

~~Barton~~ 10  
File  
25th August, 1970.

FOR FILE/WELLS -  
2/4-4AX

AGIP S.p.A.,  
Direzione Mineraria,  
C.P. 4174,  
San Renato Milanese,  
Milano, Italy.

Attention: S. Orioli

Petrofina S.A.,  
33 Rue de la Loi,  
Brussels 4,  
Belgium.

Attention: P. Masson

Elf Morge,  
7 Rue Melaton,  
Paris 15,  
France.

Attention: F. Bernard

Dear Sirs,

Core Laboratories have examined the cores from our Ekofisk Well No. 2/4-4AX for the purpose of determining the existence and orientation of any natural fractures present in the rock. Attached is a copy of their report. This examination was made by Core Laboratories on their own initiative, and not at our specific request. For this reason the report is not up to their usual standard of appearance.

We felt you would find it interesting however.

Very truly yours,

ORIGINAL SIGNED BY  
T. J. JOBIN

T. J. Jobin

c.c. F.W. Reynolds  
L.H. Hoelscher  
B. Boyce

TJJ/PAK/hw



W-2

# CORE LABORATORIES, INC.

## CORE INFORMATION

CL \_\_\_\_\_

Company: PHILLIPS County: NORWAY Field: OFF SHORE

Well: 2/4-4AX Formation: \_\_\_\_\_ Elevation: \_\_\_\_\_ D.F. Date \_\_\_\_\_

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Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
1	CONT'D		
			NOT RECOVERED.
	10168		
2	10168		heavily fractured predominantly vertical fractures small cavities <del>shaly</del> shaly c shaly
	10171		breccia
2			CHERT - VERTICALLY FRACTURED, W LST FRAGS, OCCASSIONALLY DISSOLVED OUT - SHALY PARTINGS
			VERTICAL FRACTURES
			BROKEN CORE - NUMEROUS SHALY PARTINGS - CHERT NODULES
			HORIZONTAL FRACTURES (SHALE PARTINGS) SOLUTION CAVITIES, LARGE VERTICAL FRACTURES
	10174		A/A
			VERY LARGE VERTICAL AND ARCULATE FRACTURES
2			FEW HORIZONTAL FRACTURES - LITTLE VERTICAL FRACTURING SHALY Limestone - NUMEROUS SOLUTION CHANNELS, VERTICAL FRACTURES ALSO HORIZONTAL FRACTURING ALONG SHALE PARTINGS - SOLUTION CAVITIES
			AS ABOVE
			FEW FRACTURES - SHALE PARTINGS
	10177		POOR FRACTURING - fractures enlarged by solution
2			SHALY PARTINGS - SMALL VERTICAL FRACTURES
			A/A
			A/A
			A/A

Box 1

Box 2

Box 3

Box 4

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Core D.

Core No.	Depth of Core	Fl. Rec.	CORE DESCRIPTION
Box 4 2	CONT'D		LIMESTONE: RD, L. GREY, WITH NUMEROUS SHALY PARTINGS, CONTORTED BEDDING COMMON
	10180		RARE VERTICAL FRACTURE, ENLARGED BY SOLUTION.
Box 5 2			SMALL VERTICAL CRACKS.
			LARGE VERTICAL CAVITIES AND FRACTURES, ALSO GOOD HORIZONTAL FRACTURING
			VERY PROMINENT VERTICAL FRACTURING - SOLUTION CAVITIES
			SMALL SOLUTION CAVITIES - HORIZONTAL PARTINGS. AKA NUMEROUS SMALL VERTICAL FRACTURES, PARTIALLY CALCITE FILLED.
Box 6 2	10183		FEW FRACTURES
			SEVERAL SMALL VERTICAL SOLUTION CAVITIES / FRACTURES - STYLOLITIC
			STYLOLITIC PARTINGS, FEW VERTICAL FRACTURES
			Numerous solution channels vertical fracturing and some development of stylolites
7	10186		AS ABOVE
			broken pieces
			Solution channels + cavities
8	10189		heavily fractured, vertical, horizontal + inclined, pyritic solution channels, cavities
			broken pieces
			broken
			broken
9	10192		stylolitic
			small clayey nodules

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Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
bx 9 { 2	CONTD	.	inclined fracture, List
			clay nodules + calcareous nodules
bx 10 { 2	10195	[Sketch]	stygolitic, pyritic
			vertical fracture + fissures, cavities List
			stygolite
			calcareous nodules
Core 3 { 3	10198	[Sketch]	AIA
			AIA
			AIA
			stygolitic, vertically fissured
bx 1 { 3	10201	[Sketch]	List.
bx 2 { 3		[Sketch]	List. Less calcareous
			broken
			broken
			solution channels, filled.
bx 3 { 3	10204	[Sketch]	heavily fissured
			stygolitic
			Replacements + channels thin part heavily fractured
bx 4 { 3	10207	[Sketch]	stygolitic, very small fissures

