DRILLING MUD SUMMARY,
PROPERTIES AND ADDITIVES

SUMMARY OF EVENTS

OPERATOR: STATOIL

WELL NO. 1/9-4

36" HOLE/ 30" CASING INTERVAL

Statoil's 1/9-4 location was spudded on 13. August 1977 using a high viscosity spud mud of pre-hydrated Wyoming Bentonite, Lime and Caustic Soda.

The 36" hole was drilled to 151 meters with no problems. Viscous slugs of approximately 30 barrels were spotted on each connection and the hole displaced with 300 bbls high viscosity spud mud prior to running 30" casing.

30" casing was run to 151 meters and cemented with no problems.

26" HOLE/ 20" CASING INTERVAL

The 30" shoe was drilled out and the marine riser run. The riser and hole were displaced with mud and a 17 1/2" pilot hole was drilled to 437 meters. After logging the 17 1/2" hole, the marine riser was pulled and the hole was opened up to 26" diameter. Approximately 30 barrels high viscosity mud was spotted on each connection. At T.D. the hole was displaced with 650 barrels of high viscosity mud a short trip made. A further 850 barrels of high viscosity mud was then spotted along with a 80 barrel L.C.M.Pill. 20" casing was then run and cemented with no problems.

17 1/2" HOLE/ 13 3/8" CASING INTERVAL

After running the B.O.P.'s and drilling out the 20" shoe, 17 1/2" hole was drilled to 1391 meters using a Drispac/Lime system. No problems were experienced while drilling this interval. Upom reaching T.D., a wiper trip was made and the hole circulated clean. Schlumberger then began logging, but was unable to get below 547 meters. Following a wiper trip, where the viscosity was increased and the hole again circulated clean. The logging operation was successfully completed . Another wiper trip was then made and 13 3/8" casing was run and cemented at 1375 meters.

12 1/4 HOLE / 9 5/8 CASING INTERVAL

After drilling the 13 3/8" shoe and pressure testing the formation to an equivalent of 17.4 PPG., the 12 1/4" interval was drilled to 2580 meters using a Drispac/lime system. No hole problems were experienced while drilling this interval. Initial mud weight was 14.2 PPG. and this was gradually increased, reaching 15.8+ PPG. by 2580 meters. Mud rings were experienced around 2000 meters and were successfully dealt with by circulating out. High viscosity returns and mud losses of 80-120 bbls. were experienced on most trips below 2000 meters. Upon reaching T.D at 2580 meters, the hole was logged and 9 5/8" casing run and cemented.

8 1/2 HOLE / 7" CASING INTERVAL

The D.V. collar was drilled out and an un-successful attempt was made to test the casing. A cement plug was squeezed into the D.V. collar, casing tested, and the 9 5/8" casing shoe was drilled out.

The Lime content of the existing Drispac/Lime system was reduced by watering back the 15.8 ppg system to 11.5 ppm. This system was then conditioned with chemical treatment and Barite to raise the weight to 14.2 ppg.

8 1/2" hole was then drilled to 3100 meters with no problems. At this point, the pipe was twisted off, leaving the bit and a junk sub in the hole. The ensuing fishing job was un-successful, due in part to delays caused by severe weather conditions.

The well was plugged back, and side-tracked from 2963 meters to 3032 meters. At this point, the mud became contaminated with cement, and the fish was hit.

A second cement plug was set a 2977 meters and dressed off to 3041 meters, where the well was again sidetracked. Drilling continued to 3122 meters with no further problems. Coring took place from 3122 - 3240 meters (7 cores) where logs were run. Coring operations resumed and cores 8 and 9 were cut to 3274 meters.

Core no. 10 was cut from 3274 - 3287 meters, when the core barrel became stuck while attempting to break the core to make a connection. 25000 pounds was pulled initially and the core barrel was then rotated. 50000 pounds was then pulled, and the pipe could not be rotated. B-free was then spotted and the pipe worked. All attempts to free the core barrel failed and a free-point indicator was run. While trying to back off, the jars parted, and the well was plugged back.

The plug was dressed off to 3052 meters, and the well side tracked. The hole was then drilled to 3353 meters with no further problems, and the 7" liner run and cemented, after completion of logging operations.

6"____ HOLE/_____ CASING INTERVAL

Following pressure testing of the 7" liner and bop's, the 7" shoe was drilled out and the formation tested to an equivalent of 16.9 ppg. 6" hole was drilled to 3710 m with no problems. Following log runs, a cement plug was set at 3475 meters.

Drilling Mud Properties Record

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM SPUD MUD DRISPAC-LIME ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE 1977	DEPTH FEET □ METERS □	MUD PROPERTIES: DENSITY PPG □ SG □	VISCOSITY: sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0 / 10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis: Cl⁻ ppm x1000	Ca. ++ ppm	Pf	RETORT: % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMARKS
1	12/8																							
2	13/8	114	8.6	150+								9.0												
3	14/8	151	8.6	150								9.0												
4	15/8	168	9.0	41													2.0							
5	16/8	437	9.1	40								9.2	6.2											
6	17/8	437	8.6	150								9.4												
7	18/8	437	8.6	38								9.0												
8	20/8	530	9.3	45	22	17	10	1 / 3	12.8	2		12.6	17.8	160	5.0		8.0	.75						EX.LIME 5.8
9	21/8	954	9.8	58	28	16	24	5 / 20	22.0	3		12.3	27.0	100	4.5		15.0	.50						EX.LIME 5.5
10	22/8	1355	10.8	46	19	13	12	2 / 18	14.4	2		12.6	24.0	80	6.5		16.0	TR						EX.LIME 5.6
11	23/8	1391	10.8	53	22	16	12	2 / 14	10.4	2		12.5	25.5	100	4.4		16.0	TR						EX.LIME 5.4
12	24/8	1391	10.8	47	22	17	10	2 / 10	9.0	2		12.5	26.0	80	5.0		16.0	TR						EX.LIME 5.4
13	25/8	1391	10.8	43	24	19	10	2 / 9	8.6	2		12.4	26.0	100	4.2		16.0	TR						EX.LIME 5.4
14	26/8	1394	14.2	48	32	20	24	3 / 20	7.0	2		12.6	26.0	80	6.0		30.0	.25						EX.LIME 5.9

REMARKS

Drilling Mud Properties Record

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM DRISPAC/LIME - GEL/CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE 1977	DEPTH FEET ☐ METERS ☐	MUD PROPERTIES: DENSITY PPG ☐ SG ☐	VISCOSITY: sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0/10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis: Cl ppm X1000	Ca. ++ ppm	Pf	RETORT: % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMARKS
15	27/8	1690	14.4	54	44	32	24	5/20	8.2	2		12.3	26.0	80	4.5	28.0	TR	30						EX.LIME 4.6
16	28/8	1808	14.6	56	42	31	22	4/21	6.4	2		12.2	26.0	80	4.5	28.0	TR	27.5						EX.LIME 5.1
17	29/8	2057	15.0	53	40	31	19	5/23	5.8	2		12.3	27.0	80	5.0	28.0	TR	27.5						EX.LIME 4.5
18	30/8	2213	15.6	56	46	36	19	6/24	5.6	2		12.5	27.0	80	6.2	34.0	TR	27.5						EX.LIME 4.5
19	31/8	2337	15.8	61	50	40	19	7/21	5.4	2	16.4	12.4	27.0	80	5.0	32.0	TR	27.5						EX.LIME 4.0
20	1/9	2506	15.8	53	36	36	16	4/16	6.2	2	16.8	12.3	27.5	80	5.0	32.0	TR	27.5						EX.LIME 4.2
21	2/9	2580	15.8	55	38	30	16	4/12	5.8	2	16.8	12.3	27.0	80	5.5	32.0	TR	30						EX.LIME 3.8
22	3/9	2580	15.8	55		31	17	2/20	5.8	2	17.0	12.2	27.0	100	5.0	32.0	TR							EX.LIME 3.4
23	4/9	2580	15.8	56		30	16	3/21	6.0	2	17.0	12.2	27.0	100	4.8	32.0	TR							EX.LIME 3.4
24	5/9	2580	15.8	54		30	16	3/21	7.0	2	17.0	12.3	27.0	100	4.6	32.0	TR							EX.LIME 3.2
25	6/9	2580	15.8	54		30	16	3/21	6.8	2	17.0	12.2	27.0	100	4.4	32.0	TR							EX.LIME 3.1
26	7/9							/																
27	8/9	2706	14.2	49	35	29	13	2/20	5.8	2	18.6	10.5	10.0	360	1.8	26.0								
28	9/9	2790	14.7	46	34	28	13	2/19	5.0	2	18.2	10.5	9.0	200	1.8	26		22.5						

