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Source rock

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## SUMMARY

On the basis of the light hydrocarbon data, the analysed section is divided into six zones: A: 1690 - 1830 m, B: 1830 - 2155 m, C: 2155 - 2915 m, D: 2915 - 3305 m, E: 3305 - 3350 m and F: 3350 - 3725 m.

Zone A is an immature source rock with a poor potential for gas and oil. Zone B is an immature/moderate mature source rock with a poor/fair potential for gas and oil. Zone C can be divided into three sections. The upper part, down to 2500 m is a moderate mature/mature source rock with a good/rich potential for gas. The middle part, approximately 2500 - 2700 m of the zone is mature with a good potential for oil and gas. The lower part of the zone has a mature/oilwindow maturity, with a rich potential for oil and gas. Indications of migrated hydrocarbons are found in the samples from 2225 - 2240 m, 2490 - 2505 m, 2565 - 2580 m and 2730 - 2750 m. Zone D can also be divided into two sections. The upper part, down to approximately 3150 m has an oilwindow maturity with a rich potential as a source rock for oil. The lower part also has an oilwindow maturity, with a good potential as a source rock for oil. Zone E, which consists mainly of quartz sand, has indications of migrated hydrocarbons. Zone F also contains large amounts of quartz sand. The claystone in this interval is found to have a poor/fair potential as a source rock for oil and gas with an oilwindow maturity.

## EXPERIMENTAL

One ml. of the headspace gas from each of the cans was analysed gas-chromatographically for light hydrocarbons. The results are shown in Table I.a. The canned samples were washed with tempered water on a 0.125 mm sieve to remove drilling mud and thereafter dried at 35°C.

### Light Hydrocarbons

Aliquotes of the samples were dried at room temperature after washing and sieving. The cuttings with a grain size between 1 and 2 mm were used for light hydrocarbon determination. These were treated with 6N HCl in a closed evacuated system, thereafter flushed with water and the released gas analysed gaschromatographically. The results are shown in Table I.b.

### Total Organic Carbon (TOC)

Aliquotes of the samples were treated with hot 6N HCl to remove carbonates, and then analysed on a Leco 12 carbon determinator, to determine the total organic carbon (TOC). Table II.

### Extractable Organic Matter (EOM)

From the TOC results, samples were selected and extracted with DCM in soxhlet apparatus for 48 h., and the amount of extractable organic matter was determined. Table III.

### Chromatographic Separation

The extracts were separated on columns packed with 2/3 silica and 1/3 alumina, by eluting with hexane, benzene and methanol. Table III. The saturated fractions were analysed gaschromatographically on a

25 mm glass capillary column, using a Carlo Erba FV 2150 Chromatograph. The measurements from the gaschromatograms are shown in Table VII.

#### Vitrinite Reflectance

Five sidewall cores and six cutting samples were sent for vitrinite reflectance measurements at Geoconsultants, Newcastle upon Tyne. Upon receipt, the samples were soaked in warm water and sieved through 72 mesh to remove drilling mud. After oven drying at 40°C, they were mounted in Bakelite resin blocks; care being taken during the setting in the plastic to avoid temperatures in excess of 100°C. The samples were then ground, initially on a diamond lap followed by two grades of corundum paper. All grinding and subsequent polishing stages in the preparation were carried out using isopropyl alcohol as lubricant, since water leads to the swelling and disintegration of the clay fraction of the samples.

Polishing of the samples was performed on Selvyt cloths using three grades of alumina, 5/20, 3/50 and Gamma, followed by careful cleaning of the surface.

Reflectance determinations were carried out on a Leitz M.P.V. microphotometer under oil immersion, R.I. 1.516 at a wavelength of 546 nm. The field measured was varied to suit the size of the organic particle, but was usually of the order of 2 micron diameter.

The surface of the polished block was searched by the operator for suitable areas of vitrinitic material in the sediment. The reflectance of the organic particle was determined relative to optical glass standards of known reflectance. Where possible, a minimum of twenty individual particles of vitrinite was measured, although in many cases this number could not be achieved. The search for vitrinitic material was maintained for approximately 45 minutes on each sample before termination, if the operator considered that no more vitrinitic particles were likely to be located.

### Visual Kerogen

Samples for visual kerogen were picked from the screening analyses. The samples were crushed, treated with HCl and HF to remove the rock matrix, centrifuged and mounted on slides.

Maturity of the individual samples was determined by visual estimation of the colours of pollen, spores, cuticles, wood remains, and finely dispersed organic matter.

The colour tones are given according to Burgess' index (Burgess, J.D., 1974. Geol. Soc. Amer. Spec. Paper, 153, 19-30).

### Rock-Eval Pyrolyses

100 mg. crushed sample was put into a boat whose bottom and cover are made of sintered steel and analysed on a Rock-Eval pyrolyser.

## RESULTS AND DISCUSSION

### Light Hydrocarbons

On the basis of the abundance of the  $C_1-C_4$  and the  $C_5-C_7$  hydrocarbons, together with the wetness of the gas and the iso butane/n butane ( $iC_4/nC_4$ ) ratio, the analysed sequence 1690-3725 m will be divided into six zones:

- A: 1690-1830 m
- B: 1830-2155 m
- C: 2155-2915 m
- D: 2915-3305 m
- E: 3305-3350 m
- F: 3350-3725 m

A: 1690-1830 m: The light hydrocarbons show a poor to fair abundance. The gas is very dry and the  $iC_4/nC_4$  ratio is very high, mostly above 10.

B: 1830-2155 m: This zone is markedly different from the zone above in all measured parameters. Both the abundance of the  $C_1-C_4$  and the  $C_5-C_7$  hydrocarbons show a large increase while the  $iC_4/nC_4$  ratio drop sharply to approximately 0.5. The wetness of the gas increases sharply to approximately 35%. One of the samples in the zone, 1890-1950 m, shows a low abundance both for  $C_1-C_4$  and  $C_5-C_7$  hydrocarbons. However, we have not separated this sample out as a separate zone.

C: 2155-2915 m: This zone is separated from the one above by a marked increase in the abundance of  $C_1-C_4$  and  $C_5-C_7$  hydrocarbons together with an increase in the wetness of the gas. The abundance of both the  $C_1-C_4$  and the  $C_5-C_7$  hydrocarbons vary considerably within the zone. Most of the samples in this zone contained relatively small amounts of cuttings and this would of course increase the uncertainty factor. The abundance of hydrocarbons in all the samples is, however, found to be good.

Zone C could possibly be separated into two zones.  $C_1$ : 2155-2700 and  $C_2$ : 2700-2915 m. There is a marked change in the abundance of both  $C_1-C_4$  and  $C_5-C_7$  hydrocarbons and the wetness of the gas at this depth.

We have however, decided not to divide the zone mainly because of the large variation found for the abundance of the light hydrocarbons over most of the zone.

D: 2915-3305 m: The abundance of the C<sub>1</sub>-C<sub>4</sub> hydrocarbons is similar to the zone above while the abundance of C<sub>5</sub>-C<sub>7</sub> hydrocarbons shows a marked decrease together with a decrease in the wetness of the gas.

E: 3305-3350 m: This zone, which consists of only 45 m, shows a marked increase in the C<sub>1</sub>-C<sub>4</sub> and the C<sub>5</sub>-C<sub>7</sub> hydrocarbons.

D: 3350-3725 m (T.D.): The samples from this zone contained large amounts of sand and due to this, only headspace analyses were undertaken on most of the samples. Most of the samples show a poor abundance of light hydrocarbons and the gas is rather dry. This indicates that the sand in this interval has not reservoired migrated hydrocarbons.

#### Total Organic Carbon (TOC)

Total organic carbon (TOC) was measured on all the samples. Where significant amounts of different lithologies were found, TOC was measured on the different lithologies with exception of the quartz sand, where TOC was not measured.

A: 1690-1830 m. The two uppermost samples show a fair potential while the three lowermost samples show a slightly higher potential.

B: 1830-2155 m: The TOC values are relatively constant over the whole zone and show a fair potential.

C: 2155-2915 m: The uppermost part of this zone, down to approximately 2450 m shows similar potential as zone B, while the lowermost part shows a slightly higher potential, fair/good.

D: 2915-3305 m: The TOC values in this zone are markedly higher than in the zone above and the whole zone shows a rich potential.

E: 3305-3350 m: The TOC values of the shale cuttings in this zone show similar values to the zone above.

F: 3350-3725 m: The TOC values in this zone show a marked drop compared with the zone above, and they decrease with increasing depth. The upper part of the zone shows a good potential decreasing to fair to poor for the lower part.

#### Extractable Organic Matter (EOM) and Chromatographic Separations

A: 1690-1830 m: Two samples from this zone, 1720-1750 and 1770-1800 m were extracted. Both of the samples show a poor abundance of hydrocarbons and the gaschromatograms of the saturated hydrocarbon fractions both show a very large sterane hump and only a small proportion of n-alkanes. This indicates an immature source.

B: 1830-2155 m: Two samples from this zone, 2000-2030 and 2125-2140 m were extracted. The abundance of hydrocarbons are markedly larger in these samples than in those from the zone above, especially in the lowermost sample, which indicates a good to rich potential. The gaschromatograms of the saturated hydrocarbon fractions also show large differences compared to the zone above. The large sterane hump has diminished and the n-alkanes are more pronounced. They show, however, a large CPI value which indicates immaturity.

C: 2155-2915 m: Seven samples from this zone were extracted. The abundance of the hydrocarbons in the uppermost analysed sample, 2225-2240 m indicates a poor potential which all the other analysed samples are found to have a good and rich potential. The gaschromatograms of the saturated hydrocarbon fractions are found to give a smooth pattern for most of the samples, except for the uppermost samples which have a CPI value slightly above 1.0. The pristane/nC<sub>17</sub> ratio is rather high for some of the samples, especially compared with the pristane/phytane ratio. This relatively large amount of pristane could indicate deposition in oxidizing condition which favours production of pristane.

D: 2915-3305 m: Nine samples from this zone were extracted and all the samples down to 3100 m show a rich abundance of hydrocarbons while the samples between 3100 and 3300 m indicate a good abundance. Some of the samples, especially those between 3000 and 3100 m have a large proportion of hydrocarbons in the extract, and this could indicate an input of migrated hydrocarbons.

The gaschromatograms of the saturated hydrocarbon fractions vary considerably. The uppermost samples show a relatively smooth n-alkane distribution with CPI values slightly above 1.0 while the sample from 3080-95 has an extremely large sterane hump. This is probably caused by some contamination of the sample. The lowermost samples in this interval have rather high CPI values, which indicates a change in the organic material to a more terrestrial source.

E: One sample from this zone, 3320-3335 m was extracted from this zone. The results of this sample is fairly similar to those in the lowermost part of the zone above.

F: Six samples from this zone were extracted in the uppermost sample, 3350-65 m. The abundance of hydrocarbons indicate a good potential, and the gaschromatogram of the saturated hydrocarbons is similar to the zone above. Further down in the zone, the abundance decreases rapidly and all the analysed samples, with exception of the sample from 3725-30 m, have a poor/fair abundance of hydrocarbon. The sample from 3725-30 m has a good abundance of hydrocarbons. The gaschromatograms of the saturated hydrocarbon fractions vary slightly from each other. The most striking difference is the large pristane peak in the lowermost sample which indicates deposition in oxidizing conditions.

#### Vitrinite Reflectance

Twentyeight samples were analysed for vitrinite reflectance. In the following we will describe the individual samples, and together with the reflectance values, other information from the analyses will be given.

1720-1750 m: Shale,  $R_o = 0.37$  (20). The sample has a low overall organic content and most of the cuttings are barren. A few of the cuttings have a moderate to rich organic content with small wispy particles and particles of vitrinite. UV light shows a yellow/orange fluorescence from spores and a low exinite content.

1770-1800 m: Mixed shale lithologies - red and light grey,  $R_o = 0.47$  (5). The sample is virtually barren with a few minute particles and wisps,

mostly of reworked material and a few specks of low reflectance material, possibly bitumen. UV light shows a yellow/orange and dull orange fluorescence from spore specks and a trace of exinite. The pyrite in the samples is oxidized and some haematite and siderite is also found.

2000-2030 m: Shale and sand grains with some glauconite,  $R_o = 0.44$  (16) and  $R_o = 0.75$  (5). The sample has a low organic content with small particles, mostly reworked material and inertinite. Possibly some true material but it is difficult to differentiate between them. UV light shows a light to mid orange fluorescence from spores and a low exinite content.

2125-2140 m: Cement and light Shale,  $R_o = 0.51$  (6). The sample has a low organic content with small gnarled particles of inertinite and reworked material. It is very doubtful if any of the readings are an reliable material. UV light shows a yellow/orange fluorescence from spore specks and algae and a low exinite content.

2225-2240 m: Shale, silty limestone, sandstone and limestone,  $R_o = 0.44$  (4) and  $R_o = 0.70$  (1). The sample has a very low organic content with small particles, mostly inertinite and reworked material together with some bitumen staining and wisps. A few particles of doubtful vitrinite are recorded. UV light shows an orange fluorescence from spores and hydrocarbon specks and a trace of exinite.

2345-2360 m: Shale, siltstone and red marl,  $R_o = 0.48$  (2),  $R_o = 0.73$  (8) and  $R_o = 1.44$  (1). The sample has a moderate organic content, almost exclusively small gnarled particles of reworked material and inertinite together with some bitumen and some tenuous wispy particles of vitrinite. UV light shows a mid orange fluorescence from spores and a low exinite content. The very wide spread in the readings renders the results meaningless.

2460-2475 m: Coal, carbargillite and shale.  $R_o = 0.36$  (22). The shale is virtually barren while the carbargillite is full of inertinite and reworked fragments. The coal has a very variable composition. UV light shows a yellow/orange fluorescence from spores, mainly in coal, and a moderate exinite content. All the readings are on coal and could possibly be an additive.

2490-2475 m: Calcareous shale and limestone.  $R_o = 0.37$  (2) and  $0.55$  (3). The sample has a low organic content with small gnarled particles of high reflectance, reworked material and inertinite. A few bitumen wisps and a trace of dubious true vitrinite particles are also recorded. UV light shows a mid orange fluorescence from spores and hydrocarbon traces together with a low to moderate exinite content.

2555-2580 m: Siltstone, sandstone, coal and carbonate,  $R_o = 0.33$  (9) additive and  $R_o = 0.50$  (11). The sample has a moderate to rich organic content, mostly gnarled particles of inertinite and reworked material. Some good stringers and particles of vitrinite. UV light shows a mid-deep orange fluorescence from spores and a moderate to rich exinite content.

2655-2670 m: Shale, carbargillite, coal and siltstone,  $R_o = 0.60$  (20). The sample has a moderate to rich organic content, mostly gnarled particles of inertinite and reworked material. Some good stringers and particles of vitrinite were recorded. None of the measurements were on coal. UV light shows a mid-deep orange fluorescence from spores and a moderate to rich exinite content.

2730-2750 m: Cement, sand and subordinate shale and carbonate,  $R_o = 0.41$  (3),  $R_o = 0.63$  (1) and  $R_o = 0.83$  (7). The sample is rich in pyrite modules together with coal cuttings which probably is an additive. Only a few sediment cuttings, most probably cavings. Only a trace of organic material with high reflectance values. Some gnarled particles of reworked material and inertinite. A few bitumen wisps and some dubious vitrinite. UV light shows a fluorescence from hydrocarbon traces and a mid orange fluorescence from spores together with a trace of exinite. The results of this sample are uncertain because of the quality of the sample.

2855-2870 m: Shale, siltstone, sandstone, cement and coal (additive),  $R_o = 0.47$  (1) and  $R_o = 0.71$  (5). The sample has a moderate organic content, almost exclusively small gnarled particles of reworked material and inertinite. Some bitumen staining together with some small tenuous particles of vitrinite are also recorded. UV light shows a mid orange fluorescence from a few spore specks and a trace of vitrinite.

2915-2930 m: Carbonate, red and grey shale and carbargillite,  $R_o = 0.61$  (20). The organic content in the samples varies with the lithologies. In the carbargillite and the grey shale, inertinite and reworked particles are dominant together with a few wisps of vitrinite. The carbonate contains mainly interstitial betumen. UV light shows a mid orange fluorescence from spores and a rich exinite content.

2945-2960 m: Shale, siltstone, coal and sand,  $R_o = 0.60$  (20). The sample has a moderate organic content. The coal particles are rather brecciated while the shale contains a large amount of gnarled inertinite and reworked particles. Only a trace of vitrinite is recorded. UV light shows a mid orange fluorescence from spores and a moderate to rich exinite content.

2975-2990 m: Mixed lithologies including carbargillite and coal,  $R_o = 0.61$  (26). The various lithologies in the sample have a variable organic content. Some good particles, stringers and wisps of vitrinite together with particles of inertinite are recorded. UV light shows a mid-deep orange fluorescence from spores and a moderate exinite content.

3032-3050 m: Carbonate, shale, siltstone and coal (additive),  $R_o = 0.59$  (15) and  $R_o = 0.96$  (1). The sample has a low organic content restricted to inertinite and reworked material. Only a little reliable material. UV light shows a mid orange fluorescence from spores and hydrocarbons together with a variable fluorescence from carbonate. Only a low exinite content is recorded.

3050-3065 m: Mixed lithologies - including carbargillite and coal,  $R_o = 0.65$  (23). The sample has a variable organic content, from barren in sandstones to rich in carbargillite. In the carbargillite the vitrinite is dominant with good wisps and particles. The shale and siltstone contain mainly particles of inertinite and reworked material. UV light shows a mid orange fluorescence from spores and a variable fluorescence from carbonate together with a low to moderate exinite content.

3080-3095 m: Mixed shale lithologies,  $R_o = 0.59$  (20). The sample is rich in haematitic cuttings. The organic material in the sample is

restricted to the grey shale lithologies. Some of these are rich with bitumen impregnation. Most of the organic material are particles of inertinite and reworked material. Only a few wispy particles of vitrinite are recorded. UV light shows a mid-deep orange fluorescence from spores in a few of the cuttings and a low overall exinite content.

3110-3125 m: Shale, siltstone, carbargillite, coal and carbonate,  $R_o = 0.58$  (3). The sample has a moderate to rich overall organic content. A large proportion of the sample looks to be cavings and the vitrinite material in these is not measured. Some good stringers and wisps of vitrinite are measured. The main bulk of the organic material consists of particles of inertinite and reworked material. UV light shows a mid orange fluorescence from spores together with a variable fluorescence from carbonate and a moderate to rich exinite content.

3170-3185 m: Mixed shale lithologies,  $R_o = 0.74$  (21). The sample has a variable organic content with a moderate to rich overall picture, mostly particles of inertinite and reworked material. It is rather difficult to differentiate between true and reworked material. UV light shows a mid-deep orange fluorescence from spored and a moderate to rich exinite content.

3215-3230 m: Shale and siltstone,  $R_o = 0.55$  and  $R_o = 1.00$  (2). The sample has a moderate organic content, mainly particles of inertinite and reworked material. A trace of vitrinite seen as wisps and wispy particles are recorded. Differentiation of true vitrinite and reworked material is difficult and this give a large variation in the readings. UV light shows a mid-deep orange fluorescence from spores and a moderate exinite content.