# CORE LABORATORIES, INC.











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Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
4	3-CONT'D		slide surfaces + fractures
	10210		stylolitic
5	3		vertically fractured + fissured
	10213		calcareous nodules + channels
6	3		List. shale laminations, calcareous nodules
	10216		
7	3		List AIA stylolitic w/ vertical fractures + cavities
	10219		calcareous nodules
8	3		} broken pieces
			

Turn to page please

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CORE INFORMATION

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Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
box 1 4	10220		Mostly flint & chert nodules forming thick bands
			w/ list. of 1" thick channels of replacement
			stylolitic pure list.
			A/A
2 4	10223		A/A
			List A/A w/ flint band
			+ stylolitic
			Crossed minor fissures
box 3 4	10226		fractured
			stylolitic, fractured along stylolitic partings
			w/ small cavities
4 4	10229		cherty bands
			vertical fractures
			long vertical fracture ~ 2mm in width
Core 5 5	10232		broken pieces
			w/ chert bands & stylolites
box 1 5	10280		Numerous stylolites and small diameter vertical fractures
			solution cavities

# CORE LABORATORIES, INC.













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	Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
Box 1	5	10283		1st-1/4 grey, ore stylolitic, occasional horizontal and vertical fractures.
	5			Broken core
Box 2				Stylolites - strong vertical fracture with solution along f. plane some horizontal fracturing
				Very large vertical fracture
Box 3	5	10286		with thinner vertical fractures and vertical solution cavities Faces of large fracture Pyritized large solution cavity, infilled by Calcite + Pyrite Large vertical fractures (broken core)
		10289		Large number vertical fractures & stylolites
	5			Broken core Multiple vertical fractures - extremely stylolitic - some horizontal fracturing
Box 4				Very Prominent vertical fractures Solution cavities along vertical fracture planes
		10292		Small vertical fractures stylolites, some large vertical fractures
Box 5				Prominent vertical fractures - stylolites, solution cavities along fracture planes
		10295		Broken core - multiple fracture faces on fragments
Box 6	5			Broken core - multiple fracture faces on fragments





# CORE LABORATORIES, INC.

## CORE INFORMATION

CL \_\_\_\_\_

Company: PHILLIPS County: NORWAY Field: EKOFISK

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Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
Box 3			Stylolites
	10467		Stylolites
Box 4			Large vertical fracture, solution channels
	7		Stylolites Large vertical fracture
Box 5			Multiple parallel semi-vertical fractures
	10470		Stylolites, and calcite filled stylolitic fractures (horizontal)
Box 6			Broken Core
	7		Arcuate semi-vertical fractures. Stylolites
Box 7			Multiple vertical fractures - stylolites
	10473		One large vertical fracture - numerous arcuate semi-vertical fractures
Box 8			Multiple vertical fractures (core partially broken)
	7		Large vertical fractures - solution channels along fracture planes. Stylolites
	10476		Large fracture face visible - many stylolites
	7		Large fracture face visible - many stylolites

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Box 4

Box 5

Box 6

Box 1

Box 2

Box 3

Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
6	10452		Very large vertical fractures - stylolites
			Very large fractures, vertical & horizontal
			Broken Core
			Very large vertical fracture - stylolites
6			Stylolites
			Large solution cavities along vertical fractures
	10455		Broken Core - extremely stylolitic
			Broken Core - " "
6			few small vertical fractures
			One good vertical fracture
			Very stylolitic
7	10458		Broken core - fracture faces & stylolites visible
7			few fractures.
			Few fractures - stylolitic
			Horizontal fractures - stylolitic
			Prominent vertical fracture.
	10461		Some vertical fractures & stylolites
7			Stylolites, small vertical fractures, some solution cavities.
			Multiple small vertical fractures - horizontal fractures and solution cavities - one very large vert. fracture
			Broken core
	10464		Very stylolitic - multiple vertical fractures.
7			" " solution cavities
			Stylolites

# CORE LABORATORIES, INC.

## CORE INFORMATION

CL \_\_\_\_\_

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Well: \_\_\_\_\_ Formation: \_\_\_\_\_ Elevation: \_\_\_\_\_ D.F. Date \_\_\_\_\_

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Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
Box 8	7	10480	Lst-1 gray-wh - hd compact - hair-line vertical fracture
		10482	Very few Fractures
Box 9	7		Large vertical fracture with many small vertical fractures
		10485	Stylolites, small vertical fractures
Box 10	7		Horizontal fracture, some small vertical fractures Stylolites
		10488	Broken core - many fracture faces visible on fragments Strong semi vertical fractures
Box 1	8		Broken Core - fracture faces & stylolites Very large vertical fractures
		10491	Solution cavities - few fractures Very large vertical fractures - stylolites (Core partially broken)
Box 2	8		Stylolite - vertical fracturing Vertical fractures, some solution cavities along fractures.
		10494	Very large vertical fractures some stylolites Semi vertical fractures

