OPERATOR STATOIL

WELL NO. 34/10-2

MATERIAL CONSUMPTION & COST ANALYSIS

36" HOLE DRILLED TO 210 Meters ~~Feet~~ 30" CASING SET AT 209 Meters ~~Feet~~

ACTUAL AMOUNT OF HOLE DRILLED 52 Meters ~~Feet~~ DAYS ON INTERVAL 2

DRILLING FLUID SYSTEM SPUD MUD

MATERIAL	UNIT SIZE	PROG.	USED	VARIANCE ±	COST
BARITE	M/T	5	10	+5	$ 1090.00
WYOMING BENTONITE	50KG	250	355	+105	$ 3727.50
CAUSTIC SODA	25KG	6	13	+7	$ 130.00
SPERSENE	50LBS		19	+19	$ 270.75
CALCIUM CHLORIDE	50KG		11	+11	$ 93.50

COST/DAY $ 2655.75 TOTAL COST FOR INTERVAL $ 5311.75

COST/Mt. or Ft. $ 102.15 PROG. COST FOR INTERVAL $ 3230.00

ENGR. COST $ 600.00 COST VARIANCE FOR INTERVAL + $ 2081.75

OPERATOR STATOIL

WELL NO. 34/10-2

MATERIAL CONSUMPTION & COST ANALYSIS

26" HOLE DRILLED TO 517 Meters ~~Feet~~ 20" CASING SET AT 504 Meters ~~Feet~~

ACTUAL AMOUNT OF HOLE DRILLED 307 Meters ~~Feet~~ DAYS ON INTERVAL 3

DRILLING FLUID SYSTEM SPUD MUD

MATERIAL	UNIT SIZE	PROG.	USED	VARIANCE ±	COST
BARITE	M/T	8	83	+75	$ 9047.00
WYOMING BENTONITE	50KG	350	474	+124	$ 4977.00
CAUSTIC SODA	25KG	5	6	+1	$ 60.00
SPERSENE	50LBS		15	+15	$ 213.75
LIME	25KG		1	+1	$ 3.60
SODA ASH		8		-8	

COST/DAY $ 4767.10 TOTAL COST FOR INTERVAL $14.301.35

COST/Mt. or Ft. $ 46.58 PROG. COST FOR INTERVAL $ 4.693.00

ENGR. COST $ 1350.00 COST VARIANCE FOR INTERVAL + $ 9.608.35

OPERATOR STATOIL

WELL NO. 34/10-2

MATERIAL CONSUMPTION & COST ANALYSIS

17½" HOLE DRILLED TO 1830 Meters ~~Feet~~ 13-3/8" CASING SET AT 180 Meters ~~Feet~~

ACTUAL AMOUNT OF HOLE DRILLED 1326 Meters ~~Feet~~ DAYS ON INTERVAL 13

DRILLING FLUID SYSTEM GEL/LIGNO.

MATERIAL	UNIT SIZE	PROG.	USED	VARIANCE ±	COST
BARITE	M/T	165	170	+5	$18530.00
WYOMING BENTONITE	50KG	550	461	-89	$ 4840.50
EUROPEAN BENTONITE	50KG		20	+20	$ 140.00
CAUSTIC SODA	25KG	30	129	+99	$ 1290.00
SPERSENE	50LBS		61	+61	$ 869.25
CHROME LIGNOSULF.	25KG	230	205	-25	$ 2921.25
DRISPAC REGULAR	50LBS		11		$ 1265.00
SODA ASH	50KG		3		$ 36.00
DRILLING DETERGENT	200L		1		$ 175.00
SODIUM BICARB.	50KG	6		-6	
CMC LO VIS	25KG	60		-60	
DRISPAC SUPERLO	50LBS	45		-45	
AL. STEARATE	25KG	10		-10	

COST/DAY $ 2312.84 TOTAL COST FOR INTERVAL $30067.00

COST/Mt. or Ft. $ 22.67 PROG. COST FOR INTERVAL $36144.50

ENGR. COST $ 5840.00 COST VARIANCE FOR INTERVAL $ 6077.75

OPERATOR STATOIL

WELL NO. 34/10-2

MATERIAL CONSUMPTION & COST ANALYSIS

12" HOLE DRILLED TO 2723 Meters ~~XXX Feet~~ 9-5/8" CASING SET AT 2700 Meters ~~XXX Feet~~

ACTUAL AMOUNT OF HOLE DRILLED 921 Meters ~~Feet~~ DAYS ON INTERVAL 15

DRILLING FLUID SYSTEM GEL/LIGNO.

MATERIAL	UNIT SIZE	PROG.	USED	VARIANCE ±	COST
BARITE	M/T	300	456	+156	$49704.00
WYOMING BENTONITE	50KG	300	313	+13	$ 3286.50
CAUSTIC SODA	25KG	120	77	-43	$ 770.00
SPERSENE	50LBS		66	+66	$ 940.50
CHORME LIGNOSULF.	25KG	420	304	-116	$ 4332.00
TANNATHIN	50LBS		10	+10	$ 185.00
XP-20	50LBS		7	+7	$ 99.75
DRISPAC REGULAR	50LBS		4	+4	$ 460.00
DRISPAC SUPERLO	50LBS	40	22	-18	$ 2640.00
SODA ASH	50KG		14	+14	$ 168.00
SAPP	50KG		9	+9	$ 621.00
CMC LO VIS	25KG	110	21	-89	$ 1050.00
MICA FINE	25KG		10	+10	$ 115.00
WALNUT	25KG		12	+12	$ 145.80
ADF CHROME LIGNITE	25KG	300		-300	
EML	DRUM	5		-5	
AL. STEARATE	25KG	10		-10	

COST/DAY $ 4301.17 TOTAL COST FOR INTERVAL $64517.55

COST/Mt. or Ft. $ 70.05 PROG. COST FOR INTERVAL $61945.00

ENGR. COST $ 6740.00 COST VARIANCE FOR INTERVAL + $ 2572.55

OPERATOR STATOIL

WELL NO. 34/10-2

MATERIAL CONSUMPTION & COST ANALYSIS

8½" HOLE DRILLED TO 3730 Meters ~~Feet~~ 7" CASING SET AT 3725 Meters ~~Feet~~

ACTUAL AMOUNT OF HOLE DRILLED 1030 Meters ~~Feet~~ DAYS ON INTERVAL 51

DRILLING FLUID SYSTEM GEL-CHEMICAL

MATERIAL	UNIT SIZE	PROG.	USED	VARIANCE ±	COST
BARITE	M/T	280	704	+424	$ 76736.00
WYOMING BENTONITE	50KG	280	584	+304	$ 6132.00
CAUSTIC SODA	25KG	120	269	+149	$ 2690.00
BARITE	50KG		96	+96	$ 460.80
SPERSENE	50LBS		34	+34	$ 484.50
CHROME LIGNOSULF.	25KG	400	697	+297	$ 9932.25
ADF CHROME LIGNITE	25KG	280	421	+141	$ 7788.50
CMC LO VIS	25KG	150	10	-140	$ 500.00
DRISPAC SUPERLO	50LBS	40	17	-23	$ 2040.00
EML	DRUM	5		-5	
DEFOAMER	25KG	10		-10	
SOLTEX	50LBS		32		$ 1216.00

COST/DAY $ 2117.25 TOTAL COST FOR INTERVAL $107980.05

COST/Mt. or Ft. $ 104.83 PROG. COST FOR INTERVAL $ 60300.00

ENGR. COST $16800.00 COST VARIANCE FOR INTERVAL + $ 47680.05

OPERATOR STATOIL

WELL NO. 34/10-2

TOTAL CONSUMPTION & COST ANALYSIS

TOTAL DEPTH 3730 Meters ~~Feet~~ TOTAL HOLE DRILLED 3572 Meters ~~Feet~~

TOTAL DAYS 84

MATERIAL	UNIT SIZE	PROG.	USED	VARIANCE ±	COST
BARITE	M/T	758	1423	+665	$155107.00
BARITE	50KG		96	+96	$ 460.80
WYOMING BENTONITE	50KG	1730	2187	+457	$ 22963.50
EUROPEAN BENTONITE	50KG		20	+20	$ 140.00
CAUSTIC SODA	25KG	281	494	+213	$ 4940.00
CHROME LIGNOSULF.	25KG	1050	1206	+156	$ 17185.50
CHROME LIGNITE	25KG	580	421	-159	$ 7788.50
SPERSENE	50LBS		195	+195	$ 2778.75
XP-20	50LBS		7	+7	$ 99.75
TANNATHIN	50Lbs		10	+10	$ 185.00
DRISPAC REGULAR	50LBS		15	+15	$ 1725.00
DRISPAC SUPERLO	50LBS	130	39	-91	$ 4680.00
DRILLING DETERG.	200L		1	+1	$ 175.00
CALCIUM CHLORIDE	50KG		11	+11	$ 93.50
LIME	25KG		1	+1	$ 3.60
SODA ASH	50KG	14	17	+3	$ 204.00
MICA FINE	25KG		10	+10	$ 115.00
WALNUT	25KG		12	+12	$ 145.80
SOLTEX	50LBS		32	+32	$ 1216.00
CMC LO VIS	25KG	320	31	-289	$ 1550.00
SAPP	50KG		9	+9	$ 621.00

COST/DAY $ 2645.00

COST/Mt. or Ft. $ 62.20

ENGR. COST $31320.00

TOTAL COST FOR INTERVAL $222177.70

PROG. COST FOR INTERVAL $166312.50

COST VARIANCE FOR INTERVAL + $ 55862.50

ANCHOR DRILLING FLUIDS AS

OSLO — STAVANGER

Drilling Fluid & Material Consumption Report

MUD SYSTEM GEL-CHEMICAL

WELL NAME 34/10-2 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

ENGINEERS J.BRAY, S.ASBJØRNSEN, R.LARSEN, T.HELLSTRAND
M.ÅRSETH, A.VIGEN, A.TORSVOLL

Day No.	DATE 1978 SEPT	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE M/T	BENTONITE	SACK MATERIALS: BENTONITE	CAUSTIC	MATERIALS ADDED TO CONTROL PROPERTIES: THINNERS: SPERSENE	CHR. LIGNO.	POLYMERS: DRISPAC reg.	SODA ASH	OTHERS: DRILLING DETERGENT	CALCIUM CHLORIDE	LIME
1	9.			1350	10		280	10	19						
2	10.	950		519			75	3						11	1
3	11.		352	1000	22		230	5	6						
4	12.		338	800			175		8						
5	13.	1490		500	61		69	1	1						
6	14.	979		1250	33		186	1		1					
7	15.		120	330			15	13	21		4	1			
8	16.		120	170	25		20	24	19	2	1	1			
9	17.		70	300	20						6				
10	18.		14												
11	19.		100	344	16		60	17							
12	20.		74	100	22		63	32		55		1	1		
13	21.			215	29			29		60					
14	22.		105					4		10					
FORWARD															
ESTIMATED TOTALS		3419	1293	6878	238		1173	139	74	128	11	3	1	11	1