3275-3290 m: Shale, siltstone and carbonate,  $R_o = 0.56$  (21). The sample has a moderate organic content, mostly particles of inertinite and reworked material. A few wisps and wispy particles of true vitrinite are recorded. UV light shows a mid-deep orange fluorescence from spores and a moderate exinite content.

3320-3335 m: Shale, siltstone, sandstone and traces of coal,  $R_o = 0.58$  (22). The sample has a moderate organic content, mostly particles of inertinite

and reworked material together with some good particles and stringers of vitrinite. A few coal fragments of similar reflectance are also recorded. UV light shows a mid orange fluorescence from spores and a moderate exinite content.

3470-3485: Mixed lithologies,  $R_o = 0.72$  (19). The organic content in the sample varies with the lithology, but with a moderate overall picture. It is mostly inertinite and reworked material. Some bitumen wisps and a few small particles and wispy particles of vitrinite are also recorded. UV light shows a mid-deep orange fluorescence from spores in a few cuttings and a low to moderate exinite content.

3530-3545 m: Sand plus red and light grey shale,  $R_o = 0.45$  (2),  $0.65$  (9) and  $1.49$  (11). The organic material is restricted to the grey shale. A few cuttings contain low reflectance wisps of vitrinite together with particles of inertinite and reworked material. Some of the shale cuttings contain only high reflectance material. UV light shows an orange to red fluorescence from spores in a few cuttings and a low exinite content.

3620-3635 m: Sandstone, red shale and lignite (additive),  $R_o = 0.27$  (9),  $R_o = 0.70$  (4) and  $R_o = 1.13$  (3). Most of the cuttings are barren. The organic material is restricted to a few shale cuttings and consists almost exclusively of inertinite and reworked material. Only a few tenuous wispy particles of vitrinite are recorded. The lignite is probably an additive. UV light shows a mid-deep orange fluorescence from spores in a few of the cuttings and a trace of exinite.

3680-3695 m: Sandstone, red and grey shale,  $R_o = 0.43$  (2) and  $R_o = 0.63$  (18). The sandstone and the red shale are barren while the grey shale has a moderate organic content, mostly particles of inertinite and reworked material. A few wispy particles of vitrinite are recorded. UV light shows an orange/red fluorescence from a few spores and a low exinite content.

3725-3730 m: Mixed red and grey shale plus sandstone,  $R_o = 0.44$  (2),  $R_o = 0.72$  (16),  $R_o = 1.12$  (2). The red shale and the sandstone are barren while the grey shale has a moderate content of inertinite and reworked material together with a trace of true vitrinite wisps. One

coal cutting with a very high reflectance ( $R_o = 1.12$ ). UV light shows a mid-deep orange fluorescence from spores and a moderate exinite content.

### Visual Evaluation of Kerogen

Twentyfive samples from cutting were investigated for this visual analysis. The results have been summarized in Table VIII and in Enclosures: MATURATION.

The kerogen composition for each sample is expressed as percentages of the total acid insoluble residue. Details were supported from screened (> 15 $\mu$ ) slides of the residue. The colour index, where possible, has been evaluated from palynomorphs, otherwise upon the dominant type of kerogen. The colour of the organic remains in some samples seems increased due to early decay or due to the presence of limestone in the embedding matrix. Such factors, where suspected, were considered before drawing the colour index line.

The following interpretation has been used with the qualitative colours index for residues from individual samples of this well.

| 2+       | 3-              | 3+     | 4-         |
|----------|-----------------|--------|------------|
| Immature | Moderate mature | Mature | Oil window |

### Description of individual samples.

1720-1750 m, Fairly large residues all being dominated by finely  
1770-1800 m, dispersed (amorphous) material possibly derived from  
2000-2030 m, lithologies rich in limestone. There is a minor part  
2125-2140 m of woody matter and black coal particles.

Wellpreserved dinoflagellate cysts are present in all samples.

Colour index: 2- for material from a low energy marine environment.

An increase in coalification takes place in lower part of this interval (2125-2140 m). An immature formation though with good potentials for oil generation.

2225-2240 m: A fairly small residue dominated by finely dispersed material, partly true sapropel. There is a minor part of indetermined herbaceous material, woody matter and black coal particles. Some re-working in this assemblage. Wellpreserved dinoflagellate cysts are present. Colour index: 2 for material from a marine low energy area. An immature interval with potential for oil generation.

2345-2360 m: A small residue, dominated by true sapropel, and with a small element of herbaceous material. Colour index: 2+ for material from a marine low energy area. Deposits are moderate mature with potential for oil generation.

2435-2450 m: A fairly large residue apparently including mud additive. The residue consists of indetermined herbaceous material and woody matter. Colour index: Estimated as 2+ to 3-. Poor potential but for gas and only moderate mature.

2565-2580 m: A small residue, half of it finely dispersed amorphous material, the rest is herbaceous indetermined material and woody matter which may partly be mud additives. Colour index: 2+ to 3-. A moderate mature formation with uncertain potential, from a shallow marine medium high energy area.

2730-2750 m: A fairly small residue dominated by amorphous material. Finely dispersed material probably from limestone is present together with herbaceous matter and woody matter. Colour index: 3-. A moderate mature formation with potential for oil generations. Deposits were formed in a shallow marine to open marine, low energy area.

2780-2795 m: A small residue with a main component of suggested mud additives. Heavy mineral crystals are abundant. Indications of an unfossiliferous formation or of one very poor in organic matter. Deposition probably took place under high energy conditions close to shore line.

2870-2885 m: A small residue originally dominated by light coloured sapropel. Herbaceous indetermined material and suggested mud additives are present. Light coloured matter has been considered as downfallen. Colour index tentatively indicated as 3-.

2960-2975 m: A large residue dominated by true sapropel clearly darker than seen in the above-lying samples. Woody matter and black coal fragments are present in small amounts. Fairly well preserved cysts of different preservation from those above. Colour index: 3 to 3+. A mature formation at the beginning of the oil window, deposited in a shallow marine low energy area. Good possibilities for oil generation.

3065-3080 m: A large residue dominated by land derived material: Woody matter, indetermined herbaceous and cuticular fragments. Amorphous material (sapropel) estimated as 30%. Colour index: 3+/4-.

3110-3125 m, Fairly large residues in the upper part of this interval,  
3170-3185 m, a small residue from the lowest rock sample, Residues  
3215-3230 m, are dominated by sapropel and dinoflagellate cysts,  
3275-3290 m, with a smaller portion of indetermined herbaceous  
material or woody and cuticular material. Colour index:  
3+/4-. Deposits probably were formed under low energy shallow marine conditions not far from the shore line. Reworked material is present. Good possibilities for generation of oil and gas in upper part of this interval.

3320-3335 m, Small to fairly large organic residues dominated by land  
3410-3425 m derived material and with < 50% sapropel. Colour index:  
3+ to 4-. The deposits were formed under medium high energy conditions in a deltaic shallow marine area. Possibilities for oil and gas generation.

3455-3470 m, Fairly small residues dominated by sapropel and with a  
3500-3515 m smaller component of land derived material, including cuticles, pollen, spores, indetermined herbaceous and woody matter. Considerable amounts of heavy mineral crystals are present. Colour index: 3+ to 4- for fairly well preserved palynomorphs. The assemblages are derived mostly from a high to medium high energy, shallow marine, area. The formation seems poor in org. material.

3575-3590 m: A fairly large residue, dominated by indetermined plant material probably derived from open marine deposits. However, presence

of frequent woody matter and herbaceous material indicate sorted land-derived matter deposited closer to shore line. Colour index: 3+ to 4-. Possibilities for oil and gas generation. Oil window.

3605-3620 m: A finely dispersed small residue most of which seems derived from a marine area. There is a minor part of clearly land-derived material including woody matter cuticles, pollen and spores. Colour index: 3+ to 4- or higher.

3665-3680 m, Fairly small residues including a major component of  
3710-3725 m sapropel and a minor part of landderived material.  
Colour index: 3+ to 4- indicating the oil window  
lower part, and potential for oil generation. However, judged from fossils, the material may well be downfall into a poorly fossiliferous formation.

#### Rock-Eval Pyrolysis

Thirtyone samples, two from zone A, two from zone B, eight from zone C, fourteen from zone D and five from zone F were pyrolyzed on a Rock-Eval instrument. All the samples used in this experiment were shale cuttings. From the results, Table IX, Fig. 6 and 7, we see that the boundry between the immature and mature zone coincide with the boundry between zones C and D. All the samples from zones A, B and C are typical type III kerogen, i.e. they will normally not be source rocks for oil while the samples from zone D, especially down to approximately 3100 m are of type II kerogen, which normally will be a source rock for oil. The lowermost samples in zone D have rather high oxygen indexes. They also show good hydrogen indexes and the high oxygen index could be caused by release of CO<sub>2</sub> from the rock matrix. This phenomena sometimes happens in carbonate rich sediments. Due to this, and the high hydrogen index, we assume all of zone D to be of kerogen type II, and therefore a good source rock for oil.

All the samples in zone F are typical type III kerogen. These samples have a rather high production index, especially the sample from 3470-3485 m. This could have been caused by migrated hydrocarbons. A similar phenomena is found in the samples from zones B and C.

## CONCLUSION

Based on the light hydrocarbon data, the analysed part of the well was divided into six zones; A: 1690-1830 m, B: 1830-2155 m, C: 2155-2915 m, D: 2915-3305 m, E: 3305-3350 m and F: 3350-3725 m.

In our evaluation of the well, the richness rating is based on the abundance of light hydrocarbons, total organic carbon and extractable hydrocarbons. The maturation rating is mainly based on the vitrinite reflectance and the colour of the kerogen while the type of source rock estimation is based on the type of kerogen, with results both from the visual kerogen study and the Rock-Eval analysis.

A: 1690-1830 m: This zone consists exclusively of claystone and the various analysis have found it to be an immature zone with a poor potential for gas and oil.

B: 1830-2155 m: Again a zone with claystone. The richness analysis show an increase in this zone compared to the one above. There is also a very distinct change in the  $iC_4/nC_4$  ratio. Based on the various analysed parameters, this zone will be rated as an immature to moderate mature source rock with a poor/fair potential for gas and oil.

C: 2155-2915 m: The lithology of this zone varies considerably. The upper 250 m of the zone consists mainly of claystone, while the sequence from approximately 2400-2420 m contains a large amount of limestone. Further down the zone, down to approximately 2580 m, claystone and silty claystone again dominate. From 2580 m to 2625 m a sequence with a large proportion of sandstone is recorded. From approximately 2625 m to 2780 m a sequence with a large proportion of limestone is recorded. From 2780 m to the lower end of the zone, claystone and silty claystone again dominate the lithology.

The abundance of light hydrocarbons shows a marked increase in this zone compared with the zones above and indicate a rich potential. There is a considerable variation in the abundance of light hydrocarbons within this zone. There could be various causes for this. Due to the variation in the lithology, the quality of the cuttings varied greatly.

from sample to sample, and this is probably the main reason to the variation in the abundance of light hydrocarbons. The wetness of the gas and the  $iC_4/nC_4$  ratio did not, however, show any large variation and due to this the zone was not divided up. All the extracted samples are found to have a good to rich abundance of extractable hydrocarbons, with the exception of the sample from 2225-2240 m which shows a poor potential. The maturation is found to increase from immature/ moderate mature at the top of the zone to mature/oil window at the lower end of the zone. The Rock-Eval analysis have found this zone to contain typical type III kerogen while the visual estimation of the kerogen find the lower end of the zone to contain mainly amorphous material. As a conclusion to the various analysis we assume the upper part of the zone down to approximately 2500 m, to be moderate mature/mature with a good/ rich potential for gas. From 2500 m down to approximately 2700 m the zone is mature with a good potential for oil and gas. The lower part of the zone, 2700-2915 m has a mature/oil window maturity and with a rich potential for oil and gas. An examination in ultraviolet light has indicated migrated hydrocarbons in the samples from 2225-2240 m, 2490-2505 m, 2565-2580 m and 2730-2750 m.

D: 2915-3305 m: Claystone is the dominant rock in this zone with some siltstone and quartz sand in plases. The sequence from approximately 2950-3030 m contain a fair amount of coal. At present the coal is not studied and it might be a mud additive.

The abundance of the  $C_1-C_4$  hydrocarbons is similar to the zone above while the wetness of the gas and the abundance of the  $C_5-C_7$  is slightly lower. The abundance of the extractable hydrocarbons indicate a rich potential for the upper part of the zone, down to approximately 3150 m and a good potential for the lower part of the zone. This coincides with the TOC data. Maturation measurements indicate the whole zone to be in the upper part of the oil window. Together with the Rock-Eval analysis and the visual estimation of the kerogen which suggest the whole zone to be a source rock for oil, the following rating can be given: Upper part of the zone has an oil window maturity, with a rich potential as a source rock for oil while the lower part has an oil window maturity with a good potential as a source rock for oil. Examination in ultraviolet light indicates migrated hydrocarbons in the sample from 3032-3050 m.

E: 3305-3350 m: This zone consists mainly of claystone and quartz sand. The abundance of light hydrocarbons increases compared to the zone above. This could indicate migrated hydrocarbons in the sand lenses. One claystone sample was extracted and this is found to have a rich abundance of extractable hydrocarbons. The composition of the EOM agrees with the assumption that there is migrated hydrocarbons in this zone.

F: 3350-3725 m: This zone contains large amounts of quartz sand and only headspace gas analyses were undertaken on most of the samples. The abundance of light hydrocarbons are fairly low and this indicates that this interval has not reservoired migrated hydrocarbons. The extracted samples indicate a poor/fair potential except for the lowermost sample which is found to have a good potential. The maturity increases slightly over the measured interval, however, the whole zone is found to have an oil window maturity. The various analyses indicate a lot of reworked material in this zone.

On the basis of the various analysis this zone is found to have an oil window maturity with a poor to fair potential as a source rock for oil and gas.

TABLE Ia.

Concentration ( $\mu\text{l}$  gas/kg rock) of  $C_1$ - $C_7$  hydrocarbons in cuttings (Headspace)

| Depth     | $C_1$ | $C_2$ | $C_3$ | $iC_4$ | $nC_4$ | $C_5^+$ | $\Sigma C_1-C_4$ | $\Sigma C_2-C_4$ | % wetness | $iC_4/nC_4$ |
|-----------|-------|-------|-------|--------|--------|---------|------------------|------------------|-----------|-------------|
| 1690-1720 | 3094  | 170   | 15    | 3      | -      | 206     | 3282             | 188              | 5.7       | -           |
| 1720-1750 | 943   | 63    | 6     | 1      | -      | 134     | 1013             | 71               | 7.0       | -           |
| 1750-1770 | 841   | 67    | 116   | 8      | 1      | 3598    | 1032             | 191              | 18.5      | 11.50       |
| 1770-1800 | 2308  | 277   | 39    | 94     | 9      | 293     | 2727             | 419              | 15.4      | 10.98       |
| 1800-1827 | 1404  | 395   | 131   | 301    | 17     | 320     | 2249             | 845              | 37.6      | 18.07       |
| 1830-1860 | 8017  | 4921  | 4510  | 1631   | 3293   | 7221    | 22371            | 14354            | 64.2      | 0.50        |
| 1860-1890 | 8353  | 1972  | 1823  | 611    | 1256   | 2446    | 14016            | 5663             | 40.4      | 0.49        |
| 1890-1920 | 44    | 10    | 7     | -      | -      | 1       | 62               | 17               | 28.2      | 0.51        |
| 1920-1950 | 8963  | 1789  | 1198  | 319    | 653    | 1323    | 12923            | 3960             | 30.6      | 0.49        |
| 1950-1980 | 10652 | 1898  | 1523  | 455    | 968    | 2310    | 15495            | 4844             | 31.2      | 0.47        |
| 1980-2000 | 25530 | 4516  | 2748  | 682    | 1543   | 3420    | 35030            | 9399             | 26.8      | 0.47        |
| 2000-2030 | 8831  | 1234  | 748   | 179    | 417    | 1404    | 11410            | 2578             | 22.6      | 0.43        |
| 2030-2050 | 9949  | 1759  | 1236  | 314    | 712    | 1459    | 13970            | 4021             | 28.8      | 0.44        |
| 2060-2090 | 9715  | 1417  | 866   | 192    | 505    | 1192    | 12695            | 2980             | 23.5      | 0.38        |
| 2090-2110 | 8018  | 1117  | 740   | 79     | 215    | 874     | 10171            | 2152             | 21.2      | 0.37        |
| 2110-2125 | 2907  | 531   | 483   | 144    | 322    | 1485    | 4387             | 1480             | 33.7      | 0.45        |

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| Depth     | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | iC <sub>4</sub> | nC <sub>4</sub> | C <sub>5</sub> <sup>+</sup> | ΣC <sub>1</sub> -C <sub>4</sub> | ΣC <sub>2</sub> -C <sub>4</sub> | % wetness | iC <sub>4</sub> /nC <sub>4</sub> |
|-----------|----------------|----------------|----------------|-----------------|-----------------|-----------------------------|---------------------------------|---------------------------------|-----------|----------------------------------|
| 2125-2140 | 1128           | 254            | 188            | 59              | 122             | 1015                        | 1751                            | 623                             | 35.6      | 0.48                             |
| 2140-2155 | 23586          | 4201           | 3435           | 666             | 1673            | 6759                        | 33562                           | 9976                            | 29.7      | 0.40                             |
| 2155-2170 | 49646          | 8729           | 5635           | 1361            | 3708            | 14306                       | 69080                           | 19434                           | 28.3      | 0.37                             |
| 2170-2185 | 30376          | 5676           | 5148           | 1353            | 2043            | 11825                       | 44597                           | 14221                           | 31.9      | 0.66                             |
| 2185-2200 | 9703           | 2356           | 2180           | 598             | 1323            | 4692                        | 16161                           | 6458                            | 40.0      | 0.45                             |
| 2200-2215 | 30596          | 6044           | 4490           | 1536            | 2740            | 6885                        | 45405                           | 14809                           | 32.6      | 0.56                             |
| 2215-2240 | 18743          | 3902           | 3497           | 1089            | 2030            | 3690                        | 29262                           | 10518                           | 36.0      | 0.54                             |
| 2240-2255 | 21210          | 5961           | 9520           | 3300            | 6281            | 14969                       | 46272                           | 25062                           | 54.2      | 0.53                             |
| 2255-2270 | 184682         | 39073          | 47152          | 16090           | 30791           | 66942                       | 317787                          | 133105                          | 41.9      | 0.52                             |
| 2270-2285 | 22989          | 5313           | 5108           | 1428            | 2904            | 8899                        | 37742                           | 14752                           | 39.1      | 0.49                             |
| 2285-2300 | 29238          | 7333           | 7300           | 1981            | 3947            | 7543                        | 49799                           | 20561                           | 41.3      | 0.50                             |
| 2300-2315 | 25072          | 6308           | 6625           | 1996            | 3957            | 8122                        | 43957                           | 18886                           | 43.0      | 0.50                             |
| 2315-2330 | 95413          | 18842          | 13029          | 3552            | 7320            | 18389                       | 138156                          | 42744                           | 30.9      | 0.49                             |
| 2330-2345 | 23337          | 6470           | 6731           | 2159            | 4288            | 10348                       | 42986                           | 19649                           | 45.7      | 0.50                             |
| 2345-2360 | 16610          | 6484           | 10509          | 3680            | 7118            | 16831                       | 44402                           | 27792                           | 62.6      | 0.52                             |
| 2360-2375 | 18280          | 7500           | 11924          | 4270            | 8522            | 21177                       | 50497                           | 32216                           | 63.8      | 0.50                             |
| 2375-2390 | 25620          | 8879           | 10655          | 3383            | 6386            | 17772                       | 54923                           | 29303                           | 53.4      | 0.53                             |
| 2390-2405 | 17509          | 5825           | 7967           | 2603            | 4979            | 12012                       | 38882                           | 21373                           | 55.0      | 0.52                             |

