Appendix 1*

Field name	Albury	Andrew	Arbroath	Arkwright
Segment name				
Page no. in Memoir 20	937	133	611	611
Trap				
Type	Structural fault block	Four-way dip closed anticline	Domal antiform	Four-way dip closure
Depth to crest (ft TVDss)	2050	7972	8030	8500
Lowest closing contour (ft)	–	8379	8250	8607
GWC (ft)	2144 (GDT)	–	–	8607–8620
OWC (ft)	–	8379	8250	–
GOC (ft)		8189	–	–
Gas column (ft)	–	217	–	–
Oil column (ft)	–	190	220	151
Pay zone				
Formation	Purbeck Sandstone	Andrew Formation	Forties	Forties
Age	Lower Cretaceous	Palaeocene	Paleocene	Paleocene
Gross thickness (range) (ft)	21	<407	330 (260–440)	502
Net/gross ratio (%)	12.5	0.97	0.5 (0.3–0.8)	0.78 (0.6–0.9)
Porosity average (range) (%)	25.3	20 (10–23)	24 (3–30)	19 (16–21)
Permeability average (range) (mD)	1067	200 (20–500)	80 (1–2000)	40 (20–50)
Petroleum saturation average (range) (%)	84	0.9 (0.89–0.91)	55 (25–65)	51 (25–73)
Production index	–	–	–	–
Hydrocarbons				
Oil density (°API)	31	40	0.28	0.66
Gas gravity (°API)	0.574	–	38–42	38–42
Viscosity (cp)	–	0.286	0.4	0.43
Bubble point (psia)	–	3720	1991	2670
Dew point	–	–	–	–
Gas/oil ratio (SCF/BBL)	–	871	490	700
Formation volume factor (RB/STB)	–	1.52	1.327	1.456
Gas expansion factor (SCF/RCF)	77	2.07	–	–
Formation water				
Salinity (ppm NaCl eq.)	80 000	50 000	135 000	55 000
Resistivity (ohm m)	0.072@89°F	–	0.023@245°F	0.023@245°F
Reservoir conditions				
Temperature	–	–	–	–
Pressure (psi)	–	–	–	–
Field characteristics				
Area (acres)	300	–	7712	1473
Gross rock volume (acre ft)	–	–	555 000	12 600
Initial pressure (psi)	1100	3720	3700	3700
Temperature (°F)	89	230	245	250
Oil initially-in-place (MMBBL)	–	292	334	73
Gas initially-in-place (BCF)	7–22	200	–	–
Recovery factor (%)	–	46	51	34
Drive mechanism	Gas expansion	Active aquifer drive and gas injection	Aquifer drive/gas lift	Aquifer drive
Recoverable oil (MMBBL)	–	140	170	25
Recoverable gas (BCF)	2–3	240	–	–
Recoverable NGL/condensate (MMBBL)	–	219	–	–
Production				
Start-up date	February 1995	Jul 96	1990	1996
Production rate plateau oil (BOPD)	–	60 500	42 000	8000
Production rate plateau gas (MMSCF/D)	0.5	60	12 production wells	2 producers
Number/type of wells	1	12 producers 1 gas injection	8 injection wells	1 injector well

*Updated and improved compilation of field statistics compiled and checked by R. Bailey and P. Dromgoole.

Field name	Armada			Auk	
Segment name	Fleming	Drake	Hawkins		
Page no. in Memoir 20	139	139	139	485	
Trap					
Type	Stratigraphical/structural	Tilted and inverted fault block	Four-way closure over salt diapir	Structural	
Depth to crest (ft TVDss)	8500	10 920	9500	7300	
Lowest closing contour (ft)	9200	11 322	10 2000	7750	
GWC (ft)	9191	11 322	10 145	n/a	
OWC (ft)	–	–	–	–	
GOC (ft)	–	–	–	–	
Gas column (ft)	700	400	650	0	
Oil column (ft)	–	–	–	450	
Pay zone					
Formation	Maureen Formation	Fulmar Formation	Fulmar Formation	Auk Formation	Turbot Bank & Halibut Bank
Age	Paleocene	Upper Jurassic	Upper Jurassic	Permian Rotliegend	Permian Zechstein
Gross thickness (range) (ft)	0–300	–	450	1000	30
Net/gross ratio (%)	0.55	0.98	0.70	0.85 (0.46–0.92)	1.0 (fractures)
Porosity average (range) (%)	0.18	22	17	19 (11–27)	13 (2–26)
Permeability average (range) (mD)	200	60	5	5 (0.2–125)	53 (0.02–620)
Petroleum saturation average (range) (%)	81	88	64	55–80	–
Production index	–	–	–	1 (vertical well average)	50–159
Hydrocarbon					
Oil density (°API)	50	54	47	38	
Gas gravity (°API)	0.65	0.67	0.66	–	
Viscosity (cp)	0.025	0.033	0.031	0.9	
Bubble point (psia)	–	–	–	700	
Dew point	3970	5200	–	–	
Gas/oil ratio (SCF/BBL)	–	–	–	190	
Formation volume factor (RB/STB)	–	–	–	1.54	
Gas expansion factor (SCF/RCF)	200	244	245	–	
Formation water					
Salinity (ppm NaCl eq.)	–	–	–	105 000	
Resistivity (ohm m)	0.124@60°F	0.076@60°F	0.07@60°F	0.025@205°F	
Reservoir conditions					
Temperature	–	–	–	–	
Pressure (psi)	–	–	–	–	
Field characteristics					
Area (acres)	13 244	1161	1359	22 980	
Gross rock volume (acre ft)	–	–	–	28×10^6	
Initial pressure (psi)	4092	6185	5544	4067@7600 ft TVDss	
Temperature (°F)	257	293@ − 11 200 ft	276@ − 10 000 ft	215	
Oil initially-in-place (MMBBL)	–	–	–	795	
Gas initially-in-place (BCF)	1064	472	225	133	
Recovery factor (%)	–	–	–	19	
Drive mechanism	Depletion	Depletion	Depletion	Natural water drive/artificial lift	
Recoverable oil (MMBBL)	–	–	–	151	
Recoverable gas (BCF)		Armada total 1200			
Recoverable NGL/condensate (MMBBL)		Armada total 70			
Production					
Start-up date	October 1997	October 1997	October 1997	January 1976	
Production rate plateau oil (BOPD)	(20 000–23 000 Armada total)	–	–	70 000 peak rate	
Production rate plateau gas (MMSCF/D)	(450 off-platform Armada total)	–	–	n/a	
Number/type of wells	5 high angle extended reach	2 extended reach S-shaped	1 high angle extended reach	10 explorative/appraisal, 23 deviated development wells/ production sidetracks, 8 horizontal sidetracks	

Balmoral	Banff	Barque	Beaufort
395	497	663	705
No information provided (see Memoir 14)	Four-way dip closure over salt diapir, with side, top and updip seal provided by shaly lithologies	Dip closure with anticlinical rollover against fault	Tilted fault block
	4249 (approximately)	7000	8400
	9600 (approximately). Structure is not full to spill	–	8618
	–	8570–8850	8618
	7610	–	–
	4551	–	–
	298 (approximately)	Up to 1600	218
	3059	–	–
	Ekofisk and Tor chalk. Oil is present in overlying Paleocene sands, but this oil is not considered recoverable except to the extent which it drains into the chalk	Leman Sandstone (Rotliegend)	Leman Sandstone
	Late Cretaceous (Tor Formation) and Early Paleocene (Danian) (Ekofisk Formation)	Lower Permian	Early Permian
	Ekofisk and Tor ranging from approximately 1000 ft (300 m) near FWL, thinning to zero at updip edges of raft	700–800	270
	69.8	–	0.95–1.0
	Mean = 20.3 (P90/P10 10–27)	11.1	17 (10–24)
	0.1–10 (Chalk)	0.02–100	30 (1–1000)
	Mean = 62.3	51	80
	200–300	–	–
	–	–	–
	38–40	0.59	0.609
	–	–	0.023
	2660@GOC	–	–
	–	–	–
	600–800	–	–
	1.31	–	–
		228	228
	64 000	160 000 ppm chloride 200 000 ppm NaCl equivalent	196 200
	0.115@60°F (15.5°C)	0.02	0.0185
	77–99°F (25–37°C)	175°F	–
	2600–3750, depending on reservoir elevation	3800–3850 at datum 8200 ft TVDss	–
	1000	9000	419
	563 928 acre ft	–	3.4×10^4
	–	–	4001
	–	–	195
	304	–	–
	–	3020 (includes barque 'J' area)	40
	26	–	80
	Water injection	–	Volumetric
	78	–	–
		1366	32
	Phase 1: September 1996, Phase 2: January 1999	October 1990	1996
	Up to 60 000	–	–
	–	–	25
	2 producers 2 injectors	Two normally unmanned platforms, installed 1990 and 1994 17 development wells (+1 producing appraisal) to date 2 further development wells planned in 2000–1 Future infill drilling dependent on well/field performance	1 production

