

SPECIAL CORE ANALYSIS STUDY

FOR

STATOIL
Den Norske Stats Oljeselskap A.S.,

Interim Report Number 2
Well: 34/10-16
File Number: SCAL-0181

September, 1984

INTRODUCTION

This interim report comprises preliminary results from Special Core Analysis tests performed on plug samples from the Gullfaks Well 34/10-16.

The original test specifications for the project were outlined in a telex from Mr. Jon Ringen of Statoil, ref. telex ZCZC 09I001 dated 20/9/83. The test requirements were later modified in a letter from Mr. Kare Sorheim of Statoil, ref. letter THE/BF dated 2/11/83.

The final report, which will include details of test procedures and highlight any problematic samples/results will follow on the completion of the entire study.

This report includes the results from the following tests:-

1. (3) High Rate Waterfloods (Constant Flowrate)
2. (8) 4cc/hr Waterfloods (Constant Flowrate)



SUMMARY OF WATERFLOOD TEST RESULTS
High Rate Waterfloods, Constant Flowrate.

SAMPLE NUMBER	DEPTH METRES	AIR PERMEABILITY MILLIDARCIES	POROSITY PERCENT	INITIAL CONDITIONS		TERMINAL CONDITIONS			OIL RECOVERED	
				WATER SATURATION PERCENT PORE SPACE	OIL PERMEABILITY MILLIDARCIES	OIL SATURATION PERCENT PORE SPACE	WATER PERMEABILITY MILLIDARCIES	PERCENT PORE SPACE	PERCENT OIL IN PLACE	
1	3171.85	1015	24.7	8.5	756	26.4	301	65.1	71.1	
*44	3401.65	6.5	14.3	37.3	4.1	21.0	1.6	41.7	66.5	
**50	3419.10	2.04	12.5	43.3	0.48	31.4	0.06	25.3	44.6	

* Flood performed at a constant flowrate of 80 cc hr⁻¹ ** Flood performed at a constant flowrate of 32 cc hr⁻¹

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made.
Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 1 INITIAL WATER PERCENT PORE SPACE 8.5
 PERMEABILITY TO AIR md 1015 POROSITY PERCENT 24.7
 PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md 756 FLOODING PRESSURE PSI
 SAMPLE DEPTH 3171.85 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.550	47.7***		
0.645	48.7	48.2	89.6
0.743	49.5	49.1	91.7
0.852	50.4	49.9	92.1
0.964	51.1	50.7	93.7
1.07	51.6	51.3	95.0
1.19	52.0	51.8	96.1
1.40	52.9	52.4	96.3
1.51	53.2	53.0	97.0
1.69	53.6	53.4	97.6
1.92	54.2	53.9	97.6
2.26	54.8	54.5	98.1
2.52	55.4	55.1	97.7
2.86	56.0	55.7	98.4
3.18	56.4	56.2	98.6
4.19	57.4	56.9	99.0
4.77	57.9	57.6	99.2
5.34	58.1	58.0	99.5
6.74	58.8	58.5	99.5

- * Calculated for mid-point of incremental through-put
- * * Calculated from incremental through-put volumes
- * * * Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 1 INITIAL WATER PERCENT PORE SPACE 8.5
 PERMEABILITY TO AIR md 1015 POROSITY PERCENT 24.7
 PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md 756 FLOODING PRESSURE PSI
 SAMPLE DEPTH 3171.85 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
8.16	59.3	59.1	99.6
18.0	61.2	60.3	99.8
23.3	61.8	61.5	99.9
28.8	62.1	61.9	99.9
39.6	62.5	62.3	100
53.0	62.9	62.7	100
79.3	63.7	63.3	100
105	64.2	64.0	100
184	65.0	64.6	100
210	65.1	65.0	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 44 INITIAL WATER PERCENT PORE SPACE 37.3

PERMEABILITY TO AIR md 6.5 POROSITY PERCENT 14.3

PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md 4.1 FLOODING PRESSURE PSI

SAMPLE DEPTH 3401.65 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.249	23.4***		
0.296	24.8	24.1	72.0
0.354	26.1	25.4	77.0
0.454	27.9	27.0	82.1
0.563	29.1	28.5	88.6
0.695	30.1	29.6	92.9
0.846	30.9	30.5	94.3
1.22	32.1	31.5	96.9
1.40	32.6	32.4	96.9
1.59	33.1	32.9	97.4
1.88	33.8	33.4	97.7
2.22	34.3	34.0	98.6
2.62	34.6	34.4	99.1
3.63	34.9	34.8	99.7
4.19	35.2	35.1	99.5
8.54	36.2	35.7	99.8
15.8	37.6	36.9	99.8
20.6	38.0	37.8	99.9
29.9	38.9	38.4	99.9

- * Calculated for mid-point of incremental through-put
- * * Calculated from incremental through-put volumes
- * * * Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 44 INITIAL WATER PERCENT PORE SPACE 37.3
 PERMEABILITY TO AIR md 6.5 POROSITY PERCENT 14.3
 PERMEABILITY TO OIL WITH 4.1 FLOODING PRESSURE PSI
 INITIAL WATER PRESENT md SAMPLE DEPTH 3401.65 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
39.2	39.3	39.1	100
62.4	40.2	39.8	100
109	41.0	40.6	100
154	41.5	41.2	100
201	41.7	41.6	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 50 INITIAL WATER PERCENT PORE SPACE . 43.3
 PERMEABILITY TO AIR md . . 2.00 POROSITY PERCENT 12.5
 PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md . . 48 FLOODING PRESSURE PSI
 SAMPLE DEPTH 3419.10 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.256	20.2***		
0.470	20.6	20.4	97.9
0.685	21.0	20.8	98.5
1.01	21.6	21.3	98.0
1.67	21.8	21.7	99.7
2.75	22.2	22.0	99.7
5.55	22.7	22.4	99.8
11.2	23.4	23.1	99.9
16.8	23.6	23.5	100
27.7	24.0	23.8	100
81.9	25.1	24.6	100
124	25.2	25.2	100
196	25.4	25.3	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.

COMPANY: STATOIL

FORMATION: ZONE. 1

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

FIELD: GULLFAKS

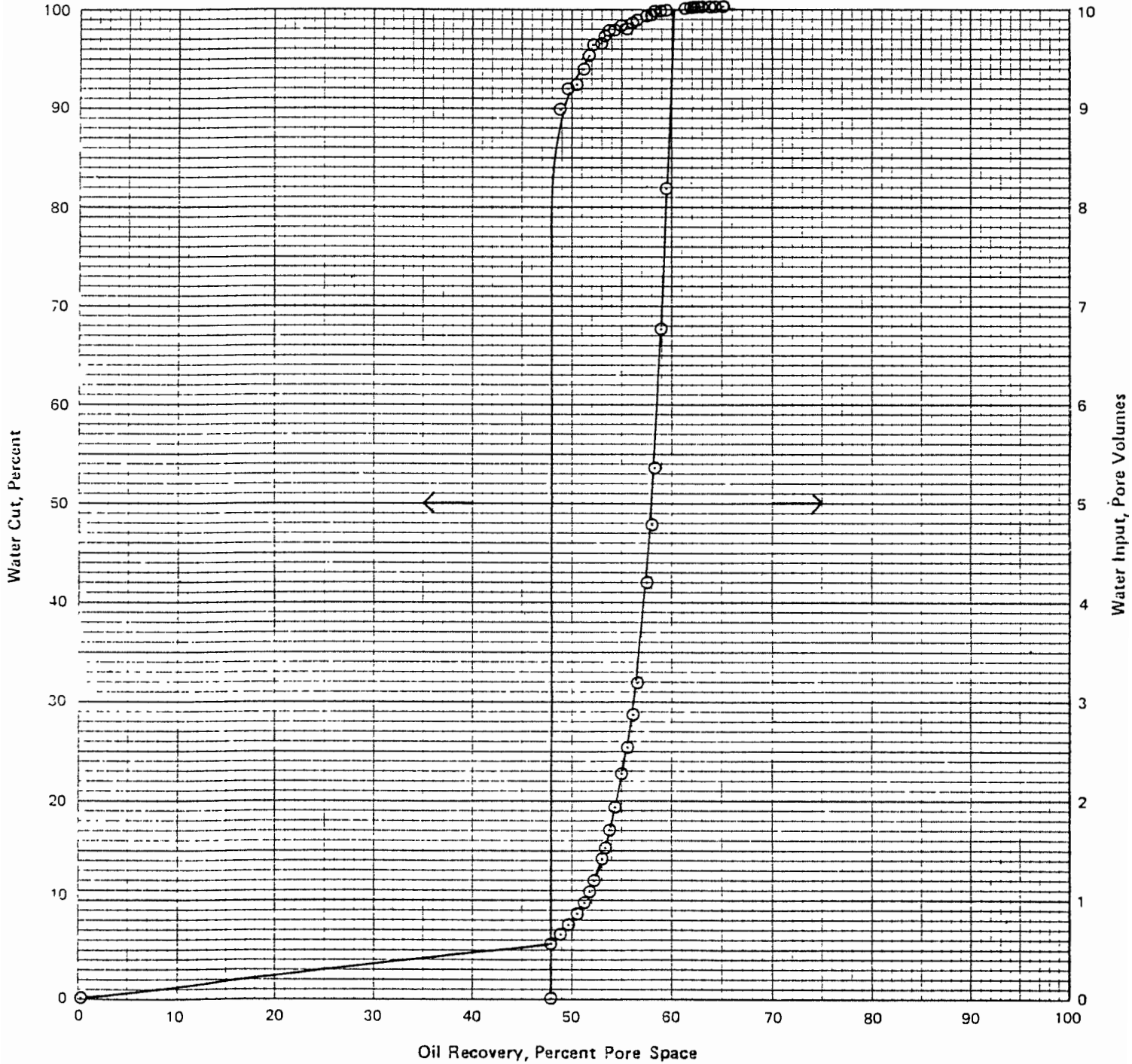
COUNTRY: NORWAY

SAMPLE NUMBER: 1

PERMEABILITY md : 1015.

