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Descriptions of 44 cored sequences through the
Broom Formation (Middle Jurassic) and associated
strata, northern North Sea.

By
F. Simpson

WR/M I/86/11

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Contents

	Page
Introduction	1
Core descriptions (see Table 1 for index)	2
Acknowledgements	130
References	132

Figure 1 Location of study area in northern North Sea

Table 1 List of wells

Description of 44 cored sequences through the Broom Formation (Middle Jurassic) and associated strata, northern North Sea.

F. Simpson¹ B.Sc., Dr. Nat. Sc., P. Eng.

Introduction

The sequences examined are located in the northern Viking Graben, in U.K. Licensed Quadrants 2, 3, 210 and 211 and Norwegian Licensed Quadrant 33 of the North Sea (Figure 1).

The Broom Formation is the basal unit of the Brent Group (Aalenian-Bajocian), described by Deegan and Scull (1977). Cores through the Broom Formation and associated strata were examined as part of a stratigraphic and sedimentological study.

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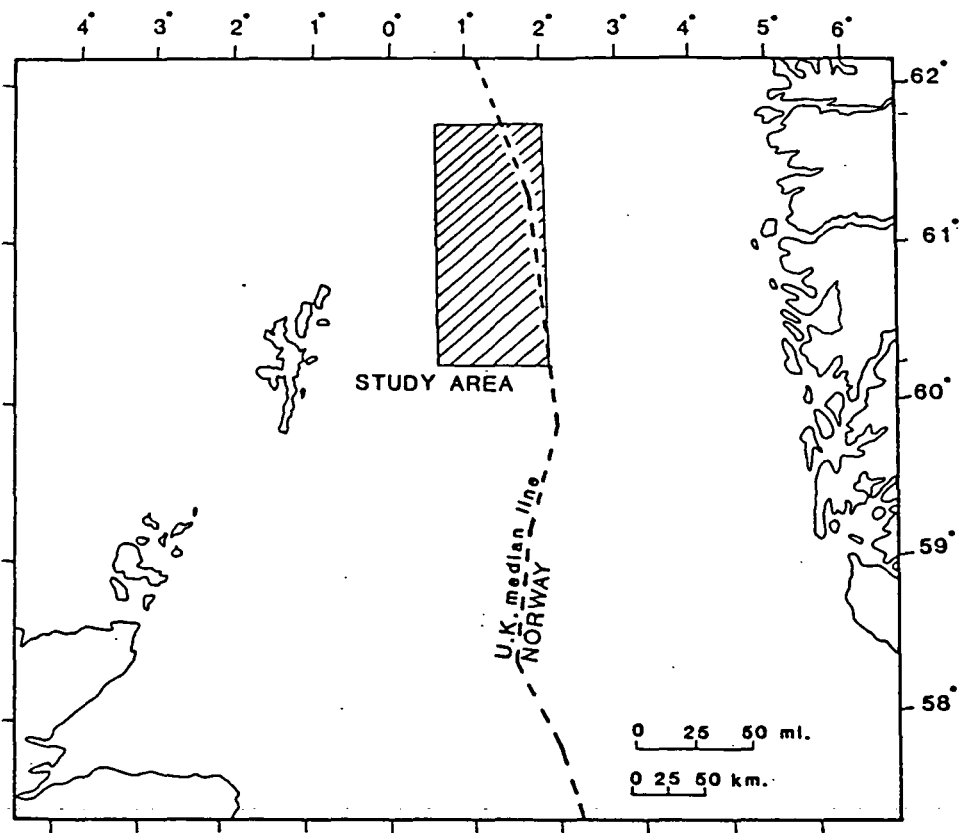


Fig.1 Location of study area in northern North Sea.

UK Well 2/5-2

Operator : Union
 Co-ordinates : 60°57'3.9"N 00°55'0.6"E
 Spudded : 25/1/74
 Drilling completed : 25/3/74
 KBE : 108ft (32.9m)
 Water depth : 447ft (145.4m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Siltstone and mudstone. Siltstone medium grey (N5) and medium dark grey (N4), quartzose, sandy in places, micaceous, in layers up to few cm thick and as pods and laminae in mudstone. Mudstone dark grey (N3), dominantly silty and laminated, non-calcareous, with silt content decreasing downwards. Scattered lenses of fine-grained sandstone near base of interval. Pyrite nodules in mudstone.	9ft (2.7m)	10,762ft (3280.3m)
ETIVE FORMATION		
Sandstone. Light olive grey (5Y6/1), fine-grained quartzose, micaceous, composed of planer, inclined laminae, mostly defined by sporadic increase in clay content; clay partings irregular, discontinuous, crenulated in places. Sub-vertical sand-filled, mud-lined tubular burrows conspicuous in top 1ft (0.3m).	17ft (5.2m)	10,771ft (3283.0m)
Sandstone. Light olive grey (5Y6/1) and light grey (N7); light olive grey sandstone as in 10,771 to 10,788ft (3283.0 to 3288.2m), interbedded with dominant grey sandstones, which are mostly medium- to coarse-grained, quartzose, micaceous, and calcite-cemented, with minor pyrite cement and without clayey partings.	12ft (3.6m)	10,788ft (3288.2m)
RANNOCH FORMATION		
Sandstone. Yellowish grey (5Y7/2) and light grey (N7), fine- to medium-grained, quartzose, very micaceous with planer, inclined laminae delineated by clayey partings. Herringbone cross-lamination at interval top.	3ft (0.9m)	10,800ft (3291.8m)
No core.	12ft (3.6m)	10,803-10,815ft (3292.7-3296.4m)
Sandstone. Light olive grey (5Y6/1), fine-grained, quartzose, very micaceous, with	24ft (7.3m)	10,815ft (3296.4m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
irregular sub-horizontal and inclined laminae defined by clayey partings; mica flakes both scattered and closely packed in partings. Lamination disrupted by indistinct burrows. Calcite cement sporadically distributed; pyrite modules present.		
Sandstone. Light grey (N7), fine-grained, quartzose, very micaceous, with scattered clayey partings; strongly indurated, with abundant calcite cement. Large <u>Teichichnus</u> at 10,841.5ft (3304.5m).	5ft (1.5m)	10,839ft (3303.7m)
Sandstone. As in 10,815 to 10,839ft (3296.4 to 3303.7m)	4ft (1.2m)	10,844ft (3305.3m)
Sandstone. As in 10,839 to 10,844ft (3303.7 to 3305.3m). Sand-filled, mud-lined, tubular burrows oblique to lamination.	4ft (1.2m)	10,848ft (3306.5m)
BROOM FORMATION		
Sandstone. Light olive grey (5Y6/1), fine- to coarse-grained, quartzose, micaceous, with sub-horizontal and inclined lamination defined by clayey partings, which are frequently crenulated. Grain size increases downwards; calcite cement abundant in some coarse-grained laminae. Sand-filled, mud-lined, tubular burrows.	4.5ft (1.4m)	10,852ft (3307.7m)
Shaly sandstone. Light olive grey (5Y6/1) and medium dark grey (N4), fine- to coarse-grained, quartzose, feldspathic, micaceous, with widespread biogenic disruption of clayey partings and mudstone intercalations. Interbedded 0.5ft (15cm) of sandstone at 10,857.5 (3309.4m) as in 10.852 to 10,856.5ft (3307.7 to 3309.1m). Sand-filled, mud-lined, tubular burrows both sub-horizontal and oblique to general bedding orientation.	2.5ft (0.7m)	10,856.5ft (3309.1m)
Sandstone. Light olive grey (5Y6/1) and light grey (N7) to medium light grey (N6), coarse-grained, quartzose, micaceous, feldspathic, with irregular, inclined clayey laminae. Grey sandstones strongly indurated, with abundant calcite cement, occur interbedded with and as pods and lenses within the light olive grey strata. Pyrite cement dispersed around some laminae.	10.5ft (3.2m)	10,859ft (3309.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Shaly sandstone. As in 10,856.5 to 10,859ft (3309.1 to 3309.8m). Pyritized burrows.	7.5ft (2.3m)	10,869.5ft (3313.0m)
Sandstone. As in 10,852 to 10,856ft (3307.7 to 3309.1m), though more uniformly coarse-grained. Irregular segregations of pyrite cement occur sporadically.	4ft (1.2m)	10,877ft (3315.3m)
Sandstone. Light grey (N7) and medium light grey (N6), coarse-grained, quartzose, micaceous, feldspathic, with irregular sub-horizontal and inclined lamination; strongly indurated, with abundant calcite cement, scattered segregations of pyrite cement. Sand-filled, mud-lined, tubular burrows, both vertical and oblique to bedding near base of interval.	16ft (4.9m)	10,881ft (3316.5m)
No core.		10,897-10,914ft (3321.4-3326.6m)
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), micaceous, non-calcareous, silty in places. Large mica flakes and plant fragment in laminae at interval top. Coarse grained sandstone, as in 10,881 to 10,897ft (3316.5 to 3321.4m), in layer 0.5ft (15cm) thick at about 10,915ft (3326.9m). Siderite concretionary layer with calcite veining (2.5ins, 6cm) at about 10,922ft (3329.0m)	19.5ft (5.9m)	10,914ft (3326.6m)
Sideritic concretionary layer. Light olive grey (5Y6/1) and medium light grey (N6), silty, with irregular lamination and calcite veins.	1.5ft (0.5m)	10,933.5ft (3332.5m)
Siltstone. Medium dark grey (N4), quartzose, micaceous, laminated. Calcareous segregations present.	1.5ft (0.5m)	10,935ft (3333m)

UK Well 2/5-3

Operator : Union
 Co-ordinates : 60°58'37.0"N 0°58'54.4E
 Spudded : 16/4/74
 Drilling completed : 23/5/74
 KBE : 108ft(32.9m)
 Water depth : 490ft (149.4m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Shaly sandstone and siltstone. Sandstone medium light grey (N6), very fine-grained, quartzose, micaceous; composed of irregular laminae, forming lenses and continuous layers, intercalated with siltstone and mudstone. Siltstone medium light grey (N6) and medium grey (N5), similar in composition to sandstone. Mudstone medium dark grey (N4) and dark grey (N3), micaceous, non-calcareous, variably fissile, occurring as mostly discontinuous partings.	2ft (0.6m)	11,168.5ft (3404.2m)
Shaly sandstone. Sandstone light grey (N7), fine-grained, quartzose, micaceous, incorporating subordinate, carbonaceous mudstone as discontinuous partings and continuous layers up to a few mm thick. Bioturbated layering common in basal half of interval. Coalified plant debris common. Sporadic occurrence of minor pyrite cement.	1ft (0.3m)	11,170.5ft (3404.8m)
Sandstone. Light grey (N7), fine-grained, quartzose, micaceous, kaolinitic, largely composed of planer, inclined laminae, irregular in places and intercalated with partings of dark grey (N3) and greyish black (N2), carbonaceous mudstone.	1.5ft (0.5m)	11,171.5ft (3405.1m)
Shaly sandstone and siltstone. Main lithologies as in 11,168.5 to 11,170.5ft (3404.2 to 3404.8m). Includes some disrupted sandy laminae, forming inclined sets, and irregular intercalations of greyish black, (N2), carbonaceous mudstone.	0.5ft (0.2m)	11,173.0ft (3405.5m)
Sandstone. Light grey (N7), fine- to medium-grained, quartzose, micaceous, kaolinitic; mostly in sub-horizontal laminae, delineated by irregular partings of carbonaceous mudstone; sets of ripple-drift cross-laminae occur sporadically. Mudstone, dark grey (N3) to greyish black (N2), silty, micaceous, non calcareous, laminated, in variably disrupted layers, up to 1m (2.5m) thick. Sporadic occurrence of minor pyrite cement.	5ft (1.5m)	11,173.5ft (3405.7m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Light grey (N7) to medium grey (N5) downwards with progressive increase in proportion of coarse siltstone; fine-grained, silty, quartzose, micaceous, with abundant, scattered plant debris; sub-horizontal lamination and partings of carbonaceous mudstone. Tubular burrows of variable orientation. Gradational contact with	1ft (0.3m)	11,178.5ft (3407.2m)
Mudstone. Dark grey (N3), micaceous, carbonaceous, non-calcareous, silty; laminated, incorporating layers of bioturbated, fine-grained sandstone and siltstone in basal 6 ins (15cm).	2.5ft (0.8m)	11,179.5ft (3407.5m)
Sandstone. Light grey (N7) and light brownish grey (5YR6/1) to brownish grey (5YR4/1), fine-grained, quartzose, micaceous; mostly in irregular, sub-horizontal laminae with intercalated partings of carbonaceous mudstone, but also forming scarce sets of ripple-scale cross laminae. Lamination transected in places by sand-filled, mud-lined, tubular burrows. Strongly indurated, with abundant calcite, nodular pyrite, notably at 11.184.5ft (3409.0m).	3ft (0.9m)	11,182ft (3408.3m)
Mudstones. Dark grey (N3), micaceous, silty in places, non-calcareous; carbonaceous, notably in basal 4 ins (10cm), which is a dirty coal. Crude lamination throughout interval. Sharp contact with	5ft (1.5m)	11,185ft (3409.2m)
? ETIVE FORMATION		
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1), fine- to coarse- grained, quartzose, micaceous, kaolinitic, with common flakes of plant debris; in planer, inclined laminae, frequently in herringbone format; spherical pyrite nodules, up to 1cm in diameter, scattered throughout interval. Irregular, nodular bodies of pyrite and pyrite-cemented sandstone in the 2ft (0.6m), where partings and layers of carbonaceous mudstone a few mm thick are common; 3ins (7.6cm) layer of greyish black (N2), laminated, carbonaceous mudstone at 11,190.5ft (3410.9m). Gradational contact with	12ft (3.7m)	11,190ft (3410.7m)
Sandstone. Very light grey (N8), light grey (N7) and yellowish grey (5Y8/1), medium- to coarse- grained, quartzose, micaceous, kaolinitic, with calcite cement particularly abundant in more strongly indurated sandstone	23ft (7.0m)	11,202ft (3414.4m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
from 11,208 to 11,211ft (3416.2 to 3417.1m); in planer, inclined laminae, delineated by minor concentrations of clay; scattered flakes of coalified plant debris. Several small faults with throws of up a few cm from 11,206 to 11,208ft (3415.6 to 3416.2m). Gradational contact with		
RANNOCH FORMATION		
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1), medium- to coarse-grained, quartzose, very micaceous; in planer, inclined laminae, delineated by argillaceous partings, which are crenulated in places. Calcite cement sporadically abundant.	9ft (2.7m)	11,225ft (3421.4m)
Sandstone. Yellowish grey (5Y8/1), light grey (N7) and light olive grey (5Y6/1), fine- to medium- grained, quartzose, very micaceous, in planer, sub-horizontal and inclined laminae, delineated by crenulated argillaceous partings; latter are both continuous and discontinuous, solitary and grouped, frequently forming interconnected networks; mica flakes concentrated in argillaceous partings, as well as dispersed in sandstone. Calcite cement sporadically abundant, where partings in low concentration. Grading between mica-poor and mica-rich sandstone in layer up to 1.5in (3.8cm) thick from 11,249.5 to 11,250.5ft (3428.8 to 3429.2m). Pyrite and siderite cements minor and sporadically distributed. Distribution of primary layering evidenced by minor faults and small folds affecting partings; sand-filled, mud-lined tubular burrows of variable orientation. Fragment of calcareous sandstone incorporated at 11,251ft (3429.3m). Gradational contact with	27ft (8.2m)	11,234ft (3424.1m)
Sandstone. Main lithology as in 11.234 to 11.261ft (3424.1 to 3432.4m), except for greatly reduced proportion of argillaceous partings. Strongly indurated throughout interval, with abundant calcite cement.	13ft (4m)	11,261ft (3432.4m)
Sandstone. Main, lithology as in 11,234 to 11,261ft (3424.1 to 3432.4m). Plant debris on partings.	5ft (1.5m)	11,274ft (3436.3m)
Sandstone. As in 11,261 to 11.274ft (3432.4 to 3436.3m).	5.5ft (1.7m)	11,279ft (3437.8m)
Sandstone. Yellowish grey (5Y8/1) and light greenish grey (5GY8/1), main lithology as in	10ft (3.0m)	11,284.5ft (3439.5m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
11,234 to 11,261ft (3424.1 to 3432.4m), but with downward increase in grain size. Coalified plant debris on partings. Gradational contact with		
BROOM FORMATION		
Shaly sandstone. Light grey (N7) to medium grey (N5), medium- to coarse- grained, quartzose, micaceous, kaolinitic, with calcite cement; sandstone in irregular pods, lenses and continuous layers up to a few cm thick, separated by medium dark grey (N4) argillaceous partings and layers in the order of a few mm thick. Scattered, small pyrite nodules present.	5.5ft (1.7m)	11,294.5ft (3442.6m)
Shaly sandstone. Main lithology as in 11,294.5 to 11,300ft (3442.6 to 3444.2m), but strongly indurated, with abundant calcite cement. Top 3ins (7.6cm) with irregular pebble layer with quartz and siderite clasts. Vertical, sand-filled, mud-lined, tubular burrows.	3ft (0.9m)	11,300ft (3444.2m)
Sandstone. Light grey (N7), coarse-grained, quartzose, micaceous, kaolinitic, strongly indurated, with abundant calcite cement; in crude, planar, inclined laminae, delineated by irregular partings of carbonaceous mudstone. Sand-filled, mud-lined, tubular burrows present.	1.5ft (0.5m)	11,303ft (3445.2m)
Shaly sandstone. Main lithology as in 11,294.5 to 11,300ft (3442.6 to 3444.2m), with scattered interstitial pyrite.	1ft (0.3m)	11,304.5ft (3445.6m)
Sandstone. As in 11,303 to 11,304.5ft (3445.2 to 3445.6m). Pyrite nodules present.	9ft (2.7m)	11,305.5ft (3445.9m)
Shaly sandstone. As in 11,294.5 to 11,300ft (3442.6 to 3444.2m) Strongly indurated, with abundant calcite cement, scattered pyrite nodules. Sandstone pebbly in places.	2ft (0.6m)	11,314.5ft (3448.7m)
Sandstone. As in 11,303 to 11,304.5ft (3445.2 to 3445.6m). Strongly indurated with abundant calcite cement throughout interval; sub-ordinate, interstitial pyrite present. Relatively scarce argillaceous partings.	28ft (8.5m)	11,316.5ft (3449.3m)
Shaly sandstone. Main lithology as in 11,294.5 to 11,300ft (3442.6 to 3444.2m), but with primary lamination more widely preserved. Scattered pebbles of concretionary	2.5ft (0.8m)	11,344.5ft (3457.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
siderite and carbonaceous mudstone. Strongly indurated, with abundant calcite cement. Relatively sharp contact with		
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), micaceous, non-calcareous, silty in places, laminated. Top 5ins (12.7cm) with scattered medium to coarse sand grains; irregular lenses and continuous layers of fine-grained sandstone and siltstone at interval top and at about 11,354ft (3460.7m), where burrows similar to Teichichnus present. Sideritic, concretionary layers: 2ins (5.0cm) at 11,350ft (3459.5m), 3ins (7.6cm) at 11,351ft (3459.8m).	15ft (4.6m)	11,347ft (3458.6m)

UK Well 2/5-4

Operator : Union
 Co-ordinates : 60°56'35.8"N 0°58'19.3"E
 Spudded : 5/6/74
 Drilling completed : 6/8/74
 KBE : 108ft (32.9m)
 Water depth : 452ft (137.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
BROOM FORMATION (part)		
Shaly sandstone. Yellowish grey (5Y7/2), light olive grey (5Y6/1) and medium light grey (N6) to medium grey (N5), coarse-grained, with scattered granules and pebbles; quartzose, micaceous, kaolinitic; in irregular lenses and continuous layers a few mm to several cm thick, separated by interconnected partings of carbonaceous mudstone. Mudstone dark grey (N3) to black (N1), non-calcareous, micaceous, with mica flakes up to several mm in diameter. Partings markedly serrated in places. Sharp contact with	1.5ft (0.5m)	9,715.5ft (2961.3m)
Sandstone. Yellowish grey (5Y7/2) and light olive grey (5Y6/1), coarse-grained, quartzose, micaceous, kaolinitic; primary stratification largely obscured by homogeneity of grain size, appears to consist of irregular, sub-horizontal and gently inclined, planar laminae. Continuity of sandstone broken by solitary and grouped partings of carbonaceous mudstone, occurring every 2 to 4ins (5 to 10cm) of vertical section. Mudstone dark grey (N3) to black (N1), non-calcareous, micaceous; partings frequently interconnected, irregularly undulating, commonly serrated. Carbonaceous flakes scattered throughout interval. Vertical burrows commonly terminate upwards at partings, less frequently transect partings and occur where no parting present; these are sand-filled, mud-lined, tubular burrows, a few mm wide. Also indistinct, scarce, vertical burrow type with Spreiten. Interstitial siderite associated with argillaceous partings at about 9,728.5ft (2965.2m).	15.0ft (4.6m)	9,717ft (2961.7m)
Shaly sandstone. Main lithology as in 9,715.5 to 9,717ft (2961.3 to 2961.7m). Vertical, sand-filled burrows common. Basal 0.5ft (0.2m) with greatly increased proportion of carbonaceous mudstone. Irregular, sideritic, concretionary layers at 9,733ft (2966.2m). Pyrite nodules in strongly indurated sandstone with abundant calcite cement at base of interval.	2.0ft (0.6m)	9.732ft (2966.3m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
DRAKE FORMATION		
Mudstone. Medium dark grey (N4) and dark grey (N3), silty in places, non-calcareous, micaceous; laminated. Disseminated pyrite in mudstone around slickensided surface at 9,746.5ft (2970.7m). Sideritic concretionary layers: 1in (2.5cm) at 9,756ft (2967.5m), 2ins (5cm) at 9,744.5ft (2970.1m). Scattered pyrite nodules.	16.0ft (4.9m)	9,734ft (2966.9m)
No core.	2.0ft (0.6m)	9,750ft (2971.6m)
Siltstone. Medium grey (N5) and medium dark grey (N4), quartzose, micaceous; laminated. Scattered pyrite nodules.	11.0ft (3.4m)	9,752ft (2972.4m)
Oolitic, sideritic siltstone. Moderate brown (5YR4/4), brownish grey (5YR4/1) and olive grey (5Y4/1), ooids calcareous, also replaced by pyrite; sideritic siltstone in irregular lenses and continuous layers up to a few inches thick, separated by argillaceous partings and layers of oolite. Scattered pyrite nodules present. Calcite veins of variable orientation throughout interval.	1.5ft (0.5m)	9,763ft (2975.8m)
Siltstone. As in 9,752 to 9,763ft (2972.4 to 2975.8m).	1.0ft (0.3m)	9,764.5ft (2976.2m)
Oolitic, sideritic siltstone. As in 9.763 to 9,764.5ft (2975.8 to 2976.2m).	0.5ft (0.2m)	9,765.5ft (2976.5m)
Siltstone. Main lithology as in 9,752 to 9,764ft (2972.4 to 2975.8m); becoming increasingly sandy downwards. Contact with underlying, bioturbed, shaly sandstone is sharp at thin layer of reworked relict nodular siderite.	1.5ft (0.5m)	9,766ft (2976.7m)

UK Well 2/5-6

Operator : Union
 Co-ordinates : 60°56'8.7"N 0°50'7.0"E
 Spudded : 7/10/74
 Drilling completed : 14/11/74
 KBE : 108.0ft (32.9m)
 Water depth : 452.0ft (137.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
RANNOCH FORMATION (part)		
Sandstone. Pale brown (5YR5/2) and non-calcareous, medium grey (N5) and calcareous, fine-grained; quartzose, micaceous, becoming very micaceous below 11,103ft (3384.2m); in inclined, planar laminae. Strongly indurated in places, with abundant calcite cement; calcite impregnated parts of core very irregular in form. Scattered segregations of pyrite parallel to lamination. With carbonaceous partings above 11,101ft (3383.6m). Orientation of <u>Teichichnus</u> below argillaceous partings at 11,121ft (3389.7m) confirms inferred rotation of strata through up to 60 to give high dips.	31.5ft (9.1m)	11,093ft (3381.1m)
No core	245.5ft (74.8m)	11,124.5ft (3390.7m)
BROOM FORMATION (part)		
Sandstone. Olive grey (5Y4/1), oil stained coarse-grained; quartzose, feldspathic, kaolinitic; stratification indistinct, appears to be rotated from sub-horizontal as above. Calcite cement abundant in strongly indurated, spheroidal segregations, a few cm in diameter; also as irregular stratiform bodies, found near base of interval: strongly indurated sandstone with abundant calcite cement forms 1ft (0.3m) layer at 11,372ft (3466.2m).	20.0ft (6.1m)	11,370ft (3465.6m)
Pebbly sandstone. Very light grey (N8) to light grey (N7), coarse-grained, with common, scattered pebbles; quartzose, feldspathic, micaceous; stratification indistinct. Strongly indurated, with abundant calcite cement. Pyrite nodules present.	10.5ft (3.2m)	11,390ft (3471.7m)
Shaly sandstone. Medium light grey (N6) to medium dark grey (N4), coarse-grained; quartzose, feldspathic, micaceous, in irregular lenses up to 0.5ins (1cm) thick, rotated from sub-horizontal.	2.5ft (0.8m)	11,400.5ft (3474.9m)
Sandstone. Main lithologies as from 11,370 to 11,390ft (3465.6 to 3471.7m). Top 1ft (0.3m) strongly indurated, with abundant calcite cement.	7.5ft (2.3m)	11,403ft (3475.6m)

UK Well 3/2-2

Operator : Conoco
 Co-ordinates : 60 53'52.9"N 1 12'31.7"E
 Spudded : 26.5.76
 Drilling completed : 7.8.76
 KBE : 78ft (23m)
 Water depth : 483ft (147.2m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Sandstone. Yellowish grey (5Y8/1) and medium-grey (N5), fine-grained, silty, quartzose, micaceous, kaolinitic; in horizontal laminae and micro-cross-laminae, which are distinctly bipartite above 11,865.5ft (3616.6m); below this level, numerous interconnected parting of carbonaceous mudstone are seen.	4.0ft (1.2m)	11,863ft (3615.8m)
Siltstone and mudstone. Siltstone yellowish grey (5Y8/1) and medium grey (N5), sandy in places, quartzose, micaceous, kaolinitic; in lenses and continuous layers, a few mm thick, separated by mudstone layers of similar thickness; laminated, variably disrupted by vertical escape burrows. Mudstone dark grey (N3) and greyish black (N2), silty, carbonaceous, micaceous; laminated. With scattered, irregular pyrite nodules.	8.0ft (2.4m)	11,867ft (3617.0m)
Sandstone. Light olive grey (5Y6/1) to olive grey (5Y4/1), fine-grained, muddy, replaced by siltstone below 10,876ft (3315.0m), quartzose, micaceous, kaolinitic; extensively bioturbated Pyrite nodules.	2.0ft (0.6m)	11,875ft (3619.5m)
ETIVE FORMATION		
Sandstone. Pale yellowish brown (10YR6/2) to dark yellowish brown (10YR4/2) and yellowish grey (5Y7/2), fine- to medium- grained, quartzose, micaceous, kaolinitic; moderately indurated, with minor calcite cement, in horizontal and inclined, planar laminae, delineated by minor variation in interstitial clay and by common argillaceous partings.	29.0ft (8.8m)	11,877ft (3620.1m)
RANNOCH FORMATION		
Sandstone. Pale yellowish brown (10YR6/2) and light grey (N7) to medium light grey (N6), fine-grained, quartzose, very micaceous, kaolinitic; strongly indurated, with abundant calcite cement; in horizontal and inclined, planar laminae, which are bipartite. Scarce burrows; no extensive disruption of primary lamination.	24.0ft (7.3m)	11,906ft (3628.9m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Similar to lithology from 11,906 to 11,930ft (3628.9 to 3636.3m), but with abundant carbonaceous debris in clayey parts of lamina. Disruption of primary layering by burrowing is common; with <u>Teichichnus</u> and sand-filled tubular burrows.	14.0ft (4.3m)	11,930ft (3636.3m)
BROOM FORMATION		
Sandstone. Pale yellowish brown (10YR6/2) and light olive grey (5Y6/1), fine-to medium-grained, quartzose, micaceous, kaolinitic; in horizontal and inclined, planar laminae, delineated by minor variation in clay content and by carbonaceous partings with concentrations of mica flakes. With <u>Teichichnus</u> and sand-filled burrows. Scattered plant debris present.	9.0ft (2.7m)	11,944ft (3640.5m)
Sandstone. As in 11,944 to 11,953ft (3640.5 to 3643.3m), but strongly indurated, with abundant calcite cement. Mica flakes closely packed on partings.	1.5ft (0.5m)	11,953ft (3643.3m)
Sandstone. As in 11,944 to 11,953ft (3640.5 to 3643.3).	2.5ft (0.8m)	11,954.5ft (3643.8m)
Sandstone. As in 11,953 to 11,954.5ft (3643.3 to 3643.7m).	1.0ft (0.3m)	11,957ft (3644.8m)
Sandstone. As in 11,944 to 11,953ft (3640.5 to 3643.3m).	1.0ft (0.3m)	11,958ft (3644.8m)
Sandstone. As in 11,953 to 11,954.5ft (3643.3 to 3643.7m).	1.0ft (0.3m)	11,959ft (3645.1m)
Sandstone. As in 11,944 to 11,953ft (3640.5 to 3643.3m). Medium-grained.	10.5ft (3.2m)	11,960ft (3645.4m)
Sandstone. Medium light grey (N6) medium- to coarse-grained, quartzose, micaceous, kaolinitic; in horizontal and inclined, planar laminae, with common carbonaceous partings. Most of interval is strongly indurated, with abundant calcite cement. Sand-filled, tubular burrows of variable orientation are common.	5.5ft (1.7m)	11,970.5ft (3648.6m)
Shaly sandstone. Medium light grey (N6) to medium dark grey (N4), medium- to coarse-grained, quartzose, micaceous, kaolinitic; in irregular lenses, bounded by partings of silty mudstone. Basal 2ins (5cm) contains pyrite nodules.	0.5ft (0.2m)	11,976ft (3650.3m)
Sandstone. Main lithology as in 11,944 to 11,953ft (3640.5 to 3643.3m), but medium- to coarse-grained; shaly in places; scattered granules and small pebbles.	1.5ft (0.5m)	11,976.5ft (3650.4m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Light olive grey (5Y6/1) and medium light grey (N6) to medium grey (N5), coarse-grained, with scattered granules and pebbles, shaly in places; quartzose, micaceous, kaolinitic; in horizontal and inclined, planar laminae; with irregular carbonaceous partings. Strongly indurated with abundant calcite cement in top 5ft (1.5m) and basal 7ft (2.1m); with sporadic cementation by calcite in rest of interval. Sand-filled tubular burrows of variable orientation. Pyrite nodules at base of unit.	21.0ft (6.4m)	11,978ft (3650.9m)
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), silty, carbonaceous, non-calcareous. Sideritic concretionary layers : 6ins (15cm) at 12,011ft (3661m) 7ins (18cm) at 12,015ft (3662.2m).	23.5ft (7.2m)	11,999ft (3657.3m)

