
nC6/MCP	1.74	1.99	1.20
%n-PARAFFINS	34.16	36.63	25.40
%iso-PARAFFINS	23.65	26.34	21.65
% NAPHTHENES	31.54	25.78	36.33
% AROMATICS	10.65	11.25	16.63

Table 19

Crude Oil Bulk Properties

SAMPLE NUMBER	IDENTITY	DEPTH	API GRAVITY (°API)
1687-003	DST-3	4474-4514	46.4
1687-002	DST-2	4702-4707	42.4
1687-001	DST-1	4741-4748	41.2