SAMPLE DEPTH: 3171.85

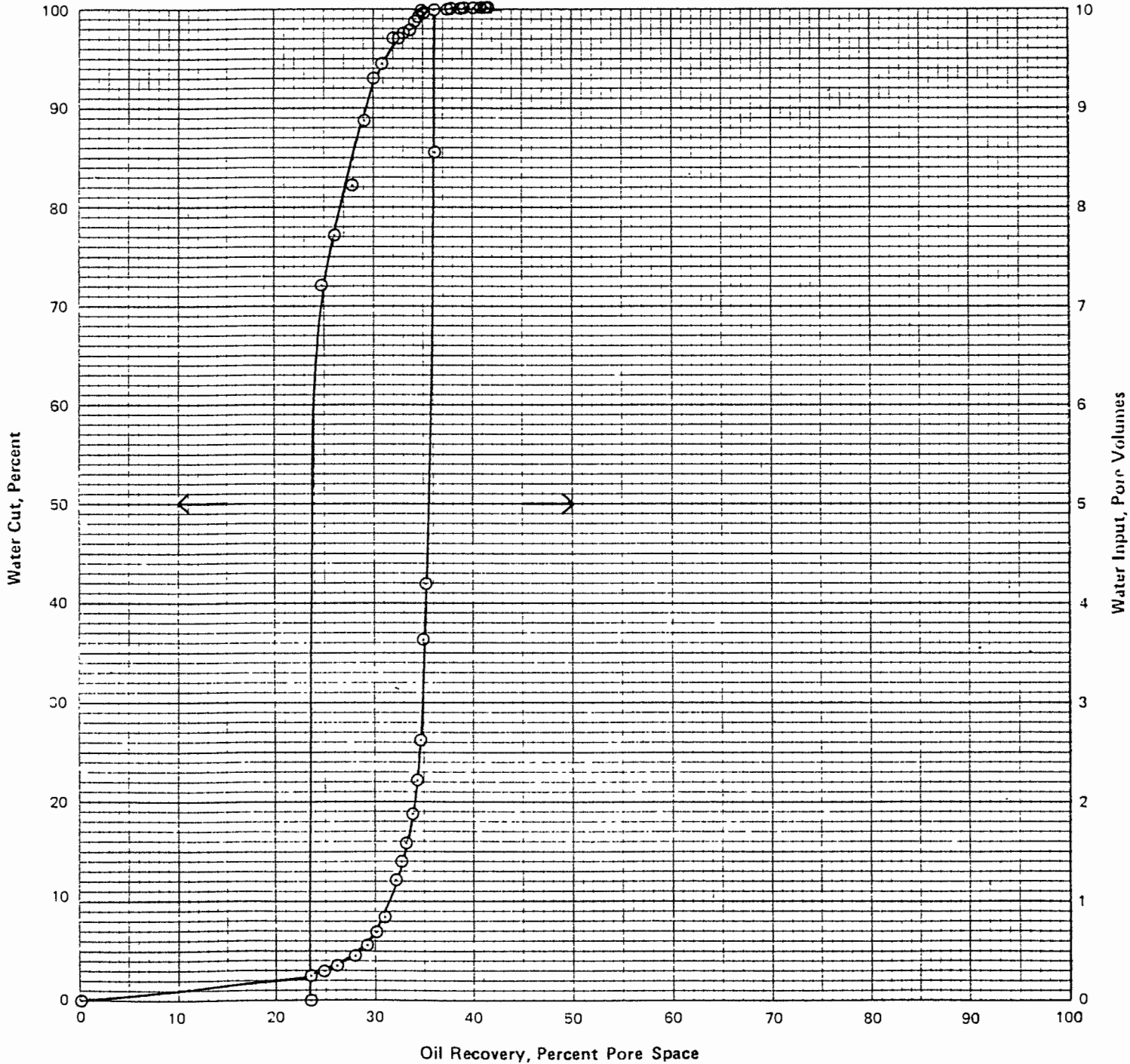
400 cc/hr WATERFLOOD



COMPANY: STATOIL
WELL: 34/10-16
FIELD: GULLFAKS
SAMPLE NUMBER: 44

FORMATION: ZONE 3
LOCATION: NORWEGIAN NORTH SEA
COUNTRY: NORWAY
PERMEABILITY md :6.5... ..
SAMPLE DEPTH: 3401.65 m

HIGHRATE WATERFLOOD
performed at 80 cc/hr Constant Flowrate



COMPANY: STATOIL

FORMATION: ZONE 4

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

FIELD: GULLFAKS

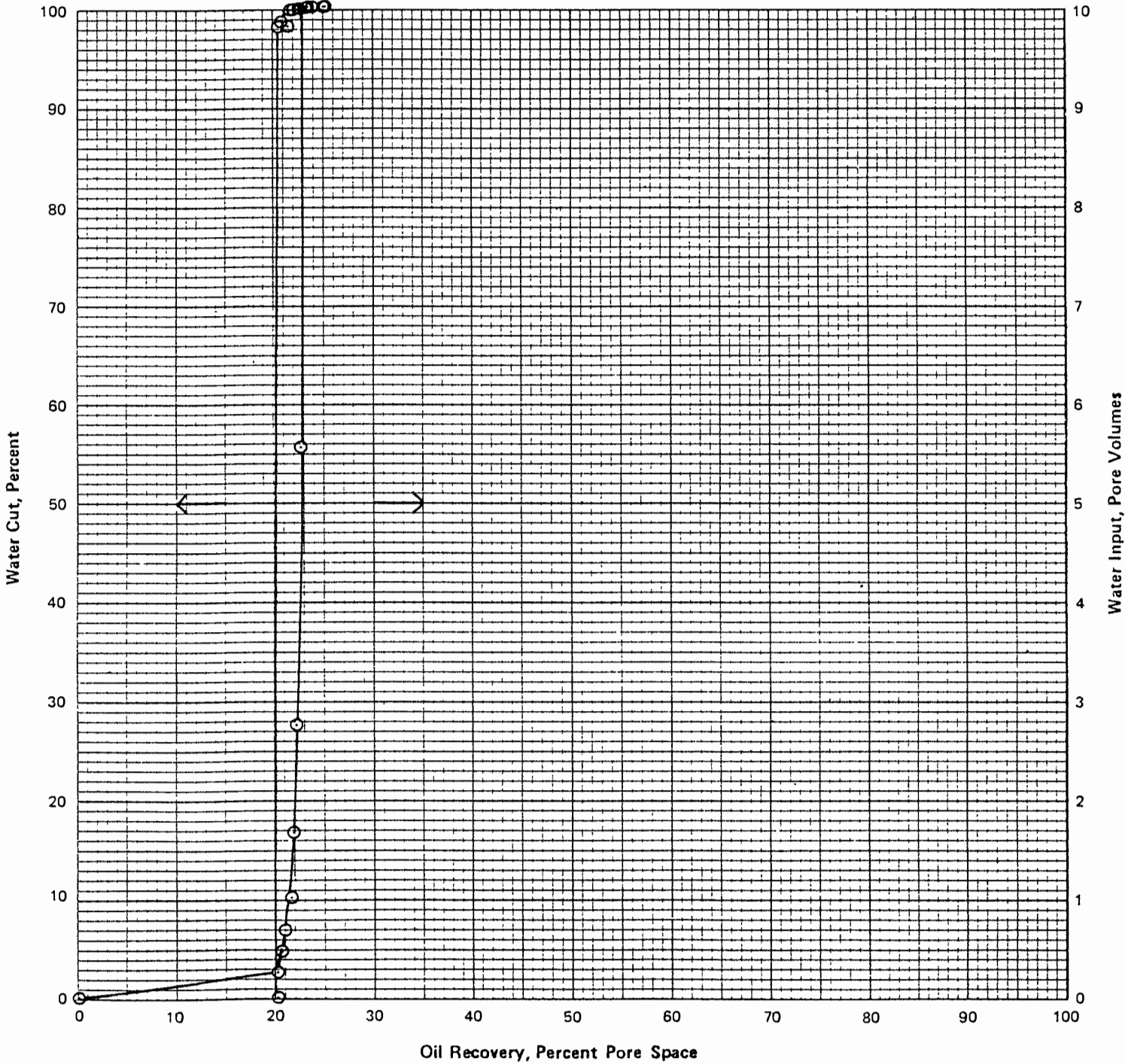
COUNTRY: NORWAY

SAMPLE NUMBER: 50

PERMEABILITY md 2.00

SAMPLE DEPTH: 3419.10 m

HIGHRATE WATERFLOOD
performed at 32 cc/hr Constant Flowrate





WATER – OIL RELATIVE PERMEABILITY DATA

SAMPLE NUMBER 1 INITIAL WATER SATURATION
PERCENT PORE SPACE 8.5

AIR PERMEABILITY md 1015 POROSITY PERCENT 24.7

OIL PERMEABILITY AT
INITIAL WATER SATURATION md 756 SAMPLE DEPTH 3171.85 m

WATER SATURATION PERCENT PORE SPACE	WATER – OIL RELATIVE PERMEABILITY RATIO	RELATIVE PERMEABILITY TO WATER*, FRACTION	RELATIVE PERMEABILITY TO OIL*, FRACTION
8.50			1.00
50.5	4.78	0.206	0.043
51.8	6.11	0.211	0.035
52.1	6.45	0.218	0.034
53.4	8.20	0.231	0.028
54.8	10.6	0.234	0.022
56.0	13.8	0.249	0.018
56.1	14.2	0.250	0.018
57.2	18.0	0.275	0.015
58.0	22.5	0.274	0.012
58.1	22.8	0.272	0.012
58.2	23.5	0.287	0.012
59.2	29.0	0.296	0.010
59.8	33.3	0.307	0.0092
60.6	40.2	0.316	0.0078
61.8	56.6	0.314	0.0055
62.4	65.7	0.331	0.0050
64.1	116	0.338	0.0029
64.1	119	0.358	0.0030
64.7	144	0.380	0.0026

* Relative to oil permeability

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATER – OIL RELATIVE PERMEABILITY DATA

SAMPLE NUMBER 1 INITIAL WATER SATURATION
 PERCENT PORE SPACE 8.5
 AIR PERMEABILITY md 1015
 POROSITY PERCENT 24.7
 OIL PERMEABILITY AT
 INITIAL WATER SATURATION md. 756 SAMPLE DEPTH 3171.85

WATER SATURATION PERCENT PORE SPACE	WATER – OIL RELATIVE PERMEABILITY RATIO	RELATIVE PERMEABILITY TO WATER*, FRACTION	RELATIVE PERMEABILITY TO OIL*, FRACTION
66.4	417	0.417	0.0010
68.3	700	0.453	0.0006
69.6	1572	0.459	0.0003
69.9	1951	0.476	0.0002
69.7	1787	0.479	0.0003
70.5	2653	0.485	0.0002
71.7	5721	0.418	<10E-4
73.1	26533	0.731	<10E-4

* Relative to oil permeability

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc.,/Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on



WATER – OIL RELATIVE PERMEABILITY DATA

SAMPLE NUMBER 44 INITIAL WATER SATURATION
PERCENT PORE SPACE 37.3

AIR PERMEABILITY md 6.5 POROSITY PERCENT 14.3

OIL PERMEABILITY AT
INITIAL WATER SATURATION md 4.1 SAMPLE DEPTH 3401.65 m

WATER SATURATION PERCENT PORE SPACE	WATER – OIL RELATIVE PERMEABILITY RATIO	RELATIVE PERMEABILITY TO WATER*, FRACTION	RELATIVE PERMEABILITY TO OIL*, FRACTION
37.3			1.00
53.8	1.44	0.129	0.090
55.3	1.88	0.129	0.069
56.7	2.39	0.139	0.058
60.3	4.61	0.165	0.036
62.4	7.28	0.176	0.024
63.4	9.33	0.185	0.020
65.6	17.7	0.197	0.011
65.6	17.5	0.208	0.012
66.3	21.2	0.209	0.0099
66.8	24.2	0.215	0.0089
68.5	39.8	0.221	0.0056
69.5	58.9	0.227	0.0039
71.2	198	0.244	0.0012
70.4	110	0.260	0.0024
71.6	274	0.271	0.0010
71.4	223	0.280	0.0013
72.0	307	0.314	0.0010
73.6	700	0.325	0.0005
73.2	549	0.338	0.0006

* Relative to oil permeability

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATER – OIL RELATIVE PERMEABILITY DATA

SAMPLE NUMBER 44
 AIR PERMEABILITY md 6.5
 OIL PERMEABILITY AT INITIAL WATER SATURATION md 4.1
 INITIAL WATER SATURATION PERCENT PORE SPACE 37.3
 POROSITY PERCENT 14.3
 SAMPLE DEPTH 3401.65 m

WATER SATURATION PERCENT PORE SPACE	WATER – OIL RELATIVE PERMEABILITY RATIO	RELATIVE PERMEABILITY TO WATER*, FRACTION	RELATIVE PERMEABILITY TO OIL*, FRACTION
75.0	1372	0.345	0.0003
75.0	1372	0.357	0.0003
76.5	3401	0.363	0.0001
77.1	5341	0.361	<10E-4
77.8	9369	0.374	<10E-4

* Relative to oil permeability

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on

COMPANY: STATOIL

FORMATION: ZONE. 1

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

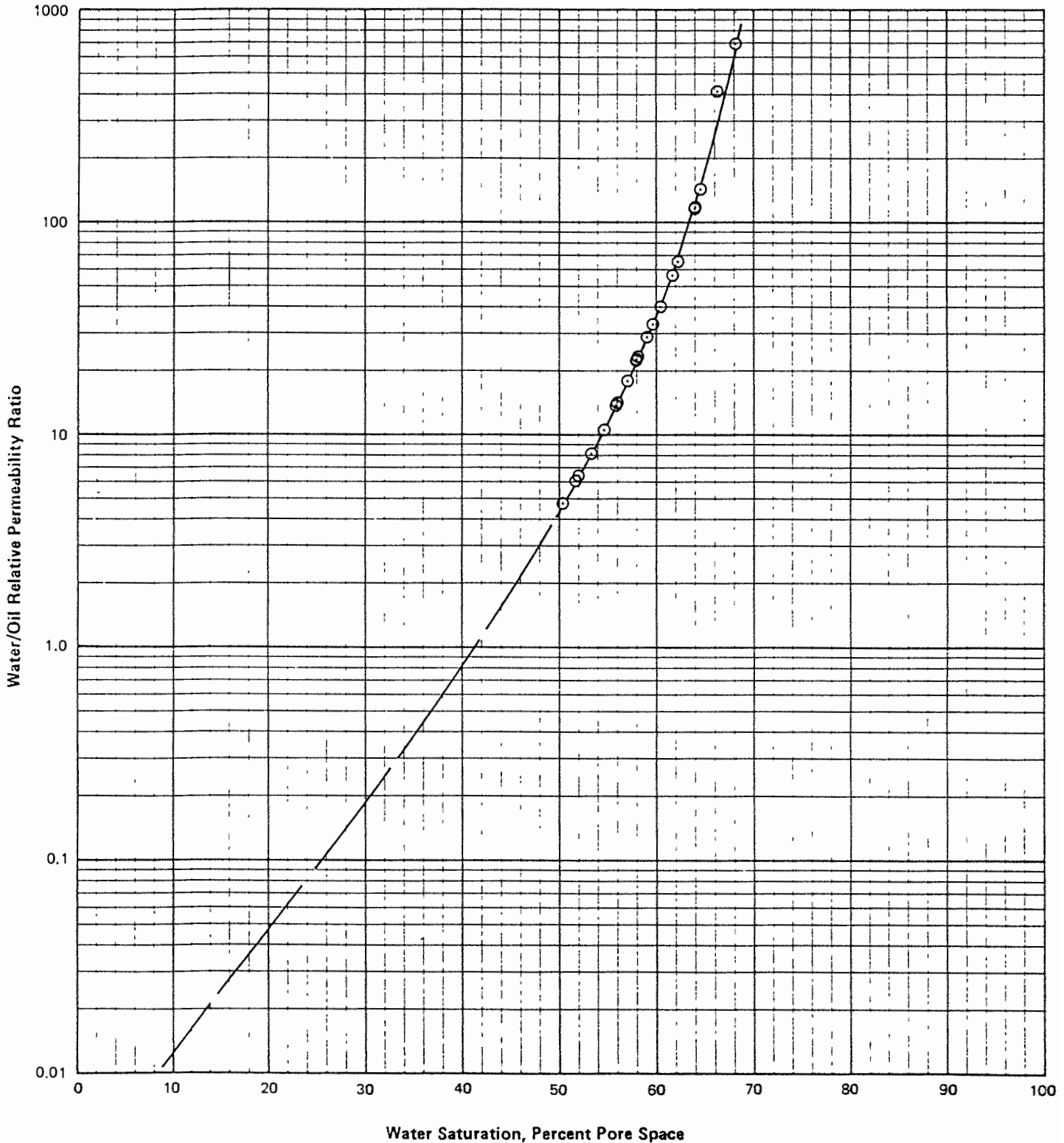
FIELD: GULLFAKS

COUNTRY: NORWAY

SAMPLE NUMBER: 1

PERMEABILITY_{md}: 1015

SAMPLE DEPTH: 3171.85 m



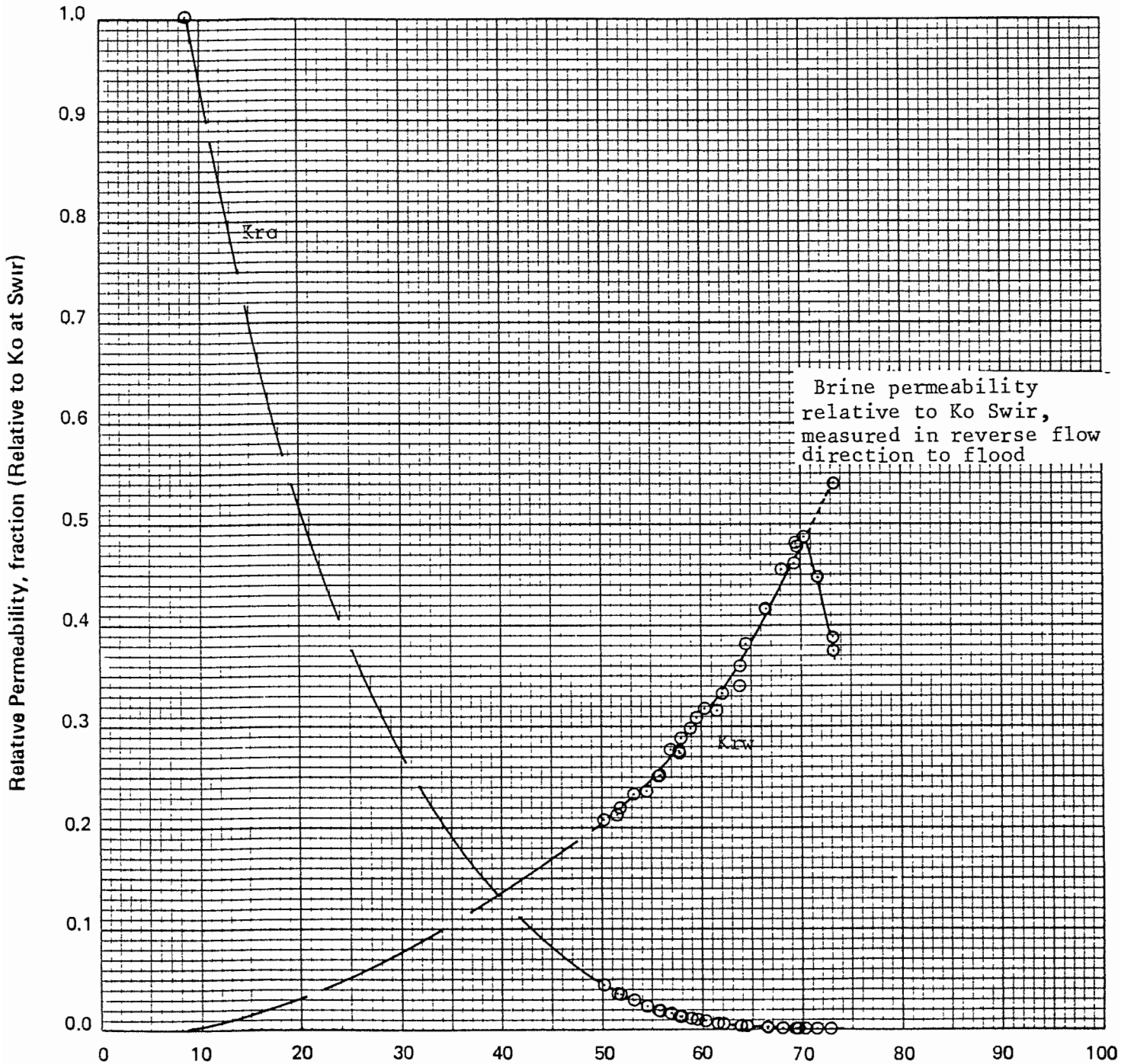
Water Saturation, Percent Pore Space

400 cc/hr WATERFLOOD

COMPANY: STATOIL
 WELL: 34/10-16
 FIELD: GULLFAKS
 SAMPLE No.: 1

FORMATION: ZONE 1
 LOCATION: NORWEGIAN NORTH SEA
 COUNTRY: NORWAY
 PERMEABILITY md: 1015
 SAMPLE DEPTH: 3171.85 m

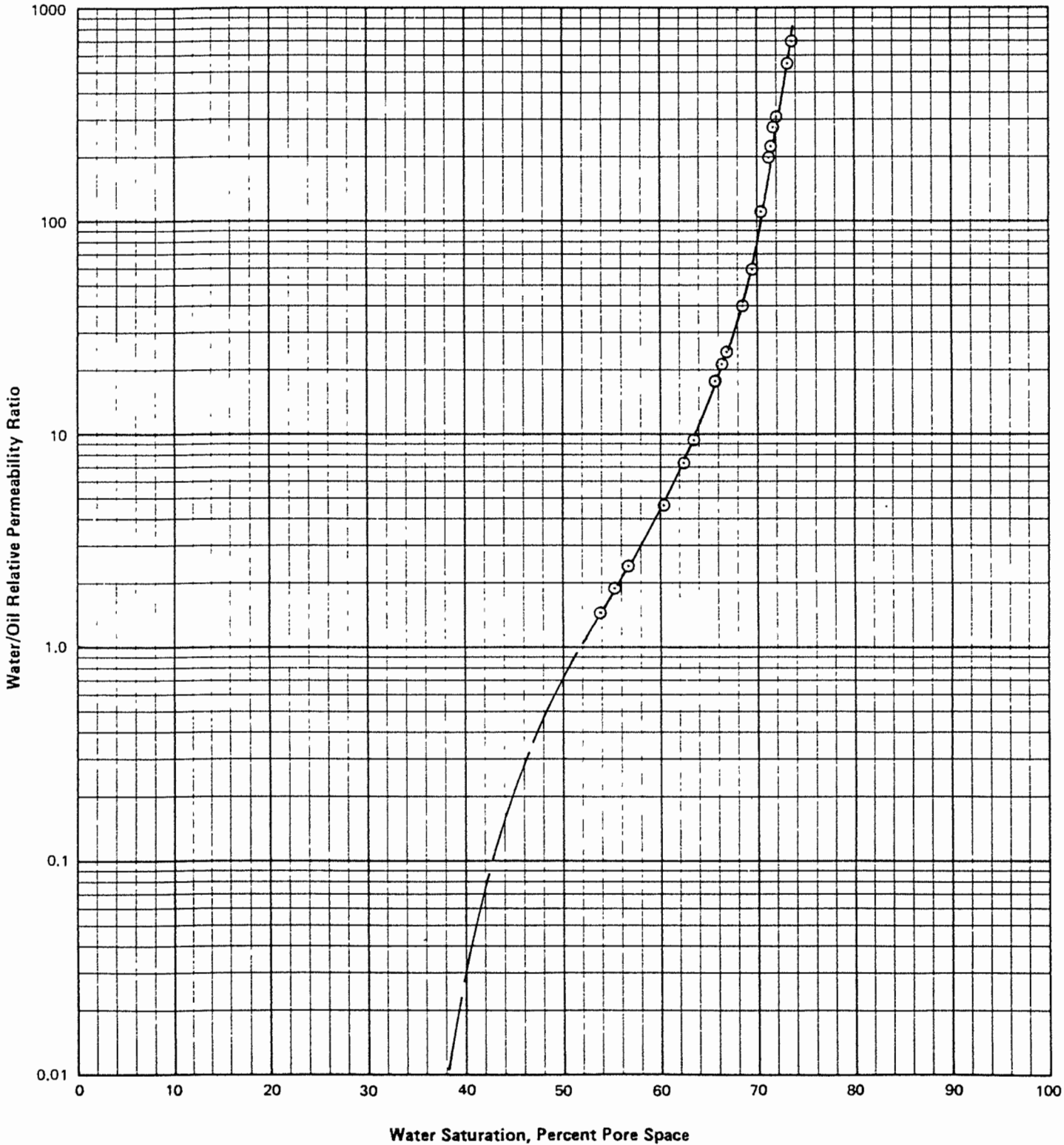
WATER - OIL RELATIVE PERMEABILITY
 Unsteady State, Restored State, Increasing Water Saturation



