

BASIC DATA

DAILY MUD PROPERTIES

PHASE I



N L INDUSTRIES, INC.

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 36 inch at 532
 WELL 1/9-3 COUNTY Norway inch at _____
 DATE _____ CONTRACTOR Dyvi Offshore A/S LOCATION 1/9-3 inch at _____
 STOCKPOINT Stavanger BAROID ENGINEER Svendson/Hansen SEC. TWP RNG _____ TOTAL DEPTH _____

DATE	DEPTH feet	WEIGHT lb/gal	VISCOSITY Sec	FILTRATION		SAND %	SALT		pH	VISCOSITY			GELS		FILTRATE ANALYSIS				RETORT ANALYSIS			REMARKS AND TREATMENT
				cc	Cake 32nd		NaCl ppm	Cl ppm		cp	Pv	Yp	in	10min	Cl ppm	Ca ppm	SO ₄ ppm	Alk PI	Oil %	Water %	Solids %	
11.8.77																						Arrived on rig. Doing inventory check.
12.8.77		8.7	120+																			Working on rig to get it drlg. position. Mixed 75 bbls. spud mud.
13.8.77	50	8.7	120+																			Rigged up for drlg. Made 350 bbls. of 10.0 ppg. S mud. Started drlg. 44" h.
14.8.77	557	8.7	120+																			Drilled to 557'. Displace hole twice. Used 1000 b spud mud for 44" hole.
15.8.77	557	8.7	60																			Run 36" csq. to 532'. Cemented. W.O.C. made up 800 b of mud for 26" hole.
16.8.77	557	8.7	60																			Cemented. W.O.C. P.O.O.H. made up 400 bbls. of Ben nite/H-921 spud mud.
17.8.77	557	8.7	60																			Drilled cement. Displace hole. with 550 bbls. mud. P.O.O.H. mixed 200 bbls. mud and 350 bbls. of 10.0 ppg.
18.8.77	557	8.7	60																			Nipple up B.O.P. Welders working on diverter line and flow line.
19.8.77	640	9	55			2																R.I.H. to 500'. Reamed to 557'. Displaced 600 bbls in hole. Drilled to 640'
20.8.77	1460	9	53			2																Drilled to 725'. Circ. 4 vey (1/4") circ. to decr mud wt. from 9.5 to 9.0. Formation up to 50% sand



N L INDUSTRIES, INC.

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 36 inch at 532
 WELL 1/9-3 COUNTY Norway 20 inch at 1424
 DATE _____ CONTRACTOR Dyvi Offshore A/S LOCATION 1/9-3 inch at _____
 STOCKPOINT Stavanger BAROID ENGINEER Svendsten/Hansen SEC _____ TWP _____ RNG _____ TOTAL DEPTH _____

DATE	DEPTH feet	WEIGHT lb/gal	VISCOSITY Sec	FILTRATION		SAND %	SALT		pH	VISCOSITY			GELS				FILTRATE ANALYSIS				RETORT ANALYSIS			REMARKS AND TREATMENT
				cc	Cake 32nd		Ex- lime	Cl ppm		cp	Pv	Yp	In	10min	Cl ppm	Co ppm	MF	Alk PI	Oil %	Water %	Solids %			
																								rest clay. Drlg. to 1460 P.O.O.H. to log.
21.8.77	1460	9	49			1/4																		Formation, clay + sand. Logged, made up 250 bbls. Spud mud for 26" hole.
22.8.77	1460	8.9	63			2																		Formation, Clay + sand. R.I.H. Reamed from 532' 1460'. Circ. bottoms-up. Wiper trip O.K. Spot hole w/250 bbls. LCM mud. P.O. O.H. made up 500 bbls. no spud mud. Lost 900 bbls. mud to formation, and clean- ing of desilter, desander pits.
23.8.77	1460	8.9	62			1/4																		Run 20" csg. to 1424'. Ce- mented. Displaced cement w/480 bbls. seawater. Spo- ted 70 bbls. of high Vis pill into annular
24.8.77	1460	11.0	45																					W.O.C. Wt. up and re-con- ditioned old spud mud for 19" hole.
25.8.77	1460	11.0	45	6.2	1	1/2			10.5	20	15	2	20	15,500	480		.6	0	91	9				Nippling up.
26.8.77	1460	10.9	43	6.4	1	1/2			10.0	18	13	2	12	15,500	480		.4	0	91	9				Add viscosifier to help b rite suspension.
27.8.77	1460	11.0	53	5.8	1	1/2			9.5	22	17	2	17	17,000	600		.3	0	91	9				Built 350 bbls. HiVis mud
28.8.77	1460	11.0	46	6.0	1	1/2			9.5	20	16	2	12	17,000	600		.3	0	91	9				Built 300 bbls. gel mud. Displaced casing.
29.8.77	2040	11.5+	48	4.8	1	1			10.0	23	21	2	7	15,400	420		.7	0	84	16				Wt. up to 11.5. Drill out shoe .
30.8.77	2768	11.5+	52	4.6	1	2			10.0	25	22	3	8	16,500	500		.5	0	84	16				Drilled ahead.