UK Well 3/3-2

Operator : Burmah
 Co-ordinates : 60 53'47.4"N 01 25'46.4"E
 Spudded : 13/4/74
 Well completed : 11/7/74
 KBE : 78ft (23.8m)
 Water depth : 461ft (140.5m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Silty mudstone. Medium dark grey (N4) to dark grey (N3), micaceous, non-calcareous, laminated. Siltstone and minor very fine-grained sandstone concentrated in laminated lenses and continuous layers a few mm thick; sandy lenses cross-laminated. Scattered sub-horizontal, silt-filled, mud-lined, tubular burrows and chevron-type escape structures.	2.5ft (0.8m)	10,448ft (3184.5m)
Sandstone. Yellowish grey (5Y8/1), fine-grained, quartzose, micaceous, kaolinitic, composed of planar cross-laminae in sets of a few cm thick. Carbonaceous mudstone forming numerous closely spaced partings for 0.3ins (1cm) at about 10,453ft (3186.1m). Lower half of interval with clayey partings disrupted by bioturbation.	6.5ft (2m)	10,450.5ft (3185.5m)
Shaly sandstone. Yellowish grey (5Y8/1), light olive grey (5Y6/1), and olive grey (5Y4/1) sandstone, fine-grained, quartzose, micaceous, in laminated, continuous layers and cross-laminated lenses, intercalated with mudstone and shale. Mudstone dark grey (N3), micaceous, non-calcareous, silty, in irregular lenses and continuous layers up to several mm thick. Widespread shredding of lamination by burrowing; sand-filled, mud-lined, tubular burrows common.	2ft (0.6m)	10,457ft (3187.3m)
Silty mudstone. As in 10,448 to 10,450.5ft (3184.5 to 3185.3m).	4ft (1.2m)	10,459ft (3187.9m)
Shaly sandstone. As in 10,457 to 10459ft (3187.3 to 3187.9m). Pyrite nodules at 10,464ft (3189.4m) and 10,468ft (3190.8m); calcareous concretionary layer at 10,466.5ft (3190.2m). Sharp contact with	7ft (2.1m)	10,463ft (3189.1m)
? ETIVE FORMATION		
Sandstone. Light olive grey (5Y6/1) to olive grey (5Y4/1), fine- to coarse-grained, with downward increase in grain size; quartzose,	48ft (14.7m)	10,470ft (3191.2m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
micaceous, variably kaolinitic; strongly indurated in places, with calcite cement. Coalified plant debris and thin coal lenses scattered throughout interval. Horizontal and planar inclined laminae widespread. Scattered argillaceous partings. Sharp contact with		
RANNOCH FORMATION		
Sandstone. Light grey (N7) and medium light grey (N6), fine-grained, quartzose, kaolinitic, very micaceous, with scattered flakes of carbonaceous mudstone abundant near interval base; horizontal and planar, inclined, commonly bipartite laminae widespread.	42.5ft (12.9m)	10,518ft (3205.9m)
Sandstone. Main lithologies as AN 10518 to 10,560.5ft (3205.8 to 3218.7m), but with lamination sub-horizontal and commonly disrupted by burrowing. Sand-filled, mud-lined tubes (? Phycodes) densely packed in places; variety of escape structures. Abundant carbonaceous flakes on bedding planes. Basal 2ft (0.6m) strongly indurated, with abundant calcite cement. Pebbles of nodular siderite form thin layer at 10,567ft (3220.8m). Sporadic occurrence of siderite cement in basal 1ft (0.3m) of interval.	7ft (2.1m)	10,560.5ft (3218.8m)
BROOM FORMATION		
Sandstone. Yellowish grey (5Y8/1) to olive grey (5Y6/1), dominantly coarse-grained, quartzose, micaceous, very kaolinitic; largely composed of irregular sub-horizontal laminae, with relatively scarce argillaceous partings associated with siderite cement. Pyrite and siderite nodules in upper half of interval. Sand-filled, mud-lined tubular burrows common in finer-grained sandstones above 10,581ft (3225.1m).	28.5ft (8.7m)	10,567.5ft (3221m)
Shaly sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1), coarse-grained, quartzose, micaceous, kaolinitic, with numerous, interconnected, dark grey (N3), argillaceous partings.	10ft (3m)	10,596ft (3229.7m)
DRAKE FORMATION		
Mudstone and shale. Dark grey (N3), non-calcareous, laminated, variably fissile; with sideritic concretionary layers at 10,606.5ft (3232.9m) and 10,614ft (3235.1m): 2ins (5cm) and 4ins (10cm) respectively.	11ft (3.3m)	10,610ft (3232.7m)

UK Well 3/3-3

Operator : Burmah
 Co-ordinates : 60 55'27.8"N 1 25'13.2"E
 Spudded : 14/9/74
 Drilling completed : 19/12/74
 KBE : 79ft (24.1m)
 Water depth : 476ft (145.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Sandstone. Yellowish grey (5Y8/1) and light olive grey (5Y6/1), fine-grained, quartzose, micaceous, kaolinitic; in irregular, horizontal and gently inclined, planar laminae; micro-cross-laminated in places; lamination delineated by argillaceous partings and siltstone laminae. Primary layering disrupted to varying degrees by bioturbation, which is particularly extensive below 10,502.5ft (3201.2m). Vertical, sand-filled, mud-lined burrows are common. Scattered carbonaceous debris throughout interval.	11.5ft (3.5m)	10,492ft (3198m)
Siltstone and mudstone. Siltstone yellowish grey (5Y8/1) and medium light grey (N6), quartzose, micaceous, sandy near top of interval; in lenses and continuous layers, generally a few mm thick, separated by mudstone layers of slightly greater thickness. Mudstone mostly medium dark grey (N4) to dark grey (N3), non-calcareous, silty, micaceous, laminated; in places greyish black (N2) and black (N1), carbonaceous, with intercalated coal.	5.5ft (1.7m)	10,503.5ft (3201.5m)
Sandstone. Main lithology as in 10,492 to 10,503.5ft (3198 to 3201.5m). Mudstone intercalations less than 0.5ins (1cm) thick above 10,510ft (3203.4m). Irregular pyrite nodules, minor concretionary siderite.	2.5ft (0.8m)	10,509ft (3203.2m)
Siltstone and mudstone. Main lithologies as in 10,503.5 to 10,509ft (3201.5 to 3203.1m). Layers of fine-grained sandstone, up to 0.5ins (1cm) thick, interbedded above 10,512.5ft (3204.2m).	5.5ft (1.7m)	10,511.5ft (3203.9m)
ETIVE FORMATION		
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1) and pale yellowish brown (10YR6/2), fine- to medium-grained, quartzose, micaceous, kaolinitic; in horizontal and inclined, planar laminae, delineated by carbonaceous partings. Abundant coalified plant debris at unit top. Coarse-grained sandstone in 9in (23cm) layer at base.	47.0ft (14.3m)	10,517ft (3205.6m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
RANNOCH FORMATION		
Sandstone Light grey (N7) to medium light grey (N6) and yellowish grey (5Y8/1), fine-grained, quartzose, very micaceous, kaolinitic, in horizontal and inclined, planar laminae, which are distinctly bipartite.	33.0ft (10.1m)	10,564ft (3219.9m)
No core.	14.0ft (4.3m)	10,597ft (3230m)
Sandstone. Yellowish grey (5Y8/1), fine-grained, quartzose, very micaceous, kaolinitic; in horizontal and inclined, planar laminae, delineated by irregular, frequently serrated, carbonaceous partings; laminae indistinct. Top 7ins (18cm) extensively bioturbed; <u>Teichichnus</u> terminates beneath grouped, carbonaceous partings at 10,618ft (3236.3m) sand-filled, tubular burrows common.	16.0ft (4.9m)	10,611ft (3234.2m)
Sandstone. Main lithology as in 10,611 to 10,627ft (3234.2 to 3239.1m), but strongly indurated, with abundant calcite cement; sub-ordinate sideritic present.	1.0ft (0.3m)	10,627ft (3239.1m)
Sandstone. As in 10,611 to 10,627ft (3234.2 to 3239.1m). Thin coal intercalations and carbonaceous partings.	2.0ft (0.6m)	10,628ft (3239.4m)
BROOM FORMATION		
Sandstone. Yellowish grey (5Y8/1), coarse grained with scattered granules and pebbles; quartzose, micaceous, kaolinitic, lamination indistinct, sub-horizontal.	7.0ft (2.1m)	10,630ft (3240.0m)
Sandstone. As in 10,630 to 10,637ft (3240.0 to 3242.2m), but strongly indurated, with abundant calcite cement.	0.5ft (0.2m)	10,637ft (3242.2m)
Sandstone. As in 10,630 to 10,637ft (3240.0 to 3242.2m).	2.5ft (0.8m)	10,637.5ft (3242.3m)
Sandstone. As in 10,630 to 10,637ft (3240.0 to 3242.2m), but strongly indurated, with abundant calcite cement.	2.0ft (0.6m)	10,640ft (3243.1m)
Shaly sandstone. Yellowish grey (5Y8/1) and medium grey (N5) to medium dark grey (N4), coarse-grained, quartzose, micaceous, kaolinitic; in irregular lenses and continuous layers, bounded by partings of carbonaceous mudstone.	4.0ft (1.2m)	10,642ft (3243.7m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
DRAKE FORMATION (part)		
Siltstone. Medium grey (N5) to medium dark grey (N4), sandy, with common, scattered coarse sand grains, cemented by pyrite in basal 2ins (5cm) of interval. Concretionary siderite associated with scattered plant debris near top.	1.0ft (0.3m)	10,646ft (3244.9m)
Mudstone. Dark grey (N3), micaceous, non-calcareous, silty in places.	8.0ft (2.4m)	10,647ft (3245.2m)

UK Well 3/3-4A

Operator : Burmah
 Co-ordinates : 60 51'44.5"N 01 31'0.0"E
 Spudded : 28/1/75
 Drilling completed : 31/3/75
 KBE : 79ft (24.1m)
 Water depth : 438ft (133.5m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
UNDIFFERENTIATED BRENT GROUP (part)		
Sandstone. Medium grey (N5), fine-grained, quartzose, micaceous, bedding varies from even, sub-horizontal lamination to chaotic arrangement of pods and lenses, separated by muddy siltstone. Coal in basal 0.5ft (0.15cm); scattered plant debris present. Irregular pyrite segregations in disrupted sandstones.	4ft (1.2m)	9,213ft (2808.1m)
Mudstone. Dark grey (N3), micaceous in places, carbonaceous, non-calcareous.	3ft (1m)	9,217ft (2809.3m)
Siltstone and mudstone. Siltstone and subordinate very fine-grained sandstone, medium grey (N5), quartzose, irregular lenses and continuous laminae, intercalated with mudstone layers of similar thickness. Mudstone dark grey (N3), carbonaceous, non-calcareous.	1ft (0.3m)	9,220ft (2810.3m)
Sandstone. Light olive grey (5Y6/1), fine-grained, quartzose, micaceous, with irregular, sub-horizontal and inclined lamination defined by clayey partings.	4.5ft (1.4m)	9,221ft (2810.6m)
Shaly sandstone. Light olive grey (5Y6/1), fine-grained sandstone, as in 9,221 to 9,225.5ft (2810.6 to 2811.9m), interbedded with sets of alternating siltstone/very fine sandstone and mudstone, a few cm thick, similar to lithologies in 9,220 to 9,221ft (2810.2 to 2810.6m). Scattered plant debris in mudstone.	4.5ft (1.4m)	9,225.5ft (2811.9m)
Sandstone. Light olive grey (5Y6/1) and yellowish grey (5Y7/2), fine- to medium-grained, as in 9,221 to 9,225.5ft (2810.6 to 2811.9m). Plant fragments common; carbonaceous mudstone partings rich in mica, as in 2cm layer at 9,261ft (2882.7m). Strongly indurated sandstone with abundant calcite cement forms layer 3ft (0.9) thick at 9,261.5ft (2822.9m). Scattered pyrite nodules.	39ft (11.9m)	9,230ft (2813.3m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), silty, non-calcareous, micaceous.	5ft (1.5m)	9,269ft (2825.2m)
Siltstone. Medium dark grey (N4) to dark grey (N3), quartzose, micaceous, muddy; laminated throughout most of interval. Common intercalations of mudstone, as in 9,269 to 9,274ft (2825.2 to 2826.7m). Sporadic occurrence of irregular pyrite nodules.	5ft (1.5m)	9,274ft (2826.7m)

UK Well : 3/3-5A

Operator : Burmah

Co-ordinates : 60 51'5.1"N 1 24'44.8"E

Spudded : 14/4/75

Drilling completed : 30/6/75

KBE : 79ft (24.1m)

Water depth : 450ft (137.2m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Sandstone. Yellowish grey (5Y7/2) and light olive grey (5Y6/1) to olive grey (5Y4/1), fine- to coarse-grained with general upward fining throughout interval; quartzose, micaceous, kaolinitic, with scattered plant debris becoming common below 10,395ft (3168.4m); in horizontal and inclined, planar laminae, delineated by variation in amount of interstitial clay and by scarce, carbonaceous partings.	3.5ft (1.1m)	10,388ft (3166.3m)
Siltstone and mudstone. Siltstone medium light grey (N6) to medium grey (N5), sandy in places, quartzose, micaceous; in lenses and continuous layers up to a few mm thick, separated by layers of silty mudstone, of similar thickness. Mudstone medium dark grey (N4) to dark grey (N3), non-calcareous, micaceous, laminated. Pyrite nodules at top and base of interval.	10.5ft (3.2m)	10,391.5ft (3167.3m)
Sandstone. Main lithology as in 10,388 to 10,391.5ft (3166.3 to 3167.3m); fine- to medium-grained, fining upwards.	2.0ft (0.6m)	10,402ft (3170.5m)
Carbonaceous mudstone and coal. Greyish black (N2) and black (N1); mudstone and non-calcareous, silty in places, laminated.	1.0ft (0.3m)	10,404ft (3171.3m)
Siltstone and mudstone. Main lithology as in 10,391.5 to 10,402ft (3167.3 to 3170.5m), but with increased proportion of sandy siltstone. Bedding with evidence of biogenic disruption; common, vertical, mud-filled burrows. Basal 9ins (23cm) consists of fine-grained sandstone and siltstone with irregular argillaceous partings.	2.0ft (0.6m)	10,405ft (3171.4m)
Carbonaceous mudstone and coal. As in 10,404 to 10,405ft (3171.1 to 3171.4m).	2.0ft (0.6m)	10,407ft (3172.1m)
Sandstone. Yellowish grey (5Y7/2) and light olive grey (5Y6/1) to olive grey (5Y4/1), fine-grained, silty in places; quartzose,	1.5ft (0.5m)	10,409ft (3172.7m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
micaceous, kaolinitic; in irregular, variably disrupted layers, up to several cm thick, separated by silty mudstone layers a few mm thick; micro-cross-laminated in places. Mudstone dark grey (N3), carbonaceous, non-calcareous, micaceous. Vertical tubular burrows are sand-filled, mud-lined.		
Sandstone and mudstone. Main lithology similar to that from 10,391 to 10,402ft (3167.3 to 3170.5m), but with increased proportion of fine-grained sandstone, in layers a few cm thick, below 10,412.5ft (3173.7m). With scattered pyrite nodules. Vertical burrows common.	4.0ft (1.2m)	10,410.5ft (3173.1m)
Sandstone. Main lithology as in 10,409 to 10,410.5ft (3172.7 to 3173.1m). Nodular pyrite above contact with	1.0ft (0.3m)	10,414.5ft (3174.3m)
Coal and carbonaceous mudstone. As in 10,404 to 10,405ft (3171.1 to 3171.4m); silty in places. Siltstone medium grey (N5), quartzose, micaceous, with abundant plant fragments: 6ins (0.2cm) at 10,419ft (3175.9m), 4.5ins (11cm) at 10,420.5ft (3176.2m).	7.5ft (2.3m)	10,415.5ft (3174.6m)
Sandstone. Main lithology as in 10,388 to 10,391.5ft (3166.3 to 3167.3m), but entirely fine-grained.	1.5ft (0.5m)	10,423ft (3176.9m)
Sandstone. Main lithology as in 10,409 to 10,410.5ft (3172.7 to 3173.1m). Bioturbated below 10,426ft (3177.8m).	2.0ft (0.6m)	10,424.5ft (3177.4m)
Coal and carbonaceous mudstone. As in 10,404 to 10,405ft (3171.1 to 3171.4m).	1.0ft (0.3m)	10,426.5ft (3178m)
Sandstone. Yellowish grey (5Y8/1) and light grey (N7) to medium grey (N5), fine-grained, quartzose, micaceous, kaolinitic; in horizontal and gently inclined, planar laminae, dominantly bipartite; lamination sporadically disrupted by burrowing with escape types common. Abundant, scattered plant debris. Pyrite nodules present.	6.5ft (2m)	10,427.5ft (3178.3m)
Sandstone and mudstone. As in 10,410.5 to 10,414.5ft (3173.1 to 3174.3m), but with pronounced decrease in proportion of intercalated sandstone below 10,439ft (3181.8m).	3.5ft (1.1m)	10,434ft (3180.3m)
Sandstone. As in 10,434 to 10,437.5ft (3180.3 to 3181.4m). With scattered pyrite nodules.	3.5ft (1.1m)	10,437.5ft (3181.4m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone and mudstone. As in 10,410.5 to 10,414.5ft (3193.1 to 3174.3m), but with pronounced decrease in proportion of intercalated sandstone below 10,445.4ft (3183.8); basal 1.5ins (4cm) of interval are fine-grained sandstone. Scattered pyrite nodules.	5.5ft (1.7m)	10,442.5ft (3182.9m)
Coal and carbonaceous mudstone. As in 10,404 to 10,405ft (3171.1 to 3171.4m), but including common lenses of fine-grained sandstone and siltstone. Pyritic.	1.0ft (0.3m)	10,448ft (3184.6m)
ETIVE FORMATION		
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1) and pale yellowish brown (10YR6/2) mostly fine- to medium-grained, but coarse-grained in places; quartzose, micaceous, kaolinitic; in horizontal and inclined, planar laminae, delineated by minor variation in clay content and by irregular, argillaceous partings; partings crenulated, solitary and grouped. Granules concentrated in several laminae at about 10,484ft (3195.5m). Layer of very coarse-grained sandstone, 5ins (13cm) thick, marks base of unit. Scattered coalified plant debris; locally concentrated, notably in top few inches of interval.	46.0ft (14.0m)	10,449ft (3184.9m)
RANNOCH FORMATION		
Sandstone. Yellowish grey(5Y7/2) and light olive grey (5Y6/1) to olive grey (5Y4/1), fine-grained, quartzose, very micaceous, kaolinitic; in horizontal and inclined, planar laminae; which are bipartite. Plant debris disseminated and concentrated in clayey parts of laminae within given set or coset. Biogenic disruption of lamination relatively scarce; oblique alectorurid burrow at about 10,525.5ft (3209.1m). Pyrite nodules present.	32.0ft (9.8m)	10,495ft (3198.9m)
Sandstone. Yellowish grey (5Y8/1) and very light grey (N8) to light grey (N7), fine-grained, quartzose, very micaceous, kaolinitic, with common, scattered plant debris; in horizontal and inclined, planar laminae, delineated by irregular carbonaceous partings. Strongly indurated, with abundant calcite cement. With pyrite nodules.	1.5ft (0.5m)	10,527ft (3208.6m)
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1), fine- to medium-grained,	7.0ft (2.1m)	10,528.5ft (3209.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
quartzose, micaceous, very kaolinitic; in horizontal and inclined, planar laminae, delineated by irregular, carbonaceous partings. Induration moderate, non-calcareous. With scattered pyrite nodules.		
Sandstone. Main lithology as in 10,527 to 10,528.5ft (3208.6 to 3209.1m). With scattered, irregular pyrite nodules.	1.5ft (0.5m)	10,535.5ft (3211.2m)
Sandstone. Main lithology as in 10,528.5 to 10,537.5ft (3209.1 to 3211.8m). Burrowed in places. With pyrite nodules.	7.0ft (2.1m)	10,537ft (3211.7m)
Sandstone. Main lithology as in 10,527 to 10,528.5ft (3208.6 to 3209.1m). Concretionary siderite associated with grouped carbonaceous partings in top 2ft (0.6m). Large plant fragments and flakes of sideritic mudstone concentrated locally. Vertical burrows, sand-filled, mud-lined.	5.0ft (1.5m)	10,544ft (3213.8m)
BROOM FORMATION		
Sandstone. Yellowish grey (5Y8/1) and very light grey (N8) to medium light grey (N6), coarse-grained, quartzose, micaceous, kaolinitic; in sub-horizontal and gently inclined, planar laminae, delineated by irregular carbonaceous partings; partings mostly solitary, occurring every few cm, serrated. Abundant plant debris and redeposited, concretionary siderite in basal 6ins (15cm), which is strongly indurated, with abundant calcite cement and calcite-filled veins.	13.0ft (4m)	10,549ft (3215.3m)
Shaly sandstone. Light grey (N7) to medium grey (N5), coarse-grained, quartzose, micaceous, kaolinitic; in irregular lenses and continuous layers, up to a few cm thick, bounded by interconnected, argillaceous partings. Mudstone of latter dark grey (N3), carbonaceous, non-calcareous, micaceous. Sand-filled, tubular burrows of variable orientation common.	4.0ft (1.2m)	10,562ft (3219.3m)
Shaly sandstone. As in 10,562 to 10,566ft (3219.3 to 3220.5m), but strongly indurated, with abundant calcite cement.	1.5ft (0.5m)	10,566ft (3220.5m)
Shaly sandstone. As in 10,562 to 10,566ft (3219.3 to 3220.5m).	1.0ft (0.3m)	10,567.5ft (3221m)
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1), coarse-grained, with abundant, scattered granules and small	2.5ft (0.8m)	10,568.5ft (3221.3m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
pebbles, quartzose, kaolinitic, micaceous; in horizontal and gently inclined, planar laminae, delineated by variation in both sand size and amount of interstitial clay.		
No core.	5.5ft (1.7m)	10,571ft (3222m)
Sandstone. Main lithology as in 10,568.5 to 10,571ft (3221.3 to 3222.0m), but strongly indurated, with abundant calcite cement; siderite cement occurs sporadically. Pebbles of mudstone and concretionary siderite found below 10,581ft (3225.1m), notably at contact with	6.0ft (1.8m)	10,576.5ft (3223.7m)
DRAKE FORMATION (part)		
Siltstone. Medium dark grey (N4), sandy near top, quartzose, micaceous, calcareous, strongly indurated; irregularly laminated. Transected by oblique burrows with Spreiten immediately below interval top, where scattered coarse sand grains occur.	1.0ft (0.3m)	10,582.5ft (3225.5m)
Mudstone. Medium dark grey (N4) to dark grey (N3), silty non-calcareous, micaceous. Sideritic concretionary layers: 2ins (5cm) at 10,584ft (3226.0m), at least 6ins (15cm) at 10,590.5ft (3228m); latter with calcite veining.	9.5ft (2.9m)	10,583.5ft (3225.9m)

UK Well 3/3-6

Operator : Chevron
 Co-ordinates : 60 56'32.0"N 1 24'35.7"E
 Spudded : 28/10/75
 Drilling completed : 13/2/76
 KBE : 80ft (24.4m)
 Water depth : 482ft (146.9m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Siltstone and mudstone. Siltstone yellowish grey (5Y8/1) and medium light grey (N6), sandy in places, quartzose, micaceous, kaolinitic; in lenses and continuous layers, generally a few mm to 1cm thick, separated by mudstone layers of similar thickness; laminated, disrupted to varying degrees by vertical escape burrows. Mudstone medium-dark grey (N4) to dark grey (N3), silty, variably carbonaceous, non-calcareous, micaceous; laminated. With scattered pyrite nodules.	2.5ft (0.8m)	10,482ft (3194.9m)
Carbonaceous mudstone. Greyish black (N2) to black (N1), silty, laminated.	1.0ft (0.3m)	10,484.5ft (3195.7m)
No core.	6.5ft (2m)	10,485.5ft (3196m)
Siltstone and mudstone. Main lithology as in 10,482 to 10,484.5ft (3194.9 to 3195.7m). Mudstone increasingly carbonaceous below 10,501.5ft (3200.9m); basal 1in (2.5cm) with lenses of fine- to medium- grained sandstone.	10.0ft (3.0m)	10,492ft (3198m)
ETIVE FORMATION		
Sandstone. Pale yellowish brown (10YR6/2) to dark yellowish brown (10YR4/2) and yellowish grey (5Y7/2), oil stained above 10,515ft (3205m); fine- to medium-grained, quartzose, micaceous, very kaolinitic; in horizontal and inclined, planar laminae, delineated by slight variations in clay content and by relatively scarce, dark grey (N3) argillaceous partings.	26.0ft (7.9m)	10,502ft (3201.0m)
No core.	26.5ft (8.1m)	10,528ft (3208.9m)
Sandstone. Main lithology as in 10,502 to 10,528ft (3201.0 to 3208.9m), but with increase in mica content and frequency of argillaceous partings.	8.0ft (2.4m)	10,554.5ft (3217.0m)
RANNOCH FORMATION		
Sandstone. Yellowish grey (5Y8/1) and light grey (N7) to medium light grey (N6),	36.0ft (11m)	10,562.5ft (3219.5m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
fine-grained, quartzose, very micaceous, kaolinitic; in horizontal and inclined, planar laminae, which are distinctly bipartite; micro-cross-laminae in scarce cosets only a few cm thick. Irregular argillaceous partings are relatively rare. Teichichnus and sand-filled horizontal, tubular burrows (cf. Phycodes) present. Pyrite nodules.		
Sandstone. Main lithology as in 10,562.5 to 10,598.5ft (3219.5 to 3230.4m), but widespread and in places extensive bioturbation; common, sand-filled, horizontal burrows very closely spaced; vertical and oblique, sand-filled, tubular burrows; chevron-like disruptions of laminae.	4.0ft (1.2m)	10,598.5ft (3230.4m)
Sandstone. Main lithology as in 10,562.5 to 10,598.5ft (3219.5 to 3230.4m). Extensively burrowed in basal 3.5ins (9cm).	3.5ft (1.1m)	10,602.5ft (3231.6m)
Sandstone. Similar to 10,562.5 to 10,598.5ft (3219.5 to 3230.4m), but with scattered, siderite-cemented layers, up to 1in (2.5cm) thick. In places, bipartite laminae replaced by sandstone with solitary and grouped, irregular, argillaceous partings. Sporadic disruption of primary layering by burrowing.	4.0ft (1.2m)	10,606ft (3232.1m)
Sandstone. Yellowish grey (5Y7/2), fine-grained, quartzose, micaceous, kaolinitic; in horizontal and gently inclined, planar laminae, which are frequently bipartite; with common, irregular partings of carbonaceous mudstone, interconnected in places; coalified plant debris and large flakes of mica in partings. Teichichnus at 10,618ft (3236.4m), below grouped partings. Gradational contact with	16.0ft (4.9m)	10,610ft (3233.9m)
BROOM FORMATION		
Sandstone. Yellowish grey (5Y7/2), fine- to coarse-grained, with upward decrease in grain size from base of interval; quartzose, micaceous, kaolinitic; lamination indistinct, appears to be horizontal and gently inclined, planar from partings of carbonaceous mudstone, occurring every few cm. Basal 2ins (5cm) with abundant granules.	10.0ft (3.0m)	10,626ft (3238.8m)
Sandstone. Similar to 10,626 to 10,636ft (3238.9 to 3241.9m), with upward decrease in grain size. Burrowed in places. With sideritic, concretionary layers.	6.0ft (1.8m)	10,636ft (3241.9m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Shaly sandstone. Yellowish grey (5Y8/1) and medium grey (N5) to medium dark grey (N4), coarse-grained, quartzose, micaceous, kaolinitic; in irregular lenses and continuous layers, bounded by partings of carbonaceous mudstone. Recovery about 1.5ft (0.5m).	?10.0ft (?3.0m)	10,642ft (3243.7m)
Sideritic siltstone and mudstone. Siltstone dark yellowish brown (10YR4/2), with scattered sand, up to coarse grade, in irregular lenses, a few mm to several cm thick, separated by mudstone layers a few mm in thickness. Mudstone dark grey (N3), carbonaceous, silty, non-calcareous.	1.0ft (0.3m)	10,652ft (3246.7m)
Sandstone. Yellowish grey (5Y8/1) and medium grey (N5) to medium dark grey (N4), coarse-grained, quartzose, micaceous, kaolinitic; lamination sub-horizontal, partings of carbonaceous mudstone present. Pyrite nodules at base. Recover 1.3ft (0.4m).	?6.0ft (1.8m)	10,653ft (3247.0m)
DRAKE FORMATION		
Mudstone. Dark grey (N3), silty, carbonaceous, non-calcareous, laminated.	15.0ft (4.6m)	10,659ft (3248.9m)

Note

The Broom/Drake contact is at 10,659ft (3248.9m) on geophysical well logs, but at about 10,646ft (3244.9m) on the basis of depths, marked on the core.