Water Saturation (Percent Pore Space)

COMPANY: STATOIL
WELL: 34/10-16
FIELD: GULLFAKS
SAMPLE NUMBER: 44

FORMATION: ZONE 2
LOCATION: NORWEGIAN NORTH SEA
COUNTRY: NORWAY
PERMEABILITY md: 6.5
SAMPLE DEPTH: 3401.65 m



COMPANY: STATOIL

FORMATION: ZONE 3

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

FIELD: GULLFAKS

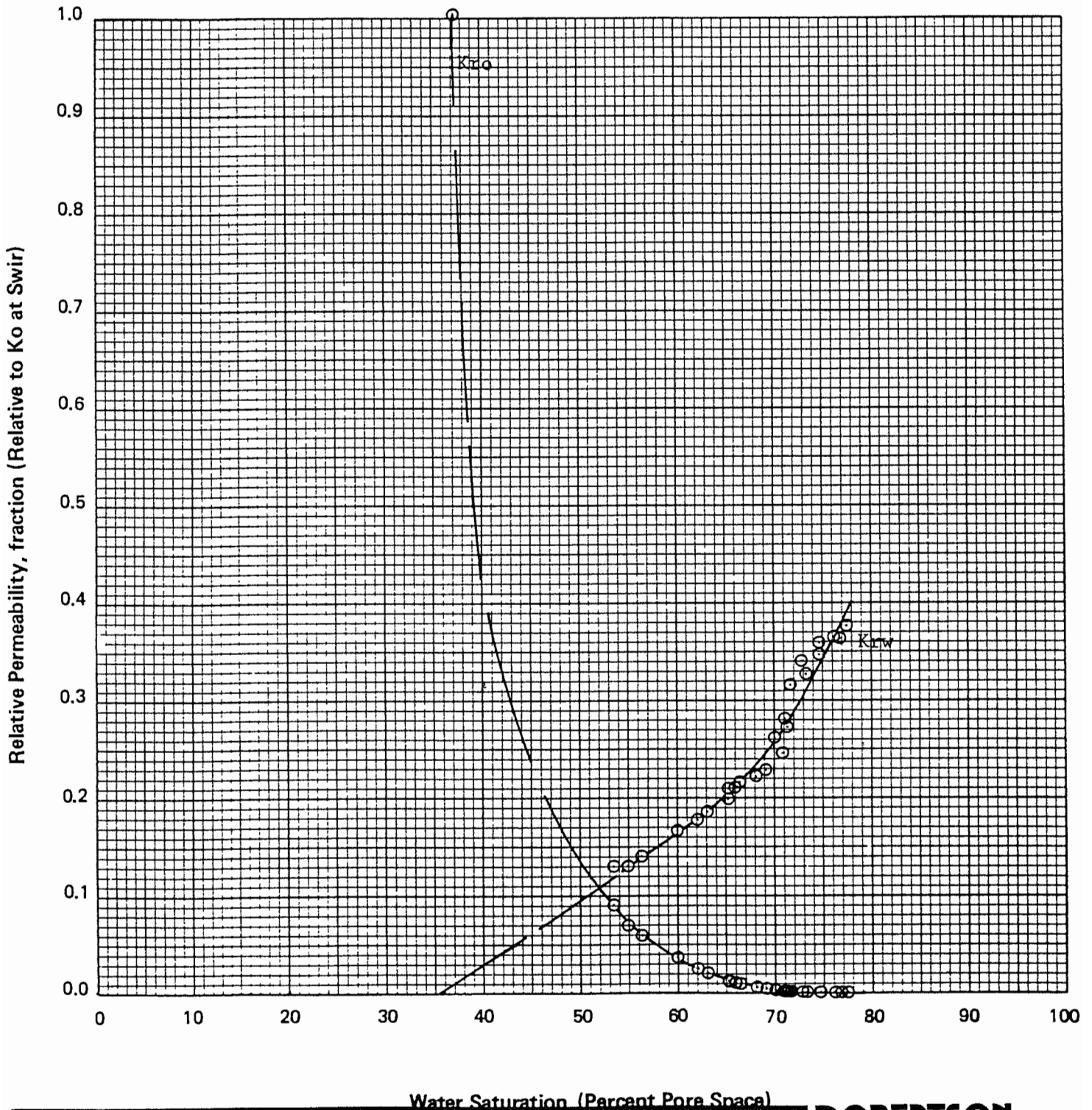
COUNTRY: NORWAY

SAMPLE No.: 44

PERMEABILITY md: 6.5

SAMPLE DEPTH: 3419.10

WATER - OIL RELATIVE PERMEABILITY
Unsteady State, Restored State, Increasing Water Saturation





SUMMARY OF WATERFLOOD TEST RESULTS
4 cc/hr Waterfloods, Constant Rate.

SAMPLE NUMBER	DEPTH METRES	AIR PERMEABILITY MILLIDARCIES	POROSITY PERCENT	INITIAL CONDITIONS		TERMINAL CONDITIONS			OIL RECOVERED	
				WATER SATURATION PERCENT PORE SPACE	OIL PERMEABILITY MILLIDARCIES	OIL SATURATION PERCENT PORE SPACE	WATER PERMEABILITY MILLIDARCIES	PERCENT PORE SPACE	PERCENT OIL IN PLACE	
8	3200.00	198	23.1	13.9	164	40.8		45.3	54.5	
9	3204.15	456	24.5	13.1	421	47.3		39.6	45.6	
27	3325.15	8.8	19.9	34.8	4.2	19.0		46.2	70.9	
33	3347.50	2210	22.0	4.0	1963	46.2		49.8	51.8	
35	3359.15	470	20.3	15.1	441	35.9		49.0	57.4	
47	3407.50	128	19.2	20.7	114	32.4		46.9	59.1	
50	3419.10	2.0	13.0	44.9	0.67	17.5		37.6	68.2	
52	3422.10	18	18.4	30.0	13.5	30.7		39.3	56.1	

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees. assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 8 INITIAL WATER PERCENT PORE SPACE 13.9
 PERMEABILITY TO AIR md 198 POROSITY PERCENT 23.1
 PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md 164 FLOODING PRESSURE PSI
 SAMPLE DEPTH 3200.00 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.313	30.7***		
0.342	32.6	31.7	36.0
0.378	34.6	33.6	43.5
0.418	36.6	35.6	51.4
0.467	38.1	37.3	69.4
0.525	39.4	38.7	76.8
0.612	40.1	39.7	92.1
0.726	40.6	40.4	95.4
0.906	41.4	41.0	95.8
1.20	42.2	41.8	97.2
1.62	42.9	42.5	98.2
2.09	43.4	43.2	99.0
4.86	44.8	44.1	99.5
7.68	45.2	45.0	99.9
10.5	45.3	45.2	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 9 INITIAL WATER PERCENT PORE SPACE 13.1

PERMEABILITY TO AIR md 456 POROSITY PERCENT 24.5

PERMEABILITY TO OIL WITH 421 FLOODING PRESSURE PSI

INITIAL WATER PRESENT md SAMPLE DEPTH 3201.15 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.336	32.4***		
0.363	33.3	32.8	66.7
0.399	34.2	33.7	75.0
0.447	35.1	34.6	81.3
0.507	35.6	35.3	91.0
0.596	36.2	35.9	93.3
0.706	36.7	36.5	95.1
1.38	38.3	37.5	97.7
1.98	38.6	38.4	99.5
3.42	39.0	38.8	99.7
4.87	39.3	39.2	99.8
7.89	39.5	39.4	99.9
13.2	39.6	39.6	100

- Calculated for mid-point of incremental through-put
- • Calculated from incremental through-put volumes
- • • Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.

**WATERFLOOD SUSCEPTIBILITY DATA**

SAMPLE NUMBER 27 INITIAL WATER PERCENT PORE SPACE 34.8

PERMEABILITY TO AIR md 8.8 POROSITY PERCENT 19.9

PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md 4.2 FLOODING PRESSURE PSI

SAMPLE DEPTH 3325.15

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.350	33.7***		
0.401	34.0	33.9	93.2
0.501	34.7	34.3	93.7
0.641	34.8	34.7	99.0
0.898	35.2	35.0	98.4
1.31	35.7	35.5	98.8
7.31	45.1	40.4	98.4
14.5	46.2	45.7	99.8

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 33 INITIAL WATER PERCENT PORE SPACE . 4.0

PERMEABILITY TO AIR md 2210 POROSITY PERCENT 22.0

PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md 1963 FLOODING PRESSURE PSI

SAMPLE DEPTH 3347.50 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.618	49.2***		
1.01	49.3	49.3	99.7
4.35	49.7	49.5	99.9
10.9	49.8	49.7	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 35 INITIAL WATER PERCENT PORE SPACE 15.1
 PERMEABILITY TO AIR md 470 POROSITY PERCENT 20.3
 PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md 441 FLOODING PRESSURE PSI
 SAMPLE DEPTH 3559.15 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.435	40.8***		
0.528	42.4	41.6	83.1
0.605	43.0	42.7	91.2
0.691	43.7	43.3	92.9
1.03	44.7	44.2	96.8
1.66	46.1	45.4	97.8
2.32	46.8	46.5	99.0
5.70	48.2	47.5	99.6
9.13	49.0	48.6	99.8
11.6	49.0	49.0	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitableness of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 47 INITIAL WATER PERCENT PORE SPACE 20.7

PERMEABILITY TO AIR md 128 POROSITY PERCENT 19.2

PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md 114 FLOODING PRESSURE PSI

SAMPLE DEPTH 3407.50 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.438	41.9***		
0.536	42.6	42.2	92.6
0.684	43.3	42.9	95.6
0.943	44.0	43.7	96.9
1.36	44.6	44.3	98.6
2.03	45.3	45.0	99.0
3.80	46.4	45.8	99.4
7.39	46.9	46.6	99.9
10.5	47.0	46.9	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 50 INITIAL WATER PERCENT PORE SPACE 44.9

PERMEABILITY TO AIR md 2.0 POROSITY PERCENT 13.0

PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md67 FLOODING PRESSURE PSI

SAMPLE DEPTH 3419.10

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.372	34.9***		
0.767	35.2	35.0	99.2
1.14	35.4	35.3	99.4
1.76	35.5	35.5	99.8
2.86	36.9	36.2	98.8
5.54	37.1	37.0	99.9
10.6	37.4	37.2	99.9
16.5	37.6	37.5	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 52 INITIAL WATER PERCENT PORE SPACE . 30.0
 PERMEABILITY TO AIR md . . 18 POROSITY PERCENT 18.4
 PERMEABILITY TO OIL WITH FLOODING PRESSURE PSI
 INITIAL WATER PRESENT md . 13.5
 SAMPLE DEPTH 3422.10

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.517	37.1***		
1.68	37.2	37.2	99.9
3.64	37.5	37.4	99.8
7.37	38.9	38.2	99.6
10.0	39.2	39.1	99.9
14.4	39.3	39.3	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.