REMARKS:

ANCHOR DRILLING FLUIDS AS

OSLO — STAVANGER

Drilling Fluid & Material Consumption Report

WELL NAME 34/10-2 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL-CHEMICAL

ENGINEERS J.BRAY, S.ASBJØRNSEN, R.LARSEN, T.HELLSTRAND M.ÅRSETH, A.VIGEN, A.TORSVOLL

Day No.	DATE 1978 SEPT	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE M/T	BENTONITE	SACK MATERIALS: WYOMING BENTONITE	CAUSTIC SODA	MATERIALS ADDED TO CONTROL PROPERTIES — THINNERS: SPERSENE	CHROME LIGNOSULF.	TANNATHIN	XP-20	POLYMERS: DRISPAC REGULAR	DRISPAC SUPERLO				OTHERS: SODA ASH	SAPP	CMC LO VIS	DRILL. DETERGENT	MICA FINE	CHROME LIGNITE	WALNUT	CALCIUM CHLORIDE	LIME
15	23.		50	98			60	5																		
16	24.		45	195	2		75																			
17	25.		50	149	12		2	4		61																
18	26.				11				21	16																
19	27.	730						4	19																	
20	28.	15	245		6		3	5	30									11	1							
21	29.		24	50	112		5		3	59								3	8							
22	30.		75	84	37		81			58										21						
23	1.10		182	350	78		86			54			2	6												
24	2.		56		22		13			23																
25	3.		250	577	100		70	20		26	7		2	8												
26	4.		28	56	20			6	5		3															
27	5.		50	100	40		27	6	9	15		7		8												
28	6.		60	60						7																
FORWARD		3419	1293	6878	238		1173	139	74	128			11					3	0	0	1					
ESTIMATED TOTALS		4164	2408	8597	678		1595	189	161	447	10	7	15	22				17	9	21	1					

REMARKS:

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

Drilling Fluid & Material Consumption Report

WELL NAME 34/10-2 AREA NORTH SEA

OPERATOR STATOIL RIG ROSS RIG

MUD SYSTEM GEL-CHEMICAL

ENGINEERS J.BRAY, S.ASBJØRNSEN, R.LARSEN, T.HELLSTRANI M.ÅRSETH, A.VIGEN, A.TORSVOLL

Day No.	DATE 1978 Okt.	ESTIMATED DAILY MUD VOLUMES			BULK MATERIALS		SACK MATERIALS			MATERIALS ADDED TO CONTROL PROPERTIES																						
											THINNERS			POLYMERS																			
		LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BARITE M/T	BARITE SXS	WYOMING BENTONITE	CAUSTIC SODA	SPERSENE	CHROME LIGNOSULF.	TANNATHIN	XP-20	DRISPAC REGULAR	DRISPAC SUPERLO				SODA ASH	SAPP	CMC LO VIS	DRILLING DETERGENT	MICA FINE	CHROME LIGNITE	WALNUT	CALCIUM CHLORIDE	LIME						
29	7.		209	278	7			16		22																						
30	8.		63	140	18		28	15		25																						
31	9.		50		13					5																						
32	10.		80							3																						
33	11.		100	70	3			5		7											10		12									
34	12.		35		8	96		5		32																						
35	13.		80		17		57	5		20																						
36	14.			100	10			13		36									1													
37	15.			140	40			16		50												40										
38	16.		25	40	14			7		21																						
39	17.		20	20	5			8		29																						
40	18.		35	40				7		20																						
41	19.		10	20	5			2		15																						
42	20.		111				3	3	9																							
FORWARD		4164	2408	8597	678		1595	189	161	447	10	7	15	22				17	9	21	1				11	1						
ESTIMATED TOTALS		4164	3226	9445	818	96	1683	291	170	732	10	7	15	22				17	9	22	1	10	40	12	11	1						

REMARKS

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

Drilling Fluid & Material Consumption Report

WELL NAME 34/10-2 AREA NORTH SEA

OPERATOR STATOIL RIG ROSS RIG

MUD SYSTEM GEL-CHEMICAL

ENGINEERS J.BRAY, S.ASBJØRNSEN, R.LARSEN, T.HELLSTRAND
M.ÅRSETH, A.VIGEN, A.TORSVOLL

Day No.	DATE 1978 OCT.	ESTIMATED DAILY MUD VOLUMES: LOSSES SUB SURFACE	LOSSES SURFACE	VOLUME MUD BUILT	BULK MATERIALS: BARITE M/T	BARITE SXS	SACK MATERIALS: WYOMING BENTONITE	CAUSTIC SODA	THINNERS: SPERSENE	CHROME LIGNOSULF.	TANNATHIN	XP-20	POLYMERS: DRISPAC REGULAR	DRISPAC SUPERLO				OTHERS: SODA ASH	SAPP	CMC LO VIS	DRILLING DETERGENT	MICA FINE	CHROME LIGNITE	WALNUT	CALCIUM CHLORIDE	LIME	
43	21.		50	91	35		30	17	25	20																
44	22.		20	52	15		15	10		44																
45	23.		50	70	32		44	12		39																
46	24.		20	47	61		7	5		23												19				
47	25.		85																							
48	26			14																						
49	27.		85	200	20		35	1		12												3				
50	28.			26	4																					
51	29.		40	68	10		30	8		17				3								10				
52	30.		15		1		20	4		27																
53	31.		141	120	31		31	5		33												4				
54	1.	11			4					17																
55	2.				6																	14				
56	3.				9			5		16												10				
FORWARD		4164	3226	9445	818	96	1683	291	170	732	10	7	15	22				17	9	22	1	10	40	12	11	1
ESTIMATED TOTALS		4164	3737	10133	1046	96	1895	358	195	980	10	7	15	25				17	9	22	1	10	100	12	11	1

REMARKS

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

Drilling Fluid & Material Consumption Report

MUD SYSTEM GEL-CHEMICAL

WELL NAME 34/10-2 AREA NORTH SEA
OPERATOR STATOIL RIG. ROSS RIG
ENGINEERS J.BRAY, S.ASBJØRNSEN, R.LARSEN, T.HELLSTRAND
M.ÅRSETH, A.VIGEN, A.TORSVOLL

Day No.	DATE 1978 NOV.	Estimated Daily Mud Volumes: Losses Sub Surface	Losses Surface	Volume Mud Built	Bulk Materials: Barite M/T	Barite SXS	Wyoming Bentonite	Sack Materials: Caustic Soda	Materials Added to Control Properties – Thinners: Spersene	Chrome Lignosulf.	Tannathin	XP-20	Polymers: Drispac Regular	Drispac Superlo				Others: Soda Ash	SAPP	CMC Lo Vis	Drilling Detergent	Mica Fine	Chrome Lignite	Walnut	Calcium Chloride	Lime
57	4.									4													5			
58	5.		74		19		32	8															10			
59	6.			200	19		32	6															16			
60	7.				20					30													17			
61	8.		150	100	10		29	5		4													8			
62	9.			67	18			8		9													27			
63	10.		108	75	21		24	6		14													24			
64	11.		80	75	25		27	5		7													9			
65	12.			110	25		24	7		9													11			
66	13.																									
67	14.																									
68	15.		165	150	12		50	8		11													12			
69	16.		150	276	58		12	11		13				6									22			
70	17.		20		10			4		20					12								12			
FORWARD		4164	3737	10133	1046	96	1895	358	195	980	10	7	15	25				17	9	22	1	10	100	12	11	1
ESTIMATED TOTALS		4164	4484	11186	1283	96	2125	426	195	1101	10	7	15	31	12			17	9	22	1	10	273	12	11	1

REMARKS

ANCHOR DRILLING FLUIDS AS

OSLO — STAVANGER

Drilling Fluid & Material Consumption Report

WELL NAME 34/10-2 AREA NORTH SEA

OPERATOR STATOIL RIG ROSS RIG

MUD SYSTEM GEL-CHEMICAL

ENGINEERS J.BRAY, S.ASBJØRNSEN, R.LARSEN, T.HELLSTRAND M.ÅRSETH, A.VIGEN, A.TORSVOLL

Day No.	DATE 1978 NOV.	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 M/T	BARITE SXS	WYOMING BENTONITE	CAUSTIC SODA	SPERSENE	CHROME LIGNOSULF.	TANNATHIN	XP-20	DRISPAC REGULAR	DRISPAC SUPERLO	SOLTEX			SODA ASH	SAPP	CMC LO VIS	DRILLING DETERGENT	MICA FINE	CHROME LIGNITE	WALNUT	CALCIUM CHLORIDE	LIME				
71	18.																													
72	19.		124		20			3		6													4							
73	20.																													
74	21.		358		4			8		7										3			10							
75	22.		13	370	62		70	10		16				2						6			37							
76	23.			50	10			8		34				3									26							
77	24.				8					4													4							
78	25.				16			10		12				3									20							
79	26.		52		6			6		6													16							
80	27.		33																											
81	28.		5				10	7		20					12								24							
82	29.			117	14		2	8							8								7							
83	30.																													
84	1. 12							8																						
FORWARD		4164	4484	11186	1283	96	2125	426	195	1101	10	7	15	31	12			17	9	22	1	10	273	12	11	1				
ESTIMATED TOTALS		4164	5069	11723	1423	96	2207	494	195	1206	10	7	15	39	32			17	9	31	1	10	421	12	11	1				