REMARKS

Drilling Mud Properties Record

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE	DEPTH FEET ☐ METERS ☒	MUD PROPERTIES																							OPERATION REMARKS
			DENSITY PPG ☒ SG ☐	VISCOSITY sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0/10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis Cl⁻ ppm X1000	Ca. ++ ppm	Pf	RETORT % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"			
29	10/9	2828	14.7	49	36	29	14	3/16	5.4	2	18.2	10.5	9.0	200	1.8		26.0	TR	22.5							
30	11/9	2886	14.7	49	35	28	14	3/18	5.6	2	18.2	10.2	8.8	280	1.2		26.0	TR	25.0							
31	12/9	2977	14.5	51		28	14	3/8	5.0	2	14.6	10.6	6.9	160	1.4		26.0	TR	30.0							
32	13/9	2977	14.5	55	32	28	15	3/8	4.8	2	14.0	10.7	6.8	140	1.5		28.0	TR	27.5							EX.LIME = 0.60
33	14/9	3016	14.7	56	31.5	25	13	3/6	4.2	2	13.8	11.0	6.6	100	1.2		26.0	TR	27.5							
34	15/9	3082	14.7	54	33	27	12	3/6	.8	1	12.8	10.8	6.8	180	1.4		26.0	TR	27.5							EX.LIME = 0.63
35	16/9	3100	14.7	54	34.5	28	13	3/6	2.8	1	12.0	11.0	6.9	240	1.6		26.0	TR	27.5							
36	17/9	3000	14.7	55	34	27	14	2/7	3.6	2	12.2	10.5	6.9	240	1.6		26.0	TR	27.5							
37	18/9	2963	14.7	58	34	28	12	2/10	3.8	2	12.2	11.5	6.7	160	2.4		26.0	TR	27.5							
38	19/9	2997	14.7	52	33	27	12	2/6	3.6	2	12.0	11.5	6.4	180	2.0		26.0	TR	27.0							
39	20/9	3018	14.7	55	35	29	13	2/10	3.4	2	12.6	11.0	6.4	200	1.6		26.0	TR	27.5							
40	21/9	3027	14.7	58	34	27	14	2/12	3.8	2	12.8	11.0	6.4	240	1.6		26.0	TR	30.0							
41	22/9	3000	14.7	58	36	28	16	2/10	3.6	2	13.4	11.5	6.0	100	2.6		26.0	TR	27.5							
42	23/9	3041	14.7	52	33	27	13	2/8	4.2	2	13.8	11.5	6.0	100	2.4		26.0	TR	27.5							

REMARKS

Drilling Mud Properties Record

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE	DEPTH FEET ☐ METERS ☒	MUD PROPERTIES																							OPERATION REMARKS
			DENSITY PPG ☒ SG ☐	VISCOSITY sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0/10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis Cl ppm X1000	Ca. ++ ppm	Pf	RETORT % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"			
43	24/9	3055	14.7	52		26	13	2/7	4.8	2	13.6	11.4	6.3	100	2.4		26	TR	27.5							
44	25/9	3061	14.7	54		26	13	2/8	4.9	2	14.2	11.5	6.2	80	2.1		26	TR	30							
45	26/9	3083	14.7	56	31	26	11	2/7	5.1	2	14.1	11.5	6.9	180	2.4		26	TR	30							
46	27/9	3117	14.7	54	31	27	11	2/7	5.1	2	14.7	11.5	6.9	180	2.0		26	TR	30							
47	28/9	3122	14.7	51	32	26	11	2/7	5.2	2	14.7	11.2	6.9	200	2.0		27	TR	30							
48	29/9	3154	14.7	51	30	29	10	2/8	5.3	2	14.4	11.5	6.9	180	1.4		27	TR	30							
49	30/9	3180	14.7	51	31	26	10	2/7	5.4	2	14.2	11.3	6.8	100	2.0		27	TR	30							
50	1/10	3210	14.7	53		27	11	2/12	5.0	2	14.4	11.5	6.7	120	1.8		27	TR	30							
51	2/10	3212	14.7	54	33	28	10	2/10	5.4	2	14.6	11.5	6.7	120	1.8		27	TR	27.5							
52	3/10	3229	14.7	51	30	25	10	2/9	5.6	2	14.4	11.5	6.7	100	2.0		27	TR	27.5							
53	4/10	3236	14.7	54	33	27	12	2/9	5.2	2	14.0	11.5	6.7	100	2.0		27	TR	30							
54	5/10	3240	14.7	54	34	28	12	2/10	5.6	2	14.8	11.5	6.7	100	1.8		27	TR	30							
55	6/10	3255	14.7	54	34	28	12	2/10	5.6	2	15.2	11.5	6.8	60	2.0		27		30							
56	7/10	3277	14.7	54	33	28	12	2/8	5.6	2	14.6	11.5	6.8	100	1.8		27		30							

REMARKS

Drilling Mud Properties Record

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE	DEPTH FEET □ METERS ☒	MUD PROPERTIES																							OPERATION REMARKS
			DENSITY PPG ☒ SG □	VISCOSITY sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0/10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis Cl⁻ ppm x1000	Ca. ++ ppm	Pf	RETORT % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"			
57	8/10	3287	14.7	52	33	28	12	2/8	5.2	2	14.8	11.3	6.7	100	1.8		27		30							
58	9/10	3286	14.7	52	32	27	11	2/10	5.6	2	14.4	11.2	6.6	100	1.1		26		27.5							EX.LIME 0.57
59	10/10	3286	14.7	52	32	28	12	2/10	5.4	2	14.4	11.2	6.6	90	1.2		26		27.5							EX.LIME 0.56
60	11/10	3052	14.7	56		28	14	3/14	5.6	2	15.8	11.5	6.6	100	1.9		26		27.5							
61	12/10	3057	14.7	54	34	28	12	4/12	5.2	2	14.8	11.5	6.6	100	1.9		27		27.5							EX.LIME 0.48
62	13/10	3066	14.7	53	33	27	12	3/12	5.4	2	14.6	11.5	6.5	160	1.8		27		25							
63	14/10	3093	14.7	57	35	28	14	4/12	5.4	2	13.2	11.6	6.4	130	2.0		28		27.5							
64	15/10	3114	14.7	56	36	28	17	4/22	4.4	2	11.2	11.5	6.4	40	2.2		28		27.5							
65	16/10	3178	14.7	59	37	28	19	4/22	3.8	2	8.8	11.5	6.3	60	2.0		28		30							
66	17/10	3270	14.7	54		28	12	3/16	4.2	2	9.2	11.5	6.1	80	1.6		28		30							
67	18/10	3330	14.7	54	33	27	12	3/14	3.8	2	9.0	11.5	6.1	60	2.0		28		30							
68	19/10	3351	14.7	53	34	28	11	2/10	3.8	2	9.0	11.5	6.0	80	1.6		28		27.5							
69	20/10	3353	14.7	56	34	28	13	2/14	3.8	2	9.0	11.5	6.0	80	1.6		28		27.5							
70	21/10	3353	14.7	56	34	28	13	2/12	4.0	2	9.4	11.5	6.0	60	2.0		28		27.5							

REMARKS

Drilling Mud Properties Record

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE	DEPTH FEET ☐ METERS ☒	MUD PROPERTIES																							OPERATION REMARKS
			DENSITY PPG ☒ SG ☐	VISCOSITY sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0 / 10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH x1000 →	Filtrate Analysis Cl⁻ ppm	Ca ++ ppm	Pf	RETORT % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"			
71	22/10	3353	14.7	56	32	26	12	3 / 12	4.2	2	9.8	10.7	5.8	90	0.9		28		27.5							EXCESS LIME 0.48
72	23/10	3353	14.7	56	32	26	13	4 / 12	4.2	2	9.6	10.8	5.8	100	1.0		28		27.5							EXCESS LIME 0.47
73	24/10	3352	14.7	56	33	27	12	3 / 12	4.4	2	10.2	11.3	6.0	100	1.2		28		27.5							EXCESS LIME 0.45
74	25/10	3352	14.7	59	36	28	16	4 / 20	5.1	2	13.8	11.3	6.0	260	1.6		28		27.5							
75	26/10	3352	14.7	59	35.5	28	15	4 / 18	5.2	2	13.8	11.3	6.0	250	1.5		28		27.5							
76	27/10	3352	14.7	60	35.5	28	15	4 / 18	5.4	2	13.8	11.3	6.0	240	1.5		28		27.5							
77	28/10	3358	14.0	49	27	22	10	3 / 10	5.6	2	13.8	11.2	5.8	100	1.5		25									
78	29/10	3368	14.0	50	25	20	10	2 / 6	5.6	2	14.4	11.5	5.7	60	2.0		24		25							
79	30/10	3401	14.0	58	28	22	12	2 / 14	4.8	2	14.0	11.5	5.5	80	1.8		26		27.5							
80	31/10	3435	14.0	58	29	23	13	2 / 16	4.6	2	13.6	11.5	5.4	60	2.0		26		27.5							
81	01/11	3484	14.2	57	32	26	13	2 / 13	4.6	2	13.2	11.5	5.3	80	2.0		26		30							
82	02/11	3505	14.2	57	33	27	12	2 / 12	4.2	2	13.4	11.0	5.2	80	1.6		26		30							
83	03/11	3534	14.2	56	33	26	13	2 / 13	4.0	2	13.0	11.5	5.2	80	1.8		26		30							
84	04/11	3555	14.2	57	32	26	13	2 / 15	4.4	2	12.2	11.5	5.2	80	2.0		26		30							