COMPANY: STATOIL

FORMATION: ZONE 1

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

FIELD: GULLFAKS

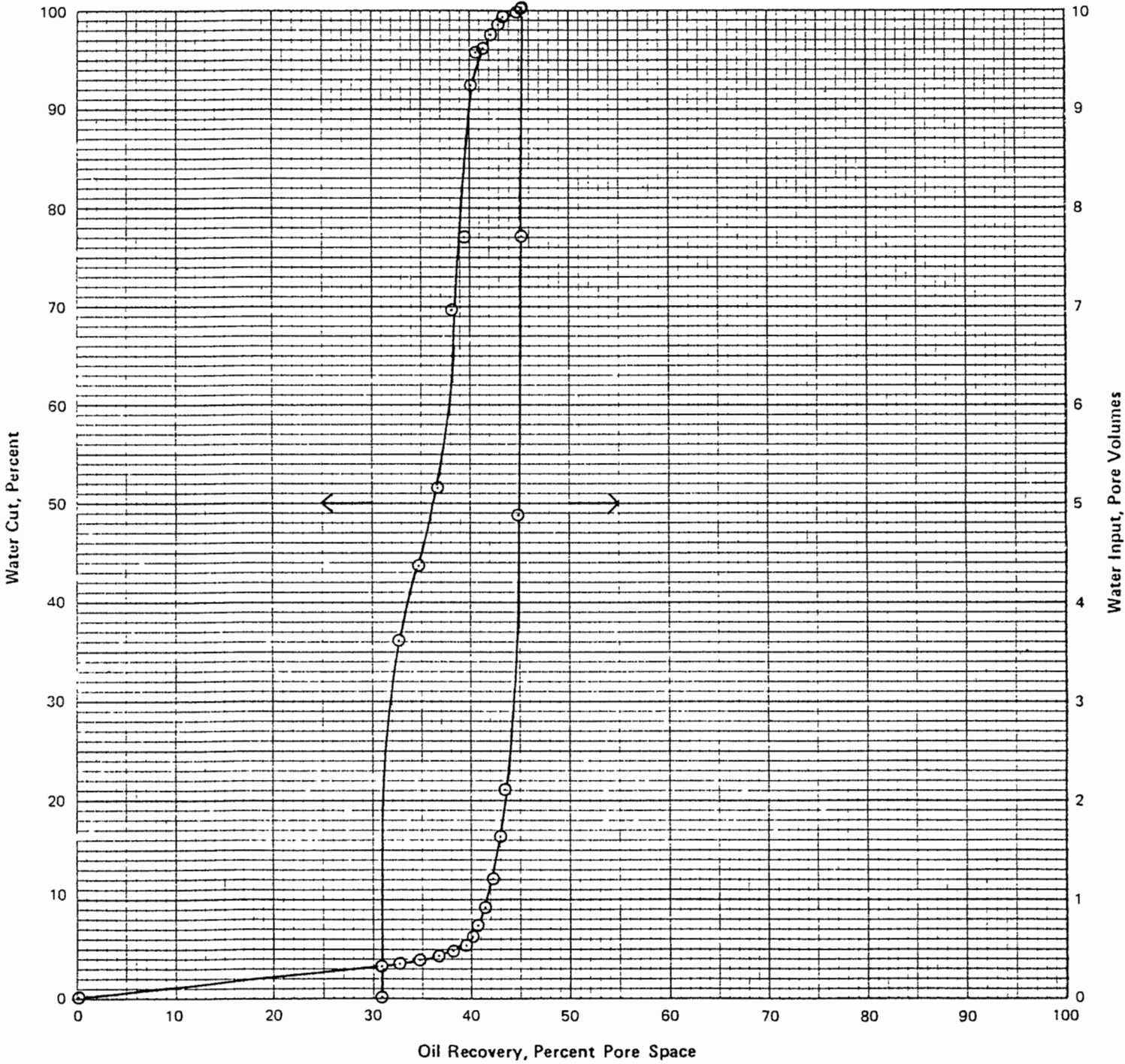
COUNTRY: NORWAY

SAMPLE NUMBER: 8

PERMEABILITY md :1.98

SAMPLE DEPTH: 3200.00 m

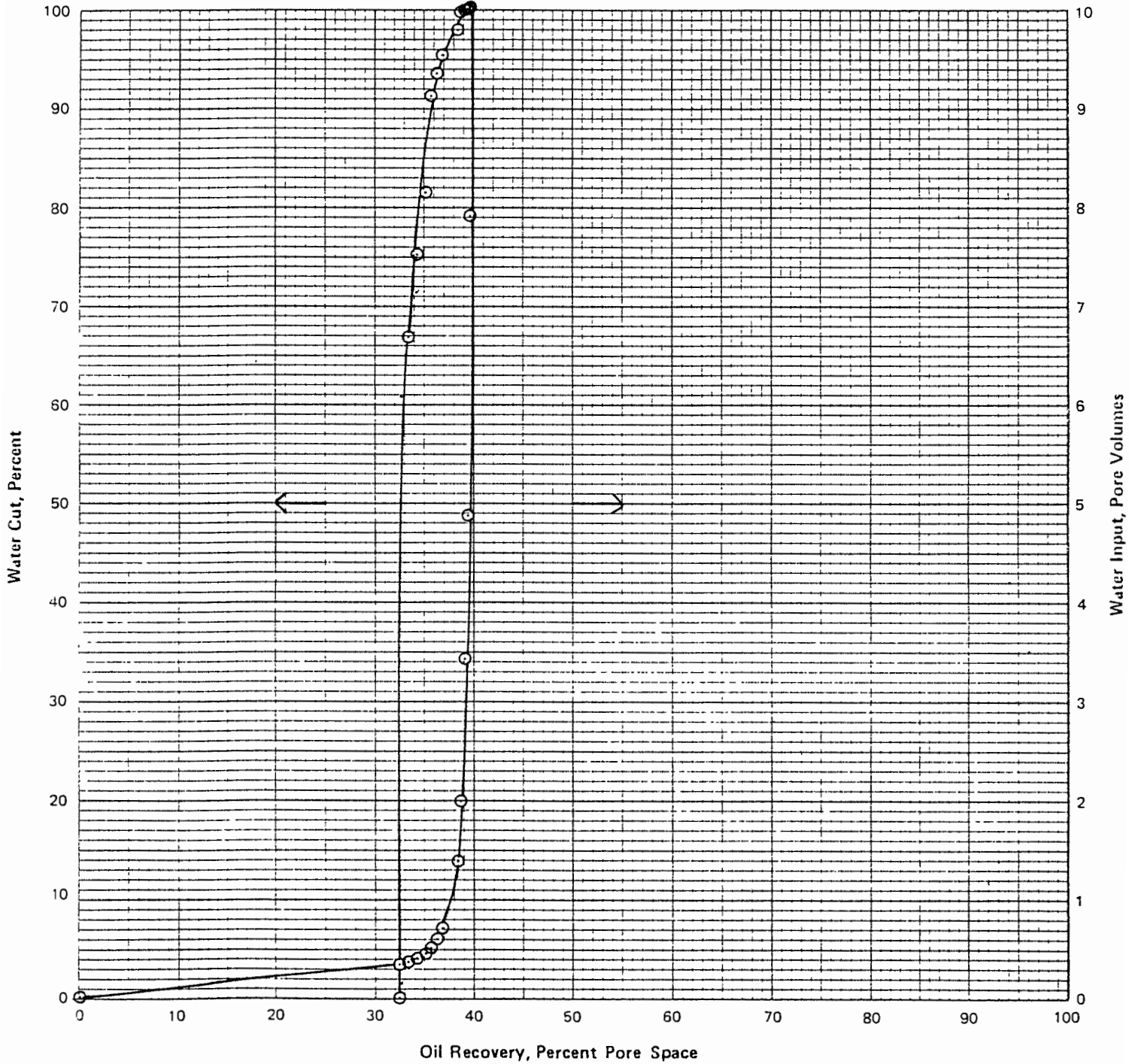
4 cc/hr WATERFLOOD



COMPANY: STATOIL
WELL: 34/10-16
FIELD: GULLFAKS
SAMPLE NUMBER: 9

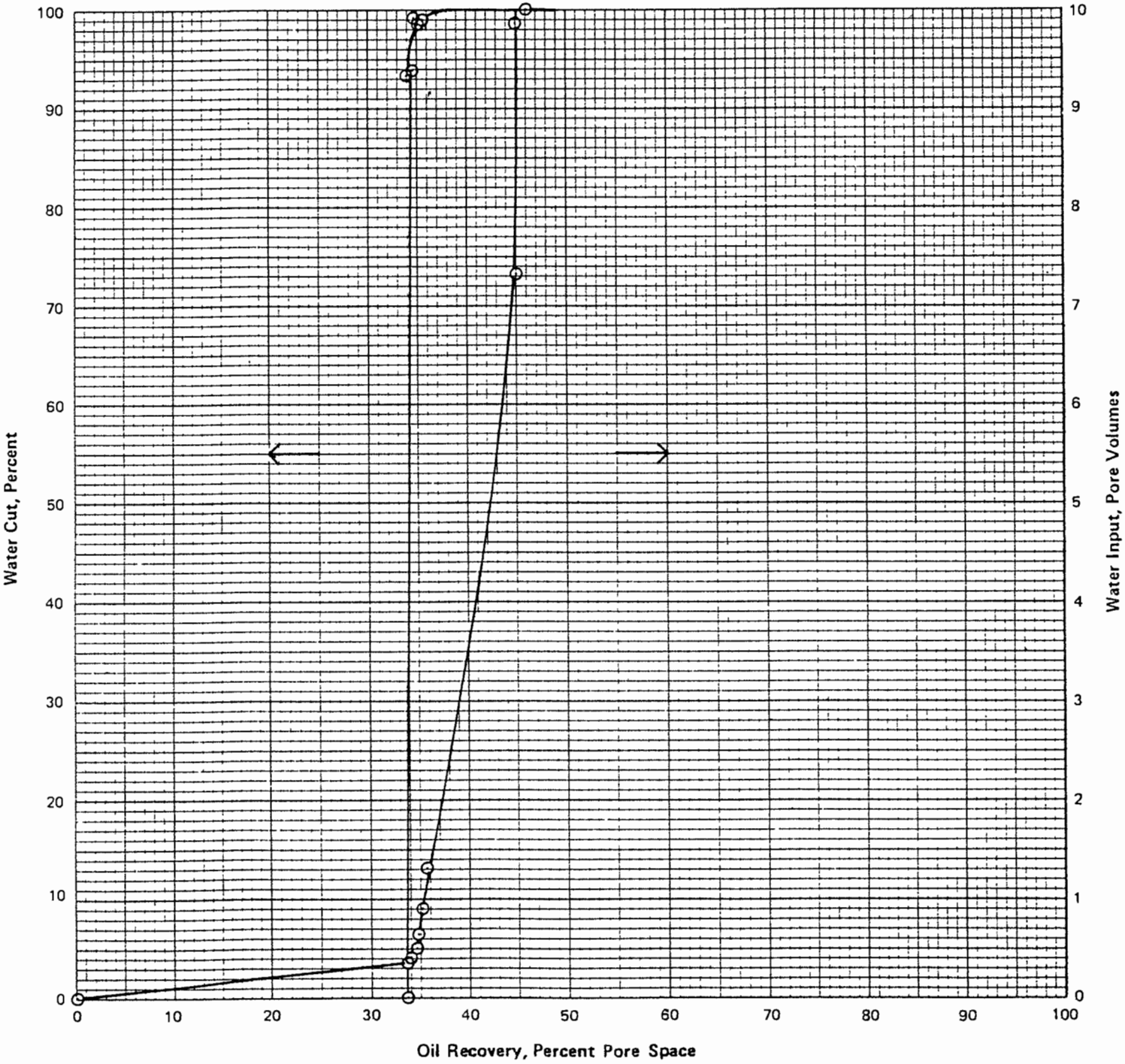
FORMATION: ZONE 1
LOCATION: NORWEGIAN NORTH SEA
COUNTRY: NORWAY
PERMEABILITY md :456
SAMPLE DEPTH: 3204.15