Field name	Beinn	Beryl	Bessemer	Birch
Segment name				
Page no. in Memoir 20	199	153	705	167
Trap				
Type	–	See page 165 Beryl comprises 5 separate accumulations	Tilted fault block	Combination structural/stratigraphic landslide closure
Depth to crest (ft TVDss)	14 400		8450	12 868
Lowest closing contour (ft)			8696	13 250
GWC (ft)	–		8696	
OWC (ft)	–		–	13 815
GOC (ft)	–		–	–
Gas column (ft)	–		218	–
Oil column (ft)	–		–	947
Pay zone				
Formation	Hugin		Leman Sandstone	Brae Formation/Brae Conglomerate
Age	Middle Jurassic (Oxfordian)		Early Permian	Late Jurassic
Gross thickness (range) (ft)	–		250	947
Net/gross ratio (%)	–		0.95–1.0	83
Porosity average (range) (%)	–		17 (10–24)	10.5 (0.8–27.7)
Permeability average (range) (mD)	–		30 (1–1000)	94.3 (0.01–4480)
Petroleum saturation average (range) (%)	–		80	70.2
Production index	–		–	5–120
Hydrocarbons				
Oil density (°API)	–		–	42–43
Gas gravity (°API)	–		0.609	0.90
Viscosity (cp)	–		0.023	0.14
Bubble point (psia)	–		–	4225
Dew point				
Gas/oil ratio (SCF/BBL)	–		–	2648
Formation volume factor (RB/STB)	–		–	2.4
Gas expansion factor (SCF/RCF)	–		228	–
Formation water				
Salinity (ppm NaCl eq.)	–		196 200	100 000
Resistivity (ohm m)	–		0.0185	0.0935
Reservoir conditions				
Temperature	–		–	–
Pressure (psi)	–		–	–
Field characteristics				
Area (acres)	–		1050	988
Gross rock volume (acre ft)	–		9.4×10^4	423 343
Initial pressure (psi)	–		4029	7462
Temperature (°F)	–		195	270
Oil initially-in-place (MMBBL)	–		–	75
Gas initially-in-place (BCF)	–		130	–
Recovery factor (%)	–		80	42
Drive mechanism	Pressure depletion		Gas expansion	Waterflood
Recoverable oil (MMBBL)	–		–	30
Recoverable gas (BCF)	–		100	54
Recoverable NGL/condensate (MMBBL)	–		–	4.1
Production				
Start-up date	1992		1995	September 1995
Production rate plateau oil (BOPD)	20 000		–	28 000
Production rate plateau gas (MMSCF/D)	–		50	70 000
Number/type of wells	4 producers		2 production	1 exploration 3 appraisal 2 development

Bletchingley	Boulton B	Brae		
		Central	East	North
937	671	183	191	199
Structural faulted dome	Tilted fault block	Structural/stratigraphic	Four-way dip closure	Three-way dip + fault
3380 South; 3050 North	12 400–12 570	11 570	12 680	11 920
3750 South; 3750 North	Field full to spill	12 000	13 735	–
Not seen	–	13 426	13 735	12 475
–	–	–	–	–
–	–	–	–	–
–	250–420	–	1055	–
–	–	1676	–	–
Corallian Limestone	Westphalian C Lower Ketch unit	Brae	Brae	Brae
Upper Jurassic	Carboniferous	Late Jurassic (Kimmeridgian–Early Volgian)	Late Jurassic (Kimmeridgian–Late Mid-Volgian)	Late Jurassic (Kimmeridgian–mid-Volgian)
131	580 (550–700)	800 (0–1676)	1055	Variable 800–1150
50	0.37 (0.32–0.42)	0.6	0.85	0.85
10	10 (8.0–12.0)	11.5	17 (3.4–28.7)	15 (7–23)
<1	73 (0.1–1000)	100 (1–1000)	558 (0.04–8490)	300 (0.3–2000)
48	61	80	84 (80–95)	85
–	–	–	20–100 (wet gas)	60
–	–	–	39–40	39–50
–	0.65	33	0.85	0.85
–	–	–	0.05–0.11	0.05–0.11
–	–	4112	6330–7356	–
–	–	–	–	5500–6000
168	–	1415	–	2500–6500
–	–	1.77	1.04	–
110 South; 100 North	295	–	–	–
85 000	2000 000 ppm	79 000	45 000–72 000	77 000
0.06 @ 120°F	0.16	0.098 @ 60°F	0.04616 @ 255°F	0.12 @ 60°F
–	240°F @ 12 555 ft	246°F @ 12 600 ft TVDss	–	–
–	0.17	7057 @ 12 600 ft TVDss	–	–
3700	–	1800	5302	4700
–	619 000	675 000	1.32×10^6	1 600 000
–	6490 psia @ 12 555 ft	–	7456	6900 @ 12 475 TVDss
120	–	–	254.7	260
–	–	–	447	–
1–16	206	–	2303	–
–	69	20	80	80
Fluid Exp./sol'n gas	–	–	Gas recycle	Gas recycle
–	–	65–75	242	–
–	142	–	1530	800
–	–	–	19	207
–	December 1997	September 1989	December 1993	March 1988
–	–	7500	115 331	81 500
–	–	–	750	600
0	–	1 exploration 5 appraisal 10 development (to May 1999)	1 exploration 5 appraisal 26 development	1 discovery 6 appraisal 27 development

Field name	Brae			Brent	
Segment name	South	West		Brent Reservoir	Statfjord Reservoir
		Balder Reservoir	Flugga Reservoir		
Page no. in Memoir 20	211	223		233	
Trap					
Type	Combination structure/ stratigraphic	Structural/stratigraphic	Structural	Unconformity: tilted fault block	Unconformity: tilted fault block
Depth to crest (ft TVDss)	11 821	−5350	−5450	8240	9000
Lowest closing contour (ft)	12 100	−5620	−5652	9300	10 700
GWC (ft)	13 488	−5516 (16/07a) −5433 (16/06a)	−5500 (16/07a)	8560	9100
OWC (ft)	–	−5650 (16/07a)	−5652 (16/07a)	9040	9690
GOC (ft)	–	–	–	–	–
Gas column (ft)	–	166 (16/07a)/13 (16/06a)	50 (16/07a)	320	100
Oil column (ft)	1670	104 (16/07a)/187 (16/06a)	152 (16/07a)	480	590
Pay zone					
Formation	Brae	–	–	Brent Group	Statfjord Formation
Age	Upper Jurassic (Kimmeridgian–mid-Volgian)	–	–	Middle Jurassic	Lower Jurassic/Triassic
Gross thickness (range) (ft)	800 (0–1670)	58	72	810 (780–850)	850 (800–1000)
Net/gross ratio (%)	0.75	87	85	–	–
Porosity average (range) (%)	11.5	31.0	29.2	21 (16–28)	23 (16–29)
Permeability average (range) (mD)	131 (1–2100)	7500	6000	650 (10–6000)	500 (20–10 000)
Petroleum saturation average (range) (%)	80	92	92	–	–
Production index	10–40	350–500	250	–	–
Hydrocarbons					
Oil density (°API)	1.02–1.05	22	22	–	–
Gas gravity (°API)	33–37	–	–	54.7 (oil), 0.74 (gas)	53.0 (oil), 0.76 (gas)
Viscosity (cp)	–	5.75	3.5	–	–
Bubble point (psia)	3702	2455–2485	2485	–	–
Dew point	–	–	–	–	–
Gas/oil ratio (SCF/BBL)	1343	271	296	1.58	2.17
Formation volume factor (RB/STB)	1.73	1.16	1.15	1.80	2.04
Gas expansion factor (SCF/RCF)	–	–	–	–	–
Formation water					
Salinity (ppm NaCl eq.)	75 000	600 000	60 000	25 000	24 000
Resistivity (ohm m)	0.120 @ 60°F	0.138 @ 60°F	0.138 @ 60°F	0.236 @ 77°F	0.270 @ 77°F
Reservoir conditions					
Temperature	253°F @ 12 740 ft TVDss	–	–	204°F	218°F
Pressure (psi)	7128 @ 12 740 ft TVDss	–	–	5785	6020
Field characteristics					
Area (acres)	6000	1213	650	30 sq miles	
Gross rock volume (acre ft)	2 750 300	69 936	46 968	–	
Initial pressure (psi)	–	2525 @ −5620 ft TVDss	2640 @ −5652 ft TVDss	–	
Temperature (°F)	–	145	145	–	
Oil initially-in-place (MMBBL)	–	116	76	–	
Gas initially-in-place (BCF)	–	35 (16/07a)/0.34 (16/06a)	5 (16/07a)	–	
Recovery factor (%)	33	31	31.5	–	
Drive mechanism	–	Water drive	Water drive	Water injection, gas injection; depressurization	
Recoverable oil (MMBBL)	–	36	24	6000	
Recoverable gas (BCF)	–	–	–	–	
Recoverable NGL/condensate condensate (MMBBL)	–	–	–	–	
Production					
Start-up date	July 1983	20 October 1997	20 October 1997	November 1976	
Production rate plateau oil (BOPD)	–	35 000 (first 4 wells only)	35 000 (first 4 wells only)	97 000	
Production rate plateau oil (MMSCF/D)	–	–	–	866	
Number/type of wells	2 exploration 6 appraisal 42 development	5 horizontal producers 1 water injector	5 horizontal producers 1 water injector	– –	

Brimmond	Britannia	Brown	Camelot
557	415	705	681
Structure & stratigraphic	Combined stratigraphic/structural	Horst block	Fault terraces, tilted fault blocks
6365	11 800	8325	6050
6460	–	8565	–
–	–	8565	6232 (South) 6244 (Central)
6460	12760–13154	–	–
–	–	–	–
–	West 1000, East 1250	240	200
50	0–85	–	–
Balder	Britannia	Leman Sandstone	Leman Sandstone
Eocene	Lower Cretaceous (Aptian)	Early Permian	Lower Permian (Rotliegend Gp)
30	250 (100–600)	700	700–800
–	West 12–30, East 28–58	0.95–1.0	1.0 (0.98–1.0)
33–34	15 (0–20) (net pay >10)	16 (10–24)	19 (15–22)
1100	West 60 (0.1–800), East 30 (0.1–400) (net pay > 0.1)	30 (1–1000)	150 (5–4500)
60–80	–	60	80 (max)
6–9	–	–	–
23.9	–	–	–
–	–	0.597	0.615 relative to air
5.8	–	0.022	–
–	–	–	–
–	–	–	–
106	–	–	–
–	–	–	–
–	–	223	192
45 700	17 000–100 000 +	225 800	180 000
0.056	0.04–0.11	0.0194	0.025 @ 150°F
–	West 129°C, East 145°C	–	140°F
–	5990 at start of production	–	2800
400–700	61 000	370	2200
–	–	4×10^4	219 000
2863	–	3968	–
–	–	–	–
14.8	–	–	–
–	–	35	280
10–15	–	70	90
Aquifer support	Pressure depletion	Gas expansion	Moderate water drive
1.4	–	–	–
–	3000	25	251
–	131	–	–
September 1975	August 1998	1998	–
–	50	–	–
–	800	30	–
2 producers	19 gas/condensate producers 22 additional wells planned	1 horizontal producer	–