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| Depth     | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | iC <sub>4</sub> | nC <sub>4</sub> | C <sub>5</sub> <sup>+</sup> | ΣC <sub>1</sub> -C <sub>4</sub> | ΣC <sub>2</sub> -C <sub>4</sub> | % wetness | iC <sub>4</sub> /nC <sub>4</sub> |
|-----------|----------------|----------------|----------------|-----------------|-----------------|-----------------------------|---------------------------------|---------------------------------|-----------|----------------------------------|
| 2405-2420 | 42863          | 12149          | 14791          | 4390            | 8202            | 17062                       | 82395                           | 39532                           | 48.0      | 0.54                             |
| 2420-2435 | 28334          | 9480           | 11175          | 3003            | 5538            | 11309                       | 57530                           | 29197                           | 50.8      | 0.54                             |
| 2435-2450 | 2540           | 851            | 1220           | 214             | 465             | 1207                        | 5290                            | 2750                            | 52.0      | 0.46                             |
| 2460-2475 | 3056           | 1228           | 1592           | 366             | 531             | 1471                        | 6775                            | 3718                            | 54.9      | 0.69                             |
| 2475-2490 | 56508          | 28279          | 40719          | 11391           | 23490           | 43042                       | 160387                          | 103879                          | 64.8      | 0.48                             |
| 2490-2505 | 22016          | 13124          | 17700          | 4143            | 8364            | 14639                       | 65348                           | 43332                           | 66.3      | 0.50                             |
| 2505-2520 | 24866          | 9389           | 9710           | 2284            | 4184            | 6846                        | 50434                           | 25568                           | 50.7      | 0.55                             |
| 2520-2535 | 25255          | 13392          | 17883          | 4528            | 8620            | 20349                       | 69678                           | 44422                           | 63.8      | 0.53                             |
| 2535-2550 | 15107          | 7345           | 7910           | 1746            | 3238            | 10746                       | 35346                           | 20240                           | 57.3      | 0.54                             |
| 2550-2565 | 47546          | 22549          | 30971          | 9227            | 17833           | 42156                       | 128126                          | 80580                           | 62.9      | 0.52                             |
| 2565-2580 | 26710          | 11978          | 14916          | 4188            | 7575            | 24325                       | 65367                           | 38656                           | 59.1      | 0.55                             |
| 2580-2595 | 45262          | 26115          | 45364          | 14213           | 26703           | 72483                       | 157657                          | 112395                          | 71.3      | 0.53                             |
| 2595-2610 | 19547          | 11726          | 19798          | 5651            | 10267           | 20075                       | 66990                           | 47442                           | 70.8      | 0.55                             |
| 2610-2625 | 22786          | 15371          | 25317          | 7392            | 13060           | 23970                       | 83926                           | 61140                           | 72.9      | 0.57                             |
| 2625-2640 | 6260           | 4214           | 5566           | 1601            | 2689            | 5737                        | 20330                           | 14071                           | 69.2      | 0.60                             |
| 2640-2655 | 24174          | 10783          | 12925          | 3375            | 5592            | 13496                       | 56848                           | 32674                           | 57.5      | 0.60                             |
| 2655-2670 | 14399          | 6979           | 7556           | 1742            | 2622            | 5836                        | 33298                           | 18899                           | 56.8      | 0.66                             |
| 2670-2685 | 1638           | 566            | 906            | 360             | 505             | 1452                        | 3975                            | 2338                            | 58.8      | 0.71                             |

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| Depth     | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | iC <sub>4</sub> | nC <sub>4</sub> | C <sub>5</sub> <sup>+</sup> | ΣC <sub>1</sub> -C <sub>4</sub> | ΣC <sub>2</sub> -C <sub>4</sub> | % wetness | iC <sub>4</sub> /nC <sub>4</sub> |
|-----------|----------------|----------------|----------------|-----------------|-----------------|-----------------------------|---------------------------------|---------------------------------|-----------|----------------------------------|
| 2685-2700 | 9411           | 4082           | 5379           | 1620            | 2354            | 2690                        | 22846                           | 13435                           | 58.8      | 0.69                             |
| 2700-2715 | 8156           | 4795           | 7995           | 2401            | 4352            | 8464                        | 27700                           | 19544                           | 70.6      | 0.55                             |
| 2715-2730 | 12523          | 8320           | 19637          | 6473            | 12674           | 26078                       | 59626                           | 47103                           | 79.0      | 0.51                             |
| 2730-2750 | 15190          | 12511          | 39472          | 15504           | 30833           | 65730                       | 113510                          | 98320                           | 86.6      | 0.50                             |
| 2750-2765 | 5342           | 3217           | 9004           | 3676            | 6606            | 21996                       | 27844                           | 22503                           | 80.8      | 0.56                             |
| 2765-2780 | 9478           | 4843           | 11194          | 3900            | 7543            | 23456                       | 36957                           | 27480                           | 74.4      | 0.52                             |
| 2780-2795 | 12404          | 4646           | 7640           | 2707            | 4573            | 9977                        | 31970                           | 19566                           | 61.2      | 0.59                             |
| 2795-2810 | 30452          | 11117          | 21677          | 7908            | 17797           | 37807                       | 85952                           | 55500                           | 64.6      | 0.53                             |
| 2810-2825 | 39041          | 17024          | 36847          | 15146           | 28631           | 88280                       | 136689                          | 97648                           | 71.4      | 0.53                             |
| 2825-2840 | 22886          | 8360           | 15363          | 5983            | 12511           | 46413                       | 65103                           | 42217                           | 64.9      | 0.48                             |
| 2840-2855 | 20049          | 9741           | 20088          | 6872            | 15526           | 53138                       | 72275                           | 52227                           | 72.6      | 0.44                             |
| 2855-2870 | 10073          | 2964           | 4038           | 1336            | 3060            | 17070                       | 21471                           | 11398                           | 53.1      | 0.44                             |
| 2870-2885 | 23935          | 17896          | 16146          | 3088            | 7426            | 11732                       | 68491                           | 44556                           | 65.1      | 0.42                             |
| 2885-2900 | 21216          | 16185          | 10633          | 1261            | 2960            | 944                         | 52255                           | 31039                           | 59.4      | 0.43                             |
| 2900-2915 | 29778          | 14581          | 10404          | 1495            | 3180            | 3521                        | 59348                           | 29661                           | 49.9      | 0.47                             |
| 2915-2930 | 1977           | 985            | 522            | 4               | 8               | 145                         | 3496                            | 1519                            | 43.4      | 0.46                             |
| 2930-2945 | 23342          | 10301          | 6779           | 999             | 1981            | 2440                        | 43401                           | 20059                           | 46.2      | 0.50                             |
| 2945-2960 | 156920         | 50364          | 12311          | 1420            | 2511            | 3508                        | 223527                          | 66606                           | 29.8      | 0.57                             |

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| Depth     | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | iC <sub>4</sub> | nC <sub>4</sub> | C <sub>5</sub> <sup>+</sup> | ΣC <sub>1</sub> -C <sub>4</sub> | ΣC <sub>2</sub> -C <sub>4</sub> | % wetness | iC <sub>4</sub> /nC <sub>4</sub> |
|-----------|----------------|----------------|----------------|-----------------|-----------------|-----------------------------|---------------------------------|---------------------------------|-----------|----------------------------------|
| 2960-2975 | 507087         | 170943         | 35088          | 3564            | 5993            | 6441                        | 722673                          | 215586                          | 29.8      | 0.59                             |
| 2975-2990 | 91936          | 34657          | 8382           | 833             | 1463            | 1461                        | 137272                          | 45355                           | 33.0      | 0.57                             |
| 2990-3005 | 136440         | 33254          | 8922           | 1101            | 2008            | 3178                        | 181725                          | 45285                           | 24.9      | 0.55                             |
| 3005-3020 | 213729         | 59868          | 10788          | 1160            | 1882            | 2367                        | 287428                          | 73699                           | 25.6      | 0.62                             |
| 3020-3035 | 32269          | 12306          | 4594           | 624             | 1123            | 3903                        | 50917                           | 18647                           | 36.6      | 0.56                             |
| 3035-3050 | 89224          | 24568          | 6121           | 687             | 1288            | 2478                        | 121888                          | 32664                           | 26.8      | 0.53                             |
| 3050-3065 | 43423          | 9104           | 1495           | 64              | 154             | 243                         | 54240                           | 10817                           | 19.9      | 0.42                             |
| 3065-3080 | 184079         | 31325          | 6151           | 638             | 1115            | 3795                        | 223309                          | 39230                           | 17.6      | 0.57                             |
| 3080-3095 | 15001          | 5414           | 1978           | 19              | 33              | 250                         | 22445                           | 7444                            | 33.2      | 0.56                             |
| 3095-3110 | 13266          | 4799           | 2153           | 245             | 547             | 2137                        | 21009                           | 7743                            | 36.9      | 0.45                             |
| 3110-3125 | 35472          | 9778           | 4192           | 656             | 1111            | 1718                        | 51209                           | 15737                           | 30.7      | 0.59                             |
| 3125-3140 | 12097          | 5072           | 2774           | 320             | 736             | 4508                        | 21000                           | 8902                            | 42.4      | 0.43                             |
| 3140-3155 | 23896          | 8526           | 2978           | 262             | 589             | 4056                        | 36251                           | 12355                           | 34.1      | 0.44                             |
| 3155-3170 | 19172          | 8101           | 3475           | 341             | 702             | 1170                        | 31791                           | 12618                           | 39.7      | 0.49                             |
| 3170-3185 | 12604          | 4126           | 2210           | 290             | 626             | 1177                        | 19856                           | 7252                            | 36.5      | 0.46                             |
| 3185-3200 | 4945           | 2409           | 1142           | 129             | 313             | 549                         | 8939                            | 3995                            | 44.7      | 0.41                             |
| 3200-3215 | 4190           | 2303           | 1237           | 132             | 331             | 524                         | 8193                            | 4004                            | 48.9      | 0.40                             |
| 3215-3230 | 7193           | 3417           | 1867           | 226             | 530             | 826                         | 13233                           | 6040                            | 45.6      | 0.43                             |
| 3230-3245 | 6010           | 2650           | 1500           | 94              | 411             | 1258                        | 10666                           | 4655                            | 43.7      | 0.23                             |

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| Depth     | $C_1$ | $C_2$ | $C_3$ | $iC_4$ | $nC_4$ | $C_5^+$ | $\Sigma C_1-C_4$ | $\Sigma C_2-C_4$ | % wetness | $iC_4/nC_4$ |
|-----------|-------|-------|-------|--------|--------|---------|------------------|------------------|-----------|-------------|
| 3245-3260 | 8525  | 3122  | 1436  | 127    | 344    | 607     | 13554            | 5029             | 37.1      | 0.37        |
| 3260-3275 | 9702  | 3136  | 1254  | 115    | 255    | 464     | 14462            | 4760             | 32.9      | 0.45        |
| 3275-3290 | 6597  | 1744  | 751   | 32     | 86     | 126     | 9210             | 2614             | 28.4      | 0.38        |
| 3290-3305 | 3708  | 1799  | 1352  | 117    | 421    | 2091    | 7397             | 3689             | 49.8      | 0.28        |
| 3305-3320 | 4370  | 1757  | 986   | 77     | 245    | 1177    | 7435             | 3064             | 41.2      | 0.31        |
| 3320-3335 | 27820 | 6167  | 1678  | 179    | 378    | 1258    | 36223            | 8402             | 23.2      | 0.47        |
| 3335-3350 | 12590 | 2394  | 657   | 37     | 155    | 663     | 15833            | 3243             | 20.5      | 0.24        |
| 3350-3365 | 4461  | 1249  | 442   | 11     | 44     | 426     | 6207             | 1746             | 28.1      | 0.25        |
| 3365-3380 |       |       |       |        |        |         |                  |                  |           |             |
| 3380-3395 | 17706 | 2558  | 687   | 13     | 46     | 442     | 21011            | 3304             | 15.7      | 0.28        |
| 3395-3410 | 16745 | 1612  | 249   | 26     | 43     | 415     | 18675            | 1931             | 10.3      | 0.60        |
| 3410-3425 | 1549  | 214   | 66    | 6      | 10     | 224     | 1840             | 291              | 15.8      | 0.57        |
| 3425-3440 | 976   | 212   | 103   | 3      | 7      | 198     | 1300             | 325              | 25.0      | 0.48        |
| 3440-3455 | 2190  | 357   | 115   | 4      | 9      | 218     | 2675             | 485              | 18.1      | 0.46        |
| 3455-3470 | 948   | 134   | 59    | 2      | 5      | 163     | 1148             | 200              | 17.5      | 0.48        |
| 3470-3485 | 1769  | 293   | 166   | 19     | 56     | 524     | 2303             | 534              | 23.1      | 0.33        |
| 3485-3500 | 618   | 130   | 70    | 1      | 2      | 112     | 820              | 202              | 24.6      | 0.36        |
| 3500-3515 | 1175  | 140   | 60    | 1      | 3      | 145     | 1379             | 204              | 14.8      | 0.36        |
| 3515-3530 | 384   | 68    | 38    | 1      | 2      | 124     | 492              | 108              | 21.9      | 0.38        |

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| Depth     | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | iC <sub>4</sub> | nC <sub>4</sub> | C <sub>5</sub> <sup>+</sup> | ΣC <sub>1</sub> -C <sub>4</sub> | ΣC <sub>2</sub> -C <sub>4</sub> | % wetness | iC <sub>4</sub> /nC <sub>4</sub> |
|-----------|----------------|----------------|----------------|-----------------|-----------------|-----------------------------|---------------------------------|---------------------------------|-----------|----------------------------------|
| 3530-3545 | 979            | 251            | 148            | 1               | 2               | 132                         | 1380                            | 401                             | 29.1      | 0.37                             |
| 3545-3560 | 731            | 222            | 150            | 7               | 16              | 216                         | 1125                            | 395                             | 35.1      | 0.42                             |
| 3560-3575 | 304            | 73             | 48             | 1               | 2               | 143                         | 429                             | 125                             | 29.1      | 0.38                             |
| 3575-3590 | 296            | 54             | 31             | 1               | 2               | 136                         | 383                             | 87                              | 22.6      | 0.38                             |
| 3590-3605 | 311            | 53             | 28             | 1               | 1               | 116                         | 394                             | 83                              | 21.1      | 0.37                             |
| 3605-3620 | 34             | 11             | 9              | -               | -               | 94                          | 55                              | 20                              | 37.4      | 0.42                             |
| 3620-3635 | 406            | 90             | 51             | 4               | 9               | 183                         | 560                             | 154                             | 27.5      | 0.38                             |
| 3635-3650 | 665            | 126            | 44             | 1               | 2               | 141                         | 839                             | 173                             | 20.1      | 0.40                             |
| 3650-3665 | 636            | 162            | 73             | 5               | 12              | 213                         | 886                             | 251                             | 28.3      | 0.37                             |
| 3665-3680 | 435            | 179            | 116            | 12              | 32              | 294                         | 774                             | 339                             | 43.8      | 0.39                             |
| 3680-3695 | 181            | 46             | 47             | 4               | 16              | 219                         | 293                             | 113                             | 38.4      | 0.26                             |
| 3695-3710 | 359            | 68             | 51             | 11              | 23              | 235                         | 513                             | 154                             | 30.0      | 0.49                             |
| 3710-3725 | 651            | 97             | 47             | 6               | 13              | 216                         | 814                             | 163                             | 20.0      | 0.46                             |
| 3725-TD.  | 1607           | 318            | 230            | 50              | 106             | 1031                        | 2311                            | 704                             | 30.5      | 0.47                             |

TABLE Ib

Concentration ( $\mu\text{l}$  gas/kg rock) of  $C_1 - C_7$  hydrocarbons in cuttings. (Absorbed gas).

| Depth       | $C_1$ | $C_2$ | $C_3$ | $iC_4$ | $nC_4$ | $C_5^+$ | $\Sigma C_1-C_4$ | $\Sigma C_2-C_4$ | % wetness | $iC_4/nC_4$ |
|-------------|-------|-------|-------|--------|--------|---------|------------------|------------------|-----------|-------------|
| 1690 - 1720 | 248   | 86    | 31    | -      | -      | 18      | 365              | 119              | 32.4      | -           |
| 1720 - 1750 | 260   | 89    | 34    | -      | -      | 16      | 384              | 128              | 33.0      | -           |
| 1750 - 1770 | 294   | 91    | 38    | 1      | -      | 12      | 423              | 131              | 30.8      | -           |
| 1770 - 1800 | 306   | 94    | 41    | 2      | 1      | 8       | 444              | 138              | 31.1      |             |
| 1800 - 1827 | 209   | 74    | 28    | -      | -      | 7       | 313              | 104              | 32.3      |             |
| 1830 - 1860 | 184   | 99    | 212   | 18     | 119    | 56      | 632              | 447              | 70.8      | 0.15        |
| 1860 - 1890 | 218   | 78    | 90    | 11     | 13     | 32      | 411              | 193              | 47.0      | 0.87        |
| 1890 - 1920 | 135   | 36    | 52    | 1      | 4      | 16      | 228              | 93               | 40.9      | 0.41        |
| 1920 - 1950 | 299   | 75    | 102   | 9      | 31     | 45      | 515              | 216              | 42.0      | 0.29        |
| 1950 - 1980 | 264   | 26    | 16    | 2      | 6      | 21      | 314              | 50               | 15.9      | 0.33        |
| 1980 - 2000 | 255   | 251   | 17    | 3      | 10     | 27      | 309              | 54               | 17.6      | 0.26        |
| 2000 - 2030 | 364   | 34    | 22    | 3      | 7      | 18      | 430              | 66               | 15.4      | 0.43        |
| 2030 - 2050 | 426   | 54    | 32    | 4      | 6      | 15      | 522              | 96               | 18.4      | 0.46        |
| 2060 - 2090 | 469   | 53    | 28    | 3      | 6      | 16      | 559              | 90               | 16.1      | 0.48        |
| 2090 - 2110 | 564   | 58    | 12    | 4      | 10     | 24      | 648              | 84               | 12.9      | 0.44        |
| 2110 - 2125 | 272   | 25    | 13    | 2      | 4      | 84      | 316              | 44               | 14.0      | 0.41        |
| 2125 - 2140 | 302   | 39    | 15    | 3      | 7      | 114     | 366              | 64               | 17.5      | 0.45        |