REMARKS

Drilling Mud Properties Record

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE	DEPTH FEET ☐ METERS ☒	MUD PROPERTIES																						OPERATION REMARKS
			DENSITY PPG ☒ SG ☐	VISCOSITY sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0/10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis Cl⁻ ppm x1000	Ca. ++ ppm	Pf	RETORT % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"		
85	05/11	3568	14.2	56	33.5	28	11	3/12	4.6	2	12.4	10.8	5.2	80	1.1		26		30						EXCESS LIME .40
86	06/11	3582	14.2	56		28	11	3/14	4.6	2	13.6	11.0	5.2	80	1.2		26		30						EXCESS LIME .40
87	07/11	3629	14.2	58	33	28	10	2/12	4.2	2	13.2	11.5	5.0	80	1.5		26		30						EXCESS LIME .34
88	08/11	3677	14.2	58	32	28	10	2/10	4.0	2	13.0	11.6	5.0	100	1.6		26		30						EXCESS LIME .32
89	09/11	3710	14.4	66	40	33	14	3/16	4.4	2	14.2	11.5	13.0	100	1.6		28		25						EXCESS LIME .48
90	10/11	3710	14.4	68		34	14	3/18	4.5	2	14.8	11.5	13.0	100	1.6		28		25						EXCESS LIME .48
91	11/11	3710	14.4	60		30	11	2/11	4.2	2	12.2	11.4	12.0	90	1.2		27		25						EXCESS LIME .40
92	12/11	3340	14.4	63	34	28	12	2/13	3.8	2	11.4	11.5	11.9	60	1.9		27		25						
93	13/11	3340	14.4	64	35	29	13	2/14	3.8	2	11.4	11.5	11.8	60	1.8		27		25						
94	14/11	3340	14.4	64	35	29	13	2/14	3.8	2	11.4	11.5	11.8	60	1.8		27		25						
95	15/11	3340	14.4	62	34	28	13	2/13	3.8	2	11.4	11.5	11.7	60	1.8		27		25						
96	16/11	3340	14.4	56	32	27	11	2/9	3.8	2	11.4	11.5	11.7	60	1.8		27		25						
97	17/11	3340	14.4	57	32	27	11	2/9	3.8	2	11.4	11.5	11.7	60	1.8		27		25						
98	18/11	3340	14.4	58	32	27	12	2/10	3.8	2	11.4	11.5	11.7	80	1.6		27		25						

REMARKS

Drilling Mud Properties Record

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE	DEPTH FEET ☐ METERS ☐	MUD PROPERTIES																							OPERATION REMARKS
			DENSITY PPG ☐ SG ☐	VISCOSITY sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0 / 10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis Cl⁻ ppm x1000	Ca ++ ppm	Pf	RETORT % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"			
99	19/11	3340	14.4	57	32	27	12	2/12	3.8	2	13.4	11.4	11.7	80	1.6		27		25							
100	20/11	3307	14.4	56	32	27	12	2/10	4.0	2	13.4	11.3	11.7	80	1.6		27		25							
101	21/11	3307	14.4	56	32	27	12	2/10	4.0	2	13.4	11.3	11.7	80	1.5		27		25							
102	22/11	3307	14.4	56	32	27	12	2/11	4.0	2	13.4	11.3	11.7	80	1.5		27		25							
103	23/11	3307	14.4	59	32	27	13	3/14	4.4	2	14.2	11.5	11.7	80	1.7		27		25							
104	24/11	3298	14.4	58	34	27	14	3/15	5.2	2	14.5	11.6	11.4	100	1.8		27		25							
105	25/11	3298	14.4	57	34	27	13	2/14	5.0	2	14.6	11.5	10.9	100	1.7		27		25							
106	26/11	3280	14.4	59	34	28	11	2/14	5.2	2	15.0	11.6	10.9	180	1.7		27		25							
107	27/11	3307	14.4	59	34	28	12	3/14	5.3	2	15.0	11.6	10.9	170	1.8		27		27.5							
108	28/11	3306	14.4	58	27	27	11	3/13	5.6	2	16.1	11.5	10.8	200	1.65		27		27.5							
109	29/11	3306	14.4	60	28	28	13	4/14	5.7	2	16.9	11.4	9.8	400	1.6		26.5		27.5							
110	30/11	3305	14.2	56	27	25	11	4/13	5.7	2	16.9	11.5	7.2	140	1.55		27		30							
111	01/12	3305	14.2	56	31	27	11	4/13	5.8	2	16.1	11.6	7.1	140	1.55		26.5		27.5							
112	02/12	3305	14.2	57	31	26	11	/	5.6	2	16.8	11.6	7.1	140	1.55		26.5		27.5							

REMARKS

Drilling Mud Properties Record

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE	DEPTH FEET ☐ METERS ☒	MUD PROPERTIES																								OPERATION REMARKS
			DENSITY PPG ☒ SG ☐	VISCOSITY sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0/10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis Cl⁻ ppm x1000	Ca. ++ ppm	Pf	RETORT % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"				
113	03/12	3306	14.2	59	33	28	11	2/12	5.4	2	17.2	11.7	7.8	150	1.8		27		27.5								
114	04/12	3306	14.2	58	33	28	10	2/13	5.7	2	17.0	11.7	7.9	150	1.7		27		30.0								
115	05/12	3263	14.2	64	32	27	11	3/14	5.6	2	16.8	11.4	7.9	180	1.4		27		30								
116	06/12	3260	14.2	65	31	26	11	2/14	5.6	2	16.6	11.4	7.9	180	1.3		26		30								
117	07/12	3270	14.2	65	32	27	11	3/15	5.5	2	16.6	11.4	7.9	180	1.3		26		30								
118	08/12	3270	14.2	65	33	28	11	3/13	5.6	2	16.6	11.4	7.9	180	1.4		26		30								
119	09/12	3270	14.2	68	34	29	10	2/20	4.4	2	14.8	12.1	8.0	50	2.1		27		30								
120	10/12	3270	14.2	73	36	30	10	2/19	4.9	2	15.1	12.2	7.9	100	2.2		27		30								
121	11/12	3255	14.1	74	36	29	10	3/20	5.0	2	15.1	12.2	7.8	100	2.1		27		30								
122	12/12	3255	14.2	62	26	24	10	2/16	4.9	2	14.9	12.0	7.9	100	2.0		27		30								
123	13/12	3255	14.2	63	28	24	10	3/17	4.7	2	14.9	12.0	7.9	80	2.0		27		30								
124	14/12	3255	14.2	61	27	23	9	2/17	5.0	2	15.1	12.1	7.9	80	2.0		27		30								
125	15/12	3255	14.2	59	26	20	10	2/16	4.9	2	15.1	12.0	7.9	80	2.0		27		30								
126	16/12	3231	14.1	60	27	20	8	2/15	5.1	2	15.1	12.2	7.9	80	2.1		26		30								

REMARKS

Drilling Mud Properties Record

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL/CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE 1977	DEPTH FEET ☐ METERS ☐	MUD PROPERTIES																							OPERATION REMARK
					VISCOSITY				GELS								Filtrate Analysis			RETORT							
			DENSITY PPG ☐ SG ☐	sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	0 / 10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Cl⁻ ppm x1000	Ca. ++ ppm	Pf	% OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	
127	17/12	3231	14.2	60	28	24	8	2 / 15	5.4	2	15.6	12.1	7.9	80	2.0		27		30							
128	18/12	3234	14.2	69	31	26	10	3 / 14	4.8	2	14.8	12.3	7.8	60	2.6		27		30							
129	19/12	3234	14.2	68	31	26	10	3 / 15	5.0	2	15.2	12.2	7.8	70	2.5		27		30							
130	20/12	3234	14.2	67	32	27	10	2 / 14	5.2	2	15.4	12.2	7.8	70	2.5		27		27.5							
131	21/12	3234	14.2	68	31	27	9	2 / 14	5.2	2	15.4	12.2	7.8	80	2.5		27		27.5							
132	22/12	3234	14.2	65	-	26	10	2 / 13	4.4	2	14.8	12.0	7.5	80	1.7		27		30							
133	23/12	3234	14.2	68	30	26	8	2 / 10	4.2	2	14.2	12.0	7.2	80	2.0		27		30							
134	24/12	3234	14.2	78	32	27	11	3 / 13	4.4	2	14.2	12.0	7.2	60	2.2		27		30							
135	25/12	3234	14.2	84	33	27	12	3 / 15	4.2	2	14.2	12.0	7.2	80	2.0		27		30							
136	26/12	3173	14.2	75	32	27	10	3 / 13	4.2	2	14.2	12.0	7.2	80	2.0		27		30							
137	27/12	3173	14.2	73	32	27	10	3 / 13	4.2	2	14.2	12.0	7.2	80	2.0		27		30							
138	28/12	3173	14.2	73	32	27	10	3 / 13	4.2	2	14.2	12.0	7.2	80	2.0		27		30							
139	29/12	3173	14.2	73	32	27	10	3 / 13	4.2	2	14.2	12.0	7.2	80	2.0		27		30							
140	30/12	3173	14.2	68	31	27	10	3 / 11	4.2	2	14.2	12.0	7.2	80	2.0		27		30							