REMARKS

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

Drilling Mud Properties Record

MUD SYSTEM GEL-LIGNOSULFONATE

WELL NAME 34/10-2 AREA NORTH SEA

OPERATOR STATOIL RIG ROSS RIG

ENGINEERS J.BRAY, S.ASBJØRNSEN, R.LARSEN, T.HELLSTRAND, M.ÅRSETH, A.VIGEN, A.TORSVOLL

Day No.	DATE 1978 SEP.	DEPTH FEET □ METERS ☒ M	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	Ca ++ ppm	Pf	RETORT: % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMARKS
1	9.	0	1.06	85	42.5							10.5												Arr loc. Mix spud
2	10.	210	1.06	82	41							10.5												Drill. 36" hole
3	11.	445	1.10	50	25	14	22	8/48	NC			9.5	4000	100	0.01	6	1/4	22			.48	1.75		" 17½" hole
4	12.	517	1.13	47	23.5	7	35	12/65	NC			9.0	3500	100	0.01	7	TR	25½			.22	10.9		Underream. 17½ to 26"
5	13.	517	1.26	53	26.5	12	36	12/68	NC			9.0	3300	150	0.01	9.5	TR	26			.31	7		Used 1.26 SG mud belc runn. casing
6	14.	517	1.20	43	26	19	14	10/35	NC			9.0	3200	150	0.13	9.5					.65	.60		Mix. jud for next sec
7	15.	520	1.21	44	26	20	12	5/35	12	2		10.2	3600	180	1.3	13	TR				.70	.42		Drill. out casing shoe P.O.O.H.
8	16.	867	1.22	43	22.5	11	23	26/42	13.8	2		10.5	7200	120	.62	14	1/4	12½			.46	1.8		Drill. 130"/hr.
9	17.	867	1.22	43	21.5	12	19	20/36	13.6	2		10.4	7200	120	.82	14	1/4	12½						W.O.W.
10	18.	867	1.22	42	20	11	18	4/28	13.4	2		10.4	7200	110	.9	13	TR	15						Nippled up mud riser
11	19.	1400	1.22	45	22.5	13	19	6/32	12.4	2		10.4	8700	160	.65	9	TR	20			.62	.84		Drill. 30-70 m/hr.
12	20.	1617	1.22	43	23	17	12	5/35	10.	2		10.5	9600	150	.42	8.5	.3	15			.62	.61		Drill. clay + sand stringers
13	21.	1810	1.27	48	28	21	14	8/32	6.7	2		10.8	11000	150	.61	12	TR	17½			.61	.81		Wt. up to 1.27 per orders.
14	22.	1827	1.27	51	28	20	14	9/36	6.8	2		10.6	11200	150	.6	12	TR	17½			.599	.98		

REMARKS

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

Drilling Mud Properties Record

MUD SYSTEM GEL-CHEMICAL

WELL NAME 34/10-2 AREA NORTH SEA

OPERATOR STATOIL RIG ROSS RIG

ENGINEERS J.BRAY, S.ASBJØRNSEN, R.LARSEN, T.HELLSTRAND M.ÅRSETH, A.VIGEN, A.TORSVOLL

Day No.	DATE 1978	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	Ca ++ ppm	Pf	RETORT: % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMARK
15	23.	1020	1.23	49	29.5	20	19	6/36	6	2		10.1	8000	100	.3	0	11	1/4	18			.59	.98	Reaming W/17½" bit.
16	24.	1225	1.22	49	30	19	19	6/37	6.2	2		10.0	7800	100	.3	0	12	1/4	18			.38	1.0	Let wt. fall back per orders.
17	25.	1568	1.22	48	27	20	18	6/32	8.1	2		9.8	7000	100	.2	0	12	1/4	18			.56	1.5	Raising wt. to 1.25 per orders.
18	26.	1830	1.25	51	34	24	20	5/31	8	2		9.7	6000	150	.15	0	11	1/4	20			.55	1.45	Circulate to run 13-3/8" Casing.
19	27.	1830	1.25	50	30	21	19	6/27	7.8	2		9.8	5100	135	.15	0	11	TR	18.5			.58	.92	Ran casing lost 73 bbls. displacing ce
20	28.	1802	1.25	47	30	21	18	5/21	8.7	2		10.3	7000	375	.15	0	11.5	TR	19			.62	.84	Lost 245 bbls. over shakers.
21	29.	1891	1.50	49	41.5	34	15	3/32	11.2	3		10.8	7200	425	.3	0	20	1/4	21			.76	.45	Wt. up mud to 1.50 per orders.
22	30.	2128	1.50	47	37	34	14	2/14	7.5	3		10.8	6000	240	.35	0	20	1/4	20			.78	.56	Drl. mud making cla of shale.
23	1.	2278	1.50	55	46	38	16	3/17	6.0	2		10.8	5800	210	.40	0	16	1/8	22			.70	.75	Trip for bit. Built 500 bbl. of mud for
24	2.	2342	1.52	50	45	37	12	3/14	6.1	2	17.2	10.0	5500	150	.30	0	17	1/4	20			.78	.43	reserve per orders. Trip for bit. Raise
25	3.	2439	1.52	49	38	32	17	3/11	4.8	2	15	10.5	5200	110	.40	0	17	1/8	20			.78	.37	wt. to 1.52 per ord Mix.500 bbl. lost 2
26	4.	2494	1.52	49	42	35	16	3/25	5.4	2	16	10.0	5300	100	.20	0	20	1/4	22			.70	.45	bbl. in heaves. Load.barite 10t us
27	5.	2602	1.52	52	42	34	18	5/32	5.0	1	14.8	10.2	5350	110	.30	0	18	1/8	20			.72	.60	10t overblown board 15 t barite lost in
28	6.	2623	1.52	53	35	30	17	3/28	4.8	2	17	10.0	5200	110	.3/10	0	18	1/8	20			.72	.51	shipment. Drill,trip for bit, drag. RIH,drill ahe

REMARKS

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

Drilling Mud Properties Record

WELL NAME 34/10-2 AREA NORTH SEA

OPERATOR STATOIL RIG ROSS RIG

MUD SYSTEM GEL-CHEMICAL

ENGINEERS J.BRAY, S.ASBJØRNSEN, R.LARSEN, T.HELLSTRA M.ÅRSETH, A.VIGEN, A.TORSVOLL

Day No.	DATE 1978 OCI.	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	FLUIDLOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis: Cl ppm	Ca ++ ppm	PI	RETORT: % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMARKS
29	7.	2671	152	49	33	26	15	6 / 35	4.8	2	17	10.6	6200	100	.48 / 150		19	1/8	20			.70	.52	Dr. 2-2.8m/hr. POOH for new bit. No drag
30	8.	2723	156	49	36	28	16	5 / 39	4.7	2	16	10.8	6800	100	.48 / 171		19	TR	22.5			.71	.32	shale + limest. Increas.mudwt. to
31	9.	2723	156	48	34.5	27	15	5 / 38	4.9	2	17	10.6	6800	100	.45 / 160		19	TR	22.5			.71	.50	1.56SG POOH for log Log.Dump.&cl.sh.box
32	10.	2723	156	50	32	24	16	3 / 28	4.4	2	17.9	10.8	7600	110	.34 / 152		19	TR	22.5			.68	.57	Run 5logs,no cl.up. RIH circ.btm. up.
33	11.	2721	156	49	32	24	15	3 / 29	4.6	2	20	11.0	7600	110	.45 / 17		19	TR	22.5					Run 95/8"Csg,cmt.lo 90bbl.to form bef.c
34	12.	2724	162	50	36	29	16	5 / 36	5.1	2	19.2	11.0	7600	300	117 / 162		22	1/4	22.5					Test.BOP,made up ne bha.Drl.cmt & shoe.
35	13.	2788	162	52	33.5	29	9	5 / 10	5.0	2	20.2	10.7	8200	100	.68 / 18		22	TR	22.5			.74	.26	Drl.clay+silt.POOH new bit. No drag.
36	14.	2870	162	51	36	29	16	3 / 10	5.0	1	18.4	10.8	9100	60	1.0 / 2.1		22	TR	22.5			.67	.70	Drl.clay+silt.POOH change bit. No drag
37	15.	2959	168	54	35.5	30	11	3 / 7	5.0	1	17.5	10.7	10000	40	1.2 / 27		25	0.4	25			.79	.32	Drl.to 2909, weight up to 1.68SG.
38	16.	3006	170	59	32.5	28	11	3 / 6	4.0	1	12.0	10.6	10000	40	1.0 / 27		25	1/4	24			.81	.24	Drl. 2961mto2976m, weigh. up to 1.70SG
39	17.	3040	170	62	31	26	10	2 / 6	3.9	1	16.5	10.8	9600	40	1.05 / 25		25	1/4	23			.81	.27	Drl.to3031m.POOH, m up BHA w/core bbl.
40	18.	3101	170	61	37	31	12	3 / 6	3.3	1	15.2	10.9	10200	40	1.4 / 29		25.5	1/4	24			.78	.35	Cut core no. 1.
41	19.	3112	170	59	29	25	8	2 / 5	3.1	1	11.6	10.5	9800	40	1.1 / 29		24.5	1/4	21			.81	.29	Cut core no. 2. POOH, new bit.
42	20.	3110	170	59	29	28	8	2 / 5	3.1	1	11	10.5	9800	40	1.1		24.5	1/4	21			.81	.22	W.O.W.

REMARKS

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

Drilling Mud Properties Record

WELL NAME 34/10-2 AREA NORTH SEA

OPERATOR STATOIL RIG ROSS RIG

MUD SYSTEM GEL-CHEMICAL

ENGINEERS J.BRAY, S.ASBJØRNSEN, R.LARSEN, T.HELLSTRAN M.ÅRSETH, A.VIGEN, A.TORSVOLL

Day No.	DATE 1978 OCT/NOV.	DEPTH FEET / METERS	MUD PROPERTIES: DENSITY	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	Ca ++ ppm	Pf	RETORT: % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMARKS
43	21.	3122	1.70	55	32	28	8	1/4	3	1	11	10.8	8800	40	1.8	24	1/8	20			.81	.24	W.O.W.
44	22.	3155	1.70	52	29	22	14	2/4	3	1	10.8	11	8800	40	2.4	23	TR	22			.68	.54	Maintain pH above 11 per orders.
45	23.	3221	1.70	50	28	25	6	1/3	2.8	1	11.1	11.5	8900	40	3.5	24	TR	20			.84	.152	Centrifuge down.
46	24.	3231	1.70	53	28	24	9	1/4	2.7	1	11.2	11.5	9000	40	3.5	24	TR	22			.78	.20	Circ. to log WOW.
47	25.	3234	1.70	53	28	25	10	1/4	2.7	1	11.1	11.2	9200	40	2.5	24	TR	22			.75	.20	No flow WOW.
48	26.	3234	1.70	53	29	27	5	1/4	2.5	1	12	11.2	9200	40	2.6	23	TR	22			.1	.09	Logging.
49	27.	3234	1.70	54	30	26	8	1/4	3	1	12	11.2	11500	40	2.8	23	TR	22			.85	.18	Mix 200 bbls. pre-hydr. gel.
50	28.	3282	1.70	52	30	25	10	1/4	4	1	12	11	7800	20	2.5	24	TR	24			.78	.27	Lost 2 cones on bit
51	29.	3283	1.70	53	29	26	10	1/4	4.1	2	12	11	8000	20	2	24	TR	24			.80	.23	Fishing - built 100bbls. pre-hydr.
52	30.	3338	1.70	52	29	25	8	1/4	4.3	2	11.8	11	7800	20	2	24	TR	22			.80	.23	
53	31.	3341	1.70	52	28	24	8	1/4	3.8	1	12.1	11	7600	20	2.1	24	TR	22			.81	.21	CORING
54	1.	3363	1.70	51	29	24	7	1/4	4	2	11.8	11	6800	20	2	24	TR	22			.79	.23	CORING WOW
55	2.	3367	1.70	68	39	34	10	3/6	5.8	1	12.5	11	6700	40	1.4	25	TR	22			.84	.22	CORING
56	3.	3390	1.70	58	29	26	8	2/4	4.8	1	12.5	11	7000	40	1.4	25	TR	25			.84	.22	CORING