4 cc/hr WATERFLOOD



COMPANY: STATOIL
WELL: 34/10-16
FIELD: GULLFAKS
SAMPLE NUMBER: 27

FORMATION: ZONE 2
LOCATION: NORWEGIAN NORTH SEA
COUNTRY: NORWAY
PERMEABILITY md $\times .8$
SAMPLE DEPTH: 3325.15 m



COMPANY: STATOIL

FORMATION: ZONE 2

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

FIELD: GULLFAKS

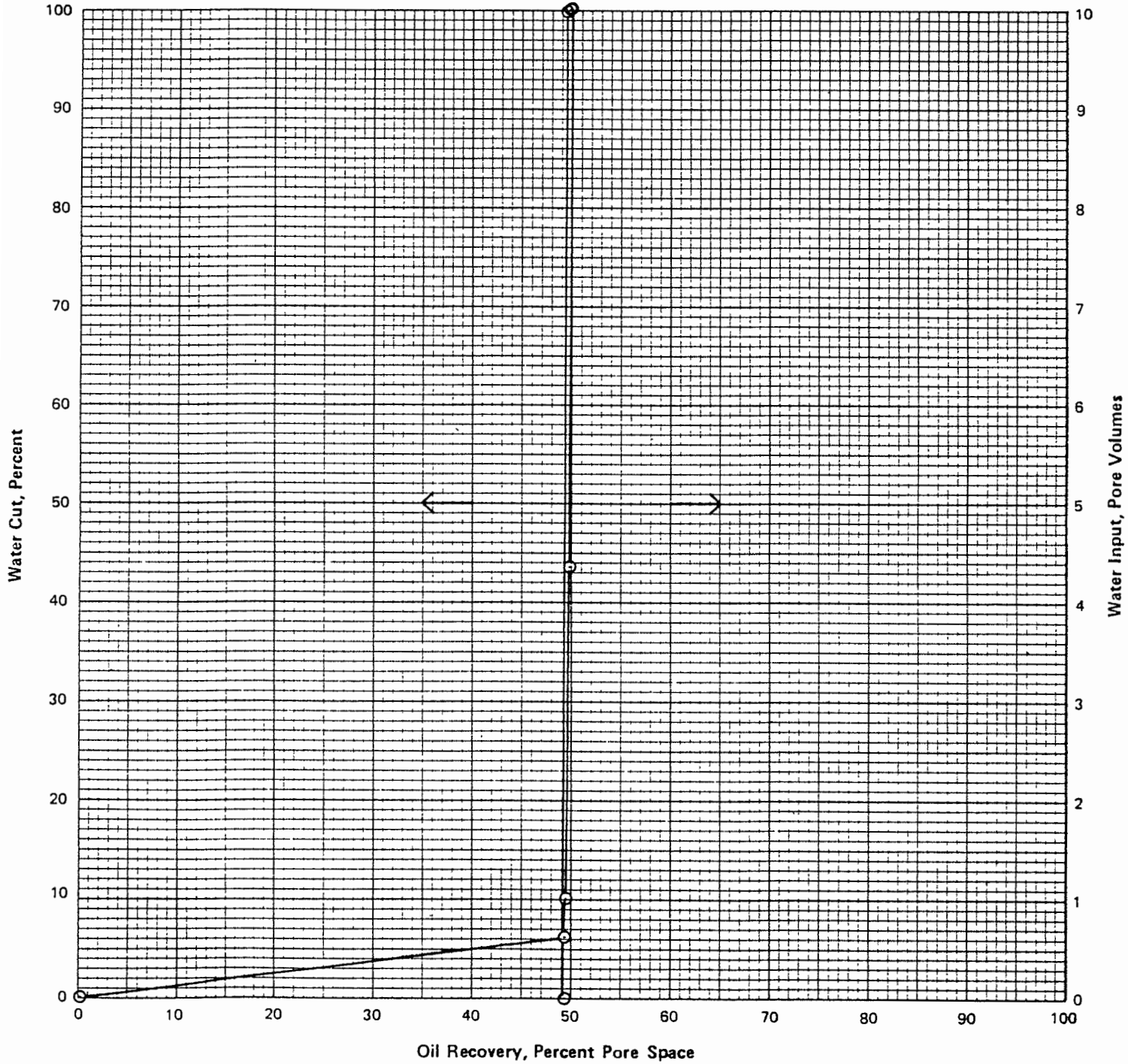
COUNTRY: NORWAY

SAMPLE NUMBER: 33

PERMEABILITY md :2210

SAMPLE DEPTH: 3347.50 m

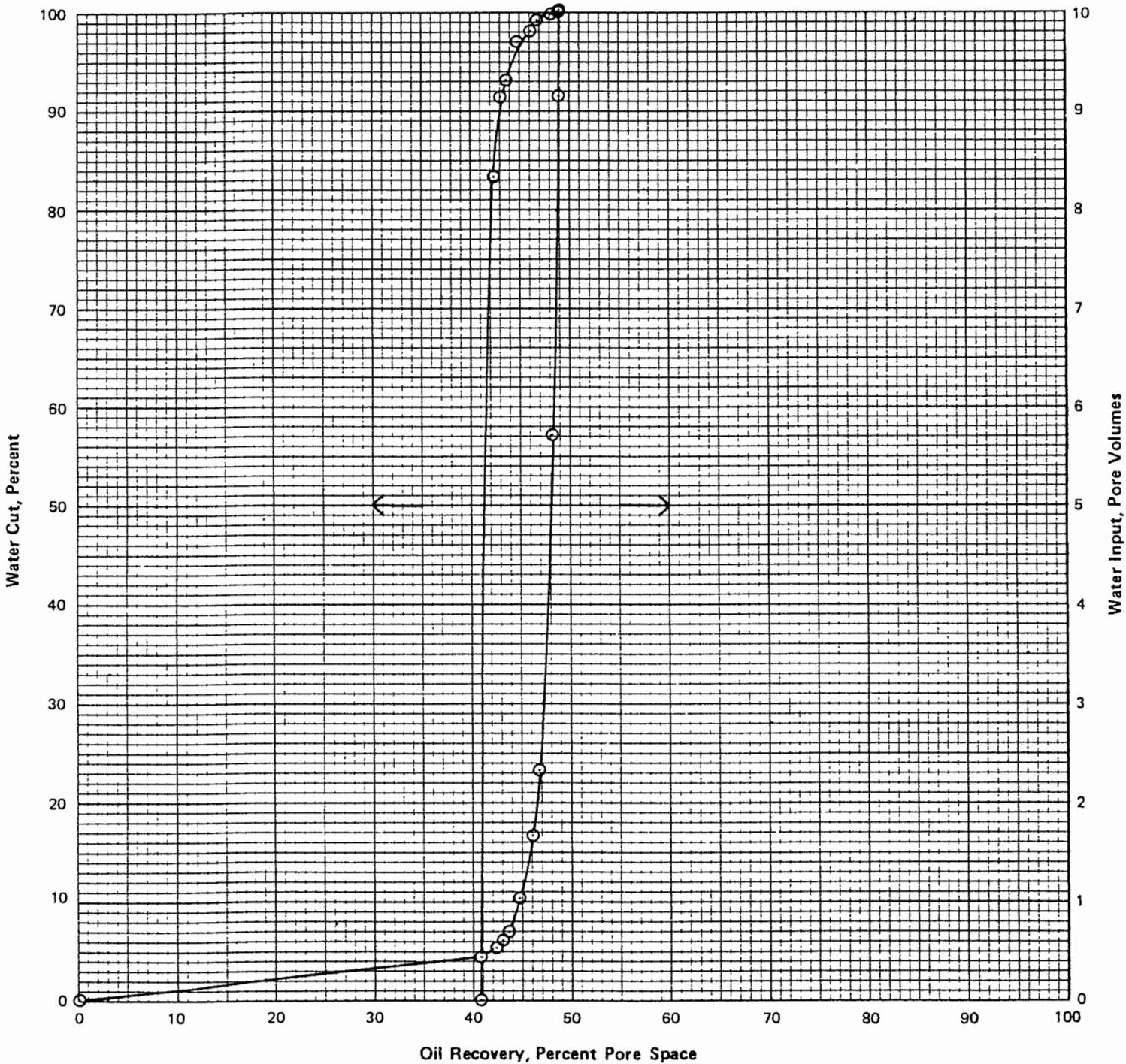
4 cc/hr WATERFLOOD



COMPANY: STATOIL
WELL: 34/10-16
FIELD: GULLFAKS
SAMPLE NUMBER: 35

FORMATION: ZONE 2
LOCATION: NORWEGIAN NORTH SEA
COUNTRY: NORWAY
PERMEABILITY md :470
SAMPLE DEPTH: 3359.15 m

4 cc/hr WATERFLOOD



COMPANY: STATOIL

FORMATION: ZONE 3

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

FIELD: GULLFAKS

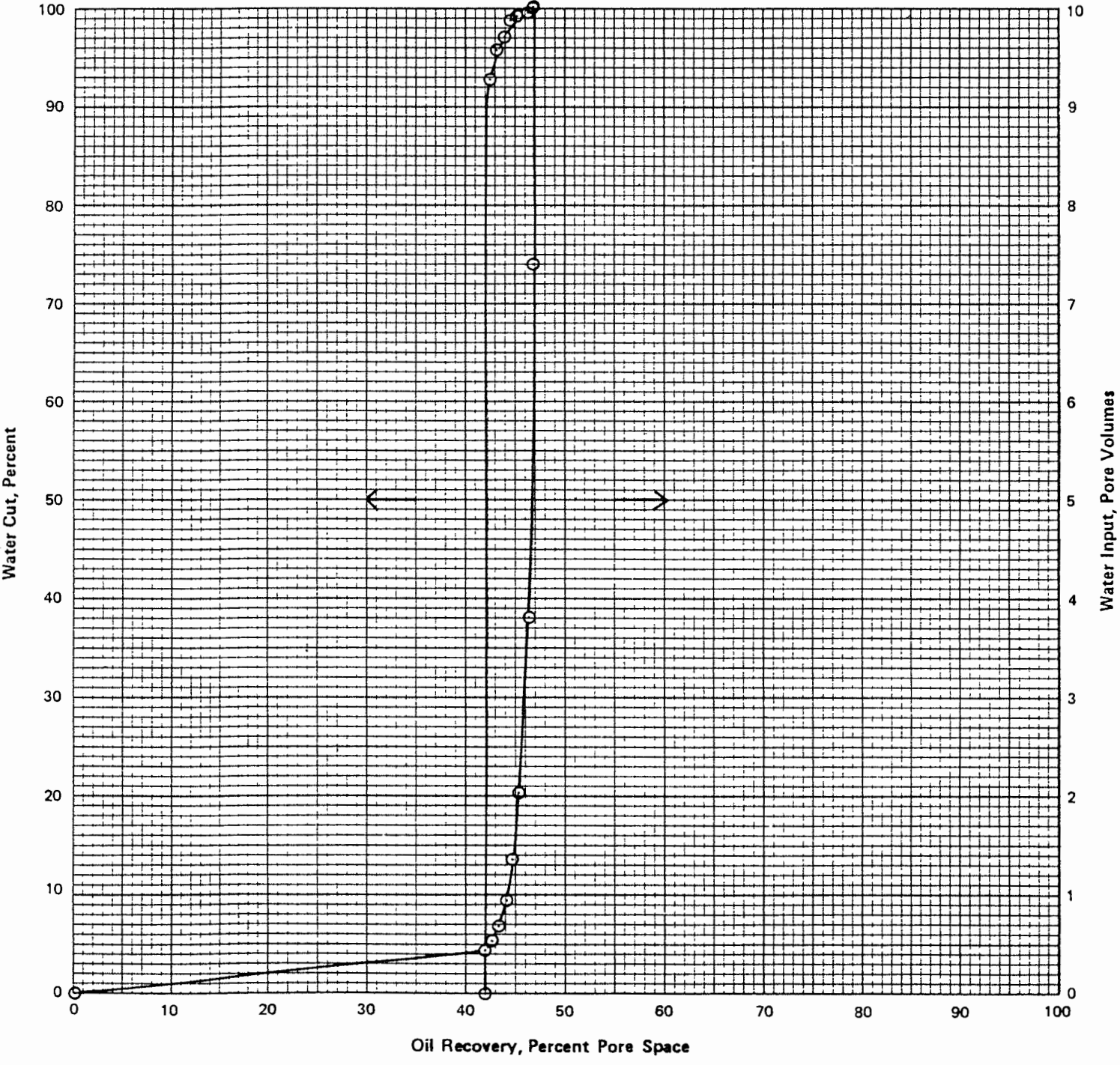
COUNTRY: NORWAY

SAMPLE NUMBER: 47

PERMEABILITY md :1.28

SAMPLE DEPTH: 3407.50 m

4 cc/hr WATERFLOOD



COMPANY: STATOIL

FORMATION: ZONE 4.

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

FIELD: GULLFAKS

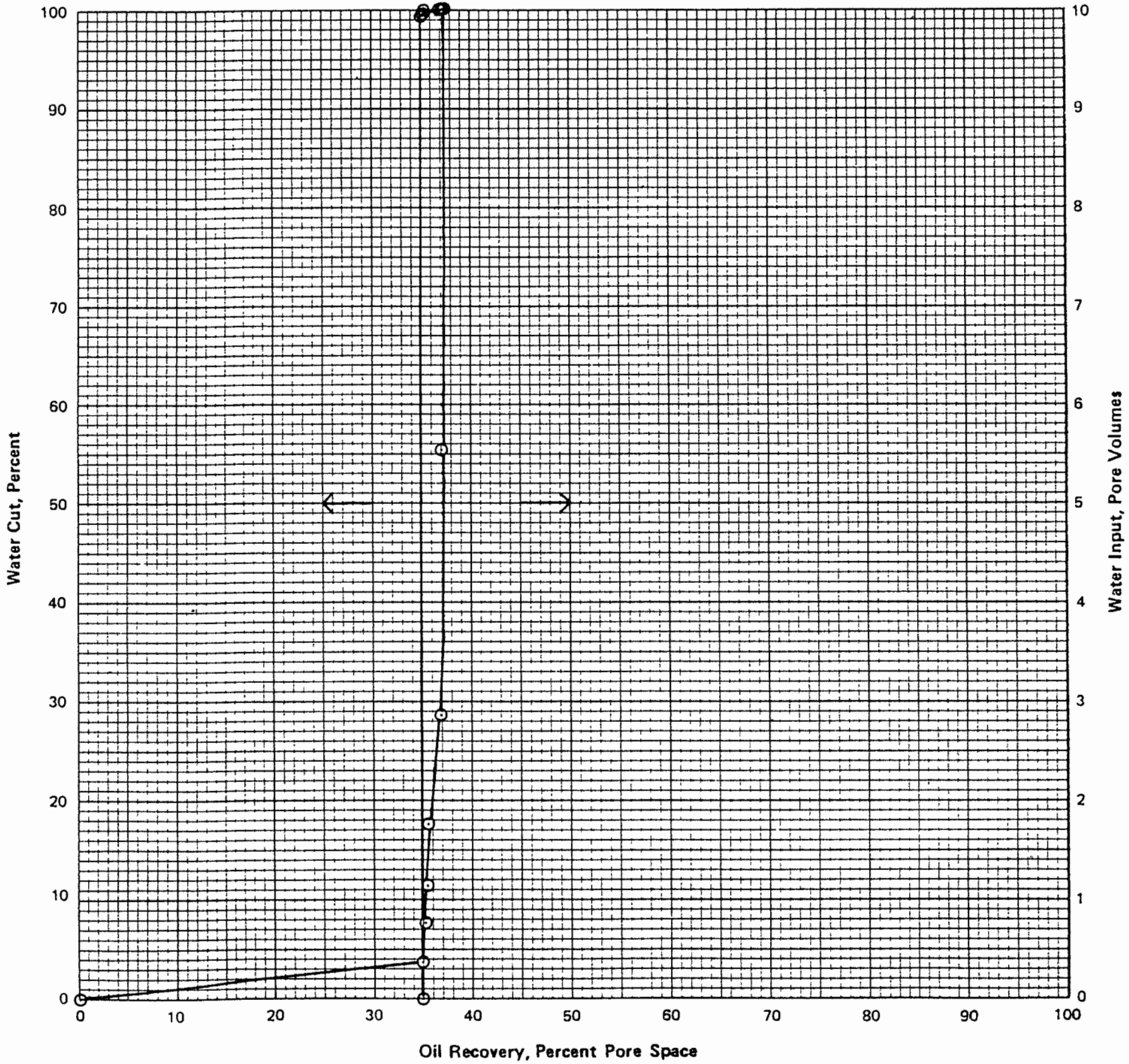
COUNTRY: NORWAY

SAMPLE NUMBER: 50

PERMEABILITY md 2.0

SAMPLE DEPTH: 3419.10 m

4 cc/hr WATERFLOOD



COMPANY: STATOIL

FORMATION: ZONE 4.

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

FIELD: GULLFAKS

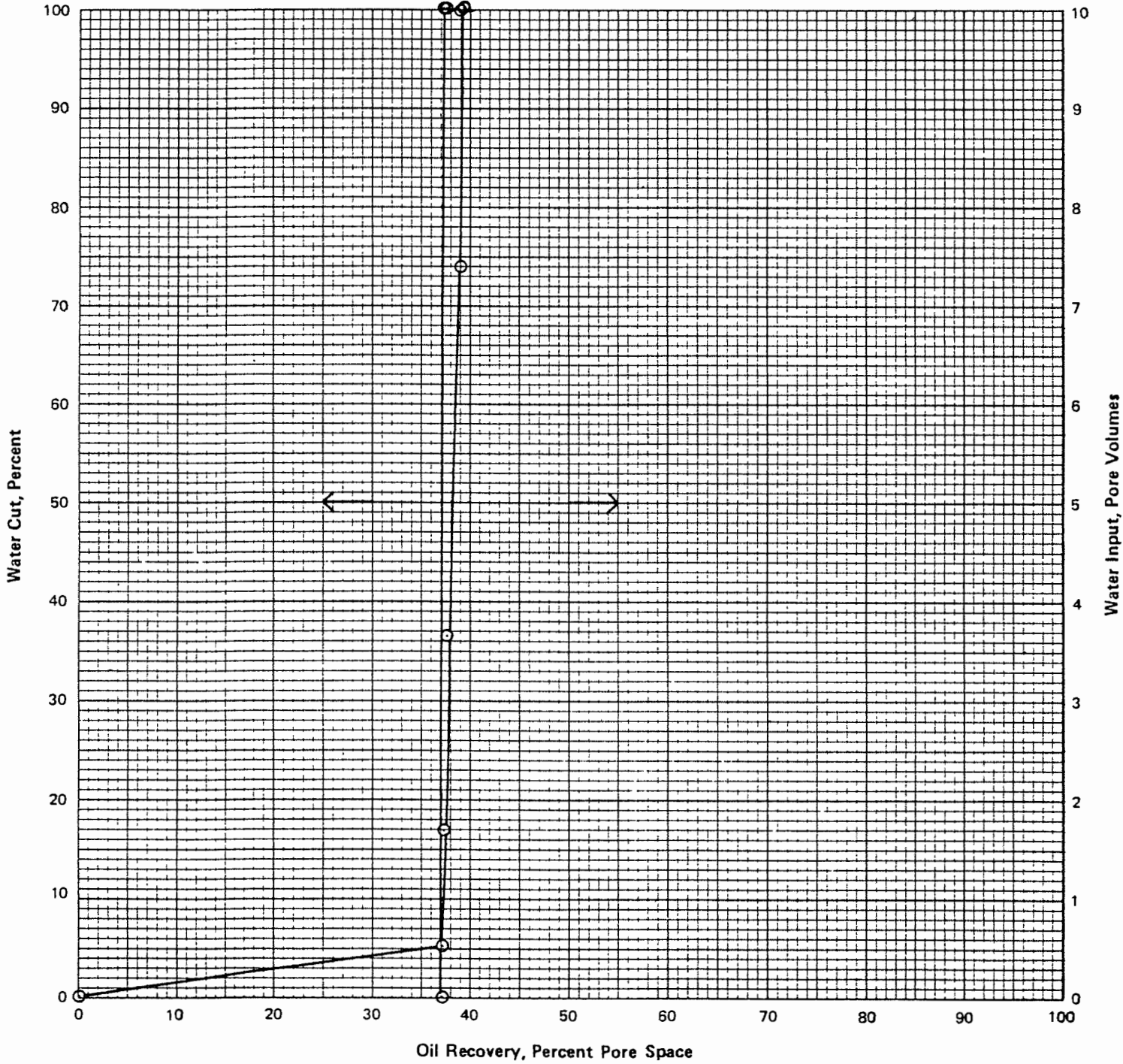
COUNTRY: NORWAY

SAMPLE NUMBER: 52

PERMEABILITY md :18

SAMPLE DEPTH: 3422.10 m

4 cc/hr WATERFLOOD





WATER – OIL RELATIVE PERMEABILITY DATA

SAMPLE NUMBER 8
INITIAL WATER SATURATION
PERCENT PORE SPACE 13.9

AIR PERMEABILITY md 198
POROSITY PERCENT 23.1

OIL PERMEABILITY AT
INITIAL WATER SATURATION md 164
SAMPLE DEPTH 3200.00 m

WATER SATURATION PERCENT PORE SPACE	WATER – OIL RELATIVE PERMEABILITY RATIO	RELATIVE PERMEABILITY TO WATER*, FRACTION	RELATIVE PERMEABILITY TO OIL*, FRACTION
13.9			1.00
27.6	0.307	0.025	0.080
30.2	0.421	0.030	0.070
33.2	0.578	0.033	0.058
40.7	1.24	0.045	0.037
44.1	1.80	0.053	0.029
52.2	6.37	0.069	0.011
54.2	11.4	0.069	0.0061
54.5	12.5	0.073	0.0058
55.7	19.0	0.077	0.0040
57.0	30.5	0.086	0.0028
58.2	55.1	0.088	0.0016
59.2	109	0.099	0.0009
61.0	380	0.105	0.0003
61.8	1316	0.105	<10E-4

* Relative to oil permeability

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATER – OIL RELATIVE PERMEABILITY DATA

SAMPLE NUMBER 9 INITIAL WATER SATURATION
 PERCENT PORE SPACE 13.1
 AIR PERMEABILITY md 456 POROSITY PERCENT 24.5
 OIL PERMEABILITY AT
 INITIAL WATER SATURATION md 421 SAMPLE DEPTH 3204.15 m

WATER SATURATION PERCENT PORE SPACE	WATER – OIL RELATIVE PERMEABILITY RATIO	RELATIVE PERMEABILITY TO WATER*, FRACTION	RELATIVE PERMEABILITY TO OIL*, FRACTION
13.1			1.00
34.8	1.21	0.037	0.030
37.3	1.70	0.043	0.026
39.8	2.45	0.043	0.018
44.1	5.73	0.051	0.0088
45.3	7.87	0.053	0.0067
46.4	11.1	0.053	0.0048
48.2	24.0	0.061	0.0026
50.7	114	0.060	0.0005
51.1	193	0.066	0.0003
51.4	274	0.069	0.0003
52.0	716	0.069	<10E-4
52.6	5074	0.070	<10E-4

* Relative to oil permeability

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on



WATER – OIL RELATIVE PERMEABILITY DATA

SAMPLE NUMBER 35 INITIAL WATER SATURATION 15.1
PERCENT PORE SPACE
AIR PERMEABILITY md 470 POROSITY PERCENT 20.3
OIL PERMEABILITY AT 441 SAMPLE DEPTH 3359.15 m
INITIAL WATER SATURATION md

WATER SATURATION PERCENT PORE SPACE	WATER – OIL RELATIVE PERMEABILITY RATIO	RELATIVE PERMEABILITY TO WATER*, FRACTION	RELATIVE PERMEABILITY TO OIL*, FRACTION
15.1			1.00
48.5	2.76	0.041	0.015
52.8	5.78	0.044	0.0076
53.8	7.30	0.043	0.0058
56.5	16.8	0.045	0.0027
57.6	25.4	0.046	0.0018
59.5	53.7	0.042	0.0008
60.9	132	0.044	0.0003
62.1	255	0.050	0.0002
63.8	2061	0.053	<10E-4

* Relative to oil permeability

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc.,/Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.