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Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
8	10494.5		Strongy semi vertical fracturing, some solution channels along fracture planes
			Broken core Stylolites
8	10497		Stylolites, small solution cavities
			Stylolites
8	10500		Multiple vertical fracturing
			Stylolites - multiple vertical fractures
8	10503		Vertical fracturing semi vertical solution channels along fractures
			Stylolitic - vertical fracturing - solution channels along fractures
8	10506		Numerous vertical fractures, broken core.
			Stylolitic - stylitic, few vert. fract. solution cavity?
8	10508		stylolitic, semi-vert fractures & solution channels
			Broken segment of core - about stylolites
8	10509		Stylolites.
			Numerous vertical fractures, calcite along frac. planes.
8	10509		Anged fracture unfilled with white calcite. few sol. cavities + stylolites.
			Stylolitic, few vertical frac. possible solution cavities.

Box 3

Box 4

Box 5

Box 6

Box 7

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Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
Box 8 8	10509.5		Faint fracture, semi vertical stylolites.
			Numerous stylolites + vertical fracture cross connected. Some calcite.
			stylolitic, calcite infilling vertical fractures.
Box 9 8	10502		Stylolites, vertical and horizontal, small fractures only.
			continuation of large stylolite.
			no fractures.
Box 10 8	10515		Vertical fracture, stylolites, cherty.
			continuation of vertical fracture only.
			fractured + stylolitic pore list.
Box 9	10518		heavily fractured + fissured, 1-2 mm width stylolitic list
			horizontal + vertical stylolites
			A/A
			A/A
Box 2 9	10521		Small fissures + horizontal stylolites
			A/A
			A/A w/ vertical stylolites.
			A/A
3 9	10524		stylolitic list

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3			stylolite
	10527		stylolite, horizontal + Vert.
4			
	10530		
5			stylolitic, fissured & fractured
			fractures filled w/ calcite crystal
			Vertical + horizontal fractures
			cavities + solution channels
6	10533		bands of different colour list w/ nodules
			vertical + horizontal fissures
			wide fractures
7			abundant of stylolite
	10536		
			rarely stylolitic
8			calcite replacement
	10539		

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Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION	
9			horizontal & vertical fractures & stylolites	
			} broken pieces	
	10542			
9			broken pieces in sacks. heavily stylolitic, fissured & fractured	
	10545		Flocculent cone as milky to gold colour through bedding planes, fissured, fractures but rarely through the stylolites or the replacements	
9			stylolitic, heavily fractured & fissured	
	10548		calcite replacement	
10			stylolitic, heavily fractured & fissured	
	10551			
10			stylolitic, heavily fractured & fissured	
	10554			



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Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
3	10		stylolitic, solution channels List
	10557		
4	10		} broken vertical fractures + stylolitic calcite replacement
	10560		
5	10		
	10563		
6	10		Very few stylolites
	10566		
7	10		

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Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
2 } 3 }	11	<i>[scribble]</i>	
	10584	<i>[scribble]</i>	<i>heavily fractured &amp; fissured w/ stylolites</i>
4 }	10587	<i>[scribble]</i>	<i>A/A w/ bands of different calcareous material</i>
	11	<i>[scribble]</i>	
5 }	10590	<i>[scribble]</i>	
	11	<i>[scribble]</i>	<i>A/A len stylolites</i>
6 }	10593	<i>[scribble]</i>	
	11	<i>[scribble]</i>	<i>A/A</i>
7 }	10596	<i>[scribble]</i>	<i>A/A</i>
	11	<i>[scribble]</i>	<i>heavily stylolitic w/ bands &amp; sinuses along the stylolites</i>

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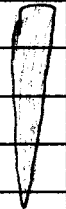
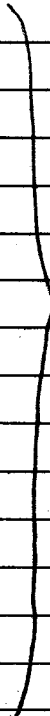






CORE INFORMATION

CL. \_\_\_\_\_

Company: \_\_\_\_\_ County: \_\_\_\_\_ Field: \_\_\_\_\_

Well: \_\_\_\_\_ Formation: \_\_\_\_\_ Elevation: \_\_\_\_\_ D.F. Date \_\_\_\_\_

**INSTRUCTIONS:**—A sample consisting of 8 to 10 inches should be selected from each foot of core having possible show. Drilling fluid should be siped or brushed off of sample before placing in sack. The specific depth of sample should be marked on sample sack. If part of core other than bottom is believed lost, state how it should be logged in describing core. Cores should be sampled and frozen immediately upon arrival to surface. Samples submitted for analysis must be accompanied by core information sheet or interpretation of analysis results will be withheld.

Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
7 } 10	10569		Thick fractures
8 } 10			
	10572		
9 } 10			
	10575		broken pieces showing little stylolite + very few fractures.
10 } 10			mainly pure list.
	10578		
1 } 11			bands of calcareous material of different colour
			stylolites
			long vertical fractures
	10581		
2 } 11			heavily fractured & fissured
			vertical & inclined long fractures w/ stylolites

# CORE LABORATORIES, INC.

## CORE INFORMATION

CL \_\_\_\_\_

Company: \_\_\_\_\_ County: \_\_\_\_\_ Field: \_\_\_\_\_

Well: \_\_\_\_\_ Formation: \_\_\_\_\_ Elevation: \_\_\_\_\_ D.F. Date \_\_\_\_\_

**INSTRUCTIONS:**—A sample consisting of 8 to 10 inches should be selected from each foot of core having possible show. Drilling fluid should be siped or brushed off of sample before placing in sack. The specific depth of sample should be marked on sample sack. If part of core other than bottom is believed lost, state how it should be logged in describing core. Cores should be sampled and frozen immediately upon arrival to surface. Samples submitted for analysis must be accompanied by core information sheet or interpretation of analysis results will be withheld.

Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
11			heavily fractured, fissured, & abundant of stylolites, vertical & inclined fractures.
10599			
11			heavily fractured & fissured, vertical inclined and horizontal fractures, solution channels, cavities filled w/ calcite & stylolitic showing broken pieces
10602			
11			
			broken pieces showing heavy & wide fractures stylolites, fissures.
10605			
11			broken pieces showing the same as the broken interval of 10603-10605
10608			
12			Stylolites, vertical joints & fractures, solution channels, calcite-filled solution cavities - discontinuous semi-vertical fractures - stylolitic.
			Two very large angled fractures - stylolitic Multiple small vertical fractures
10611			+ small solution channels & stylolites
			large number of stylolites - solution cavities Stylolites - horizontal fractures & soln. cavities

# CORE LABORATORIES, INC.

## CORE INFORMATION

CL \_\_\_\_\_

Company: Phillips County: NORWAY Field: Offshore

Well: 2/4-LAX Formation: \_\_\_\_\_ Elevation: \_\_\_\_\_ D.F. Date \_\_\_\_\_

**INSTRUCTIONS:**—A sample consisting of 8 to 10 inches should be selected from each foot of core having possible show. Drilling fluid should be siped or brushed off of sample before placing in sack. The specific depth of sample should be marked on sample sack. If part of core other than bottom is believed lost, state how it should be logged in describing core. Cores should be sampled and frozen immediately upon arrival to surface. Samples submitted for analysis must be accompanied by core information sheet or interpretation of analysis results will be withheld.

Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
Box 2 12	10612.5		Abundant stylolites - very small vertical fractures - some arcuate horizontal fracturing.
	10614		stylolites
Box 3 12			Vertical stylolites and vertical fractures + some channels As above; also horizontal fracturing + also solution cavities
	10617		Multiple small vertical fractures Many stylolites
Box 4 12			stylolites
			Numerous stylolites
Box 5 12	10620		Two large vertical fractures stylolites
			stylolites - few fractures
			Vertical fractures,
Box 6 12	10623		Vertical Fractures
			Arcuate semi-vertical fractures.
Box 7 12			Multiple large vertical fractures
	10626		stylolites

# CORE LABORATORIES, INC.

CORE INFORMATION

CL \_\_\_\_\_

Company: Phillips County: \_\_\_\_\_ Field: \_\_\_\_\_

Well: 2/4 WAX Formation: \_\_\_\_\_ Elevation: \_\_\_\_\_ D.F. Date \_\_\_\_\_

**INSTRUCTIONS:**—A sample consisting of 8 to 10 inches should be selected from each foot of core having possible show. Drilling fluid should be siped or brushed off of sample before placing in sack. The specific depth of sample should be marked on sample sack. If part of core other than bottom is believed lost, state how it should be logged in describing core. Cores should be sampled and frozen immediately upon arrival to surface. Samples submitted for analysis must be accompanied by core information sheet or interpretation of analysis results will be withheld.

Core No.	Depth of Core	Ft. Rec.	CORE DESCRIPTION
Box 7	12	10627	large vertical fracture - stylolites
			Stylolitic - well fractured vertically
Box 8	12	10629	Abundant stylolites & vertical & semi-vertical fractures
			Very large vertical fractures
Box 9	12	10632	stylolites
			stylolites - few fractures
Box 10	12	10635	Two prominent vertical fractures Moderately stylolitic few small semi-vertical fractures
			Few fractures - horizontal stylolites
		10638	Broken Core - stylolites and fracture planes visible on fragments.