REMARKS

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

Drilling Mud Properties Record

WELL NAME 34/10-2 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL-CHEMICAL

ENGINEERS J.BRAY, S.ASBJØRNSEN, R.LARSEN, T.HELLSTRAND, M.ÅRSETH, A.VIGEN, A.TORSVOLL

Day No.	DATE 1978 NOV.	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	Ca ++ ppm	Pf	RETORT % OIL	RETORT % SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMARK
57	4.	3390	1.70	47	26	24	8	2/4	4.6	1	11.5	11.0	6900	40	1.4		24	TR	25.0			.80	.25	
58	5.	3410	1.70	49	30	26	8	2/4	4.8	1	11.0	11.0	7000	40	1.4		23	TR	26.0			.80	.23	
59	6.	3461	1.70	51	32	27	10	3/5	4.2	1	12.0	11.2	6900	40	1.4		24	TR	26.0			.79	.27	DRILLING
60	7.	3527	1.70	56	36	31	11	3/5	4.4	1	11.8	11.0	6200	40	1.4		22	1/4	27.5			.80	.29	DRILLING
61	8.	3548	1.70	54	34	29	9	3/6	4.6	1	13.5	11.0	5900	40	1.3		22	1/4	27.5			.82	.23	DRILLING
62	9.	3597	1.70	55	33	29	9	2/7	4.4	1	9.8	11.2	5800	40	1.4		23	TR	25.0			.81	1.19	DRILLING
63	10.	3663	1.70	54	34	30	8	2/6	3.8	1	10.2	11.1	5700	60	1.3		23	TR	25.0			.82	1.05	DRILLING
64	11.	3688	1.70	58	33	29	8	2/5	4.0	1	10.6	11.3	5600	60	1.1		23	TR	25.0			.82	1.1	DRILLING
65	12.	3707	1.70	49	27	23	8	2/4	4.2	1	11.4	10.8	6100	80	1.0		22	TR	22.5			.80	1.07	DRILLING
66	13.	3707	1.70	49	27	23	8	2/4	4.2	1	11.4	10.8	6100	80	1.0		22	TR	22.5			.80	1.07	W.O.W.
67	14.	3707	1.70	56	27	24	8	2/6	4.2	1	11.4	10.8	6000	80	1.0		23	TR	22.5					W.O.W.
68	15.	3707	1.70	54	30	26	8	2/9	4.8	1	12.0	11.0	6100	80	1.1		24	TR	22.5					REAMING
69	16.	3707	1.70	54	30	26	8	2/9	4.8	1	12.0	11.0	6100	80	2.1		24	TR	22.5			.81	.28	Built 500 bbls. New mud.
70	17	3730	1.70	58	33	29	9	2/8	3.0	1	10.5	11.2	5800	60	2.3		23	TR	24.0			.80	.22	Circulate to log.

REMARKS

ANCHOR DRILLING FLUIDS AS
OSLO — STAVANGER

Drilling Mud Properties Record

WELL NAME 34/10-2 AREA NORTH SEA

OPERATOR STATOIL RIG. ROSS RIG

MUD SYSTEM GEL-CHEMICAL

ENGINEERS J.BRAY, S.ASBJØRNSEN, R.LARSEN, T.HELLSTRA M.ÅRSETH, A.VIGEN, A.TORSVOLL

Day No.	DATE 1978 NOV.	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 min	FLUID LOSS 30 Min cc's	CAKE 32 nds	H.T.H.P. cc's	pH	Filtrate Analysis Cl⁻ ppm	Ca ++ ppm	Pf	RETORT % OIL	% SOLIDS	% SAND	BENTONITE #/BBL	POTASH #/BBL	POLYMER #/BBL	"N"	"K"	OPERATION REMAR
71	18.	3730	1.70	58	30	25	8	2/8	4.0	1	10.2	11.0	5750	40	2.0	24	TR	24.0			.80	.22	LOGGING
72	19.	3730	1.70	57	31	26	9	2/8	4.1	1	10.7	11.0	6000	60	2.3	24	TR	24.0			.78	.27	WIPER TRIP
73	20.	3730	1.70	57	31	26	9	2/8	4.1	1	10.7	11.0	6000	60	2.3	24	TR	24.0			.78	.27	Schlum. stuck.
74	21.	3730	1.70	57	31	28	9	2/9	4.0	1	10.4	11.2	6400	80	1.9	24	TR	24.0			.81	.22	Lost 358 bbls. W.O.W. in heaves.
75	22.	3730	1.70	53	29	25	7	2/7	3.8	1	10.0	11.1	6800	80	2.3	24	TR	22.5			.85	.21	
76	23.	3730	1.70	63	32	28	10	2/12	4.5	2	10.5	11.3	6800	80	2.0	25	TR	22.5			.78	.35	
77	24.	3730	1.70	52	29.9	24	8	2/8	3.8	1	10.3	11.0	6300	60	1.9	24	TR	22.5			.84	.21	Logging
78	25.	3730	1.70	51	29	24	7	2/8	3.5	1	10.1	11.2	6300	60	2.3	24	TR	24.0			.80	.22	Logging
79	26.	3730	1.70	58	30	26	9	2/9	4.0	1	10.3	11.2	6000	60	2.3	25	TR	24.0			.81	.23	Logging
80	27.	3730	1.70	58	30	26	9	2/9	4.0	1	10.3	11.2	6000	60	2.3	25	TR	24.0			.81	.23	Logging
81	28.	3730	1.70	55	30	26	10	3/12	3.9	1	10.0	11.1	5800	40	2.1	24	TR	22.5			.75	.38	Circ. after fishing
82	29.	3730	1.70	58	31	27	12	3/15	4.0	2	10.5	11.0	5700	60	2.1	25	TR	22.5			.80	.21	Run 7" liner.
83	30.	3730	1.70	68	29	25	8	3/13	3.6	2	10.5	11.0	5700	40	1.4	25	TR	22.5					Test csg no success
84	1.12	3730	1.70	66	29.5	25	9	3/14	3.8	2	10.5	11.5	5700	40	1.8	25	TR	22.5					Eng. released from

REMARKS

RFT RESULTS AND ANALYSIS

Fig. no. 1 shows reservoir pressure (RFT) plotted vs depth in the Brent formation. The gradient is 0.28 g/cm^3 (0.12 psi/ft). This indicates a gas condensatd system.

The reservoir pressure (RFT) vs depth in the Statfjord formation is shown in fig. 2. The gradients are 0.75 g/cm^3 (0.325 psi/ft) in the oil zone and 1.07 g/cm^3 in the water zone. The oil/water contact is picked at 3367 $\pm$ 2 m MSL.

Test no 7 in run no. 5 gave a pressure point (6919.5 psi at 3313 m MSL) which is above assumed gradient. A pretest at same depth indicated the same pressure. There is probably no barrier between 3312 and 3322 m MSL so the deviation is hard to explain. The gradient through this pressure point and the OWC corresponds to a sp. gravity of 0.44 (o.19 psi/ft). These values is not in harmony with the PVT-study performed on bottom hole samples from DST no. 3A which shows densities in the range of 0.8 g/cm^3. Based in this the gradient can not be correct.

During the first run the cable got stuck, but the RFT-pressure at 3646 m MSL is 700-800 psi above extrapolated gradient from run no. 5. This indicates that there is no pressure communication between the Statfjord formation and the layers below.

Repeat Formation Tests

Six separate run were made to obtain pressure data and formation fluid samples.
Deatils of the RFT run are summarized below:

Test no.	depth (m MSL)	P-hyd(psi) before/after	set time min sec	P-final (psi)	Remarks
RUN NO 1					
1	2925	7133/7135	0250	6391	
2	2939.5	7170/7169	0155	6398	
3	2961.5	7222/7218	0210		*tight fm.
4	2961.5	7219/7218			*seal failure
5	2962	7220/7220	0155	6408	
6	2983	7270/7270	0450	6413	*long build up
7	2999	7309/7309	0135	6422	
8	3021	7362/7303	0130	6430	
9	3040	7409/7409	0150	6439.5	
10	3054	7443/7433	0145	6445	
11	3074	7490/7490	0155	6453.5	
12	3089	7526/7525	0140	6461	
13	3080	7504/	0110	6455	
RUN NO 2					
1	2934	7193/7192	1040	6399	*long build up
2	2947	7226/7225	0630	6413	*long build up
3	2972	7285/7285			*tight
4	2977	7297/7297	1430	6429	*long build up
5	2994	7336/7337	0320	6417	
6	3013.5	7385/7385	0300	6425.5	
7	3026	7415/7415	0310	6430	
8	3035	7437/7437	0315	6433.5	
9	3048.5	7469/7468			*seal failure
10	3048.6	7470/7469	0305	6439	
11	3062.5	7503/7502	0315	6445.5	
12	3069.5	7519/7518			*seal failure
13	3069.6	7520/	0300	6447	

Test no.	depth m MSL	P-hyd(psi) before/after	set time	P-final (psi)	Remarks
RUN NO 3					
1	3082.5	7554/7555	0210	6454.5	
2	3097	7586/7586	0110		*tight
3	3094	7580/7580	0100		*tight
4	2999	7351/7351	0110	6419	
RUN NO 4					
1	2939.5	7204/	0230	6396.5	
RUN NO 5					
1	3311	8115/	0740	6926	*long build up
2	3312				*seal failure
3	3309	8111/8111	0630	6922	*long build up
4	3322	8138/8140	0245	6906.5	
5	3335	8172/8171	0220	6922.5	
6	3352	8213/8214	0330	6953	*long build up
7	3313	8120/	0200	6919.5	*above assumed *gradient
8	3344	8192/8192	0520	6930.5	) 6932 4/3360
9	3365	8243/8342	0240	6953	
10	3368	8250/8249	0215	6956.5	
11	3377	8272/8271	0215	6970	
12	3394	8314/8314	0210	6996	
13	3422	8383/8383	0240	7039	
14	3439	8423/8424	0135		*tight
RUN NO 6					
1	3457	8465/8466	0210	7088.5	
2	3482	8525/8523	0250	7172.5	
3	3492	8548/8546	0805	7202	*long build up
4	3528	8633/8633	0145		*tight
5	3551				*seal failure
6	3567	8726/8727	0730	7353	*long build up

*not included in analysis

RFT SAMPLING

Run no.	Sampling depth (m MSL)	Vol. of chamber (gal)	Opening pressure (psig)	Vol.of gas (SCF)	Vol.of liquid (CC)	Type of liquid
1a	3080(Br.fm.)	1	800	-	-	mudfiltrate
	"	2 3/4		-	-	
3	2999(Br.fm.)	1	3000	345	200	condensate
		2 3/4		-	-	
4	2939.5(B.fm)	1	2800	146	2250	mud/fr. of cond.
	"	6	1600			
6	3567(St.fm)	1		-	-	mudfiltrate
	"	2 3/4		-	-	"

1 gal chambers in runs 1a, 3 and 4 are transfered on rig. All the other chmbers are transfered onshore.