COMPANY: STATOIL

FORMATION: ZONE 1

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

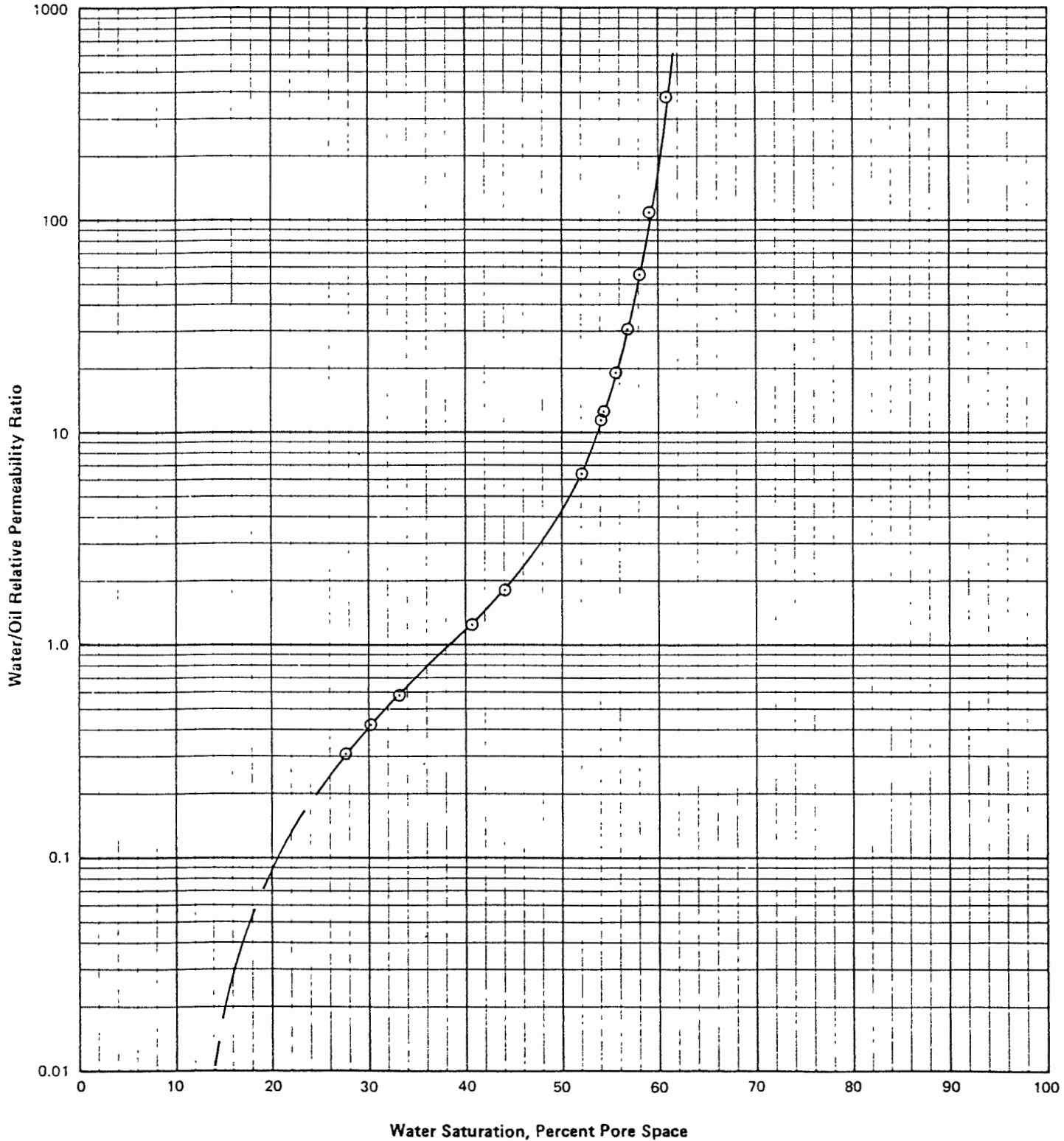
FIELD: GULLFAKS

COUNTRY: NORWAY

SAMPLE NUMBER: 8

PERMEABILITY_{md}: 198

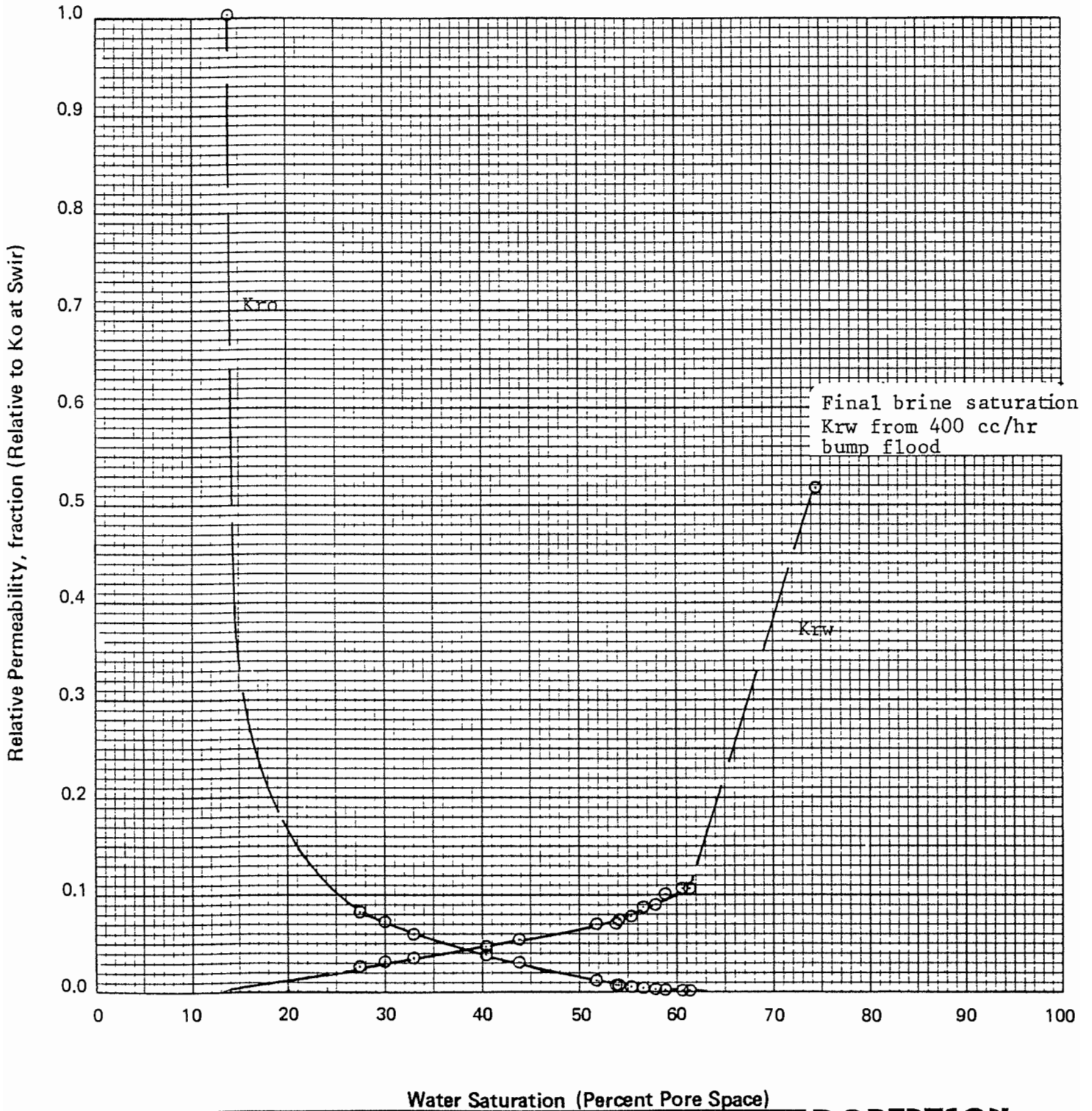
SAMPLE DEPTH: 3200.00



COMPANY: STATOIL
WELL: 34/10-16
FIELD: GULLFAKS
SAMPLE No.: 8

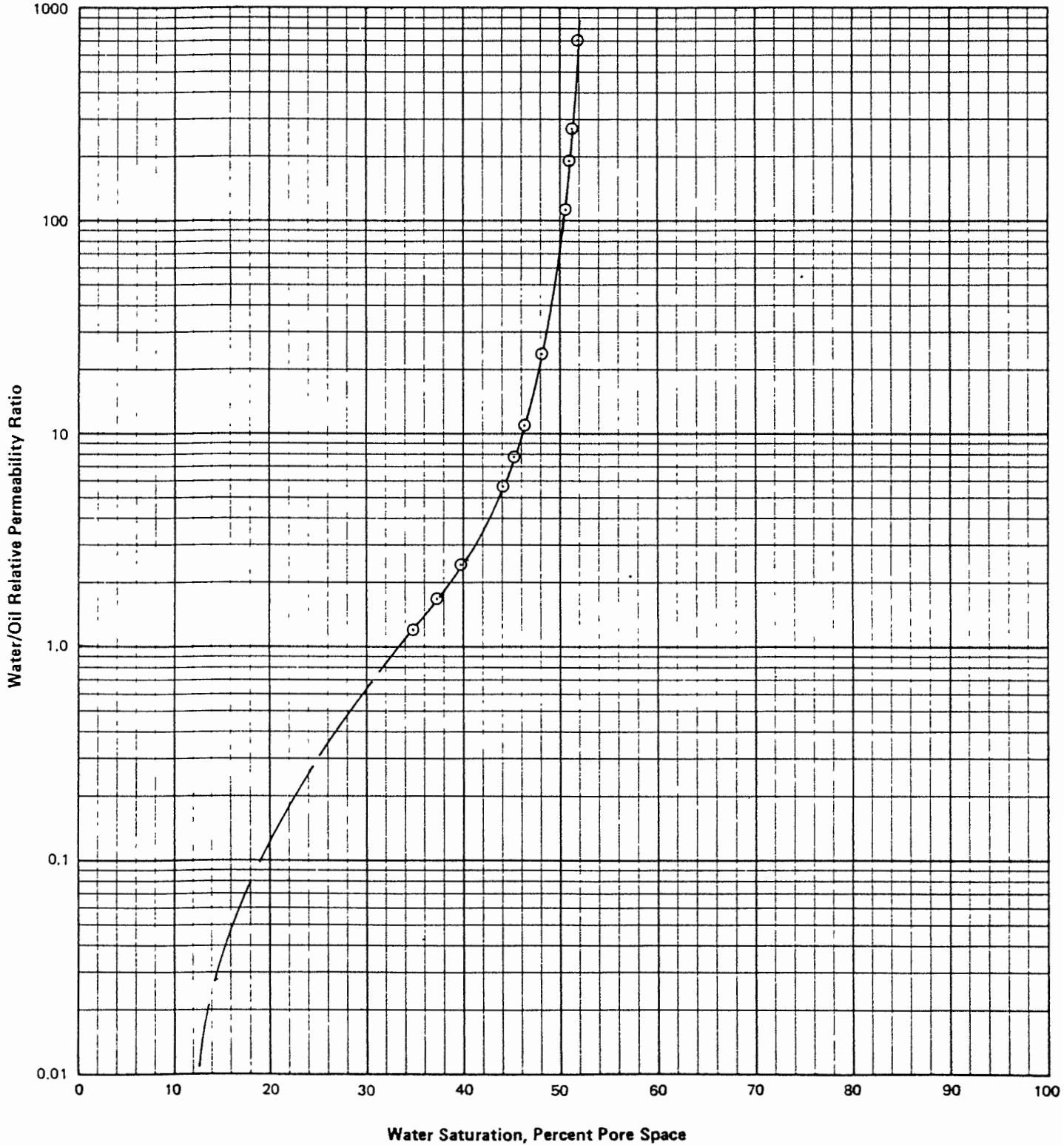
FORMATION: ZONE 1
LOCATION: NORWEGIAN NORTH SEA
COUNTRY: NORWAY
PERMEABILITY md: 198
SAMPLE DEPTH: 3200.00 m

WATER – OIL RELATIVE PERMEABILITY Unsteady State, Restored State, Increasing Water Saturation



COMPANY: STATOIL
WELL: 34/10-16
FIELD: GULLFAKS
SAMPLE NUMBER: 9

FORMATION: ZONE. 1.
LOCATION: NORWEGIAN NORTH SEA
COUNTRY: NORWAY
PERMEABILITY md : .456
SAMPLE DEPTH: 3204.15 m



COMPANY: STATOIL

FORMATION: ZONE 1

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

FIELD: GULLFAKS

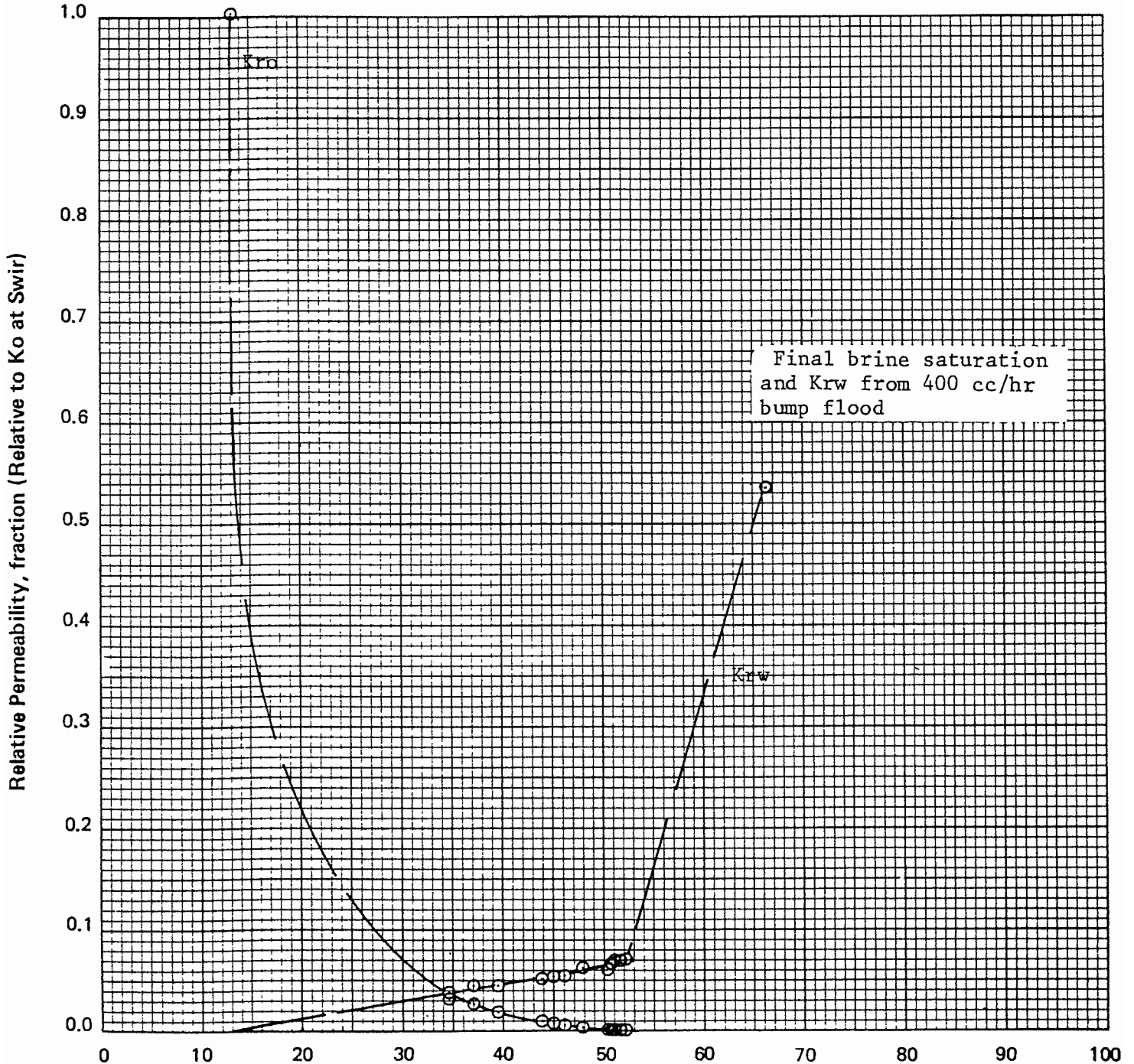
COUNTRY: NORWAY

SAMPLE No.: 9

PERMEABILITY md: 421

SAMPLE DEPTH: 3204.15 m

WATER – OIL RELATIVE PERMEABILITY
 Unsteady State, Restored State, Increasing Water Saturation



Final brine saturation and K_{rw} from 400 cc/hr bump flood

Water Saturation (Percent Pore Space)