**WELL FILE**

2/4-4A

**CORE LABORATORIES, INC.**  
 Petroleum Reservoir Engineering  
 DALLAS, TEXAS

Page No. 1

**CORE ANALYSIS RESULTS**

Company PHILLIPS PETROLEUM COMPANY Formation \_\_\_\_\_ File UKCA 295  
 Well 2/4-4AX Core Type \_\_\_\_\_ Date Report 1.9.70  
 Field Ekofisk Drilling Fluid \_\_\_\_\_ Analysts RFB  
 County North Sea State Norway Elev. \_\_\_\_\_ Location \_\_\_\_\_

**Lithological Abbreviations**

SAND - SD SHALE - SH LIMB - LM DOLOMITE - DOL CHERT - CH GYPSUM - GYP ANHYDRITE - ANHY CONGLOMERATE - CONG FOSSILIFEROUS - FOSB SANDY - SDY SHALY - SHY LIMY - LMY FINE - FN MEDIUM - MED COARSE - CSE CRYSTALLINE - XLN GRAIN - GRN GRANULAR - GRNL BROWN - BRN GRAY - GRV VUGGY - VGY FRACTURED - FRAC LAMINATION - LAM STYLOLITIC - STY SLIGHTLY - SL/ VERY - V/ WITH - W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS		POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
		Ka	Kl		OIL	TOTAL WATER	
1	10167	<0.01	<0.01	0.2			Ls, lt gy, vf gr, chert
2	68	0.071	0.04	12.5			A.A, wh, hd.
	69	0.014	0.01	5.6			A.A, arg, bnds.
4	70	0.014	0.01	8.4			Ls, conglom, dk gy matrix, wh lt frags.
5	71	<0.01	<0.01	10.1			A.A.
6	72	0.042	0.02	12.4			A.A, lt gy matrix
7	73	0.062	0.03	16.6			Ls, wh, xln, homo.
8	74	0.11	0.07	19.1			A.A.
9	75	0.042	0.02	12.8			Ls, conglom, dk gy matrix, wh lt frags.
10	76	0.067	0.04	13.5			Ls, wh, hd, xln.
11	77	<0.01	<0.01	5.9			A.A, pyrite.
12	78	0.14	0.08	4.7			A.A, gy chert, vf arg bands.
13	79	0.19	0.11	4.5			A.A, pyrite.
	80	0.03	0.02	7.8			A.A, less arg.
	81	0.03	0.02	6.2			A.A.
16	82	0.07	0.04	11.2			A.A, sl frac.
17	83						A.A.
18	84	0.042	0.02	13.5			A.A.
19	85	0.09	0.06	13.8			Ls, vf, xln.
20	86						A.A.
21	87	0.19	0.11	19.7			A.A, shell frags.
22	88	0.39	0.25	24.1			A.A.
23	89	0.46	0.29	23.3			A.A.
24	90	0.55	0.36	22.3			A.A.
25	91	0.42	0.27	27.4			A.A.
26	10192	0.81	0.54	31.5			A.A.

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**CORE LABORATORIES, INC.**  
**Petroleum Reservoir Engineering**  
**DALLAS, TEXAS**

File UKCA 295 Page No. 2  
 Well 2/4-4AX

## CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs		POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
					OIL	TOTAL WATER	
		Ka	Kl				
27	10193	0.64	0.40	29.8			Ls,vf,xln stylolitic.
28	94	0.37	0.23	25.2			A.A, frag,arg tr.
29	95						No plug possible, A.A.
30	96	0.48	0.31	24.6			A.A.
31	97	0.48	0.31	24.6			Lt gy, f, gran, (?) ls & ill-sorted,rdd, ls frag.
32	98	0.19	0.12	20.6			Ls, lt gy,vfg,hd.
33	99	0.25	0.16	24.8			Wh,hd,xln,ls / small chert patches.
34	10200	1.59	1.00	23.8			A.A, no chert, num stylolitic partings.
35	01	0.23	0.14	21.2			A.A, & small rdd, ls frags.
36	02	0.21	0.13	22.6			Wh,hd,xln,ls, & v small pyr, patches.
37	03	0.19	0.12	23.0			A.A, & weak (solution ?) partings.
38	04	0.54	0.35	27.5			Wh,hd,xln,ls,tr arg mat.
39	05	0.42	0.27	25.5			A.A.
40	06	0.52	0.34	29.0			A.A, & v small wh ls frags.
41	07	0.57	0.37	29.3			A.A, & more num frags.
42	08	0.61	0.40	29.0			A.A.
43	09	0.54	0.35	20.7			Wh,hd, patchy ls.
44	10	0.22	0.13	19.2			A.A, & num v weakly developed stylolite bnds.
	11	0.13	0.08	18.1			Gy-wh, streaky ls, & small wh ls frags.
46	12	0.36	0.23	22.2			A.A.
47	13	0.38	0.24	25.4			A.A.
48	14	0.47	0.30	27.0			A.A, mtx, more homogeneous.
49	15	0.51	0.33	27.1			A.A, frags larger ill sorted.
50	16	0.32	0.20	24.5			A.A.
51	17	0.092	0.05	13.7			Lt gy bnd ls, f xln, v hd, frags & stylolite bnds.
52	18	2.1	1.5	33.1			Wh, homogeneous, f gran ls.
53	19	0.93	0.63	31.4			A.A, & num minute dtrl grs.
54	20						No plug possible.
55	10221	0.64	0.42	29.1			A.A, & num minute dtrl grs.