N L INDUSTRIES, INC.

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 36 inch of 532
 WELL 1/9-3 COUNTY Norway 20 inch of 1424
 DATE _____ CONTRACTOR Dyvi Offshore A/S LOCATION 1/9-3 _____ inch of _____
 STOCKPOINT Stavanger BAROID ENGINEER Svendson/Hansen SEC _____ TWP _____ RNG _____ TOTAL DEPTH _____

DATE	DEPTH feet	WEIGHT lb/gal	VISCOSITY Sec	FILTRATION			SALT		pH	VISCOSITY			GELS		FILTRATE ANALYSIS			RETORT ANALYSIS			REMARKS AND TREATMENT	
				cc	Coke 2nd	%	EX- lime	Cl ppm		cp	Pv	Yp	in	10min	Cl ppm	Ca ppm	MF	Alk PI	Oil %	Water %		Solids %
31.8.77	3215	11.5*	48	5.6	1	3/4			11.0	23	17	3	9	14,000	420		.8	0	84	16	Mix 500 bbls. replacement mud.	
1.9.77	3772	12.0	52	6.6	2	1			10.5	26	21	3	11	15,000	440		.5	0	18	82	Add Con Det. Treat foam.	
2.9.77	4133	11.8	42	6.8	2	3/4			11.0	21	15	2	7	14,000	400		1.1	0	17	83	Thin mud to reduce foam.	
3.9.77	4310	11.8	49	6.4	2	3/4			10.5	23	18	3	11	14,600	440		1.0	0	17	83	Add Aktaflo-S for foam and bit balling.	
4.9.77	4460	11.8	44	6.2	2	3/4			10.5	22	16	3	8	15,000	400		.7	0	17	83	Add Walnut to clean bit.	
5.9.77	4460	11.8	42	6.8	2	3/4			10.0	25	13	3	8	15,000	480		.6	0	17	83	Ran Electric logs.	
6.9.77	4460	11.8	44	7.0	2	1/2			10.0	23	16	3	7	14,600	400		.6	0	17	83	Ream 19 1/2" hole.	
7.9.77	4460	11.8	58	7.0	2	1/2			10.0	28	24	5	14	15,000	480		.6	0	17	83	Work on H ₂ O pump. Agitate off.	
8.9.77	4460	11.8	46	6.2	2	1/2			10.0	24	17	2	8	16,500	420		.5	0	17	83	Reamed 19 1/2" hole to 4460'	
9.9.77	4460	11.8	47	6.5	2	1/2			10.0	23	16	2	8	16,500	420		0.5	0	16	84	Circ. short trip R.I.H. Circ. P.O.O.H. to run csq.	
10.9.77	4460	11.8	46	6.6	2	1/2			10.0	23	16	2	7	16,500	420		0.5	0	16	84	Run csq. to 4408' circ. cemented.	
11.9.77	4460	14.2		Mixing up Lime/Surfactant																		W.O.C. made up new mud for 17 1/2" hole
12.9.77	4460	14.2		Conditioning mud for 17 1/2" hole.																		Conditioning mud.
13.9.77	4460	14.2	52	7.6	2	TR	3.8		12.3	32	16	2	14	18,500	280	5	3.5	0	22	78	Testing B.O.P. Nippling	
14.9.77	4460	14.0	46	7.9	2	TR	4.2		12.1	37	14	2	10	19,000	260	5	3.9	0	22	78	R.I.H. Displaced old mud in csq. with Lime/Surfactant (800 bbls).	
15.9.77	4465	12.6	50	13	3	TR	4.7		12.5	34	15	2	12	19,000	250	4.8	3.5	0	19	81	Drig. plug and cement + shoe. Drig. 5' of new hole. Did leak off test.	
16.9.77	4465	12.1	54	6.6	2	4.6			12.4	24	16	2	12	19,000	240	5.3	4	-	88	12	Waiting on rig repairs. Circ. and cond. mud.	
17.9.77	4465	13.5	51	6.0	2	TR	5.3		12.5	34	15	3	14	19,000	230	5.4	4.5	-	79	21	Waiting on rig repairs. Start weighting up.	
18.9.77	5018	14.6	57	11.0	3	TR	5.3		12.2	40	17	3	16	19,000	280	5.0	4.0	-	75	25	Drig. Clay. Flowline plug ged twice w/ mudrings.	