UK Well 3/7-1

Operator : Chevron
 Co-ordinates : 60 46'5.4"N 1 21'49.6"E
 Spudded : 20/2/76
 Drilling completed : 18/6/76
 KBE : 80ft (24.4m)
 Water Depth : 480ft (146.3m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Sandstone. Dark yellowish brown (10YR4/2) to pale yellowish brown (10YR6/2), medium- to coarse-grained, quartzose, micaceous, kaolinitic, with scattered, carbonaceous fragments; in planar, inclined laminae, delineated by variation in interstitial clay and by scarce, irregular, argillaceous partings.	3.0ft (0.9m)	12,390ft (3776.5m)
Silty mudstone. Medium dark grey (N4), non-calcareous, micaceous; laminated.	1.5ft (0.5m)	12,393ft (3777.4m)
Sandstone. Yellowish grey (5Y7/2), fine-grained, quartzose, micaceous, kaolinitic, in irregular partings. With scattered flakes of carbonaceous mudstone and pebbles of nodular siderite. Top half of interval incorporates contorted strata.	1.5ft (0.5m)	12,394.5ft (3777.8m)
Silty mudstone. As in 12,393 to 12,394.5ft (3777.4 to 3777.8m).	1.5ft (0.5m)	12,396ft (3778.3m)
Carbonaceous mudstone. Greyish black (N2) to black (N1), non-calcareous, laminated, blocky; coal in flattened lenses.	0.5ft (0.5m)	12,397.5ft (3778.8m)
No core.	4.0ft (1.2m)	12,398ft (3778.9m)
Carbonaceous mudstone and coal. As in 12,397.5 (3778.9m); with 0.5ft (0.2m) of strongly indurated, carbonaceous, sandy siltstone at base.	2.0ft (0.6m)	12,402ft (3780.1m)
Sandstone. Light brownish grey (5YR6/1) to brownish grey (5YR4/1), fine-grained, quartzose, micaceous, kaolinitic, with abundant carbonaceous debris; micro-cross-laminated, with scattered partings of carbonaceous mudstone. Sand-filled, tubular burrows.	0.5ft (0.2m)	12,404ft (3780.7m)
Sandstone and siltstone. Greenish grey (5GY6/1) and medium light grey (N6) to medium	4.5ft (1.4m)	12,404.5ft (3780.9m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
dark grey (N4); sandstone fine-grained, quartzose, micaceous, kaolinitic; in irregular lenses and continuous layers, separated by layers of sandy siltstone of similar composition and argillaceous partings. Bioturbated in places. Interval includes several layers of mudstone and carbonaceous mudstone, as in 12,397.5 to 12,398ft (3778.8 to 3778.9m), each a few cm thick.		
Sandstone. Light olive grey(5Y6/1) and medium light grey (N6) to medium dark grey (N4), fine-grained, quartzose, micaceous, kaolinitic; in irregular sub-horizontal laminae and micro-laminae, forming sets and cosets a few cm thick, separated by layers of muddy siltstone of similar composition. Grain size decreases progressively downwards.	3.0ft (0.9m)	12,409ft (3782.3m)
Sandstone and siltstone. Main lithology as in 12,404.5 to 12,409ft (3780.9 to 3782.3m) but with increase in sand content below 12,418ft (3784.0m).	8.0ft (2.4m)	12,412ft (3783.2m)
No core.	3.0ft (0.9m)	12,420ft (3785.6m)
Sandstone. Brownish grey (5YR4/1) to brownish black (5YR2/1), fine- to medium-grained, quartzose, micaceous, kaolinitic, with abundant, carbonaceous debris; in horizontal and inclined, planar laminae; carbonaceous partings closely spaced below 12,433.5ft (3789.7m).	2.0ft (0.6m)	12,423ft (3786.5m)
Coal and carbonaceous mudstone. Greyish black (N2) and black (N1), laminated. Pyrite nodules present in mudstone.	2.5ft (0.8m)	12,425ft (3787.1m)
ETIVE FORMATION		
Sandstone. Light olive grey (5Y6/1) and brownish grey (5YR4/1), fine-grained, quartzose, micaceous, kaolinitic; micro-cross-laminated with scattered, carbonaceous flakes. Pyrite nodules near interval top.	3.0ft (0.9m)	12,427.5ft (3787.9m)
Sandstone. Light olive grey (5Y6/1) to olive grey (5Y4/1), fine- to medium-grained; quartzose, micaceous, kaolinitic, with carbonaceous debris abundant in places, in horizontal and inclined, planar laminae, delineated by variation in interstitial clay and by scarce argillaceous partings. Thin layer (at least 1 inch, 2.5cm) of carbonaceous mudstone at 12,440ft (3791.7m).	10.5ft (3.2m)	12,430.5ft (3788.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. As in 12,427.5 to 12,430.5ft (3787.9 to 3788.8m).	0.5ft (0.2m)	12,441ft (3792m)
Sandstone. Main lithology as in 12,430.5 to 12,441ft (3788.8 to 3792.0m). Muddy siltstone intercalation, a few inches thick, at about 12,442ft (3792.3m). Scattered, argillaceous partings solitary and crenulated. Abundant, incorporated, carbonaceous material below 12,465.5ft (3799.5m).	25.5ft (7.8m)	12,441.5ft (3792.2m)
RANNOCH FORMATION		
Sandstone. Yellowish grey (5Y7/2) and light olive grey (5Y6/1), fine-grained, quartzose, very micaceous, kaolinitic; in horizontal and inclined, planar laminae, which are prominently bipartite. Scattered carbonaceous debris abundant in places. Grading of laminae particularly pronounced below 12,464ft (3799.0m).	19.0ft (5.8m)	12,467ft (3799.9m)
Sandstone. Yellowish grey (5Y7/2), light olive grey (5Y6/1) and medium grey (N5); fine-grained, quartzose, very micaceous, kaolinitic; in irregular layers, bounded by argillaceous partings and bioturbed to different degrees throughout interval. Sand-filled, tubular burrows of variable orientation and forms similar to <u>Teichichnus</u> noted. In places, bedding undisturbed and similar to that in 12,467 to 12,485ft (3799.9 to 3805.4m). Scattered pyrite nodules.	15.0ft (4.6m)	12,485ft (3805.4m)
Alternating sandstone and mudstone. Sandstone light olive grey (5Y6/1), fine-grained, but with abundant granules and pebbles of nodular siderite and flakes of carbonaceous mudstone above 12,500.5ft (3810.2m); quartzose, micaceous, kaolinitic; in layers up to several cm thick, with horizontal lamination and micro-cross-lamination. Mudstone dark grey (N3) and greyish black (N2), non-calcareous, carbonaceous, micaceous; mostly up to 0.5ins (1cm) in thickness.	1.5ft (0.5m)	12,500ft (3810.0m)
BROOM FORMATION		
Pebbly sandstone. Light olive grey (5Y6/1), coarse-grained with abundant granules and small pebbles; quartzose, micaceous, kaolinitic, in planar inclined laminae and irregular, sub-horizontal laminae; with scarce partings of carbonaceous mudstone; 3ins (8cm) of alternating sandstone and mudstone, as in 12,500 to 12,501.5ft (3810.0 to 3810.5m), 8ins (20cm) above base of interval.	6.5ft (2m)	12,501.5ft (3810.5m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Yellowish grey (5Y8/1) and light olive grey (5Y6/1), coarse-grained, with scattered granules and pebbles; quartzose, feldspathic, micaceous, kaolinitic; in irregular, horizontal laminae, delineated by scarce, argillaceous partings. Sideritic concretionary layer 0.5ins (1cm) thick, at about 12,511ft (3813.4m). Vertical sand-filled burrows.	27.5ft (8.4m)	12,508ft (3812.4m)
Sandstone with interbedded mudstone. Sandstone as in 12,508 to 12,535.5ft (3812.4 to 3820.8m). Mudstone dark grey (N3), non-calcareous, carbonaceous, micaceous; in layers from a few mm thick to several cm thick, occurring at intervals of 2 to 4ins (5 to 10cm).	3.0ft (0.9m)	12,535.5ft (3820.8m)

UK Well 3/7-2

Operator : Conoco
 Co-ordinates : 60 49'40.3"N 1 23'12.8"E
 Spudded : 9/8/76
 Drilling completed 9/11/76
 KBE :84ft (25.6m)
 Water depth : 455.0ft (138.7m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Sandstone. Medium light grey (N6) to medium grey (N5) and light olive grey (5Y6/1), fine-grained, quartzose, micaceous, kaolinitic; in horizontal and planar, inclined laminae; with common intercalations of mudstone up to a few cm thick. Mudstone dark grey (N3), silty in places, micaceous, non-calcareous. Scattered plant debris common. Gradational contact with	4.5ft (1.4m)	11,530.5ft (3514.5m)
Sandstone. Medium light grey (N6) to medium grey (N5) and light olive grey (5Y6/1), fine-grained, quartzose, micaceous, kaolinitic; in lenses and irregular layers, ranging from a few mm to several cm in thickness, separated by layers of siltstone and mudstone of similar thickness; thicker sandstone layers are micro-cross-laminated; bioturbated. Proportion of interbedded mudstone increases downwards; mudstone dark grey (N3) to greyish black (N2), silty in places, variably micaceous, non-calcareous, carbonaceous.	10ft (3.0m)	11,535.0ft (3515.9m)
Carbonaceous mudstone. Dark grey (N3) to greyish black (N2), silty, non-calcareous, with coalified plant debris common. Scattered pyrite nodules.	2.0ft (0.6m)	11,545.0ft (3518.9m)
ETIVE FORMATION (part)		
Sandstone. Medium grey (N5) and light olive grey (5Y6/1), fine- to medium-grained, quartzose, micaceous, kaolinitic; in horizontal and planar, inclined laminae; with scattered, irregular, argillaceous partings and scarce intercalations of mudstone. Scattered plant debris. Pyrite nodules present.	16.6ft (5.1m)	11,547.0ft (3519.5m)
No core.	31.4ft (9.6m)	11,563.6ft (3524.6m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
RANNOCH FORMATION (part)		
Sandstone. Light grey (N7) to medium grey (N5) and light olive grey (5Y6/1) to greenish grey (5GY6/1), fine-grained, quartzose, very micaceous, kaolinitic; in planar, inclined laminae; with relatively scarce, irregular, argillaceous partings.	9.0ft (2.7m)	11,595.0ft (3534.2m)
Sandstone. Light grey (N7) and light olive grey (5Y6/1), fine-grained, quartzose, very micaceous, in planar, inclined laminae. Strongly indurated; porosity plugged with abundant calcite cement.	14.0ft (4.3m)	11,604.0ft (3536.9m)
Sandstone. Light grey (N7) to medium grey (N5), light olive grey (5Y6/1), fine-grained, quartzose, very micaceous, kaolinitic; in planar, inclined laminae; laminae prominently bipartite, with clayey partings becoming dominant downwards.	14.0ft (4.3m)	11,618.0ft (3541.2m)
Sandstone. As in 11,604 to 11,618ft (3536.9 to 3541.2m). With common, argillaceous partings. Common, sub-horizontal and vertical, sand-filled, mud-lined, tubular burrows.	2.0ft (0.6m)	11,632.0ft (3545.4m)
No core.	32.0ft (9.8m)	11,634.0ft (3546.0m)
BROOM FORMATION (part)		
Sandstone. Medium light grey (N6) to medium grey (N5) and light olive grey (5Y6/1), coarse-grained, quartzose, feldspathic, micaceous, kaolinitic; scattered plant debris in sub-horizontal and planar, inclined laminae; irregular, argillaceous partings sporadically distributed. Top 6ins (15cm) strongly indurated, with porosity plugged by abundant calcite cement.	9.0ft (2.7m)	11,666.0ft (3555.8m)
Sandstone. Main lithology as in 11,666 to 11,675ft (3555.8 to 3558.5m), but with porosity plugged with abundant calcite cement. Gradational contact with	5.5ft (1.7m)	11,675.0ft (3558.5m)
DRAKE FORMATION (part)		
Sandy siltstone. Medium grey (N5) to medium dark grey (N4), muddy, with irregular pods and lenses of coarse-grained sandstone, in addition to floating grains.	1.5ft (0.5m)	11,680.5ft (3560.1m)
Mudstone. Dark grey (N3), silty in places, micaceous, non-calcareous.	19.0ft (5.8m)	11,682.0ft (3560.7m)

UK Well 3/8-2

Operator : B.P.

Co-ordinates : 60°47'11.0"N 1°25'48.0"E

Spudded : 30/5/74

Drilling completed : 16/9/74

KBE : 30.0m (98.6ft)

Water depth : 147.1m (482.4ft)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
ETIVE FORMATION (part)		
Sandstone. Yellowish grey (5Y8/1) and light olive grey (5Y6/1), fine-grained, quartzose, micaceous, kaolinitic; in inclined, planar laminae, delineated by variation in interstitial clay content and by crenulated, argillaceous partings.	7.9m (25.9ft)	3142.6m (10,310.2ft)
Sandstone. Light olive grey (5Y6/1) to light brownish grey (5YR6/1), fine- to medium-grained, quartzose, micaceous, kaolinitic; in irregular, horizontal and gently inclined, planar laminae.	0.6m (2.0ft)	3150.5m (10,336.2ft)
Sandstone. Light olive grey (5Y6/1), medium- to coarse-grained, quartzose, kaolinitic; in irregular, sub-horizontal laminae, delineated by discontinuous, solitary, argillaceous partings. Incorporates 10cm (4ins) of medium grey (N5), fine-grained, quartzose, very micaceous sandstone at 3151.0m (10,340.9ft). Scattered segregations of pyrite. Sharp contact with	4.9m (16.1ft)	3151.1m (10,338.2ft)
RANNOCH FORMATION		
Sandstone. Light grey (N7) to medium grey (N5) and light olive grey (5Y6/1), fine-grained, quartzose, very micaceous; with numerous, solitary and grouped, argillaceous partings, frequently crenulated, and mudstone intercalations up to 1cm thick; in horizontal laminae, commonly disrupted by burrowing. Mudstone dark grey (N3), micaceous, non-calcareous. Common sand-filled, mud-lined, tubular burrows in sandstones and indeterminate burrows with spreiten in shalier parts. Sandstone strongly indurated, with abundant calcite cement.	2.1m (14.1ft)	3156.0m (10,354ft)
Sandstone. Light grey (N7) and medium light grey (N6), fine-grained, silty, quartzose, micaceous, strongly indurated, with abundant calcite cement; in horizontal laminae; with	1.1m (3.6ft)	3158.1m (10,361.1ft)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
mudstone intercalations up to 1cm thick. Mudstone dark grey (N3), micaceous, non-calcareous. Sharp contact with		
BROOM FORMATION		
Sandstone. Light olive grey (5Y6/1) and medium grey (N5), coarse-grained, pebbly, quartzose, kaolinitic, in irregular, sub-horizontal laminae; with scarce argillaceous partings. Top 10cm (4ins) of interval pebbly, strongly indurated, with abundant calcite cement.	4.6m (15.1ft)	3159.2m (10,364.7ft)
Shaly sandstone. As in 3159.2 to 3163.8m (10,364.7 to 10,379.8ft), but with downward increase in proportion of argillaceous partings. Sandstone occurs as irregular pods and lenses. Gradational contact with	0.4m (1.3ft)	3163.8m (10,379.8ft)
DRAKE FORMATION (part)		
Sandy siltstone. Medium dark (N4) to dark grey (N3), micaceous, non-calcareous, muddy; incorporates sand grains of all grades at floating grains and irregular lenses up to 2.5cm (1in) thick. Gradational contact with	0.6m (2ft)	3164.2m (10,381ft)
Mudstone. Dark grey (N3), micaceous, non-calcareous, silty, laminated.	1.2m (3.9ft)	3164.8m (10,393.1ft)

UK Well 3/8-3

Operator : B.P.

Co-ordinates : 60°45'0.6"N 1°25'10.7"E

Spudded : 25/1/75

Drilling completed : 4/5/75

KBE : 26m (85.3ft)

Water depth : 151m (495.4ft)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
BROOM FORMATION (part)		
Sandstone. Yellowish grey (5Y8/1) and light olive grey (5Y6/1), medium- to coarse-grained, pebbly in places, quartzose, micaceous, kaolinitic; in sub-horizontal and gently inclined planar laminae. Closely spaced partings of greyish black (N2) and dark grey (N3), carbonaceous mudstone largely confined to top 7cm (2.7ins).	6m (19.7ft)	3724.0m (12,217.7ft)
Sandstone. Main lithology as in 3724.0 to 3730.0m (12,217.7 to 12,237.4ft), but with irregular argillaceous partings scattered throughout interval. Sandstone lenses with interstitial siderite sporadically distributed. Sand-filled, mud-lined, tubular burrows present.	2.1m (6.9ft)	3730.0m (12,237.4ft)
Shaly sandstone. Sandstone light olive grey (5Y6/1), coarse-grained, pebbly, quartzose, micaceous, kaolinitic; in irregular lenses and continuous layers up to a few cm thick, separated by partings and layers of silty mudstone. Mudstone dark grey (N3), micaceous, carbonaceous. Pebble layer continuous at base of interval. Sharp contact with	1.3m (4.3ft)	3732.1m (12,244.3ft)
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), silty, micaceous, carbonaceous, variably fissile, laminated. Sideritic concretionary layer, 16cm (6.3ins) at 3736.0m (12,257.1ft).	6.9m (22.6ft)	3733.4m (12,248.5ft)

UK Well 3/8-4

Operator : B.P.

Co-ordinates : 60°40'3.7"N 1°34'51.1"E

Spudded : 22/7/75

Drilling completed : 25/12/75

KBE : 26m (85ft)

Water depth : 147m (482.3ft)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Sandstone. Yellowish grey (5Y8/1) and light olive grey (5Y6/1), fine-grained, quartzose, micaceous, in horizontal and inclined planar laminae. Mudstone intercalations common, dark grey (N3), silty micaceous, carbonaceous, ranging from thin, irregular partings to layers several cm thick. Proportion of mudstone decreasing downward.	6m (19.4ft)	3740.0m (12,270.5ft)
ETIVE FORMATION		
Sandstone. Light olive grey (5Y6/1), fine- to medium-grained, quartzose, micaceous, kaolinitic, with common flakes of coalified plant debris; in irregular lenses and layers up to a few cm thick, separated by argillaceous partings, which are closely spaced in places. Coal layer at about 3749.9m (12,302.2ft).	4.7m (15.3ft)	3746.0m (12,289.9ft)
Sandstone. Light grey (N7), yellowish grey (5Y8/1) and light olive grey (5Y6/1), medium- to coarse-grained, quartzose, micaceous, kaolinitic; in planar, inclined laminae; argillaceous partings relatively scarce. Gradational contact with	8.3m (27.3ft)	3750.7m (12,305.2ft)
RANNOCH FORMATION		
Sandstone. Light grey (N7) and medium light grey (N6), fine-grained, quartzose, very micaceous, in horizontal and inclined, planar laminae.	10m (32.8ft)	3759.0m (12,332.5ft)
Sandstone. Medium light grey (N6) and medium grey (N5), fine-grained, quartzose, very micaceous, in horizontal and subordinate, inclined, planar laminae; sinusoidal ripple laminae at 3770.0m (12,368.6ft). Extensive disruption of lamination by burrowing from 3769.7 to 3769.9m (12,367.6 to 12,368.3ft). Boudinage features at 3769.6m (12,367.3ft). Medium- to coarse-grained sandstone laminae intercalated from 3770.1 to 3770.3m (12,368.9 to 12,369.6ft). Gradational contact with	1.3m (4.3ft)	3769.0m (12,365.3ft)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
BROOM FORMATION		
Sandstone. Yellowish grey (5Y8/1) to light grey (5Y6/1), medium- to coarse-grained, quartzose, micaceous, kaolinitic; in sub-horizontal and inclined planar laminae.	1.7m (5.6ft)	3770.3m (12,369.6ft)
Sandstone. Main lithology as in 3770.3 to 3772.0m (12,369.6 to 12,375.2ft), but with irregular, argillaceous partings. Interstitial siderite associated with grouped partings at interval top.	2.3m (7.4ft)	3772.0m (12,375.2ft)
Sandstone. As in 3770.3m to 3772.0m (12,369.6 to 12,375.2ft) but with common, sand-filled tubular burrows, oblique to lamination.	1.9m (6.3ft)	3774.3m (12,382.6ft)
Shaly sandstone. Sandstone light olive grey (5Y6/1), coarse-grained, pebbly in places, quartzose, micaceous, kaolinitic; in irregular lenses and continuous layers up to a few cm thick, separated by partings and layers of mudstone up to a few mm thick. Mudstone dark grey (N3), micaceous, carbonaceous.	0.7m (2.2ft)	3776.2m (12,389ft)
Sandstone. As in 3772.0 to 3774.3m (12,375.2 to 12,382.6ft). Sharp contact with	1.3m (4.2ft)	3776.9m (12,391.2ft)
DRAKE FORMATION		
Mudstone. Dark grey (N3), silty, micaceous, carbonaceous, laminated.	2.33m (7.6ft)	3778.2m (12,395.4ft)

UK Well 3/9A-2

Operator : Total

Co-ordinates : 60°47'23.1"N 1°44'36.7"E

Spudded : 2/1/76

Drilling completed : 19/4/76

KBE : 27m (88.6ft)

Water depth : 128m (419.9ft)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
ETIVE FORMATION (part)		
Sandstone. Light brownish grey (5YR6/1) and medium light grey (N6), dominantly medium- to coarse-grained, fine-grained in places; quartzose, micaceous, in horizontal and gently inclined, planar laminae, which are delineated by minor variation in grain size and by crenulated, argillaceous partings.	2.5m (8.2ft)	3447.0m 11,308.9ft)
Sandstone. Light brownish grey (5YR6/1) and medium light grey (N6) to medium dark grey (N4), dominantly fine-grained, with intercalations of medium- to coarse-grained sandstone as in 3,447.0 to 3,449.5m (11,308.9 to 11,317.1ft). Fine-grained sandstone, quartzose, very micaceous, in distinctly bipartite, horizontal and inclined planar laminae; in places, bipartite laminae with scattered medium and coarse sand grains. At interval base, 25cm (9.6ins) of strongly indurated, coarse-grained sandstone, with abundant calcite cement and scattered pyrite nodules.	4.7m (15.4ft)	3,449.5m (11,317.1ft)
RANNOCH FORMATION		
Sandstone. Medium grey (N5) to medium dark grey (N4), mostly fine-grained, but medium-grained in places; quartzose, very micaceous, in bipartite, horizontal and inclined, planar laminae. Medium-grained sandstone commonly above erosional, lower bounding surface of set of inclined laminae, as at 3,457.6m (11,343.7ft). Scattered burrows near interval base.	6.9m (22.6ft)	3454.2m (11,332.5ft)
Sandstone. Medium grey (N5) to medium dark grey (N4), fine-grained; quartzose, very micaceous; micro-cross-laminated. Burrowed in places, with horizontal, sand-filled burrows common. With scattered plant debris.	0.8m (2.6ft)	3461.1m (11,355.2ft)
Sandstone. Light grey (N7) to medium dark grey (N4), dominantly fine-grained, with sub-ordinate intercalations of medium- to	2.75m (9.0ft)	3461.9m (11,357.8ft)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
coarse-grained sandstone. Fine-grained sandstone as in 3454.2 to 3461.1m (11,322.5 to 11,355.2ft), but extensively bioturbated in places; with common, scattered plant debris. Medium- to coarse-grained sandstone, quartzose, feldspathic, micaceous, in inclined, planar laminae and micro-cross-laminae; with carbonaceous partings. Prolapsed bedding in fine-grained sandstone at 3464.15m (11,365.2ft); reworked nodular siderite at same level.		
BROOM FORMATION		
Sandstone. Light brownish grey (5YR6/1) and light olive grey (5Y6/1), medium- to coarse-grained, quartzose, feldspathic, micaceous; in inclined, planar laminae, delineated by argillaceous partings, which are common below 3465.5m (11,369.6ft). With common, scattered plant debris.	1.65m (5.4ft)	3464.7m (11,367.2ft)
Sandstone. Light grey (N7) to medium dark grey (N4), fine-grained, quartzose, micaceous; top 20cm (7.9ins) micro-cross-laminated, rest of interval with indistinct stratification, mainly intercalations of carbonaceous mudstone and coal, up to a few mm thick. Sand-filled, tubular burrows common. Flakes of concretionary siderite present.	0.6m (2ft)	3466.3m (11,372.2ft)
Sandstone. Light brownish grey (5YR6/1) and light olive grey (5Y6/1), coarse-grained, with scattered pebbles near base, quartzose, feldspathic, micaceous, kaolinitic; lamination irregular, sub-horizontal.	0.2m (0.7ft)	3466.9m (11,374.2ft)
Sandstone. Main lithology as in 3466.3 to 3466.9m (11,372.2 to 11,374.2ft).	0.1m (0.3ft)	3467.1m (11,374.9ft)
Sandstone. Pale yellowish brown (10YR6/1), mostly coarse-grained, but with minor intercalations of fine- to medium-grained sandstone and with scattered pebbles; quartzose, feldspathic, micaceous; in horizontal and inclined, planar laminae; finer-grained sandstones exhibit micro-cross-lamination and are associated with grouped, argillaceous partings and layers, a few mm thick. Sand-filled burrows in medium-grained sandstone at 3468.62m (11,369.8ft).	1.9m (6.2ft)	3467.2m (11,375.2ft)
Sandstone. Main lithology as in 3466.3 to 3466.9m (11,372.2 to 11,374.2ft). Flakes of	0.7m (2.3ft)	3469.1m (11,381.4ft)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
concretionary siderite common. Medium- to coarse-grained sandstone in micro-cross-laminated layer, 7cm (2.8ins) thick, at 3469.35m (11,382.2ft).		
Siltstone. Medium grey (N5), sandy, with scattered grains of coarse sand at top and base of interval; quartzose, micaceous; extensively bioturbated.	1.45m (4.7ft)	3469.7m (11,383.7ft)
Sandstone. Main lithology as in 3466.9 to 3467.1m (11,374.2 to 11,374.9ft). Siltstone as in 3469.7 to 3471m (11,383.4 to 11,388.1ft) form irregularly eroded layer with uneven upper surface at about 3471.22m (11,388.4ft). With common, irregular, argillaceous partings.	0.85m (2.8ft)	3471.15m (11,388.5ft)
No core.	2.0m (6.6ft)	3472.1m (11,391.2ft)
DRAKE FORMATION		
Mudstone. Medium dark grey (N4) to dark grey (N3), very silty; micaceous, carbonaceous, non-calcareous; laminated, extensively bioturbated. Calcareous concretion layer 5cm (2ins) thick, with calcite veining, at 3475.1m (11,401.1ft).	1.66m (5.4ft)	3474.1m (11,397.8ft)

UK Well 3/14A-3

Operator : Total

Co-ordinates : 60°39'20.0"N 1°37'54.5"E

Spudded : 15/11/74

Drilling completed : 10/5/75

KBE : 24m (79ft)

Water depth : 149m (489ft)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Sandstone. Light olive grey (5Y6/1) and medium grey (N5) to medium dark grey (N4), very fine-grained, silty, quartzose, micaceous; in irregular lenses and continuous layers a few mm thick, with widespread horizontal lamination, disrupted in places. Scattered plant debris and partings of carbonaceous mudstone. Basal 3ins (7.6cm) light olive grey, fine-grained sandstone, with abundant plant debris and indistinct lamination.	0.5m (1.6ft)	3410.0m (11,187.5ft)
Carbonaceous mudstone with coal. Black (N1) to dark grey (N3) and brownish black (5YR2/1), silty; in irregular, horizontal laminae. Coal partings and in lenses up to a few mm thick.	0.5m (1.6ft)	3410.5m (11,189.2ft)
Sandstone. Light olive grey (5Y6/1), fine-grained, quartzose, micaceous, with common flakes of plant debris; in inclined, planar laminae, delineated by carbonaceous material.	0.4m (1.3ft)	3411.0m (11,190.8ft)
Sandstone. As in 3410.0 to 3410.5 (11,187.5 to 11,189.2ft). Lamination of basal 2.5in (6cm) disrupted by minor faults.	0.2m (0.7ft)	3411.4m (11,192.1ft)
Carbonaceous mudstone with coal. As in 3410.5 to 3411.0m (11,189.2 to 11,190.8ft).	0.5m (1.6ft)	3411.6m (11,192.8ft)
Sandstone. As in 3411.0 to 3411.4m (11,190.8 to 11,192.1ft).	0.9m (3ft)	3412.1m (11,194.4ft)
Sandstone. Greenish grey (5GY&/1) and light olive grey (5Y6/1), fine-grained, sporadically silty, quartzose, micaceous; in irregular lenses and discontinuous layers up to a few mm thick, extensively bioturbated. Scattered interstitial pyrite and siderite.	1.5m (4.9ft)	3413.0m (11,197.4ft)
ETIVE FORMATION		
Pebbly sandstone. Light olive grey (5Y6/1) to light brownish grey (5YR6/1), matrix is fine-	0.4m (1.3ft)	3414.5m (11,202.3ft)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
to medium-grained sandstone, quartzose, micaceous; pebbles are mostly flat-lying fragments of silty mudstone, siltstone and fine-grained sandstone, angular and showing internal lamination. Layer of silty mudstone at base of interval 1.5ins (4cm) thick may also be clast.		
Sandstone. Light olive grey (5Y6/1), mostly medium- to coarse-grained, fine-grained in places, quartzose, micaceous, kaolinitic; in planar, inclined laminae, generally delineated by minor differences in clay content; with scattered plant debris. Sharp contact of coarse-grained sandstone upon fine-grained sandstone at 3426.0m (11,240.0ft) and at interval base. Scattered laminae of micaceous mudstone in basal 1ft (0.3m). Sharp contact with	11.6m (38.1ft)	3414.9m (11,203.6ft)
RANNOCH FORMATION		
Sandstone. Light olive grey (5Y6/1), fine-grained, quartzose, very micaceous, kaolinitic; with scarce, scattered pebbles and thin (few cm) intercalations of medium- to coarse-grained sandstone of similar composition; in horizontal and inclined, planar laminae. Dark greenish grey (5GY4/1) to medium dark grey (N4) muddy siltstone forms layer 3ins (7.6cm) thick at about 3432.2m (11,260.4ft). Pyrite in scarce nodules.	7.1m (23.3ft)	3426.4m (11,241.2ft)
Siltstone. Dark greenish grey (5GY4/1) to medium dark grey (N4), quartzose, micaceous, muddy in places; in ripple cross-laminae. Mudstone, dark grey (N3), micaceous, carbonaceous, in scattered layers up to 1cm thick.	0.5m (1.6ft)	3433.5m (11,264.6ft)
Sandstone. Main lithology as in 3426.4 to 3433.5m (11,241.2 to 11,264.6ft).	2m (6.6ft)	3434.0m (11,266.3ft)
BROOM FORMATION		
Sandstone. Light olive grey (5Y6/1), fine- to medium-grained, quartzose, micaceous, kaolinitic; friable and disaggregated in core; basal 2ins (5cm) indurated and composed of pebbly, coarse-grained sandstone.	0.6m (2ft)	3436.0m (11,272.8ft)
Sandstone. Main lithology as in 3426.4 to 3433.5m (11,241.3 to 11.264.6ft). Plant fragments and abundant micas on lamination surfaces.	0.2m (0.7ft)	3436.8m (11,274.6ft)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Light olive grey (5Y6/1), medium- to coarse-grained, with scattered pebbles in basal 4.5ins (11cm); quartzose, micaceous, kaolinitic; in irregular, sub-horizontal laminae.	0.2m (0.7ft)	3436.8m (11,275.3ft)
Sandstone. Main lithology as in 3436.0 to 3436.6m (11,272.8 to 11,274.6ft).	0.4m (1.3ft)	3437m (11,276ft)
No core.	6.6m (21.7ft)	3437.4m (11,277.4ft)
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), silty in places, micaceous, non-calcareous; laminated.	3.0m (9.8ft)	3444m (11,299.1ft)

UK Well 3/23-1

Operator : Ball & Collins

Co-ordinates : 60°10'30.7"N 1°35'25.2"E

Spudded : 25/8/75

Drilling completed : 3/11/75

KBE : 85ft (26m)

Water depth : 471.0ft (143.6m)

	<u>Thickness</u>	<u>Depth below KB</u>
<u>Description of strata</u>		
INDETERMINATE (? MIDDLE JURASSIC)	62.0ft (18.9m)	9,840ft (2999.2m)
Sandstone. Light olive grey (5Y6/1), fine-grained, with scattered limestone pebbles; quartzose, micaceous. Irregular distribution of sphaero-siderite and calcareous cement. Flakes of medium dark grey (N4) mudstone at 9,888ft (3013.9m). Layering for the most part not visible; sub-horizontal, clayey partings occur sporadically.		

UK Well 210/24-1

Operator : Amoco

Co-ordinates : 61°13'33.0N 0°40'3.6"E

Spudded : 28/4/74

Drilling completed : 8/5/74

KBE : 87ft (26.5m)

Water depth : 511.0ft (155.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
BROOM FORMATION (part)		
Shaly sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1), fine-grained; quartzose, micaceous (large flakes), kaolinitic; in lenses and irregular, continuous layers, generally up to a few mm thick, bounded by argillaceous partings and laminae; appears to be micro-cross-laminated in places. Mudstone medium dark grey (N4) to dark grey (N3), sandy, silty, micaceous, carbonaceous, non-calcareous, with layering commonly interrupted by sand-filled, mud-lined, tubular burrows of variable orientation. Bioturbation appears to be extensive, but discrete, tubular burrows, up to 1cm wide are discernible.	1.0ft (0.3m)	5,061ft (1542.6m)
No core.	1.0ft (0.3m)	5,062ft (1542.9m)
Shaly sandstone. Main lithology as in 5,061 to 5,062ft (1542.6 to 1542.9m); medium grained in places.	1.0ft (0.3m)	5,063ft (1543.2m)
No core.	1.0ft (0.3m)	5,064ft (1543.5m)
Shaly sandstone. Main lithology as in 5,061 to 5,062ft (1542.6 to 1542.9m).	1.0ft (0.3m)	5,065ft (1543.8m)
No core.	1.0ft (0.3m)	5,066ft (1544.1m)
Shaly sandstone. Main lithology as in 5,061 to 5,062ft (1542.6 to 1542.9m).	1.0ft (0.3m)	5,067ft (1544.4m)
Shaly sandstone. Main lithology as in 5,061 to 5,062ft (1542.6 to 1542.9m); micro-cross-laminated and extensively burrowed. Muddy cross-laminae may be in part biogenic (c.f. <u>Teichichinus</u>).	1.0ft (0.3m)	5,068ft (1544.7m)
No core.	1.0ft (0.3m)	5,069ft (1545.0m)
	1.0ft (0.3m)	5,070ft (1545.3m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Light olive grey (5Y6/1) and light brown (5YR6/4) to moderate brown (5YR4/4), medium- to coarse-grained; quartzose, micaceous, kaolinitic; strongly indurated, with abundant calcite and siderite cement; in irregular, inclined, planar laminae. Calcite-filled veins lined with kaolinite. Scattered coalified plant debris and scarce, carbonaceous partings.	1.0ft (0.3m)	5,071ft (1545.6m)
No core.	1.0ft (0.3m)	5,072ft (1545.9m)
Shaly sandstone. Main lithology as in 5,061 to 5,062ft (1542.6 to 1542.9m); extensively bioturbated, with sand-filled, tubular burrows of variable orientation and forms similar to <u>Teichichnus</u> . Scattered plant debris. Sporadic concentrations of siderite and pyrite.	1.0ft (0.3m)	5,073ft (1546.3m)
No core.	1.0ft (0.3m)	5,074ft (1546.6m)
Sandstone. Yellowish grey (5Y7/2) and medium light grey (N6), coarse-grained, with scattered, small pebbles, quartzose, micaceous, kaolinitic; delineated by uneven and discontinuous mudstone partings, interconnected in places.	1.0ft (0.3m)	5,075ft (1546.9m)

Note

The descriptive intervals from 5,061 to 5,068ft (1542.6 to 1544.7m) and 5,075 to 5,076ft (1546.9 to 1547.2m) are based on fragmented core, kept in labelled bags; those from 5,069 to 5,074ft (1545.0 to 1546.6m) relate to undisrupted, slabbed core, also in labelled bags, with no indication of way up given.