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**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
**DALLAS, TEXAS**

File UKCA 295 Page No. 3  
 Well 2/4-4AX

**CORE ANALYSIS RESULTS**

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
		Ka	Kl			
56	10222	0.67	0.44	30.2		Wh, homogeneous, f gran ls & small arg patches.
57	23	0.56	0.36	29.2		A.A, & shell frags.
58	24	1.4	1.00	27.0		A.A, & stylolites & f frac.
59	25	0.54	0.35	23.6		No sample.
60	26	0.33	0.21	38.6		A.A, & stylolites & f frac.
	27	0.62	0.41	26.7		Wh, hd, xln, ls, /num, weak stylolitic bnds.
62	28	0.45	0.29	26.1		A.A, & f ls, & shell frags.
63	29	2.78	1.90	26.7		A.A.
64	30	1.00	0.68	33.2		A.A.
65	31	1.03	0.8	29.8		A.A.
66	10280	2.36	1.7	33.4		Wh, homogeneous, sly coarser gran ls.
67	81	2.20	1.6	33.8		A.A, & minute dtrl grs.
68	82	2.14	2.1	35.2		A.A.
69	83	2.6	1.9	34.6		A.A.
70	84	1.5	1.0	26.2		A.A.
71	85	3.00	2.2	33.6		A.A, softer.
72	86	3.05	2.2	31.5		A.A.
73	87	2.98	2.2	34.8		A.A.
74	88	2.90	2.1	33.8		A.A, & minute shell frags.
75	89½	2.20	1.6	30.2		A.A.
76	10290	2.06	1.5	33.7		A.A.
77	91	2.80	2.0	35.8		A.A.
78	92	2.00	1.4	34.5		A.A.
79	93	2.43	1.7	26.8		A.A, & shell mat, & a few f frac.
80	94	1.76	1.3	33.4		A.A, finer grd.
81	95					No plug possible.
82	10299	1.35	1.0	30.6		A.A.
83	10440	0.23	0.14	19.9		A.A, xln, hdr.
84	41	0.27	0.17	20.8		A.A, stylolitic.
85	10442	2.8	2.0	16.1 ✓		A.A, stylolitic.

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**CORE LABORATORIES, INC.**  
**Petroleum Reservoir Engineering**  
**DALLAS, TEXAS**

File UKCA 295 Page No. 4  
 Well 2/4-4AX

## CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
		Ka	Kl			
86	10443	0.51	0.33	21.7		Wh, homo, sl coarser, gran ls, v hd, xln
87	44	0.60	0.39	26.8		Wh, homo, sl coarser, gran ls.
88	45	0.92	0.62	27.5		A.A.
89	46	0.95	0.65	27.5		A.A.
90	47	0.34	0.21	21.0		A.A, syololitic.
91	48	0.23	0.14	17.6		Wh, hd, xln, ls, / syololitic frac.
	49	0.51	0.33	22.8		A.A, no stylolites.
93	10450	0.37	0.23	20.9		A.A.
94	51	0.33	0.21	21.3		A.A.
95	52	0.56	0.36	23.8		A.A.
96	53	0.40	0.26	21.4		A.A.
97	54	0.48	0.31	24.4		A.A, & stylolites.
98	55	1.0	0.68	17.9 ✓		A.A, & stylolites.
99	56	0.47	0.30	23.6		A.A.
100	57	0.80	0.54	23.2		A.A.
101	58	0.34	0.21	22.0		A.A.
102	59	7.4	5.7	23.9		A.A, & num, G stylolitic frac.
103	10460	0.87	0.58	28.4		A.A, chk, appearance.
104	61	1.11	0.8	27.6		A.A, v hd.
105	62	0.37	0.23	23.0		A.A, v hd.
106	63	0.57	0.37	25.0		A.A, & f dtrl, mat.
107	64	0.85	0.05	15.5		A.A.
108	65	0.04	0.02	12.2		A.A.
109	66	0.25	0.16	20.5		A.A, v f & v hd.
110	67	0.33	0.21	23.5		A.A.
111	68	0.35	0.22	23.2		A.A.
112	69	0.37	0.23	23.1		A.A.
113	10470	0.34	0.21	22.8		A.A, & weak soln. parting.
114	71	0.43	0.28	21.2		A.A.
115	72	0.29	0.18	22.8		A.A.
116	10473	0.15	0.09	19.0		A.A, & stylolites.