Field name	Captain	Clipper	Corvette	Curlew		
Segment name				Curlew B	Curlew D	Curlew D South
Page no. in Memoir 20	431	691	699	509		
Trap						
Type	Drape anticline/ stratigraphic pinch-out	Faulted anticline, multiple culminations	Faulted pop up	Fault-dip	Fault-dip	Fault-dip
Depth to crest (ft TVDss)	–	7500	8000	10 550	10 087	10 300
Lowest closing contour (ft)	–	–	9000	10 900	10 790	11 000
GWC (ft)	–	8530	–	–	10 644	–
OWC (ft)	–	–	–	10 722	–	10 890
GOC (ft)	–	–	–	–	–	–
Gas column (ft)	–	Up to 1000	941	–	555	–
Oil column (ft)	270	–	–	172	–	590
Pay zone						
Formation	Valhall/Wick Sandstone	Leman Sandstone (Rotliegend)	Leman Sandstone	Upper Fulmar	Fulmar	Fulmar
Age	Late Aptian	Early Permian	Permian	Upper Jurassic	Upper Jurassic	Upper Jurassic
Gross thickness (range) (ft)	300	650–775	220	530	568	856
Net/gross ratio (%)	0.95	–	100	87 (85–95)	82 (43–96)	67 (40–90)
Porosity average (range) (%)	31 (28–34)	11.1	20	21 (10–24)	17 (5–27)	17 (5–26)
Permeability average (range) (mD)	7 (1–12)	0.02–100	400	20 (0.001–250)	450 (0.001–8000)	450 (0.001–3500)
Petroleum saturation average (range) (%)	84 (68–94)	49	85	54 (39–59)	72 (50–96)	51 (50–95)
Production index	–	–	–	20	50	58
Hydrocarbons						
Oil density (°API)	–	–	–	39	44	40
Gas gravity (°API)	19–21 (oil), 0.52 (gas)	0.59	0.59	0.82	0.86	0.86
Viscosity (cp)	–	–	–	0.4	0.1	0.2 (initial)
Bubble point (psia)	1270 @ 2799 ft TVDss	–	–	3130	–	4255
Dew point	–	–	–	–	–	–
Gas/oil ratio (SCF/BBL)	88–140	–	–	1078	–	2200
Formation volume factor (RB/STB)	1.03–1.06	–	–	1.5	–	1.9
Gas expansion factor (SCF/RCF)	–	–	232	–	–	–
Formation water						
Salinity (ppm NaCl eq.)	12 000–25 000	200 000 (1 60 000 chloride)	200 000	200 000	200 000	200 000
Resistivity (ohm m)	0.394 @ 87°F	0.02	0.018	0.014	0.014	0.014
Reservoir conditions						
Temperature	87°F	175	186°F	–	–	–
Pressure (psi)	1340 @ −2992 ft TVDss	3850 @ 8200 ft TVDss	4083	–	–	–
Field characteristics						
Area (acres)	9400	12 000	795	2.60	3.87	1.57
Gross rock volume (acre ft)	–	–	–	54438	489 011	99 076
Initial pressure (psi)	–	–	–	7298	7319	7285
Temperature (°F)	–	–	–	250	250	252
Oil initially-in-place (MMBBL)	1000	–	–	24	100	8
Gas initially-in-place (BCF)	–	1171	236	25	340	17
Recovery factor (%)	20–40	–	89	25	32	25
Drive mechanism	Full voidage replacement, water injection	–	Depletion	Natural depletion	Natural depletion	Natural depletion
Recoverable oil (MMBBL)	–	–	–	6	26	2
Recoverable gas (BCF)	–	753	211	4	74	4.4
Recoverable NGL/ condensate (MMBBL)	–	–	–	1	16	0
Production						
Start-up date	March 1997	October 1990	January 1999	November 1997	February 1998	March 2000
Production rate plateau oil (BOPD)	55 000–85 000	–	–	23 000	34 000	20 000
Production rate plateau gas (MMSCF/D)	–	–	–	25 000	115 000	40 000
Number/type of wells	–	–	2 production	1 horizontal oil producer	2 vertical gas producers	1 vertical oil producer

Cyrus	Davy	Deveron	Don
133	705	251	257
4 way dip	Tilted fault block	Rotated fault block/dip	Fault blocks
8246	7300	8700	10 900
8379	7743	9000	11 500
–	7743	–	11 320–11 430
8379	–	8910	–
–	–	–	–
–	443	–	–
115	–	210	500
Andrew Sandstone	Leman Sandstone	Brent Group	Brent Group
Palaeocene	Early Permian	Middle Jurassic	Middle Jurassic
160	300	450	420
0.37–0.95	0.9–1.0	–	20–80
19.6	16 (10–24)	24 (16–30)	0.16 (0.12–0.28)
240	30 (1–1000)	(100–3000)	(5–40)
55	70	70	–
50	–	–	4–15
35.0	–	38	37–42
–	–	–	–
–	0.6	–	–
–	0.022	1.05 @ 4500 psia	0.32–0.87
1308	–	617	1225–2950
–	–	–	–
–	–	150	335–944
1.19	–	1.133	1.25–1.47
–	206	–	–
50 000	225 800	13 000	21 596
–	0.0194	0.253	0.314
232	–	–	–
–	–	–	–
–	1482	512	700
–	2.0×10^5	50 000	200 000
2430	3562	4700	7240–7350
232	190	220	265
82	–	54	52 (NE), 99 (SW)
–	200	–	–
20.6	87	28.5	14.6 (NE), 8 (SW)
Aquifer drive	Gas expansion	Depletion	Depletion, waterflood
16.52	–	15.4	7.6 (NE), 8.2 (SW)
–	175	–	–
–	–	–	–
April 1990	1995	September 1984	August 1989
17 800	–	7000	10 000
–	80	–	–
–	4 producers	1 producer 2 P & A	1 producer 1 injector

Field name	Douglas	Dunbar	Ellon	Erskine
Segment name				
Page no. in Memoir 20	63	265	265	523
Trap				
Type	Structural	See page 280 for field segment data		See page 534 for field segment data
Depth to crest (ft TVDss)	2140			
Lowest closing contour (ft)	–			
GWC (ft)	2515–2535			
OWC (ft)	–			
GOC (ft)	–			
Gas column (ft)	–			
Oil column (ft)	375			
Pay zone				
Formation	Ormskirk Sandstone			
Age	Triassic			
Gross thickness (range) (ft)	–			
Net/gross ratio (%)	0.90–1.0			
Porosity average (range) (mD)	Zone I 18, Zone II 13.7			
Permeability average (range) (mD)	Zone I 2000, Zone II 300			
Petroleum saturation average (range) (%)	–			
Production index	5–30			
Hydrocarbons				
Oil density (°API)	–			
Gas gravity (°API)	44			
Viscosity (cp)	–			
Bubble point (psia)	285			
Dew point	–			
Gas/oil ratio (SCF/BBL)	170			
Formation volume factor (RB/STB)	1.075			
Gas expansion factor (SCF/RCF)	–			
Formation water				
Salinity (ppm NaCl eq.)	270 000			
Resistivity (ohm m)	0.030 @ 30°C			
Reservoir conditions				
Temperature	30°C			
Pressure (psi)	1125 @ 2240 ft TVDss			
Field characteristics				
Area (acres)	6.5			
Gross rock volume (acre ft)	240 000			
Initial pressure (psi)	–			
Temperature (°F)	–			
Oil initially-in-place (MMBBL)	202			
Gas initially-in-place (BCF)	–			
Recovery factor (%)	–			
Drive mechanism	Water injection			
Recoverable oil (MMBBL)	–			
Recoverable gas (BCF)	–			
Recoverable NGL/condensate (MMBBL)	–			
Production				
Start-up-date	February 1986			
Production rate plateau oil (BOPD)	–			
Production rate plateau gas (MMSCF/D)	–			
Number/type of wells	5 exploration/appraisal 11 producers 7 water injectors			

Fergus	Fife		Flora	Foinaven	Forties
	Fife Field	Fife Chalk oil pool			
537	537		549	121	557
Four-way dip closure	Four-way dip closure	Three-way dip closure/diagenetic trap	Tilted fault block	Anticline/stratigraphic	Four-way dip closure anticline
8640	8250	8000	8500	6610	6660
8780	8512	–	8745	7221	7274
–	–	–	–	6719–6841	–
8780	8512	Variable, oil down to 8150 (OWC)	–	7221	7274
–	–	–	–	–	–
–	–	–	–	322	322
140 vertical closure	262 vertical closure	150 vertical closure	245	367–578	367–518
Fife Sandstone Member	Fife Sandstone Member	Tor Formation	Flora Sandstone	Valia Formation	Forties Formation
Late Jurassic	Late Jurassic	Upper Cretaceous	Westphalian C (Carboniferous) to Asselian (Permian)	Late Paleocene	Paleocene
440	300–500	180–360	>1000	250	1161 (653–1539)
90	81	45	Average 85, Vsh 50	55	0.65
26.5	24 (0–31)	24.5 (23–27)	21	27 (22–30)	0.27 (0.10–0.36)
500 (1–4000)	50 (1–6000)	0.75 (0–4)	1–10 000	800 (500–2000)	700 (30–4000)
40	40	40–60	70	80 (70–85)	0.85
29	20	–	–	5–40	25 (5–70)
36.4	36.4	36.4	–	24–27	37
1.081	1.081	1.081	8.20	–	–
1.32	1.32	1.32	–	3.5–4.0	0.76
490	490	490	–	3141	1142–1390
–	–	–	–	–	–
96	96	96	98	350	300
1.108	1.108	1.108	1.129	1.17	1.22
–	–	–	–	2.17	–
61 340	61 340	61 340	69 000	18 000	55 000
0.041	0.041	0.041	0.1002	0.22	0.034
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	914	23 000
–	–	–	–	15.4×10^6	1.5×10^6
5650 @ 8500 ft TVDss	5650 @ 8500 ft TVDss	5650 @ 8500 ft TVDss	5750 @ 8600 ft TVDss	3242	3215
223	226	226	2360	137	96
16.3	132	23	69	1097	4196
–	–	–	–	244	–
69	37	0	19	23	57
Edge water drive	Edge water drive/injection	–	Aquifer support/ water injection	Aquifer and water flood	Predominantly bottom drive aquifer with peripheral water injection
11.3	48.3	0	13	250	2545
–	–	–	–	–	550–650
–	–	–	–	–	9
1996	1995	–	October 1998	November 1997	September 1975
18 000 (peak)	50 000 (peak)	–	30 000	86 000	520 000
–	–	–	–	–	–
1 producer	5 producers 1 injector	– –	2 horizontal producers	15 horizontal producers 6 inclined water injectors 1 gas injector	142 well slots 103 wells 59 producers 11 water injectors 72 spares/dead