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| Depth       | $C_1$ | $C_2$ | $C_3$ | $iC_4$ | $nC_4$ | $C_5^+$ | $\Sigma C_1-C_4$ | $\Sigma C_2-C_4$ | % wetness | $iC_4/nC_4$ |
|-------------|-------|-------|-------|--------|--------|---------|------------------|------------------|-----------|-------------|
| 2140 - 2155 | 374   | 44    | 18    | 4      | 8      | 126     | 448              | 74               | 16.5      | 0.48        |
| 2155 - 2170 | 402   | 46    | 19    | 5      | 8      | 132     | 480              | 78               | 19.0      | 0.46        |
| 2170 - 2185 | 342   | 41    | 16    | 3      | 7      | 112     | 409              | 67               | 16.4      | 0.43        |
| 2185 - 2200 | 284   | 33    | 14    | 2      | 4      | 92      | 337              | 53               | 15.6      | 0.43        |
| 2700 - 2215 | 236   | 30    | 13    | 3      | 6      | 192     | 288              | 52               | 18.1      | 0.45        |
| 2215 - 2240 | 218   | 18    | 7     | 1      | 3      | 180     | 247              | 9                | 11.8      | 0.42        |
| 2240 - 2255 | 236   | 23    | 11    | 1      | 3      | 196     | 273              | 37               | 13.6      | 0.45        |
| 2255 - 2270 | 461   | 52    | 16    | 2      | 4      | 212     | 535              | 74               | 13.8      | 0.49        |
| 2270 - 2285 | 587   | 71    | 23    | 4      | 9      | 314     | 694              | 107              | 15.4      | 0.41        |
| 2285 - 2300 | 334   | 36    | 8     | 2      | 4      | 307     | 384              | 49               | 12.8      | 0.44        |
| 2300 - 2315 | 361   | 38    | 8     | 1      | 3      | 296     | 411              | 50               | 12.2      | 0.44        |
| 2315 - 2330 | 391   | 44    | 9     | 1      | 3      | 284     | 449              | 58               | 12.9      | 0.43        |
| 2330 - 2345 | 306   | 24    | 7     | 1      | 2      | 206     | 394              | 34               | 10.0      | 0.45        |
| 2345 - 2360 | 236   | 18    | 6     | 1      | 2      | 220     | 261              | 27               | 10.3      | 0.46        |
| 2360 - 2375 | 346   | 30    | 8     | 1      | 3      | 418     | 388              | 42               | 10.8      | 0.39        |
| 2375 - 2390 | 441   | 41    | 18    | 2      | 6      | 712     | 510              | 68               | 13.4      | 0.38        |
| 2390 - 2405 | 606   | 56    | 24    | 3      | 6      | 696     | 695              | 89               | 12.8      | 0.50        |
| 2405 - 2420 | 5334  | 561   | 156   | 11     | 19     | 1042    | 6081             | 748              | 12.3      | 0.56        |
| 2420 - 2435 | 1651  | 178   | 52    | 6      | 11     | 724     | 1898             | 247              | 13.0      | 0.49        |

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| Depth       | $C_1$ | $C_2$ | $C_3$ | $iC_4$ | $nC_4$ | $C_5^+$ | $\Sigma C_1-C_4$ | $\Sigma C_2-C_4$ | % wetness | $iC_4/nC_4$ |
|-------------|-------|-------|-------|--------|--------|---------|------------------|------------------|-----------|-------------|
| 2435 - 2450 | 1049  | 118   | 37    | 4      | 8      | 718     | 1216             | 167              | 13.7      | 0.46        |
| 2450 - 2475 | 1261  | 129   | 41    | 5      | 10     | 612     | 1445             | 185              | 12.8      | 0.48        |
| 2475 - 2490 | 1142  | 123   | 39    | 4      | 9      | 503     | 1347             | 175              | 13.3      | 0.44        |
| 2490 - 2505 | 1462  | 168   | 50    | 5      | 10     | 562     | 1695             | 233              | 13.8      | 0.48        |
| 2505 - 2520 | 64    | 6     | 2     | -      | 1      | 334     | 741              | 9                | 12.5      | 0.46        |
| 2520 - 2535 | 1664  | 179   | 66    | 6      | 12     | 826     | 1927             | 203              | 13.7      | 0.47        |
| 2535 - 2550 | 1527  | 172   | 61    | 4      | 9      | 707     | 1773             | 246              | 13.9      | 0.44        |
| 2550 - 2565 | 1451  | 168   | 58    | 4      | 9      | 642     | 1690             | 239              | 14.1      | 0.44        |
| 2565 - 2580 | 722   | 94    | 40    | 3      | 7      | 511     | 866              | 144              | 16.6      | 0.42        |
| 2580 - 2595 | 741   | 93    | 40    | 4      | 9      | 324     | 887              | 146              | 16.5      | 0.44        |
| 2595 - 2610 | 726   | 89    | 39    | 4      | 9      | 154     | 866              | 140              | 16.2      | 0.44        |
| 2610 - 2625 | 1041  | 106   | 51    | 5      | 10     | 284     | 1213             | 172              | 14.2      | 0.42        |
| 2625 - 2640 | 4862  | 586   | 134   | 9      | 25     | 1060    | 5617             | 755              | 13.4      | 0.36        |
| 2640 - 2655 | 1651  | 194   | 56    | 6      | 11     | 562     | 1918             | 267              | 13.9      | 0.50        |
| 2655 - 2670 | 1862  | 217   | 61    | 7      | 19     | 794     | 2165             | 303              | 14.0      | 0.40        |
| 2670 - 2685 | 6042  | 802   | 354   | 194    | 168    | 696     | 7560             | 1018             | 20.1      | 1.15        |
| 2685 - 2700 | 6915  | 882   | 375   | 200    | 173    | 705     | 8547             | 1631             | 19.1      | 1.16        |
| 2700 - 2715 | 3642  | 316   | 162   | 51     | 46     | 342     | 4217             | 575              | 13.6      | 1.11        |
| 2715 - 2730 | 2143  | 202   | 65    | 8      | 7      | 214     | 2424             | 281              | 11.6      | 1.17        |

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| Depth       | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | iC <sub>4</sub> | nC <sub>4</sub> | C <sub>5</sub> <sup>+</sup> | ΣC <sub>1</sub> -C <sub>4</sub> | ΣC <sub>2</sub> -C <sub>4</sub> | % wetness | iC <sub>4</sub> /nC <sub>4</sub> |
|-------------|----------------|----------------|----------------|-----------------|-----------------|-----------------------------|---------------------------------|---------------------------------|-----------|----------------------------------|
| 2730 - 2750 | 4280           | 546            | 144            | 36              | 27              | 382                         | 5034                            | 753                             | 15.0      | 1.31                             |
| 2750 - 2765 | 3640           | 386            | 112            | 24              | 20              | 325                         | 4182                            | 542                             | 13.0      | 1.20                             |
| 2765 - 2780 | 2438           | 278            | 89             | 13              | 11              | 211                         | 2828                            | 390                             | 13.8      | 1.16                             |
| 2780 - 2795 | 2141           | 264            | 83             | 12              | 11              | 214                         | 2511                            | 370                             | 14.7      | 1.09                             |
| 2795 - 2810 | 1640           | 204            | 80             | 10              | 9               | 196                         | 1943                            | 303                             | 15.6      | 1.11                             |
| 2810 - 2825 | 1410           | 182            | 77             | 7               | 6               | 190                         | 1682                            | 272                             | 16.2      | 1.15                             |
| 2825 - 2840 | 820            | 104            | 52             | 6               | 5               | 186                         | 987                             | 167                             | 16.9      | 1.20                             |
| 2840 - 2855 | 649            | 88             | 35             | 4               | 3               | 114                         | 779                             | 131                             | 16.8      | 1.17                             |
| 2855 - 2870 | 2640           | 394            | 118            | 14              | 13              | 264                         | 3179                            | 539                             | 17.0      | 1.08                             |
| 2870 - 2885 | 3318           | 450            | 143            | 20              | 18              | 318                         | 3948                            | 631                             | 16.0      | 1.08                             |
| 2885 - 2900 | 2242           | 364            | 120            | 36              | 32              | 416                         | 2794                            | 552                             | 19.8      | 1.13                             |
| 2900 - 2915 | 1545           | 282            | 103            | 36              | 30              | 482                         | 1995                            | 450                             | 22.6      | 1.20                             |
| 2915 - 2931 | 1142           | 244            | 86             | 24              | 29              | 384                         | 1525                            | 383                             | 25.1      | 0.83                             |
| 2930 - 2945 | 3035           | 526            | 227            | 11              | 86              | 725                         | 3886                            | 851                             | 21.9      | 0.13                             |
| 2945 - 2960 | 830            | 137            | 234            | 88              | 210             | 830                         | 1499                            | 669                             | 44.6      | 0.42                             |
| 2960 - 2975 | 831            | 137            | 236            | 89              | 216             | 925                         | 1508                            | 677                             | 44.9      | 0.41                             |
| 2975 - 2990 | 856            | 140            | 240            | 91              | 220             | 960                         | 1547                            | 691                             | 44.7      | 0.41                             |
| 2990 - 3005 | 756            | 130            | 226            | 64              | 206             | 942                         | 1382                            | 626                             | 45.3      | 0.31                             |
| 3005 - 3020 | 743            | 126            | 219            | 61              | 223             | 966                         | 1371                            | 629                             | 45.9      | 0.27                             |
| 3020 - 3035 | 642            | 106            | 201            | 56              | 208             | 892                         | 1213                            | 571                             | 47.1      | 0.27                             |

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| Depth       | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | iC <sub>4</sub> | nC <sub>4</sub> | C <sub>5</sub> <sup>+</sup> | ΣC <sub>1</sub> -C <sub>4</sub> | ΣC <sub>2</sub> -C <sub>4</sub> | % wetness | iC <sub>4</sub> /nC <sub>4</sub> |
|-------------|----------------|----------------|----------------|-----------------|-----------------|-----------------------------|---------------------------------|---------------------------------|-----------|----------------------------------|
| 3350 - 3365 | 667            | 150            | 72             | 24              | 41              | 352                         | 964                             | 287                             | 29.7      | 0.59                             |
| 3365 - 3380 |                |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3380 - 3395 | 1043           | 220            | 112            | 26              | 47              | 368                         | 1447                            | 405                             | 28.0      | 0.56                             |
| 3395 - 3410 | 542            | 132            | 150            | 19              | 78              | 694                         | 921                             | 379                             | 41.2      | 0.25                             |
| 3410 - 3425 |                |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3425 - 3440 |                |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3440 - 3455 | NOT DETERMINED |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3455 - 3470 |                |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3470 - 3485 | 373            | 39             | 24             | 1               | 3               | 385                         | 339                             | 67                              | 19.6      | 0.25                             |
| 3485 - 3500 | 142            | 22             | 8              | -               | 1               | 164                         | 173                             | 31                              | 18.0      | 0.25                             |
| 3500 - 3515 |                |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3515 - 3530 | NOT DETERMINED |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3530 - 3545 | 191            | 26             | 20             | -               | -               | 92                          | 238                             | 46                              | 19.5      | 0.25                             |
| 3545 - 3560 | 329            | 37             | 12             | -               | 1               | 60                          | 379                             | 50                              | 13.3      | 0.24                             |
| 3560 - 3575 | 381            | 50             | 12             | 5               | 21              | 142                         | 469                             | 88                              | 18.8      | 0.25                             |
| 3575 - 3590 |                |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3590 - 3605 |                |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3605 - 3620 | NOT DETERMINED |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3620 - 3625 |                |                |                |                 |                 |                             |                                 |                                 |           |                                  |

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| Depth       | $C_1$ | $C_2$ | $C_3$ | $iC_4$ | $nC_4$ | $C_5^+$ | $\Sigma C_1-C_4$ | $\Sigma C_2-C_4$ | % wetness | $iC_4/nC_4$ |
|-------------|-------|-------|-------|--------|--------|---------|------------------|------------------|-----------|-------------|
| 3035 - 3050 | 344   | 62    | 112   | 48     | 159    | 1056    | 725              | 381              | 52.6      | 0.31        |
| 3050 - 3065 | 880   | 210   | 216   | 78     | 240    | 1402    | 1624             | 744              | 45.8      | 0.33        |
| 3065 - 3080 | 885   | 213   | 220   | 79     | 245    | 1364    | 1643             | 758              | 46.1      | 0.32        |
| 3080 - 3095 | 840   | 198   | 204   | 69     | 207    | 1153    | 1518             | 678              | 44.7      | 0.33        |
| 3095 - 3110 | 808   | 106   | 132   | 50     | 193    | 1296    | 1289             | 481              | 37.3      | 0.26        |
| 3110 - 3125 | 2302  | 327   | 244   | 129    | 222    | 1300    | 3225             | 923              | 28.6      | 0.58        |
| 3125 - 3140 | 2544  | 348   | 142   | 32     | 60     | 375     | 3127             | 583              | 18.6      | 0.54        |
| 3140 - 3155 | 2367  | 333   | 189   | 69     | 125    | 892     | 3084             | 717              | 23.3      | 0.55        |
| 3155 - 3170 | 1657  | 233   | 101   | 45     | 38     | 412     | 2075             | 417              | 20.1      | 1.20        |
| 3170 - 3185 | 1749  | 226   | 87    | 43     | 40     | 244     | 2145             | 396              | 18.5      | 1.08        |
| 3185 - 3200 | 1162  | 162   | 87    | 40     | 35     | 260     | 1486             | 324              | 21.8      | 1.14        |
| 3200 - 3215 | 1402  | 297   | 103   | 37     | 66     | 413     | 1824             | 422              | 23.2      | 0.57        |
| 3215 - 3230 | 1093  | 159   | 69    | 31     | 20     | 150     | 1372             | 278              | 20.3      | 1.58        |
| 3230 - 3245 | 1269  | 192   | 77    | 29     | 28     | 210     | 1594             | 325              | 20.4      | 1.05        |
| 3245 - 3260 | 1655  | 240   | 112   | 49     | 47     | 467     | 2102             | 447              | 21.3      | 1.04        |
| 3260 - 3275 | 1800  | 243   | 163   | 61     | 145    | 780     | 2412             | 612              | 25.4      | 0.42        |
| 3275 - 3290 | 1417  | 188   | 83    | 23     | 28     | 224     | 1739             | 322              | 18.5      | 0.82        |
| 3290 - 3305 | 939   | 146   | 67    | 17     | 21     | 218     | 1190             | 251              | 21.1      | 0.82        |
| 3305 - 3320 | 2991  | 457   | 224   | 49     | 67     | 424     | 3787             | 797              | 21.0      | 0.73        |

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| Depth       | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | iC <sub>4</sub> | nC <sub>4</sub> | C <sub>5</sub> <sup>+</sup> | ΣC <sub>1</sub> -C <sub>4</sub> | ΣC <sub>2</sub> -C <sub>4</sub> | % wetness | iC <sub>4</sub> /nC <sub>4</sub> |
|-------------|----------------|----------------|----------------|-----------------|-----------------|-----------------------------|---------------------------------|---------------------------------|-----------|----------------------------------|
| 3320 - 3335 | 633            | 110            | 65             | 25              | 44              | 356                         | 877                             | 243                             | 27.8      | 0.58                             |
| 3335 - 3350 | 969            | 117            | 89             | 34              | 58              | 435                         | 1328                            | 359                             | 27.0      | 0.59                             |
| 3635 - 3650 |                |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3650 - 3665 | NOT DETERMINED |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3665 - 3680 |                |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3680 - 3695 | 233            | 27             | 10             | -               | 1               | 124                         | 271                             | 38                              | 13.9      | 0.24                             |
| 3695 - 3710 |                |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3710 - 3725 | NOT DETERMINED |                |                |                 |                 |                             |                                 |                                 |           |                                  |
| 3725 - TD   | 451            | 67             | 29             | 6               | 10              | 746                         | 563                             | 112                             | 19.8      | 0.59                             |

TABLE Ic.

Concentration ( $\mu\text{l}$  gas/kg rock) of  $C_1$ - $C_7$  hydrocarbons in cuttings. (Headspace + Absorbed gas).

| Depth     | $C_1$ | $C_2$ | $C_3$ | $iC_4$ | $nC_4$ | $C_5^+$ | $\Sigma C_1-C_4$ | $\Sigma C_2-C_4$ | % wetness | $iC_4/nC_4$ |
|-----------|-------|-------|-------|--------|--------|---------|------------------|------------------|-----------|-------------|
| 1690-1720 | 3352  | 256   | 46    | 3      | -      | 224     | 3647             | 307              | 8.4       | -           |
| 1720-1750 | 1203  | 152   | 40    | 1      | -      | 150     | 1397             | 199              | 14.2      | -           |
| 1750-1770 | 1133  | 158   | 154   | 9      | 1      | 3610    | 1455             | 322              | 22.1      | 9.70        |
| 1770-1800 | 2614  | 371   | 80    | 96     | 10     | 301     | 3171             | 577              | 17.6      | 9.60        |
| 1800-1827 | 1613  | 469   | 159   | 301    | 17     | 327     | 2562             | 949              | 37.0      | 18.07       |
| 1830-1860 | 8201  | 5020  | 4722  | 1649   | 3311   | 7277    | 23003            | 14801            | 64.3      | 0.50        |
| 1860-1890 | 8571  | 2050  | 1913  | 622    | 1269   | 2478    | 14427            | 5856             | 40.6      | 0.49        |
| 1890-1920 | 179   | 46    | 59    | 1      | 4      | 17      | 290              | 110              | 37.9      | 0.45        |
| 1920-1950 | 9362  | 1864  | 1300  | 328    | 684    | 1268    | 13487            | 4176             | 31.0      | 0.49        |
| 1950-1980 | 10916 | 1924  | 1539  | 457    | 974    | 2331    | 15809            | 4894             | 31.0      | 0.47        |
| 1980-2000 | 25885 | 4541  | 2765  | 685    | 1553   | 3447    | 35339            | 9453             | 26.7      | 0.44        |
| 2000-2030 | 9195  | 1268  | 770   | 182    | 424    | 1422    | 11840            | 2644             | 22.3      | 0.43        |
| 2030-2050 | 10375 | 1813  | 1268  | 318    | 718    | 1474    | 14492            | 4117             | 28.4      | 0.44        |
| 2060-2090 | 10184 | 1470  | 894   | 195    | 511    | 1208    | 13254            | 3070             | 23.2      | 0.38        |
| 2090-2110 | 8572  | 1175  | 798   | 91     | 219    | 998     | 10819            | 2236             | 20.7      | 0.42        |

Table 1c - page 2.