UK Well 210/25-1

Operator : Shell

Co-ordinates : 61°16'42.0"N 0°54'9.5"E

Spudded : 2/2/75

Drilling completed : 6/4/75

KBE : 107.0ft (32.6m)

Water depth : 548.0ft (167.0m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Shaly sandstone. Light olive grey (5Y6/1) and light brownish grey (5YR6/1), fine-grained, quartzose, micaceous, kaolinitic in lenses and irregular layers up to 2cm thick, separated by interconnected, argillaceous partings and layers up to a few mm in thickness. Mudstone dark grey (N3), sandy, micaceous, carbonaceous. Interval incorporates layer of carbonaceous mudstone and coal, about 3ins (7.5cm) thick at 8,133ft (2478.9m). Gradational contact with	3.0ft (0.9m)	8,132ft (2478.6m)
ETIVE FORMATION		
Sandstone. Light olive grey (5Y6/1), oil-stained; dominantly fine-grained, medium-grained in places; quartzose, kaolinitic, micaceous; in horizontal and inclined, planar laminae, distinctly bipartite in places; with relatively scarce argillaceous partings, both solitary and grouped. Large mica flakes closely packed in carbonaceous mudstone layer (? a few mm thick) at 8,166ft (2489m). Gradational contact with		
Sandstone. Main lithology as in 8,135 to 8,186ft (2479.5 to 2495.1m), but with increased mica content, as large flakes, which are particularly prominent on parting surfaces. With coalified plant debris; scattered pyrite nodules.	29.0ft (8.8m)	8,186ft (2495.1m)
RANNOCH FORMATION		
Sandstone. Light grey (N7) to medium light grey (N6), fine-grained; quartzose, very micaceous, kaolinitic; in horizontal and inclined, planar laminae, which are prominently bipartite, with distinctly darker, clayey parts of laminae.	3.5ft (1.1m)	8,215ft (2503.9m)
Sandstone. Light grey (N7) to medium light grey (N6), fine-grained; quartzose, very micaceous, kaolinitic; in horizontal and	7.5ft (2.3m)	8,218.5ft (2505m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
inclined, planar laminae, which are distinctly bipartite. Strongly indurated with porosity plugged by abundant calcite cement.		
Sandstone. Main lithology as in 8,215 to 8,218.5ft (2503.9 to 2505m). Concentric growth of pyrite concretion at 8,231.5ft (2509m) possibly related to burrow form.	7.0ft (2.1m)	8,226ft (2507.3m)
Sandstone. Main lithology as in 8,218.5 to 8,226ft (2505 to 2507.3m); with scattered, carbonaceous partings. Micro-cross-laminated in places. Scarce sand-filled, tubular burrows.	4.0ft (1.2m)	8,233ft (2509.4m)
Sandstone. Main lithology as in 8,215 to 8,218.5ft (2503.9 to 2502m).	6.0ft (1.8m)	8,237ft (2510.6m)
Sandstone. Main lithology as in 8,218.5 to 8,226ft (2505 to 2507.3m).	4.5ft (1.4m)	8,243ft (2512.5m)
Sandstone. Main lithology as in 8,215 to 8,218.5ft (2503.9 to 2505m).	2.5ft (0.8m)	8,247.5ft (2513.8m)
No core.	18.0ft (5.5m)	8,250ft (2514.6m)
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1), oil-stained in places, notably from 8,280 to 8,291ft (2523.7 to 2527.1m), fine-grained, quartzose, very micaceous, kaolinitic; sporadically laminated as in 8,215 to 8,218.5ft (2503.9 to 2505m), but with primary stratification largely disrupted by burrowing. Sand-filled, mud-lined, tubular burrows, straight and of variable orientation. Argillaceous partings, solitary and grouped in upper half of interval and interconnected around irregular sandstone lenses in lower half. Gradational contact with	25.0ft (7.6m)	8,268ft (2520.1m)
Sandstone. Light olive grey (5Y6/1) and medium grey (N5), fine-grained; quartzose, very micaceous, kaolinitic; in irregular lenses and layers, a few mm to several cm thick, bounded by frequently interconnected partings of carbonaceous mudstone; extensively bioturbed.	10.0ft (3.0m)	8,293ft (2527.7m)
BROOM FORMATION		
Sandstone. Light grey (N7) to medium grey (N5), coarse-grained; quartzose, micaceous, kaolinitic; in crude, inclined, planar laminae; strongly indurated, with abundant calcite cement.	0.5ft (0.2m)	8,303ft (2530.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Yellowish grey (5Y8/1) and light grey (N7), coarse-grained; quartzose, micaceous, kaolinitic; in crude, inclined, planar laminae. Induration moderate.	0.5ft (0.2m)	8,303.5ft (2530.9m)
No core.	13.0ft (4m)	8,304ft (2531.1m)
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1) and light grey (N7), coarse-grained; quartzose, micaceous, kaolinitic; stratification obscured by homogeneity of grain size, but inclined, planar laminae discernible in places.	3.5ft (1.1m)	8,317ft (2535.0m)
Sandstone. Medium light grey (N6) to medium grey (N5), coarse-grained, with scattered granules and small pebbles, shaly in basal 1ft (0.3m); quartzose, micaceous, kaolinitic; indistinct, gently inclined, planar laminae replaced downwards by irregular lenses and continuous layers, up to 0.5in (1cm) thick, bounded by interconnected argillaceous partings; latter most numerous at interval base. Scattered plant debris. Clasts of concretionary siderite. Strongly indurated with abundant calcite cement. Gradational contact with	4.5ft (1.4m)	8,320.5ft (2536.1m)
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), non-calcareous, micaceous, silty in places, laminated. Top 3ins (7.5cm) composed of muddy siltstone with scattered coarse sand grains (quartz, feldspar, concretionary siderite) and flakes of coalified plant debris. Sideritic concretionary layer, 1.5in (3cm) thick, at about 8,326ft (2537.8m).	6.0ft (1.8m)	8,325ft (2537.5m)

UK Well 210/25-2

Operator : Shell

Co-ordinates : 61°14'29.5"N 0°55'14.1"E

Spudded : 24/11/75

Drilling completed : 8/2/76

KBE : 82ft (25m)

Water depth : 550.0ft (167.6m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Siltstone and mudstone. Siltstone medium grey (N5), sandy in places; quartzose, micaceous; in lenses and continuous layers up to a few mm thick, separated by mudstone layers of similar thickness. Mudstone medium dark grey (N4) and dark grey (N3) to greyish black (N2), silty in places, non-calcareous, micaceous, carbonaceous. Gradational contact with	5.0ft (1.5m)	8,537ft (2602.1m)
Sandstone. Yellowish grey (5Y8/1) and very light grey (N8) to light grey (N7), fine-grained; quartzose, micaceous, kaolinitic, in horizontal and inclined, planar laminae; with scattered, uneven partings of dark grey (N3), carbonaceous mudstone, frequently solitary, more rarely grouped and interconnected; latter are numerous in basal 1ft (0.3m), associated with thin, sideritic, concretionary layers. Common, sand-filled, tubular burrows, of variable orientation, above 8,546ft (2610.3m). Gradational contact with	13.0ft (4m)	8,542ft (2603.6m)
Siltstone and mudstone. Main lithology as in 8,537 to 8,542ft (2602.1 to 2603.6m).	9.0ft (2.7m)	8,555ft (2607.6m)
No core.	4.0ft (1.2m)	8,564ft (2610.3m)
Sandstone. Main lithology as in 8,537 to 8,542ft (2602.1 to 2603.6m); top 0.5ft (0.2m) extensively burrowed. With scattered plant debris.	1.5ft (0.5m)	8,568ft (2611.5m)
Carbonaceous mudstone and coal. Greyish black (N2) and black (N1), silty in places, notably in basal 3ins (7.6m) and at interval top; laminated. With pyrite nodules above gradational contact with	4.5ft (1.4m)	8,569.5ft (2612m)
? ETIVE FORMATION		
Sandstone. Yellowish grey (5Y8/1) and light grey (N7), medium- to coarse-grained, quartzose, micaceous, kaolinitic, with	2.5ft (0.8m)	8,574ft (2613.4m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
scattered plant debris; in indistinct, horizontal and inclined, planar laminae; grouped, carbonaceous partings at the top of interval. Gradational contact with		
Sandstone. Very light grey (N8) to light grey (N7), fine- to medium-grained; quartzose, very micaceous, with large mica flakes closely partings kaolinitic; in horizontal and inclined, planar laminae; with common clayey and micaceous partings, solitary and grouped. Scattered plant debris. Small nodules occur sporadically.	21.0ft (6.4m)	8,574.5ft (2614.1m)
RANNOCH FORMATION		
Sandstone. Yellowish grey (5Y8/1), fine grained; quartzose, very micaceous, kaolinitic; in horizontal and inclined, planar laminae; burrows common, in form of sand-filled, mud-lined, tubular types, straight and variable in orientation. Irregular, clayey and micaceous partings are common.	6.0ft (1.8m)	8,597.5ft (2620.5m)
Sandstone. Light grey (N7) to medium light grey (N6), fine-grained; quartzose, very micaceous; in horizontal and inclined, planar laminae, disrupted by burrows, as in 8,595 to 8,601ft (2615.8 to 2621.6m). Strongly indurated, with abundant calcite cement.	1.5ft (0.5m)	8,603.5ft (2622.3m)
Sandstone. Main lithology as in 8,597.5 to 8,603.5ft (2620.5 to 2622.3m).	2.0ft (0.6m)	8,605ft (2622.8m)
Sandstone. Main lithology as in 8,603.5 to 8,605ft (2622.3 to 2622.8m).	4.0ft (13.1m)	8,607ft (2623.4m)
Sandstone. Light grey (N7) to medium light grey (N6), fine-grained, quartzose, very micaceous, kaolinitic, with scattered plant debris; in horizontal and inclined, planar laminae, with clayey parts of bipartite laminae strongly developed, up to few mm thickness; also common argillaceous partings with concentrations of large mica flakes. Burrows common, as in 8,597.5 to 8,603.5ft (2620.5 to 2622.3m); also forms similar to <u>Spirophyton</u> noted.	7.5ft (2.3m)	8,611ft (2624.6m)
Sandstone. Main lithology as in 8,597.5 to 8,603.5ft (2620.5 to 2622.3m). <u>Spirophyton</u> present.	10.5ft (3.2m)	8,618.5ft (2626.9m)
No core.	1.0ft (0.3m)	8,629ft (2630.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Light grey (N7) to medium light grey (N6), fine-grained; quartzose, micaceous, kaolinitic, extensively bioturbated, but subsequently mechanically disrupted, as indicated by chaotic attitudes of common carbonaceous partings and intercalated muddy laminae. Calcited veins in top 3ins (7.6cm).	1.5ft (0.5m)	8,630ft (2630.4m)
BROOM FORMATION		
Sandstone. Light grey (N7) to medium light grey (N6), coarsed grained, with scattered granules and small pebbles, notably at interval top; quartzose, micaceous, kaolinitic, in horizontal and gently inclined, planar laminae, which are for most part indistinct; with solitary and grouped, carbonaceous partings occurring every few cm. Top 0.5ft (0.2m) with siderite cement.	3.5ft (1.1m)	8,631.5ft (2630.9m)
Sandstone. As in 8,631.5 to 8,635ft (2630.9 to 2631.9m), but strongly indurated with abundant calcite cement. Sand-filled mud-lined, tubular burrows common.	9.0ft (2.7m)	8,635ft (2632m)
Sandstone. Main lithology as in 8,631.5 to 8,635ft (2630.9 to 2631.9m).	2.0ft (0.6m)	8,644ft (2634.7m)
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), silty in places, non-calcareous, laminated.	2.0ft (0.6m)	8,646ft (2636.3m)

UK Well 211/11-1

Operator : Arpet

Co-ordinates : 61°35'47.6"N 1°9'53.2"E

Spudded : 25/5/74

Drilling completed : 7/8/74

KBE : 84ft (25.6m)

Water depth : 612.0ft (186.5m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
ETIVE FORMATION (part)		
Sandstone. Light olive grey (5Y6/1), fine-grained; quartzose, micaceous; in indistinct, inclined laminae, which are discontinuous, delineated by minor variation in interstitial clay. Small mica flakes closely spaced on surfaces of splitting parallel lamination.	4.5ft (1.4m)	9,938ft (3029.1m)
Sandstone. Light olive grey (5Y6/1), fine-grained; quartzose, micaceous; in sub-horizontal and inclined, planar laminae, delineated by irregular, dark grey (N3), carbonaceous partings; micro-cross-laminated in places. Partings closely spaced and interconnected in places, where burrowing common, numerous, sand-filled, sub-horizontal, tubular forms and segmented, sand-filled, vertical burrows, both types mud-lined. More extensive bioturbation is scarce. Oblique fractures in burrowed sandstone at 9,951ft (3033.1m). With scattered plant debris.	13.5ft (4.1m)	9,942.5ft (3030.5m)
Sandstone. Light olive grey (5Y6/1), fine-grained; quartzose, micaceous, in inclined, planar laminae, delineated by scarce, carbonaceous partings and minor variation in interstitial clay. Minor faults at base.	3.5ft (1.1m)	9,956ft (3034.6m)
Shaly sandstone. Light olive grey (5Y6/1) and pale red (5R6/2), dominantly fine-grained with scattered medium sand grains; quartzose, micaceous; in irregular lenses, up to 1cm thick, bounded by interconnected argillaceous partings; extensively bioturbated; sub-horizontal and vertical, sand-filled burrows very common. Carbonaceous material common on partings. Interstitial siderite present; irregular segregations of pyrite.	4.5ft (1.4m)	9,959.5ft (3035.7m)
Sandstone. Light olive grey (5Y6/1), dominantly fine-grained, but medium- to coarse-grained in basal 1ft (0.3m); quartzose, micaceous; in inclined, planar laminae,	22.0ft (6.7m)	9,964ft (3037.0m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
delineated by crenulated, carbonaceous partings commonly disrupted by bioturbation. Sand-filled, tubular burrows of variable orientation are common. Scattered, small pyrite concretions.		
Sandstone. Light olive grey (5Y6/1), fine- to medium-grained; quartzose, micaceous; in inclined, planar laminae; lamination irregular in places, where closely spaced, argillaceous partings occur. Small pyrite concretions.	6.0ft (1.8m)	9,986ft (3043.7m)
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1) and light grey (N7); fine- to medium-grained; quartzose, micaceous; in indistinct, inclined laminae. Strongly indurated, with abundant calcite cement.	3.5ft (1.1m)	9,992ft (3045.6m)
Sandstone. Light olive grey (5Y6/1), fine-grained; quartzose, micaceous; in horizontal and inclined, planar laminae, delineated by minor variation in interstitial clay and by irregular, argillaceous partings. Patchy distribution of calcite cement. Small pyrite concretions.	9.5ft (2.9m)	9,995.5ft (3046.6m)
Sandstone. Light olive grey (5Y6/1), fine- to coarse-grained, with grain size increasing downwards, most markedly below about 10,010ft (3051.0m); quartzose, micaceous, kaolinitic; in horizontal and inclined planar laminae, delineated by grouped, clayey partings, abundant above 10,010ft (3051.0m). Sporadic occurrences of interstitial pyrite and irregular segregations of pyrite in coarser-grained sandstone. Sharp erosional contact with	11.0ft (3.4m)	10,005ft (3049.5m)
Sandstone. Light olive grey (5Y6/1), fine- to coarse-grained; quartzose, micaceous, kaolinitic, with marked increase in mica content of fine-grained sandstones below 10,033ft (3058.1m); in crude, horizontal and inclined, planar laminae, delineated by clayey partings in fine-grained sandstones and by interbedding of fine-grained sandstone with coarser grades. Coarse-grained at base. Scattered, irregular segregations of pyrite.	29.0ft (8.8m)	10,016ft (3052.9m)
RANNOCH FORMATION		
Sandstone. Light olive grey (5Y6/1) and medium light (N6) to medium grey (N5), fine-grained, but with scattered grains of coarse sand above 10,048ft (3062.6m);	132.5ft (40.4m)	10,045ft (3061.7m)

Description of strata	Thickness	Depth below KB
<p>quartzose, very micaceous, in bipartite, horizontal and inclined, planar laminae. Calcite cement concentrated to give irregular, strongly indurated, concretionary bodies; 4.5ins (11cm) thick. At 10,051ft (3063.5m) up to 4ins (10cm) at 10,070ft (3069.3m), 1ft (0.3m) at 10,077ft (3071.5m), 1ft (0.3m) at 10,087ft (3071.8m), 6ins (15cm) at 10,097.5ft (3077.7m), 9ins (23cm) at 10,099ft (3078.2m), and 9ins (23cm) at 10,173ft (3100.6m); elsewhere calcite cement is sporadically distributed. Sand-filled, mud-lined, horizontal burrows at 10,103ft (3079.4m) and 10,151ft (3094.0m). Scattered, small pyrite concretions.</p>		
<p>Sandstone. Medium light grey (N6) to medium dark grey (N4), fine-grained; quartzose, very micaceous; mostly in bipartite, horizontal and inclined, planar laminae, but with common layers of burrowed and extensively bioturbated strata 4 to 8ins (10 to 20cm) thick, giving varying degrees of destruction of primary lamination. Sand-filled burrows of variable orientation are common. With scattered plant debris, especially common in bioturbated strata. Lower boundaries of burrowed strata generally diffuse; tops relatively sharp. Scarce pyritic segregations.</p>	16.5ft (5.0m)	10,177.5ft (3102.1m)
<p>No core.</p>		
<p>Shaly sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1) in upper part, becoming medium light grey (N6) to medium grey (N5) with decrease in grain size below 10,235ft (3119.7m), fine-grained; quartzose, very micaceous; in irregular lenses up to 0.5ins (1cm) thick, several ins long, bounded by interconnected argillaceous partings; extensively bioturbated. <u>Teichichnus</u> and sand-filled, tubular burrows of varying orientation very common. Primary stratification preserved in scarce sets of horizontal and inclined, planar laminae, generally less than 4ins (10cm) thick. Sporadic distribution of abundant calcite cement; strongly indurated strata from 10,231 to 10,242ft (3118.4 to 3121.8m) are noteworthy, in that they include several sets of undisturbed lamination. Scattered, small segregations of pyrite. Common plant debris. Dark grey (N3) mudstone, silty, micaceous, carbonaceous; in 0.5ins (1cm) layer at 10,234ft (3119.3m). Gradational contact with</p>	26.0ft (7.9m) 22.0ft (6.7m)	10,194ft (3107.1m) 10,220ft (3115.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Shaly sandstone. Medium light grey (N6) to medium dark grey (N4), fine-grained, with interbedded siltstone, quartzose, very micaceous, in irregular lenses, less than 1cm thick, bounded by layers of silty mudstone, a few mm in thickness; extensively bioturbated. Sets of undisturbed, horizontal and inclined, planar laminae, generally less than 1in (2cm) thick, becoming common below 10,249ft (3123.9m). Common plant debris. Dark grey (N3) mudstone, silty, micaceous, carbonaceous; in 1in (2cm) layer at 10,244.5ft (3122.5m). Gradational contact with	9.0ft (2.7m)	10,242ft (3121.8m)
Sandstone and mudstone. Sandstone medium light grey (N6) to medium grey (N5), fine-grained; quartzose, very micaceous; in layers up to 1in (1cm) thick, with horizontal laminae and micro-cross-laminae, intercalated with subordinate mudstone. Mudstone dark grey (N3), silty, micaceous, carbonaceous, non-calcareous; laminated, in layers generally a few mm thick. Sand-filled, tubular burrows of variable orientation are common; also present are mud-filled forms similar to <u>Teichichnus</u> . Common plant debris.	3.0ft (0.9m)	10,251ft (3124.5m)
No core.	69.0ft (21.0m)	10,254ft (3125.4m)
BROOM FORMATION (part)		
Sandstone. Light grey (N7) and yellowish grey (5Y8/1) to light olive grey (5Y6/1), coarse-grained; quartzose, feldspathic, kaolinitic; stratification indistinct and irregular. Strongly indurated, with abundant calcite cement. Irregular segregations of interstitial siderite.	2.5ft (0.8m)	10,323ft (3118.7m)
Sandstone. Light olive grey (5Y6/1) and pale yellowish brown (10YR6/2) coarse-grained; quartzose, feldspathic, kaolinitic; stratification irregular, with horizontal and inclined, planar lamination indicated in places by argillaceous partings. Sand-filled burrows of variable orientation associated with partings. Sporadic occurrence of calcite cement below 10,363ft (3158.6m).	49.5ft (15.1m)	10,325.5ft (3147.2m)
Shaly sandstone. Light olive grey (5Y6/1) and pale yellowish brown (10YR6/2), coarse-grained; quartzose, feldspathic, kaolinitic; in irregular lenses and continuous layers, delineated by interconnected, argillaceous partings, which become	11.0ft (3.4m)	10,375ft (3162.3m)

Description of strataThicknessDepth below KB

increasingly numerous and closely spaced downwards. Calcite cement relatively abundant below 10,382ft (3164.4m). Scattered irregular segregations of siderite, incorporating coarse sand grains. At interval base, pebble of nodular siderite with calcite- and pyrite-filled veins; this is in most muddy part of interval, which includes pyrite nodules.

DRAKE FORMATION (part)

Siltstone. Medium dark grey (N4) to dark grey (N3), muddy; quartzose, micaceous, pyritic; irregularly laminated. With scattered, common pyrite nodules.

3.0ft
(0.9m)

10,386ft

UK Well 211/18-6

Operator : Signal
 Co-ordinates : 61°24'13.1"N 1°32'33.0"E
 Spudded : 16/7/74
 Drilling completed : 17/8/74
 KBE : 64ft (19.5m)
 Water depth : 539.0ft (164.3m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
RANNOCH FORMATION (part)		
Sandstone. Medium light grey (N6) to medium grey (N5), fine-grained, though medium- to coarse-grained in top 4ins (10.1cm); quartzose, very micaceous; lamination mechanically disrupted, chaotic. Strongly indurated, with abundant calcite cement.	3.0ft (0.9m)	9,278ft (2827.9m)
Sandstone. Light brownish grey (5YR6/1), oil-stained, fine-grained; quartzose, very micaceous; in sub-horizontal laminae, transected by closely spaced, oblique faults.	1.5ft (0.5m)	9,281ft (2828.8m)
Sandstone. Light grey (N7) to medium light grey (N6), fine-grained; quartzose, very micaceous; lamination indistinct. Strongly indurated, with abundant calcite cement.	0.5ft (0.2m)	9,282.5ft (2829.3m)
Sandstone. Main lithology as in 9,281 to 9,282.5ft (2828.8 to 2829.3m). Oil-stained. With disrupted, argillaceous partings.	3.0ft (0.9m)	9,283ft (2829.5m)
Sandstone. Light grey (N7) to medium light grey (N6), fine-grained; quartzose, very micaceous; composed of disrupted, bipartite laminae, transected by closely spaced, oblique faults. Strongly indurated, with abundant calcite cement. Segregations of pyrite present. Vertical calcite veins.	4.0ft (1.2m)	9,286ft (2830.4m)
Sandstone. Main lithology as in 9,281 to 9,282.5ft (2828.8 to 2829.3m). Disrupted, bipartite laminae in calcite-cemented layers, 6ins (15.2cm) thick at 9,293.5ft (2832.7m) and 9,299ft (2834.3m) respectively. Oblique faults present throughout interval.	9.5ft (2.9m)	9,290ft (2831.6m)
Sandstone. Light grey (N7) to medium light grey (N6), fine-grained; quartzose, very micaceous, in distinctly bipartite, horizontal and inclined, planar laminae.	3.5ft (1.1m)	9,299.5ft (2834.5m)
Sandstone. Main lithology as in 9,299.5 to 9,303ft (2834.5 to 2835.6m). (Recovery not known; core disrupted and stored in bags.)	3.0ft (0.9m)	9,303ft (2835.6m)

Note

According to the company, the adjusted depth below KB for the top of the cored interval is 9,269ft (2825.2m).

UK Well 211/18-8

Operator : Burmah
 Co-ordinates : 61°23'27.4"N 1°32'36.2"E
 Spudded : 19/5/75
 Drilling completed : 20/6/75
 KBE : 64ft (19.5m)
 Water depth : 469.0ft (143m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
? ETIVE FORMATION (part)		
Sandstone. Pale yellowish brown (10YR6/2) and moderate yellowish brown (10YR5/4), fine-grained; quartzose, micaceous; in horizontal and inclined, planar laminae; sporadic occurrence of strongly indurated strata with abundant calcite cement.	14.0ft (4.3m)	8,700ft (2651.8m)
RANNOCH FORMATION		
Sandstone. Medium grey (N5) to medium dark grey (N4), fine-grained; quartzose, very micaceous; in horizontal and inclined, planar laminae, micro-cross-laminated and prolapsed in places. Scattered plant debris. Pyrite nodules. Abundant calcite cement in places.	6.0ft (1.8m)	8,714ft (2656.0m)
Sandstone and mudstone. Sandstone medium grey (N5), fine-grained; quartzose, micaceous; in layers up to 0.8ins (2cm) thick, with horizontal laminae and micro-cross-laminae; lamination disrupted by burrows in places. Mudstone dark grey (N3), silty; micaceous, carbonaceous, non-calcareous; in layers up to a few mm thick. With scattered pyrite nodules.	11.5ft (3.5m)	8,720ft (2657.9m)
BROOM FORMATION		
Shaly sandstone. Medium light grey (N6) to medium dark grey (N4), coarse-grained; quartzose, feldspathic, micaceous; in irregular lenses and continuous layers up to 0.8ins (2cm) thick, bounded by partings and layers of mudstone, a few mm thick. Mudstone dark grey (N3), silty, micaceous, carbonaceous, non-calcareous. Sporadic occurrence of abundant calcite cement.	3.0ft (0.9m)	8,731.5ft (2661.4m)
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), silty; micaceous, carbonaceous, non-calcareous; laminated. Sideritic concretionary layer 3.5ins (8.9cm) thick, at 8,736ft (2662.7m).	4.5ft (1.4m)	8,734.5ft (2662.3m)

UK Well 211/19-1

Operator : Conoco

Co-ordinates : 61°21'25.5"N 1°36'37.7"E

Spudded : 3/4/74

Drilling completed : 22/5/74

KBE : 78ft (23.8ft)

Water depth : 522.0ft (159.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
RANNOCH FORMATION (part)		
Sandstone. Light grey (N7) to medium grey (N5), fine-grained; quartzose, very micaceous; in bipartite, horizontal and inclined, planar laminae. With common scattered plant debris. Recovery from 9,667 to 9,669ft (2946.5 to 2947.1m) not known, because of broken core.	11.0ft (3.4m)	9,660ft (2944.4m)
Sandstone. Light grey (N7) to medium light grey (N6), fine-grained; quartzose, very micaceous; in bipartite, horizontal and gently inclined, planar laminae. Strongly indurated throughout most of interval, with abundant calcite cement; scattered, small pyrite concretions.	5.5ft (1.7m)	9,671ft (2947.7m)
Sandstone. Main lithology as in 9,660 to 9,671ft (2944.4 to 2947.7m). Recovery from 9,691.5 to 9,694ft (2953.4 to 2954.7m) not known, because of broken core.	29.5ft (9m)	9,676.5ft (2949.4m)
Sandstone. Main lithology as in 9,671 to 9,676.5ft (2947.7 to 2949.4m).	1.0ft (0.3m)	9,706ft (2958.4m)
Sandstone. Main lithology as in 9,660 to 9,671ft (2944.4 to 2947.7m). Scattered, small pyrite nodules.	27.0ft (8.2m)	9,707ft (2958.7m)
Sandstone. Yellowish grey (5Y8/1) and light grey (N7) to medium dark grey (N4), fine-grained; quartzose, very micaceous; mostly in bipartite, horizontal and inclined, planar laminae, but with subordinate cosets of micro-cross-laminae, up to 3.9ins (10cm) thick, characterized by biogenic disruption of primary layering and abundant plant debris. Siderite concretion at 9,744ft (2970m). Bipartite laminae display mica-rich parts, increasingly well defined, thicker, as compared with above intervals.	22.0ft (6.7m)	9,734ft (2966.9m)
Sandstone. Main lithology as in 9,671 to 9,676.5ft (2947.7 to 2949.4m).	11.0ft (3.4m)	9,756ft (2973.6m)
Sandstone. Main lithology as in 9,660 to 9,671ft (2944.4 to 2947.7m). Mica-rich parts	19.0ft (5.8m)	9,767ft (2977m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
of laminae prominent, relatively thick from 9,773 to 9,777.5ft (2978.8 to 2980.2m), associated with cosets of micro-cross-laminae, up to 0.8ins (2cm) thick, occurring sporadically. With scattered flakes of nodular siderite.		
Sandstone. Yellowish grey (5Y8/1) and light grey (N7) to medium dark grey (N4), fine-grained; quartzose, very micaceous; in bipartite, horizontal and inclined, planar laminae, forming groups a few cm thick, which frequently include subordinate cosets of micro-cross-laminae; also layers of sandstone a few cm thick, in which lamination indistinct. Intercalated are layers of extensively bioturbated laminae with common, mud-filled escape burrows and partings and thin layers of mudstone; latter dark grey (N3), silty, very micaceous, carbonaceous, non-calcareous, laminated. With common, scattered plant debris. Bioturbated strata increasingly common downwards.	5.0ft (1.5m)	9,786ft (2982.8m)
Sandstone. Yellowish grey (5Y8/1), fine-grained; quartzose, very micaceous, in bipartite, inclined, planar laminae.	2.5ft (0.8m)	9,791ft (2984.3m)
Sandstone. Main lithology as in 9,786 to 9,791ft (2982.8 to 2984.3m). Bioturbated strata dominant. Downward increase in amount of intercalated mudstone. Gradational contact with	7.5ft (2.3m)	9,793.5ft (2985.1m)
Siltstone and mudstone. Siltstone and associated very fine-grained sandstone light grey (N7) to medium grey (N5), quartzose, very micaceous; in lenses and irregular layers a few mm thick, with horizontal laminae and micro-cross-laminae. Layer of graded, sandy siltstone, 2.5ins (6.4cm) thick, with coarse sand grains largely confined to basal 0.4ins (1cm), at 9,809.5ft (2990m); common siderite flakes, scattered plant debris. Mudstone dark grey (N3), laminated silty; micaceous, non-calcareous, in layers less than 0.5cm thick.	20.0ft (6.1m)	9,801ft (2987.3m)