N L INDUSTRIES, INC.

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 36 inch at 532
 WELL 1/9-3 COUNTY Norway 20 inch at 1424
 DATE _____ CONTRACTOR Dyvi Offshore A/S LOCATION 1/9-3 16 inch at 4408
 STOCKPOINT Stavanger BAROID ENGINEER Svendsen/Hansen/Crawford/Small SEC _____ TWP _____ BNG _____ TOTAL DEPTH _____

DATE	DEPTH feet	WEIGHT lb/gal	VISCOSITY Sec	FILTRATION			SAND % Ex- lime	SALT		pH	VISCOSITY			GELS				FILTRATE ANALYSIS				RETORT ANALYSIS			REMARKS AND TREATMENT
				cc	Coke 32nd	%		Cl ppm			cp	Pv	Yp	in	10min	Cl ppm	Co ppm	MF	Alk PI	Oil %	Water %	Solids %			
19.9.77	5658	14.8	57	7.0	2	1/2	TR	5.2		12.5	30	15	2	12	19,000	230	4.7	3.5	-	75	25	Drlg. clay. Had several mudrings.			
20.9.66	6025	15.2	58	9.0	2	1/2		4.9		12.4	26	15	2	11	19,000	250	5.0	3.3	-	73	27	Drlg. clay. Got 650 unit gas. P.O.O.H. for new bit			
21.9.77	6445	15.4	52	7.0	2	1/2		5.0		12.5	28	15	2	10	19,000	250	4.6	3.7	-	73	27	R.I.H. Hole's O.K. Drlg. Claystone.			
22.9.77	6690	15.4	55	5.0	1	1%	5 3/4	-		12.4	37	20	2	10	18,500	240	5.0	4.0	0	73	27	Drlg. gumbo. Continued getting mud rings. Circ.			
	6832	15.4	55	6.0	2	1%	5 1/2	-		12.4	35	16	3	15	19,000	250	5.0	4.0	-	73	27	out gas bubble at 6686' Built 300 bbls.			
	7016	15.4	58	6.9	2	1%	4.9	-		12.2	37	23	4	25	19,000	360	4.7	3.7	TR	73	27	Lost approx. 50 bbls. fr dumping possum belly.			
23.9.77	7100	15.4	55	8.1	2	1%	5 1/4	-		12.0	38	22	2	11	19,000	320	4.2	3.2	TR	72	28	Made wiper trip. Got mud rings up after. Lost 24' bbls. mud. Started using reg. mud scales to check weight. Necessary to raise weight from 15.1 to 15.3			
		15.5	52	9.0	2	3/4	3.9	-		11.9	33	21	3	30	19,000	400	3.5	3.2	TR	72	28	Built 450 bbls. mud. Lost approx. 120 bbls. mud to formation at 7205'. Pull into casing and staged back to bottom. No mud l			
	7205	15.5	48	8.2	2	3/4	4.5	-		12.1	34	14	2	7	19,000	320	5.1	3.7	TR	72	28	Finished short trip - no mud loss or mud rings. P			
24.9.77	7386	15.4	56	6.5	2	3/4	4	-		11.9	39	25	3	20	19,000	320	4.4	3.4	TR	71	29	P.O.O.H. at 7386' for bit chge. R.I.H. to shoe. C out, cont. going in hole. Chge. shaker screens to 30 mesh.			
25.9.77	7590	15.5	53	6.8	2	3/4	3.7	-		12.0	34	21	2	21	19,000	340	4.4	3.1	TR	72	28	Finished going in hole. Circ. bottoms-up. No gum			



N L INDUSTRIES, INC.