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**CORE LABORATORIES, INC.**  
*Petroleum Reservoir Engineering*  
**DALLAS, TEXAS**

File UKCA 295 Page No. 5  
 Well 2/4-4AX

**CORE ANALYSIS RESULTS**

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs		POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
		Ka	Kl		OIL	TOTAL WATER	
117	10474	0.18	0.11	12.9			Wh, hd, xln, ls, /stylolitic frac.
118	75	0.40	0.26	23.5			A.A.
119	76	0.44	0.28	23.4			A.A.
120	77	0.48	0.31	24.6			A.A, trs of chert.
121	78	0.23	0.14	11.2			Wh v hd, xln, ls, chalky appearance.
122	79	0.65	0.43	19.1			A.A, & stylolites.
123	80	0.62	0.41	26.0			A.A.
124	81	0.88	0.59	28.0			A.A, & pyrites.
125	82	0.85	0.57	27.2			A.A.
126	83	0.79	0.53	26.7			A.A.
127	84	1.1	0.75	28.6			A.A.
128	85	0.78	0.52	27.3			A.A.
129	86	0.97	0.66	24.7			A.A.
130	87	2.20	1.60	31.7			A.A.
131	88	2.60	1.90	28.5			A.A, & f frac.
132	89	1.20	0.80	28.0			A.A.
133	10490	0.71	0.47	27.5			A.A, & trs f dtrl mat.
134	91	1.50	1.00	28.0			A.A.
135	92	1.35	0.71	28.0			A.A.
136	93	0.37	0.23	20.0			A.A.
137	94	3.05	2.2	19.5 ✓			A.A, & trs f dtrl mat.
138	95	0.81	0.54	27.4			A.A.
139	96	0.80	0.54	25.2			A.A.
140	97	0.56	0.36	25.1			A.A.
141	98						No plug possible.
142	99	2.60	1.90	22.8			A.A.
143	10500	0.65	0.43	23.7			A.A.
144	01						No plug possible.
145	02	0.39	0.25	23.7			A.A.
146	10504	0.75	0.50	18.7			A.A. & stylolites.

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**CORE LABORATORIES, INC.**  
**Petroleum Reservoir Engineering**  
**DALLAS, TEXAS**

File UKCA 295 Page No. 6  
 Well 2/4-4AX

## CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs		POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
		Ka	Kl		OIL	TOTAL WATER	
147	10505						No plug possible.
148	06						No plug possible.
149	07	0.21	0.13	17.4			Wh, v hd,xln,ls, chalky appearance & soln cracks.
150	08	0.32	0.20	20.3			A.A.
151	09	0.33	0.21	11.0			A.A.
152	10	0.33	0.21	10.2			Wh, v hd,xln,ls, chalky appearance.
153	11	0.23	0.14	19.2			A.A.
154	13	0.58	0.38	11.0			A.A.
155	14	0.02	0.01	4.2			Mot gy,wh, mainly chert.
156	15	0.54	0.35	12.7			Wh, v hd,xln,ls, chalky appearance.
157	16	0.48	0.31	32.8			A.A.
158	10519	0.37	0.23	21.0			A.A.
159	20	0.47	0.30	20.9			A.A, & stylolites.
160	21	191.0	171.0				A.A, high perm, due to chipped plug.
161	22	317.0	287.0	18.4 ✓			A.A, & G stylolitic partings.
162	23	0.30	0.19	20.4			A.A.
163	24	0.47	0.30	19.0			A.A. & stylolites.
164	25	0.53	0.34	18.6			A.A. & stylolites.
165	26	0.39	0.25	19.0			A.A.
166	27	4.53	3.20	8.5 ✓			A.A, & stylolites.
167	28	3.82	2.80	24.0			A.A.
168	29	2.50	1.80	12.1 ✓			A.A.
169	10530	5.70	4.30	22.2			A.A, f frac.
170	31	1.10	0.80	16.1 ✓			A.A.
171	32	0.70	0.46	10.3			A.A, & so chert.
172	33	0.28	0.17	18.5			A.A.
173	34	0.29	0.18	16.3			A.A.
174	35	0.33	0.21	17.1			A.A, & stylolites.
175	36	0.86	0.58	16.0			A.A.
176	37	1.00	0.68	15.9 ✓			A.A.
177	10538	0.92	0.62	16.45 ✓			A.A, & dtrl grs.

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**CORE LABORATORIES, INC.**  
**Petroleum Reservoir Engineering**  
**DALLAS, TEXAS**