REMARKS

Drilling Mud Properties Record

WELL NAME 1/9-4 AREA NORTH SEA

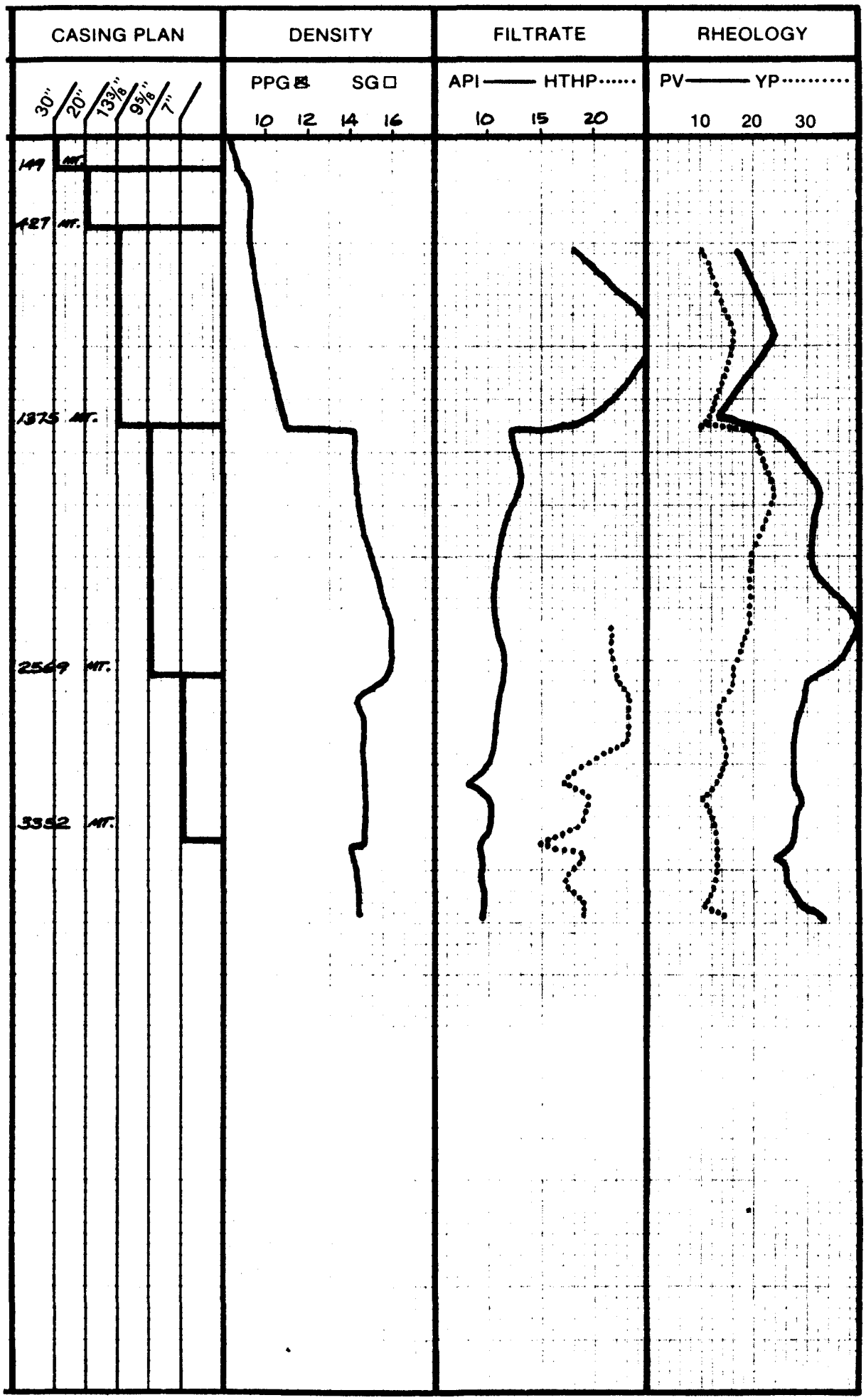
OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL/CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE	DEPTH FEET ☐ METERS ☒	MUD PROPERTIES																							OPERATION REMARKS
			DENSITY PPG ☒ SG ☐	VISCOSITY sec/qt	A.V. cps	P.V. cps	Y.P. #/100 sq.ft.	GELS 0 / 10	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis Cl⁻ ppm x1000	Ca ++ ppm	Pf	RETORT % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"			
141	31/12	3173	14.2	65	31	27	9	3 / 10	4.4	2	14.2	12.0	7.2	80	2.1		27		30							
142	1978 01/01	3173	14.2	67	32	28	9	3 / 10	4.4	2	14.4	12.0	7.2	80	2.2		27		30							
143	02/01	3173	14.2	67	31	27	9	3 / 10	4.5	2	14.5	12.0	7.2	80	1.9		27		30							
144	03/01	3173	14.2	62	29	26	8	3 / 11	4.4	2	14.4	12.0	7.1	80	1.8		27		30							
145	04/01	3173	14.2	62	29	26	8	3 / 11	4.8	2	14.8	12.0	7.2	80	1.8		27		30							
146	05/01	3173	14.2	65	31	26	8	3 / 11	4.3	2	14.4	12.0	7.4	80	1.6		27		30							
147	06/01	3173	14.2	65	31	27	8	3 / 10	4.9	2	14.4	12.0	7.2	100	1.6		27		30							
148	07/01	3173	14.2	67	32	27	8	3 / 9	4.8	2	14.9	12.0	7.8	80	1.9		27		30							
149	08/01	3173	14.2	62	31	27	8	3 / 9	4.8	2	14.4	12.2	7.4	80	2.0		27		30							
150	09/01	3173	14.2	63	32	26	8	3 / 9	4.9	2	-	12.1	7.1	200	2.1		27		30							
								/																		
								/																		
								/																		
								/																		

REMARKS

OPERATOR: STATOIL PAGE NO: 1
WELL NAME: 1/9-4 SPUD DATE: 13-8-77
CONTRACTOR: ROSS RIG: ROSS RIG



Drilling Fluid & Material Consumption Report

WELL NAME 1/9-4 AREA N.S. NORWAY

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM SPUD MUD - DRISPAC/LIME ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE 1977	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE	BENTONITE	SACK MATERIALS: BENTONITE	MATERIALS ADDED TO CONTROL PROPERTIES: THINNERS: FCL				POLYMERS: DRISPAC R.	DRISPAC S.L.			AL. STEARATE	OTHERS: LIME	BICARB	SODA ASH	CAUSTIC SODA	CA CL2	KWIK SEAL	MICA F	MICA M.	WALNUT M.	
1	12/8																									
2	13/8			1200			209										3		5	6						
3	14/8	1 680		200			6														5					
4	15/8			500			145										2			8						
5	16/8	200	420	1200			129													14						
6	17/8	2400		800			40										2		5	4		6	12	12	12	
7	18/8	500		1500			100										118			48						
8	20/8																									
9	21/8		100	100								35														
10	22/8		200	320				43				49	2				143			84						
11	23/8		200	750	18			88				3	42				119			96						
12	24/8		50	95	24			63					35			1	51			65						
13	25/8		230					10					12				22			20						
14	26/8				15		64	6					6							12						
FORWARD																										
ESTIMATED TOTALS		3780	1200	6665	57		693	210				87	97			1	460		10	357	5	6	12	12	12	

REMARKS 1 DISPLACE 36" HOLE TO MUD.

Drilling Fluid & Material Consumption Report

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM DRISPAC-LIME GEL-CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE 1977	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE	BENTONITE	SACK MATERIALS: BENT.	THINNERS: FCL	LIGNITE	POLYMERS: DRIS. R	DRIS. S.L.	Al. STEARATE	OTHERS: LIME	BICARB.	S.A.	CAUSTIC SODA	$CACL_2$	KWIK SEAL	MICA F.	MICA M.	WALNUT M	WALNUT F
15	27/8		150	110	50			85			20		75			31						
16	28/8	50	90	235	70			79			19		34			30						
17	29/8	40		270	74			70			19		21			34						
18	30/8		40	50	71			86			12		34			43						
19	31/8	80	40	240	79			70	12		6		20			27						
20	1/9	50	120	240	54				27		2		36			38						
21	2/9		40	160	42			121	9		2		10									4
22	3/9			40	4			11			1		3			3						
23	4/9				5			21					5			1						
24	5/9				5																	
25	6/9																					
26	7/9																					
27	8/9			1200	77		202	56	27		14	1			1	2						
28	9/9				15		93	15	27						1	18						
FORWARD		3780	1200	6665	57		693	210		87	97	1	460		10	357	5	6	12	12	12	
ESTIMATED TOTALS		4000	1680	9210	603		988	824	102	87	192	2	698		12	584	5	6	12	12	12	4

REMARKS:

Drilling Fluid & Material Consumption Report

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL - CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE 1977	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE	BENTONITE	BENT.	SACK MATERIALS	MATERIALS ADDED TO CONTROL PROPERTIES — THINNERS: FCL	LIG.	DESCO	POLYMERS: DRIS R.	DRIS. S.L.	LIME 40 KG	AL. STER.	OTHERS: LIME 25 KG	BICARB.	S.A.	CAUSTIC SODA	$CACL_2$	KWIK SEAL	MICA F	MICA M	WALNUT M	WALNUT
29	10/9				66		44		21										1						
30	11/9		20	60	31		45		35	1								1	8						
31	12/9			100	3				100	20					1	3			13						
32	13/9	50	100	100	13				54	15						3			6						
33	14/9		20	10	9		12		46							3			8						
34	15/9			78	6		28		10	10						4		1	11						
35	16/9		20						18							2			3						
36	17/9		30						17																
37	18/9		50		2				18		4								18						
38	19/9				22				29		14														
39	20/9				10		26		4		2														
40	21/9				3		11		7	15				1					4						
41	22/9				38				33		30			3					4						
42	23/9			80	7				5							9									
FORWARD		4000	1680	9210	603		988		824	102		87	192		2	698		12	584	5	6	12	12	12	4
ESTIMATED TOTALS		4050	1920	9638	813		1154		1221	163	50	87	192	4	3	722		14	660	5	6	12	12	12	4