UK Well 211/19-3

Operator : Conoco
 Co-ordinates : 61°24'36.4"N 1°42'59.2"E
 Spudded : 2/10/75
 Drilling completed 9/11/75
 KBE : 80ft (24.4m)
 Water depth : 516.0ft (157.3m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
RANNOCH FORMATION (part)		
Sandstone. Light grey (N7) to medium light grey (N6) and yellowish grey (5Y7/2), fine-grained; quartzose, very micaceous, kaolinitic; in horizontal and inclined, planar laminae, which are distinctly bipartite, with clayey and micaceous parts up to several mm thick.	7.5ft (2.3m)	10,433.5ft (3180.1m)
Sandstone. Yellowish grey (5Y8/1) and light grey (N7), fine-grained; quartzose, very micaceous, kaolinitic; in horizontal and inclined planar laminae, indistinct, discernible through minor variation in grain size. Strongly indurated, with abundant calcite cement.	3.0ft (0.9m)	10,441ft (3182.4m)
Sandstone. Light grey (N7) to medium dark grey (N4) and yellowish grey (5Y7/2), fine-grained; quartzose, very micaceous, kaolinitic, in horizontal and gently inclined, planar laminae. Micaceous and clayey parts of laminae very conspicuous from 10,446 to 10,449ft (3183.9 to 3184.9m) and 10,455.5 to 10,457ft (3186.8 to 3187.3m). Micro-cross-laminated at 10,448.5ft (3184.7m) and 10,449ft (3184.9m).	16.0ft (4.9m)	10,444ft (3183.3m)
Sandstone. Light grey (N7); main lithology as in 10,441 to 10,444ft (3182.4 to 3183.3m).	5.0ft (1.5m)	10,460ft (3188.2m)
Sandstone. Yellowish grey (5Y8/1) and light grey (N7), fine-grained; quartzose, very micaceous, kaolinitic, in indistinct, horizontal and gently inclined, planar laminae, delineated mostly by minor variation in grain size. Clayey and micaceous parts of laminae are diffuse, composed of interconnected partings.	11.5ft (3.5m)	10,465ft (3189.7m)
Sandstone. Yellowish grey (5Y8/1) and light grey (N7) to medium light grey (N6), fine-grained; quartzose, very micaceous, kaolinitic; in generally well defined, bipartite laminae, which are horizontal and subordinate gently inclined, planar types.	11.0ft (3.4m)	10,476.5ft (3193.2m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Micro-cross-laminated with primary lamination from 10,476.5 to 10,477.5ft (3193.2 to 3193.5m) and 10,486.5 to 10,487.5ft (3196.3 to 3196.6m).		
Sandstone. Main lithology as in 10,444 to 10,460ft (3183.3 to 3188.2m). Micro-cross-lamination disrupted by burrowing from 10,498 to 10,498.5ft (3199.8 to 3199.9m).	14.5ft (4.4m)	10,487.5ft (3196.6m)
Sandstone. Main lithology as in 10,441 to 10,444ft (3182.4 to 3183.3m).	4.0ft (1.2m)	10,502ft (3201.0m)
Sandstone. Main lithology as in 10,444 to 10,460ft (3183.3 to 3188.2m).	7.5ft (2.3m)	10,506ft (3202.2m)
Sandstone. Yellowish grey (5Y8/1) and light grey (N7) to medium grey (N5), fine-grained; quartzose, very micaceous, kaolinitic; micro-cross-laminated, with numerous, grouped, micaceous partings at set boundaries. Primary layering extensively disrupted by burrowing; vertical escape types common.	6.5ft (2m)	10,513.5ft (3204.5m)
Sandstone. Main lithology as in 10,444 to 10,460ft (3183.3 to 3188.2m).	10.0ft (3.0m)	10,520ft (3206.5m)
Sandstone. Light grey (N7) to medium dark grey (N4), fine-grained; quartzose, very micaceous, kaolinitic, in bipartite, horizontal and gently inclined, planar laminae; micro-cross-laminated in places. Primary lamination commonly disrupted by burrowing over vertical distances of 3.9ins (10cm) or more. Abundant, scattered plant debris; thin lenses of coal present.	10.0ft (3.0m)	10,530ft (3209.5m)
Sandstone. Yellowish grey (5Y8/1) and light grey (N7) to medium dark grey (N4), fine-grained; quartzose, very micaceous, kaolinitic; in bipartite, horizontal and gently inclined, planar laminae; micro-cross-laminated in places. Abundant, scattered plant debris; thin lenses of coal present. Mudstone dark grey (N3), silty; micaceous, carbonaceous, non-calcareous; in scarce, irregular, continuous layers, up to 1cm thick; incorporate sub-horizontal, sand-filled burrows.	17.5ft (5.3m)	10,540ft (3212.6m)
Sandstone. Main lithology as in 10,465 to 10,476.5ft (3189.7 to 3193.2m).	3.5ft (1.1m)	10,557.5ft (3217.9m)
Sandstone. Main lithology as in 10,530 to 10,540ft (3209.5 to 3212.6m). With scarce intercalations of mudstone, dark grey (N3), silty, micaceous, carbonaceous,	11.0ft (3.4m)	10,561ft (3219m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
non-calcareous, in layers up to 0.4ins (1cm) thick, laminated. Scattered, irregular segregations of pyrite.		
Siltstone and mudstone. Siltstone and associated very fine-grained sandstone, medium light grey (N6) to medium grey (N5), quartzose, micaceous; in lenses and continuous layers a few mm thick, separated by mudstone layers of similar thickness. Mudstone dark grey (N3) and greyish black (N2), silty, micaceous, carbonaceous, non-calcareous; laminated. Continuity of lamination frequently disrupted by escape burrows; also sub-horizontal sand-filled burrows in mudstone. Stratiform pyrite segregations present.	20.5ft (6.2m)	10,572ft (3222.3m)

UK Well 211/19-4

Operator : Conoco
 Co-ordinates : 61°24'26.2"N 1°44'58.8"E
 Spudded : 28/11/75
 Drilling completed : 17/1/76
 KBE : 80ft (24.4m)
 Water depth : 511.0ft (155.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Siltstone. Olive grey (5Y4/1) and medium dark grey (N4), muddy, incorporating mostly disrupted intercalations of sandstone up to a few cm thick; micaceous, non-calcareous; forming sub-horizontal laminae, which envelop sandy lenses, irregular lumps and prolapsed-bedded, irregular layers frequently less than 1mm thick. Sandstone light olive grey (5Y6/1), fine-grained, quartzose, micaceous. Gradational contact with	2.5ft (0.8m)	10,005ft (3049.5m)
Sandstone. Light olive grey (5Y6/1) and yellowish grey (5Y7/2), mostly fine-grained, but sporadically coarse-grained; medium- to coarse-grained in top 3ins (7.6cm); quartzose, micaceous; irregularly bedded, with common argillaceous partings delineating sandstone lenses and continuous layers. Burrowing extensive: sand-filled, mud-lined, tubular burrows and near-vertical forms with spreiten. Gradational contact with	2ft (0.6m)	10,007.5ft (3050.3m)
Siltstone. Main lithology as in 10,005 to 10,007.5ft (3049.5 to 3050.3m). Incorporates disrupted sandstone layers. Gradational contact with	1.5ft (0.5m)	10,009.5ft (3050.9m)
Sandstone. Main lithology as in 10,007.5 to 10,009.5ft (3050.3 to 3050.9m). Gradational contact with	3ft (0.9m)	10,011ft (3051.4m)
Carbonaceous mudstone and coal. Dark grey (N3) to black (N1), with downward increase in carbonaceous content; mudstone at interval top laminated, with bark impressions on parting surfaces.	4ft (1.2m)	10,014ft (3052.3m)
Sandstone. Main lithology as in 10,007.5 to 10,009.5ft (3050.3 to 3050.9m). Incorporates common flakes of carbonaceous mudstone and coal.	2ft (0.6m)	10,018ft (3053.5m)
Carbonaceous mudstone and coal. As in 10,014 to 10,018ft (3052.3 to 3053.5m). Sharp contact with	1ft (0.3m)	10,020ft (3054.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
ETIVE FORMATION		
Sandstone. Yellowish grey (5Y7/2) and light olive grey (5Y6/1), dominantly fine-grained, quartzose, micaceous; in irregular laminae, delineated by variation in amount of interstitial clay. Partings of carbonaceous mudstone and coal flakes in top 4ins (10.2cm). Sandy carbonaceous mudstone in 2in (5cm) layer at about 10,025ft (3055.6m).	5.5ft (1.7m)	10,021ft (3054.4m)
Sandstone. Light olive grey (5Y6/1), fine-grained, quartzose, micaceous; with common, irregular argillaceous partings. Bioturbated.	5ft (1.5m)	10,026.5ft (3056.1m)
Sandstone. Main lithology as in 10,021 to 10,026.5ft (3054.4 to 3056.1m). Few cm sandstone with closely spaced carbonaceous partings at 10,032.5 (3057.9m).	2ft (0.6m)	10,031.5ft (3057.6m)
Sandstone. Medium grey (N5) and light olive grey (5Y6/1), fine-grained, quartzose, micaceous; extensively bioturbated, with sandstone forming irregular lenses, bounded by partings of carbonaceous mudstone.	1.5ft (0.5m)	10,033ft (3058.2m)
Sandstone. As in 10,021 to 10,026.5ft (3054.4 to 3056.1m).	2ft (0.6m)	10,035ft (3158.7m)
Sandstone. Light olive grey (5Y6/1) to olive grey (5Y4/1) and medium dark grey (N4), fine-grained, quartzose, micaceous, with abundant argillaceous partings and laminae; micro-cross-laminated; abundant mica flakes in clayey layers. Scattered, common plant debris. Top 6ins (15cm) with numerous, closely spaced, argillaceous intercalations.	3ft (0.9m)	10,037ft (3059.3m)
Sandstone. Yellowish grey (5Y7/2) and light olive grey (5Y6/1) fine- to medium-grained, quartzose, micaceous; in planar, inclined laminae, delineated by variation in interstitial clay.	9.5ft (2.9m)	10,040ft (3060.2m)
Sandstone. As in 10.037 to 10,040ft (3059.3 to 3060.2m); very micaceous. Pryite nodules present.	6ft (1.8m)	10,047.5ft (3063.1m)
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1) medium- to coarse-grained, but fine-grained in places; quartzose, micaceous, with scattered, common plant debris; in horizontal and planar, inclined laminae, delineated by variation in	93.5ft (28.5m)	10,055.5ft (3064.9m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
interstitial clay and scarce, irregular argillaceous partings. Below 11,138ft (3394.9m) marked increase in mica content, as dispersed flakes and as concentrations in more numerous, argillaceous partings. Gradational contact with		
RANNOCH FORMATION		
Sandstone. Light olive grey (5Y6/1) to greenish grey (5GY6/1), fine-grained, quartzose, very micaceous, kaolinitic; in planar, inclined laminae; top 1ft (0.3m) with micro-cross-lamination. Lamination regular, but indistinct, bipartite, evenly distributed throughout most of interval.	24ft (7.3m)	10,149ft (3093.4m)
Sandstone. Light olive grey (5Y6/1) and light grey (N7), fine-grained, quartzose, micaceous; in horizontal laminae; strongly indurated, with abundant calcite cement.	2ft (0.6m)	10,173ft (3100.8m)
Sandstone. As in 10,149 to 10,173ft (3093.4 to 3100.7m). Micro-cross-lamination from 10,183 to 10,183.5ft (3103.8 to 3103.9m).	18ft (5.5m)	10,175ft (3101.4m)
Sandstone. As in 10,173 to 10,175ft (3100.7 to 3101.4m).	7.5ft (2.3m)	10,193ft (3106.9m)
Sandstone. Yellowish grey (5Y8/1) to light olive (5Y6/1) and light brownish grey (5YR6/1), fine-grained, quartzose, micaceous, kaolinitic; in horizontal and planar, inclined laminae; micro-cross-lamination from 10,232.5 to 10,233ft (3118.9 to 3119.0m). Lamination regular but indistinct, bipartite, evenly distributed throughout most of the interval. Scattered, coalified plant debris.	39.5ft (12.0m)	10,200.5ft (3109.2m)
Sandstone. As in 10,173 to 10,175ft (3100.7 to 3101.4m).	8ft (2.4m)	10,240ft (3121.2m)
Sandstone. As in 10,200.5 to 10,240ft (3109.2 to 3121.2m). Micro-cross-lamination from 10,249 to 10,249.5ft (3123.8 to 3124.0m) and in basal 6ins (15cm) of interval.	3ft (0.9m)	10,248ft (3123.6m)
Sandstone. As in 10,173 to 10,175ft (3100.8 to 3101.4m).	1.5ft (0.5m)	10,251ft (3124.5)
Sandstone. As in 10,200.5 to 10,240ft (3109.2 to 3121.2m).	13.5ft (4.1m)	10,252.5ft (3129.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
<p>Sandstone. Yellowish grey (5Y8/1) and medium light grey (N6) to medium dark grey (N4), fine-grained, quartzose, very micaceous, kaolinitic, with mica flakes both dispersed in sandstone and concentrated in common, argillaceous partings and laminae; in dominantly horizontal laminae, with grading in individual, bipartite laminae up to 0.2ins (0.5cm) (rarely 0.5ins) thick; planar, inclined laminae and micro-cross-laminae in sets and co-sets up to several cm thick. Disruption of primary layering by burrowing largely confined to top 11ft (3.4m). Scattered plant debris. Sand-filled, mud-lined, tubular burrows throughout interval. Scattered flakes of nodular siderite.</p>	<p>43ft (13.1m)</p>	<p>10,266ft (3129.1m)</p>
<p>RANNOCH MUDSTONE</p>		
<p>Alternating siltstone and mudstone. Siltstone and subordinate, fine-grained sandstone yellowish grey (5Y8/1) and medium grey (N5) to medium dark grey (N4), quartzose, micaceous; in lenses and sets of sub-horizontal laminae generally less than 1cm thick, commonly separated by mudstone layers of similar thickness, into which siltstone grades upwards. Mudstone dark grey (N3), silty, variably micaceous, carbonaceous. Generalized fining-upwards within unit from 10,312.5ft (3143.3m) and 10,315ft (3144.0m); below latter depth unit undergoes decrease in abundance of mica as large flakes. Coarse-grained sandstone in thin layers at 10,335ft (3150.1m), 10,336ft (3150.4m), 10,339.5ft (3151.5m).</p>	<p>35ft (10.7m)</p>	<p>10,309ft (3142.2m)</p>
<p>Mudstone and sandstone. Mudstone medium dark grey (N4) and dark grey (N3), micaceous, non-calcareous, silty in places. Sandstone medium light grey (N6) and light olive grey (5Y6/1), coarse-grained, quartzose, feldspathic; occurring as planar, inclined laminae, making up layers a few cm thick; also found as irregular lenses and scattered grains in mudstone. Main sandstone intercalations at 10,347.5ft (3153.9m), 10,348.5ft (3154.2m), 10,349.5ft (3154.5m), 10,352ft (3155.3m). Sandstone layer with ovoidal bodies at 10,348.5ft (3154.2m). Calcite, siderite and subordinate pyrite cements in sandstones. Alternating siltstone and mudstone layers, as in 10,309 to 10,344ft (3142.2 to 3152.9m), associated with coarse-grained sandstones. Scattered calcareous nodules in mudstone.</p>	<p>8.5ft (2.6m)</p>	<p>10,344ft (3152.9m)</p>

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
DRAKE FORMATION (part)		
Mudstone. Medium dark (N4) and dark grey (N3), silty, micaceous, with calcareous nodules and concretionary layers.	5.5ft (1.7m)	10,352.5ft (3155.4m)

UK Well 211/19-6

Operator : Conoco
 Co-ordinates : 61°26'37.3"N 1°42'52.8"E
 Spudded : 11/11/76
 Drilling completed : 26/12/76
 KBE : 80ft (24.4m)
 Water depth : 515.0ft (157m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
ETIVE FORMATION (part)		
Sandstone. Light brown (5YR5/2) to moderate brown (5YR4/4), fine- to medium-grained; quartzose, micaceous, kaolinitic; in horizontal and inclined, planar laminae. Carbonaceous mudstone and coal, dark grey (N3) to greyish black (N2), micaceous, non-calcareous, silty; laminated, in layer 3.5ins (8.8cm) thick at 10,694.5ft (3259.7m). Gradational contact with	41.0ft (12.5m)	10,685ft (3256.8m)
RANNOCH FORMATION		
Sandstone. Light brownish grey (5YR6/1) and light grey (N7) to medium grey (N5), dominantly fine-grained, but medium- and coarse-grained in places; quartzose, very micaceous; in bipartite, horizontal and inclined, planar laminae, with mica-rich, clayey parts of laminae increasingly conspicuous downwards. Strongly indurated strata with abundant calcite cement occur sporadically. Plant debris common. Scattered, small segregations of pyrite.	112.0ft (34.1m)	10,726ft (3269.3m)
Sandstone. Very light grey (N8) to medium grey (N5), fine-grained; quartzose, very micaceous; in bipartite, horizontal and inclined, planar laminae; micro-cross-laminated in places, with cosets up to 8ins (20.3cm) thick, displaying varying degrees of disruption by burrowing, also extensively bioturbated layers of similar thickness. Common plant fragments and scattered lenses of coal present. Gradational contact with	41.0ft (12.5m)	10,838ft (3303.4m)
Shaly sandstone. Light grey (N7) to medium grey (N5), fine-grained, quartzose, very micaceous; in lenses and irregular, continuous layers up to 1cm thick, bounded by interconnected, argillaceous partings; extensively bioturbated. Scarce sets of undisturbed bipartite laminae a few cm thick. Common scattered plant debris. Pyrite nodules. Gradational contact with	10.0ft (3.0m)	10,879ft (3315.9m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone and mudstone. Sandstone medium light grey (N6) and medium grey (N5), fine- and very fine-grained, associated with siltstone; quartzose, very micaceous; in lenses and continuous layers generally a few mm thick, with horizontal laminae and micro-cross-laminae, commonly transected by escape burrows. Mudstone dark grey (N3), silty, micaceous, carbonaceous, non-calcareous; in layers a few mm thick. Proportion of mudstone increases downwards. Sand-filled, tubular burrows of variable orientation are common. Pyrite nodules present.	19.0ft (5.8m)	10,889ft (3319m)

UK Well 211/21-1A

Operator : Shell
 Co-ordinates : 61°11'13.6"N 1°5'43.2"E
 Spudded : 3/12/72
 Drilling completed : 18/3/73
 KBE : 109ft (33.2m)
 Water depth : 535.0ft (163.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Siltstone and mudstone. Siltstone medium grey (N5) and medium dark grey (N4), quartzose, micaceous; in lenses and continuous layers up to a few mm thick, separated by mudstone layers of similar thickness. Mudstone dark grey (N3), silty, non-calcareous, carbonaceous, laminated. Pyrite nodules at base.	2.0ft (0.6m)	9,440ft (2865.1m)
ETIVE FORMATION		
Sandstone. Pale yellowish brown (10YR6/2) and yellowish grey (5Y8/1) to light olive grey (5Y6/1), fine-grained, quartzose, kaolinitic, micaceous in places, with mica content increasing below 9,480ft (2889.5m); in horizontal and inclined, planar laminae, delineated by variation in interstitial clay. Pyrite nodules occur sporadically. Gradational contact with	46.0ft (14.0m)	9,442ft (2877.9m)
RANNOCH FORMATION (part)		
Sandstone. Light grey (N8), fine-grained, quartzose, very micaceous, kaolinitic; in horizontal and inclined, planar laminae, which are commonly bipartite. Bioturbated in places; 2.5ins (6.4cm) at 9,490ft (2892.6m) and 6ins (15.5cm) at 9,497ft (2894.7m).	9.5ft (2.9m)	9,488ft (2891.9m)
Sandstone. Main lithology as in 9,488 to 9,497.5ft (2891.9 to 2894.8m), but strongly indurated, with abundant calcite cement.	2.0ft (0.6m)	9,497.5ft (2894.8m)
Sandstone. Main lithology as in 9,488 to 9,497.5ft (2891.9 to 2894.8m).	13.5ft (4.1m)	9,499.5ft (2895.4m)
Sandstone. Yellowish grey (5Y8/1) and medium light grey (N6) to medium grey (N5), fine-grained, shaly in places; quartzose, very micaceous, kaolinitic; regularly laminated strata, as in 9,488 to 9,497.5ft (2891.9 to 2894.8m), form layers up to 1 to 2ft (0.3 to 0.6m) thick, alternating with bioturbated, shaly sandstone layers of similar thickness.	22.0ft (6.7m)	9,513ft (2899.6m)

Description of strataThicknessDepth below KB

Sand-filled, tubular burrows of variable orientation and forms, similar to Teichichnus are common. Bioturbated layers contain abundant plant debris. Scattered pyrite nodules present. Strongly indurated strata, with abundant calcite cement, 4ins (10.1cm) at 9,524ft (2902.9m), 8ins (20.2cm) at 9,528ft (2904.1m) and 4ins (10.1cm) at 9,533ft (2905.7m).

UK Well 211/21-2

Operator : Shell

Co-ordinates : 61°12'53.8"N 1°9'40.2"E

Spudded : 10/6/74

Drilling completed : 9/8/74

KBE : 107ft (32.6m)

Water depth : 526.0ft (160.3m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Mudstone. Dark grey (N3), silty; micaceous, carbonaceous, non-calcareous; laminated. Sharp contact with	3.0ft (0.9m)	9,411ft (2868.5m)
Sandstone. Medium grey (N5) to medium dark grey (N4), fine-grained; quartzose, micaceous, with common, coalified plant debris; in irregular layers, delineated by variation in sand size and by carbonaceous partings. Plant debris commonly in sinuous cracks, which are sub-vertical and oblique.	1.0ft (0.3m)	9,414ft (2896.4m)
Mudstone. Main lithology as in 9,411 to 9,414ft (2868.5 to 2896.4m). With scarce, thin intercalations of yellowish grey (5Y8/1) siltstone.	1.0ft (0.3m)	9,415ft (2869.7m)
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1), fine-grained; quartzose, micaceous; lamination indistinct, irregular near interval top.	1.0ft (0.3m)	9,416ft (2870m)
No core.	1.0ft (0.3m)	9,417ft (2870.3m)
Mudstone. Main lithology as in 9,411 to 9,414ft (2868.5 to 2896.4m). Sharp contact with	0.5ft (0.2m)	9,418ft (2870.6m)
ETIVE FORMATION		
Shaly sandstone. Light olive grey (5Y6/1), fine-grained, quartzose, micaceous; in irregular layers, up to 0.8ins (2cm) thick, commonly less than 0.4ins (1cm), bounded by argillaceous partings. At interval base, mudstone, dark grey (N3), micaceous, carbonaceous, non-calcareous, in layers less than 1in thick, laminated. Burrowing extensive, with sand-filled, tubular forms common. Scattered pyrite nodules.	1.0ft (0.3m)	9,418.5ft (2870.8m)
Sandstone. Light olive grey (5Y6/1) and pale yellowish brown (10YR6/2), oil-stained, dominantly fine-grained, medium-grained in places; quartzose, micaceous, kaolinitic; in	49.5ft (15.1m)	9,419.5ft (2871.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
horizontal and inclined, planar laminae; stratification irregular from 9,421 to 9,422.5ft (2871.5 to 2872m). Layer of carbonaceous mudstone and coal, 2ins (5.1cm) thick, at 9,421ft (2871.5m). Scattered, argillaceous partings, particularly below 9,463ft (2884.3m). Pyrite nodules present.		
RANNOCH FORMATION		
Sandstone. Light olive grey (5Y6/1), fine-grained; quartzose, very micaceous; lamination indistinct, sub-horizontal in places. Mudstone, dark grey (N3), sandy; very micaceous, carbonaceous, non-calcareous; in irregular layers a few mm thick. Pyrite nodules. Recovery 3.5ins (8.8cm).	1.0ft (0.3m)	9,469ft (2886.2m)
No core.	27.0ft (8.2m)	9,470ft (2886.5m)
Sandstone. Pale yellowish brown (10YR6/2), fine-grained, quartzose, very micaceous; in horizontal and inclined, planar laminae, which are distinctly bipartite in places.	9.0ft (2.7m)	9,497ft (2894.7m)
Sandstone. Medium light grey (N6) and pale yellowish brown (10YR6/2), fine-grained; quartzose, very micaceous; lamination mostly indistinct, with irregular, argillaceous partings closely spaced in places; inclined, planar laminae in top 0.5ft (0.2m). Burrowing-related disruption of argillaceous partings below 9,507ft (2897.7m). Scattered plant debris. Strongly indurated, with abundant calcite cement.	2.0ft (0.6m)	9,506ft (2897.4m)
Sandstone. Light olive grey (5Y6/1) and pale yellowish brown (10YR6/2), fine-grained; quartzose, very micaceous; in horizontal laminae and micro-cross-laminae, delineated by argillaceous partings. Burrows very common, notably escape forms; also sand-filled vertical burrows; mud-filled diminutive forms c.f. <u>Teichichnus</u> ; and networks of mud-filled tubes c.f. <u>Chondrites</u> . Scattered plant debris.	5.0ft (1.5m)	9,508ft (2898.0m)
Sandstone. Light grey (N7); strongly indurated, with abundant calcite cement; otherwise description as for 9,508 to 9,513ft (2898.0 to 2899.6m).	2.5ft (0.8m)	9,513ft (2899.6m)
Sandstone. Main lithology as in 9,497 to 9,506ft (2894.7 to 2897.4m), but with bipartite laminae throughout interval. Burrowed in places. With scattered plant debris.	3.0ft (0.9m)	9,515.5ft (2900.3m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Main lithology as in 9,506 to 9,508ft (2897.4 to 2898.0m). Vertical, sand-filled burrows terminate below irregular, argillaceous partings. Horizontal, sand-filled burrows up to 0.4ins (1cm) in diameter at interval top.	1.5ft (0.5m)	9,518.5ft (2901.2m)
No core.	37.5ft (11.4m)	9,520ft (2901.7m)
Shaly sandstone. Light olive grey (5Y6/1), fine-grained; quartzose, very micaceous; in irregular lenses and continuous layers, up to 0.4ins (1cm) thick, bounded by argillaceous partings and layers up to a few mm in thickness; extensively bioturbated. With very common, scattered plant debris; thin, irregular lenses of coal.	9.5ft (2.9m)	9,557.5ft (2913.1m)
BROOM FORMATION		
Sandstone. Light olive grey (5Y6/1), medium- to coarse-grained; quartzose, very micaceous, feldspathic; in irregular, sub-horizontal and inclined, planar laminae. Mudstone, dark grey (N3) to greyish black (N2), silty; micaceous, carbonaceous, non-calcareous; in scarce layers a few mm thick. Sand-filled, tubular burrows of variable orientation are common.	2.0ft (0.6m)	9,567ft (2916.0m)
Shaly sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1), coarse-grained, with scattered pebbles; quartzose, feldspathic, micaceous, kaolinitic; in irregular lenses and continuous layers up to 0.4ins (1cm) thick, bounded by argillaceous partings, which are frequently interconnected. Common siderite, both as pebbles and sporadically distributed, filling interstices in irregular segregations. Scattered plant debris.	1.5ft (0.5m)	9,569ft (2916.6m)
No core.	14.5ft (4.4m)	9,570.5ft (2917.1m)
Sandstone. Light grey (N7) to medium grey (N5), coarse-grained; quartzose, feldspathic, micaceous, kaolinitic; in inclined, planar laminae. Strongly indurated, with abundant calcite cement.	14.5ft (4.4m)	9,585ft (2921.5m)
Sandstone. Pale yellowish brown (10YR6/2), coarse-grained; quartzose, feldspathic, micaceous, kaolinitic, in inclined, planar laminae. Shaly sandstone with scattered pebbles makes up basal 2ins (5.1cm) of interval. Sharp contact with	7.5ft (2.3m)	9,589.5ft (2925.9m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
DRAKE FORMATION		
Mudstone. Dark grey (N3), with scattered grains of coarse sand above 9,600ft (2926.1m); very silty; micaceous, carbonaceous, non-calcareous; laminated, but extensively bioturbated in places, particularly from 9,597 to 9,600ft (2925.2 to 2926.1m). Sideritic siltstone in 2.5ins (6.4cm) layer at 9,601ft (2926.4m). Scattered pyrite nodules present.	11.5ft (3.5m)	9,597ft (2925.2m)

UK Well 211/21-3A

Operator : Shell

Co-ordinates : 61°15'32"N 1°8'15"E

Spudded : 22/12/74

Drilling completed : 27/2/75

KBE : 85ft (25.9m)