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## CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs Ka                      K1		POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
					OIL	TOTAL WATER	
178	10539	0.90	0.60	16.0 ✓			Wh, v hd, xln ls, chalky appearance.
179	10540	1.70	1.20	16.3 ✓			A.A, & stylolites & f frac.
180	10548	0.34	0.21	16.4			A.A, & dtrl, grs.
181	49	0.60	0.39	16.0			Wh, v hd, xln ls.
182	10550			15.7			A.A.
183	51	0.69	0.45	16.1			A.A.
	52	0.29	0.18	18.3			A.A. & stylolites.
185	53	0.87	0.58	17.5 ✓			A.A.
186	54	2.20	1.60	16.9 ✓			A.A, & stylolitic partings.
187	55	0.21	0.12	18.2			A.A.
188	56	0.24	0.15	19.5			A.A.
189	57	0.21	0.13	18.2			A.A, & dtrl grs.
190	58	0.22	0.13	17.5			A.A.
191	59	0.25	0.16	17.9			A.A, & shell frag.
192	10560	0.41	0.26	17.2			A.A, & stylolites.
193	61	0.28	0.17	18.8			A.A.
194	62	0.33	0.21	19.1			A.A, & dtrl grs.
195	63	0.29	0.18	19.9			A.A.
196	64	0.51	0.33	22.3			A.A, & shell frag.
197	65	0.50	0.32	22.3			A.A, & num, dtrl grs.
198	66	0.35	0.22	20.4			A.A, & stylolites.
199	67	0.37	0.23	21.3			A.A.
200	68	0.35	0.22	20.3			A.A.
201	69	0.33	0.21	21.6			A.A.
202	10570	0.48	0.31	22.8			A.A, & dtrl grs.
203	71	0.36	0.23	21.9			A.A.
204	72	0.40	0.26	20.7			A.A.
205	73	0.36	0.23	22.7			A.A.
206	74	0.25	0.16	18.8			A.A.
207	75	0.20	0.12	18.7			A.A.
208	10576	0.22	0.13	17.9			A.A.

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*Petroleum Reservoir Engineering*  
**DALLAS, TEXAS**

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## CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS		POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
					OIL	TOTAL WATER	
		Ka	Kl				
209	10577	0.21	0.13	15.1			Wh, v hd, xln ls.
210	78	0.24	0.15	13.6			A.A.
211	79	0.37	0.23	17.9			Wh, v hd xln ls, & dtrl grs.
212	10580	0.24	0.15	17.0			A.A.
213	81½	0.19	0.12	17.4			A.A.
214	82	0.19	0.12	17.9			A.A.
	83	0.28	0.17	18.8			A.A.
216	84	0.34	0.21	19.6			A.A.
217	85	0.31	0.19	18.6			A.A.
218	86	0.30	0.19	18.7			A.A. & stylolites.
219	87	0.25	0.16	18.5			A.A.
220	88	0.18	0.11	16.5			A.A.
221	89						No plug possible.
222	10590	0.17	0.10	15.6			A.A.
223	91	0.26	0.16	19.0			A.A.
224	92	1.15	0.80	18.7			A.A, & stylolites.
225	93	0.37	0.23	19.7			A.A.
226	94	0.25	0.16	17.8			A.A.
227	95	0.28	0.17	18.9			A.A.
	96	0.48	0.31	20.4			A.A.
229	97	0.56	0.36	20.8			A.A, & dtrl grs.
230	98	0.40	0.26	21.6			A.A.
231	99	0.46	0.29	21.4			A.A.
232	10600	0.69	0.45	20.9			A.A.
233	01	0.38	0.24	22.0			A.A, & stylolites.
234	02	0.46	0.29	21.4			A.A.
235	10609	0.30	0.19	17.8			A.A.
236	10610	0.53	0.34	2.16			A.A.
237	11	0.12	0.07	14.7			A.A, & dtrl grs.
238	12	0.27	0.17	17.9			A.A.
239	10613	0.24	0.15	17.3			A.A.

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## CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
		Ka	K1			
240	10614	0.28	0.17	17.6		Wh, v hd xln ls, & dtrl grs.
241	15	0.19	0.12	16.5		Wh, v hd xln ls, v f & stylolites.
242	16	0.06	0.03	14.7		A.A, & shell frag.
243	17	0.03	0.01	9.8		A.A.
244	18	0.04	0.02	12.7		A.A, many dtrl grs.
245	19	0.03	0.01	7.5		A.A.
246	10620	0.01	<0.01	8.9		A.A.
247	21	0.06	0.03	12.1		A.A.
248	22	0.01	<0.01	9.3		A.A, & weak stylolite bnd.
249	23	0.01	<0.01	1.2		A.A, & trs, chert.
250	24	0.01	<0.01	10.3		A.A, & weak stylolites.
251	25	0.02	0.01	10.8		A.A, & trs, chert.
252	26	0.01	<0.01	9.4		A.A.
253	27	0.01	<0.01	10.6		A.A, & trs, chert.
254	28	0.01	<0.01	11.5		A.A, & weak stylolites.
255	29	0.01	<0.01	9.3		A.A, & trs, chert.
256	10630	0.02	0.01	11.2		A.A, & trs, chert.
257	31	0.01	<0.01	9.8		A.A.
258	32	0.01	<0.01	11.6		A.A, & chert & stylolites.
259	33	<0.01	<0.01	8.0		A.A, & weak stylolites.
260	34	0.01	<0.01	8.9		A.A.
261	35	<0.01	<0.01	10.0		A.A, & weak stylolites
262	10636	0.01	<0.01	6.4		A.A.

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