| Depth     | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | iC <sub>4</sub> | nC <sub>4</sub> | C <sub>5</sub> <sup>+</sup> | ΣC <sub>1</sub> -C <sub>4</sub> | ΣC <sub>2</sub> -C <sub>4</sub> | % wetness | iC <sub>4</sub> /nC <sub>4</sub> |
|-----------|----------------|----------------|----------------|-----------------|-----------------|-----------------------------|---------------------------------|---------------------------------|-----------|----------------------------------|
| 2110-2125 | 3179           | 556            | 496            | 146             | 326             | 1569                        | 4703                            | 1524                            | 32.4      | 0.45                             |
| 2125-2140 | 1430           | 293            | 203            | 62              | 129             | 1129                        | 2117                            | 687                             | 32.5      | 0.48                             |
| 2140-2155 | 23960          | 4245           | 3453           | 670             | 1681            | 6885                        | 34010                           | 10050                           | 29.6      | 0.48                             |
| 2155-2170 | 50048          | 8775           | 5654           | 1366            | 3716            | 14438                       | 69560                           | 19512                           | 28.1      | 0.37                             |
| 2170-2185 | 30718          | 5717           | 5164           | 1356            | 2050            | 11937                       | 45006                           | 14288                           | 31.7      | 0.66                             |
| 2185-2200 | 9987           | 2389           | 2194           | 600             | 1327            | 4784                        | 16498                           | 6511                            | 39.5      | 0.45                             |
| 2200-2215 | 30832          | 6074           | 4503           | 1539            | 2746            | 7077                        | 45793                           | 14861                           | 32.5      | 0.56                             |
| 2215-2240 | 18961          | 3920           | 3504           | 1090            | 2033            | 3870                        | 29507                           | 10547                           | 35.7      | 0.54                             |
| 2240-2255 | 21446          | 5984           | 9532           | 3301            | 6284            | 15165                       | 46555                           | 25099                           | 53.9      | 0.53                             |
| 2255-2270 | 185143         | 39125          | 47168          | 16092           | 30795           | 67165                       | 318322                          | 133179                          | 41.8      | 0.52                             |
| 2270-2285 | 23576          | 5384           | 5131           | 1432            | 2915            | 9213                        | 38436                           | 14861                           | 38.7      | 0.49                             |
| 2285-2300 | 29572          | 7369           | 7308           | 1983            | 3951            | 7850                        | 50183                           | 20610                           | 41.1      | 0.50                             |
| 2300-2315 | 25433          | 6346           | 6633           | 1997            | 2960            | 8418                        | 44368                           | 18936                           | 42.7      | 0.50                             |
| 2315-2330 | 95804          | 18886          | 13038          | 3553            | 7323            | 18673                       | 138605                          | 42802                           | 30.9      | 0.49                             |
| 2330-2345 | 23643          | 6494           | 6738           | 2160            | 4290            | 10554                       | 43326                           | 19683                           | 45.4      | 0.50                             |
| 2345-2360 | 16845          | 6502           | 10515          | 3681            | 7120            | 17051                       | 44663                           | 27819                           | 62.3      | 0.52                             |
| 2360-2375 | 18626          | 7530           | 11930          | 4271            | 8525            | 21595                       | 50885                           | 32258                           | 63.4      | 0.50                             |
| 2375-2390 | 26061          | 8920           | 10673          | 3385            | 6392            | 18484                       | 55433                           | 29371                           | 53.0      | 0.53                             |
| 2390-2405 | 18115          | 5881           | 7991           | 2606            | 4985            | 12708                       | 39577                           | 21462                           | 54.2      | 0.52                             |

Table 1c - page 3.

| Depth     | $C_1$ | $C_2$ | $C_3$ | $iC_4$ | $nC_4$ | $C_5^+$ | $\Sigma C_1-C_4$ | $\Sigma C_2-C_4$ | % wetness | $iC_4/nC_4$ |
|-----------|-------|-------|-------|--------|--------|---------|------------------|------------------|-----------|-------------|
| 2405-2420 | 48197 | 12810 | 14947 | 4401   | 8221   | 18104   | 88476            | 40280            | 45.5      | 0.54        |
| 2520-2435 | 29985 | 9658  | 11224 | 3009   | 5549   | 12033   | 59428            | 29444            | 49.5      | 0.54        |
| 2435-2450 | 2589  | 969   | 1257  | 218    | 472    | 12027   | 6506             | 2917             | 44.8      | 0.46        |
| 2450-2475 | 4316  | 1357  | 1633  | 371    | 541    | 2083    | 8220             | 2935             | 35.7      | 0.69        |
| 2475-2490 | 57650 | 28402 | 40758 | 11395  | 23499  | 43545   | 161704           | 104064           | 64.4      | 0.48        |
| 2490-2505 | 23478 | 13292 | 17750 | 4148   | 8374   | 15201   | 67043            | 43565            | 65.0      | 0.50        |
| 2505-2520 | 24930 | 9395  | 9712  | 2284   | 4185   | 7180    | 50508            | 25577            | 50.7      | 0.55        |
| 2520-2535 | 26919 | 13541 | 17949 | 4534   | 8632   | 21175   | 71605            | 44625            | 62.3      | 0.53        |
| 2535-2550 | 16634 | 7517  | 7971  | 1750   | 3247   | 11451   | 37119            | 20486            | 55.2      | 0.54        |
| 2550-2565 | 48997 | 22717 | 31029 | 9231   | 17842  | 42798   | 129816           | 80819            | 65.3      | 0.52        |
| 2565-2580 | 27432 | 12072 | 14956 | 4191   | 7582   | 24649   | 66254            | 38802            | 58.6      | 0.55        |
| 2580-2595 | 46003 | 26208 | 45404 | 14217  | 26712  | 72807   | 158544           | 112541           | 71.0      | 0.53        |
| 2595-2610 | 20273 | 11715 | 19837 | 5655   | 10296  | 20229   | 67856            | 27582            | 70.1      | 0.55        |
| 2610-2625 | 23827 | 15477 | 25368 | 7397   | 13070  | 24254   | 85139            | 61312            | 72.0      | 0.57        |
| 2625-2640 | 11122 | 4800  | 5700  | 1610   | 2714   | 6797    | 25947            | 14826            | 57.1      | 0.59        |
| 2640-2655 | 25911 | 10977 | 12981 | 3381   | 5603   | 14048   | 58756            | 32941            | 56.1      | 0.60        |
| 2655-2670 | 16261 | 7196  | 7617  | 1749   | 2641   | 6630    | 35363            | 19202            | 54.3      | 0.66        |
| 2670-2685 | 7680  | 1348  | 1260  | 554    | 673    | 2148    | 11535            | 3356             | 29.1      | 0.82        |
| 2685-2700 | 16326 | 4964  | 5755  | 1820   | 2527   | 3395    | 31393            | 15066            | 48.0      | 0.72        |

Table 1c - page 4

| Depth     | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | iC <sub>4</sub> | nC <sub>4</sub> | C <sub>5</sub> <sup>+</sup> | ΣC <sub>1</sub> -C <sub>4</sub> | ΣC <sub>2</sub> -C <sub>4</sub> | % wetness | iC <sub>4</sub> /nC <sub>4</sub> |
|-----------|----------------|----------------|----------------|-----------------|-----------------|-----------------------------|---------------------------------|---------------------------------|-----------|----------------------------------|
| 2700-2715 | 11798          | 5111           | 8157           | 2452            | 4398            | 8806                        | 31917                           | 20119                           | 63.0      | 0.56                             |
| 2715-2730 | 14666          | 8522           | 19702          | 6481            | 12681           | 26292                       | 62050                           | 47384                           | 76.4      | 0.51                             |
| 2730-2750 | 19470          | 13057          | 39616          | 15540           | 30860           | 65112                       | 118544                          | 99073                           | 83.6      | 0.50                             |
| 2750-2765 | 8982           | 3603           | 9116           | 3700            | 6626            | 22321                       | 32026                           | 23045                           | 72.0      | 0.56                             |
| 2765-2780 | 11916          | 5121           | 11281          | 3913            | 7554            | 23667                       | 39785                           | 27870                           | 70.1      | 0.52                             |
| 2780-2795 | 14445          | 4910           | 7723           | 2719            | 4584            | 10191                       | 34481                           | 19936                           | 54.6      | 0.59                             |
| 2795-2810 | 32092          | 11321          | 21757          | 7918            | 17816           | 38003                       | 87895                           | 55803                           | 63.5      | 0.44                             |
| 2810-2825 | 40451          | 17206          | 36924          | 15153           | 28637           | 88470                       | 138371                          | 97920                           | 70.8      | 0.53                             |
| 2825-2840 | 23706          | 8464           | 15415          | 5989            | 12516           | 46599                       | 66090                           | 42384                           | 64.1      | 0.48                             |
| 2840-2855 | 20698          | 9829           | 20123          | 6876            | 15529           | 53452                       | 73054                           | 52358                           | 71.7      | 0.44                             |
| 2855-2870 | 12713          | 3358           | 4156           | 1350            | 3073            | 17334                       | 24650                           | 11937                           | 48.4      | 0.44                             |
| 2870-2885 | 27252          | 18346          | 16289          | 3108            | 7444            | 12050                       | 72839                           | 45187                           | 62.0      | 0.42                             |
| 2885-2900 | 23458          | 16549          | 10753          | 1296            | 2992            | 1360                        | 55049                           | 31591                           | 57.4      | 0.43                             |
| 2900-2915 | 31323          | 14863          | 10507          | 1531            | 3210            | 4003                        | 61433                           | 30111                           | 49.0      | 0.48                             |
| 2915-2930 | 3119           | 1229           | 608            | 28              | 37              | 529                         | 5021                            | 1902                            | 37.9      | 0.76                             |
| 2930-2945 | 26377          | 10827          | 7006           | 1010            | 2067            | 3165                        | 47287                           | 20910                           | 44.2      | 0.49                             |
| 2945-2960 | 157750         | 50501          | 12545          | 1508            | 2721            | 4338                        | 225026                          | 67275                           | 29.9      | 0.55                             |
| 2960-2975 | 507918         | 171080         | 35324          | 3653            | 6209            | 7355                        | 724181                          | 216261                          | 29.9      | 0.59                             |
| 2975-2990 | 92792          | 34797          | 8622           | 924             | 1683            | 2421                        | 138819                          | 46026                           | 33.2      | 0.55                             |

Table 1c - page 5

| Depth     | $C_1$  | $C_2$ | $C_3$ | $iC_4$ | $nC_4$ | $C_5^+$ | $\Sigma C_1-C_4$ | $\Sigma C_2-C_4$ | % wetness | $iC_4/nC_4$ |
|-----------|--------|-------|-------|--------|--------|---------|------------------|------------------|-----------|-------------|
| 2990-3005 | 137196 | 33384 | 9148  | 1165   | 2214   | 4120    | 183107           | 45911            | 25.9      | 0.53        |
| 3005-3020 | 214472 | 59994 | 11007 | 1221   | 2105   | 3333    | 288799           | 74328            | 25.7      | 0.58        |
| 3020-3035 | 32911  | 12412 | 4795  | 680    | 1331   | 4795    | 52130            | 19218            | 36.9      | 0.51        |
| 3035-3050 | 89568  | 24630 | 6233  | 735    | 1447   | 3534    | 122603           | 33045            | 27.0      | 0.51        |
| 3050-3065 | 44303  | 9314  | 1711  | 142    | 394    | 1645    | 55864            | 11561            | 20.7      | 0.36        |
| 3065-3080 | 184974 | 31538 | 6371  | 717    | 1360   | 5159    | 224952           | 39988            | 17.8      | 0.53        |
| 3080-3095 | 15841  | 5612  | 2182  | 88     | 240    | 1403    | 23963            | 8122             | 33.9      | 0.37        |
| 3095-3110 | 14074  | 4905  | 2285  | 295    | 740    | 3433    | 22298            | 8224             | 36.9      | 0.40        |
| 3110-3125 | 37774  | 10105 | 4436  | 785    | 1333   | 3018    | 54434            | 16660            | 30.6      | 0.59        |
| 3125-3140 | 14641  | 5420  | 4916  | 352    | 796    | 4883    | 24127            | 9485             | 39.3      | 0.44        |
| 3140-3155 | 26263  | 8859  | 3167  | 331    | 714    | 4948    | 37335            | 13072            | 35.0      | 0.46        |
| 3155-3170 | 20829  | 8334  | 3576  | 386    | 740    | 1582    | 33866            | 13035            | 38.5      | 0.52        |
| 3170-3185 | 14353  | 4352  | 2297  | 333    | 666    | 1361    | 22001            | 7648             | 34.8      | 0.50        |
| 3185-3200 | 6107   | 2571  | 1229  | 169    | 348    | 809     | 10425            | 4319             | 41.4      | 0.49        |
| 3200-3215 | 5592   | 2520  | 1340  | 169    | 397    | 937     | 10016            | 4427             | 44.2      | 0.43        |
| 3215-3230 | 8286   | 3576  | 1936  | 257    | 550    | 976     | 14605            | 6318             | 43.3      | 0.47        |
| 3230-3245 | 7279   | 2842  | 1577  | 123    | 439    | 1468    | 12260            | 4980             | 40.6      | 0.28        |
| 3245-3260 | 9794   | 3314  | 1513  | 156    | 372    | 817     | 15148            | 5354             | 35.3      | 0.42        |
| 3260-3275 | 11502  | 3379  | 1417  | 176    | 400    | 1244    | 16874            | 5372             | 31.8      | 0.44        |

Table 1c - page 6

| Depth       | $C_1$ | $C_2$ | $C_3$ | $iC_4$ | $nC_4$ | $C_5^+$ | $\Sigma C_1-C_4$ | $\Sigma C_2-C_4$ | % wetness | $iC_4/nC_4$ |
|-------------|-------|-------|-------|--------|--------|---------|------------------|------------------|-----------|-------------|
| 3275-3290   | 8014  | 1932  | 834   | 55     | 114    | 350     | 10949            | 2936             | 26.8      | 0.48        |
| 3290-3305   | 4647  | 1945  | 1419  | 134    | 442    | 2309    | 8587             | 3940             | 45.9      | 0.30        |
| 3305-3320   | 7361  | 2214  | 1210  | 126    | 312    | 1601    | 11222            | 3861             | 34.4      | 0.40        |
| 3320-3335   | 28453 | 6277  | 1743  | 204    | 422    | 1614    | 37100            | 8645             | 23.3      | 0.48        |
| 3335-3350   | 13559 | 2571  | 746   | 71     | 213    | 1098    | 17161            | 3602             | 21.0      | 0.33        |
| 3350-3365   | 5128  | 1399  | 514   | 35     | 85     | 778     | 7171             | 2030             | 28.4      | 0.41        |
| 3365-3380 + |       |       |       |        |        |         |                  |                  |           |             |
| 3380-3395   | 18749 | 2778  | 799   | 39     | 93     | 810     | 22458            | 3709             | 16.5      | 0.42        |
| 3395-3410   | 17287 | 1744  | 399   | 45     | 121    | 1109    | 10596            | 2310             | 11.8      | 0.37        |
| 3410-3425 * | 1549  | 214   | 66    | 6      | 10     | 224     | 1840             | 291              | 15.8      | 0.57        |
| 3425-2440 * | 976   | 212   | 103   | 3      | 7      | 198     | 1300             | 325              | 25.0      | 0.48        |
| 3440-3455 * | 2190  | 357   | 115   | 4      | 9      | 218     | 2675             | 487              | 18.1      | 0.46        |
| 3455-3470 * | 948   | 134   | 59    | 2      | 5      | 163     | 1148             | 200              | 17.5      | 0.48        |
| 3470-3405   | 2142  | 332   | 190   | 20     | 59     | 909     | 2642             | 601              | 22.7      | 0.34        |
| 3485-3500   | 760   | 152   | 78    | 1      | 3      | 276     | 993              | 233              | 23.5      | 0.36        |
| 3500-3515 * | 1175  | 140   | 60    | 1      | 3      | 145     | 1379             | 204              | 14.8      | 0.36        |
| 3515-3530 * | 384   | 68    | 38    | 1      | 2      | 124     | 492              | 108              | 21.9      | 0.38        |
| 3530-3545   | 1170  | 277   | 168   | 1      | 2      | 324     | 1618             | 447              | 27.6      | 0.43        |
| 3545-3560   | 1060  | 259   | 162   | 7      | 17     | 276     | 1504             | 445              | 29.6      | 0.41        |

Table 1c - page 7

| Depth      | C <sub>1</sub> | C <sub>2</sub> | C <sub>3</sub> | iC <sub>4</sub> | nC <sub>4</sub> | C <sub>5</sub> <sup>+</sup> | ΣC <sub>1</sub> -C <sub>4</sub> | ΣC <sub>2</sub> -C <sub>4</sub> | % wetness | iC <sub>4</sub> /nC <sub>4</sub> |
|------------|----------------|----------------|----------------|-----------------|-----------------|-----------------------------|---------------------------------|---------------------------------|-----------|----------------------------------|
| 3560-3575  | 685            | 123            | 60             | 6               | 23              | 285                         | 898                             | 213                             | 23.7      | 0.26                             |
| 3575-3590* | 296            | 54             | 31             | 1               | 2               | 136                         | 283                             | 87                              | 22.6      | 0.38                             |
| 3590-3605* | 311            | 53             | 28             | 1               | 1               | 116                         | 394                             | 83                              | 21.1      | 0.37                             |
| 3605-3620* | 34             | 11             | 9              | -               | -               | 94                          | 55                              | 20                              | 37.4      | 0.42                             |
| 3620-3635* | 406            | 90             | 51             | 4               | 9               | 183                         | 560                             | 154                             | 27.5      | 0.38                             |
| 3635-3650* | 665            | 126            | 44             | 1               | 2               | 141                         | 839                             | 173                             | 20.1      | 0.40                             |
| 3650-3665* | 636            | 162            | 73             | 5               | 12              | 213                         | 886                             | 251                             | 28.3      | 0.37                             |
| 3665-3680* | 435            | 179            | 116            | 12              | 32              | 294                         | 774                             | 339                             | 43.8      | 0.39                             |
| 3680-3695  | 414            | 73             | 57             | 4               | 17              | 343                         | 564                             | 151                             | 26.8      | 0.24                             |
| 3695-3710* | 359            | 68             | 51             | 11              | 23              | 235                         | 513                             | 154                             | 30.0      | 0.49                             |
| 3710-3725* | 651            | 97             | 47             | 6               | 13              | 216                         | 814                             | 163                             | 20.0      | 0.46                             |
| 3725-TD.   | 2058           | 385            | 259            | 56              | 116             | 1777                        | 2874                            | 816                             | 28.4      | 0.48                             |

\* Headspace analysis only.

+ Sample missing.