PVT analysis was performed on the 6 gal chamber, the reults of which are presented in a report dated 20.8.79. Problem with sealing this chamber properly.

No samples taken in run no. 2a.

Because of probe plugging no samples from run no. 5. Pretest at 3313 and 3322 m MSL.

Low pressure indicated probe plugging during sampling in run no. 6.

Drill stem tests

Production tests were carried out on five reservoir intervals in order to evaluate the reservoir and liquid properties. Three tests were run in the Statfjord formation and two in the Brent formation. The results are listed in table 1 to 5 and all details in Appendix 1 to 5.

DST No. 1

Objective

To investigate the waterbearing interval from 3380 to 3420 m in the Statfjord formation and get sample of the reservoir fluid. Perforated interval 3385 to 3395.

Teststring

The teststring run was a standard Halliburton test string with an APR-N tester situated at 3353 m. The RTTS packer was set at 3357 m. One Amerada temperature gauge, three Sperry-Sun pressure gauges and one Lynes pressure and temperature gauge were run. A full string of water cushion was run

Test operation

During wireline operations the tool got stuck and the string had to be pulled to Otis sub sea test tree. Sperry Sun gauge found to be jammed in the tree and the Lynes DMR 10 K battery housing was damaged. Afterwards the test was mechanically successful. The test consisted of an initial flow for 5 mins. followed by a 58 mins initial shut-in, then 237 mins flow period and a 299 mins final shut-in.

Fluid production and sampling

During the final flow , the well was produced through a 48/64 inch fixed choke at a metered rate declining from about 4400 bbl/D initially, to approximately 3600 bbl/D at the end of the flow period. Cloride content was measured to about 27000 ppm and Total Hardness to 1640. Small traces of solids and gas were observed during the test. During the final flow 60 l of formationwater were caught.

Interpretation of DST No.1

The Horner plot shows a slope of 615 psi/log cycle, and a kH value of approximately 304 md ft. If the contributing H is taken as perforated interval it results in a permeability of about 9.3 md. In the calculations the contributing H is taken as the interval from 3385 m to 3403 m (59 ft)
The maximum bottom hole temperature was measured to 267°F during the final flow period.
The analysis indicated a P* of 6932 psi and a negative skinfactor of about - 3.7.
A productivity index of 2.9 bbl/d/psi was calculated.
A summary of the results are listed in Table 1, and all details in Appendix 1.

Gauge performance

Only the Sperry Sun pressure and temperature gauge functioned correctly. For well head pressure readings, the Lynes surface pressure recording system was used. Temperature and separator measurement was done by Otis.

DST No. 2

Objective

Test no. 2 was performed to obtain reliable information of the Statfjord formation at a depth of 3350 to 3370 m RKB.
Perforated interval: 3355 - 3365 m RKB

Teststring

A standard Halliburton test string was run, and the APR-N tester was situated at a depth of 3310 m RKB. The packer was set at 3315 m RKB.
Four Sperry-Sun and one Amerada gauge were run during the test.

Test operation.

After the initial flow period of 20 min, the well was shut in for 126 mins.
The well was opened for clean up and final flow. Stable flow was reached after about 375 mins. Then flow was directed to the separator.
After about 30 mins the anulus pressure started to drop.
The APR-N valve was closed, and the string was pulled.
The pressure drop was caused by a leakage in a slip joint with the effect of mud leakage from the anulus into the teststring.

Fluid production and sampling.

Due to the early shut in, no separator metering was obtained. An oil and gas rate have been calculated on the basis of tank measurement and "choke correlations".
During the flow liquid samples were caught at the "Goos neck" and about 60 l of seaparator liquid was caught after the test.
Small traces of Co_2 was observed but no H_2S was indicated.
Due to the interruption of the test, no PVT samples were obtained.

Conclusion of DST No. 2.

Due to the missing information, no satisfactory test analysis can be done. On the basis of the initial build up and a total rate of 800 bbl/d a kh value of about 26 md ft was estimated.
All details for the test in Appendix 2.

DST No. 3 & 3A

Objective

To investigate the hydrocarbon-bearing interval from 3330 to 3350 m in the upper Statfjord formation and get sample of the reservoir fluid. Perforated interval 3335 to 3345 m RKB.

Teststring

The teststring run was a standard Halliburton test string with an APR-N tester situated at 3297 m. The RTTS packer was set at 3301 m. A sand screen was set at 3318 m.
Due to plugging and damaging the sand-screen a new teststring was run without the sand-screen. The APR-N tester and the RTTS-packer were set at the same depths as in the originally test. One Sperry-Sun temperature gauge, three Sperry -Sunn pressure gauges, one Amerada pressure gauge and one Lynes pressure and temperature gauge were run.

Test operation and gauge performance.

As mentioned the sand screen was plugged and damaged and it was decided to run another test without the screen. This was far more successful. Only one Sperry-Sun pressure gauge and the Amerada pressure gauge were functioning correctly during the test. The test consisted of an initial flow of 2 minutes followed by a 32 minutes initial shut-in, then 521 minutes second flow period and a 672 minutes second build-up, 317 minutes third period for clean-up prior to sampling, 209 minutes flow with bottomhole sampling, 94 minutes final flow period and finally 24.5 hours of final build-up. Before this last build-up the wireline tool could not be run through the APR-N tester, which would not open completely.

Fluid production and sampling.

During second flow period, the well producing through a 48/64" fixed choke at an average of 800 STB/D.
Bottomhole samples of gas and oil were taken during the third flow period.
Oil and gas samples were also taken at the separator outlets during the second flow period.

Interpretation of DST No. 3 & 3A.

The Horner plot shows a slope of 794 psi/log cycle and a kh value of approximately 79 md ft. If the contributing h is taken as perforated interval it results in a permeability of about 2.4 md. In the calculations the contributing h is taken as the net pay thickness in the interval from 3330 t0 3350 m, which is 17 m (56 ft). The maximum bottomhole temperature was measured to 257^{o}F. The analysis indicated a p* of 6924 psi and a positive skinfactor of about 2.6.
The productivity index was calculated to 0.12 STB/D/psi. A summary of the results are listed in Table 3, and all details in Appendix 3.

DST No. 4

Objective

To investigate the hydrocarbon-bearing Brent formation Perforated interval 3110 - 3115 m RKB.

Teststring

The teststring run was a standard Halliburton teststring with the APR-N tester situated at 3071 m. The RTTS packer was set at 3075 m. One Amerada temperature gauge, one Amerada pressure gauge and four Sperry-Sun pressure gauges were run during the test.

Test operation

The test consisted of 6 mins initial flow, 37 mins initial shut-in, 681 mins second flow and 100 mins of final shut-in. During the final shut-in there was a leakage in the APR-N value and no good build-up was measured.

Fluid production and sampling

During second flow period, the well produced an average of 75 STB/D of water at 20/64" choke. The gas rate was at an average of 3.38 MMSCFD.
25 l of water and several samples of oil and gas were taken at the separator outlets during the second flow period.

Interpretation of DST No. 4

Initial build-up

The Horner plot shows a slope of 426 psi/log cycle, and a kh value of approximately 25 md ft. If the contributing h is taken as perforated interval it results in a permeability of about 1.5 md. In the calculations the contributing h is taken as the net pay thickness of the formation equal to 40.5 m (132.9 ft).

The maximum bottomhole temperature was measured to 230^{o}F. The analysis indicated a p* of 6410 psi and a negative skinfactor of about -0.4. The productivity index was calculated to about 2902 SCF/D/psi. A summary of the results are listed in Table 4A, and all details in Appendix 4.

The calculations was based on production data for second flow.

Final build-up

The Horner plot shows a slope of 2065 psi/log cycle, and a a kh value of approximately 5.2 md ft. It must be notified that there was a leakage in the APR-n value causing low p* and p1hr compared with RFT-data.

Using these datas gave a negative skinfactor of about - 1.62. A summary of the results are listed in Table 4B, and all the details in Appendix 4.

DST No. 5

Objective

Test no. 5 was performed to obtain reliable information and fluid samples of the Brent formation sand from 3016 - 3030 m.
Perforated interval: 3017 - 3022 m.

Teststring

A standard Halliburton teststring with an APR-N tester situated at 2980 m. The RTTS packer was set at 2985 m.
Two Sperry-Sun and one Amerada pressure gauge were run in the DST hanger. Two Sperry-Sun and one Lynes pressure and temperature gauges were set in the XN-nipple. A full string of water cushion was run.