Field name *Segment name*	Fulmar	Gawain	Glamis	Goodworth	Grant
Page no. in Memoir 20	563	713	395	929	265
Trap					
Type	Salt induced eroded anticline	Tilted Horst block	No information provided	No information provided	See page 280 for field segment data
Depth to crest (ft TVDss)	9900	8600			
Lowest closing contour (ft)	–	–			
GWC (ft)	10 840 (main field), 10 875 (Ribble), 10 590 (Northern)	8904			
OWC (ft)	–	–			
GOC (ft)	–	–			
Gas column (ft)	–	304			
Oil column (ft)	930	–			
Pay zone					
Formation	Fulmar Formation Kimmeridge Clay Formation (Ribble Sands)	Leman Sandstone			
Age	Oxfordian–Kimmeridgian	Permian			
Gross thickness (range) (ft)	1200	104–271			
Net/gross ratio (%)	94	1.00			
Porosity average (range) (%)	23 (17–28)	18 (6–27)			
Permeability average (range) (mD)	500 (10–2000)	100 (0.1 mD-5 Darcies)			
Petroleum saturation average (range) (%)	79	67–84			
Production index	80	–			
Hydrocarbons					
Oil density (°API)	40	–			
Gas gravity (°API)	–	0.606			
Viscosity (cp)	0.42	–			
Bubble point (psia)	1800	–			
Dew point	–	–			
Gas/oil ratio (SCF/BBL)	614	–			
Formation volume factor (RB/STB)	1.43	–			
Gas expansion factor (SCF/RCF)	1.47	227			
Formation water					
Salinity (ppm NaCl eq.)	138 000	200 000			
Resistivity (ohm m)	0.018 @ 285°F	0.014 @ 194°F			
Reservoir conditions					
Temperature	–	176°F @ 8850 ft TVDss			
Pressure (psi)	–	4118 @ 8850 ft TVDss			
Field characteristics					
Area (acres)	2825	2740			
Gross rock volume (acre ft)	877 500	–			
Initial pressure (psi)	5700 @ 10 500 ft TVDss	4118			
Temperature (°F)	285 @ 10 500 ft TVDss	176			
Oil initially-in-place (MMBBL)	822	–			
Gas initially-in-place (BCF)	498	–			
Recovery factor (%)	69	68			
Drive mechanisms	Water flood, natural gas lift	–			
Recoverable oil (MMBBL)	567	–			
Recoverable gas (BCF)	342	196			
Recoverable NGL/condensate (MMBBL)	–	–			
Production					
Start-up-date	February 1982	September 1995			
Production rate plateau oil (BOPD)	165	95			
Production rate plateau gas (MMSCF/D)	103	110			
Number/type of wells	28 oil wells 13 water injectors 1 gas injector	6 exploration 3 development (1 on hold)			

Guinevere	Hamilton	Hamilton North	Hamish	Harding	
				Central	South
723	77	77	443	283	
Faulted bounded Horst structure with reverse fault closure to the NE and SW plus dip	Structural	Structural	Structural	Structural/stratigraphic	Structural/stratigraphic
8150	2300	2600	7750	5080	5240
–	–	–	–	–	–
8599	2910	3166	7962	5735	5682
				–	–
–	–	–	–	5500	5489
–	–	–	–	–	–
449	610	466	–	700	249
–	–	–	212	235	193
Leman Sandstone (Rotliegend)	Ormskirk Sandstone	Ormskirk Sandstone	Piper sands	Balder	Balder
Early Permian	Triassic	Triassic	Upper Jurassic	Eocene	Eocene
276	–	–	120	0–475	0–150
0.99	–	–	1.000	99	93
13.9 (10–17)	(11–19)	(13–17)	0.238	35	34
20 (7–300)	(300–2100)	(240–400)	1080	10 000	–
64.9	–	–	0.945	92	89
0.095–0.719	–	–	–	>1000	>1000
–	–	–	39	20	23
0.71	0.65	0.67	–	0.57	0.57
0.0218	–	–	–	10	5
–	–	–	1900	Depth variable	Depth variable
–	–	–	–	–	–
–	–	–	613	238	303
–	–	–	1.44	1.11	1.136
230	108	120	–	168	168
159 000	300 000	300 000	90 990	43 000	43 000
0.057 @ 60°F	0.039 @ 30°C	0.039 @ 30°C	0.102	0.103	0.103
–	30°C	30°C	–	–	–
–	1404 @ 2600 ft TVDss	1535 @ 2900 ft TVDss	–	–	–
1280	15 km^2	8 km^2	–	914	731
121 333	1 100 000	390 000	–	107 548	44 158
4000 @ 8550 ft TVDss	–	–	3510	2580	2550
198 @ 8550 ft TVDss	–	–	175	140	140
–	–	–	7	236	86
100	627	230	–	257	34
90	–	–	43	60	53
Pressure depletion	Natural water drive	Natural water drive	Aquifer drive and water injection	Waterflood	Waterflood
1.2	–	–	3.8	154	46
90	–	–	–	206	35
–	–	–	–	–	–
June 1993	February 1997	December 1995	February 1990	April 1996	December 1996
–	–	–	80 000	93 000	93 000
30	–	–	–	–	–
1 vertical 1 horizontal producer	3 exploration/appraisal 4 gas producers	1 exploration 3 gas producers	1P	7 production 1 gas injection 2 water injection	3 production 0 gas injection 1 water injection

Field name	Hatfield Moors	Hatfield West	Heather	Herriard
Segment name				
Page no. in Memoir 20	905	905	291	932
Trap				
Type	Tilted anticlinal fault block	Tilted anticlinal fault block	Tilted fault block	Structural tilted fault block
Depth to crest (ft TVDss)	±1400	±1300	9450	3265
Lowest closing contour (ft)	–	–	–	3425
GWC (ft)	1460	1349	No gas cap	3425
OWC (ft)	–	–	–	–
GOC (ft)	–	–	–	–
Gas column (ft)	–	–	–	–
Oil column (ft)	–	–	1598	160
Pay zone				
Formation	Oaks Rock Sandstone	Oaks Rock Sandstone	Brent Group Sandstones	Great Oolite
Age	Late Westphalian B	Late Westphalian B	Middle Jurassic (Aalenian–Bathonian)	Middle Jurassic
Gross thickness (range) (ft)	25–90	25–90	224 (125–370)	159
Net/gross ratio (%)	0.9	0.9	0.48 (0–1.0)	135
Porosity average (range) (%)	17.2–25.6	12.9–23.9	14.5 (10–24)	16
Permeability average (range) (mD)	21–1100	0.05–880	20 (0.1–2000)	1
Petroleum saturation average (range) (%)	55	55	41 (8–100)	50
Production index	–	–	0.1–10	–
Hydrocarbons				
Oil density (°API)	–	–	32–37	37.5
Gas gravity (°API)	0.629	0.629	*c*. 0.91	–
Viscosity (cp)	–	–	0.4–0.66	–
Bubble point (psia)	–	–	1910–3890	1181
Dew point	–	–	–	–
Gas/oil ratio (SCF/BBL)	–	–	450–1280	315
Formation volume factor (RB/STB)	–	–	1.234–1.743	1.2
Gas expansion factor	–	–	–	–
Formation water				
Salinity (ppm NaCl eq.)	–	–	22 000	85 000
Resistivity (ohm m)	–	–	0.326 @ 60°F	0.057
Reservoir conditions				
Temperature	–	–	–	–
Pressure (psi)	–	–	–	–
Field characteristics				
Area (acres)	–	–	13 947	750
Gross rock volume (acre ft)	–	–	–	–
Initial pressure (psi)	–	–	4950–10 250	1515–1540
Temperature (°F)	–	–	227–242	–
Oil initially-in-place (MMBBL)	–	–	464	6
Gas initially-in-place (BCF)	6.1	2.4	–	–
Recovery factor (%)	?70	?70	31	–
Drive mechanisms	Pressure depletion	Pressure depletion	Waterflood	Fluid Exp./Sol'n gas
Recoverable oil (MMBBL)	–	–	146	–
Recoverable gas (BCF)	4.27	1.68	–	–
Recoverable NGL/condensate (MMBBL)	–	–	–	–
Production				
Start-up-date	–	–	October 1978	September 1987
Production rate plateau oil (BOPD)	–	–	38 000	150
Production rate plateau gas (MMSCF/D)	–	–	–	–
Number/type of wells	–	–	21 gas-lifted producers 9 water injectors	– 1