COMPANY: STATOIL

FORMATION: ZONE 2

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

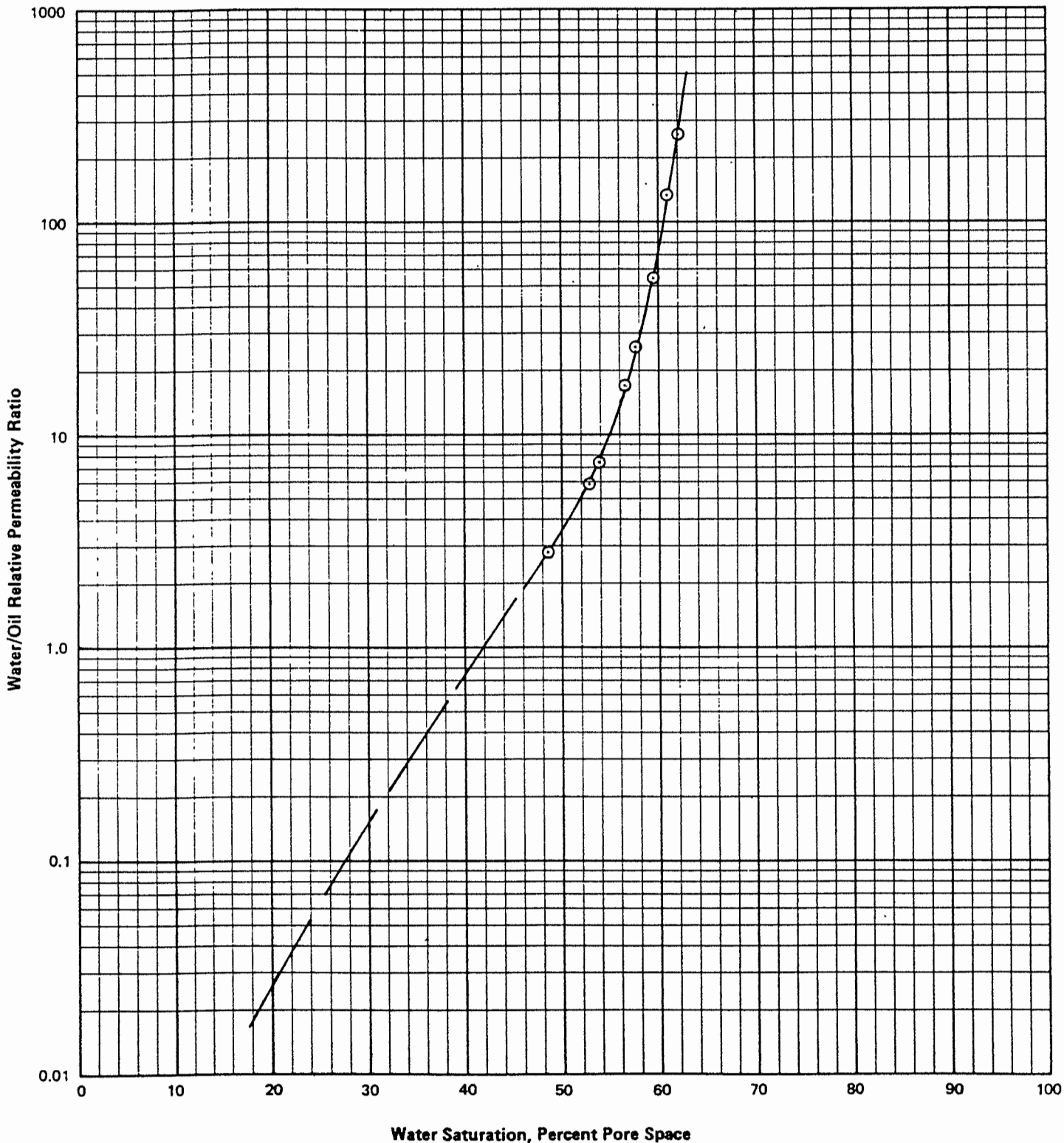
FIELD: GULLFAKS

COUNTRY: NORWAY

SAMPLE NUMBER: 35

PERMEABILITY md : 441

SAMPLE DEPTH: 3559.15 m



COMPANY: STADIL

FORMATION: ZONE 2

WELL: 34/10-1.6

LOCATION: NORWEGIAN NORTH SEA

FIELD: GULLFAKS

COUNTRY: NORWAY

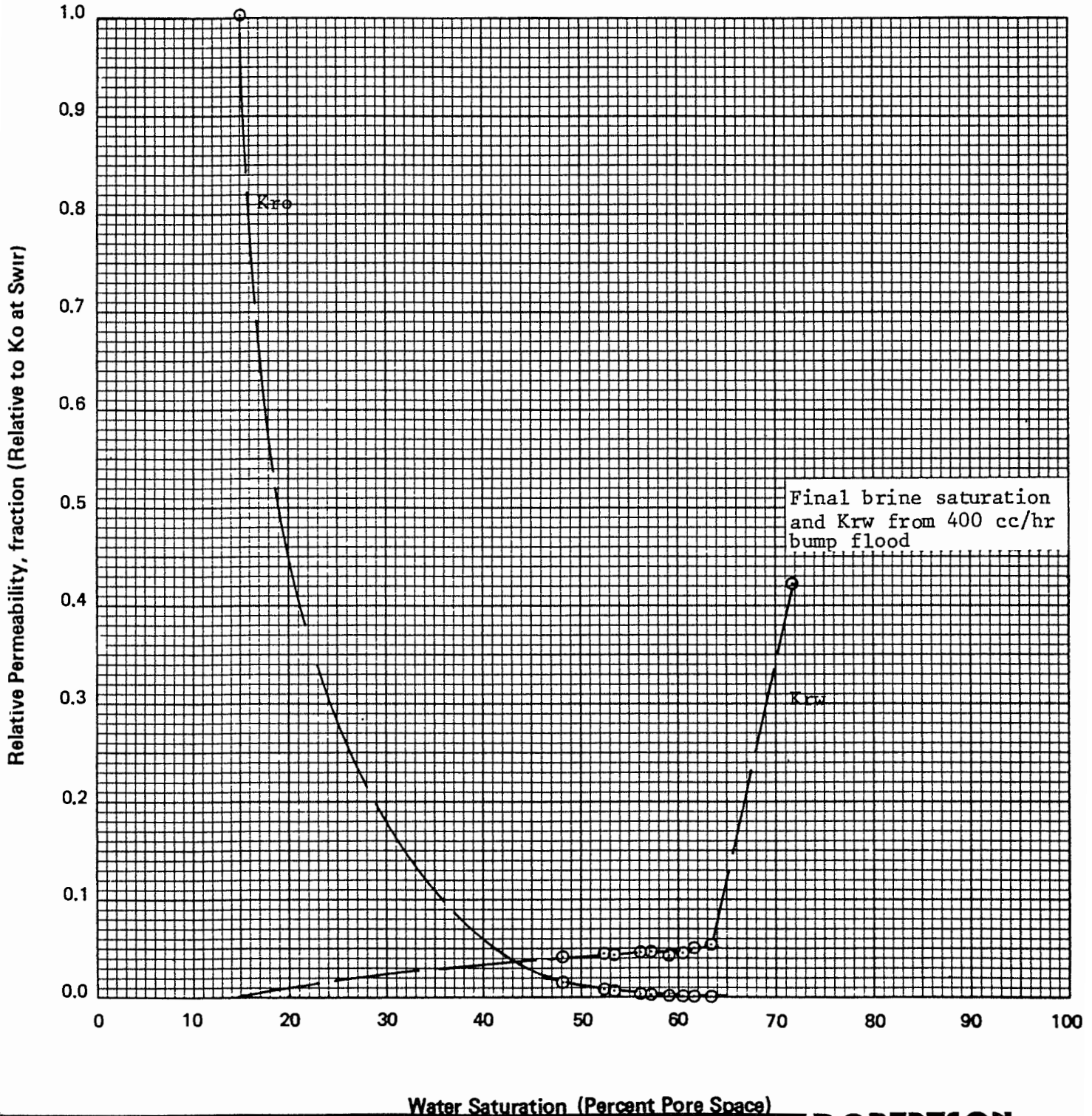
SAMPLE No.: 35

PERMEABILITY md: 470

SAMPLE DEPTH: 3359.15 m

WATER – OIL RELATIVE PERMEABILITY

Unsteady State, Restored State, Increasing Water Saturation





SUMMARY OF WATERFLOOD TEST RESULTS

400 cc/hr 'Bump Floods'

SAMPLE NUMBER	DEPTH XREF METRES	AIR PERMEABILITY MILLIDARCIES	POROSITY PERCENT	INITIAL CONDITIONS		TERMINAL CONDITIONS		OIL RECOVERED	
				WATER SATURATION PERCENT PORE SPACE	OIL PERMEABILITY MILLIDARCIES	OIL SATURATION PERCENT PORE SPACE	WATER PERMEABILITY MILLIDARCIES	PERCENT PORE SPACE	PERCENT OIL IN PLACE
8	3200.00	198	23.1	59.2		25.6	85	12.2	32.2
9	3204.15	456	24.5	52.7		33.7	226	13.6	28.8
27	3325.1	8.8	19.9	81.0		16.3	1.5	2.70	14.2
33	3347.50	2210	22.0	53.8		32.5	639	13.7	29.7
35	3359.15	470	20.3	64.1		28.4	186	8.0	22.0
47	3407.50	128	19.2	67.6		26.6	52	5.8	17.9
50	3419.10	2.0	13.0	82.5		17.5	0.04	0.00	0.00
52	3422.10	18	18.4	69.3		30.0	0.74	0.7	2.2

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 8 INITIAL WATER PERCENT PORE SPACE . 59.2
 PERMEABILITY TO AIR md . 198 POROSITY PERCENT 23.1
 PERMEABILITY TO OIL WITH FLOODING PRESSURE PSI
 INITIAL WATER PRESENT md
 SAMPLE DEPTH 3200.00 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.173	0.924***		
0.413	1.56	1.24	97.3
0.720	1.91	1.73	98.9
1.07	2.20	2.05	99.2
1.42	2.31	2.25	99.7
1.90	2.43	2.37	99.8
2.38	2.77	2.60	99.3
2.98	2.95	2.86	99.7
4.48	3.58	3.26	99.6
5.96	4.04	3.81	99.7
8.93	4.91	4.48	99.7
11.9	5.66	5.29	99.7
14.8	6.12	5.89	99.8
17.9	6.59	6.35	99.8
23.7	7.39	6.99	99.9
29.4	7.91	7.65	99.9
35.1	8.26	8.09	99.9
49.3	9.07	8.67	99.9
77.2	10.1	9.59	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 8 INITIAL WATER PERCENT PORE SPACE . 59.2
 PERMEABILITY TO AIR md 198 POROSITY PERCENT 23.1
 PERMEABILITY TO OIL WITH FLOODING PRESSURE PSI
 INITIAL WATER PRESENT md SAMPLE DEPTH 3200.00 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
106	11.0	10.5	100
134	11.5	11.2	100
162	11.8	11.6	100
189	12.1	11.9	100
204	12.2	12.1	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 9 INITIAL WATER PERCENT PORE SPACE . 52.7

PERMEABILITY TO AIR md . 456 POROSITY PERCENT 24.5

PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md FLOODING PRESSURE PSI

SAMPLE DEPTH 3204.15

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.176	0.597***		
0.418	1.31	0.956	97.0
0.694	1.85	1.58	98.0
1.02	2.33	2.09	98.5
1.37	2.69	2.51	99.0
1.72	3.11	2.90	98.8
2.08	3.29	3.20	99.5
2.60	3.82	3.55	99.0
3.21	4.12	3.97	99.5
4.75	4.84	4.48	99.5
6.28	5.38	5.11	99.6
9.35	6.33	5.85	99.7
12.4	6.81	6.57	99.8
15.4	7.47	7.14	99.8
21.4	8.30	7.89	99.9
27.4	8.84	8.57	99.9
32.9	9.20	9.02	99.9
48.0	10.3	9.74	99.9
76.9	11.4	10.8	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 9 INITIAL WATER PERCENT PORE SPACE . 52.7
 PERMEABILITY TO AIR md . 456 POROSITY PERCENT 24.5
 PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md FLOODING PRESSURE PSI
 SAMPLE DEPTH 3204.15

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
106	12.1	11.7	100
135	12.6	12.3	100
165	13.1	12.8	100
193	13.4	13.3	100
208	13.6	13.5	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 27 INITIAL WATER PERCENT PORE SPACE 81.0

PERMEABILITY TO AIR md 8.8 POROSITY PERCENT 19.9

PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md FLOODING PRESSURE PSI
 SAMPLE DEPTH 3325.15 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.211	0.420***		
0.532	0.630	0.525	99.3
0.938	0.700	0.665	99.8
1.53	0.840	0.770	99.8
2.28	0.980	0.910	99.8
4.07	1.19	1.09	99.9
7.63	1.33	1.26	100
14.5	1.54	1.44	100
31.8	2.03	1.79	100
65.6	2.38	2.21	100
99.1	2.59	2.49	100
201	2.66	2.63	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 33 INITIAL WATER PERCENT PORE SPACE . . 53.8
 PERMEABILITY TO AIR md . . 2210 POROSITY PERCENT 22.0
 PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md FLOODING PRESSURE PSI

SAMPLE DEPTH 3347.50 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.215	4.62***		
0.496	7.68	6.15	89.1
0.814	8.92	8.30	96.1
1.19	9.57	9.24	98.3
1.62	9.96	9.77	99.1
2.00	10.3	10.1	99.2
2.64	10.8	10.5	99.2
3.29	11.0	10.9	99.7
4.96	11.5	11.2	99.7
6.63	11.8	11.6	99.8
9.98	12.0	11.9	99.9
13.3	12.3	12.2	99.9
19.7	12.6	12.4	100
26.3	12.8	12.7	100
42.3	13.2	13.0	100
73.9	13.3	13.2	100
105	13.5	13.4	100
137	13.6	13.5	100
168	13.7	13.6	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 35 INITIAL WATER PERCENT PORE SPACE . 64.1
 PERMEABILITY TO AIR md 470 POROSITY PERCENT 20.3
 PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md FLOODING PRESSURE PSI
 SAMPLE DEPTH 3359.15 m

WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.218	1.64***		
0.490	1.77	1.71	99.5
0.899	1.84	1.81	99.8
1.60	2.32	2.08	99.3
3.31	2.80	2.56	99.7
6.79	3.68	3.24	99.7
10.3	4.23	3.96	99.8
17.0	4.64	4.43	99.9
23.9	5.12	4.88	99.9
40.6	6.00	5.56	99.9
73.9	6.82	6.41	100
107	7.23	7.03	100
140	7.71	7.47	100
173	7.91	7.81	100
205	8.05	7.98	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.



WATERFLOOD SUSCEPTIBILITY DATA

SAMPLE NUMBER 47 INITIAL WATER PERCENT PORE SPACE ... 67.6 ...
 PERMEABILITY TO AIR md 128 POROSITY PERCENT 19.2
 PERMEABILITY TO OIL WITH INITIAL WATER PRESENT md FLOODING PRESSURE PSI
 SAMPLE DEPTH 3407.50 m

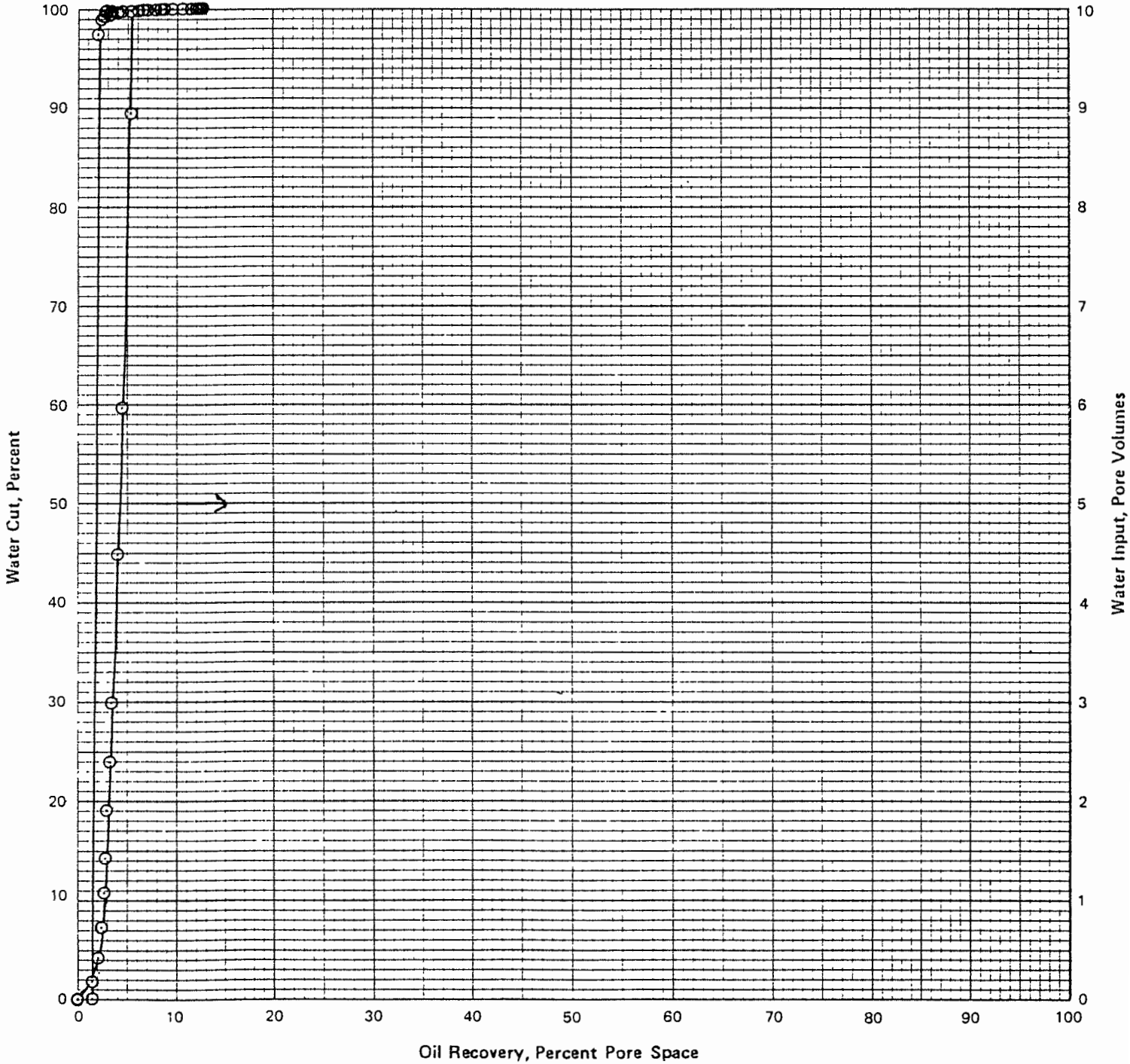
WATER INPUT PORE VOLUMES	CUMULATIVE OIL RECOVERY PERCENT PORE SPACE	AVERAGE OIL RECOVERY * PERCENT PORE SPACE	AVERAGE WATER CUT ** PERCENT
0.332	0.508***		
0.761	0.653	0.581	99.7
1.47	0.798	0.726	99.8
3.34	1.31	1.05	99.7
7.07	1.67	1.49	99.9
10.8	2.03	1.85	99.9
14.5	2.32	2.18	99.9
21.7	2.61	2.47	100
28.9	2.90	2.76	100
46.7	3.63	3.27	100
81.9	4.50	4.06	100
117	5.08	4.79	100
153	5.52	5.30	100
188	5.73	5.62	100
206	5.81	5.77	100

- * Calculated for mid-point of incremental through-put
- ** Calculated from incremental through-put volumes
- *** Break-through recovery

All analyses, opinions or interpretations are based on observations and materials supplied by the client whom, and for whose exclusive and confidential use, a report is made. Any interpretations or opinions expressed represent the best judgement of The Analysts Inc./Robertson Research International Limited and their officers and employees assume no responsibility and make no warranty or representation as to the productivity, proper operations, or profitability of any oil, gas or other mineral well or sand in connection with which such a report is used or relied on.