Water depth : 537.0ft (163.7m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Sandstone and mudstone. Sandstone yellowish grey (5Y7/2) and medium light grey (N6) to medium grey (N5), fine-grained, commonly silty, quartzose, micaceous, kaolinitic; in laminae and laminated layers, less than a few mm thick, exceptionally greater than 0.4ins (1cm) in thickness, separated by mudstone layers of generally subordinate thickness; the thicker sandstone layers are micro-cross-laminated. Mudstone medium dark grey (N4) to dark grey (N3), silty, micaceous, carbonaceous, non-calcareous. At 8,916ft (2717.6m), 2.5ins (6.4cm) of oil-stained, fine-grained sandstone, similar to that of next interval below. Basal 0.5ft (0.2m) extensively bioturbated; rest of interval with common disruption of primary layering by burrows. Nodular pyrite at top of interval.	2.0ft (0.6m)	8,915ft (2717.3m)
ETIVE FORMATION		
Sandstone. Light olive grey (5Y6/1), oil-stained; fine-grained, quartzose, micaceous, kaolinitic, in sub-horizontal and inclined, planar laminae, delineated by variation in interstitial clay and by scarce partings of carbonaceous mudstone. Scattered plant debris. Small pyrite nodules occur sporadically. At 8,919.5ft (2718.7m), 4.5ins (10.4cm) of interbedded sandstone and mudstone, extensively bioturbated, with scattered, pyrite nodules: as in 8,915 to 8,917ft (2717.3 to 2717.9m).	35.0ft (1.1m)	8,917ft (2717.9m)
Sandstone. Light olive grey (5Y6/1) to olive grey (5Y4/1), oil-stained; fine- to medium-grained; otherwise main lithology as in 8,917 to 8,952ft (2717.9 to 2728.6m).	1.5ft (0.5m)	8,952ft (2728.6m)
No core.	4.5ft (1.4m)	8,953.5ft (2729.0m)
Sandstone. Light olive grey (5Y6/1) to olive grey (5Y4/1), oil-stained; medium- to	38.0ft (11.6m)	8,958ft (2730.4m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
coarse-grained; otherwise main lithology as in 8,917 to 8,952ft (2717.9 to 2728.6m). Induration generally moderate but sandstone very friable from 8,962.5 to 8,964ft (2731.8 to 2732.2m), 8,974 to 8,974.5ft (2735.3 to 2735.3m), 8,978.5 to about 8,980.5ft (2736.6 to about 2737.5m), 8,982 to 8,983ft (2737.7 to 2738.0m), 8,985 to 8,986ft (2738.6 to 2738.9m) and 8,988 to 8,989ft (2739.5 to 2739.8m). Large mica flakes sporadically abundant, particularly in argillaceous partings, below 8,977.5ft (2736.3m).		
Sandstone. Very light grey (N8) to light grey (N7), fine- to coarse-grained, with general downward increase in grain size; quartzose, very micaceous, kaolinitic; in inclined, planar laminae. Strongly indurated, with abundant calcite cement. Mudstone dark grey (N3) micaceous, carbonaceous, non-calcareous, with intercalated lenses and laminae of sandstone, forms 1.2ins (3cm) layer at about 8,996.5ft (2742.1m).	1.0ft (0.3m)	8,996ft (3742m)
Sandstone. Main lithology as in 8,917 to 8,952ft (2717.9 to 2728.6m); fine- to coarse-grained, with downward decrease in grain size. Mica increasingly abundant downwards in clayey parts of laminae. Scattered pyrite nodules. Basal 1in (2.5cm) is of very micaceous, laminated mudstone.	12.0ft (3.7m)	8,997ft (2742.3m)
RANNOCH FORMATION		
Sandstone. Light grey (N7) to medium grey (N5), fine-grained, quartzose, very micaceous; in inclined, planar laminae, which are prominently bipartite; strongly indurated, with abundant calcite cement. Pyritic at base.	1.5ft (0.5m)	9,009ft (2745.9m)
Sandstone. Yellowish grey (5Y7/2) and medium light grey (N6) to medium grey (N5), fine-grained; quartzose, very micaceous, kaolinitic; in inclined, planar laminae, which are prominently bipartite. With scattered small pyrite nodules.	5.5ft (1.7m)	9,010.5ft (2746.4m)
Sandstone. Light olive grey (5Y6/1), oil-stained; fine-grained, quartzose, very micaceous, with increased kaolinitic content; in horizontal and inclined, planar laminae; latter are bipartite, but indistinct above 9,023ft (2750.2m). With scattered pyrite nodules.	13.5ft (4.1m)	9,016ft (2748.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Main lithology as in 9009 to 9010.5ft (2745.9 to 2746.4m); strongly indurated, with abundant calcite cement and scattered pyrite nodules.	4.0ft (1.2m)	9,029.5ft (2752.2m)
Sandstone. Main lithology as in 9,016 to 9,029.5ft (2748.1 to 2752.2m).	9.0ft (2.7m)	9,033.5ft (2753.4m)
Sandstone. Main lithology as in 9,010.5 to 9,016ft (2746.4 to 2748.1m).	8.0ft (2.4m)	9,042.5ft (2756.2m)
Sandstone. Main lithology as in 9,009 to 9,010.5ft (2745.9 to 2746.4m). Strongly indurated, with abundant calcite cement.	0.5ft (0.2m)	9,050.5ft (2758.6m)
Sandstone. Main lithology as in 9,016 to 9,029.5ft (2748.1 to 2752.2m). With 4ins (10.1cm) strongly indurated sandstone with calcite cement at 9,052.5ft (2759.2m).	4.5ft (1.4m)	9,051ft (2758.7m)
Sandstone. Main lithology as in 9,009 to 9,010.5ft (2745.9 to 2746.4m). Strongly indurated, with abundant calcite cement.	0.5ft (0.2m)	9,055.5ft (2760.1m)
Sandstone. Main lithology as in 9,016 to 9,029.5ft (2748.1 to 2752.2m). Bipartite laminae prominent below 9,066ft (2763.3m). With scattered pyrite nodules. Burrows scarce, largely restricted to sand-filled tubes at about 9,067ft (2763.6m).	12.5ft (3.8m)	9,056ft (2760.3m)
Sandstone. Yellowish grey (5Y7/2) and medium grey (N5), fine-grained, quartzose, very micaceous, kaolinitic; in horizontal and inclined, planar laminae, which are bipartite and form sets and cosets, generally less than 10cm thick, separated by bioturbated, shaly sandstone in layers up to several cm thick. Sand-filled, tubular burrows of variable orientation very abundant. Upward passage from unburrowed to burrowed strata generally gradational; that from burrowed to unburrowed is sharp. Below 9,080.5ft (2767.7m), interval extensively bioturbated.	14.0ft (4.3m)	9,068.5ft (2764.2m)
Sandstone. Main lithology as in 9,068.5 to 9,082.5ft (2764.1 to 2768.3m); strongly indurated, with abundant calcite cement.	0.5ft (0.2m)	9,082.5ft (2768.3m)
Shaly sandstone. Yellowish grey (5Y7/2) and medium grey (N5), fine-grained, quartzose, very micaceous, kaolinitic; primary stratification largely destroyed, extensively bioturbated. Scattered plant debris. Pyrite nodules occur sporadically. Mudstone dark grey (N3), sandy, carbonaceous, micaceous, in irregular layers up to a few mm thick.	12.0ft (3.7m)	9,083ft (2768.5m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Main lithology as in 9,082.5 to 9,083ft (2768.3 to 2768.5m).	2.0ft (0.6m)	9,095ft (2772.2m)
Shaly sandstone. Yellowish grey (5Y7/2) and medium grey (N5), fine-grained; quartzose, very micaceous, kaolinitic; bioturbation extensive, primary stratification scarce; sandstone in irregular lenses, up to 1cm thick, bounded by interconnected mudstone partings and layers up to a few mm thick. With scattered plant debris. Strongly indurated sandstone, with abundant calcite cement, from 9,102 to 9,103ft (2774.3 to 2774.6m); also calcite plugging of porosity in irregular layers, occurring sporadically throughout interval. Pyrite nodules and concretionary layers of siderite widespread, notably at base of interval.	15.0ft (4.6m)	9,097ft (2772.8m)
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), silty, carbonaceous, non-calcareous. Scattered coarse sand grains in top 2ins (5.1cm).	6.0ft (1.8m)	9,112ft (2777.3m)
Oolitic, sideritic siltstone. Moderate brown (5YR4/4) and light brown (5YR5/6), with calcareous ooids scattered and incorporated into multiple concretions, some of which may be phosphoritic (c.f. Hiatus-Konkretionen) in top 0.5ft (0.2m). Lower half of interval includes regular alternations of siltstone and mudstone, as below.	1.0ft (0.3m)	9,118ft (2779.2m)
Siltstone and mudstone. Siltstone light grey (N7) to medium grey (N5), quartzose, micaceous, in lenses and continuous layers up to a few mm thick. Mudstone medium dark grey (N4) and dark grey (N3), micaceous, non-calcareous, in layers a few mm thick, laminated.	14.0ft (4.3m)	9,119ft (2779.5m)

UK Well 211/23-1

Operator : Shell
 Co-ordinates : 61°16'26.4"N 1°35'29.0"E
 Spudded : 4/4/73
 Drilling completed : 24/6/73
 KBE : 109ft (33.2m)
 Water depth : 494.0ft (150.6m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
ETIVE FORMATION (part)		
Sandstone. Pale yellowish brown (10YR6/2) and moderate brown (5YR4/4), with former very fine- to fine-grained, latter fine-grained; quartzose, micaceous, variably kaolinitic, with abundant mica in partings near interval top; in horizontal and inclined, planar laminae, delineated by minor variation in interstitial clay; with scattered, small pyrite nodules.	34.0ft (10.4m)	8,984ft (2738.3m)
Sandstone. Main lithologies as in 8,984 to 9,018ft (2738.3 to 2748.7m). (Recovery unknown; core disrupted, stored in bag.)	3.0ft (0.9m)	9,018ft (2748.7m)
Sandstone. Main lithologies as in 8,984 to 9,018ft (2738.3 to 2748.7m); approaching medium-grained in places. With scattered plant debris. Carbonaceous partings relatively common below 9,051.5ft (2758.9m). Calcareous, concretionary layer 4ins (10.1cm) thick at 9,049ft (2758.1m).	34.0ft (10.4m)	9,021ft (2749.6m)
Sandstone. Light olive grey (5Y6/1) throughout most of interval, but moderate brown (5YR4/4) and light brownish grey (5YR6/1) in places; fine-grained, friable, quartzose, very micaceous, kaolinitic, with scattered plant debris. Large mica flakes both disseminated and concentrated as tightly packed grains in both solitary and grouped partings. In horizontal and inclined, planar laminae. With scarce, scattered pyrite nodules. Gradational contact with	17.0ft (5.2m)	9,055ft (2760m)
RANNOCH FORMATION		
Sandstone. Light olive grey (5Y6/1) and light grey (N7) to medium light grey (N6), fine-grained; quartzose, very micaceous, kaolinitic in places, with scattered plant fragments; in distinctly bipartite, horizontal and gently inclined, planar laminae. With scattered, small pyrite nodules.	28.5ft (8.7m)	9,072ft (2765.1m)
No core.	3.5ft (1.1m)	9,100.5ft (2773.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Main lithology as in 9,072 to 9,100.5ft (2765.1 to 2773.8m).	30.0ft (9.1m)	9,104ft (2774.9m)
Sandstone. Medium light grey (N6) to medium grey (N5), fine-grained; quartzose, micaceous; in bipartite, horizontal and inclined, planar laminae. Strongly indurated, with abundant calcite cement.	1.5ft (0.5m)	9,134ft (2784.0m)
Sandstone. Main lithology as in 9,072 to 9,100.5ft (2765.1 to 2773.8m). Scattered cosets of micro-cross-laminae, generally several cm thick, below 9,148ft (2788.3m); burrows of sand-filled, tubular type visible in more clay-rich, micro-cross-laminated strata.	20.5ft (6.1m)	9,135.5ft (2784.5m)
Sandstone. Main lithology as in 9,134 to 9,135.5ft (2784.0 to 2784.5m).	1.5ft (0.5m)	9,155.5ft (2790.6m)
Sandstone. Main lithology as in 9,072 to 9,100.5ft (2765.1 to 2773.8m). Micro-cross-laminated in places; burrowed.	8.0ft (2.4m)	9,157ft (2791.1m)
Sandstone. Main lithology as in 9,134 to 9,135.5ft (2784.0 to 2784.5m). Micro-cross laminated in places. With scattered flakes of reworked, relict, sideritic mudstone; also these concentrated with carbonaceous flakes in 2in (5.1cm) layer at 9,167ft (2794.1m).	3.0ft (0.9m)	9,165ft (2793.5m)
Sandstone. Light olive grey (5Y6/1) to olive grey (5Y4/1), fine-grained; quartzose, very micaceous, in micro-cross-laminae and sub-horizontal laminae, commonly transected by vertical and oblique, sand-filled burrows.	1.0ft (0.3m)	9,168ft (2794.4m)
Sandstone. Main lithology as in 9,072 to 9,100.5ft (2765.1 to 2773.8m). Micro-cross-laminated in places; burrows scarce.	4.0ft (1.2m)	9,169ft (2794.7m)
Sandstone. Main lithology as in 9,168 to 9,169ft (2794.4 to 2794.7m).	3.5ft (1.1m)	9,173ft (2795.9m)
Sandstone. Main lithology as in 9,072 to 9,100.5ft (2765.1 to 2773.8m). Micro-cross-laminated in places; cosets up to 6ins (15.2cm) thick, commonly with extensive burrowing. Scattered partings and thin layers of mudstone, dark grey (N3), carbonaceous, micaceous, non-calcareous.	8.0ft (2.4m)	9,176.5ft (2797m)
Sandstone. Main lithology as in 9,168 to 9,169ft (2794.4 to 2794.7m).	1.0ft (0.3m)	9,184.5ft (2799.4m)
Sandstone. Main lithology as in 9,072 to 9,100.5ft (2765.1 to 2773.8m).	1.5ft (0.5m)	9,195.5ft (2799.7m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Main lithology as in 9,134 to 9,135.5ft (2784.0 to 2784.5m). In inclined, planar laminae and micro-cross-laminae.	1.0ft (0.3m)	9,187ft (2800.2m)
Sandstone. Main lithology as in 9,072 to 9,100.5ft (2765.1 to 2773.8m). Micro-cross-laminated, in places; burrowed. With flakes of sideritic mudstone and carbonaceous mudstone. Scarce partings and thin layers of carbonaceous mudstone and coal.	4.5ft (1.4m)	9,188ft (2800.5m)
Sandstone. Main lithology as in 9,134 to 9,135.5ft (2784.0 to 2784.5m). Micro-cross-laminated. With irregular lenses of coal and flakes of sideritic mudstone.	1.0ft (0.3m)	9,192.5ft (2801.9m)
Sandstone. Light olive grey (5Y6/1) and medium light (N6) to medium dark grey (N4), fine-grained; quartzose, very micaceous, with scattered plant debris; in horizontal and gently inclined, planar laminae, with scarce cosets of micro-cross-laminae; burrowed extensively in places, with escape features prominent. Clayey parts of laminae dominant. Intercalations of mudstone, dark grey (N3) and greyish black (N2), carbonaceous, micaceous, as partings and layers up to several mm thick.	11.0ft (3.4m)	9,193.5ft (2802.2m)
Sandstone. Main lithology as in 9,134 to 9,135.5ft (2784.0 to 2784.5m). Sideritic below 9,205ft (2805.7m). With scattered plant debris.	1.5ft (0.5m)	9,204.5ft (2805.5m)
Sandstone. Yellowish grey (5Y7/2), fine-grained; quartzose, very micaceous, kaolinitic; lamination indistinct, appears to be in horizontal and inclined, planar laminae. Pebbles of sideritic mudstone and carbonaceous mudstone in layer near top of interval. Alternating sandstone and mudstone make up 4in (10.2cm) layer at 9,207ft (2806.3m); description as for 9,210 to 9,214ft (2807.2 to 2808.4m).	4.0ft (1.2m)	9,206ft (2806m)
RANNOCH MUDSTONE		
Sandstone and mudstone. Sandstone medium light grey (N6) to medium grey (N5), very fine- to fine-grained; quartzose, very micaceous, kaolinitic; in lenses and continuous layers up to 1cm thick, micro-cross-laminated, variably disrupted by burrows, notably of escape type. Mudstone medium dark grey (N4) to dark grey (N3), silty, carbonaceous, micaceous, commonly in layers a few mm thick.	4.0ft (1.2m)	9,210ft (2807.2m)

<u>Thickness</u>	<u>Depth below KB</u>		<u>Thickness</u>	<u>Depth below KB</u>
1.0ft (.3m)	9,187ft (2800.2m)	gy as in 9,134 to 4.5m).	3.5ft (1.1m)	9,214ft (2808.4m)
4.5ft (1.4m)	9,188ft (2800.5m)	gy as in 9,168 to 7m). Extensively	1.5ft (0.5m)	9,217.5ft (2809.5m)
		gy as in 9,206 to)).	8.0ft (2.4m)	9,219ft (2810m)
1.0ft (0.3m)	9,192.5ft (2801.9m)	Main lithology as in to 2808.4m). places; primary 235ft (2814.8m).	9.5ft (2.9m)	9,227ft (2812.4m)
11.0ft (3.4m)	9,193.5ft (2802.2m)	gy as in 9,134 to 4.5m). With abundant	1.0ft (0.3m)	9,236.5ft (2815.3m)
		Main lithology as in to 2808.4m).	1.5ft (0.5m)	9,237.5ft (2815.6m)
		ey (5Y7/2), very non, scattered es of quartz and y feldspathic, ayering irregular and sideritic mudstone	3.0ft (0.9m)	9,239ft (2816.0m)
.5ft (0.5m)	9,204.5ft (2805.5m)			
4.0ft (1.2m)	9,206ft (2806m)	gy as in 9,239 to)). Intercalated, dark onaceous, silty, s, present from 9,251 2820.5m). (Recovery l, stored in bags.)	11.5ft (3.5m)	9,242ft (2817m)
			26.5ft (8.1m)	9,253.5ft (2820.5m)
		l, silty, s, laminated. upted, stored in	37.0ft (11.3m)	9,280ft (2828.5m)
4.0ft (1.2m)	9,210ft (2807.2m)			

UK Well 211/24-2

Operator : Conoco
 Co-ordinates : 61°18'4.9"N 1°35'2.7"E
 Spudded : 25/12/73
 Drilling completed : 18/3/74
 KBE : 80.0ft (24.4m)
 Water depth : 525.0ft (160.0m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
ETIVE FORMATION (part)		
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1), fine-grained; quartzose, micaceous, kaolinitic, in horizontal and inclined, planar laminae, delineated by minor variation in interstitial clay.	24.0ft (7.3m)	9,413ft (2869.1m)
Sandstone. Main lithology as in 9,413 to 9,437ft (2869.1 to 2876.4m). (Recovery not known; core disrupted, stored in bags.)	12.0ft (3.7m)	9,437ft (2876.4m)
Sandstone. Main lithology as in 9,413 to 9,437ft (2869.1 to 2876.4m). With plant debris disseminated and concentrated in carbonaceous partings.	27.0ft (8.2m)	9,449ft (2880.1m)
RANNOCH FORMATION		
Sandstone. Light grey (N7) to medium light grey (N6), fine- to coarse-grained; quartzose, very micaceous; in horizontal laminae. For the most part, strongly indurated, with abundant calcite cement. With scarce, argillaceous partings. Scattered plant debris.	2.0ft (0.6m)	9,476ft (2888.3m)
Sandstone. Light olive grey (5Y6/1), fine-grained; quartzose, very micaceous; in distinctly bipartite, horizontal and inclined, planar laminae. With scattered plant debris.	8.0ft (2.4m)	9,478ft (2888.9m)
Sandstone. Main lithology as in 9,478 to 9,486ft (2888.9 to 2891.3m). (Recovery not known; core disrupted, stored in bags.)	2.0ft (0.6m)	9,486ft (2891.3m)
No core.	33.0ft (10.1m)	9,488ft (2891.9m)
Sandstone. Main lithology as in 9,478 to 9,486ft (2888.9 to 2891.3m). (Recovery not known; core disrupted, stored in bags.)	4.5ft (1.4m)	9,519ft (2901.4m)
Sandstone. Main lithology as in 9,478 to 9,486ft (2888.9 to 2891.3m). Scattered pyrite nodules present. Strongly indurated, with abundant calcite cement, from 9,562 to 9,563.5ft (2914.5 to 2915m) and 9,565 to 9,565.5ft (2915.4 to 2915.6m). (Recovery not	60.5ft (18.4m)	9,523.5ft (2902.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
known, because of broken core, from 9,529.5 to 9,531ft (2904.6 to 2905.0m), 9,533 to 9,534ft (2905.7 to 2906.3m), 9,547 to 9,550ft (2909.9 to 2910.8m), and 9,582 to 9,584ft (2920.6 to 2921.2m).	1.0ft (0.3m)	9,584ft (2921.2m)
No core.		
Sandstone. Main lithology as in 9,478 to 9,486ft (2888.9 to 2891.3m). (Recovery not known, because of broken core, from 9,585 to 9,587ft (2921.5 to 2922.1m) and 9,588 to 9,591ft (2922.4 to 2923.3m)).	6.0ft (1.8m)	9,585ft (2921.5m)
No core.	1.0ft (0.3m)	9,591ft (2923.3m)
Sandstone. Main lithology as in 9,478 to 9,486ft (2888.9 to 2891.3m). (Recovery not known, because of broken core.)	3.0ft (0.9m)	9,592ft (2923.6m)
No core.	1.0ft (0.3m)	9,595ft (2924.6m)
Sandstone. Main lithology as in 9,478 to 9,486ft (2888.9 to 2891.3m). (Recovery not known, because of broken core, from 9,596 to 9,597ft (2924.9 to 2925.2m) and 9,599 to 9,600ft (2925.8 to 2926.1m)).	5.5ft (1.7m)	9,596ft (2924.9m)
Sandstone. Light grey (N7) to medium grey (N5), fine-grained; quartzose, very micaceous; in distinctly bipartite, horizontal and gently inclined laminae. Disrupted laminae 2.5ins (6cm) from interval top. Strongly indurated, with abundant calcite cement. Oblique sharp contact with	2.5ft (0.8m)	9,601.5ft (2926.5m)
Sandstone. Main lithology as in 9,478 to 9,486ft (2888.9 to 2891.3m). Scattered pyrite nodules.	1.5ft (0.5m)	9,604ft (2927.3m)
Sandstone. Main lithology as in 9,601.5 to 9,604ft (2926.5 to 2927.3m).	10.0ft (3.0m)	9,605.5ft (2927.8m)
Sandstone. Main lithology as in 9,478 to 9,486ft (2888.9 to 2891.3m). Disrupted laminae in top 1ft (0.3m). Mica-rich parts of laminae prominent in basal 0.5ft (0.2m).	11.0ft (3.4m)	9,615.5ft (2930.8m)
No core.	4.5ft (1.4m)	9,626.5ft (2934.2m)
Sandstone. Main lithology as in 9,478 to 9,486ft (2888.9 to 2891.3m).	1.0ft (0.3m)	9,631ft (2935.5m)
Sandstone. Light grey (N7) to medium dark grey (N4), fine-grained; quartzose, very micaceous; in bipartite, horizontal and inclined, planar laminae; micro-cross-	36.5ft (11.1m)	9,632ft (2935.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
laminated in cosets up to 4 to 8ins (10 to 20cm) thick. Burrow-related disruption of lamination associated with increased amounts of plant debris and micro-cross-laminae. Mica-rich parts of laminae become progressively thicker downwards; amount of intercalated mudstone and coal increases in same direction. Mudstone dark grey (N3) and greyish black (N2), micaceous, carbonaceous, non-calcareous, in layers up to 0.5ins (1cm) thick. Scattered pyrite nodules.		
Sandstone. Medium light grey (N6) to medium dark grey (N4), fine-grained; quartzose, very micaceous; extensively bioturbated strata interbedded with subordinate, undisrupted laminae; latter consist of bipartite horizontal laminae and micro-cross-laminae, with associated mudstone layers. Mudstone dark grey (N3) to greyish black (N2), micaceous, carbonaceous, incorporating coal lenses, non-calcareous, laminated. With common plant debris.	1.5ft (0.5m)	9,668.5ft (2947m)
No core.	3.0ft (0.9m)	9,670ft (2947.4m)
Sandstone. Main lithologies as in 9,668.5 to 9,670ft (2947 to 2947.4m), with undisturbed, primary lamination scarce below 9,677ft (2949.5m). Pyrite nodules present. Gradational contact with	11.5ft (3.5m)	9,673ft (2948.3m)
Sandstone and mudstone. Sandstone medium light grey (N6) to medium grey (N5), very fine-grained; quartzose, very micaceous; in layers a few mm to 0.5ins (1cm) thick, with horizontal laminae and micro-cross-laminae. Mudstone dark grey (N3) and greyish black (N2), silty, micaceous, carbonaceous, non-calcareous, in layers up to a few mm thick. Lamination frequently broken by escape burrows. Common, scattered plant debris.	3.5ft (1.1m)	9,684.5ft (2951.8m)
Siltstone and mudstone. Siltstone medium grey (N5), quartzose, very micaceous; in lenses and continuous layers a few mm to 0.5ins (1cm) thick, with horizontal laminae and micro-cross-laminae; lens of coarse-grained sandstone at 9,693ft (2954.6m). Mudstone as in 9,684.5 to 9,688ft (2951.8 to 2952.9m), becoming dominant below 9,693.5ft (2954.6m). Escape burrows common.	10.5ft (3.2m)	9,688ft (2952.9m)
BROOM FORMATION		
Sandstone. Light olive grey (5Y6/1), coarse-grained; quartzose, feldspathic,	1.0ft (0.3m)	9,698.5ft (2956.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
kaolinitic, micaceous; oolitic in basal 2.5ins (6cm); with irregular stratification, delineated by intercalated mudstone and siltstone. Ooids up to 0.15ins (2.5mm) in diameter, occur in strongly indurated sandstone with abundant calcite cement. Recovery about 0.5ft (0.2m).		
DRAKE FORMATION (part)		
Mudstone. Medium dark grey (N4) to dark grey (N3), very silty; micaceous, carbonaceous in places, non-calcareous; laminated. Sideritic concretionary layer, 4.5ins (11.5cm) thick at about 9,700.5ft (2956.7m). Irregular, calcareous concretion at about 9,702.5ft (2957.3m) and between 9,710 and 9,711ft (2959.6 and 2959.6m).	12.0ft (3.7m)	9,699.5ft (2956.4m)
Sandstone. Light olive grey (5Y6/1) and pale yellowish brown (10YR6/2), coarse-grained; quartzose, feldspathic, kaolinitic, micaceous, oolitic. Stratification indistinct. Strongly indurated with abundant interstitial siderite and calcite.	0.5ft (0.2m)	9,711.5ft (2960.1m)

UK Well 211/24-3

Operator : Shell
 Co-ordinates : 61°15'25.7"N 1°37'18.5"E
 Spudded : 15/7/74
 Drilling completed : 22/8/74
 KBE : 78ft (23.8ft)
 Water depth : 493.0ft (150.3m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Siltstone and mudstone. Siltstone and associated, fine-grained sandstone yellowish grey (5Y7/2) and light grey (N7) to medium grey (N5); quartzose, micaceous; in layers up to 0.8ins (2cm) thick, commonly less than 0.4ins (1cm), with horizontal laminae and micro-cross-laminae; extensively bioturbated strata, a few ins thick, also common. Mudstone dark grey (N3), micaceous, carbonaceous, especially near interval base; non-calcareous; in layers less than 0.5ins (1.3cm) thick.	5.0ft (1.5m)	9,240ft (2816.4m)
No core.	3.0ft (0.9m)	9,245ft (2817.9m)
Siltstone and mudstone. Main lithologies as in 9,240 to 9,245ft (2816.4 to 2817.9m). Core disrupted.	1.0ft (0.3m)	9,248ft (2818.8m)
ETIVE FORMATION		
Sandstone. Pale yellowish brown (10YR6/2) and light olive grey (5Y6/1), fine-grained; quartzose, micaceous, kaolinitic; lamination indistinct, appears to be in horizontal and inclined, planar laminae. At 9,250.5ft (2819.6m), 8ins (20.3cm) of bioturbated, shaly sandstone with abundant plant debris incorporates coal layer, 2ins (5.1cm) thick. Irregular pyrite segregations.	13.0m (4m)	9,249ft (2819.1m)
Sandstone. Pale yellowish brown (10YR6/2) and light olive grey (5Y6/1), fine- to medium-grained; quartzose, micaceous, becoming very micaceous in places below 9,267ft (2824.6m), kaolinitic; in horizontal and inclined, planar laminae, delineated by argillaceous partings. Sporadic occurrence of abundant calcite cement from 9,262 to 9,263ft (2823.1 to 2823.4m). Minor faults at 9,270ft (2825.5m).	17.0ft (5.2m)	9,262ft (2823.1m)
RANNOCH FORMATION		
Sandstone. Pale yellowish brown (10YR6/2), fine- to coarse-grained; quartzose, very	0.5ft (0.2m)	9,279ft (2828.2m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
micaceous, kaolinitic; in bipartite, horizontal and inclined, planar laminae. With discontinuous, carbonaceous partings.	10.5ft (3.2m)	9,279.5ft (2828.4m)
No core.		
Sandstone. Medium light grey (N6), medium- to coarse-grained; quartzose, very micaceous; in inclined, planar laminae. Strongly indurated, with abundant calcite cement.	0.5ft (0.2m)	9,290ft (2831.6m)
Sandstone. Light olive grey (5Y6/1), fine-grained; quartzose, very micaceous; in bipartite, horizontal and inclined, planar laminae.	8.5ft (2.6m)	9,290.5ft (2831.7m)
Sandstone. Light grey (N7) to medium grey (N5), fine-grained, quartzose, very micaceous; in bipartite, horizontal and inclined, planar laminae. Strongly indurated, with abundant calcite cement. Stratiform pyrite concretions.	6.0ft (1.8m)	9,299ft (2834.3m)
Sandstone. Main lithology as in 9,299 to 9,305ft (2834.3 to 2836.2m). Top 1ft (0.3m) of interval with disrupted stratification; below 9,306ft (2836.5m), numerous minor faults occur. At 9,310ft (2837.7m), sideritic concretionary layer, 3.5ins (8.8cm) thick, rests on several ins of dark grey (N3) mudstone, forming intercalation in sandstone. Several irregular layers of coal and carbonaceous mudstone, up to 0.4ins (1cm) thick. At base of interval, 3ins (7.6cm) of coarse-grained sandstone, medium light grey (N6); quartzose, feldspathic, kaolinitic; with irregular flakes of sideritic siltstone. Strongly indurated with abundant calcite cement. Irregular segregations of pyrite. Sharp contact with	6.0ft (1.8m)	9,305ft (2836.2m)
DRAKE FORMATION		
Mudstone. Dark grey (N3), very silty in places; micaceous, carbonaceous, non-calcareous.	3.0ft (0.9m)	9,311ft (2838m)
Siltstone. Medium dark grey (N4), muddy; quartzose, extensively bioturbated.	4.0ft (1.2m)	9,314ft (2838.9m)

UK Well 211/24-4

Operator : Conoco
 Co-ordinates : 61°10'42.6"N 1°46'36.7"E
 Spudded : 7/11/74
 Drilling completed : 12/1/75
 KBE : 80.0ft (24.4m)
 Water depth : 476.0ft (145.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
ETIVE FORMATION (part)		
Sandstone. Yellowish grey (5Y7/2) and pale yellowish brown (10YR6/2), dominantly medium- to coarse-grained; quartzose, micaceous, kaolinitic, in horizontal and inclined, planar laminae and sub-ordinate micro-cross-laminae, delineated by minor variation in grain size and by grouped, carbonaceous partings; with biogenic disruption of laminae in places. Abundant scattered plant fragments. With several layers of carbonaceous mudstone and coal, up to a few cm thick, from 8,873.5 to 8,876ft (2704.6 to 2705.4m). Irregular segregations of pyrite present. Basal 2.5ins (6cm) composed of micro-cross-laminated, fine-grained sandstone, with common, sand-filled burrows of variable orientation.	10.0ft (3.0m)	8,877ft (2705.7m)
Sandstone. Pale yellowish brown (10YR6/2) and light olive grey (5Y6/1), dominantly medium- to coarse-grained; quartzose, micaceous, kaolinitic; in horizontal and inclined, planar laminae, delineated by minor variation in grain size and by irregular discontinuous, carbonaceous partings. Common, scattered plant debris. Irregular segregations of pyrite.	33.0ft (10.1m)	8,887ft (2708.8m)
Sandstone. Pale yellowish brown (10YR6/2) and light olive grey (5Y6/1), fine- to medium-grained; quartzose, micaceous, kaolinitic; in micro-cross-laminae, delineated by grouped, carbonaceous partings. Burrowed in places, with sand-filled, tubular forms common.	4.0ft (1.2m)	8,920ft (2718.8m)
Sandstone. Main lithology as in 8,887 to 8,920ft (2708.8 to 2718.8m), but with increase in mica content below 8,934ft (2723.1m). Scarce sets of micro-cross-laminae in intercalated fine-grained sandstone. Partings and layers of carbonaceous mudstone up to c.0.75ins (2cm) thick in basal 1ft (0.3m).	16.0ft (4.9m)	8,924ft (2720.0m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
RANNOCH FORMATION		
Sandstone. Yellowish grey (5Y7/2), fine-grained; quartzose, very micaceous; in horizontal and inclined, planar laminae and micro-cross-laminae, delineated by mica-rich parts of laminae, carbonaceous partings and plant debris. Burrowed in places, with sand-filled, tubular forms common.	3.5ft (1.1m)	8,940ft (2724.9m)
Sandstone. Yellowish grey (5Y7/2), fine-grained; quartzose, very micaceous; in bipartite, horizontal and inclined, planar laminae. With scattered, small pyrite nodules.	58.5ft (17.8m)	8,943.5ft (2726m)
Sandstone. Light grey (N7) to medium light grey (N6), fine-grained; quartzose, very micaceous; in bipartite, horizontal and inclined, planar laminae. Strongly indurated, with abundant calcite cement.	5.0ft (1.5m)	9,002ft (2743.8m)
Sandstone. Main lithology as in 8,943.5 to 9,002ft (2726 to 2743.8m).	13.0ft (4m)	9,007ft (2745.3m)
Sandstone. Medium light grey (N6) to medium dark grey (N4), fine-grained; quartzose, very micaceous; in bipartite, horizontal and inclined, planar laminae; micro-cross-laminated from 9,033 to 9,033.5ft (2753.3 to 2753.4m). Flakes of mudstone commonly concentrated above bounding surfaces of sets of laminae. Sand-filled, tubular burrows present. Bipartite nature of laminae more strongly defined than above, because of increased thicknesses of mica-rich parts.	21.0ft (6.4m)	9,020ft (2749.3m)
Sandstone. Light grey (N7) to medium dark grey (N4), fine-grained; quartzose, very micaceous; in laminated strata as in 9,020 to 9,041ft (2749.3 to 2755.7m) and strata with less conspicuous lamination, present below 9,062ft (2762.1m), with intercalated, burrowed layers, up to 4ins (10cm) thick. Latter display varying degrees of disruption of primary lamination; sand-filled, tubular burrows of variable orientation are common; upper margins of burrowed strata commonly sharp, lower limits diffuse. With flakes of mudstone concentrated in laminae. Scattered, sideritic concretionary layers.	34.0ft (10.4m)	9,041ft (2755.7m)
Shaly sandstone. Medium grey (N5) to medium dark grey (N4), mostly fine-grained, with	16.0ft (4.9m)	9,075ft (2766.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
coarse-grained sandstone in basal 2ft (0.6m); quartzose, very micaceous; in irregular lenses up to 1cm thick, bounded by interconnected argillaceous partings; extensively bioturbated; with scarce, undisturbed strata in sets of sub-horizontal laminae, a few cm thick. Mudstone, dark grey (N3) to greyish black (N2), micaceous, carbonaceous, non-calcareous, laminated; in layers up to c.0.4 ins (1cm) thick occurring below 9,090ft (2770.6m). Coarse-grained sandstone in layer 9ins (23cm) thick at 9,089ft (2770.3m); micro-cross-laminated, incorporating flakes of concretionary siderite.		
BROOM FORMATION		
Sandstone. Yellowish grey (5Y8/1) and very light grey (N8) to light grey (N7), coarse-grained; quartzose, feldspathic, micaceous, kaolinitic; in inclined, planar laminae and micro-cross-laminae. With scattered, carbonaceous partings, common irregular segregations of siderite. Strongly indurated, with abundant calcite cement below 9,092.5ft (2771.4m).	4.5ft (1.4m)	9,091ft (2770.9m)
Shaly sandstone. Yellowish grey (5Y8/1) and very light grey (N8) to light grey (N7), coarse-grained, with scattered, small pebbles; quartzose, feldspathic, micaceous, kaolinitic; in irregular lenses, up to c.0.8ins (2cm) thick, bounded by interconnected partings of dark grey (N3) mudstone; with inclined planar laminae, making up scarce sets a few inches thick. Mudstone dark grey (N3), silty, micaceous, non-calcareous, laminated; forms numerous intercalations, several cm thick, below 9,102ft (2774.3m), as well as layer 3.5ins (9cm) thick, at 9,096ft (3019.3m). Extensively burrowed; with alectorurid burrow at about 9,099.5ft (2773.5m). Sporadic occurrence of siderite segregations.	8.5ft (2.6m)	9,095.5ft (2772.3m)
Mudstone. Dark grey (N3), silty; micaceous, non-calcareous; laminated. With lenses of coarse sandstone at interval top and scattered grains near base.	1.5ft (0.5m)	9,104ft (2774.9m)
Shaly sandstone. Main lithologies as in 9,095.5 to 9,104ft (2772.3 to 2774.9m). Scattered pebbles of concretionary siderite common below 9,109.5ft (2776.6m). Interstitial pyrite abundant in places. Mudstone intercalations, several cm thick, particularly common below 9,111.5ft (2777.2m);	9.5ft (2.9m)	9,105.5ft (2775.4m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
sideritic in places. Sporadic occurrence of abundant calcite cement from 9,110ft (2776.7m) to interval base. Calcareous ooids, partly replaced by siderite, in coarse-grained sandstone at 9,114ft (2777.9m). Gradational contact with		
DRAKE FORMATION (part)		
Siltstone. Dark grey (N3) to greyish black (N2), muddy, micaceous, laminated. Contains irregular lenses and continuous layers of coarse-grained sandstone down to 9,122ft (2780.4m), becoming common above 9,118ft (2779.2m). Fine- and very fine-grained sandstone in scattered lenses, micro-cross-laminated. Extensively bioturbated below 9,126ft (2781.6m). Sideritic concretionary layers: 2.5ins (6.5cm) at 9,115.5ft (2778.4m), 2.5ins (6.5cm) at 9,120.5ft (2779.9m), and 2.5ins (6.5cm) at 9,122ft (2780.4m). Scattered calcareous concretions below 9,135ft (2784.3m).	23.0ft (7.0m)	9,115ft (2778.3m)