Hewett					
Main Hewett			Big Dotty	Little Dotty	
Upper Bunter 731	Lower Bunter	Zechsteinkalk	Rotliegendes	Rotliegendes	Upper Bunter
–	–	–	–	–	–
2600	4026	4500	5600	5450	3500
–	–	–	–	–	–
3020	4415	4883	5830	4950	3666
–	–	–	–	–	–
–	–	–	–	–	–
420	389	383	230	500	166
–	–	–	–	–	–
Bunter Sandstone Lower Triassic	Hewett Sandstone Lower Triassic	Zechsteinkalk Upper Permian and slope Carbonates	Leman Sandstone Lower Permian Aeolian Sandstones	Leman Sandstone Lower Permian Aeolian Sandstones	Bunter Sandstone Lower Triassic Alluvial Plain Sandstones
543	135	300	600	650	660
0.96	0.88	0.65	0.99	0.98	0.95
21.0	23.0	6.5	19.0	18.8	21.0
500	1000	1	250	450	350
78	80	60	76	75	76
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
97	140	148	185	185	111
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
1362	1985	2136	2645	2746	1675
108	126	130	150	146	116
1356	2100	419	296	250	100
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
5	13	9	2	1	1

Field name	Hewett (continued)				Horndean
Segment name	Deborah Rotliegendes	Della Rotliegendes	Dawn Rotliegendes	Deliah Rotliegendes	
Page no. in Memoir 20					938
Trap					
Type	–	–	–	–	Structural, Tilted fault block
Depth to crest (ft TVDss)	5500	5800	5653	6068	4100
Lowest closing contour (ft)	–	–	–	–	4337
GWC (ft)	6118	6147	5797	6285	4337
OWC (ft)	–	–	–	–	–
GOC (ft)	–	–	–	–	–
Gas column (ft)	618	347	144	217	–
Oil column (ft)	–	–	–	–	237
Pay zone					
Formation	Leman Sandstone	Leman Sandstones	Leman Sandstones	Leman Sandstones	Great Oolite
Age	Lower Permian Aeolian Sandstones	Lower Permian Aeolian Sandstones	Lower Permian Aeolian Sandstones	Lower Permian Aeolian Sandstones	Middle Jurassic
Gross thickness (range) (ft)	684	675	600	650	280
Net/gross ratio (%)	0.98	0.99	0.99	0.96	130
Porosity average (range) (%)	14.2	12.7	19.5	14.6	15 (7–23)
Permeability average (range) (mD)	75	50	170	2	1 (0.1–5)
Petroleum saturation average (range) (%)	67	58	75	54	45 (10–60)
Production index	–	–	–	–	–
Hydrocarbons	–	–	–	–	–
Oil density (°API)	–	–	–	–	37.3
Gas gravity (° API)	–	–	–	–	–
Viscosity (cp)	–	–	–	–	1.65
Bubble point (psia)	–	–	–	–	363
Dew point	–	–	–	–	–
Gas/oil ratio (SCF/BBL)	–	–	–	–	168
Formation volume factor (RB/STB)	–	–	–	–	1.135
Gas expansion factor (SCF/RCF)	186	187	187	182	–
Formation water					
Salinity (ppm NaCl eq.)	–	–	–	–	80 000
Resistivity (ohm m)	–	–	–	–	0.049
Reservoir conditions					
Temperature	–	–	–	–	–
Pressure (psi)	–	–	–	–	–
Field Characteristics					
Area (acres)	–	–	–	–	1485
Gross rock volume (acre ft)	–	–	–	–	–
Initial pressure (psi)	2756	2800	2354	2837	1965
Temperature (°F)	145	143	148	151	140
Oil initially-in-place (MMBBL)	409	141	25	47	37
Gas initially-in-place (BCF)	–	–	–	–	–
Recovery factor (%)	–	–	–	–	–
Drive mechanisms	–	–	–	–	Fluid Exp./Sol'n gas
Recoverable oil (MMBBL)	–	–	–	–	–
Recoverable gas (BCF)	–	–	–	–	–
Recoverable NGL/condensate (MMBBL)	–	–	–	–	–
Production					
Start-up date	–	–	–	–	November 1987
Production rate plateau oil (BOPD)	–	–	–	–	700
Production rate plateau gas (MMSCF/D)	–	–	–	–	–
Number/type of wells	3	1	1	1	3 production 4 P & A

Humbley Grove		Indefatigable	Ivanhoe		Johnston
			Supra	Main	
931		741	443		749
Structural tilted fault block	Structural tilted fault block	Structural Horst block	Structural	Structural	Tilted fault block
3220	4240	7500	7590	7590	10249
3680	–	9000	–	–	–
–	4327	8850–8967 (11 distinct GCWs)	8052	8052	10644
3480	–	–	8052	8052	–
3325	–	–	–	–	–
105	87	1350	–	–	–
255	–	–	462	462	–
Great Oolite Middle Jurassic	Rhaetic Rhaetian	Leman Sandstone Early Permian	Piper Sands Upper Jurassic	Piper Sands Upper Jurassic	Lower Leman Sandstone Formation Early Permian
201	40	150–400	50	300	280 (162–375)
160	16	0.95–1.00	0.981	0.997	100
18 (6–28)	12	15 (10–24)	0.226	0.229	11 (7–17)
20 (0.1–2000)	<1	30 (1–1000)	530	2200	10 (1–800)
60 (15–60)	50	79 (60–80)	0.867	0.944	75 (50–85)
1.48	–	–	–	–	–
39	–	–	31	29	–
0.63	–	0.612	–	–	0.606
1.15	–	0.0232	–	–	–
1589	–	–	1800	1800	–
–	–	–	–	–	–
398	–	–	360	360	<5
1.173	1.359	–	1.188	1.188	–
111	142	228	–	–	240
85 000	–	196 200	90 990	90 990	175 000
0.057	–	0.0185	0.102	0.102	0.017 @ 227°F
–	–	–	–	–	227°F @ – 10 644 ft TVDss
–	–	–	–	–	4730 @ – 10644 ft TVDss
2965	2000	38400	–	–	4744.5
–	–	4.90×10^6	–	–	–
1480	2012	4122	3510	3510	–
120	140	195	175	175	–
42	1.1	–	34	66	–
1.95	3.48	5600	–	–	360–403
–	–	84	43	64	60–75
Fluid Exp./Sol'n gas	Fluid Exp./Sol'n gas	Volumetric	Aquifer drive and water injection	Aquifer drive and water injection	Unconfirmed
–	–	–	73.3		–
	–	4700	–	–	–
–	–	4.5	–	–	–
June 1984	July 1984	1971	July 1989	July 1989	October 1994
1400	300	–	80 000	80 000	–
–	500	800–1000	–	–	90
8 production 2 injection 2 suspended 6 P & A	0	56 producers	2P 1I	1P 1I	3

Field name	Kimmeridge	Kingfisher		
Segment name		Brae Unit 1	Brae Unit 2	Heather
Page no. in Memoir 20	943	305		
Trap				
Type	Structural	Structural/stratigraphic	Structural/stratigraphic	Structural/stratigraphic
Depth to crest (ft TVDss)	827	12 600	12 800	14 800
Lowest closing contour (ft)	–	13 125	13 320	15 700
GWC (ft)	–	13 100	–	15 700
OWC (ft)	–	–	13 220	–
GOC (ft)	–	–	–	–
Gas column (ft)	–	500	–	900
Oil column (ft)	–	–	420	–
Pay zone				
Formation	Cornbrash Limestone	Brae Unit 1	Brae Unit 2.2	Heather
Age	Middle Jurassic	Upper Jurassic	Upper Jurassic	Middle Jurassic
Gross thickness (range),(ft)	–	246	286	404
Net/gross ratio (%)	–	0.06–0.86	0.16–0.67	0.14–0.46
Porosity average (range) (%)	–	21 (10–22)	14 (11–15)	13.5 (12–15)
Permeability average (range) (mD)	–	10–800	10–250	5–20
Petroleum saturation average (range) (%)	–	70–85	70–85	70–80
Production index	–	20	1	20
Hydrocarbons				
Oil density (°API)	–	39–44	35–40	43–46
Gas gravity (°API)	–	0.804	–	–
Viscosity (cp)	–	0.03	0.27	0.02
Bubble point (psia)	–	–	–	–
Dew point	–	–	–	–
Gas/oil ratio (SCF/BBL)	–	3000–4000	2000–2900	6000–9000
Formation volume factor (RB/STB)	–	–	2.46	–
Gas expansion factor (SCF/RCF)	–	240	–	351
Formation water				
Salinity (ppm Nacl eq.)	–	70 000	70 000	70 000
Resistivity (ohm m)	–	0.034 @ 250°F	0.034 @ 250°F	0.034 @ 250°F
Reservoir conditions				
Temperature	–	–	–	–
Pressure (psi)	–	–	–	–
Field Characteristics				
Area (acres)	–	5190	21	12
Gross rock volume (acre ft)	–	532012	313445	504986
Initial pressure (psi)	–	7160	7250	11 800
Temperature (°F)	–	250	250	290
Oil initially-in-place (MMBBL)	10–25	104 (total field)	104 (total field)	104 (total field)
Gas initially-in-place (BCF)	–	610 (total field)	610 (total field)	610 (total field)
Recovery factor (%)	–	32 (total field)	32 (total field)	32 (total field)
Drive mechanism	–	Natural depletion	Natural depletion	Natural depletion
Recoverable oil (MMBBL)	3.5	30 (total field)	30 (total field)	30 (total field)
Recoverable gas (BCF)	–	280 (total field)	280 (total field)	280 (total field)
Recoverable NGL /condensate (MMBBL)	–	11.2 (total field)	11.2 (total field)	11.2 (total field)
Production				
Start-up date	1960	October 1997	July 1998	August 2000
Production rate plateau oil (BOPD)	400	8400	8400	8400
Production rate plateau gas (MMSCF/D)	–	130	130	130
Number/type of wells	1	5 exploration/appraisal 3 development wells completed	5 exploration/appraisal 3 development wells completed	5 exploration/appraisal 3 development wells completed