Test operation

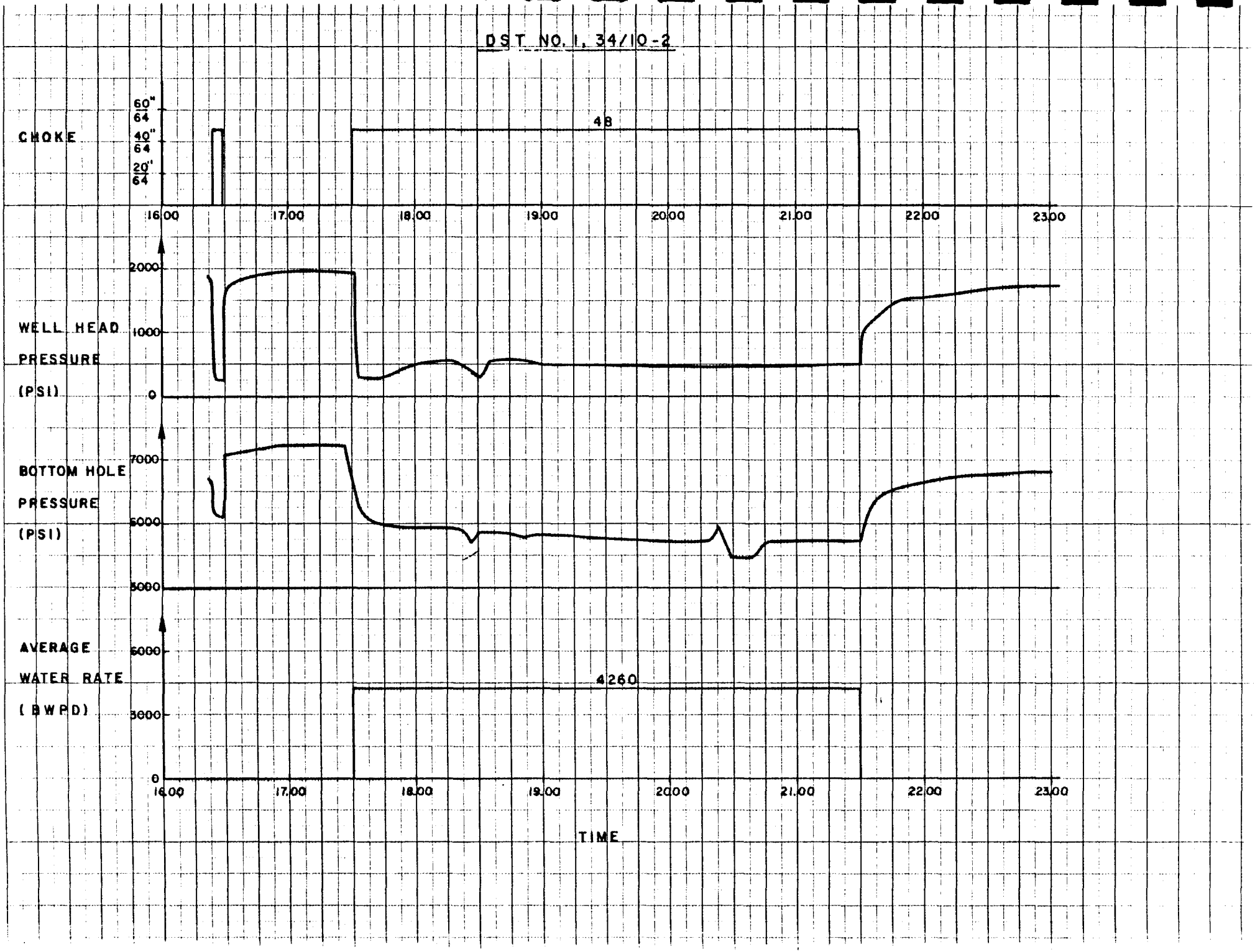
The test was mechanically successful and consisted of an initial flow for 2 min, followed by a 66 mins initial shut-in, then a 595 mins flow period and a 605 mins final shut-in.

Fluid production and sampling

During the final flow period, the well was bypassed on the choke manifold and flowed through 2 x 24/64" chokes in parallell on the heather
The gas rate was stable at about 25.9 MMSCF/D and the condensate rate was in the range of 1100 to 1500 bbl/d.
Small traces of Co_2 was observed, but no traces of H_2s.
During the flow three complete PVT samples were caught.

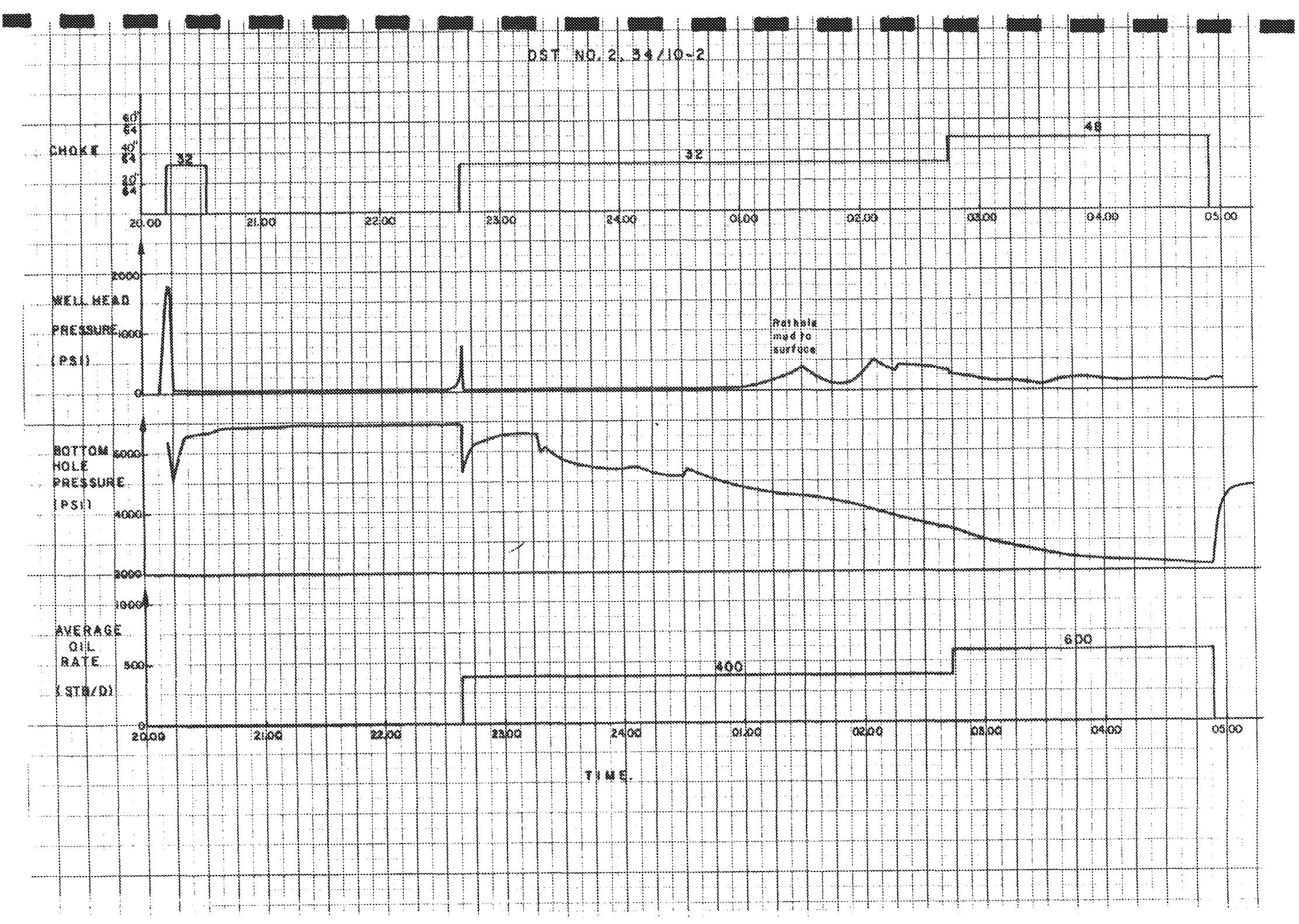
Interpretation of DST No. 5

The Horner line indicated a slope of about 8 psi/log cycle, and a kh value of about 9200 md ft was obtained. If the contributing h is taken as perforated interval it involves in a permeability of 1560 md.
For the analysis the h value is taken as the net pay thickness of about 49.2 ft which reults in a permeability of about 487 md.
Maximum bottom hole temperature was measured to $239^{o}F$.
The analysis indicated a p* of 6417 psi and a skin factor of about 13. The productivity index was calculated to 0.2 MMSCF/psi/D.
A short summary are listed in Table 5, and all details in Appendix 5.


DST NO. 1, 34/10-2
CHOKE
60"/64
40"/64
20"/64
48
16.00
17.00
18.00
19.00
20.00
21.00
22.00
23.00
WELL HEAD PRESSURE (PSI)
2000
1000
0
BOTTOM HOLE PRESSURE (PSI)
7000
5000
3000
AVERAGE WATER RATE (BWPD)
6000
4260
3000
0
TIME