UK Well 211/26-1

Operator : Shell

Co-ordinates : 61°7'43.1"N 1°6'23.7"E

Spudded : 18/6/72

Drilling completed : 12/9/72

KBE : 113ft (34.4m)

Water depth : 510ft (155.4m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Sandstone. Light olive grey (5Y6/1), fine-grained, quartzose, micaceous, kaolinitic, with scattered plant fragments; in horizontal and inclined, planar laminae.	23.0ft (7.0m)	8,930ft (2721.9m)
Sandstone. Light olive grey (5Y6/1) and yellowish grey (5Y8/1), fine-grained, quartzose, micaceous, kaolinitic, with scattered plant fragments; bedding sub-horizontal and irregular, with common intercalations of siltstone and silty mudstone a few mm thick. Sand-filled, tubular burrows common. Scattered pyrite nodules.	2.0ft (0.6m)	8,953ft (2728.9m)
Alternating siltstone and mudstone. Siltstone light grey (N7) to medium light grey (N6), sandy in places, quartzose, micaceous; in irregular lenses and continuous layers up to a few mm thick, separated by generally thicker mudstone layers. Mudstone medium dark-grey (N4) to dark grey (N3), silty, non-calcareous, micaceous. Burrowing widespread.	1.0ft (0.3m)	8,955ft (2729.5m)
Sandstone. Main lithology as in 8,930 to 8,953ft (2721.9 to 2728.9m). Scattered argillaceous partings with concentrated micas.	4.0ft (1.2m)	8,956ft (2729.8m)
Sandstone. Main lithology as in 8,953 to 8,955ft (2728.9 to 2729.5m).	2.0ft (0.6m)	8,960ft (2731.0m)
Sandstone. Main lithology as in 8,930 to 8,953ft (2721.9 to 2728.9m).	11.5ft (3.5m)	8,962ft (2731.6m)
Alternating siltstone and mudstone. As in 8,955 to 8,956ft (2729.5 to 2729.8m), but with intercalated lenses of fine-grained sandstone up to 1cm thick.	1.0ft (0.3m)	8,973.5ft (2735.1m)
Sandstone. Main lithology as in 8,930 to 8,953ft (2721.9 to 2728.9m).	1.0ft (0.3m)	8,974.5ft (2735.4m)
Alternating siltstone and mudstone. As in 8,955 to 8,956ft (2729.5 to 2729.8m), but with additional, thin sandstone lenses.	0.5ft (0.2m)	8,975.5ft (2735.7m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Main lithology as in 8,930 to 8,953ft (2721.9 to 2729.5m).	2.0ft (0.6m)	8,976ft (2735.9m)
Sandstone. Main lithology as in 8,953 to 8,955ft (2728.9 to 2729.5m).	2.0ft (0.6m)	8,978ft (2736.5m)
Sandstone. Main lithology as in 8,930 to 8,953ft (2721.9 to 2728.9m).	4.0ft (1.2m)	8,980ft (2737.1m)
Sandstone. Main lithology as in 8,953 to 8,955ft (2728.9 to 2729.5m).	2.0ft (0.6m)	8,984ft (2738.3m)
No core.	4.0ft (1.2m)	8,986ft (2738.9m)
Sandstone and mudstone. Sandstone as in 8,930 to 8,953ft (2721.9 to 2728.9m), but in layers up to a few cm thick. Mudstone dark grey (N3), non-calcareous, micaceous. (Core disrupted.)	2.0ft (0.6m)	8,990ft (2740.2m)
Sandstone. Main lithology as in 8,953 to 8,955ft (2728.9 to 2729.5m). Siderite concretion at 8,993ft (2741.1m).	7.0ft (2.1m)	8,992ft (2740.8m)
Alternating siltstone and mudstone. As in 8,955 to 8,956ft (2729.5 to 2729.8m). Abundant sandstone lenses in top 2ft (0.6m).	12.0ft (3.7m)	8,999ft (2742.9m)
Sandstone. Yellowish grey (5Y8/1) and light olive grey (5Y6/1), fine-grained, quartzose, kaolinitic, with scattered plant debris; in horizontal and inclined planar laminae. Vertical, sand-filled, mud-lined, tubular burrows near top of interval.	6.0ft (1.8m)	9,011ft (2746.6m)
Alternating siltstone and mudstone. As in 8,955 to 8,956ft (2729.5 to 2729.8m). With scattered sandstone layers a few cm thick. Pyrite nodules present. Proportion of intercalated siltstone decreases downwards.	4.0ft (1.2m)	9,017ft (2748.4m)
Mudstone. Dark grey (N3), silty, non-calcareous, carbonaceous, carbonaceous in places, micaceous. Basal 1.5ft (0.4m) with interbedded, fine-grained sandstone. (Disrupted core.)	17.0ft (5.2m)	9,021ft (2749.6m)
No core.	7.0ft	9,038ft
ETIVE FORMATION	2.1m	(2749.8m)
Sandstone. Yellowish grey (5Y8/1) and light olive grey (5Y6/1), fine-grained, quartzose, kaolinitic, micaceous, with scattered plant debris; in horizontal and inclined, planar laminae, defined by variation in interstitial clay content. Argillaceous partings in top few cm. Scattered pyrite nodules.	17.0ft (5.2m)	9,045ft (2756.9m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
RANNOCH FORMATION		
Sandstone. Light olive grey (5Y6/1) and light grey (N7) to medium grey (N5), fine-grained, quartzose, very micaceous, kaolinitic; in horizontal and inclined, planar laminae, which are prominently bipartite. Micaceous concentrated in clayey parts of laminae. Scattered pyrite nodules. Bioturbation extensive in places. [Core disrupted below 9,072ft (2765.1m).]	23.0ft (7.0m)	9,062ft (2762.1m)
BROOM FORMATION		
Sandstone. Light olive grey (5Y6/1), coarse-grained; quartzose, kaolinitic, micaceous; stratification irregular. [Disrupted core (in bag).]	5.0ft (1.5m)	9,085ft (2769.4m)
Shaly sandstone. Light olive grey (5Y6/1) and pale brown (5YR5/2), coarse-grained; quartzose, kaolinitic, micaceous; in irregular lenses and continuous layers, bounded by dark grey (N3), argillaceous partings. Siderite cement of sporadic occurrence.	4.0ft (1.2m)	9,090ft (2770.6m)
Sandstone. As in 9,085 to 9,090ft (2769.1 to 2770.6m). [Disrupted core (in bags).]	7.0ft (2.2m)	9,094ft (2771.8m)
DRAKE FORMATION (part)		
Oolitic, sideritic siltstone. Brownish grey (5YR4/1) and olive grey (5Y4/1); ooids calcareous, also replaced by pyrite; sideritic siltstone in irregular pods and continuous layers, bounded by argillaceous partings and layers of oolite.	3.5ft (1.1m)	9,101ft (2774.0m)
Siltstone. Medium dark grey (N4) to dark grey (N3), muddy, micaceous, non-calcareous, laminated.	7.5ft (2.3m)	9,104.5ft (2775.1m)

UK Well 211/26-3

Operator : Shell

Co-ordinates : 61°5'11.3"N 1°1'42.5"E

Spudded : 3/9/74

Drilling completed : 23/12/75

KBE : 107ft (32.6m)

Water depth : 505.0ft (153.9m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Alternating siltstone and mudstone. Siltstone and fine-grained sandstone light grey (N7) to medium grey (N5), quartzose, micaceous, in solitary laminae and sets up to a few mm thick, also in scarcer micro-cross-laminated layers a few cm thick; separated by mudstone layers of similar thickness. Mudstone dark grey (N3), silty, micaceous, non-calcareous; laminated.	10.0ft (3.0m)	10,105.5ft (3080.2m)
No core.	92.5ft (28.2m)	10,115.5ft (3083.2m)
BROOM FORMATION (part)		
Shaly sandstone. Light grey (N7) yellowish grey (5Y8/1) and light olive grey (5Y6/1), coarse-grained, pebbly in places, quartzose, micaceous; kaolinitic; sandstone forms irregular pods and lenses, separated by uneven, argillaceous partings, which are frequently interconnected. Mudstone of partings dark grey (N3).	14.0ft (4.3m)	10,308ft (3141.9m)
No core.	3.0ft (0.9m)	10,322ft (3146.1m)
DRAKE FORMATION (part)		
Silty mudstone. Medium dark grey (N4) to dark grey (N3), quartzose, micaceous, non-calcareous; laminated.	9.5ft (2.9m)	10,325ft (3147.0m)

UK Well 211/26-4

Operator : Shell
 Co-ordinates : 61°2'0.9"N 1°7'27.8"E
 Spudded : 15/4/75
 Drilling completed : 15/7/75
 KBE : 107ft (32.6m)
 Water depth : 504.0ft (153.6m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
ETIVE FORMATION (part)		
Sandstone. Pale brown (5YR5/2) and medium grey (N5), fine-grained; quartzose, micaceous, kaolinitic; in horizontal and inclined, planar laminae and scarce cosets of micro-cross-laminae, disrupted by burrowing. Strongly indurated, with abundant calcite cement.	3.5ft (1.1m)	11,740ft (3578.6m)
Mudstone dark grey (N3) to greyish black (N2), silty, micaceous, carbonaceous, in partings and layers up to 1cm thick.		
Sandstone. Pale brown (5YR5/2) and medium light grey (N6) to medium grey (N5), dominantly fine-grained, medium-grained in places; quartzose, micaceous, kaolinitic; in horizontal and inclined planar laminae, which are bipartite in places. With scattered plant debris. Irregular segregations of pyrite present.	30.5ft (9.3m)	11,745.5ft (3580.0m)
Sandstone. Main lithology as in 11,745.5 to 11,776ft (3580.0 to 2589.3m). (Core disrupted.)	8.0ft (2.4m)	11,776ft (3589.3m)
RANNOCH FORMATION		
Sandstone. Light brownish grey (5YR6/1) to brownish grey (5YR4/1), fine-grained; quartzose, very micaceous; in horizontal and gently inclined, planar laminae, delineated by micaceous and carbonaceous partings. With sporadic occurrence of irregular segregations of calcite cement.	5.5ft (1.7m)	11,784ft (3591.6m)
Sandstone. Dominant lithology as in 11,784 to 11,789.5ft (3591.8 to 3593.4m), with intercalations of light grey (N7) to medium grey (N5) sandstone, fine-grained, quartzose, very micaceous, in bipartite, horizontal and inclined, planar laminae. Sets of bipartite laminae generally up to 0.5ft (0.2m) thick; in places, the clayey parts of laminae seen as crenulated partings. Sporadic occurrence of calcite cement. Pyrite nodules present.	30.5ft (9.3m)	11,789.5ft (3593.4m)
Sandstone. Pale brown (5YR5/2) and light grey	16.0ft (4.9m)	11,820ft (3602.7m)

Description of strata	Thickness	Depth below KB
<p>arrangement of lithologies similar to that of 11,789.5 to 11,820ft (3593.4 to 3602.7m), except that bipartite laminae predominate and sporadic thin intercalations of mudstone occur, becoming common below 11,826ft (3604.6m); poorly laminated sandstone as intercalations of up to 0.5ft (0.2m) thick. Continuity of layering commonly broken by numerous distinctive burrows; total destruction of primary layering by bioturbation is rare. <u>Teichichnus</u> and allied forms (oblique burrows with Spreiten), as well as sand-filled, tubular burrows of variable orientation, are common in laminated sandstones. Burrowed sandstones commonly strongly indurated, with abundant calcite cement; minor interstitial siderite and pyrite of sporadic distribution. Intercalated mudstone dark grey (N3) and greyish black (N2), silty; micaceous, carbonaceous, non-calcareous; in layers up to 0.8ins (2cm) thick.</p>		
<p>Mudstone and siltstone. Mudstone dark grey (N3), silty; micaceous, carbonaceous, non-calcareous; in layers a few mm thick, laminated, but disrupted to varying degrees by burrowing. Siltstone and associated fine-grained sandstone light brownish grey (5YR6/1) and light olive grey (5Y6/1); quartzose, micaceous; in lenses and continuous layers, a few mm thick.</p>	<p>1.0ft (0.3m)</p>	<p>11,836ft (3607.6m)</p>
<p>Shaly sandstone. Light brownish grey (5YR6/1), fine-grained; quartzose, micaceous; in irregular lenses bounded by interconnected argillaceous partings, as in top 0.5ft (0.2m), and layers of mudstone up to a few mm thick; extensively bioturbated. Mudstone dark grey (N3), silty; micaceous, carbonaceous, non-calcareous; increasing in abundance downwards. Sporadic occurrence of abundant calcite cement.</p>	<p>1.5ft (0.5m)</p>	<p>11,837ft (3607.9m)</p>
<p>BROOM FORMATION</p>		
<p>Sandstone. Pale yellowish brown (10YR6/2), medium- to coarse-grained, with scarce, scattered granules and small pebbles; quartzose, feldspathic, micaceous, kaolinitic; in poorly defined, sub-horizontal laminae, delineated by minor variation in interstitial clay and by irregular, frequently crenulated, argillaceous partings. Strongly indurated, with abundant calcite cement.</p>	<p>5.5ft (1.7m)</p>	<p>11,838.5ft (3608.4m)</p>

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Shaly sandstone. Pale yellowish brown (10YR6/2), coarse-grained, quartzose, feldspathic, micaceous; in irregular lenses, up to 0.4ins (1cm) thick, bounded by interconnected partings and layers of mudstone, up to several mm thick; extensively bioturbated. Mudstone dark grey (N3, sandy; micaceous, carbonaceous, non-calcareous; increasing in abundance downwards.	0.5ft (0.2m)	11,844ft (3610.1m)
Sandstone. Main lithology as in 11,838.5 to 11,844ft (3608.4 to 3610.1m). With sporadic occurrence of irregular, argillaceous partings. Strongly indurated, with abundant calcite cement from 11,848 to 11,849.5ft (3611.3 to 3611.7m) and most of interval below 11,857ft (3614.0m). Irregular segregations of pyrite are common in non-calcareous sandstone. With oblique and vertical, tubular burrows, which are sand-filled, mud-lined, and generally straight.	20.5ft (6.2m)	11,844.5ft (3610.2m)
Pebbly sandstone. Light brownish grey (5YR6/1) and medium grey (N5), coarse-grained, with abundant sand-supported pebbles of quartz and feldspar, shaly; quartzose, feldspathic, micaceous; in irregular lenses, bounded by closely spaced interconnected partings and thin layers of sandy mudstone. Oblique, sand-filled, mud-lined burrows near interval top. Strongly indurated, with abundant calcite cement and subordinate, interstitial siderite.	1.5ft (0.5m)	11,865ft (3616.5m)
Sandstone. Main lithology as in 11,838.5 to 11,844ft (3608.4 to 3610.1m). With common, scattered granules and pebbles; irregular, argillaceous partings; segregations of pyrite.	2.5ft (0.8m)	11,866.5ft (3616.9m)
Pebbly sandstone. Main lithology as in 11,865 to 11,866.5ft (3616.5 to 3616.9m), with sporadic distribution of interstitial calcite and siderite. Basal few ins incorporate dark grey (N3) mudstone, sandy; micaceous, carbonaceous, non-calcareous; laminated with irregular lenses and continuous laminae of coarse sand grains.	4.5ft (1.4m)	11,869ft (3617.7m)

UK Well 211/27-1A

Operator : Amoco
 Co-ordinates : 61°2'55.2"N 1°23'26.2"E
 Spudded : 21/2/74
 Drilling completed : 30/6/74
 KBE : 109ft (33.2m)
 Water depth : 492.0ft (150m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
BROOM FORMATION (part)		
Sandstone. Light greenish grey (5GY6/1) to light olive grey (5Y6/1), coarse-grained, quartzose, feldspathic, micaceous, kaolinitic, friable; with irregular stratification. Recovery about 9ins (22.9cm).	3.0ft (0.9m)	10,199ft (3108.6m)
Sandstone. Yellowish grey (5Y8/1) and light olive grey (5Y6/1), coarse-grained, with scattered pebbles, quartzose, feldspathic, micaceous, kaolinitic; forms irregular lenses and layers with undulating margins, bounded by dark grey (N3), argillaceous and brownish grey (5YR4/1), sideritic partings.	2.5ft (0.8m)	10,202ft (3109.6m)
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), variably silty, micaceous, laminated, tubular burrows, impregnated with calcite. Top 3ins (7.6cm) of interval (minimum thickness) is sideritic concretionary layer. Calcareous concretion at about 10,208ft (3111.4m). Recovery about 3ft (0.9m).	7.5ft (2.3m)	10,204.5ft (3110.3m)
Oolitic, sideritic siltstone. Brownish grey (5YR4/1) and moderate brown (5YR4/4), ooids calcareous, coarse-sand grade, scattered throughout interval, replaced by siderite and pyrite in places. Calcareous oncolites (?) with concentric growth structure at 10,215.5ft (3113.7m). Sideritic siltstone forms irregular pods and lenses, up to 0.4ins (1cm) thick and bounded by oolitic stringers and argillaceous partings.	4.5ft (1.4m)	10,212ft (3112.6m)
Siltstone. Medium dark (N4) to dark grey (N3), muddy, micaceous, laminated.	9.5ft (2.9m)	10,216.5ft (3114m)

UK Well 211/27-4A

Operator : Amoco
 Co-ordinates : 61°06'30.7"N 01°17'08.0"E
 Spudded : 25/5/75
 Drilling completed : 1/9/75
 KBE : 109ft (33.2m)
 Water depth : 477ft (145.4m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Sandstone and siltstone. Sandstone light olive grey (5Y6/1) and medium grey (N5), fine-grained, quartzose, micaceous, forming irregular pods and lenses. Siltstone medium dark grey (N4), micaceous, muddy. Irregular sideritic concretionary layers in siltstone.	1.5ft (0.4m)	12,102ft (3688.7m)
Sandstone. Light olive grey (5Y6/1), fine-grained, quartzose, micaceous, with indistinct, planar inclined laminae. Flakes and pebbles of concretionary siderite present. Interval includes mudstone partings up to a few mm thick and silty mudstone intercalations, several cm in thickness. Latter show evidence of mechanical disruption.	2.5ft (0.8m)	12,103.5ft (3689.1m)
Sandstone and siltstone. As in 12,102 to 12,103.5ft (3688.7 to 3689.1m).	4.5ft (1.4m)	12,106ft (3689.9m)
Sandstone and siltstone. As in 12,102 to 12,103.5ft (3688.7 to 3689.1m), but with overall increase in proportion of fine-grained sandstone forming both irregularly laminated, cross-stratified layers and contorted pods and lenses interbedded with muddy siltstone. Small faults in sandstone at 12,118ft (3693.6m). Contorted sandstone dike at 12,125.5ft (3695.9m). Flakes of concretionary siderite in sandstone layers. Siltstone medium dark grey (N4), muddy, as intercalations up to a few cm thick, including concretionary siderite layers. Pyrite nodule in sandstone at 12,110.5ft (3691.6m). Sharp contact with	15.5ft (4.7m)	12,110.5ft (3691.3m)
ETIVE FORMATION		
Sandstone. Light olive grey (5Y6/1) fine-grained, but incorporating abundant pebbles of laminated siltstone and mudstone and micaceous sandstone; quartzose, micaceous, with planar, inclined laminae delineated by plant debris in basal 1ft (0.3m).	6.5ft (2m)	12,126ft (3696.0m)
Sandstone. Light grey (N7) and medium light grey (N6), fine-grained, quartzose, micaceous	5ft (1.5m)	12,132.5ft (3698m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
with abundant calcite cement. Coalified plant debris delineates irregular inclined laminae. Siltstone and mudstone flakes relatively uncommon. Sharp erosional contact with		
RANNOCH FORMATION		
Sandstone. Light olive grey (5Y6/1) and light grey (N7) to medium grey (N5), fine-grained quartzose, micaceous, light olive grey sandstone composed of inclined laminae, delineated in part by plant debris; light and medium grey sandstone more kaolinitic, with bipartite laminae forming sets a few cm thick. Scattered pebbles of concretionary siderite present.	5.5ft (1.7m)	12,137.5ft (3699.5m)
Sandstone. Light grey (N7) to medium grey (N5), fine-grained quartzose, micaceous, kaolinitic, in bipartite, inclined laminae, which form sets several cm to a few dm thick; truncation of sets common. Flakes of sideritic and kaolinitic mudstone common.	10ft (3m)	12,143ft (3701.2m)
Sandstone. Light olive grey (5Y6/1), fine-grained, quartzose, micaceous; with gently inclined, planar laminae and crenulated (? stylolitic) clayey partings. Straight, sand-filled tubular burrows on parting surfaces.	5ft (1.5m)	12,153ft (3704.2m)
Sandstone. Lithologies as in 12,143 to 12,153ft (3701.2 to 3704.2m) and in 12,153 to 12,158ft (3704.2 to 3705.8m) interbedded.	1ft (0.3m)	12,158ft (3705.8m)
Sandstone. As in 12,153 to 12,158ft (3704.2 to 3705.8m), but with increasing proportion of clayey partings in basal 0.5ft (0.15m).	1.5ft (0.4m)	12,159ft (3706.1m)
Sandstone. Light olive grey (5Y6/1) and greenish grey (5GY6/1), fine-grained, quartzose, micaceous, incorporating numerous, irregular, sub-parallel, clayey partings, medium dark grey (N4) in colour. Intercalations of sandstone as in 12,153 to 12,158ft (3704.2m to 3705.8m) up to 1in (2cm) thick with relatively few partings. Basal 0.5ft (0.15m) with discontinuous carbonaceous partings, apparently bioturbated.	2ft (0.6m)	12,160ft (3706.5m)
Sandstone. As in 12,153 to 12,158ft (3704 to 3705.8m).	6ft (1.9m)	12,162.5ft (3707.1m)
Sandstone. Main lithologies as in 12,158 to 12,159ft (3705.8 to 3706.1m) but with sets of bipartite laminae up to 8ins (20.3cm) thick extensively burrowed: <u>Teichichnus</u> and sand	5.5ft (1.6m)	12,168.5ft (3709m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
filled, mud lined, tubular forms present with variety of escape structures. Continuity of lamination largely maintained.		
Sandstone. As in 12,143 to 12,153ft (3701.2 to 3704.2m). Carbonaceous flakes on bedding planes in minor trough form, truncating subjacent laminae.	4ft (1.3m)	12,174ft (3710.6m)
Sandstone with mudstone intercalations. Sandstone mainly medium light grey (N6) and light grey (N5), fine-grained, silty, micaceous, with more kaolinitic laminae grouped in sets. Lamination parallel, but extensively disrupted by burrowing in places. Siderite-impregnated pods and lenses locally concentrated in basal 5ft (1.5m). Medium and coarse-grained sandstone and scattered granules and pebbles in irregular laminae occurring in basal 1ft (0.3m). Mudstone dark grey (N3) to greenish black (5G2/1) in laminae interbedded with subordinate sandstone laminae as sets a few cm thick. Gradational contact with	10ft (3m)	12,178ft (3711.9m)
BROOM FORMATION		
Pebbly sandstone and mudstone. Sandstone mainly medium grey (N5), with pebbly sandstone and medium to coarse-grained kaolinitic sandstone forming irregular pods, separated by discontinuous partings of siltstone and silty mudstone, particularly from 12,188 to 12,188.5ft (3714.9 to 3715.1m) and from 12,189.5 to 12,190ft (3715.4 to 3715.5m); remainder of interval similar to lithologies from 12,178 to 12,188ft (3711.9 to 3714.9m), but without intense bioturbation. Irregular concretionary siderite layers numerous 12,188 to 12,188.5ft (3714.9 to 3715.1m).	2ft (0.6m)	12,188ft (3714.9m)
Sandstone. Light olive (5Y6/1), coarse-grained, quartzose, micaceous, with crude sub-parallel lamination transected by vertical, sand-filled, tubular burrows.	1.5ft (0.5m)	12,190ft (3715.5m)
Shaly sandstone. Sandstone light olive grey (5Y6/1), coarse-grained, micaceous, forming irregular pods, separated by discontinuous, interconnected mudstone partings. Some sandstone lenses with siderite cement.	2.5ft (0.7m)	12,191.5ft (3716m)
Sandstone. As in 12,190 to 12,191.5ft (3715.5 to 3716m).	8ft (2.5m)	12,194ft (3716.7m)
Sandstone. Light grey (N7) to medium grey (N5), coarse-grained, quartzose, micaceous,	12.5ft (3.8m)	12,202ft (3719.2m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
kaolinitic, with abundant calcite cement. Crude sub-parallel layering defined by minor increases in mud content and occurrence of sideritic cement.		
Sandstone. Mainly light olive grey (5Y6/1), with dominant lithology as in 12,202 to 12,214.5 (3719.2 to 3723m) but displaying irregular downward increase in amount of siderite cement and proportion of mudstone partings.	15.5ft (4.7m)	12,214.5ft (3723m)
Shaly sandstone. As in 12,191.5 to 12,194ft (3716 to 3716.7m) but with irregular pods of concretionary siderite in top 1.5ft (0.46m); scattered granules and pebbles throughout interval. Gradational contact with	4ft (1.2m)	12,230ft (3727.7m)
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), non-calcareous, micaceous, laminated.	0.5ft (0.2m)	12,234ft (3728.9m)
Sandy mudstone. Light grey (N7) feldspar grains of coarse-sand grade with pebbles of dark grey mudstone (N3) in matrix of dark grey mudstone. Base of interval is sharp and erosional.	1ft (0.3m)	12,234.5ft (3729.1m)
Mudstone. As in 12,234 to 12,234.5ft (3728.9 to 3729.1m), but with subordinate intercalated siltstone, frequently with sideritic cement. The main sideritic concretionary layers are: 1.5ins (4cm) at 12,237.5ft (3730m), 7ins (17.8cm) at 12,240.5ft (3730.9m), 3.5ins (8.9cm) at 12,241.5ft (3731.2m), 4ins (10.2cm) at 12,243ft (3731.7m), 3ins (7.6cm) at 12,249ft (3733.5m), 5.5ins (14cm) at 12,267ft (3739m), and 6.5ins (16.5cm) at 12,276ft (3741.7m). Pyritized, straight, tubular burrows in mudstone.	41.5ft (12.6m)	12,235.5ft (3729.4m)