Leman	Lennox	MacCulloch	Malory	Maureen		
				Maureen (Paleocene)	Mary	Morag
761	87	453	771	587		
Faulted pericline	Structural	Four-way dip closure over turbidite sandstone mound	Fault bounded Horst structure with fault closure to the N and S and dip closure to the NW	Four-way dip over salt dome	Updip pinch-out trap	Stratigraphic
5850	2500	6000	9020	−7950	−10 050	−9200
6700	–	6249	9350	−8730	10 750	10 700
6700	–	–	–	–	–	−10 602 (ODT)
–	3400	–	–	−8730	−10 646	–
–	3257	–	–	–	–	–
850	760	–	249	–	–	1400
–	143	240	–	780	±600	Morag Member, Turbot Anhydrite Formation
Leman Sandstone	Ormskirk Sandstone	Upper Balmoral Sandstone of Lista Formation	Leman Sandstone (Rotliegend)	Maureen Formation	Hugin Formation	Permian
Permian	Triassic	Late Paleocene	Lower Permian	Danian–Thanetian	Late Jurassic	300
800	–	175–540	249	125–450	10–150	0.67
100	0.9–1.0	0.4–0.9	1	0.4–0.7	0.8	Matrix 2.6
12	11–21	28 (24–32)	4.7	15–27	18–22	Fracture
0.5–15	50–10 Darcy	200–2000 (core Kh)	0.2–1651 (core Kh)	10–1500	5–150	85
59	–	90	63.3	67	80	0.5–25
–	50–350	50–300	269 * e − 06	15	5–20	31.3
–	45	–	–	36	32	–
0.585	0.69	32–37	0.615	–	–	0.566
–	–	–	0.0227	0.7	0.7	1938
–	1620	1700–2290	–	1786	2060	750
–	650	386–424	–	393	550	1.614
–	1.3	1.2	–	1.29	1.33	–
210.9	125	–	234	–	–	–
240 000	280 000	90 000	256 690	20 000–40 000	–	–
0.026 @ 125°F	0.037 @ 30°C	0.0781 @ 25°C (77°F)	0.057 @ 190°F	–	–	–
125°F	30°C	175°C	–	–	–	1175
3022	1620 @ 3257 ft TVDss	2770 @ 6150 ft TVDss	–	–	–	19 400
62515	2224	3334	98	4100	355	6113
–	518 000 (gas), 310 000 (oil)	205 769	103 934	854 000	26 600	270
–	–	2770 @ 6150 ft TVDss	4257 @ 9145 ft TVDss	3792	6262	5.0
–	–	79	200	247	274	–
–	184	200	–	398	25.0	50
3970	497	–	99	–	–	Solution gas
91	–	30–35	76	55	9	2.6
Depletion	Gas injection	Natural aquifer	Pressure depletion	Aquifer	Depletion drive	–
–	–	60–70	–	217.4	2.83	–
3600	–	–	75	–	–	–
–	–	–	–	–	–	–
August 1968	February 1996	August 1997	October 1988	–	–	–
–	–	60 000	–	–	–	–
–	–	–	45	–	–	–
–	4 exploration/appraisal 7 oil producers 2 gas injectors	4 exploration/appraisal 11 pilot and development 6 of which are producers	1 vertical producer	–	–	–

Field name	Mercury	Moira	Montrose
Segment name			
Page no. in Memoir 20	777	603	611
Trap			
Type	NW-SE trending Horst block	Four-way dip draped over fault block	Domal antiform
Depth to crest (ft TVDss)	8850	−8850	8040
Lowest closing contour (ft)	9492	−8950	8250
GWC (ft)	9492	–	–
OWC (ft)	–	8927	8250
GOC (ft)	–	–	–
Gas column (ft)	642	–	–
Oil column (ft)	–	77	210
Pay zone			
Formation	Lower Leman Sandstone Formation	Maureen Formation	Forties
Age	Permian	Danian–Thanetian	Paleocene
Gross thickness (range) (ft)	58–110	–	330 (260–440)
Net/gross ratio (%)	73–94	0.8	0.5 (0.3–0.8)
Porosity average (range) (%)	12–14	17–25	24 (3–30)
Permeability average (range) (mD)	27–91	40–400	80 (1–2000)
Petroleum saturation average (range) (%)	58–66	–	55
Production index	–	–	–
Hydrocarbons			
Oil gravity (°API)	–	42	0.631
Gas gravity (°API)	0.612	–	40
Viscosity (cp)	0.0236	0.435	0.32
Bubble point (psia)	–	1345	2348 (West), 2737 (East)
Dew point	–	–	–
Gas/oil ratio (SCF/BBL)	–	220	600 (West), 800 (East)
Formation volume factor (RB/STB)	–	1.254	1.467 (West), 1.557 (East)
Gas expansion factor (SCF/RCF)	227.6	–	–
Formation water			
Salinity (ppm NaCl eq.)	–	20 000	111 000
Resistivity (ohm m)	0.052	–	0.027
Reservoir conditions			
Temperature	–	–	–
Pressure (psi)	–	–	–
Field characteristics			
Area (acres)	2570	–	9910
Gross rock volume (acre ft)	–	–	748 000
Initial pressure (psi)	4303	3912	3744
Temperature (°F)	204	245	257
Oil initially-in-place (MMBBL)	–	12.4	236
Gas initially-in-place (BCF)	124	–	–
Recovery factor (%)	66	34	41
Drive mechanism	Aquifer edge drive	Aquifer drive	Aquifer drive/gas lift
Recoverable oil (MMBBL)	–	4.2	98
Recoverable gas (BCF)	82	–	–
Recoverable NGL/condensate (MMBBL)	0.5	–	–
Production			
Start-up date	November 1999	–	1976
Production rate plateau oil (BOPD)	–	–	28 000
Production rate plateau gas (MMSCF/D)	50	–	–
Number/type of wells	2 High angle/horizontal production	–	8 producers 6 injectors

Morecambe North	Morecambe South	Murdoch	Nelson	Neptune
97	107	789	617	777
Faulted roll-over	Tilted fault blocks	Faulted Horst Block	Antiformal	Faulted four-way dip closure
−2950	−2200	11 250–12 600 (Top Murdoch)	7192 (22/11–7)	−8853
−4400	−4050	Field full to spill	–	−9839
–	–	–	7449–7501 (excluding 22/7a–3)	−9839
–	–	–	–	–
–	–	–	–	–
975	1300	125–875	–	−986
–	–	–	278	–
Ormskirk Sandstone St Bees Sandstone	Ormskirk Sanstone St Bees Sandstone	Westphalian B, Murdoch Sand Interval	Forties Sandstone Member	Lower Leman Sandstone Formation
Triassic-presumed Scythian (270 Ma)	Triassic	Carboniferous	Paleocene	Permian
4000	870–3100	118 (56–159)	257 (56–459)	366–405
85–99 (illite free)	79 (100–60)	0.94 (0.89–0.98)	0.7 (0.25–0.97)	99
55–92 (illite affected)	–	–	–	–
9–15 (illite affected)	14 (7–22)	10.6 (9.3–13.0)	23 (15–38)	17–21
25–180	150 (0.3–1000)	73 (0.1–1000)	216 (7–1610)	110–140
0.02–1.0 (illite affected)				
65 at FW100 at crest	75 (92–60)	55	–	68–72
1.25	2.4	–	–	–
–	–	–	–	–
0.648	0.64	0.673	40.6	0.607
–	0.016	–	–	0.0236
–	–	–	1550–1699 @ 230°F	–
–	–	–	–	–
–	–	–	–	–
0.0070	0.0068	–	1.357	–
143	146	283	–	253
270 000	300 000	200 000	–	–
0.05 @ 77°F	0.036	0.064 @ 60°F	–	0.056
–	–	235°F @ 11 700 ft TVDss	224°F @ 7400 ft TVDss	–
–	–	6140 @ 11 700 ft TVDss	2480	–
5930	20 700	–	–	1606
2 820 000	1.8×10^7	583 500	–	–
1800	1861	–	3322	4385
92	91	–	–	176
–	–	–	790	–
1290	5500	478	–	341
80	93	93	–	84
Volumetric depletion	Volumetric depletion	–	Basal aquifer supported by water injection	Aquifer edge drive
–	–	–	420–450	–
1050	5100	348	–	286
1.2	14	–	–	1
October 1994	January 1985	October 1993	February 1994	November 1999
–	–	–	–	–
265	1800	82.7	–	200
10 production 4 appraisal	34 production 7 appraisal	–	23 platform producers 4 sub-sea producers 4 water injection	3 High angle/horizontal+1 vertical production