REMARKS:

Drilling Fluid & Material Consumption Report

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL. - CHEMICAL

ENGINEERS ~~ASBJØRNSEN~~/LARSEN/STRAND

Day No.	DATE 1977	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE	BENTONITE	BENT.	SACK MATERIALS	MATERIALS ADDED TO CONTROL PROPERTIES — THINNERS: F.C.L.	LIG	DESCO	POLYMERS: DRIS. R	DRIS. S.L.	LIME 40KG	AL. STEAR.	OTHERS: LIME 25 KG	BICAR.	S.A.	CAUSTIC SODA	$CACL_2$	KWIK SEAL	MICA F	MICA M	WALNUT M.	WALNUT F
43	24/9				6		23			2						1									
44	25/9			10	2					5															
45	26/9		90		14				10										6						
46	27/9		90	100	35		38		7	4									1						
47	28/9		10	40	12		12		5										1						
48	29/9				2		1		22										6						
49	30/9			75	4		19		7										2						
50	1/10		33		2		4												2						
51	2/10			150	2		36		12										1						
52	3/10			107	23		44		2	31						2			1						
53	4/10		5		9		26			6						4									
54	5/10		30		2		5		5							3									
55	6/10			5	2		5									4									
56	7/10			15	2		3			10						3									
FORWARD		4050	1920	9638	813		1154		1221	163	50	87	192		4	3	722		14	660	5	6	12	12	12	4
ESTIMATED TOTALS		4050	2178	10140	930		1370		1291	221	50	87	192		4	3	739		14	680	5	6	12	12	12	4

REMARKS

Drilling Fluid & Material Consumption Report

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL - CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE 1977	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE	BENTONITE	BENT.	SACK MATERIALS	MATERIALS ADDED TO CONTROL PROPERTIES: F.C.L.	THINNERS: LIG	DESCO	B-FREE / EZ-SPOT	POLYMERS: DRIS. R.	DRIS. S.L.	LIME 40 KG	AL. STEARATE	OTHERS: LIME 25 KG	BICARB.	S.A.	CAUSTIC SODA	CACL2	KWIK SEAL	MICA F	MICA M	WALNUT M	WAL.
57	8/10		76	100	24		27			17		12/2														
58	9/10		30	250	55					40										3						
59	10/10				2		3																			
60	11/10		55		8		12			2	5															
61	12/10		20		3				30	6							2			6						
62	13/10			50	6		25		23	34	6						2			11						
63	14/10			45	23				42	4	9									6						
64	15/10		19		8		4		17	33																
65	16/10		248		5		37			29	14									1						
66	17/10			200	77		99		12	37	9															
67	18/10			12	16					20										4						
68	19/10			1	10					11																
69	20/10																									
70	21/10				5					2										4						
FORWARD		4050	2178	10140	930		1370		1291	221	50		87	192	4	3	739		14	680	5	6	12	12	12	4
ESTIMATED TOTALS		4050	2626	10798	1172		1577		1415	456	93	12/2	87	192	4	3	743		14	715	5	6	12	12	12	4

REMARKS:

Drilling Fluid & Material Consumption Report

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL - CHEMICAL

ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE 1977	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE	BENTONITE	BENT.	SACK MATERIALS: BARITE	MATERIALS ADDED TO CONTROL PROPERTIES: THINNERS: F.C.L.	LIG.	DESCO	B-FREE EZ-SPOT	POLYMERS: DRIS. R.	DRIS. S.L.		LIME 40 KG AL. STEARATE		OTHERS: LIME 25 KG	BICARB.	S.A.	CAUSTIC SODA	$CACL_2$	KWIK SEAL	MICA F	MICA M	WALNUT M	WALNUT
71	22/10			50																	2						
72	23/10			30	2					8											4						
73	24/10		100					50													4						
74	25/10		100		4				11	4	4							6			2						
75	26/10		58																								
76	27/10		100		4																						
77	28/10		54		3		65																				
78	29/10		80		1		36			16																	
79	30/10			1			38			27																	
80	31/10			31	8		8			34																	
81	01/11			51	26		8			36																	
82	02/11		79	50	18				27	20																	
83	03/11			1	6				25	16											2						
84	04/11		30							7											2						
FORWARD		4050	2626	10798	1172		1577		1415	456	93	12/2	87	192		4	3	743		14	715	5	6	12	12	12	4
ESTIMATED TOTALS		4050	3227	11012	1244		1732	50	1478	624	97	12/2	87	192		4	3	743	6	14	731	5	6	12	12	12	4

REMARKS:

Drilling Fluid & Material Consumption Report

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL - CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No	DATE 1977	ESTIMATED DAILY MUD VOLUMES			BULK MATERIALS		SACK MATERIALS		MATERIALS ADDED TO CONTROL PROPERTIES																						
									THINNERS				POLYMERS						OTHERS													
		LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BARITE	BENTONITE	BENT.	BARITE	LIGNOSULFON.	LIGNITE	DESCO	B-FREE EZ-SPOT	DRISPAC R.	DRISPAC S.L.	LIME 40 KG	AL. STEARATE	LIME 25 KG	BICARB.	S.A.	CAUSTIC SODA	CACL2	KWIK SEAL	MICA F	MICA M	WALNUT M	WALNUT
85	05/11			23	3				4	12	2																			
86	06/11		17		3		4		8		4																			
87	07/11		36		5				17	13	4									8										
88	08/11		2		11		10			15										2										
89	09/11		50	115	32				35	17	11						4			10										
90	10/11				4				8	13	12																			
91	11/11			70	9				7	19	8																			
92	12/11		1		7															4										
93	13/11			27	2																									
94	14/11																													
95	15/11		40		9																									
96	16/11		95																											
97	17/11				4																									
98	18/11		20		3																									
FORWARD		4050	3227	11012	1244		1732	50	1478	624	97	12/2	87	192	4	3	743	6	14	731	5	6	12	12	12	4
ESTIMATED TOTALS		4050	3488	11247	1336		1746	50	1557	713	138	12/2	87	192	4	3	747	6	14	755	5	6	12	12	12	4

REMARKS

Drilling Fluid & Material Consumption Report

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL - CHEMICAL

ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE 1977	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE	BENTONITE	SACK MATERIALS: BENTONITE	BARITE	THINNERS: LIGNOSULFON.	LIGNITE	DESCO	B-FREE EZ-SPOT	POLYMERS: DRISPAC R.	DRISPAC S.L.		LIME 40 KG	AL. STEARATE	LIME 25 KG	BICARB.	SODA ASH	CAUSTIC SODA	OTHERS: $CACL_2$	KWIK SEAL	MICA F	MICA M	WALNUT M	WALNUT
99	19/11		30																							
100	20/11		10	100	8		60		3												1					
101	21/11																									
102	22/11																									
103	23/11		50	5	4		20																			
104	24/11		80		10		6		4																	
105	25/11		30	140	7		30		5																	
106	26/11		80	80	16		30		5										6							
107	27/11		26				20		7										3							
108	28/11		10						7										2							
109	29/11		10																							
110	30/11		10	30	4		25												4		4					
111	01/12		44																							
112	02/12																									
FORWARD		4055	3488	11247	1336		1746	50	1557	713	138	12/2	87	192		4	3	747	6	14	755	5	6	12	12	12	4
ESTIMATED TOTALS		4050	3868	11602	1385		1937	50	1588	713	138	12/2	87	192		4	3	747	21	14	760	5	6	12	12	12	4

REMARKS

Drilling Fluid & Material Consumption Report

MUD SYSTEM GEL - CHEMICAL

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE 1977	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE	BENTONITE	SACK MATERIALS: BENTONITE	BARITE	MATERIALS ADDED TO CONTROL PROPERTIES: THINNERS: LIGNOSULFON.	LIGNITE	DESCO	B-FREE EZ-SPOT	POLYMERS: DRISPAC R	DRISPAC S.L.		OTHERS: LIME 40 KG AL. STEARATE		LIME 25 KG	BICARB.	SODA ASH	CAUSTIC SODA	$CACL_2$	KWIK SEAL	MICA F	MICA M	WALNUT M	WALNUT F
113	03/12		15		3		15		3										1								
114	04/12		40		4		20																				
115	05/12		40		1		5																				
116	06/12		35																								
117	07/12			100	18		35		4										1								
118	08/12																										
119	08/12		40	20	4				54	18											10						
120	10/12									5																	
121	11/12																										
122	12/12				2																						
123	13/12																										
124	14/12						15																				
125	15/12																										
126	16/12	40	40	150	49		44			12											6						
FORWARD		4050	3868	11602	1385		1937	50	1588	713	138	12 2	87	192		4	3	747	21	14	760	5	6	12	12	12	4
ESTIMATED TOTALS		4090	4078	11812	1466		2071	50	1649	748	138	12 2	87	192		4	3	747	22	14	776	5	6	12	12	12	4