DRILLING MUD RECORD

COMPANY: STATOIL STATE: Norway CASING PROGRAM: 20 inch at 1424
 WELL: 1/9-3 COUNTY: North Sea 16 inch at 4408
 DATE: _____ CONTRACTOR: Dyvi Offshore A/S Ruffing LOCATION: 1/9-3 inch at _____
 STOCKPOINT: Stavanger RAFOID ENGINEER: Svendson/Hansen/Crawford/Small/ SEC: _____ TWP: _____ RNG: _____ TOTAL DEPTH: _____

DATE	DEPTH	WEIGHT	VISCOSITY	FILTRATION		SAND		SALT		pH	VISCOSITY			GELS		FILTRATE ANALYSIS				RETORT ANALYSIS			REMARKS AND TREATMENT
				cc	Coke 32nd	%	Ex lime	Ex Sur-fact	cp		Pv	Yp	in	10min	Cl ppm	Ca ppm	MF	Alk Pt	Oil %	Water %	Solids %		
1977	feet	lb/gal	Sec																				
25 Cont.																							
	7705	15.4	48	7.8	2	3/4	4.0	2+	12.1	-	35	18	2	17	19,000	360	4.5	3.6	TR	70	30	Drill water valve leaked approx. 140 bbls. into reserve pits. Low press. end blew out of mud pump dumping 150 bbls. mud in room. P.O.H. to shoe for repairs. Valve on barite line leaked dumping barite into hopper and sack storage room. Cont. drilling. Wiper trip at 7705. O.K.	
	7797	15.5	53	7.8	2	3/4	4.2	2+	12.4	-	37	24	3	18	18,000	320	5.6	4.2	TR	70	30	Drilled to 7808'. Lost approx. 30 bbls. over shaker screens. Shut down to repair motors.	
26.9.77	7865	15.4	52	8.0	2	3/4	4.2	2+	12.1	-	36	22	2	16	19,000	340	4.8	3.5	TR	70	30	P.O.O.H. Tested electric logging tools and B.O.P. Waited on rig repairs.	
	Pit	15.5	55	7.5	2	3/4	5.0	2+	12.4	-	38	23	3	19	18,500	300	5.4	4.0	TR	71	29	Circ. out at shoe. Run 2 stds. and circ. out. P.O. to repair air compressor. Chgd bit. R.I.H. Circ. out 12 stds. off bottom. Got shale cavings over shakers.	
27.9.77	Pit	15.5	55	7.8	2	3/4	4.3	2+	12.2	-	37	23	3	18	18,000	300	5.0	3.7	TR	70	30	Run to bottom. No problem drilling. No gumbo or mud loss. Adding soltex to prevent caving shale.	
	Pit	15.4	47	8.2	2	3/4	3.6	2	11.9	-	33	15	3	13	19,000	280	4.6	3.1	TR	70	30	Drilling. Made wiper trip. No gumbo or mud loss.	
28.9.77	7897	15.5	45	8.0	2	3/4	4.1	2	12.0	-	33	17	3	12	19,000	300	5.0	3.1	TR	70	30		
	7920	15.5	62	8.6	2	3/4	3.8	2	12.0	-	27	15	5	22	20,000	400	4.6	3.3	TR	71	29		
	8033	15.5	52	8.5	2	3/4	4.3	2	12.3	-	25	14	4	20	20,000	360	5.6	4.0	TR	71	29		
29.9.77	8197	15.5	52	7.8	2	3/4	5.0	2	12.1	-	35	23	3	17	18,500	300	5.3	4.0	TR	70	30		



N L INDUSTRIES, INC

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 20 inch of 1424
 WELL 1/9-3 COUNTY North Sea 16 inch of 4408
 DATE _____ CONTRACTOR Dyvi Offshore A/S Ruffing LOCATION 1/9 inch of _____
 STOCKPOINT _____ FACID ENGINEER Svendesen/Hansen/Crawford/Small/ SEC _____ TWP _____ RING _____ TOTAL DEPTH _____