Field name	North Cormorant		Palmers Wood	Pickerill	Pierce
Segment name	Block III	Block IV			
Page no. in Memoir 20	315		938	799	647
Trap					
Type	–	–	Structural fault and dip closure	Fault dip closure	–
Depth to crest (ft TVDss)	–	–	2350	8100	–
Lowest closing contour (ft)	–	–	–	–	–
GWC (ft)	9230	Sectors 1&2: 10 040 Sectors 3A: 9360 Sectors 3B: 9530 Sectors 4A&5: 9800 Sector 4B: 9600	2430 East; 2533 West	9095 (West) (GWC), 8938 (East) (GWC)	
OWC (ft)	–	–	–	–	–
GOC (ft)	–	–	–	–	–
Gas column (ft)	–	–	–	–	
Oil column (ft)	–	–	80 East; 183 West	–	
Pay zone					
Formation	–	–	Corallian Limestone	Leman Sandstone	Forties sst
Age	–	–	Upper Jurassic	Permian	Palaeocene
Gross thickness (range) (ft)	300	400	32	80–250	–
Net/gross ratio (%)	0.72 (0.4–1.0)	0.69 (0.3–1.0)	16	0.9–1	–
Porosity average (range) (%)	20 (15–27)	20 (16–26)	17.4 (10–22)	0.12	15–22
Permeability average (range) (mD)	±200 (0–2000)	±100 (0–1000)	5 (0.05–1000)	0.05–10 (0.01–550)	<1–755
Petroleum saturation average (range) (%)	–	–	65 (25–0.70)	–	–
Production index	–	–	–	60	–
Hydrocarbons					
Oil density (°API)	36	34.5	37.5	–	–
Gas gravity (°API)	–	–	0.942–0.777	0.61	–
Viscosity (cp)	0.82 (@ Pb)	0.77 (@ Pb)	2.004	–	–
Bubble point (psia)	1040	1390	427–764	–	–
Dew point	–	–	–	–	–
Gas/oil ratio (SCF/BBL)	224	311	109–169	–	–
Formation volume factor (RB/STB)	1.191	1.245	1.098	–	–
Gas expansion factor (SCF/RCF)	–	–	–	222	–
Formation water					
Salinity (ppm NaCl eq.)	–	–	100 000	–	–
Resistivity (ohm m)	–	–	0.065	0.051 @ 60°F	–
Reservoir conditions					
Temperature	195°F	210°F	–	204°F @ 8900 ft TVDss	–
Pressure (psi)	4825 (@ 8690 ft TVDss)	5262 (@ 9100 ft TVDss)	–	3995 @ 8900 ft TVDss	–
Field Characteristics					
Area (acres)	–		6900	8150	–
Gross rock volume (acre ft)	–		–	–	–
Initial pressure (psi)	–		1180	–	–
Temperature (°F)	–		100	–	–
Oil initially-in-place (MMBBL)	1075		11.73	–	387
Gas initially-in-place (BCF)	–		–	900	125
Recovery factor (%)	37		–	–	–
Drive mechanism	–		Fluid Exp./Sol'n gas	–	–
Recoverable oil (MMBBL)	401		–	–	–
Recoverable gas (BCF)	–		–	500	–
Recoverable NGL/ condensate (MMBBL)	–		–	–	–
Production					
Start-up date	–		October 1983	August 1992	–
Production rate plateau oil (BOPD)	–		1400	–	–
Production rate plateau gas (MMSCF/D)	–		–	96	–
Number/type of wells	–		4 production 2 injection 1 suspended 3 P&A	12 exploration 15 development	–

Rob Roy		Saltfleetby	Schooner	Scott
Supra	Main			
443		911	811	467
Structural	–	Four-way dip closure	Dip closure	Structural
7550	–	7329	11 800	10 400
–	–	7627	13 075	–
–	–	7627	13 075	–
7931	7944	–	–	11 895–13 792
–	–	–	–	–
–	–	298	13 075	–
381	–	–	–	500–2000
Piper Sands	Piper Sands	Sub Alton-Ashover Equivalent	Barren Red Measures and Coal Measures Groups	Sgiath and Piper Formation
Upper Jurassic	Upper Jurassic	Late Namuria-Early Westphalian	Westphalian C/D	Upper Jurassic (Latest Oxfordian to Kimmeridgian)
100	220	184	1275	*c*.360
0.936	0.992	0.34–0.71	20–38	0.8
0.224	0.228	9.5–12.5	10–13	10–22
520	2090	1–10	30–100	<0.1–*c*.6500
0.937	0.955	80	70–85	85–97
–	–	–	0.015	1–50
41	39	61	–	36
–	–	0.721	0.66	–
–	–	–	0.0277	0.297–0.578 @ 8500 psi
3460	1900	–	–	1930–3890
–	–	–	–	–
1391	613	–	–	578–1398
1.679	1.344	–	0.0036	1.328–1.761 @ 8500 psi
–	–	225	287	–
90.990	90 990	53 500	93 700	110 000
0.102	0.102	0.085	0.027	0.027 @ 200°F
–	–	–	–	–
–	–	–	–	–
–	–	2857	13 590	8650
–	–	587 763	5 026 420	3 114 000
3510	3510	3566	6475 @ 12 800	7879–9320
175	175	183	230±15	190–248
42	101	–	–	946
–	–	114	1059	Associated gas only
56	67	55–71.5	58	46.5
Aquifer drive and water injection	Aquifer drive and water injection	Pressure depletion	Natural depletion	Water flood
109		–	–	441
–	–	63–82	612	–
–	–	0.84–0.98	7.41	–
July 1989	July 1989	December 1999	October 1996	September 1993
80 000	80 000	1450	–	>200 000
–	–	52.2	130	–
2P	3P	5 horizontal	7 single deviated	13 Scott oil producers
1I	2I			10 Piper oil producers
				11 Scott water injectors
				7 Piper water injectors
				2 Scott/Piper water injectors

Field name	Sean			Singleton
Segment name	North	South	East	
Page no. in Memoir 20	825			936
Trap				
Type	Dip/fault	Dip/fault	Dip/fault	Structural tilted fault block
Depth to crest (ft TVDss)	8280	7800	7960	−4050 North; 3950 (South)
Lowest closing contour (ft)	8550	8550	8400	–
GWC (ft)	–	–	–	−4390 North; 4170 South
OWC (ft)	–	–	–	–
GOC (ft)	–	–	–	–
Gas column (ft)	263	743	430	–
Oil column (ft)	–	–	–	340 North; 220 South
Pay zone				
Formation	Leman Sandstone	Leman Sandstone	Leman Sandstone	Great Oolite
Age	Permian	Permian	Permian	Middle Jurassic
Gross thickness (range) (ft)	200–260	240–270	300–330	250
Net/gross ratio (%)	95.4	99.9	100	180
Porosity average (range) (%)	17.5	17.1	17.0	13
Permeability average (range) (mD)	130–400	190–420	30–150	0.5
Petroleum saturation average (range) (%)	73.5	77.6	75.0	50
Production index	–	–	–	–
Hydrocarbons				
Oil or gas density (°API)	–	–	–	39.15
Oil or gas gravity (°API)	0.618	0.614	0.617	–
Viscosity (cp)	–	–	–	0.82
Bubble point (psia)	–	–	–	11.30
Dew point				
Gas/oil ratio (SCF/BBL)	–	–	–	303
Formation volume factor (RB/STB)	–	–	–	1.215
Gas expansion factor (SCF/RCF)	218	225	220	–
Formation water				
Salinity (ppm NaCl eq.)	225 000	225 000	225 000	150 000
Resistivity (ohm m)	0.017	0.017	0.017	0.04
Reservoir conditions				
Temperature	202°F	192°F	207°F	–
Pressure (psi)	3945	3977	0.068	–
Field Characteristics				
Area (acres)	1230	2420	1020	7900
Gross rock volume (acre ft)	–	–	–	135 000
Initial pressure (psi)	–	–	–	1852
Temperature (°F)	–	–	–	140
Oil initially-in-place (MMBBL)	–	–	–	75.26
Gas initially-in-place (BCF)	260	610	143	–
Recovery factor (%)	90	80	89	–
Drive mechanism	Depletion	Depletion/water	Depletion	Solution gas drive
Recoverable oil (MMBBL)	–	–	–	2.85
Recoverable gas (BCF)	234	488	127	–
Recoverable NGL/condensate (MMBBL)	–	–	–	–
Production				
Start-up date	August 1986	August 1986	November 1994	December 1990
Production rate plateau oil (BOPD)	–	–	–	1000
Production rate plateau gas (MMSCF/D)	–	–	–	–
Number/type of wells	–	–	–	4 production 1 water injection

Staffa	Statfjord			Stirling	Stockbridge
	Brent	Dunlin	Statfjord		
327	335				
Tilted fault block	Structural/Stratigraphic	Structural/Stratigraphic	Structural/Stratigraphic	No information provided	No information provided
–	7743	8120	8448		
13713	–	–	–		
–	–	–	–		
13713	8484	8543	2670		
–	–	–	–		
–	–	–	–		
475	741	423	784		
Tarbert and Ness	Brent Group/Sandstone	Cook Formation (Dunin II)/Sandstone	Statfjord Formation/Sandstone		
Middle Jurassic	Middle Jurassic–Bathonian Bajocian	Early Jurassic–Toacian	Early Jurassic/ Sinemurian–Rhaetian		
–	656	66	607		
76	0.75 (0.47–0.99)	0.05–0.45	0.6 (0.4–1.0)		
10.4	27 (17–30)	11–22	22(20–29)		
–	2500 (10–4100)	150 (5–300)	470 (100–500)		
–	−52	−4	−10		
–	*c*.2700	*c*.1000	*c*.2500		
39–44	38.4	36.4	39.6		
–	0.943	0.943	1.0		
0.18–0.21	0.37 @ 5561 psi	0.44 @ 5561 psi	0.36 @ 5864 psi		
–	3900	3553	2900		
1686–1789	1039 (185)	825 (147)	879.3 (156.6)		
1.99	1.528 @ 5561 psi	1.428 @ 5561 psi	1.484 @ 5864 psi		
–	–	–	–		
–	14 000	–	13 600		
0.2645	0.122 @ 77°C	0.122 @ 77°C	0.128 @ 83°C		
–	–	–	–		
–	–	–	–		
746	21 000	5000	11 000		
143 × 106	5.40	1.162	2.275		
7760 @ 4050mTV	5561 @ 2469 mss	5561 @ 2469 mss	5864 @ 2701 mss		
276	192 @ 2469 mss	201 @ 2469 mss	206 @ 2701 mss		
23–31–34	4894	135	1319		
–	5030	113	1158		
18	66	18	70		
Gas exsolution and aquifer inflow	Water drive/WAG	Water drive	Gas/water drive		
5.5	3249	25	918		
2.7	2500	21	140		
–	–	–	–		
3 February 1992	1979	1994	1979		
12 000	–	–	–		
–	–	–	–		
2 production	65 OP 18 WI 6 WAG	3 OP 2 WI	19 OP 2 WI 3 GI 3 WAG 3 WI/GI		