REMARKS

Drilling Fluid & Material Consumption Report

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL/CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No.	DATE 1977	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE	BENTONITE	SACK MATERIALS: BENTONITE	BARITE	MATERIALS ADDED TO CONTROL PROPERTIES: LIGNOSULFONATE	THINNERS: LIGNITE	DESCO	EZ-SPOT	B-FREE	POLYMERS: DRISPAC R	DRISPAC S.L.		LIME 40KG	AL: STEARATE	OTHERS: LIME 25 KG	BICARB.	SODA ASH	CAUSTIC SODA	$CACL_2$	KWIK SEAL	MICA F	MICA M	WALNUT M	WALNUT
127	17/12		10		2																							
128	18/12		10				46		45	14											4							
129	19/12																											
130	20/12		60		2				2																			
131	21/12																											
132	22/12		40	100	18		60													1								
133	23/12				10				2																			
134	24/12								10													2						
135	25/12																											
136	26/12				5																							
137	27/12																											
138	28/12																											
139	29/12																											
140	30/12																											
FORWARD		4090	4078	11872	1466		2071	50	1649	748	138	2/12		87	192		4	3	747	22	14	776	5	6	12	12	12	4
ESTIMATED TOTALS		4090	4198	11972	1503		2177	50	1708	762	138	2/12		87	192		4	3	747	23	14	782	5	6	12	12	12	4

REMARKS

Drilling Fluid & Material Consumption Report

WELL NAME 1/9-4 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL/CHEMICAL ENGINEERS ASBJØRNSEN/LARSEN/STRAND

Day No	DATE 1977	ESTIMATED DAILY MUD VOLUMES			BULK MATERIALS		SACK MATERIALS		MATERIALS ADDED TO CONTROL PROPERTIES																						
									THINNERS				POLYMERS			OTHERS															
		LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BARITE	BENTONITE	BENTONITE	BARITE	LIGNOSULFONATE	LIGNITE	DESCO	EZ-SPOT B-FREE	DRISPAC R	DRISPAC S.L.		LIME 40 KG	ALUM. STEAR.	LIME 25 KG	BICARB.	SODA ASH	CAUSTIC SODA	$CaCl_2$	KWIK SEAL	MICA F	MICA M	WALNUT M	WALNUT				
141	31/12		50																												
142	01/01																														
143	02/01																														
144	03/01																														
145	04/01																														
146	05/01																														
147	06/01		40																												
148	07/01		70		25				7												9										
149	08/01		20																												
150	09/01		30				15														2										
FORWARD		4090	4198	11972	1503		2187	50	1708	762	138	2/12	87	192		4	3	747	23	14	782	5	6	12	12	12	4				
ESTIMATED TOTALS		4090	4408	11972	1528		2202	50	1715	762	138	2/12	87	192		4	3	747	23	14	793	5	6	12	12	12	4				

REMARKS

VI TESTING SUMMARY

KNe/GHe/BRi
19.6.78

WELL 1/9-4 TESTING OPERATIONS AND RESULTS

Summary

Well 1/9-4 was spudded August 13th 1977 and permanently abandonded January 13th 1978. The well was drilled to depth - 3710 m.

Nine cores were cut from - 3123 m to - 3273 m with close to 100% recovery.

No RFT surveys were run.

Four drillstem tests to evaluate productivity and fluid composition were carried out. The first two in the Tor formation and the last two in the Ekofisk formation. The first drillstem test also tested the extent of the producable hydrocarbon column.

Hydrocarbons were produced during all the tests.

Weather conditions and operational problems interferred with the designed test program.

2.0.000-6-76 Litografen 7460

Extract of test activities

Date	Activities
Nov. 30	Prepare for DST No. 1 Perforated - 3292 to - 3296 m (RKB),r.i.h. w/test string.
Dec. 1	Opened well for initial flow 0600, shut in 0630 for buildup. Second flow started 0638, the last part of the flow on 48/64" fixed choke. Closed subsurface 2130 for 12 hours buildup.
2-4	P.o.o.h. w/test string, set cement plug at - 3270 m (RKB).
5	Perforated - 3235 to - 3255 m (RKB). R.i.h. w/test string for DST No. 2.
6-11	Wow, hung string off in wellhead, working on sstt, connected to teststring, recovered pressure bombs to set clocks.
12	Tested equipment, landed pressure bombs by wireline at 2209 APR-n opened at 2319 for 1. flow on 48/64" adjustable. Close APR-n for buildup 2336.
13	Opened APR-n 0518 for second flow on 48/64", through separator from 0647. Well closed 1320. Acid treatment. Opened well 2038 for clean-up flow, closed APR-n 2212, sstt closed 2213, repaired surface leak.
14	Opened APR-n 0125 for flow 3a on 48/64" adjustable choke, through separator 0148. Closed APR-n 0533, buildup. Repaired leak. APR-n opened 1203 for flow 4, choke 48/64", at 1303 choke to 28/64" choke. Well closed subsurface 1307 for buildup.

Dec. 15 Well opened 0307 for flow 5 on 48/64" adjustable choke. Reduced choke gradually to 35/64" fixed choke from 0357 on. APR-n closed 0754, gas leak, killed well. Cond. mud.

16 P.o.o.h. w/teststring after DST No. 2.

17 Cement plug at - 3220 m (RKB).

18-21 BOP test failed, set cement plug - 2400 m (RKB) and bridge plug at 2000 m (RKB). Worked on bop stack. Run bop, recovered bridge plug and drilled cement.

22 Perforated - 3176 to - 3198 m (RKB). R.i.h. w/test string for DST No. 3.

23 Opened APR-n 2146 for initial flow. Shut well in 2325.

24 APR-n opened 0229 for acid stimulation, 7100 gallons of acid injected, 1 hr acid contact time.Opened well 0537 for 2. flow. Well shut in 2033. Killed well.

25 P.o.o.h. w/test string after DST No. 3. Cement plug - 3155 m (RKB).

26 Perforated - 3137 to - 3127, then - 3123 to - 3120 m (RKB). R.i.h. w/teststring for DST No. 4.

27 Opened APR-n 1319 for 1. flow. Well shut in 1353 for 3 hours buildup. Well opened again 1654 for flow 2.

28 Had to bullhead formation and close APR-n 0052 because of bad weather. Well shut in until 1408 when 3. flow commenced. Formation acidized 1504 - 1723. Well opened 1723 for 4. flow. Had H_2S indications (1-12 ppm).

Dec. 29	Well closed in 0201 for buildup. Well opened again 1555 for flow 5, stabilized on 14/64" choke. Well shut in 2159 for buildup.
30	Bad weather, well killed, unlatch from sstt, broke anchor chain.
31 - Jan 5	Wow, repaired anchor, latched on to sstt.
6	P.o.o.h. w/teststring after DST No. 4.

Brief summary of production tests

DST 1: Tor formation, perforated - 3292 to - 3296 m (RKB). The second flow produced 1.08 MMSCFD of gas and in the range of 100 STBOPD. There was no water production. The oil produced had a gravity of 46° API.

DST 2: Tor formation, perforated - 3235 to - 3255 m (RKB). The well flowed 5 periods, 3 of which after acid treatment. After stimulation the well flowed 23.8 MMSCFD of gas and 3722 STBOPD on 48/64" choke. The test was abandoned in the 5. flow because of a leak.

DST 3: Ekofisk formation, perforated - 3176 to - 3198 m (RKB). The well flowed for one period, was stimulated and flowed then for a second period. After acid the well flowed 1.1 MMSCFD of gas with a bottomhole flowing pressure 750 psig at depth - 3154 m (RKB).

DST 4: Ekofisk formation, perforated - 3137 to - 3127 and - 3123 to - 3120 m (RKB). The well was acidized and flowed 17.6 MMSCFD of gas and 1400 STBOPD after acid on 48/64" choke. The test was abandoned after the 5. buildup because of bad weather.

DST 1. Detailed test sequence

Perforations: Interval - 3292 to - 3296 m.
RKB, ref. FDC/CNL. 4" casing gun, 4 shots/ft, 90° phased.

Cushion : Seawater down to RTTS circulating valve.

Recorders : 2 Amerada, GRC RPG 3, 0-12000 psi
1 Amerada, GRC RPG 3, 0-15000 psi
1 Leutert 0-10000 psi
1 Amerada, GRC-RT7 100-350 deg F

1. flow : 30 mins.
Total formation flow 6 bbls to displacement tank at cement unit, FWHP = 0, no choke restriction.

1. shut in : 8 mins.
Bottomhole shut in.

2. flow : 654 mins.

0-48 mins Total production 34 bbls, no choke restriction, FWHP = 0, production through kill line to displacement tank at cement unit.

48-214 mins 48/64" adjustable choke, gas and muddy water to surface through flare, no H_2S, 3% CO_2.

214-654 mins Flow on 48/64" fixed choke through separator to the flare.
Separator conditions:
pressure : 165 psia
temperature: 50°F
FWHP = 190 psig, FWHT = 56°F.

Flow conditions were fairly stable. Gas rates in the range 1.05 - 1.12 MMSCFD. Oil rates varied, but 85 STBOPD indicates a typical rate.

Gas analysis:
H_2S : negative
CO_2 : 2%
Gas gravity: .68 (rel. air)
Liquid analysis:
Water : 1%
Sediments : 3%
Oil gravity: 42° API

Sampling: Two sets of separator oil and gas (PVT).

Bottomhole pressure at end of flow at depth - 3289 m: 650 psig.

2. shut in : 12 hours.