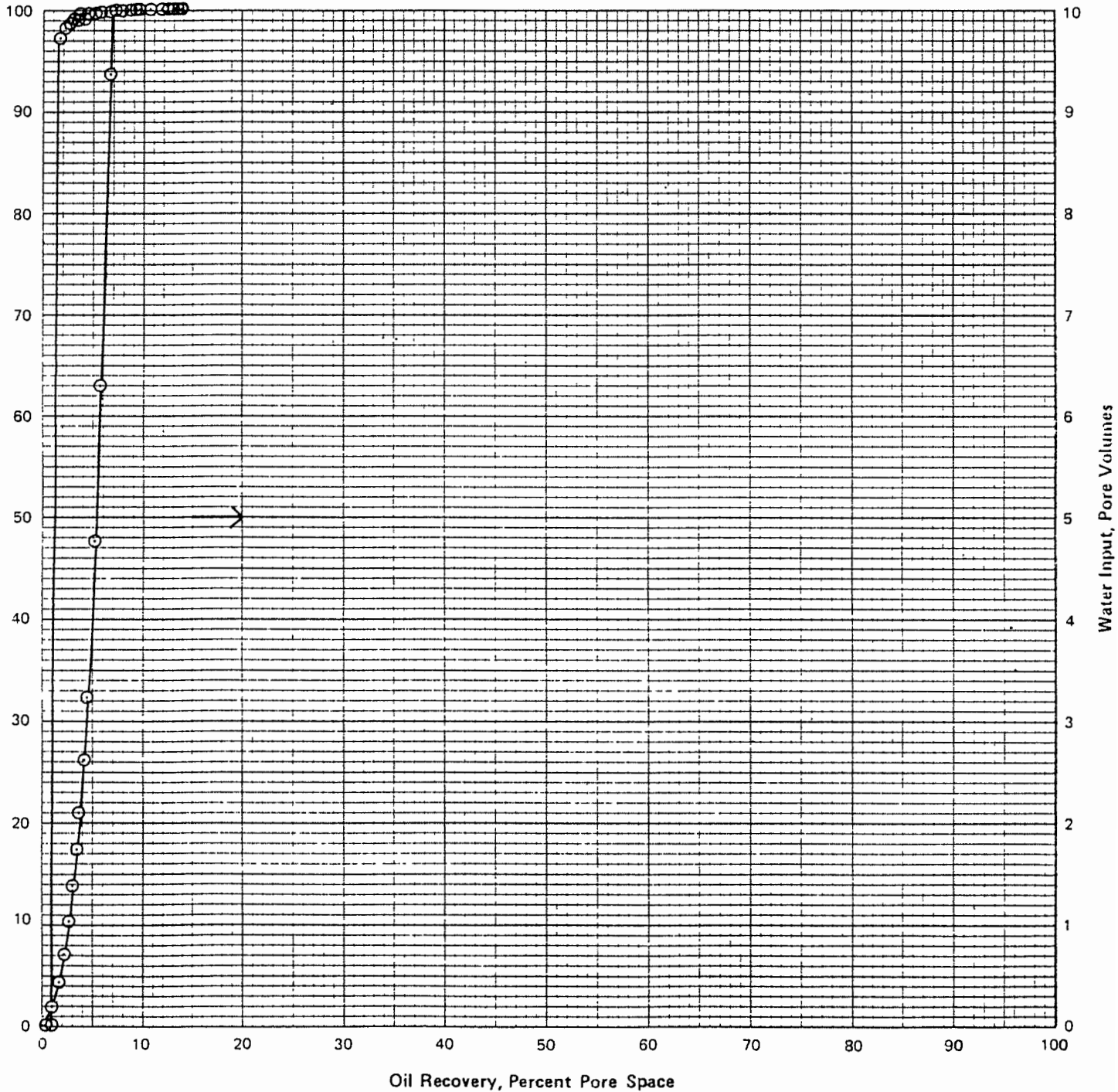
COMPANY: STATOIL
WELL: 34/10-16
FIELD: GULLFAKS
SAMPLE NUMBER: 8

FORMATION: ZONE 1.
LOCATION: NORWEGIAN NORTH SEA
COUNTRY: NORWAY
PERMEABILITY md : 198
SAMPLE DEPTH: 3200.00 m



COMPANY: STATOIL
WELL: 34/10-16
FIELD: GULLFAKS
SAMPLE NUMBER: 9

FORMATION: ZONE 1
LOCATION: NORWEGIAN NORTH SEA
COUNTRY: NORWAY
PERMEABILITY md : 456
SAMPLE DEPTH: 3204.15 m



COMPANY: STATOIL

FORMATION: ZONE 2.

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

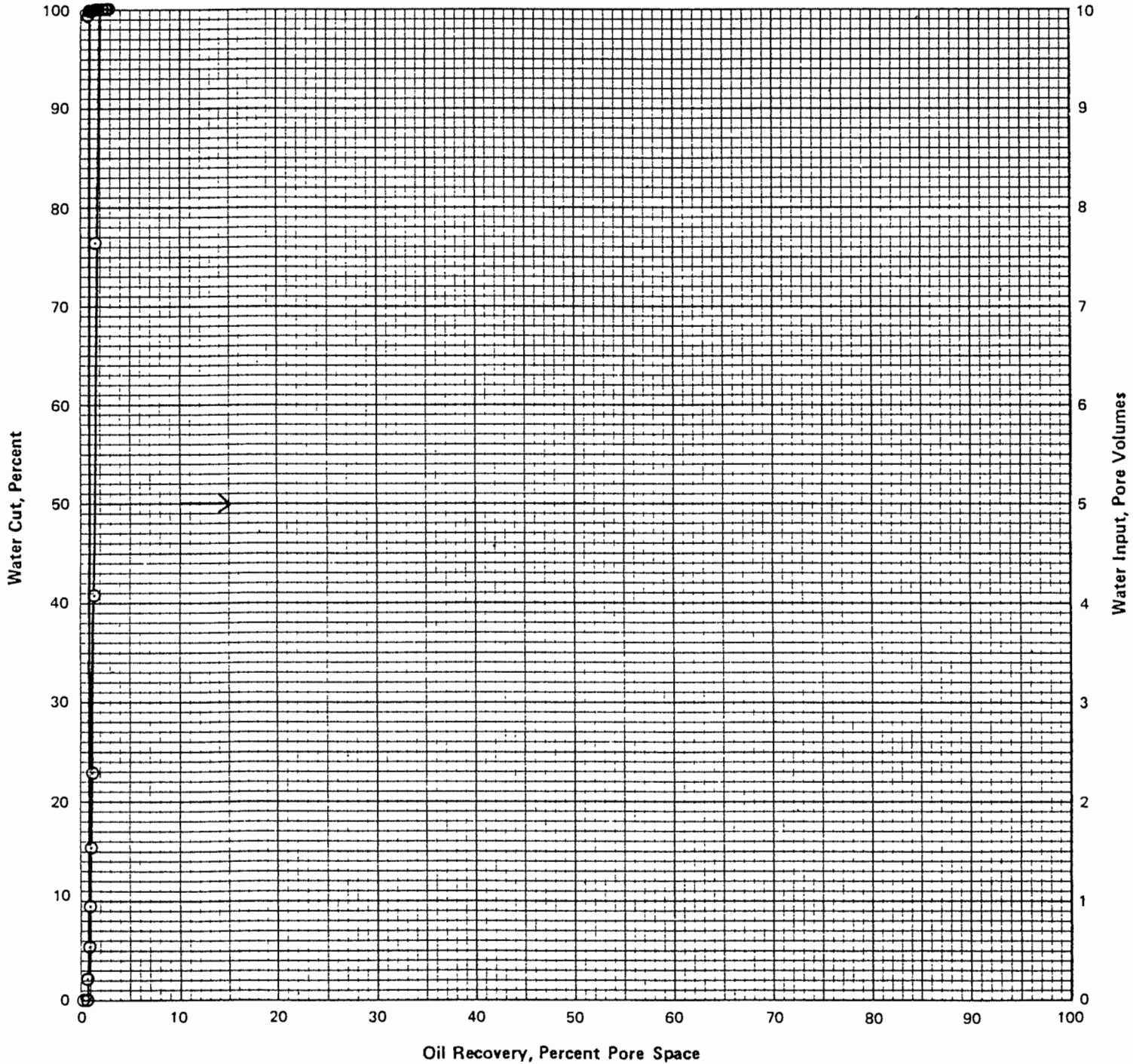
FIELD: GULLFAKS

COUNTRY: NORWAY

SAMPLE NUMBER: 27

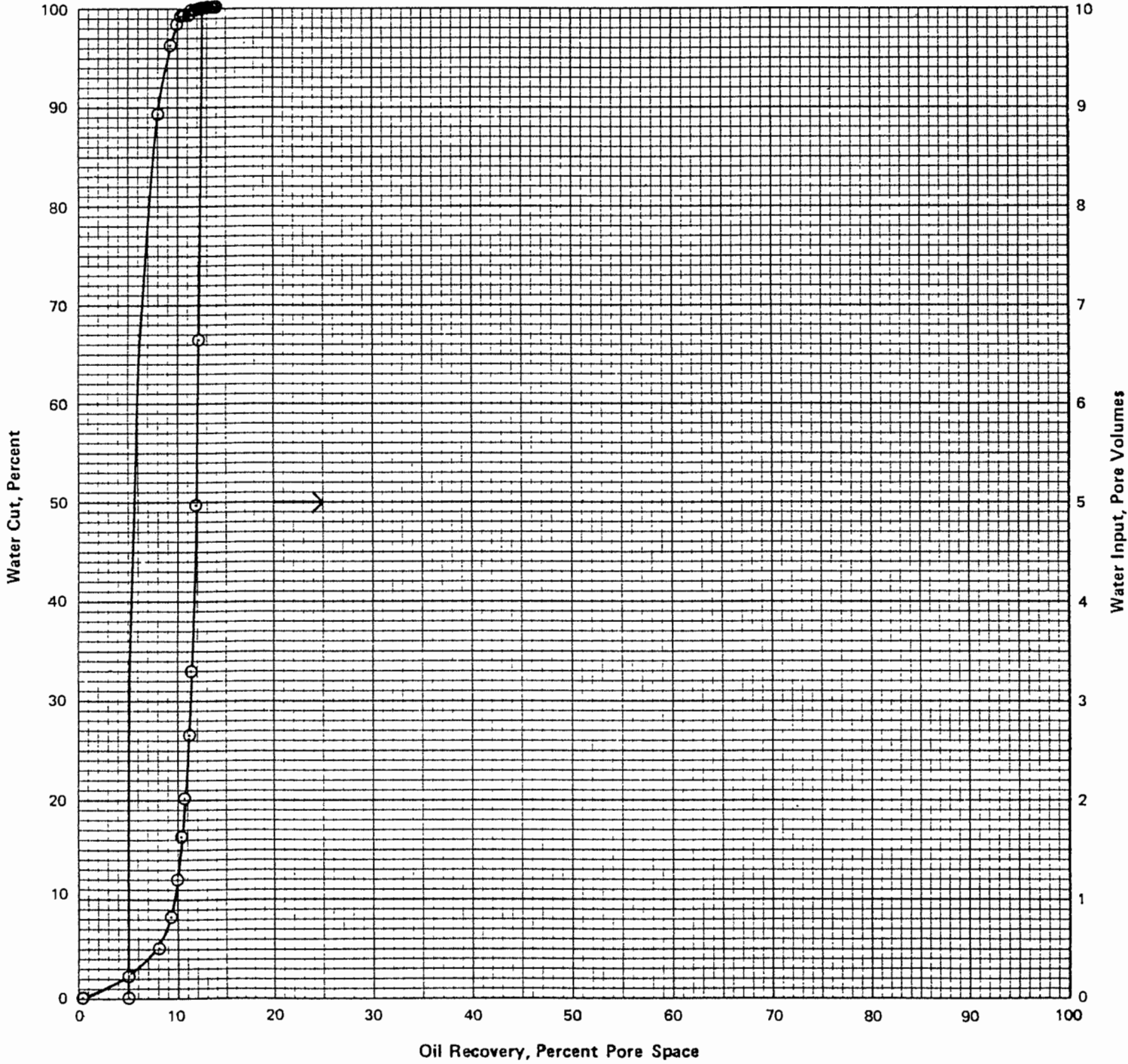
PERMEABILITY md : 8.8

SAMPLE DEPTH: 3325.15 m



COMPANY: STATOIL
WELL: 34/10-16
FIELD: GULLFAKS
SAMPLE NUMBER: 33

FORMATION: ZONE 2
LOCATION: NORWEGIAN NORTH SEA
COUNTRY: NORWAY
PERMEABILITY md :2210
SAMPLE DEPTH: 3347.50 m



COMPANY: STATOIL

WELL: 34/10-1.6

FIELD: GULLFAKS

SAMPLE NUMBER: 35

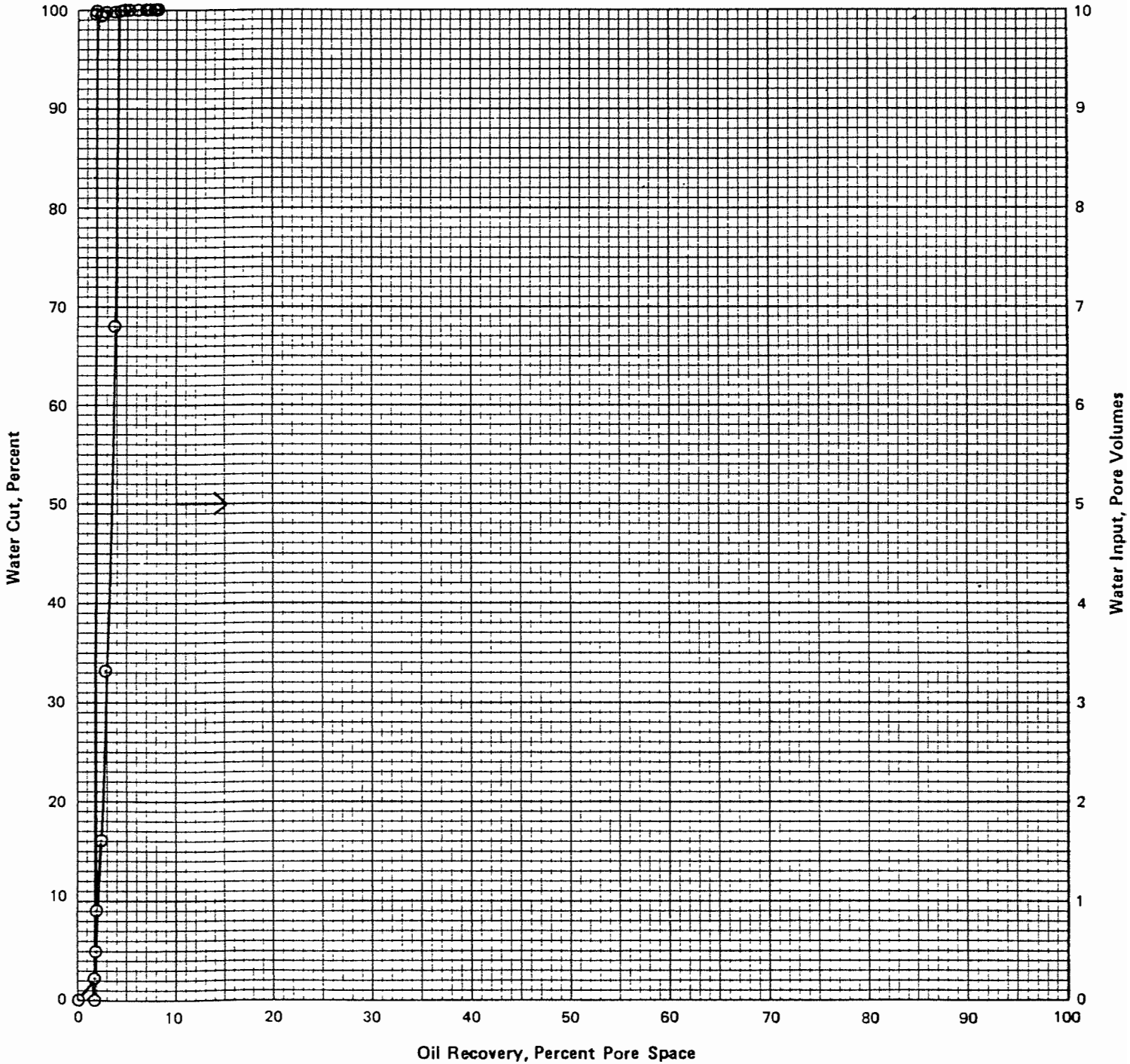
FORMATION: ZONE 2

LOCATION: NORWEGIAN NORTH SEA

COUNTRY: NORWAY

PERMEABILITY md :470

SAMPLE DEPTH: 3359.15 m



COMPANY: STATOIL

FORMATION: ZONE 3

WELL: 34/10-16

LOCATION: NORWEGIAN NORTH SEA

FIELD: GULLFAKS

COUNTRY: NORWAY

SAMPLE NUMBER: 47

PERMEABILITY md 128

SAMPLE DEPTH: 3407.50 m