T A B L E II

Lithology and Total Organic Carbon (TOC) measurements.

| Depth     | TOC  |        | Lithology  |
|-----------|------|--------|--|
| 1690-1720 | 0.58 | 100%   | Claystone, greengrey, grey, brownish, grey, some green.  |
|           |      | sm.am. | Quartz Sandstone, light  |
|           |      | obs.   | Pyrite   |
| 1720-1750 | 1.06 | 100%   | Claystone, grey, greenish grey, brownish grey, brown.  |
|           |      | sm.am. | Quartz Sandstone light; Pyrite   |
| 1750-1770 | 1.03 | 100%   | Claystone, grey, greenish grey, brown, brownish grey, green.   |
|           |      | sm.am. | Quartz Sandstone, light, brownish, with Glauconite and Pyrite; Pyrite.   |
| 1770-1800 | 1.21 | 100%   | Claystone, as above  |
|           |      | sm.am. | Limestone, light; Sand/Sandstone; Pyrite   |
| 1800-1827 | 0.67 | 100%   | Claystone, as above.   |
|           |      | sm.am. | Silty Sandstone, consisting of dark minerals and Quartz; Quartz Sand/Sandstone, light; silty Sandstone, light; Limestone; Pyrite |
| 1827-1830 | 0.71 | 100%   | Claystone, as above  |
|           |      | sm.am. | Silty Sandstone, light, grey; Siltstone, grey, light.  |
|           |      | obs.   | Limestone, light, grey; Quartz Sandstone, light; silty Sandstone, consisting of dark minerals and Quartz.                        |

T A B L E II

| Depth     | TOC  |        | Lithology  |
|-----------|------|--------|--|
| 1830-1860 | 0.89 | 75%    | Sandy Siltstone to silty Sandstone, light with dark minerals.  |
|           | 0.83 | 25%    | Silty Claystone, grey.   |
|           |      | sm.am. | Silty Sandstone and sandy Siltstone, grey; Siltstone, grey.  |
|           |      | obs.   | Limestone.   |
| 1860-1890 | 0.84 | 97%    | Claystone, grey, some green fragments.   |
|           |      | 3%     | Sandy Siltstone to silty Sandstone, as above.  |
|           |      | obs.   | Sandstone, grey; Sand/Sandstone, light.  |
| 1890-1920 | 0.82 | 100%   | Claystone, grey to light grey.   |
|           |      | obs.   | Limestone; Quartz.   |
| 1920-1950 | 0.82 | 100%   | Claystone, partly silty, grey, some greenish.  |
|           |      | sm.am. | Quartz Sand/Sandstone, light; Pyrite; Sandy Siltstone to silty Sandstone, light with dark minerals; sandy Siltstone and silty Sandstone, grey. |
|           |      | obs.   | Limestone.   |
| 1950-1980 | 0.73 | 95%    | Claystone, as above.   |
|           |      | 5%     | Quartz Sand/Sandstone, very fine to medium, light.   |
|           |      | sm.am. | Silty Sandstone, grey; Sandy Siltstone to silty Sandstone, light with dark minerals; Siltstone, grey; Pyrite; Limestone.                       |
| 1980-2000 | 0.72 | 100%   | Claystone, as above, some sandy fragments.   |
|           |      | sm.am. | Quartz Sand; Limestone, sandy Siltstone to silty Sandstone, light with dark minerals; Pyrite.  |

T A B L E II

| Depth     | TOC  | Lithology |  |
|-----------|------|-----------|--|
| 1830-1860 | 0.89 | 75%       | Sandy Siltstone to silty Sandstone, light with dark minerals.  |
|           | 0.83 | 25%       | Silty Claystone, grey.   |
|           |      | sm.am.    | Silty Sandstone and sandy Siltstone, grey; Siltstone, grey.  |
|           |      | obs.      | Limestone.   |
| 1860-1890 | 0.84 | 97%       | Claystone, grey, some green fragments.   |
|           |      | 3%        | Sandy Siltstone to silty Sandstone, as above.  |
|           |      | obs.      | Sandstone, grey; Sand/Sandstone, light.  |
| 1890-1920 | 0.82 | 100%      | Claystone, grey to light grey.   |
|           |      | obs.      | Limestone; Quartz.   |
| 1920-1950 | 0.82 | 100%      | Claystone, partly silty, grey, some greenish.  |
|           |      | sm.am.    | Quartz Sand/Sandstone, light; Pyrite;  |
|           |      |           | Sandy Siltstone to silty Sandstone, light with dark minerals; sandy Siltstone and silty Sandstone, grey.                 |
|           |      | obs.      | Limestone.   |
| 1950-1980 | 0.73 | 95%       | Claystone, as above.   |
|           |      | 5%        | Quartz Sand/Sandstone, very fine to medium, light.   |
|           |      | sm.am.    | Silty Sandstone, grey; Sandy Siltstone to silty Sandstone, light with dark minerals; Siltstone, grey; Pyrite; Limestone. |
| 1980-2000 | 0.72 | 100%      | Claystone, as above, some sandy fragments.   |
|           |      | sm.am.    | Quartz Sand; Limestone, sandy Siltstone to silty Sandstone, light with dark minerals; Pyrite.                            |

T A B L E II

| Depth     | TOC  |        | Lithology  |
|-----------|------|--------|--|
| 2000-2030 | 0.91 | 100%   | Claystone, partly silty and sandy, grey.   |
|           |      | sm.am. | Quartz Sand; Limestone; Pyrite; Sand/Siltstone, grey, with Glauconite and Pyrite.                        |
| 2030-2060 | 0.63 | 100%   | Claystone, partly silty, grey, some greenish fragments.  |
|           |      | sm.am. | Sand/Siltstone, grey, with Glauconite; Pyrite.   |
|           |      | obs.   | Limestone.   |
| 2060-2090 | 0.65 | 100%   | Claystone, silty, grey, some greenish fragments.   |
|           |      | sm.am. | Silt/Sandstone, grey, with Glauconite; Quartz.   |
|           |      | obs.   | Limestone; Pyrite.   |
| 2090-2110 | 0.80 | 100%   | Claystone, partly silty and sandy, grey, some greenish fragments.  |
|           |      | sm.am. | Silt/Sandstone, grey, with Glauconite; Limestone; Pyrite; Quartz Sand/Sandstone, light, with Glauconite. |
| 2110-2125 | 0.55 | 100%   | Claystone, as above.   |
|           |      | sm.am. | Sand/Siltstone, grey, with Glauconite; Pyrite.   |
|           |      | obs.   | Limestone; Sandstone, light, with Glauconite.  |
| 2125-2140 | 0.88 | 100%   | Claystone, as above.   |
|           |      | sm.am. | Sand/Siltstone, grey; sandy Siltstone, brownish light with dark minerals.                                |
|           |      | obs.   | Pyrite; Limestone.   |

T A B L E II

| Depth     | TOC  |        | Lithology   |
|-----------|------|--------|---|
| 2140-2155 | 0.63 | 100%   | Claystone, partly silty and sandy, grey.  |
|           |      | sm.am. | Sand/Siltstone, grey, with Glauconite.  |
|           |      | obs.   | Sandstone, light grey, with Glauconite;<br>Pyrite; Limestone.                       |
| 2155-2170 | 0.95 | 100%   | Claystone, as above.  |
|           |      | sm.am. | Silt/Sandstone, grey, with Glauconite;<br>Pyrite; Limestone; Quartz Sand/Sandstone. |
|           |      | obs.   | Glauconite.   |
| 2170-2185 | 0.84 | 100%   | Claystone, partly silty and sandy, grey,<br>some greenish fragments.                |
|           |      | sm.am. | Sand/Siltstone, grey, with Glauconite;<br>Pyrite; Quartz Sand/Sandstone.            |
| 2185-2200 | 0.97 | 100%   | Claystone, partly silty, grey.  |
|           |      | obs.   | Pyrite; Limestone; Siltstone, grey, with<br>Glauconite.                             |
| 2200-2215 | 0.73 | 100%   | Claystone, partly silty, grey, some<br>greenish fragments.                          |
|           |      | sm.am. | Pyrite.   |
| 2225-2240 | 1.28 | 100%   | Claystone, partly silty, grey.  |
|           |      | sm.am. | Pyrite; Quartz Sand/Sandstone, light;<br>Siltstone.                                 |
| 2240-2255 | 0.74 | 100%   | Claystone, partly silty, grey.  |
|           |      | sm.am. | Limestone, light, brownish light; Pyrite.   |
|           |      | obs.   | Quartz Sand; Sand/Siltstone, grey.  |
| 2255-2270 | 0.55 | 90%    | Claystone, partly silty, grey.  |
|           |      | 10%    | Limestone, light, grey.   |
|           |      | sm.am. | Quartz Sand.  |

TABLE II

| Depth     | TOC  |        | Lithology  |
|-----------|------|--------|--|
| 2270-85   | 0.66 | 100%   | Claystone, partly silty, grey.   |
|           |      | sm.am. | Limestone, as above.   |
|           |      | obs.   | Quartz; Pyrite.  |
| 2285-2300 | 0.68 | 100%   | Silty Claystone grading to clayey Siltstone, very fine sandgrains observed, grey, some greenish fragments, Glauconite obs. |
|           |      | sm.am. | Limestone, grey, light.  |
|           |      | obs.   | Pyrite; Quartz.  |
| 2300-15   | 0.66 | 100%   | Claystone, grading to clayey Siltstone, grey, some light brown.  |
|           |      | sm.am. | Limestone  |
| 2315-30   | 0.64 | 98%    | Claystone grading to clayey Siltstone grey, some greenish, Glauconite obs.   |
|           |      | 2%     | Limestone, light, light grey; Pyrite.  |
|           |      | sm.am. | Sandy Siltstone, light grey, brownish, with carbonate.   |
| 2330-45   | 0.72 |        | Silty Claystone grading to siltstone, grey, some greenish, glauconite and pyrite observed.                                 |
|           |      | sm.am. | Limestone, light/light grey, grey; Pyrite; Siltstone.  |
| 2345-60   | 0.85 | 100%   | Claystone grading to clayey Siltstone, grey, with Coal, a fragment with many Pyrite crystals observed.                     |
| 2360-75   | 0.85 | 100%   | Claystone grading to clayey Siltstone, grey, with Coal.  |

T A B L E II

| Depth     | TOC  |                                 | Lithology  |
|-----------|------|---------------------------------|--|
| 2375-90   | 0.84 | 100%<br>obs.                    | Claystone to silty claystone, grey.<br>Pyrite; sandy Siltstone; Limestone.   |
| 2390-2405 | 0.65 | 98%<br><br>2%<br>sm.am.         | Claystone grading to clayey Siltstone,<br>grey, with Coal, Glauconite observed.<br>Limestone, light/light grey, grey.<br>Siltstone, sandy, brown.                      |
| 2405-20   | 0.66 | 49%                             | Limestone, light/light grey, grey.   |
|           | 0.68 | 49%<br>2%<br>sm.am.             | Silty Claystone, grey.<br>Coal.<br>Pyrite; Quartz; Siltstone, light brown.   |
| 2420-35   | 0.85 | 97%<br><br>3%<br>sm.am.         | Claystone grading to clayey Siltstone,<br>grey.<br>Coal.<br>Limestone.   |
| 2435-50   | 0.86 | 90%<br><br>7%<br>2%<br>1%       | Claystone to clayey Siltstone, grey,<br>with coal, glauconite observed.<br>Coal.<br>Limestone, light grey.<br>Sandstone, very fine, light grey,<br>with Glauconite.    |
| 2460-75   | 1.15 | 50%<br><br>50%<br>sm.am.        | Claystone grading to clayey Siltstone,<br>grey.<br>Coal.<br>Sandstone, as above.   |
| 2475-90   | 1.07 | 98%<br>2%<br><br>sm.am.<br>obs. | Silty Claystone to Siltstone, grey.<br>Sandstone, very fine, light grey to<br>brownish, with Glauconite and Coal.<br>Siltstone, light grey; brownish.<br>Quartz; Coal. |

T A B L E II

| Depth     | TOC  |        | Lithology  |
|-----------|------|--------|--|
| 2490-2505 | 1.23 | 100%   | Claystone grading to clayey Siltstone, grey, with sm.am. Coal and Glauconite.                  |
|           |      | sm.am. | Sandstone, as above.   |
| 2505-20   | 1.09 | 97%    | Silty Claystone grading to Siltstone, grey, with Glauconite and Coal.                          |
|           |      | 3%     | Sandstone, as above.   |
|           |      | sm.am. | Siltstone, browngrey.  |
| 2520-35   | 1.02 | 98%    | Silty Claystone grading to clayey Siltstone, grey, some light brown, with Coal and Glauconite. |
|           |      | 2%     | Sandstone.   |
|           |      | sm.am. | Coal; Sandstone; Siltstone.  |
| 2535-50   | 0.99 | 100%   | Claystone grading to clayey Siltstone.   |
|           |      | sm.am. | Siltstone, light grey; Sandstone, as above; Limestone.   |
| 2550-65   | 1.29 | 100%   | Silty Claystone to Siltstone, grey, with Glauconite, Pyrite and Coal.                          |
|           |      | sm.am. | Sandstone; Siltstone; Limestone.   |
| 2565-80   | 2.05 | 99%    | Silty Claystone to Siltstone, grey.  |
|           |      | 1%     | Sandstone, very fine, light grey, brownish, with Glauconite.                                   |
|           |      | sm.am. | Coal; Limestone, light grey, grey.   |
|           |      | obs.   | Pyrite.  |
| 2580-95   | 0.73 | 50%    | Silty Sandstone, very fine, light grey, with Glauconite.                                       |
|           | 1.26 | 50%    | Claystone grading to clayey Siltstone, grey.   |
|           |      | sm.am. | Coal.  |
|           |      | obs.   | Pyrite.  |

T A B L E II

| Depth     | TOC  |        | Lithology   |
|-----------|------|--------|---|
| 2595-2610 | 0.74 | 65%    | Sandstone, very fine, light grey, with Glauconite and Coal.                                     |
|           | 1.21 | 33%    | Silty Claystone to clayey Siltstone, grey, with Coal, Glauconite observed.                      |
|           |      | 2%     | Coal.   |
|           |      | sm.am. | Limestone, light grey; Siltstone, light grey.   |
| 2610-25   | 1.43 | 90%    | Silty Claystone grading to clayey Siltstone, grey, with Coal and Glauconite.                    |
|           |      | 10%    | Sandstone, as above.  |
|           |      | sm.am. | Siltstone, light grey; Quartz; Pyrite.  |
| 2625-40   | 1.05 | 50%    | Claystone grading to clayey Siltstone, grey.  |
|           | 0.53 | 50%    | Limestone, light grey, grey.  |
|           |      | sm.am. | Sandstone, as above.  |
| 2640-55   | 1.01 | 85%    | Silty Claystone grading to clayey Siltstone, grey.  |
|           |      | 15%    | Limestone, light grey, grey.  |
|           | 0.48 | sm.am. | Sandstone, as above; Siltstone; Coal; Pyrite.   |
| 2655-70   | 0.72 | 80%    | Claystone grading to clayey Siltstone, grey, with Coal.   |
|           | 0.46 | 20%    | Limestone, as above.  |
|           |      | sm.am. | Pyrite.   |
| 2670-85   | 0.40 | 95%    | Claystone grading to clayey Siltstone, grey, greenish and brown observed, with Coal and Pyrite. |
|           |      | 5%     | Limestone, as above.  |
|           |      | obs.   | Sandstone; Siltstone.   |

TABLE II

| Depth     | TOC                  |        | Lithology  |
|-----------|----------------------|--------|--|
| 2685-2700 | 0.82                 | 50%    | Claystone grading to clayey Siltstone, grey.   |
|           | 0.33                 | 50%    | Limestone, as above.   |
| 2700-15   | 0.79                 | 80%    | Silty Claystone grading to clayey Siltstone, grey, with sm.am. Coal.                   |
|           | 0.51                 | 20%    | Limestone, as above.   |
| 2715-30   | 1.12                 | 65%    | Claystone grading to clayey Siltstone, grey, some dark grey, with Coal and Glauconite. |
|           |                      | 7%     | Limestone.   |
|           |                      | 25%    | Mud additive (nut shells).   |
|           |                      | 3%     | Siltstone, light, with dark grains.  |
| 2730-50   | 0.99                 | 91%    | Claystone grading to clayey Siltstone, grey, with coal.                                |
|           |                      | 6%     | Limestone, as above.   |
|           |                      | 2%     | Mud additive (nut shells).   |
|           |                      | 1%     | Siltstone, light, with dark grains.  |
|           |                      | sm.am. | Quartz.  |
| 2750-65   | 0.38                 | 80%    | Limestone, light grey, grey; some brownish.  |
|           | 1.21                 | 20%    | Claystone grading to clayey Siltstone, grey, with Coal.                                |
| 2765-80   | 1.27<br>0.48         | sm.am. | Siltstone, with dark grains; Sandstone, as above.                                      |
|           |                      | 42%    | Silty Claystone, grey, with Coal.  |
|           |                      | 42%    | Limestone, as above.   |
|           |                      | 15%    | Mud additive (nut shells).   |
|           |                      | 1%     | Coal.  |
|           |                      | sm.am. | Siltstone; Pyrite.   |
| obs.      | Sandstone, as above. |        |  |

TABLE II

| Depth     | TOC          | Lithology   |
|-----------|--------------|---|
| 2780-95   | 1.59         | 70% Silty Claystone, grey, some dark grey.<br>30% Mud additives (25% nut shells, 5% mica).<br>sm.am. Coal; Siltstone, light, with dark grains; Limestone.   |
| 2795-2810 | 1.07         | 85% Silty Claystone, grey, with Coal and Glauconite.<br>15% Mud additive (nut shells).<br>sm.am. Siltstone, brownish, light, Limestone, Coal.<br>obs. Mixed Clay/Sandstone, light grey, with redbrown sandgrains; Sand/siltstone with redbrown sandgrains, with Glauconite; Sandstone, light brown; Pyrite; Quartz. |
| 2810-25   | 1.69         | 95% Silty Claystone, grey.<br>3% Siltstone, light brownish.<br>2% Limestone, light grey.<br>sm.am. Sandstone.<br>obs. Coal; Pyrite.   |
| 2825-40   | 0.62<br>0.57 | 82% Silty Claystone, grey, some greenish.<br>15% Siltstone, clayey, light brown, light.<br>3% Mud additive (nut shells).<br>sm.am. Sandstone; Pyrite; Limestone.  |
| 2840-55   | 0.50         | 96% Claystone grading to clayey Siltstone, grey, with Coal and Pyrite.<br>2% Clayey Siltstone, light brown, grey, light, with Carbonate.<br>2% Mud additive (nut shells).<br>sm.am. Limestone.  |

TABLE II

| Depth     | TOC  | Lithology |  |
|-----------|------|-----------|--|
| 2855-70   | 0.60 | 82%       | Claystone grading to clayey Siltstone, grey, green observed, sm.am. Coal and Glauconite.   |
|           |      | 10%       | Sandstone, brown.  |
|           |      | 6%        | Clayey Siltstone, light brown, light, sandy.   |
|           |      | 2%        | Mud additive (nut shells).   |
|           |      | sm.am.    | Quartz Sand, with forams; Pyrite; Limestone.   |
| 2870-85   | 0.47 | 98%       | Claystone to silty Claystone, grey, redbrown, light, green, brownish grey, with Carbonate. |
|           |      | 2%        | Coal.  |
|           |      | sm.am.    | Limestone, light; Sandstone, brown.  |
| 2885-2900 | 0.97 | 95%       | Claystone, silty, grey, dark grey, redbrown, brownish light grey, green.                   |
|           |      | 5%        | Coal.  |
|           |      | sm.am.    | Limestone.   |
|           |      | obs.      | Pyrite.  |
| 2900-15   | 1.17 | 100%      | Claystone, silty, grey, dark grey, brownish grey.  |
|           |      | sm.am.    | Siltstone, light, brownish light grey; Coal; Pyrite; Limestone.                            |
| 2915-30   | 2.03 | 100%      | Claystone, silty, grey, dark grey, redbrown, some brownish light grey and green.           |
|           |      | sm.am.    | Siltstone.   |
|           |      | obs.      | Coal.  |
| 2930-45   | 2.94 | 75%       | Claystone, silty, light grey to dark grey, redbrown.                                       |
|           | 1.59 | 25%       | Siltstone, clayey and sandy, brownish light grey, with dark grains.                        |
|           |      | sm.am.    | Sandstone; Pyrite; Coal.   |