DATE	DEPTH	WEIGHT	VISCOSITY	FILTRATION		SAND		SALT		pH		VISCOSITY			FILTRATE ANALYSIS				RETORT ANALYSIS			REMARKS AND TREATMENT
				cc	Coke 32nd	%	Ex line	Ex Sur-fact	MTB	Pv	Yp	in	10 min	MF	Co ppm	PH	Alk Pt	Oil %	Water %	Solids %		
1977	feet	lb/gal	Sec																			
29.9.77	8318	15.5	51	8.0	2	3/4	5	2	12.1	27.5	35	21	3	15	5.0	300	21.5	3.6	TR	70	30	Drlg. small mud ring. Pu to shoe.
30.9.77	8521	15.4	48	7.6	2	3/4	4.8	2	12.0	-	35	18	2	14	4.7	300	21.6	3.5	TR	70	30	Drlg. - P.O.O.H. for bit no. 9.
1.10.77	8823	15.4	58	8.0	2	3/4	4.2	2+	12.0	30	34	22	3	19	4.7	280	18.5	3.2	TR	71	29	Drlg. - short trip - los 90 bbls. on bottoms-up - drlg.
2.10.77	8990	15.5	56	7.2	2	3/4	5	2+	12.1	30	36	21	3	18	5.0	270	22	3.4	TR	71	29	Drill to 8990' - P.O.O.H. from bit no. 10
3.10.77	9099	15.5	56	7.7	2	3/4	4.9	2+	12.3	32	35	21	3	17	5.9	280	22	4.5	TR	70	30	Drill to 9099' P.O.O.H. log.
4.10.77	9099	15.5	60	7.9	2	3/4	4.86	2+	12.1	5	37	23	3	18	5.3	250	21.5	4	TR	70	30	Logging.
5.10.77	9099	15.5	51	7.5	2	3/4	5.2	2+	12.0	30	31	19	2	15	5.0	250	22.5	3.5	TR	71	29	Reamed to 5169' P.O.O.H. for new bit.
6.10.77	9099	15.5	49	7.0	2	3/4	5.4	2+	12.2	30	33	16	2	14	5.8	240	24	4.7	TR	70	30	String 12 lines - ream to 5287'
7.10.77	9099	15.5	50	6.5	2	3/4	5.0	2+	12.5	30	30	18	3	16	5.8	200	25	5.0	TR	70	30	P.O.O.H. for new bit. R. Reaming.
8.10.77	9099	15.5	49	6.3	2	3/4	4.8	2+	12.4	30	28	18	3	16	5.4	230	24	4.9	TR	70	30	P.O.O.H. for new bit. R. hole. O.K.
9.10.77	9099	15.5	47	5.3	2	3/4	4.7	2+	12.4	30	27	18	3	16	5.4	250	23	4.1	TR	70	30	R.I.H. Drilled to 6206'
10.10	9099	15.5	46	6.0	2	1	5.3	2+	12.4	27	26	15	3	13	5.4	260	24	4.5	TR	69	31	Rig pumps broke down. PC
11.10	9099	15.4	45	6.5	2	1	4.6	2+	12.3	27	25	14	3	12	5.3	250	23	4.6	TR	69	31	Hole O.K. Collars and u. reamer clean. R.I.H.
12.10	9099	15.4	47	6.6	2	1	4.9	2+	12.0	27	25	15	3	15	5.0	240	24	4.2	TR	69	31	Working on rig pumps and one crane.
13.10	9089	15.5	48	7.2	2	1	5.1	2+	12.0	27	35	18	3	16	5.2	240	24.8	4.6	TR	69	31	Working on Mud pumps + motors.
14.10	9089	15.5	50	6.8	2	1	5	2+	12.2	28	30	18	3	16	6.6	220	25	5	TR	69	31	R.I.H. circ. gas. Ream to 7360'
15.10	9089	15.5	53	7.5	2	1	4.9	2	12.4	28	29	19	3	16	6.2	280	25.4	5.4	TR	70	30	P.O.O.H./R.I.H. open end Circ. bottoms-up.