Base Stavanger Customer Statoil

Date 30/11/77 DST No. 1 Well No. 1/9-4

Test String	O/D	ID	Length meters	Depth meters
Otis surface test tree		2.88"		above K.B. 7.14 m
x-over 4 3/8-6stub x 3½ tds		2.88"		
lubricator	13 3/8"	2.88"		
injection sub	10 3/4"	2.88"		
SSTT with ramlock sub		1.92"		sat on wear bushing
x-over 4½-4stub x3½tds			.30	
3½ tds tubing	3.50	2.75	2420.24	
x-over 3½tDs b x 3½if pin			.30	
3½ 5-135 d pipe	3.5	2.6	494.96	
slip joint open	5.00	2.00	5.54	
slip joint closed	5.00	2.00	4.02	
drill collars	4.75	2.25	171.47	
x-over 3½ if b x 2 7/8 eve p	4.68	2.37	.25	
7" RTTS circ valve	4.87	2.44	.91	
x-over 2 7/8 eve b x 3½ if pin	4.88	2.24	.21	
drill collars	4.75	2.25	28.59	
slip joint closed	5.00	2.00	4.02	
slip joint closed	5.00	2.00	4.02	
drill collars	4.75	2.25	28.57	
APR-A circ. sub	4.625	2.00	1.32	
APR-N tester valve	4.625	2.00	4.17	3265.44
big john jars	4.87	2.37	1.63	
7" RTTS circ valve	4.87	2.44	.91	
7" RTTS safety joint	2.44	5.00	.84	
7" RTTS packer centre	5.75	2.185	.52	3269.34
below			.82	3270.16
perforated joint	2.87		2.22	
x-over 2 7/8 eve b x 2 3/8 eve p			.22	
Otis xn nipple		1.82	.30	3272.88
x-over 2 3/8 eve b x 2 7/8 eve b			.32	
blanked of joints	2.87		20.81	

DST 2. Detailed test sequence

Perforations: Interval - 3235 to - 3255 m RKB, ref. FDC/CNL.
4" casing gun, 4 shots/ft, 90° phased.

Cushion : Seawater down to RTTS circulating valve.

Recorders : 2 Amerada, GRC RPG 3, 0-12000 psi
1 Amerada, GRC RPG 3, 0-15000 psi
1 Leutert 0-10000 psi
1 Amerada, GRC-RT7 100-350 deg F.

1. flow : 17 mins.
48/64" choke, flowed 30 bbls through kill line to displacement tank at cement unit.

1. shut in : 342 mins.
Bottomhole shut-in.

2. flow : 482 mins.
Flow through 48/64" choke.

0-29 mins Mostly water to surface through gas flare line with a continuous flare for most of the time.

29-482 mins Flow through separator.
At end of flow:
FWHP = 1560 psig
FWHT = 100°F
BHP = 3060 psig at - 3215 m (RKB).

Separator conditions:
410 psig, 56°F.

.5% water and no solids were produced.

Oilrate: 1128 STBOPD
Gasrate: 6.75 MMSCFD
GOR : 5986 SCF/STB
ρ gas : .66
ρ oil : 47° API.

Acidation : 20% HCl, 200-300 gallons/ft.

3. flow : 94 mins.
Clean up flow after acid, 48/64" choke.

3. shut in : 193 mins to repair leak.

Flow 3a : 248 mins.
48/64" adjustable choke the whole flow period.

0-23 mins Flow to gas flare line 2.5% water and .5% sediments.

23-248 mins Flow through separator.
At the end of the flow period:
FWHP = 2770 psig
FWHT = 174°F
BHP = 6148 psig

Separator conditions
655 psig, 123°F.

1.0% water and .1% solids.

Oil rate: 3722 STBOPD
Gas rate: 23.8 MMSCFD
GOR : 6308 SCF/STB
ρ gas : .672
ρ oil : 46° API

3a shut in : 390 mins.

4. flow : 364 mins.

0-11 mins 48/64" adjustable choke.

11-15 mins 42/64" adjustable choke.

15-17 mins 36/64" adjustable choke.

17-57 mins 32/64" adjustable choke.

57-364 mins Choke 28/64" adjustable. Flow through heater and separator.

At the end of the flow period:
FWHP = 4593 psig
FWHT = 111°F
Separator conditions:
765 psig, 100°F.

1.0% water and no solids were produced.

Oil rate: 1500 STBOPD
Gas rate: 8.5 MMSCFPD
GOR : 5675 SCF/STB
ρ gas : .666
ρ oil : 49° API

Two sets of separator oil and gas for PVT analysis were collected during this flow.

4. shut in : 9 hours.

5. flow : 287 mins.

0-6 mins 48/64" adjustable choke.

6-27 mins 39/64" fixed choke.

27-50 mins 37/64" fixed choke.

50-287 mins 35/64" fixed choke.
Flow through separator.

At the end of this flow:
FWHP = 3595 psig
FWHT = 154°F

Separator conditions:
585 psig, 107°F.

Oil rate: 2750 STBOPD
Gas rate: 17.7 MMSCFPD
GOR : 6400 SCF/STB
ρ gas : .67
ρ oil : 42.8° API

One set of separator PVT samples were collected.

Base Stavanger Customer Statoil

Date 6/12/77 DST No. 2 page 1 of 2 Well No. 1/9-4

Perforations 3235-3255 m

Test String	O/D	ID	Length	Depth
Surface tree above rotary				5.81
T.D.S. tubing	3.5	2.75	60.95	55.14
Cross-over, 3½" TDS box to 4½" acme pin				
Otis lubricator valve				
Injection valve				
Cross-over, 4½acme box to 3½" TDS pin			2.68	57.82
T.D.S. tubing	3.5	2.75	30.44	88.26
Cross-over 3½" TDS box to 4½", 4-stub acme pin				
Flopetrol S.S.T.T. above datum level			8.24	96.50
Flopetrol S.S.T.T. Cross-over 4½" acme pin to 3½" TDS pin			0.82	97.32
TDS tubing	3.5	2.75	2420.05	2517.37
3½" I.F. pin	4.75	2.75	0.30	2517.67
3½", S-135 D.P. 17items	3.5	2.6	433.34	2951.01
Slip jt, open	5	2.0	5.54	2956.55
Slip jt, closed	5	2.0	4.02	2960.57
Drill collars	4.75	2.25	171.47	3132.04
Cross-over 3½" IF box to 2 7/8" EVE pin	4.68	2.37	0.25	3132.29
7" RTTS circ valve	4.87	2.44	0.91	3133.20
x-over 2 7/8EVE box - 3½" IF pin	4.88	2.44	0.21	3133.41
Drill collars	4.75	2.25	28.59	3182.00
Slip jt, closed 2 items	5.00	2.00	8.04	3170.04
Drill collars	4.75	2.25	28.57	3198.61
APR-A circ valve	4.625	2.00	0.90	3199.51
APR-N test valve	4.625	2.00	4.17	3203.68

Base Stavanger Customer Statoil

Date 6/12/77 DST No. 2 page 2 of 2 Well No. 1/9-4

Test String	O/D	ID	Length	Depth
Big-John jars	4.87	2.37	1.63	3205.31
7" RTTS circ valve	4.87	2.44	0.91	3206.22
7" RTTS safety joint	5.00	2.44	0.84	3207.06
7" RTTS packer	5.75	2.185	0.52	3207.58
above / below			0.82	3208.40
Perforated IF	2.87		2.22	3210.62
Cross-over 2 7/8" IF box to 2 3/8" EVE box			0.32	3210.94
Otis XN-nipple		1.82		3211.24
Cross-over 2 3/8" EVE box to 2 7/8" EVE box			0.32	3211.56
2 7/8" tubing	2.875		9.03	3220.59
AMERADA				
2 7/8" tubing	2.875		9.61	3230.20
Mule-shoe, blanked off			2.17	3232.37

DST 3. Detailed test sequence

Perforations : 3176 - 3198 m RKB, ref. FDC/CNL. 4" casing gun, 4 shots/ft, 90° phased.

Cushion : Seawater down to RTTS circulating valve.

Recorder : 2 Amerada, GRC RPG 3, 0-12000 psi
1 Amerada, GRC RPG 3, 0-15000 psi
1 Leutert 0-10000 psi
1 Amerada, GRC-RT7 100-350 deg F

1. Flow : 91 mins.

0-6 mins	3/4" choke. Flow to stock tank FWHP dropped to zero. No measurable recovery.
6-46 mins	Closed choke manifold. Flow to displacement tank at cement unit. No measurable recovery.
46-61 mins	Injected 10 bbls of mud and water. Max. injection pressure 5300 psi. Injection rate 2 bbls/min at 4700 psi.
61-91 mins	Opened kill line to displacement tank at cement unit. Flowed back 5 bbls.

1. Build up : 184 mins
Bottom hole shut in.

Acidizing : Pumped 171 bbls acid, 3 bbls/min at 4800 psi. Displaced with 89 bbls seawater. 3 bbls/min at 4000 psi. 1 hr contact time.

2. Flow : 896 mins

0-13 mins WHP = 3325 psi. 3/4" choke. Flow to gas flare line, FWHP dropped to 35 psi.

13-28 mins Flowed to stock tank. Recovered 9 bbls.

28-415 mins Flow to gas flare line. B.S.W. ca. 75%.
48 mins FWHP = 0 psi
74 mins Gas to surface
78 mins FWHP = 800 psi
143 mins FWHP = 70 psi

415-418 mins Choke back to 28/64".