T A B L E II

| Depth     | TOC  | Lithology |  |
|-----------|------|-----------|--|
| 2945-60   | 3.59 | 95%       | Claystone, silty, grey to dark grey.   |
|           |      | 5%        | Coal.  |
|           |      | sm.am.    | Sandstone; Siltstone.  |
| 2960-75   | 4.56 | 65%       | Claystone, silty, light grey to dark grey and brownish, redbrown, greenish.                |
|           |      | 35%       | Coal.  |
|           |      | sm.am.    | Sandstone, Siltstone.  |
| 2975-90   | 4.89 | 97%       | Claystone, as above.   |
|           |      | 3%        | Coal.  |
|           |      | sm.am.    | Sandstone; Siltstone.  |
| 2990-3005 | 3.91 | 87%       | Claystone, silty, light grey to dark grey/black and brownish, green and redbrown observed. |
|           |      | 10%       | Coal.  |
|           |      | 3%        | Siltstone and Sandstone, brownish light grey.  |
| 3005-20   | 3.76 | 75%       | Claystone, as above.   |
|           |      | 15%       | Coal.  |
|           |      | 10%       | Sandstone, very fine, brownish light grey.   |
| 3020-35   | 2.90 | 82%       | Claystone, silty, light grey to dark grey, redbrown.                                       |
|           |      | 15%       | Quartz sand, medium and some coarse, moderately/well sorted, angular/subangular, light.    |
|           |      | 3%        | Sandstone, very fine, brownish light grey; and Siltstone, brownish light grey, light grey. |
|           |      | sm.am.    | Coal.  |
|           |      | obs.      | Pyrite.  |

T A B L E II

| Depth     | TOC  |        | Lithology   |
|-----------|------|--------|---|
| 3035-50   | 4.54 | 99%    | Claystone, silty, light grey to dark grey, some redbrown.                             |
|           |      | 1%     | Coal.   |
|           |      | obs.   | Pyrite.   |
| 3050-65   | 7.97 | 96%    | Claystone, silty, light grey to dark grey, green and redbrown observed.               |
|           |      | 4%     | Coal.   |
|           |      | sm.am. | Sandstone, Siltstone, Quartz Sand.  |
| 3065-80   |      | 65%    | Quartz Sand, medium to fine and coarse, moderately sorted, angular/subangular, light. |
|           | 4.19 | 33%    | Claystone, as above.  |
|           |      | 2%     | Coal.   |
|           |      | sm.am. | Sandstone; Siltstone.   |
| 3080-95   | 3.37 | 100%   | Claystone, silty, light grey to dark grey, redbrown.                                  |
|           |      | sm.am. | Sandstone, very fine; Siltstone.  |
| 3095-3110 | 2.36 | 100%   | Claystone, silty, light grey to dark grey, redbrown.                                  |
|           |      | sm.am. | Sandstone, with Glauconite; Siltstone; Coal.  |
| 3110-25   | 3.45 | 97%    | Claystone, silty, grey to dark grey, redbrown, browngrey, some greenish.              |
|           |      | 3%     | Sandstone, very fine, brownish light grey, Glauconite obs.                            |
|           |      | sm.am. | Quartz Sand, medium, light; Coal.   |
| 3125-40   | 2.53 | 100%   | Claystone, silty, grey to dark grey, redbrown, browngrey, with Coal.                  |
|           |      | sm.am. | Sandstone, as above; Siltstone, light grey, with Glauconite; Pyrite; Coal.            |
|           |      | obs.   | Siltstone, light brown.   |

TABLE II

| Depth     | TOC  |        | Lithology   |
|-----------|------|--------|---|
| 3140-55   | 2.70 | 100%   | Claystone, silty, grey to dark grey, some redbrown.   |
|           |      | obs.   | Coal; Sandstone; Siltstone; Limestone; Pyrite.  |
| 3155-70   | 2.53 | 100%   | Claystone, silty, grey to dark grey, some redbrown, green observed.   |
|           |      | sm.am. | Siltstone, clayey, light brown, light grey.   |
|           |      | obs.   | Coal; Pyrite; Limestone, light.   |
| 3170-85   | 1.81 | 97%    | Claystone, partly grading to clayey Siltstone, grey to dark grey, some redbrown, with Coal, Glauconite obs. |
|           |      | 3%     | Quartz Sand, medium, light.   |
| 3185-3200 | 2.05 | 100%   | Claystone, silty, grey to dark grey and brownish, some redbrown.  |
|           |      | sm.am. | Limestone, light; Quartz Sand.  |
| 3200-15   | 1.91 | 100%   | Claystone, silty, grey to dark grey and brownish, some redbrown.  |
|           |      | sm.am. | Quartz Sand and Sandstone.  |
|           |      | obs.   | Marl, brownish light grey; Siltstone, brownish light grey.  |
| 3215-30   | 2.58 | 100%   | Claystone, silty and partly grading to clayey Siltstone, grey to dark grey and brown, with Coal.            |
|           |      | sm.am. | Siltstone, browngrey, with carbonate cement.  |
|           |      | obs.   | Forams; Glauconite.   |
| 3230-45   | 1.84 | 100%   | Claystone, as above.  |
|           |      | sm.am. | Siltstone, browngrey, with carbonate.   |
|           |      | obs.   | Limestone, light.   |

TABLE II

| Depth     | TOC  |        | Lithology   |
|-----------|------|--------|---|
| 3245-60   | 2.34 | 98%    | Claystone, as above, with Coal.   |
|           |      | 2%     | Coal.   |
| 3260-75   | 1.48 | 100%   | Claystone, as above.  |
|           |      | obs.   | Sandstone; Siltstone; Coal.   |
| 3275-90   | 2.30 | 99%    | Claystone, as above.  |
|           |      | 1%     | Coal.   |
|           |      | sm.am. | Sandstone, very fine.   |
| 3290-3305 | 2.00 | 97%    | Claystone, as above, grey, brownish grey, some light grey and redbrown.             |
|           |      | 2%     | Coal.   |
|           |      | 1%     | Sandstone, very fine, light grey.   |
|           |      | sm.am. | Siltstone, light grey.  |
|           |      | obs.   | Glauconite  |
| 3305-20   | 2.22 | 97%    | Claystone, as above, grey, brownish grey, some redbrown fragments, with Glauconite. |
|           |      | 3%     | Sandstone, very fine to fine, light grey, Glauconite obs.                           |
|           |      | sm.am. | Coal; Siltstone, light grey.  |
|           |      | obs.   | Glauconite.   |
| 3320-35   |      | 60%    | Quartz sand, fine to medium, some coarse, poorly sorted, angular, light.            |
|           | 2.43 | 40%    | Claystone, as above.  |
|           |      | sm.am. | Sandstone, as above; Pyrite.  |
|           |      |        | Coal; Siltstone; light grey.  |
|           |      | obs.   | Glauconite.   |
| 3335-60   | 2.53 | 65%    | Claystone, as above, with Coal.   |
|           |      | 35%    | Sandstone, as above.  |
|           |      | sm.am. | Siltstone, light grey; Gypsum, white (?); Pyrite; Coal.                             |
|           |      | obs.   | Glauconite.   |

T A B L E II

| Depth     | TOC  | Lithology |  |
|-----------|------|-----------|--|
| 3350-65   | 2.25 | 95%       | Silty Claystone grading to Siltstone, dark grey, brownish grey, redbrown obs., with Glauconite, sometimes sandy. |
|           |      | 5%        | Sandstone, fine to medium, angular, light.   |
|           |      | sm.am.    | Siltstone, light grey/grey; Coal.  |
|           |      | obs.      | Pyrite; silty Sandstone, with 50% Glauconite.  |
| 3380-95   | 2.09 | 83%       | Silty Claystone grading to Siltstone, grey, dark grey, brownish grey, some redbrown.                             |
|           |      | 15%       | Quartz sand, as above.   |
|           |      | 2%        | Coal.  |
|           |      | sm.am.    | Siltstone, as above.   |
| 3395-3410 |      | 97%       | Quartz Sand, medium to coarse, poorly sorted, angular, light.  |
|           |      | 3%        | Silty Claystone grading to Siltstone, as above; Siltstone; Coal.   |
| 3410-25   |      | 95%       | Quartz Sand, as above.   |
|           |      | 5%        | Silty Claystone to clayey Siltstone; Siltstone.  |
|           |      | sm.am.    | Coal.  |
| 3425-40   | 1.66 | 75%       | Quartz Sand, as above.   |
|           |      | 25%       | Silty Claystone to clayey Siltstone and Siltstone, sometimes sandy, grey, dark grey, brownish grey.              |
|           |      | sm.am.    | Coal; Siltstone, light grey/grey.  |
|           |      |           | Siltstone, partly sandy, cemented by carbonate, white.   |
|           |      | obs.      | Sandstone, fine, green; Siltstone, brownish light grey, with black sand grains; Pyrite.                          |

T A B L E II

| Depth     | TOC  | Lithology |   |
|-----------|------|-----------|---|
| 3440-55   | 1.56 | 80%       | Sandstone, as above.  |
|           |      | 20%       | Silty Claystone grading to Siltstone, grey, dark grey, brownish grey, red-brown obs.                                    |
|           |      | sm.am.    | Siltstone, cemented by carbonate, white; siltstone, grey.   |
|           |      | obs.      | Sandstone, fine, green, micaceous.  |
| 3455-70   | 1.07 | 50%       | Quartz Sand, as above.  |
|           |      | 50%       | Claystone grading to Siltstone, as above.   |
| 3470-85   | 0.98 | 60%       | Claystone grading to Siltstone, as above.   |
|           |      | 40%       | Quartz Sand, as above.  |
|           |      | sm.am.    | Siltstone, light grey/grey.   |
|           |      | obs.      | Sandstone, very fine, green; Siltstone, sandy, light grey, cemented by carbonate.                                       |
| 3485-3500 | 0.94 | 95%       | Claystone grading to silty Claystone, grey, light grey, brownish.   |
|           |      | 5%        | Quartz Sand, as above.  |
|           |      | sm.am.    | Sandstone, fine, greenish; Siltstone, light grey/grey; Siltstone, cemented by carbonate, white; Sandstone, fine, light. |
| 3500-15   |      | 92%       | Quartz Sand, medium to coarse and some very coarse, poorly sorted, angular, light.                                      |
|           |      | 8%        | Claystone partly silty, light grey (brownish), grey, some redbrown and dark grey.                                       |
| 3515-30   | 0.98 | 80%       | Quartz Sand, as above.  |
|           |      | 20%       | Claystone, as above.  |

TABLE II

| Depth     | TOC  | Lithology |   |
|-----------|------|-----------|---|
| 3530-45   | 0.68 | 100%      | Claystone grading to clayey Siltstone, grey, light grey, dark grey, redbrown.<br>sm.am. Sandstone, very fine/fine, redbrown, light, partly with carbonate; Quartz Sand; Coal; Siltstone, light grey/grey. |
| 3545-60   | 0.52 | 92%       | Claystone grading to clayey Siltstone, grey, light grey, redbrown, dark grey.   |
|           |      | 5%        | Quartz Sand, medium to fine, light.   |
|           |      | 3%        | Sandstone, fine, very fine, redbrown, light, light grey.  |
|           |      | sm.am.    | Siltstone, grey, redbrown, Coal.  |
| 3560-75   | 0.56 | 92%       | Claystone grading to silty claystone, as above.   |
|           |      | 3%        | Quartz Sand, medium, light.   |
|           |      | 3%        | Coal.   |
|           |      | 2%        | Quartz Sandstone, fine, very fine, light, redbrown.   |
|           |      | sm.am.    | Siltstone, grey.  |
| 3575-90   | 0.47 | 77%       | Claystone grading to Siltstone, light grey, redbrown, grey.   |
|           |      | 20%       | Quartz Sand, medium to fine and coarse, poorly sorted, angular/subangular, light.   |
|           |      | 3%        | Sandstone, as above.  |
|           |      | sm.am.    | Coal.   |
| 3590-3605 | 0.60 | 50%       | Quartz Sand, as above.  |
|           |      | 50%       | Claystone grading to Siltstone, redbrown, light grey, grey.   |
|           |      | 2%        | Sandstone, as above.  |
|           |      | sm.am.    | Coal.   |

T A B L E II

| Depth     | TOC  |                | Lithology  |
|-----------|------|----------------|--|
| 3605-3620 | 0.66 | 75%            | Quartz Sand and some Sandstone, fine to medium, poorly sorted, angular/subangular, light, redbrown.                                    |
|           |      | 24%            | Claystone grading to Siltstone, as above.  |
|           |      | 1%             | Coal.  |
| 3620-35   | 0.57 | 60%            | Claystone grading to Siltstone, as above.  |
|           |      | 40%            | Quartz Sand/Sandstone, fine to medium, poorly sorted, angular/subangular, light.   |
| 3635-50   | 0.54 | 50%            | Quartz Sand/Sandstone, fine to medium, some coarse, poorly sorted, angular/subangular, light.  |
|           |      | 50%            | Claystone grading to Siltstone, as above.  |
|           |      | sm.am.<br>obs. | Coal.<br>Glauconite, Pyrite.   |
| 3650-65   | 0.66 | 50%            | Quartz Sand and some Sandstone, fine to medium, poorly sorted, angular/subangular, light, partly covered with ferric oxide (redbrown). |
|           |      | 50%            | Claystone grading to Siltstone, as above.  |
|           |      | sm.am.         | Coal.  |
| 3665-80   | 0.78 | 50%            | Claystone grading to siltstone, redbrown, grey, light grey.  |
|           |      | 50%            | Quartz Sand and some Sandstone, fine to medium, poorly sorted, angular/subangular, light.  |
| 3680-95   | 0.42 | 60%            | Claystone grading to Siltstone, as above.  |
|           |      | 40%            | Quartz Sand, as above.   |

T A B L E II

| Depth     | TOC  | Lithology                |  |
|-----------|------|--------------------------|--|
| 3695-3710 | 0.36 | 100%<br><br>sm.am.       | Claystone grading to Siltstone,<br>redbrown, grey.<br>Quartz Sand.   |
| 3710-25   | 0.40 | 70%<br><br>30%<br>sm.am. | Claystone grading to Siltstone,<br>redbrown, grey.<br>Quartz Sand, as above.<br>Sandstone, silty, very fine, redbrown. |
| 3725-30   | 1.28 | 98%<br><br>2%            | Silty Claystone, grey (88%), redbrown<br>(10%) (grading to Siltstone).<br>Quartz Sand.                                 |

Weight (mg) of EOM and chromatographic fractions.

| Depth(m)  | Rock ex-<br>tracted(g) | EOM    | Sat   | Aro   | Hydro-<br>carbons<br>HC | Non<br>Hydro-<br>cabons | TOC   |
|-----------|------------------------|--------|-------|-------|-------------------------|-------------------------|-------|
| 1720-50   | 100                    | 13.2   | 3.3   | 2.3   | 5.6                     | 3.6                     | 1.06  |
| 1770-1800 | 83.02                  | 10.3   | 3.0   | 0.9   | 3.9                     | 2.2                     | 1.21  |
| 2000-2030 | 28.76                  | 9.8    | 1.8   | 0.8   | 2.6                     | 2.1                     | 0.91  |
| 2125-40   | 18.94                  | 23.0   | 6.5   | 3.5   | 10.0                    | 5.3                     | 0.88  |
| 2225-40   | 35.82                  | 9.8    | 2.2   | 0.9   | 3.1                     | 1.5                     | 1.28  |
| 2345-60   | 67.51                  | 81.9   | 39.4  | 13.7  | 54.1                    | 12.6                    | 0.86  |
| 2460-75   | 15.15                  | 27.4   | 9.0   | 3.7   | 12.7                    | 3.1                     | 1.15  |
| 2490-2505 | 46.66                  | 66.5   | 20.7  | 6.1   | 26.8                    | 9.9                     | 1.23  |
| 2550-65   | 13.15                  | 16.6   | 3.9   | 1.5   | 5.4                     | 1.9                     | 1.30  |
| 2730-50   | 38.47                  | 56.8   | 8.4   | 14.8  | 23.2                    | 10.0                    | 2.95  |
| 2780-95   | 36.20                  | 77.4   | 23.2  | 13.6  | 36.8                    | 12.6                    | 11.56 |
| 2945-60   | 100.00                 | 476.1  | 92.3  | 172.6 | 164.9                   | 57.2                    | 3.60  |
| 2975-90   | 100.00                 | 436.1  | 80.0  | 193.6 | 273.6                   | 153.3                   | 4.90  |
| 3032-50   | 100.00                 | 380.7  | 60.1  | 172.4 | 232.5                   | 62.6                    | 4.54  |
| 3050-65   | 100.00                 | 485.3  | 85.5  | 211.5 | 297.0                   | 187.0                   | 7.98  |
| 3080-95   | 100.00                 | 1113.0 | 302.9 | 536.5 | 839.4                   | 269.3                   | 3.40  |
| 3110-25   | 100.00                 | 164.6  | 38.0  | 57.1  | 95.1                    | 25.8                    | 3.45  |
| 3170-85   | 100.00                 | 74.3   | 10.4  | 22.6  | 33.0                    | 12.3                    | 1.81  |
| 3215-30   | 100.00                 | 104.8  | 12.4  | 31.0  | 43.4                    | 18.4                    | 2.58  |
| 3275-90   | 99.24                  | 85.9   | 15.0  | 26.0  | 41.0                    | 16.2                    | 2.30  |
| 3320-35   | 88.36                  | 147.7  | 38.6  | 46.1  | 74.7                    | 32.8                    | 2.43  |
| 3350-65   | 89.10                  | 78.9   | 19.0  | 29.7  | 48.7                    | 11.9                    | 2.25  |
| 3470-85   | 100.00                 | 32.6   | 8.8   | 8.5   | 17.3                    | 8.6                     | 0.98  |
| 3530-45   | 100.00                 | 25.7   | 4.9   | 7.2   | 12.1                    | 5.6                     | 0.68  |
| 3620-35   | 100.00                 | 17.6   | 0.5   | 2.6   | 3.1                     | 3.1                     | 0.57  |
| 3680-95   | 100.00                 | 22.9   | 3.7   | 5.6   | 9.3                     | 4.0                     | 0.42  |
| 3725-30   | 100.00                 | 91.8   | 17.1  | 19.5  | 36.6                    | 12.0                    | 1.28  |

Concentration of EOM and chromatographic fractions (Weight ppm of rock).