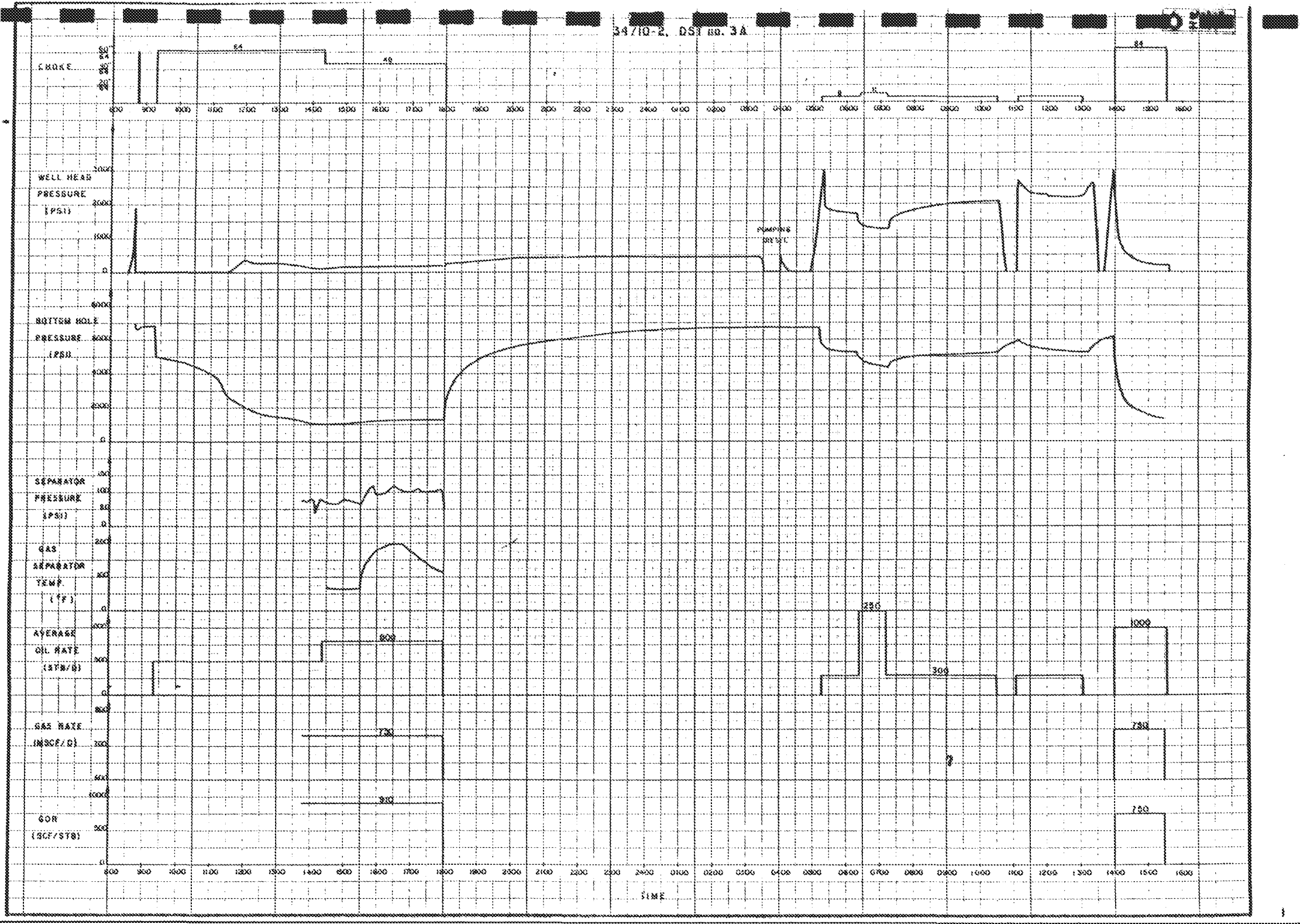
FLOW DATA

Date/Time	Bottom hole		Well head		Chokes		Separator data							Liq. and gas analysis at goos neck					
	Press. Psi	Temp. F	Press. Psi	Temp. F	Manifold	Heater 64. inc.	Press. Psi	Temp. F	Gas rat. mmscf/d	Water stb/d	GOR scf/stb	Oil API	Gas S.G.	Water %	PH	Sedim. %	Cl ppm	Rw/o_F	Hard-ness
14.7.1978																			
1730	6467	263	336	62	48/64														
1750	5667	267	351	94	"														
1800	5691	"	496	106	"											1.0	26500	.161/100	1640
1815	5687	"	566	119	"											0.25			
1830	5612	"	343	130	"		360									0.2	27000	.157/101	1680
1845	5593	"	475	132	"		455			4291						0.15			
1900	5549	"	475	137	"		380			4446						0.05	26500	.155/107	1640
1915	5525	"	460	140	"		375			4499						Trac.			
1930	5500	"	448	143	"		360			4512						"	27000	.157/107	1640
1945	5484	"	446	146	"		360			4278						"			
2000	5472	"	445	151	"		360			4421						"		.155/125	
2015	5468	"	447	154	"		360			4161						"			
2030	5460	"	447	155	"		365			4150						"	27000	.155/125	1640
2045	5475	"	447	157	"		395			3900						"			
2100	5476	"	504	160	"		400			3819						"			
2115	5482	"	513	161	"		425			3781						"			
2130	5483	"	516	162	"		430			3651						"	27000	.155/125	1680


DST NO. 2, 34/10-2
CHOKE
32
32
48
20.00
21.00
22.00
23.00
24.00
01.00
02.00
03.00
04.00
05.00
WELL HEAD PRESSURE (PSI)
2000
1000
0
Partials mud to surface
BOTTOM HOLE PRESSURE (PSI)
3000
2000
1000
AVERAGE OIL RATE (STB/D)
500
0
400
600
20.00
21.00
22.00
23.00
24.00
01.00
02.00
03.00
04.00
05.00
TIME

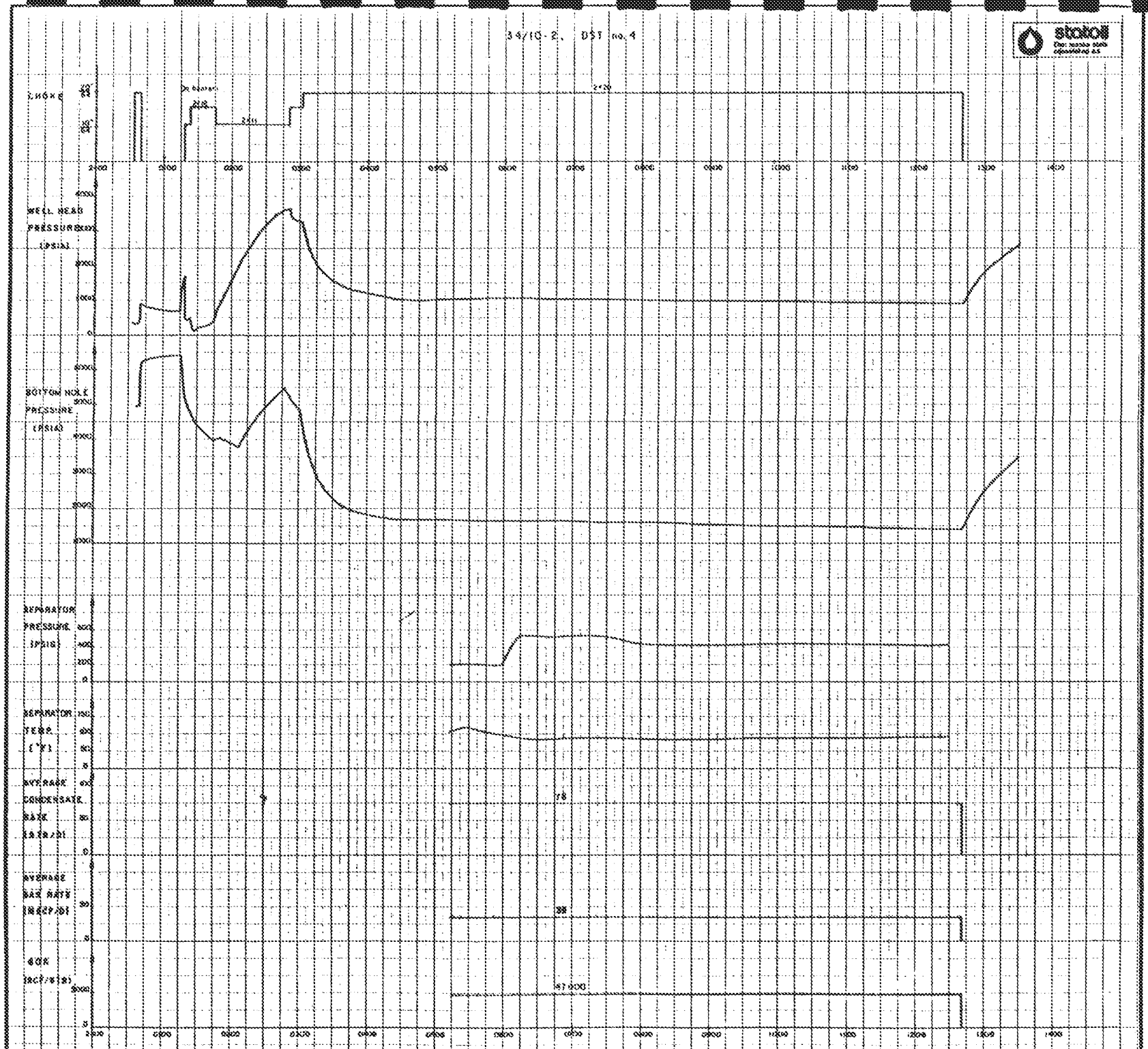
FLOW DATA

Date/Time 22/23-7	Bottom hole		Well head		Chokes		Separator data							Liq. and gas analysis at goos neck					
	Press. Psi	Temp. F	Press. Psi	Temp. F	Manifold	Heater 64. inc.	Press. Psi	Temp. F	Gas rat. mmscf/d	Oil rate stb/d	GOR scf/stb	Oil API	Gas S.G.	Water %	PH	Sedim. %	Oil API	Co2	H_2S
22.40	6876	253	757		-														
23.00	6596	255	29		32														
23.15	6557	255	30		"														
23.30	5704	256	34	56	"														
23.45	5528	257	35	56	"														
24.00	5447	258	37	56	"														
00.15	5380	259	38	56	"														
00.30	5263	259	39	57	"														
00.45	5053	258	43	59	"														
01.00	4912	258	59	62	"														
01.15	4773	261	154	68	"		GAS TO SURFACE												
01.30	4565	262	407	75	"														
01.45	4175	262	131	66	"													2	
02.00	4081	263	255	66	"														
02.15	3950	262	345	66	"									6		6			
02.30	3660	264	408	67	"									1		1		1	Neg.
02.45	3450	264	296	66	48											1			
03.00	3180	264	201	69	"											1			
03.15	2840	264	158	67	"														
03.30	2690	263	87	66	"											1			
03.45	2480	263	192	66	"														
04.00	2394	263	167	67	"											0.5			
04.15	2295	263	158	66	"		ESTIMATED												
04.30	2220	263	161	64	"		FLOW THROUGH SEPARATOR									0.5		2.5	Neg.
04.45	2130	263	155	64	"		105	56	0.67										
04.55	2110	267	173	64	"		105	58	0.68	800	850	32.2	.678			0.5			


34/10-2, DST no. 3A
CHOKE
64
48
64
WELL HEAD PRESSURE (PSI)
PUMPING STOPPED
BOTTOM HOLE PRESSURE (PSI)
SEPARATOR PRESSURE (PSI)
GAS SEPARATOR TEMP. (°F)
AVERAGE OIL RATE (STB/D)
600
250
300
1000
GAS RATE (MSCF/D)
730
930
730
GOR (SCF/STB)
TIME