Field name	Storrington	Strathspey		T-block	
Segment name		Brent Group Reservoir	Banks Group Reservoir	Tiffany	Toni
Page no. in Memoir 20	935	355		369	
Trap					
Type	Structural tilted-fault block	–	Unconformity: tilted fault block	Structural/ Stratigraphy	Structural/ Stratigraphy
Depth to crest (ft TVDss)	3780	8900	−9700	12 520	11 755
Lowest closing contour (ft)	–	9380	−10 267	–	–
GWC (ft)	–	–			
OWC (ft)	4020	9380	−10 267	13 920	12 923
GOC (ft)	3945	–	–	–	–
Gas column (ft)	165	–	567	–	–
Oil column (ft)	75	480	–	1400	1177
Pay zone					
Formation	Great Oolite	Brent Group	Banks Group	Brae	Brae
Age	Middle Jurassic	Middle Jurassic	Lower Jurassic /Triassic	Upper Jurassic	Upper Jurassic
Gross thickness (range) (ft)	218	800	750	1100	1000
Net/gross ratio (%)	150	0.46	0.44	58	35
Porosity average (range) (%)	13 (6–26)	20.3 (12.8–30.4)	14.7 (10.4–25.5)	11	11
Permeability average (range) (mD)	5 (0.1–2000)	1045 (10–9750)	356 (15–8425)	75	150
Petroleum saturation average (range) (%)	55	0.86 (0.93–0.62)	0.82 (0.93–0.71)	60	78
Production index	1.22	–	–	–	–
Hydrocarbons					
Oil density (°API)	39.04	38.9	40–49	35.6	34.8
Gas gravity (°API)	0.794	–	–	0.7	0.7
Viscosity (cp)	0.5	0.1840	–	0.23	0.21
Bubble point (psia)	1771	4223	–	3045	4480
Dew point	–	–	6236	–	–
Gas/oil ratio (SCF/BBL)	546	1604	1800–7900	885	2170
Formation volume factor (RB/STB)	1.29	1.879	2.2	1.574	2.198
Gas expansion factor (SCF/RCF)	–	–	–	–	–
Formation water					
Salinity (ppm NaCl eq.)	145 000	260 000	240 000	95 000	95 000
Resistivity (ohm m)	0.036 @ 120°F	0.1313 @ 60°F	0.3 @ 60°F	0.1 @ 60°F	0.1 @ 60°F
Reservoir conditions					
Temperature	–	–	–	–	–
Pressure (psi)	–	–	–	–	–
Field Characteristics					
Area (acres)	740	2581	1730	1532	1680
Gross rock volume (acre ft)	–	232 427	243 018	769 441	1 121 296
Initial pressure (psi)	1758	5865 @ 9250 ft TVDss	6405 @ 10 182 ft TVDss	7455	7000
Temperature (°F)	140	212 @ −9250	220 @ −10 182	275	258
Oil initially-in-place (MMBBL)	13	101	95	156	121
Gas initially-in-place (BCF)	–	–	281	–	–
Recovery factor (%)	–	Solution gas	0.21	43–47	40
Drive mechanism	Fluid Exp./ Sol'n gas	Water flood	Natural depletion	Water injection	Water injection
Recoverable oil (MMBBL)	–	57.7	–	68–75	48
Recoverable gas (BCF)	–	61.1	190	–	–
Recoverable NGL/condensate (MMBBL)	–	–	20	–	–
Production					
Start-up date	Jun-98	Nov-73	May-94	–	–
Production rate	500	39 340	14 000	–	–
Production rate plateau gas (MMSSCF/D)	800	55	127	–	–
Number/type of wells	4 producers	7 producers 2 water injectors	5 producers	–	–

		Thistle	Trent		
Thelma	SE Thelma Field		Lower Trent Sandstone	Upper Trent Sandstone	Westphalian A Sandstone
		383	835		
Structural/ Stratigraphy	Structural/ Stratigraphy	Rotated fault block	Four-way dip closure	–	–
11780	11900	8500	–	–	–
–	–	9322	–	–	–
		9322	–	–	–
12096	12743	–	–		
–	–	–	–	–	–
–	–	–	1200	–	–
316	843	822	–	–	–
Brae	Brae and Stand Shale Unit	Brent Group	Millstone Grit	Millstone Grit	Caister Coal fm
Upper Jurassic	Upper Jurassic	Middle Jurassic	Marsdenian Carboniferous Carboniferous	Marsdenian Carboniferous	Marsdenian Carboniferous
1000	600	<550	50–100	33	30
52	38	20–100	85	98	87
13.5	12	0.24 (0.16–0.30)	10.3	12.8	11
200	0–1000	40–40000	0.3 (0.05–19)	247 (0.1–1000)	38 (0.6–340)
70	70	78 (60–85)	85	70	60
–	–	–	–	–	–
38.5	34.7	38.4	–	–	–
0.63	0.67	–	0.646	0.646	0.652
0.14	0.22	0.85–0.915 (0.92 @ 5000 psia)	–	–	–
4450	3300–3600	–	–	–	–
–	–	–	–	–	–
2700	1200	290	–	–	–
2.58	1.79	1.18 @ 5000 psia	–	–	–
–	–	–	–	–	–
95 000	95 000	13 000	–	–	–
0.1 @ 60°F	0.1 @ 60°F	0.253 @ 77°F	0.06	0.06	0.06
–	–	220	233	233	240
–	–	6060	5500	5500	5605
2520	2520	3410		3100	
342 833	1 168 983	910 000		–	
6655	6945	6060 @ 9200 ft TVDss		–	
260	260	220 @ 9200 ft TVDss		–	
52	194	824		–	
–	–	–		111	
21	16	49		83	
Natural water drive	Natural water drive	Waterflood		gas expansion	
11	30	404		–	
–	–	–		–	
–	–	–		–	
–	–	February 1978		November 1996	
–	–	124 000		–	
–	–	–		–	
–	–	60 alots 22 production 7 water injection		4 exploration/appraisal 3 producers 1 uncompleted development	

Field name	Tyne		
Segment name	Tyne North	Tyne South	Tyne West
Page no. in Memoir 20	851		
Trap			
Type	Combined structural/stratigraphic	Combined structural/stratigraphic	Combined structural/stratigraphic
Depth to crest (ft TVDss)	–	–	–
Lowest closing contour (ft)	–	–	–
GWC (ft)	1940	12 339	12 228
OWC (ft)	–	–	–
GOC (ft)	–	–	–
Gas column (ft)	171	240	295
Oil column (ft)	–	–	–
Pay zone			
Formation	Lower Ketch member	Lower Ketch member	Lower Ketch member
Age	Carboniferous	Carboniferous	Carboniferous
Gross thickness (range) (ft)	<400	400	<400
Net/gross ratio (%)	0.6	0.7	0.454–0.67
Porosity average (range) (%)	11.0	10.7	10.5
Permeability average (range) (mD)	35.1 (0.1–5000)	48.4 (9–450)	36.6 (0.1–3500)
Petroleum saturation average (range) (%)	75	86	60–83
Production index	–	–	–
Hydrocarbons			
Oil density (°API)	–	–	–
Gas gravity (air=l)	0.65	0.65	0.65
Viscosity (cp)	–	–	–
Bubble point (psig)	–	–	–
Dew point	–	–	–
Gas/oil ratio (SCF/BBL)	–	–	–
Formation volume factor (RB/STB)	–	–	–
Gas expansion factor (smcf/cmcp)			
Formation water			
Salinity (ppm NaCl eq.)	–	–	–
Resistivity (ohm m)	0.057	0.057	0.057
Reservoir conditions			
Temperature	240	242	243
Pressure (psi)	6153	6393	6338
Field Characteristics			
Area (acres)	3920	1620	1930
Gross rock volume (acre ft)	–	–	–
Initial pressure (psi)	–	–	–
Temperature (°F)	–	–	–
Oil initially-in-place (MMBBL)	–	–	–
Gas initially-in-place (BCF)	163	61	149
Recovery factor (%)	50	89	70
Drive mechanism	–	–	–
Recoverable oil (MMBBL)	–	–	–
Recoverable gas (BCF)	82	54	105
Recoverable NGL/condensate (MMBBL)	–	–	–
Production			
Start-up date	March 1997	November 1997	November 1996
Production rate plateau oil (BOPD)	–	–	–
Production rate plateau gas (MMSCF/D)	–	–	–
Number/type of wells	2 exploration 2 extended reach development	1 exploration 1 extended reach development	1 exploration 1 vertical 1 extended reach well

V-Fields Gas Complex	Viking	Waveney	West Firsby	Windermere
861	871	881	921	893
Block faulted	Tilted/inverted fault blocks	Roll over anticline, with fault seal to SE	No information provided	Structural
7200–7900 ft sub-sea	8000–9000	7748		11 384
Fields filled to or close to spill point	9000–10 200	–		11 663
–	–	7884 (Log and RTF derived)		11 574
450–583 ft	700 max in the Rotilegendes	136		*c*.190
–	–	–		–
Rotliegendes Group, Leman Sandstone	Leman Sandstone Formation	Rotliegend, Leman Sandstone		Leman Sandstone
Early Permian	Permian	Early Permian		Permian
890 (790–990)	400–700	200–250		77
0.8 (0.6–1.0)	50–100	0.98 (0.9–1.0)		90
13.5 (3–23)	7–25	13 (7–20)		12–13
5.4 (0.1–1950)	0.1–100 + highly variable	12 (0.1–200)		12–14 (test)
60	50–60	–		77–83
–	4–100	–		–
–	–	–		–
0.60	0.615	0.68		0.725
–	–	–		–
–	–	–		–
–	–	–		–
220	–	–		–
–	–	–		252–256
190 000–290 000	220 000	200 000		575
0.017–0.022	0.017	0.055 @ 60°F		2.9155 @ 25°C
142–177	170–200°F	184		–
3472–3835	4150–4670	3655		–
31 358	–	1891.5		1977
25.3×10^6	–	119 000		99 714
3472–3835	4150–4670	–		5970
–	–	–		113°C
–	–	–		–
2593	2990 (Viking) 845 (Phoenix)	–		99
65–77	97 (Viking) 67 (Phoenix)	–		82
–	–	Depletion		–
–	–	–		–
1600	2895 (Viking) 507 (Phoenix)	84		81
3.35	15.6 (Viking) 3.6 (Phoenix)	–		–
October 1988	August 1972	–		April 1997
–	–	–		–
–	2880	–		1.2
–	10 producers (Viking) 5 producers (Phoenix)	–		2 producers