| Depth(m)  | EOM   | Sat   | Aro   | Total hydrocarb. | Non Hydrocarb. |
|-----------|-------|-------|-------|------------------|----------------|
| 1720-50   | 132.  | 33.   | 23.   | 56.00            | 36.            |
| 1770-1800 | 124.  | 36.   | 10.   | 46.98            | 26.            |
| 2000-2030 | 340.  | 62.   | 27.   | 90.40            | 73.            |
| 2125-40   | 1214. | 343.  | 184.  | 527.98           | 279.           |
| 2225-40   | 273.  | 61.   | 25.   | 86.54            | 41.            |
| 2345-60   | 1213. | 583.  | 202.  | 801.36           | 186.           |
| 2460-75   | 1808. | 594.  | 244.  | 838.28           | 204.           |
| 2490-2505 | 1425. | 443.  | 130.  | 574.37           | 212.           |
| 2550-65   | 1262. | 296.  | 114.  | 410.65           | 144.           |
| 2730-50   | 1476. | 218.  | 384.  | 603.07           | 259.           |
| 2780-95   | 2138. | 640.  | 375.  | 1016.57          | 348.           |
| 2945-60   | 4761  | 923.  | 1726. | 2649.00          | 1572.          |
| 2975-90   | 4361  | 800.  | 1936. | 2736.00          | 1533.          |
| 3032-50   | 3807  | 601.  | 1724. | 2325.00          | 626.           |
| 3050-65   | 4853  | 855.  | 2115. | 2970.00          | 1870.          |
| 3080-95   | 11130 | 3029. | 5365. | 8394.00          | 2693.          |
| 3110-25   | 1546  | 380.  | 571.  | 951.00           | 258.           |
| 3170-85   | 743.  | 104.  | 226.  | 330.00           | 123.           |
| 3215-30   | 1048. | 124.  | 310.  | 434.00           | 184.           |
| 3275-90   | 865.  | 151.  | 261.  | 413.14           | 163.           |
| 3320-35   | 1671. | 436.  | 521.  | 845.41           | 371.           |
| 3350-65   | 885.  | 213.  | 333.  | 546.58           | 133.           |
| 3470-85   | 326.  | 88.   | 85.   | 173.00           | 86.            |
| 3530-45   | 257.  | 49.   | 72.   | 121.00           | 56.            |
| 3620-35   | 176.  | 5.    | 26.   | 31.00            | 31.            |
| 3680-95   | 229.  | 37.   | 56.   | 93.00            | 40.            |
| 3725-30   | 918.  | 171.  | 195.  | 366.00           | 120.           |

TABLE V

Concentration of EOM and chromatographic (mg/g TOC).

| Depth(m)  | EOM    | SAT   | Aro    | Total hydrocarb. | Non hydrocarb. |
|-----------|--------|-------|--------|------------------|----------------|
| 1720-50   | 12.45  | 2.17  | 2.17   | 5.28             | 3.40           |
| 1770-1800 | 10.25  | 2.99  | 0.90   | 3.88             | 2.19           |
| 2000-30   | 37.45  | 6.88  | 3.06   | 9.93             | 8.02           |
| 2125-40   | 138.00 | 39.00 | 21.00  | 60.00            | 31.80          |
| 2225-40   | 21.37  | 4.80  | 1.96   | 6.76             | 3.27           |
| 2345-60   | 141.06 | 67.86 | 23.60  | 93.18            | 21.70          |
| 2460-75   | 157.27 | 51.66 | 21.24  | 72.89            | 17.79          |
| 2490-2505 | 115.67 | 36.07 | 10.63  | 46.70            | 17.25          |
| 2550-65   | 97.10  | 22.81 | 8.77   | 31.59            | 11.11          |
| 2730-50   | 50.05  | 7.40  | 13.04  | 20.44            | 8.81           |
| 2780-95   | 18.50  | 5.54  | 3.25   | 8.79             | 3.01           |
| 2945-60   | 132.25 | 25.64 | 47.94  | 73.58            | 43.67          |
| 2975-90   | 89.00  | 16.33 | 39.51  | 55.84            | 31.29          |
| 3032-50   | 83.85  | 13.24 | 37.97  | 51.21            | 13.79          |
| 3050-65   | 60.81  | 10.71 | 26.50  | 37.22            | 23.43          |
| 3080-95   | 327.35 | 88.82 | 157.79 | 246.88           | 79.21          |
| 3110-25   | 44.81  | 11.01 | 16.55  | 27.57            | 7.48           |
| 3170-85   | 41.05  | 5.75  | 12.49  | 18.23            | 6.80           |
| 3215-30   | 40.62  | 4.81  | 12.02  | 16.82            | 7.13           |
| 3275-90   | 37.63  | 6.57  | 11.39  | 17.96            | 7.10           |
| 3320-35   | 68.79  | 17.98 | 21.47  | 34.79            | 15.28          |
| 3350-65   | 39.36  | 9.48  | 14.81  | 24.29            | 5.94           |
| 3470-85   | 33.27  | 8.98  | 8.67   | 17.65            | 8.78           |
| 3530-45   | 37.79  | 7.21  | 10.59  | 17.79            | 8.24           |
| 3620-35   | 30.88  | 0.88  | 4.56   | 5.44             | 5.44           |
| 3680-95   | 54.52  | 8.81  | 13.33  | 22.14            | 9.52           |
| 3725-30   | 71.72  | 13.36 | 15.23  | 28.59            | 9.38           |

TABLE VI

Composition in % of the material extracted from the rock.

| Depth (m) | Sat<br>EOM | Aro<br>EOM | HC<br>EOM | Sat<br>Aro | Non HC<br>EOM | HC<br>Non HC |
|-----------|------------|------------|-----------|------------|---------------|--------------|
| 1720-50   | 25.00      | 17.42      | 42.42     | 143.48     | 27.27         | 155.56       |
| 1770-1800 | 29.13      | 8.74       | 37.86     | 333.33     | 21.36         | 177.27       |
| 2000-30   | 18.37      | 8.16       | 26.53     | 225.00     | 21.43         | 123.81       |
| 2125-40   | 28.26      | 15.22      | 43.48     | 185.71     | 23.04         | 188.68       |
| 2225-40   | 22.45      | 9.18       | 31.63     | 224.44     | 15.31         | 206.67       |
| 2345-60   | 48.11      | 16.73      | 66.06     | 287.59     | 15.38         | 429.37       |
| 2460-75   | 32.85      | 13.50      | 46.35     | 243.24     | 11.31         | 409.68       |
| 2490-2505 | 31.13      | 9.17       | 40.30     | 339.34     | 14.89         | 270.71       |
| 2550-65   | 23.49      | 9.04       | 32.53     | 260.00     | 11.45         | 284.21       |
| 2730-50   | 14.79      | 26.06      | 40.85     | 56.76      | 17.61         | 232.00       |
| 2780-95   | 29.97      | 17.57      | 47.55     | 170.59     | 16.28         | 292.06       |
| 2945-60   | 19.39      | 36.25      | 55.64     | 53.48      | 33.02         | 168.51       |
| 2975-90   | 18.34      | 44.39      | 62.74     | 41.32      | 35.15         | 178.47       |
| 3032-50   | 15.79      | 45.29      | 61.07     | 34.86      | 16.44         | 371.41       |
| 3050-65   | 17.62      | 43.58      | 61.20     | 40.43      | 38.53         | 158.82       |
| 3080-95   | 27.13      | 48.20      | 75.40     | 56.29      | 24.20         | 311.70       |
| 3110-25   | 24.58      | 36.93      | 61.51     | 66.55      | 16.69         | 368.60       |
| 3170-85   | 14.00      | 30.42      | 44.41     | 46.02      | 16.55         | 268.29       |
| 3215-30   | 11.83      | 29.58      | 41.41     | 40.00      | 17.56         | 235.87       |
| 3275-90   | 17.46      | 38.27      | 47.73     | 57.69      | 18.96         | 253.09       |
| 3320-35   | 26.31      | 31.21      | 50.58     | 83.73      | 22.21         | 227.74       |
| 3350-65   | 24.08      | 37.64      | 61.72     | 63.97      | 15.08         | 409.24       |
| 3470-85   | 22.99      | 26.07      | 53.07     | 103.53     | 26.38         | 201.16       |
| 3530-45   | 19.07      | 28.02      | 47.08     | 68.06      | 21.79         | 216.07       |
| 3620-35   | 2.84       | 14.77      | 17.61     | 19.23      | 17.61         | 100.00       |
| 3680-95   | 16.16      | 24.45      | 40.61     | 66.07      | 17.47         | 232.50       |
| 3725-30   | 18.63      | 21.24      | 39.87     | 87.69      | 13.07         | 305.00       |

TABLE VII

Tabulation of data from the gaschromatograms.

| Depth(m)  | Pristane/nC <sub>17</sub> | Pristane/Phytane | CPI  |
|-----------|---------------------------|------------------|------|
| 1720-50   | 0.57                      | 1.71             | 1.04 |
| 1770-1800 | 0.47                      | 1.28             | 0.97 |
| 2000-30   | 0.50                      | 1.24             | 1.08 |
| 2125-40   | 0.65                      | 1.67             | 1.70 |
| 2225-40   | 0.67                      | 2.00             | 1.11 |
| 2345-60   | 1.06                      | 3.03             | 1.28 |
| 2460-75   | 0.66                      | 2.72             | 1.03 |
| 2490-2505 | 0.77                      | 2.23             | 1.04 |
| 2550-65   | 0.67                      | 2.43             | 1.04 |
| 2730-50   | 0.89                      | 2.70             | 1.13 |
| 2780-95   | 0.83                      | 2.50             | 1.04 |
| 2945-60   | 0.59                      | 2.00             | 1.04 |
| 2975-90   | 0.79                      | 3.95             | 1.32 |
| 3032-50   | 0.72                      | 2.56             | 1.09 |
| 3050-65   | 1.29                      | 3.70             | 1.20 |
| 3080-95   | 0.42                      | 1.10             | 1.00 |
| 3110-25   | 0.98                      | 2.50             | 1.08 |
| 3170-85   | 1.00                      | 2.97             | 1.18 |
| 3215-30   | 1.16                      | 3.14             | 1.32 |
| 3275-90   | 1.02                      | 2.91             | 1.31 |
| 3320-35   | 0.63                      | 2.42             | 1.06 |
| 3350-65   | 0.90                      | 2.63             | 1.21 |
| 3470-85   | 0.75                      | 2.38             | 1.10 |
| 3530-45   | 0.73                      | 2.28             | 1.17 |
| 3620-35   | 0.90                      | 2.73             | 1.18 |
| 3680-95   | 0.78                      | 1.45             | 1.10 |
| 3725-30   | 1.31                      | 2.84             | 1.08 |

TABLE VIII

Vitrinite reflectance and visual kerogen measurements.

| Depth (m) | Vitrinite reflectance |          |         | Colour index | Type of organic matter                |
|-----------|-----------------------|----------|---------|--------------|---------------------------------------|
| 1720-1750 | 0.37(20)              |          |         | 2-           | Am/W (limestone)                      |
| 1770-1780 | 0.47(5)               |          |         | 2-           | Am/W Coal (limestone)                 |
| 2000-2030 | 0.44(16)              | 0.75(5)  |         | 2-           | Am/He, W, Coal (limestone)            |
| 2125-2140 | 0.51(6)               |          |         | 2-           | Am/He, W, Coal (limestone)            |
| 2225-2240 | 0.44(4)               | 0.70(1)  |         | 2            | Am/He, W, Coal (sapropel & limestone) |
| 2345-2360 | 0.48(2)               | 0.73(8)  | 1.44(1) | 2+           | Am/H, W, Coal (sapropel)              |
| 2435-2450 |                       |          |         | 2+/3-        | He/W* (Mud. add.)                     |
| 2460-2475 | 0.36(22)              |          |         |              |                                       |
| 2490-2505 | 0.37(2)               | 0.55(3)  |         |              |                                       |
| 2565-2580 | 0.33(9)               | 0.50(11) |         | 2+/3-        | Am/He/W                               |
| 2655-2670 | 0.60(20)              |          |         |              |                                       |
| 2730-2745 | 0.41(3)               | 0.63(1)  | 0.83(7) | 3-           | Am/He, W, Coal                        |
| 2780-2795 |                       |          |         |              |                                       |
| 2855-2870 | 0.34(1)               | 0.47(1)  | 0.71(5) | (3-)         | Am/W* (Mud. add.)                     |
| 2870-2885 |                       |          |         | (3-)         | Am/He, W* (Mud. add.)                 |
| 2915-2930 | 0.61(20)              |          |         |              |                                       |

Table VIII - p. 2

| Depth (m) | Vitrinite reflectance |          |          | Colour index | Type of organic matter   |
|-----------|-----------------------|----------|----------|--------------|--------------------------|
| 2945-2960 |                       | 0.60(20) |          |              |                          |
| 2960-2975 |                       |          |          | 3/3+         | Am/W, Coal, He           |
| 2975-2990 |                       | 0.61(26) |          |              |                          |
| 3032-3050 |                       | 0.51(15) | 0.96(1)  |              |                          |
| 3050-3065 |                       | 0.65(23) |          |              |                          |
| 3065-3080 |                       |          |          | 3+           | W, He, Cut/Am            |
| 3080-3095 |                       | 0.59(20) |          |              |                          |
| 3110-3125 | 0.33(1)               | 0.58(23) |          | 3+           | Am/He                    |
| 3170-3185 |                       | 0.74(21) |          | 3+           | Am/He                    |
| 3215-3230 |                       | 0.55(20) | 1.00(2)  | 3+           | Am/He, W, Cut            |
| 3275-3290 |                       | 0.56(21) |          | 3+           | Am/W, He, Cut            |
| 3320-3355 |                       | 0.58(22) |          | 3+/4-        | W, He, Cut, Poll-Spor/Am |
| 3410-3425 |                       |          |          | 3+/4-        | W, He, Cut/Am            |
| 3465-3470 |                       |          |          | 3+/4-        | Am/Cut, W                |
| 3470-3485 |                       | 0.72(19) |          |              |                          |
| 3500-3515 |                       |          |          | 3+/4-        | Am/Cut, He, W            |
| 3530-3545 | 0.42(2)               | 0.65(9)  | 1.49(11) |              |                          |
| 3575-3590 |                       |          |          | 3+/4-        | ?Am/W, He (limestone)    |

Table VIII - p. 3

| Depth     | Vitrinite reflectance |          |         | Colour index | Type of organic matter |
|-----------|-----------------------|----------|---------|--------------|------------------------|
| 3605-3620 |                       |          |         | 3+/4-        | Am/W, Cut. Reworking   |
| 3620-3635 | 0.27(9)               |          |         | 1.13(3)      |                        |
| 3665-3680 |                       |          |         | 3+/4-        | Am/W, Cut              |
| 3680-3695 | 0.43(2)               | 0.63(18) |         |              |                        |
| 3710-3725 |                       |          |         | 3+/4-        | Am/Cut, W              |
| 3725-3730 | 0.44(2)               | 0.72(16) | 1.12(2) |              |                        |

TABLE IX  
Rock-Eval Pyrolysis

| Sample | Depth     | Free HC<br>mg | Pyrolysed HC<br>mg | CO <sub>2</sub><br>mg | C<br>mg | iH  | iO  | iP   | Max. T °C | Oil<br>kg/t |
|--------|-----------|---------------|--------------------|-----------------------|---------|-----|-----|------|-----------|-------------|
| 1      | 1690-1720 | 0.003         | 0.017              | 0.048                 | 0.58    | 30  | 83  | 0.15 | 392       | 0.20        |
| 2      | 1770-1800 | 0.006         | 0.013              | 0.073                 | 1.21    | 11  | 60  | 0.31 |           | 0.19        |
| 3      | 2000-2030 | 0.010         | 0.018              | 0.065                 | 0.91    | 20  | 72  | 0.36 | 415       | 0.28        |
| 4      | 2125-2140 | 0.018         | 0.027              | 0.119                 | 0.88    | 23  | 135 | 0.47 |           | 0.45        |
| 5      | 2225-2240 | 0.010         | 0.019              | 0.053                 | 1.28    | 15  | 41  | 0.34 | 407       | 0.29        |
| 6      | 2330-2345 | 0.015         | 0.023              | 0.067                 | 0.72    | 33  | 93  | 0.40 | 391       | 0.38        |
| 7      | 2460-2475 | 0.026         | 0.048              | 0.024                 | 1.15    | 42  | 21  | 0.35 | 410       | 0.74        |
| 8      | 2490-2505 | 0.050         | 0.090              | 0.073                 | 1.23    | 73  | 59  | 0.36 | 405       | 1.40        |
| 9      | 2565-2580 | 0.030         | 0.097              | 0.222                 | 2.05    | 47  | 108 | 0.23 | 407       | 1.27        |
| 10     | 2730-2750 | 0.035         | 0.060              | 0.104                 | 2.95    | 20  | 35  | 0.37 | 413       | 0.95        |
| 11     | 2810-2825 | 0.060         | 0.121              | 0.334                 | 1.69    | 72  | 198 | 0.33 | 420       | 1.81        |
| 12     | 2915-2930 | 0.031         | 0.144              | 0.276                 | 2.03    | 71  | 136 | 0.18 | 427       | 1.75        |
| 13     | 2945-2960 | 0.090         | 0.898              | 0.098                 | 3.59    | 250 | 27  | 0.09 | 440       | 9.88        |
| 14     | 2960-2975 | 0.147         | 0.910              | 0.144                 | 4.56    | 200 | 32  | 0.14 | 430       | 10.57       |
| 15     | 2975-2990 | 0.130         | 0.948              | 0.196                 | 4.89    | 194 | 40  | 0.13 | 430       | 10.86       |
| 16     | 2990-3005 | 0.111         | 0.669              | 0.095                 | 3.91    | 171 | 24  | 0.14 | 437       | 7.80        |

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| Sample | Depth     | Free HC<br>mg | Pyrolysed HC<br>mg | CO <sub>2</sub><br>mg | C<br>mg | iH  | iO | iP   | Max. T °C | Oil<br>kg/t |
|--------|-----------|---------------|--------------------|-----------------------|---------|-----|----|------|-----------|-------------|
| 17     | 3005-3020 | 0.092         | 0.557              | 0.060                 | 3.76    | 148 | 16 | 0.14 | 440       | 6.49        |
| 18     | 3020-3035 | 0.064         | 0.481              | 0.056                 | 2.90    | 166 | 19 | 0.12 | 427       | 5.44        |
| 19     | 3032-3050 | 0.125         | 0.892              | 0.073                 | 4.54    | 196 | 16 | 0.12 | 432       | 10.17       |
| 20     | 3050-3065 | 0.232         | 2.014              | 0.076                 | 7.97    | 253 | 10 | 0.10 | 432       | 22.46       |
| 21     | 3065-3080 | 0.112         | 0.946              | 0.070                 | 4.19    | 226 | 17 | 0.11 | 430       | 10.58       |
| 22     | 3095-3110 | 0.059         | 0.252              | 0.185                 | 2.36    | 107 | 78 | 0.19 | 432       | 3.11        |
| 23     | 3125-3140 | 0.060         | 0.380              | 0.110                 | 3.45    | 11  | 3  | 0.14 | 443       | 4.40        |
| 24     | 3155-3170 | 0.050         | 0.390              | 0.110                 | 2.53    | 154 | 43 | 0.12 | 428       | 4.40        |
| 25     | 3215-3230 | 0.040         | 0.270              | 0.150                 | 2.58    | 104 | 57 | 0.12 | 433       | 3.10        |
| 26     | 3320-3335 | 0.060         | 0.330              | 0.100                 | 2.43    | 137 | 39 | 0.16 | 435       | 3.90        |
| 27     | 3470-3485 | 0.101         | 0.030              | 0.040                 | 0.98    | 29  | 41 | 0.78 | 443       | 1.31        |
| 28     | 3530-3545 | 0.003         | 0.010              | 0.040                 | 0.68    | 14  | 61 | 0.23 | 447       | 0.13        |
| 29     | 3620-3635 | 0.005         | 0.010              | 0.040                 | 0.57    | 21  | 62 | 0.30 | 440       | 0.15        |
| 30     | 3680-3695 | 0.002         | 0.010              | 0.040                 | 0.42    | 18  | 84 | 0.23 | 433       | 0.12        |
| 31     | 3725-3730 | 0.030         | 0.010              | 0.050                 | 1.28    | 88  | 40 | 0.18 | 440       | 0.40        |