STATOIL DIVISION
N L INDUSTRIES, INC

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 20 inch ct. 142
 WELL 1/9-3 COUNTY North Sea 16 inch ct. 440
 DATE _____ CONTRACTOR Dyvi Offshore A/S LOCATION 1/9 _____ inch ct. _____
 STOCKPOINT Stavanger BAROID ENGINEER Svendsen/Hansen/Crawford/Small Ruffing _____
 SEC _____ TWP _____ PNG _____ TOTAL DEPTH: _____

DATE	DEPTH	WEIGHT	VISCOSITY	FILTRATION			SALT		pH	VISCOSITY			GELS		FILTRATE ANALYSIS				REPORT ANALYSIS			REMARKS AND TREATMENT	
				cc	Coke 32nd	%	EX lime	EX Sur- fact		MBT	Pv	Yp	in	10min	HF	Co ppm	PM	Alk Pf	Oil %	Water %	Solids %		
1977	feet	lb/gal	Sec																				
16.10	9089	15.5	54	7.0	2	1	5.3	1.5	12.2	32	31	18	3	20	6	280	24.3	4.6	-	70	30	R.I.H. to TD Circ. bottom up. POOH run BOP test.	
17.10	9089	15.5	53	7.6	2	1	5.6	1.5	12.2	34	30	18	3	18	6.2	320	24.2	4.7	-	70	30	POOH to cs/BIH to TD circ bottoms-up.	
18.10	9089	15.5	53	7.7	2	1	5.6	1.5	12.6	34	30	17	3	19	8.6	240	23.8	6	-	70	30	RIH to TD Circ. bottoms- POOH to cs.	
19.10	9089	15.5	53	7.0	2	1	5.2	1.5	12.6	31	30	20	3	20	8	260	23	5.8	TR	71	29	RIH to TD Circ. bottoms- POOH to cs. lost 30 bbl.	
20.10	9089	15.5	53	6.6	2	1	4.6	1.5	12.5	325	35	17	3	18	8.1	240	21.5	5.5	TR	71	29	Circ. bottoms-up no prod.	
21.10	9089	15.5	53	7.4	2	1	4.6	1.5	12.5	325	35	17	3	18	8.1	240	21.5	5.5	TR	71	29	Circ. bottoms-up. Start air compressor.	
22.10	9089	15.5	52	6.6	2	1	5.1	2	12.4	32	27	19	3	16	6.0	250	23	4.8	TR	71	29	Reamed to 7315' - no prod.	
23.10	9089	15.5	50	6.7	2	1	4.9	2+	12.5	32	28	18	3	20	6.1	280	23.5	4.6	TR	70	30	Ream- work on air comp.	
24.10	9089	15.5	53	7.0	2	3/4	5.0	2+	12.3	32	27	18	3	20	5.8	280	22.5	4.6	TR	71	29	Reamed - some hard spots	
25.10	9089	15.5	53	7.0	2	1	4.8	2+	12.2	325	28	19	3	20	6	280	21.5	4.1	TR	70	30	Ream 17 1/2" hole.	
26.10	9089	15.5	52	7.2	2	1	4.6	2	12.1	32	29	17	3	18	5.9	300	20.4	3.8	TR	70	30	Reamed to TD circ. to loc	
27.10	9089	15.5	51	6.6	2	1	4.7	2	12.1	32	28	16	3	16	6.0	300	21	4.1	TR	71	31	Log - lay down DP.	
28.10	9089	15.5	54	6.6	2	1	4.9	2	12.4	32	29	20	3	19	6.5	19500	21.5	4	TR	71	29	Reamed to 4625'	
28.10	9089	15.5	55	6.6	2	1	4.9	2	12.4	32	28	18	3	16	5.5	19000	23	4.1	TR	71	29	Crane broke down. POOH R.I.H. w/gauge ring.	
29.10	9089	15.5	58	7.0	2	1	4.7	2	12.3	32	29	19	3	18	5.3	19000	23	4.0	TR	71	29	Scrape csg. R.I.H. w/gau ring. POOH	
30.10	9089	15.5	60	7.2	2	1	4.5	2	12.2	32	30	20	4	23	5.5	19000	22	4.1	TR	71	29	R.I.H. to 9084'. Circ. Pulled up to csg. shoe. R.I.H. w/ csg. scraper.	
31.10	9089	15.5	50	6.0	2	1	4.7	2+	12.4	30	28	18	3	16	5.7	19500	23	4.2	TR	70	30	P.O.O.H. R.I.H. w/gauge ring to 449'. POOH R.I.H. to shoe circ. POOH.	
1.11	9089	15.5	57	4.0	2	TR	4.0	2+	12.0	27	32	22	4	19	4.9	9000	32	3.7	TR	59	30	R.I.H. w/gauge ring to POOH R.I.H. to 9085'. C bottoms-up. Pulled up to casing shoe.	