UK WELL 211/28-1A

Operator : Conoco
 Co-ordinates : 61°4'21.2"N 1°24'13.0"E
 Spudded : 16/6/73
 Drilling completed : 3/11/73
 KBE : 79ft (24.1m)
 Water depth : 491ft (149.6m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Sandstone. Dark yellowish brown (10YR4/2) and brownish grey (5YR3/2) and dusky brown (5YR2/2), clayey parts of laminae, micaceous, with scattered plant debris, induration moderate to poor; in planar, inclined laminae, commonly bipartite. Scattered partings of dark grey (N3) mudstone, carbonaceous, non-calcareous, micaceous. Several minor faults present. (Disrupted core.)	19.0ft (5.8m)	9,842ft (2999.8m)
Alternating siltstone and mudstone. Siltstone and fine-grained sandstone light olive grey (5Y6/1) and medium grey (N5), quartzose, micaceous, with sporadic oil staining in top 3ft (0.9m); in irregular lenses and continuous layers up to few mm thick, separated by mudstone layers of similar thickness. Mudstone medium dark grey (N4) and dark grey (N3), carbonaceous, non-calcareous, micaceous. Sporadic disruption of laminae considered to be mostly biogenic. (Disrupted core.)	8.0ft (2.4m)	9,861ft (3005.6m)
Sandy siltstone. Main lithologies as in 9,861 to 9,869ft (3005.6 to 3008.1m), but with increased sand content and extensive bioturbation, reducing number of continuous mudstone intercalations. Abundant, sub-horizontal, sand-filled, tubular burrows, similar to <u>Phycodes</u> . Abundant, scattered plant fragments and flakes of carbonaceous mudstone. (Disrupted core.)	5.0ft (1.5m)	9,869ft (3008.1m)
Sandstone. As in 9,842 to 9,861ft (2999.8 to 3005.6m). Pronounced oil staining throughout interval. (Top 8.5ft (2.6m) of core disrupted.)	11.5ft (3.5m)	9,874ft (3009.6m)
Alternating siltstone and mudstone. Main lithologies as in 9,861 to 9,869ft (3005.6 to 3008.1m), but with subordinate, fine-grained sandstone in layers up to several cm thick, with horizontal laminae and micro-cross-laminae variably disrupted. Abundant, carbonaceous flakes tightly packed in top few	4.0ft (1.2m)	9,885.5ft (3013.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
vertical and oblique, carbonaceous stringers. Continuity of stratification variably disrupted by burrowing.		
Sandstone. Light olive grey (5Y6/1) and pale yellowish brown (10YR6/2), fine-grained, quartzose, micaceous, kaolinitic; in horizontal and planar, inclined laminae, with scarce partings of carbonaceous mudstone in top few cm. Grain size increases downwards.	2.5ft (0.8m)	9,889.5ft (3014.3m)
Alternating siltstone and mudstone. As in 9,861 to 9,869ft (3005.6 to 3008.1m). Concretionary siderite layers at 9,893.5ft (3015.5m).	2.5ft (0.8m)	9,892ft (3015.1m)
Sandstone and siltstone. Light olive grey (5Y6/1) and medium grey (N5) to medium dark grey (N4); sandstone fine-grained, muddy, quartzose, micaceous, with abundant, scattered plant debris; downward decrease in grain size, particularly in basal 0.5ft (0.2m). Extensively bioturbated. Irregular sideritic nodules in 2ins (5.1cm) shaly siltstone at 9,895.5ft (3016.1m).	1.5ft (0.5m)	9,894.5ft (3015.8m)
Sandstone. As in 9,889.5 to 9,892ft (3014.3 to 3015.1m).	2.0ft (0.6m)	9,896ft (3016.3m)
Alternating sandstone and mudstone. Sandstone light olive grey (5Y6/1) and medium grey (N5), fine-grained, quartzose, micaceous, kaolinitic; in layers from 1mm to several cm thick, separated by mudstone layers of similar or subordinate thickness; horizontal lamination and micro-cross-lamination, as well as common planar, inclined lamination. Mudstone dark grey (N3) and medium dark grey (N4), silty, micaceous, non-calcareous, carbonaceous. Sand-filled, tubular burrows of variable orientation very common; more widespread biogenic disruption of primary layering mostly confined to thicknesses of a few cm. Plant debris common throughout interval. About 1ft (0.3m) of siderite-cemented sandstone at 9,904ft (3018.7m), similar to that of 9,889.5 to 9,892ft (3014.3 to 3015.1m). Apparently sharp contact with	18.5ft (5.6m)	9,898ft (3016.9m)
ETIVE FORMATION		
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1), fine-grained, quartzose, micaceous, kaolinitic; in horizontal and planar, inclined laminae. Common irregular,	5.5ft (1.7m)	9,916.5ft (3022.5m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
clayey partings closely spaced in basal 2.5ft (0.8m).		
Sandstone. As in 9,916.5 to 9,922ft (3022.5 to 3024.2m), but with moderate to poor induration. (Disrupted core.)	21.0ft (6.4m)	9,922ft (3024.2m)
Sandstone. Light grey (N7) and medium light grey (N6), fine-grained, quartzose, micaceous; with indistinct, horizontal lamination. Strongly indurated, with abundant calcite cement. [Disrupted core from 9,946 to 9,949ft (3031.5 to 3032.5m).]	6.0ft (1.8m)	9,943ft (3030.6m)
Sandstone. Main lithology as in 9,916.5 to 9,922ft (3022.5 to 3024.2m), but with poor induration; appears to be largely uncemented from 9,955 to 9,962ft (3043.3 to 3036.4m). Scarce clayey intercalations a few mm thick.	13.0ft (4m)	9,949ft (3032.5m)
No core.	33.0ft (10.1m)	9,962ft (3036.3m)
Sandstone. As in 9,916.5 to 9,922ft (3022.5 to 3024.2m). Basal 8ins (20.4cm) with abundant bipartite laminae.	3.0ft (0.9m)	9,995ft (3034.3m)
RANNOCH FORMATION		
Sandstone. Medium light grey (N6) to medium grey (N5), fine-grained, quartzose, micaceous in horizontal and planar, inclined, bipartite laminae. Strongly indurated, with abundant calcite cement, except in top 4ins (10.2cm), where clayey parts of laminae are relatively thick.	5.5ft (1.7m)	9,998ft (3047.4m)
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1) and subordinately medium grey (N5), fine-grained, quartzose, micaceous, kaolinitic; in horizontal and gently inclined, planar laminae; laminae are distinctly bipartite though clayey parts dominant in places and very micaceous.	4.5ft (1.4m)	10,003.5ft (3049.1m)
Sandstone. As in 9,998 to 10,003.5ft (3047.4 to 3049.1m).	1.0ft (0.3m)	10,008ft (3050.4m)
Sandstone. As in 10,003.5 to 10,008ft (3049.1 to 3050.4m). Scattered plant debris, especially in basal 0.5ft (15.2cm).	3.5ft (1.1m)	10,009ft (3050.7m)
Sandstone. Yellowish grey (5Y8/1) to light olive grey (5Y6/1) and medium grey (N5) to medium dark grey (N4), fine-grained, quartzose, very micaceous, kaolinitic; in horizontal and gently inclined, planar,	5.5ft (1.7m)	10,012.5ft (3051.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
bipartite laminae. Scattered pebbles and granules of concretionary siderite. Sideritic concretionary layer, 6ins (15.2cm) thick, at about 10,017ft (3053.2m).		
Sandstone. Light olive grey (5Y6/1) and light grey (N7) to medium dark grey (N4), fine-grained, quartzose, very micaceous, kaolinitic; interval comprises lithologies as in 10,012.5 to 10,018ft (3051.8 to 3053.5m) in sets up to 1cm or so thick, separated by intensely bioturbated strata of similar overall thickness. Several layers of mudstone up to 1cm thick in top 1ft (0.3m) and basal 3ft (0.9m) dark grey (N3), non-calcareous, carbonaceous, micaceous. Scattered, coalified wood debris. Layers of concretionary siderite up to a few cm thick, sporadically occurring throughout interval. Abundant, sand-filled, mud-lined, tubular burrows similar to <u>Phycodes</u> ; also undetermined, vertical burrows with spreiten. [Core disrupted below about 10,023ft (3055.0m).]	24ft (7.3m)	10,018ft (3053.5m)
Sandstone. Light olive grey (5Y6/1) and medium grey (N5) to medium dark grey (N4), fine-grained, quartzose, very micaceous, shaly; extensively bioturbated. Scattered, carbonaceous partings. Recovery about 50%. Gradational contact with	10.0ft (3.0m)	10,042ft (3060.1m)
BROOM FORMATION		
Sandstone. Light olive grey (5Y6/1) and pale yellowish brown (10YR6/2), fine- to coarse-grained, with downward increase in sand size; quartzose, very micaceous, kaolinitic; in horizontal and gently inclined, planar laminae. Several intercalations of mudstone, a few mm to 2cm thick, occurring at irregular intervals; dark grey (N3), carbonaceous, non-calcareous, silty, very micaceous. Sporadic occurrence of siderite cement. Scattered plant debris. Burrowed in places.	2.0ft (0.6m)	10,052ft (3063.8m)
Sandstone. Light olive grey (5Y6/1), coarse-grained, with scattered granules and small pebbles; quartzose, micaceous, kaolinitic; in irregular, sub-horizontal laminae, delineated by scarce, argillaceous partings with concentrated mica flakes. Scattered, concretionary layers of siderite, up to 1cm thick. Grouped intercalations of mudstone as in 10,052 to 10,054ft (3063.8 to 3064.5m) for 0.5ft (15.2cm) at 10,059ft (3066m).	6.5ft (1.9m)	10,054ft (3064.5m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Shaly sandstone. Light olive grey (5Y6/1) and medium grey (N5), coarse-grained, with scattered granules and pebbles; quartzose, micaceous, kaolinitic; in irregular lenses and continuous layers, bounded by argillaceous partings. Interstitial siderite sporadically distributed; strongly indurated layer of very light grey (N8) sandstone, with abundant calcite cement at about 10,061.5ft (3066.7m).	2.0ft (0.6m)	10,060.5ft (3066.4m)
Sandstone. Main lithology as in 10,054 to 10,060.5ft (3064.5 to 3066.4m), but with planar, inclined laminae defined by variation in clay content.	3.5ft (1.1m)	10,062.5ft (3067.1m)
Sandstone. Light olive grey (5Y6/1) and light brownish grey (5YR6/1), coarse-grained, with scattered granules and small pebbles of quartz; quartzose, micaceous, kaolinitic; in planar, inclined laminae, delineated by scarce, argillaceous partings. Strongly indurated, with abundant calcite cement.	9.0ft (2.7m)	10,066ft (3068.1m)
Sandstone. Main lithology as in 10,066 to 10,075ft (3068.1 to 3070.9m). Core disrupted.	8.0ft (2.4m)	10,075ft (3070.9m)
Sandstone. Main lithology as in 10,054 to 10,060.5ft (3064.5 to 3066.4m). Core disrupted.	4.5ft (1.4m)	10,083ft (3073.3m)
Shaly sandstone. Appears to be as in 10,060.5 to 10,062.5ft (3066.4 to 3067.1m). Only basal 0.5ft (15.2cm) is in place. Sharp contact with	2.5ft (0.8m)	10,087.5ft (3074.7m)
DRAKE FORMATION (part)		
Mudstone. Dark grey (N3), silty in places, non-calcareous, micaceous; with scattered pyrite nodules. Sideritic, concretionary layers: 3.5ins (8.8cm) at 10,092ft (3076.0m), 3.5ins (8.8cm) at 10,098ft (3077.9m).	11.0ft (3.3m)	10,090ft (3075.5m)
No core.	3.0ft (0.9m)	10,101ft (3078.8m)
Mudstone. Main lithology as in 10,090 to 10,101ft (3075.5 to 3078.8m). [Recovery in top 6.3ft (1.9m) is about 1.3ft (0.4m); disrupted core from 10,121 to 10,126.5ft (3084.9 to 3086.6m).]	22.5ft (6.9m)	10,104ft (3079.7m)
Oolitic, sideritic siltstone. Brownish grey (5YR4/1) and greyish brown (5YR3/2); ooids calcareous, coarse-sand grade, scattered throughout interval; sideritic siltstone forms irregular pods and continuous layers, bounded	4.5ft (1.4m)	10,126.5ft (3086.6m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
by stringers of ooids and argillaceous partings. Ooids replaced by siderite and pyrite in places.		
Siltstone. Medium dark grey (N4) to dark grey (N3), muddy, micaceous, non-calcareous, laminated.	8.0ft (2.4m)	10,134.5ft (3089m)

UK Well 211/29-3

Operator : Shell
 Co-ordinates : 61°8'6"N 1°43'36.5"E
 Spudded : 14/7/73
 Drilling completed : 14/10/73
 KBE : 110ft (33.5m)
 Water depth : 502.0ft (153m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Alternating siltstone and mudstone. Siltstone and fine-grained sandstone light olive grey (5Y6/1), moderate reddish brown (10R4/6) in places, quartzose, micaceous, sideritic; in irregular lenses and continuous layers a few mm to 1cm thick, separated by mudstone layers of similar thickness. Mudstone dark grey (N3), silty, micaceous, increasingly carbonaceous downwards, non-calcareous. Intercalated coal in basal 1.5ft (0.5m).	3.0ft (0.9m)	9072ft (2765.1m)
Sandstone. Yellowish grey (5Y7/2) and light olive grey (5Y6/1), fine-grained, but decreasing in grain size downwards; quartzose, micaceous, with common, coalified plant debris; in horizontal and micro-cross-laminae, with numerous partings and laminae of carbonaceous mudstone.	5.0ft (1.5m)	9075ft (2766.1m)
Sandstone. Yellowish grey (5Y7/2) and light olive grey (5Y6/1), medium- to coarse-grained, quartzose, micaceous; in crude, horizontal laminae; with scarce, argillaceous partings.	5.0ft (1.5m)	9080ft (2767.6m)
Alternating siltstone and mudstone. Main lithologies as in 9072 to 9075ft (2765.1 to 2766.1m), but with increased proportion of interbedded, mainly fine-grained sandstone, particularly in top 2ft (0.6m). Mudstone commonly greyish black (N2) and carbonaceous. Carbonaceous partings and laminae and coal fragments common.	10.0ft (3.0m)	9085ft (2769.1m)
ETIVE FORMATION		
Shaly sandstone and siltstone. Sandstone and siltstone light olive grey (5Y6/1) and yellowish grey (5Y7/2), sandstone mostly fine-grained, quartzose, micaceous; in laminae and irregular layers up to few cm thick, separated by mudstone layers generally less than 0.5m in thickness. Mudstone dark grey (N3), silty, micaceous, carbonaceous, non-calcareous. Bioturbated.	18.0ft (5.5m)	9095ft (2772.1m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Shaly sandstone. Light olive grey (5Y6/1) and yellowish grey (5Y7/2), fine- to medium-grained, quartzose, micaceous; in irregular layers, bounded by mudstone partings and laminae, which increase in frequency downwards. Mudstone dark grey (N3), micaceous, carbonaceous, non-calcareous. Bioturbated. Sideritic concretionary layer at 9120.5ft (2779.9m). Scattered pyrite nodules.	10.0ft (3.0m)	9113ft (2777.6m)
Sandstone. Light olive grey (5Y6/1), fine- to coarse-grained, quartzose, micaceous; with scarce, micaceous, argillaceous partings and intercalations of carbonaceous mudstone. Coal fragments common. Scattered pyrite nodules. Gradational contact with	19.0ft (5.8m)	9123ft (2780.7m)
RANNOCH FORMATION		
Sandstone. Yellowish grey (5Y7/2) and light olive grey (5Y6/1), fine-grained, quartzose, very micaceous; in horizontal and planar, inclined laminae. Laminae mostly bipartite; argillaceous partings scarce.	46.5ft (14.2m)	9142ft (2786.5m)
Sandstone. As in 9142 to 9188.5ft (2786.5 to 2800.7m), but with porosity plugged by abundant calcite cement. Top 2ins (5cm) incorporate dark grey (N3) mudstone layer disrupted by sand-filled burrow with Spreiten.	2.5ft (0.8m)	9188.5ft (2800.7m)
Sandstone. As in 9142 to 9188.5ft (2786.5 to 2800.7m). Disruption of bedding by burrowing generally scarce. Common sand-filled, mud-lined, tubes, similar to <u>Phycodes</u> , from 9200 to 9201.5ft (2804.2 to 2804.6m).	37ft (11.3m)	9191ft (2801.4m)
Sandstone. As in 9142 to 9188.5ft (2786.5 to 2800.7m), but with widespread disruption of primary layering by burrowing. Numerous argillaceous partings and mudstone intercalations up to 1cm thick; some of latter are impregnated with siderite. Sideritic concretionary layer, 2ins (5cm) thick at 9229ft (2813m). Gradational contact with	14ft (4.3m)	9228ft (2812.7m)
BROOM FORMATION		
Shaly sandstone. Light olive grey (5Y6/1), fine- to coarse-grained, quartzose, micaceous, kaolinitic; in irregular lenses, bounded by interconnected, argillaceous partings. Scattered, carbonaceous flakes.	3.0ft (0.9m)	9242ft (2817m)
Sandstone. Light olive grey (5Y6/1), mostly fine-grained, with scattered coarse sand;	4.0ft (1.2m)	9245ft (2817.9m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
quartzose, micaceous; in planar, inclined laminae.		
Shaly sandstone. As in 9242 to 9245ft (2817 to 2817.9m). Coarse-grained. <u>Teichichnus</u> occurs throughout interval.	2.5ft (0.8m)	9249ft (2819.1m)
Shaly sandstone. As in 9242 to 9245ft (2817 to 2817.9m), coarse-grained, but with porosity plugged by abundant calcite cement. Irregular segregations of siderite in top 3ins (7.6cm).	3.5ft (1.0m)	9251.5ft (2819.9m)
Sandstone. Light olive grey (5Y6/1), coarse-grained, quartzose, micaceous, kaolinitic, in sub-horizontal laminae; with scarce lenticular segregations of siderite.	6.5ft (2m)	9255ft (2820.9m)
Sandstone. As in 9255 to 9261.5ft (2820.9 to 2822.9m) but with porosity plugged by abundant calcite cement. Numerous large flakes of carbonaceous mudstone at top of interval.	0.5ft (0.2m)	9261.5ft (2822.9m)
Shaly sandstone. Light olive grey (5Y6/1), coarse-grained, quartzose, micaceous, kaolinitic, in irregular lenses and continuous layers, delineated by mudstone partings and layers a few mm thick. Mudstone intercalations several cm in thickness in basal 1ft (0.3m) of interval; dark grey (N3) and medium dark grey (N2), silty, with sandy laminae, micaceous, non-calcareous. Top 6ins (15cm) with irregular segregations of siderite. Recovery about 5ft (1.5m).	14.5ft (4.4m)	9262ft (2823.1m)
Shaly sandstone. As in 9262 to 9276.5ft (2823.1 to 2827.5m). Sporadic occurrence of interstitial siderite above 9279ft (2828.3m). Downward increase in proportion of silty mudstone.	4.5ft (1.4m)	9276.5ft (2827.5m)
Shaly sandstone. As in 9262 to 9276.5ft (2823.1 to 2827.5m). Top 6ins (15cm) with irregular segregations of siderite.	2.5ft (0.8m)	9281ft (2828.8m)
Silty mudstone. Medium dark grey (N4) to dark grey (N3), micaceous, non-calcareous, with scattered lenses, continuous layers and floating grains of coarse sand.	1.5ft (0.5m)	9283.5ft (2829.6m)
Shaly sandstone. As in 9262 to 9276.5ft (2823.1 to 2827.5m). Top 2ins (5cm) with abundant interstitial siderite. Downward increase in proportion of silty mudstone.	2.5ft (0.8m)	9285ft (2830.1m)
Silty mudstone. As in 9283.5 to 9285ft (2829.6 to 2830.1m). Sideritic, concretionary layer, 3ins (7.6cm) thick at 9288ft (2831m).	1.0ft (0.3m)	9287.5ft (2830.8m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Shaly sandstone. As in 9262 to 9276.5ft (2823.1 to 2827.5m). Gradational contact with	1.0ft (0.3m)	9288.5ft (2831.1m)
DRAKE FORMATION (part)		
Silty mudstone. As in 9283.5 to 9285ft (2829.6 to 2830.1m). Several prominent intercalations of coarse-grained sandstone, strongly indurated, calcite-cemented: 1.5ins (3.8cm) at 9291.5ft (2832.0m), 1in (2.5cm) at 9292ft (2832.2m), 2ins (5cm) at 9293.5ft (2832.7m), and 1in (2.5cm) at base of interval. Numerous thinner layers of coarse-grained sandstone, as well as common lenses and laminae of fine-grained sandstone and siltstone.	6.5ft (2m)	9289.5ft (2831.4m)
Mudstone. Dark grey (N3), silty, micaceous, non-calcareous, with scattered calcite nodules; laminated.	7.0ft (2.1m)	9296ft (2833.4m)

Norwegian Well 33/9-3

Operator : Mobil
 Co-ordinates : 61°17'55.1"N 1°53'39.9"E
 Spudded : 15/9/74
 Drilling completed : 14/11/74
 KBE : 82ft (25.0m)
 Water depth : 484ft (147.5m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
NESS FORMATION (part)		
Siltstone. Medium light grey (N6) to medium grey (N5), sandy in places, quartzose, micaceous, with irregular sub-horizontal lamination. Plant rootlets present as carbonaceous streaks. Sharp contact with	3.0ft (0.9m)	8,261ft (2,518.0m)
ETIVE FORMATION		
Sandstone. Yellowish grey (5Y7/2) to light olive grey (5Y5/2), mostly medium- to coarse-grained, fine-grained in places; quartzose, micaceous, kaolinitic; in planar, inclined laminae, delineated by increased, interstitial clay and by sporadic concentrations of coalified plant debris. Large mica flakes in irregular mudstone partings and carbonaceous laminae.	45.0ft (13.7m)	8,264ft (2,518.9m)
No core.	12.0ft (3.6m)	8,309ft (2,532.6m)
Sandstone. Yellowish grey (5Y7/2) to light olive grey (5Y5/2), medium- to coarse-grained; quartzose, increasingly micaceous towards unit base, kaolinitic; in planar, inclined laminae. With irregular, carbonaceous partings and scattered plant debris. Sharp contact with		
RANNOCH FORMATION		
Sandstone. Yellowish grey (5Y7/2) to light olive grey (5Y5/2), fine-grained, quartzose, very micaceous, kaolinitic; in horizontal and planar, inclined laminae, delineated by variation in interstitial clay.	15.5ft (4.1m)	8,333ft (2,539.9m)
No core.	34.5ft (10.5m)	8,346.5ft (2,544.0m)
Sandstone. Yellowish grey (5Y7/2) to light olive grey (5Y5/2), fine-grained; quartzose, very micaceous, kaolinitic; in horizontal and planar, inclined laminae, defined by scattered, argillaceous partings. Very friable from 8,387 to 8,399.5ft (2,556.4 to 2,560.2m).	20.5ft (6.2m)	8,381ft (2,554.5m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Sandstone. Light grey (N7) to medium light grey (N6), fine-grained; quartzose, micaceous; in horizontal and planar, inclined laminae, which are prominently bipartite; strongly indurated, with abundant calcite cement. Sporadic occurrence of small (up to a few mm), spherical segregations of pyrite. Scattered plant debris.	3.5ft (1.1m)	8,401.5ft (2,560.7m)
Sandstone. Main lithology as in 8,381 to 8,401.5ft (2,554.5 to 2,562.7m). Very friable throughout most of interval; top 1ft (0.3m) with moderate induration, with bipartite laminae.	27.0ft (8.2m)	8,405ft (2,561.8m)
No core.	9.0ft (2.7m)	8,432ft (2,570.1m)
Sandstone. Yellowish grey (5Y7/2) to light olive grey (5Y5/2), fine-grained; quartzose, very micaceous, kaolinitic; in horizontal and planar, inclined laminae, commonly bipartite. Abundant calcite cement in 2ins (5cm) of laminated sandstone with abundant plant debris and small pyrite spherules at about 8,459ft (2,578.3m). Carbonaceous flakes and pyrite bodies at 8,468ft (2,581.0m). Bioturbation disrupts scarce argillaceous intercalations a few mm thick near base of interval. Calcite cement abundant in 3ins (7.6cm) of cross-laminated sandstone at 8,487ft (2,586.8m).	53.0ft (16.2m)	8,441ft (2,572.8m)
Sandstone. Yellowish grey (5Y7/2) to light olive grey (5Y5/2), fine-grained; quartzose, very micaceous, kaolinitic; in horizontal and planar, inclined laminae and micro-cross-laminae, commonly bipartite. Intercalations of mudstone up to a few mm thick occur sporadically, both solitary and grouped; latter as shaly sandstone layers a few cm thick. Mudstone dark grey (N3), non-calcareous, carbonaceous, laminated; frequently incorporates sand-filled tubular burrows; variably disrupted by bioturbation. Scattered plant debris. Intraformational breccia at about 8,497ft (2,589.9m) contains fragments of fine-grained, very micaceous sandstone and shaly sandstone up to 3cm diameter. Strongly indurated, with abundant calcite cement from 8,508 to 8,510ft (2,593.2 to 2,593.8m). Thin (up to a few mm) coal lenses in basal 6ins (15.2cm) of interval. With scattered pyrite segregations.	21.0ft (6.4m)	8,494ft (2,589.0m)
Sandstone. Main lithologies as in 8,494 to 8,515ft (2,589 to 2,595.1m), but bioturbated,	11,0ft (3.3m)	8,515ft (2,595.4m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
shaly sandstone very common, forming regularly repeated intercalations, a few cm thick; bioturbation has mostly affected the sandstones with grouped intercalations of mudstone. Undisrupted sandstones in layers up to a few cm thick. Plant debris sporadically very abundant. Thin coal lenses and pyrite segregations in top 3ins (7.6cm) of interval.		
Shaly sandstone. Yellowish grey (5Y7/2) light olive grey (5Y5/2), fine-grained; quartzose, very micaceous, kaolinitic; sandstone dominantly in irregular lenses and continuous layers, bounded by argillaceous partings and layers up to a few mm thick; extensively bioturbated with undisturbed, primary lamination very scarce throughout most of interval, becoming increasingly common below 8,534ft (2,601.2m). Strongly indurated, calcite-cemented sandstone, 4.5ins (11.4cm) thick, at 8,534ft (2,601.2m), with planar, inclined laminae. Gradational contact with	13.0ft (4.0m)	8,526ft (2,598.7m)
RANNOCH MUDSTONE		
Sandstone and mudstone. Sandstone medium grey (N5) and yellowish grey (5Y7/2) to light olive grey (5Y5/2), fine-grained, quartzose, micaceous, kaolinitic; in layers a few mm to 1cm thick, with horizontal laminae and micro-cross-laminae; replaced progressively by siltstone towards base. Intercalated mudstone dark grey (N3), non-calcareous, in layers of similar thickness, though generally increasing in proportion downwards. Sand-filled, tubular burrows common. Scattered plant debris. Sporadic occurrence of pyrite bodies. At bottom of interval, irregular lens of coarse-grained sandstone (c.f. Broom Formation), up to 8mm thick, occurs at base of bioturbated, sideritic siltstone layer.	15.0ft (4.6m)	8,539ft (2,602.7m)
No core.	2.0ft (0.6m)	8,554ft (2,607.3m)
BROOM FORMATION		
Shaly sandstone. Light grey (N7) to medium grey (N5), dominantly coarse-grained; quartzose, very feldspathic, kaolinitic; in irregular layers up to a few cm thick, separated by layers of siltstone and mudstone containing scattered, coarse sand grains. Mudstone dark grey (N3), silty micaceous non-calcareous, laminated. Top 6ins (15.2cm) strongly indurated, with abundant calcite cement. Interstitial pyrite also common.	1.0ft (0.3m)	8,556ft (2,607.9m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
Pyritized and calcareous ooids present. Scattered plant debris. Sharp contact with		
DRAKE FORMATION		
Mudstone. Dark grey (N3), silty, micaceous, non-calcareous, with common lenses and intercalations of sandstone and siltstone, generally a few mm thick. Sandstone yellowish grey (5Y7/2), fine-grained, quartzose, micaceous, kaolinitic; commonly micro-cross-laminated.	5.0ft (1.5m)	8,557ft (2,608.2m)

Norwegian Well 33/12-4

Operator : Mobil
 Co-ordinates : 61°14'19.2"N 1°53'27.5"E
 Spudded : 14/5/75
 Drilling completed : 17/7/75
 KBE : 82ft (25.0m)
 Water depth 478ft (145.7m)

<u>Description of strata</u>	<u>Thickness</u>	<u>Depth below KB</u>
UNDIFFERENTIATED BRENT GROUP (part)		
Sandstone. Yellowish grey (5Y7/2) to light olive grey (5Y5/2), fine- to medium-grained; quartzose, micaceous, kaolinitic; in horizontal and planar, inclined laminae, delineated by variation in interstitial clay and irregular, argillaceous partings; above 8,833ft (2,692.3m), latter are scarce and mostly solitary, but grouped and abundant below that level. Mudstone dark grey (N3), silty in places, micaceous, non-calcareous, laminated.	22.0ft (6.7m)	8,824ft (2,689.6m)
Sandstone. Yellowish grey (5Y7/2) to light olive grey (5Y5/2), fine-grained, quartzose, micaceous, kaolinitic; in irregular laminae, disrupted by closely spaced, minor faults.	1.0ft (0.3m)	8,846ft (2,696.3m)
Sandstone. Medium grey (N5), coarse-grained (c.f. Broom Formation); quartzose, very feldspathic, micaceous, kaolinitic; lamination irregular, delineated by intercalations of sandy mudstone, up to a few mm thick. Mudstone dark grey (N3), non-calcareous, micaceous. Sandstone with abundant calcite cement in places, interstitial pyrite common. Scarce calcareous and pyritic ooids.	2.0ft (0.6m)	8,847ft (2,696.6m)
Sandstone. Light grey (N7) and yellowish grey (5Y7/2), fine-grained; quartzose, micaceous kaolinitic; in horizontal and planar, inclined laminae, bipartite in top 4ft (1.2m), contorted and disrupted by faulting below 8,856ft (2,699.3m). For the most part, strongly indurated, with abundant calcite cement. Sporadic occurrence of argillaceous partings.	10.0ft (3.0m)	8,849ft (2,697.2m)

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TABLE 1 - LIST OF WELLS

<u>UK Well</u>	<u>Operator</u>	<u>Location</u>	<u>Page</u>
2/5-2	Union	60° 57' 3.9"N 0° 55' 0.6"E	2
2/5-3	Union	60° 58' 37.0"N 0° 58' 54.4"E	5
2/5-4	Union	60° 56' 35.8"N 0° 58' 19.3"E	10
2/5-6	Union	60° 56' 8.1"N 0° 50' 7.0"E	12
3/2-2	Conoco	60° 53' 52.9"N 1° 12' 31.7"E	13
3/3-2	Burmah	60° 53' 47.4"N 1° 25' 46.4"E	16
3/3-3	Burmah	60° 55' 27.8"N 1° 25' 13.2"E	18
3/3-4A	Burmah	60° 51' 44.5"N 1° 31' 0.0"E	21
3/3-5A	Burmah	60° 51' 5.1"N 1° 24' 44.8"E	23
3/3-6	Chevron	60° 56' 32.0"N 1° 24' 35.7"E	28
3/7-1	Chevron	60° 46' 5.4"N 1° 21' 49.6"E	31
3/7-2	Conoco	60° 49' 40.3"N 1° 23' 12.8"E	35
3/8-2	B.P.	60° 47' 11.0"N 1° 25' 48.0"E	37
3/8-3	B.P.	60° 45' 0.6"N 1° 25' 10.7"E	39
3/8-4	B.P.	60° 40' 3.7"N 1° 34' 51.1"E	40
3/9A-2	Total	60° 47' 23.1"N 1° 44' 36.7"E	42
3/14A-3	Total	60° 39' 20.0"N 1° 37' 54.5"E	45

<u>UK Well</u>	<u>Operator</u>	<u>Location</u>	<u>Page</u>
3/23-1	Ball & Collins	60° 10' 30.7"N 1° 35' 25.2"E	48
210/24-1	Amoco	61° 13' 33.0"N 0° 40' 3.6"E	49
210/25-1	Shell	61° 16' 42.0"N 0° 54' 9.5"E	51
210/25-2	Shell	61° 14' 29.5"N 0° 55' 14.1"E	54
211/11-1	Arpet	61° 35' 47.6"N 1° 9' 53.2"E	57
211/18-6	Signal	61° 24' 13.1"N 1° 32' 33.0"E	64
211/18-8	Burmah	61° 23' 27.4"N 1° 32' 36.2"E	65
211/19-1	Conoco	61° 21' 25.5"N 1° 36' 37.7"E	66
211/19-3	Conoco	61° 24' 36.4"N 1° 42' 59.2"E	68
211/19-4	Conoco	61° 24' 26.2"N 1° 44' 58.8"E	71
211/19-6	Conoco	61° 26' 37.3"N 1° 42' 52.8"E	77
211/21-1A	Shell	61° 11' 13.6"N 1° 5' 43.2"E	79
211/21-2	Shell	61° 12' 53.8"N 1° 9' 40.2"E	81
211/21-3A	Shell	61° 15' 32.0"N 1° 8' 15.0"E	85
211/23-1	Shell	61° 16' 26.4"N 1° 35' 29.0"E	89
211/24-2	Conoco	61° 18' 4.9"N 1° 35' 2.7"E	93
211/24-3	Shell	61° 15' 25.7"N 1° 37' 18.5"E	97

<u>UK Well</u>	<u>Operator</u>	<u>Location</u>	<u>Page</u>
211/24-4	Conoco	61° 10' 42.6"N 1° 46' 36.7"E	99
211/26-1	Shell	61° 7' 43.1"N 1° 6' 23.7"E	103
211/26-3	Shell	61° 5' 11.3"N 1° 1' 42.5"E	106
211/26-4	Shell	61° 2' 0.9"N 1° 7' 27.82"E	107
211/27-1A	Amoco	61° 2' 55.2"N 1° 23' 26.2"E	110
211/27-4A	Amoco	61° 6' 30.7"N 1° 17' 8.0"E	111
211/28-1A	Conoco	61° 4' 21.2"N 1° 24' 13.0"E	115
211/29-3	Shell	61° 8' 6.0"N 1° 43' 36.5"E	121
<u>Norwegian Well</u>	<u>Operator</u>	<u>Location</u>	<u>Page</u>
33/9-3	Mobil	61° 17' 55.1"N 1° 53' 39.9"E	125
33/12-4	Mobil	61° 14' 19.2"N 1° 53' 27.5"E	129