FLOW DATA

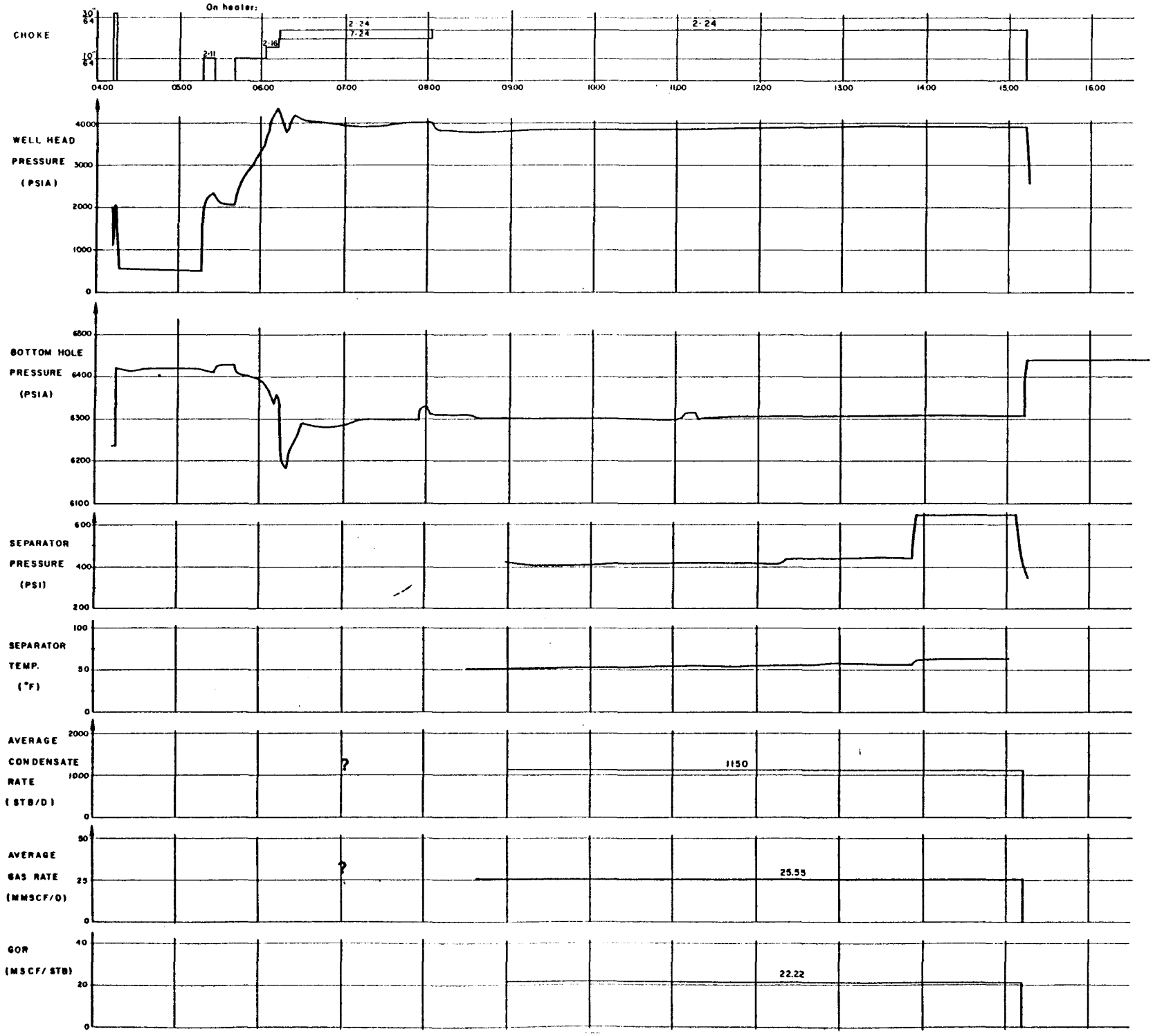
Date/Time	Bottom hole		Well head		Chokes		Separator data							Liq. and gas analysis at goos neck					
	Press. Psi	Temp. F	Press. Psi	Temp. F	Manifold	Heater	Press. Psi	Temp. F	Gas rat. mmscf/d	Oil rate stb/d	GOR scf/stb	Oil API	Gas S.G.	Water %	PH	Sedim. %	Oil API	Co2	H_2S
28. juli																			
0918	6811	240			1														
1345	1240	257	120	77	1	3/4	70	66	.715	-	-								
1400	1127	"	125	77	1	"	75	66	.815	1099	741			2.0		Trace	31.8	Trace	neg
1415	1130	256	70	"	"	"	80	68	.746	805	926			2.0					
1422	1113	"			3/4	"													
1430	1125	"	100	76	3/4	"	80	72	.761	859	886			2.0		Trace			
1445	1159	"	120	75	"	"	70	70	.645	919	702			2.0					
1500	1185	"	160	75	"	"	80	69	.763	813	934			3.0		0.25	31.9		
1515	1155	255	100	"	"	"	70	"	"	954	800			3.0					
1530	1135	"	150	"		"	50	"	.669	839	797			2.5		0.1			
1545	1155	"	170	"		"	90	156	.661	744	888			"					
1600	1226	256	200	"		"	100	180	.680	-	-			2.0		Trace	32.2		
1615	1274	"	180	"		"	90	187	.720	917	785			"					
1630	1291	257	"	74		"	100	200	.822	988	832			"					
1645	1297	"	190	"		"	105	202	.838	753	1113			"					
1700	1287	"	180	75		"	90	176	.769	706	1089	32.0	.696	"			32.0		
1715	1274	"	150	"		"	95	158	.754	659	1144			"					
1730	1257	"	175	"		"	90	138	.710	677	1048			"					
1745	1236	"	195	"		"	95	124	.693	673	1030			"					


34/10-2, DST no. 4
statoil
WELL HEAD PRESSURE (PSIA)
BOTTOM HOLE PRESSURE (PSIA)
SEPARATOR PRESSURE (PSIG)
SEPARATOR TEMP. (°F)
AVERAGE CONDENSATE RATE (STB/D)
AVERAGE GAS RATE (MSCF/D)
GOR (SCF/STB)
2400
78
38
47200

FLOW DATA

Date/Time 2.AUG.-79	Bottom hole		Well head		Chokes		Separator data GAS							Liq. and gas analysis at goos neck					
	Press. Psi	Temp. F	Press. Psi	Temp. F	Manifold	Heater 64. inc.	Press. Psi	Temp. F	Gas rat. mmscf/d	Oil rate stb/d	GOR scf/stb	Oil API	Gas S.G.	Water %	PH	Sedim. %	Oil API	Co2	H_2S
0500	1646	208	1040	68	20/64	20								70		Trace		1.5	neg
0515	1692	207	1070	"	"	"	185	102	3.845			48	0.652						
0530	1701	208	1030	"	"	"	"	115	3.925				"	60					
0545	1669	"	1025	"	"	"	190	105	4.014				"						
0600	1630	207	"	"	"	"	185	92	4.017	72	55792		"	"					
0615	1625	"	1005	"	"	"	530	88	3.641				"						
0630	1629	"	1040	"	"	"	"	80	3.590	80.4	44652		"	50					
0700	1585	206	1050	67	"	"	520	84	3.622	64.32	56312		"	11	7.05				
0715	1594	"	970	68	"	"	540	"	3.608				"						
0730	1593	"	905	67	"	"	525	"	3.438				"	40					
0800	1590	"	1010	"	"	"	430	82	3.489				"	25				1.5	
0815	1577	"	1000	"	"	"	425	83	3.512				"						
0830	1538	"	1020	"	"	"	430	"	3.462			47.6	"	28					
0845	1543	"	970	"	"	"	"	"	3.552				"						
0900	1525	"	"	66	"	"	420	"	3.373	32.16	104882		"	35	7.00				
0915	1496	"	1010	"	"	"	"	"	3.421										
0930	"	"	980	"	"	"	"	"	"	32.16	106374		"	26					
0945	1455	"	965	60	"	"	430	82	3.502				"						
1000	1443	205	975	66	"	"	"	"	3.442	32.16	107027		"	6					
1015	1438	"	970	"	"	"	435	83	3.443				"						
1030	1422	"	960	"	"	"	415	85	3.392				"	55	7.45				
1045	1442	"	950	65	"	"	420	"	3.316				"						
1100	1411	"	930	"	"	"	430	86	3.352	16.08	208458		"	66	6.9				
1115	1412	204	960	"	"	"	420	87	3.209				"						
1130	1407	"	950	"	"	"	"	"	3.284	48.24	68076		"						
1145	1389	"	940	"	"	"	415	"	3.313				"						
1200	1382	"	945	"	"	"	420	88	3.401	96.48	35251		"						
1215	1384	"	930	64	"	"	"	90	3.248				"						
1230	1370	"	"	"	"	"	420		"	48.24	67330	48	"		6.9				

34710-2, DST no. 5



FLOW DATA

Date/Time	Bottom hole		Well head		Chokes		Separator data							Liq. and gas analysis at goos neck					
	Press. Psi	Temp. F	Press. Psi	Temp. F	Manifold	Heater 64. inc.	Press. Psi	Temp. F	Gas rat. mmscf/d	Oil rate stb/d	GOR scf/stb	Oil API	Gas S.G.	Water %	PH	Sedim. %	Oil API	Co2	H_2S
5.August 79																			
08.15	6310	236.6	3855	70.1	Bypass	2x24			25.9				.645						
08.30	6312	237	3800	70.5		"													
08.40	6305	"				"								0.5		0.2		0.1	neg.
08.45	6302	237.6	3828	71.2		"	425	54	25.8										
09.10	6305	238				"	420	56						0.5		0.4			
09.15	6305	"	3834	70.8		"	415	"	25.8	1530	16863	44.3							
09.30	6305	"	3836	70.1		"			25.9	1122	23084								
09.45	6305	"	3844	69.8		"	415	58	25.9	1131	22900								
10.15	6305	239	3862	73		"	420	60	25.9	1028	25195	43.0	.645						
10.45	6302	"	3868	74		"	"	61	25.9	1180	21949			0.5		0.2		0.15	"
11.00	6300	"	3870	71.9		"	"		25.9	1152	22483								
11.15	6312	"	3884	70.5		"	"	62	25.9	1526	16972								
11.30	6305	"	3897	69.4		"	"	62	25.9	1526	16972			0.5		0.1		0.15	"
11.45	"	"	3888	68.7		"	"		25.9	1468	17643								
12.00	"	"	3883	67.6		"	"	64	25.9	1238	20920	42.8	.645						
12.15	"	"	3886	66.2		"	"		25.9	1247	20770								
12.30	"	"	3888	66.9		"	"		26.1	1250	20880								
12.40	"	"				"	"												
12.45	"	"	3894	63.3		"	"		25.9	1209	21423								
13.00	"	"	3900	62.6		"	"	68	25.9	1267	20441								
13.15	"	"	3906	62.9		"	"		25.8	1065	24225								
13.30	"	"	3915	65.5		"	445	72	25.8	1066	24203	42.0		0.5		0.1		0.15	"
13.45	"	"	3911	63.7		"	"		25.8	1152	22396								
14.00	"	"	3912	63.3		"	"	80	25.5	1382	18452								
14.15	"	"	3915	64		"	"	82	25.5	1382	18452		.645						
14.30	"	"	3910	64		"	"	82	25.5	1382	18452								
14.32	"	"				"	"												
14.45	"	"	3916	64		"	"	83	25.5	1411	18073								
15.00	"	"	3916	65		"	"	83	25.5	1397	18253								
15.08	"	"		BYPASS	SEPARATOR														

BY PASS MANIFOLD