418-616 mins Flow directed through separator.

FWHP	:	210 - 240 psi
FTHT	:	50 - 52 deg F
Oil flow rate	:	70 STBOPD
Gas flow rate	:	.81 MM SCF/D
GOR	:	ca. 11-12000 SCF/STB
Gravity condensate	:	45.5° API
Sp. gravity gas	:	0.81 (Air = 1.0)

Gas analysis (Draeger)
H_2S : negative
CO_2 > 10%
B.S.W.: 40 - 50%

616-885 mins Choke up to 3/4"

FWHP	:	100-140 psi
FTHT	:	50-52 deg F
Oil flow rate	:	110 STBOPD
Gas flow rate	:	1.1 MMSCF/D
GOR	:	10 MSCF/STB
Gravity condensate	:	45.0° API
Sp. gravity gas	:	.81 (Air = 1.0)

Gas analysis (Draeger)
H_2S: Negativ
CO_2: 3%

B.S.W.: 10-45%

885-896 mins Bypassed separator
896 Closed STT. Bullheaded with mud. No buildup.

End of DST 3.

Base Stavanger Customer Statoil

Date 20/12/77 DST No. 3 Well No. 1/9-4

Perforation 3176-3198 m

Test String	O/D	ID	Length	Depth
Otis surface tree above rotary				4.54
TDS tubing	3.5	2.75	60.02	55.48
XO 3½" TDS box-4½" acme pin				
Otis lubricator valve				
injection sub				
XO 4½" acme box-3½"TDS pin			2.68	58.16
TDS tubing	3.5	2.75	30.10	88.26
XO 3½" TDS box-4½" 4 stub				
acme pin				
FLOPETROL SSTT				
above datum line			8.24	96.50
FLOPETROL SSTT below			0.82	97.32
TDS tubing	3.5	2.75	2348.03	2445.35
3½ S-135 D.P.			436.62	2881.97
3½ S-135 D.P.			9.76	2891.73
Slip joint, open	5.0	2.0	5.54	2897.27
Slip joint, closed	5.0	2.0	4.02	2901.29
Drill collars	4.75	2.25	171.47	3072.76
XO 3½" IF box-2 7/8 EVE pin	4.68		0.25	3073.01
7" RTTS circ valve	4.87	2.44	0.91	3073.92
XO 2 7/8" EVE box-3½"IF pin	4.88	2.44	0.21	3074.13
Drill collars	4.75	2.25	28.59	3102.72
Slip joints closed, 2 items	5.00	2.00	8.04	3110.76
Drill collars	4.75	2.25	28.57	3139.33
APR-A circ valve	4.625	2.00	0.90	3140.23
APR-N test valve	4.625	2.00	4.17	3144.40
Big-John jars	4.87	2.37	1.63	3146.03
7" RTTS circ valve	4.87	2.44	0.91	3146.94
Safety joint	5.00	2.44	0.84	3147.78
7" RTTS packer above	5.75	2.185	0.52	3148.30
below			0.82	3149.12
Perforated joint	2.87		2.22	3151.34
XO 2 7/8" EVE box-				
2 3/8" EVE box			0.32	3151.66
Otis x-n-nipple		1.82	0.30	3151.96
XO 2 3/8EVE box-2 7/8 EVE pin			0.32	3152.28
2 7/8" tubing	2.875		18.64	3170.92

DST 4 Detailed test sequence

Perforations	:	3120-3123 m, 3127-3137 m RKB ref. FDC/CNL. 4" casing gun, 4 shots/ft, 90° phased.
Cushion	:	Seawater down to RTTS curculating valve.
Recorders	:	2 Amerada, GRC RPG 3, 0-12000 psi 1 Amerada, GRC RPG 3, 0-15000 psi 1 Leutert 0-10000 psi 1 Amerada, GRC RT7, 100-350 deg F
1. Flow	:	30 mins
0-6 min		WHP = 1650 psi, 3/4" choke. Flow to stock tank. FWHP dropped to zero.
6-30 mins		Closed choke manifold. Opened kill line to displacement tank at cement unit. Total recovery during initial flow 8 bbls.
1. Build up	:	181 mins Bottom hole shut in.
Injection test	:	Injected 8 bbl into formation. Injection rate 3 bbls/min at 4000 psi.
2. Flow	:	447 mins
0-7 mins		WHP = 3900 psi. 3/4" choke. Flow to stock tank. FWHP dropped to 200 psi. 23 bbls recovered.
7-135 mins		Flow to gas flare line.
11 mins		FWHP 415 psi. Traces of gas to surface.
18 mins		FWHP 1850 psi. Rat hole mud to surface.

135-283 mins Flow directed through separator.

FWHP	:	505-565 psi
FTHT	:	69-72 deg F
Oil flow rate	:	300 STBOPD
Gas flow rate	:	4.9 MM SCF/D
GOR	:	16 MSCF/STB
Gravity condensate	:	60° API
Sp. gravity gas	:	0.67 (Air = 1.0)

Gas analysis (Draeger)
H_2S - negative
CO_2 - 2.5%
B.S.W. - 2-8%

283-288 mins Choke back to 40/64"

288-444 mins Choke back to ½"

444-447 mins Bypassed separator, flow to gas flare line.
447 mins Closed choke manifold.

447-470 mins Bullheaded due to bad weather.

2. Build up : 796 mins (WOW)

3. Flow : 56 mins.

0-56 mins 3/4" choke. Flow to gas flare line. Clean up before acidizing.

Acidizing : Pumped 135 bbls acid. Injection rate 4 bbls/min. Max. pumping pressure 3650 psi. Displaced with 85 bbls seawater. 1 hr contact time.

4. Flow : 518 mins.

0-465 mins 3/4" choke. Flow to gas flare line. FWHP = 770 psi. Pressure increased to 2500 psi (after 31 mins) and dropped to 1075 psi at the end of the period. Max FWHT = 132 deg F. At the end of the period B.S.W. = 7%.

465-517 mins Flow through separator.

FWHP	:	1070 psi
Gas flow rate	:	17.6 MM SCF/D
Oil flow rate	:	1400 STBOPD
Gas gravity	:	69 (Air = 1.0)
Oil gravity	:	50.8 deg API
H_2S	:	7 ppm

1 set PVT sample

518 mins FWHP = 1070 psi. Closed choke minifold.

4. Build up : 835 mins

0-19 mins Surface shut in. WHP = 2800

19-835 mins Bottom hole shut in.

5. Flow : 359 mins

0-13 mins 3/4" choke. Flow to burner. FWHP dropped to 1100 psi.

13-23 mins ½" choke.

23-29 mins FWHP = 1800 psi. Flow directed through heat exchanger, 3/8" choke, FWHP increased to 2140 psi.

29-67 mins 14/64" choke at heat exchanger. FWHP increased to 2140 psi.

67 mins Flow directed through separator.

67-359 mins	: FWHP	:	4070
	FWHT	:	82 deg F.
	Gas flow rate	:	4.4 MM SCF/Day
	Oil flow rate	:	780 STBOPD
	5600 SCF/STB		
	B.S.W.	:	1-2%
	H_2S	:	2-4 ppm
	Gas gravity	:	0.688
	Oil gravity	:	50.6 deg API
	Sampling	:	2 set P.V.T. samples

5. Build up : 670 mins (WOW)

Bottom hole shut in.

Base Stavanger Customer Statoil

Date 27/12/77 DST No. 4 Well No. 1/9-4

Perforation 3120-3137 m

Test String	O/D	ID	Length	Depth
Otis surface tree above rotary				
TDS tubing				
XO 3½" TDS box-4½acmepin	3.5	2.75	62.50	55.48
Otis lubricator valve				
injection sub			2.68	58.16
XO 4½" acme box-3½ TDS pin				
TDS tubing			30.10	88.26
XO 3½" TDS box-4½" acme pin				
FLOPETROL SSTT above			8.24	96.50
below			0.82	97.32
TDS tubing	3.5	2.75	2348.03	2445.35
3½ S-135 D.P. 2 items	3.5	2.6	388.06	2833.41
Slip joint, open	5.0	2.0	5.54	2838.95
Slip joint, closed			4.02	2842.97
Drill collars	4.75	2.25	171.47	3014.44
XO 3½" IF box-2 7/8" EVE pin	4.68	2.37	0.25	3014.69
7" RTTS circ valve	4.87	2.44	0.91	3015.60
Drill collars	4.75	2.25	28.59	3044.40
Slip joints closed,				
2 off	5.00	2.00	8.04	3052.44
Drill collars	4.75	2.25	28.57	3081.01
APR-A circ valve	4.625	2.00	0.90	3081.91
APR-N test valve			4.17	3086.08
Big John jars	4.87	2.37	1.63	3087.71
7" RTTS circ valve	4.87	2.44	0.91	3088.62
Safety joint	5.00	2.44	0.84	3089.46
7" RTTS packer above	5.75	2.185	0.52	3089.98
below			0.82	3090.80
Perforated joint	2.87		2.22	3092.02
XO 2 7/8" EVE box -				
2 3/8" EVE box			0.32	3093.34
Otis x-n nipple		1.82	0.30	3093.64
XO 2 3/8" EVE box -				
2 7/8" EVE pin			0.32	3093.96
2 7/8" tubing	2.875		18.64	3112.60
Mule - shoe, blanked				
off			2.17	3114.74