N L INDUSTRIES, INC.

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 16 inch at 4408 ft.
 WELL 1/9-3 COUNTY Norway 13 3/8 inch at 9056 ft.
 DATE _____ CONTRACTOR Dyvi Gamma LOCATION North Sea _____ inch at _____ ft.
 STOCKPOINT Stavanger BAROID ENGINEER Crawford/Svendsen/Hansen/Oswald SEC _____ TWP _____ RNG _____ TOTAL DEPTH _____ ft.

DATE	DEPTH	WEIGHT	VISCOSITY	FILTRATION		SAND		SALT		pH			VISCOSITY		GELS		FILTRATE ANALYSIS				RETORT ANALYSIS		REMARKS AND TREATMENT
				cc	Coke 32nd	%	EX lime	EX Sur- fact	MBT	Pv	Yp	In	10min	MF	Cl ppm	PH	Alk PI	Oil %	Water %	Solids %			
1977	feet	lb/gal	Sec	cc																			
	1 Cont.																						Added 12% diesel to mud in casing. Circ. bottoms-
2.11	9089	15.5	55	4.1	2	TR	4.3	2+	12.2	27	30	18	3	16	5.4	19000	21	39	11	59	30	R.I.H. to 6300'. Circ. and added 12% diesel to mud.	
3.11	9089	15.5	51	4.5	2	TR	4.8	2+	12.2	27.5	30	17	3	16	5.4	19500	21.5	4.0	12	58	30	R.I.H. to 9089'. Circ. and added 12% diesel to mud.	
																						Pulled up to casing shoe and added 12% diesel to mud. Circ. and cond. mud. Added a total of 260 bbl of diesel.	
4.11	9089	15.5	50	4.4	2	1/4	4.6	2+	12.3	27.5	29	18	3	19	5.7	20000	20.5	4.0	11	59	30	Gauge ring O.K. Circ. bot- toms-up.	
5.11	9089	15.5	51	4.8	2	1/4	4.8	2+	12.3	27.5	30	18	3	15	5.7	20000	21.5	12	58	59	30	Change BOP + test CK reamer Ream.	
6.11	9089	15.5	52	4.4	2	1/4	4.9	2+	12.5	28	31	16	3	14	6.8	20000	22.5	5.1	12	58	30	Reaming	
7.11	9089	15.5	52	5.0	2	1/4	4.5	2+	12.2	30	30	18	3	17	5.8	20000	20	3.9	13	58	29	Ream to 9089' - circ. to log	
8.11	9089	15.6	53	4.8	2	TR	4.6	2+	12.2	28	31	18	3	17	6.0	20000	20.5	4.0	12	59	29	Cal log O.K. Run gauge ring set test plug + change BOP.	
9.11	9089	15.5	53	5.0	2	TR	4.7	2+	12.3	28	31	19	3	17	6.8	20000	21.0	4.0	13	58	29	Cond. mud for csq. run 13 3/8" csq.	
10.11	9089	15.5	55	5.0	2	TR	4.6	2+	12.2	28	31	18	3	18	6.7	20000	20.5	3.8	12	58	30	Finish running csq.	
11.11	9089	15.0	56	7.6	2	TR	3.9	5	12.0	22	25	16	2	14	5.8	16000	18	4.0	6	68	26	Mixed volume to cement. Cemented 13 3/8 csq. with no returns. Start mixing volume for 2nd stage.	
12.11	9089	15.0	51	8.0	2	TR	3.8	-	11.8	-	24	18	2	13	5.0	16500	17	3.2	N.1	74	26	Make new volume - WOC.	
13.11	9089	15.1	56	8.2	2	TR	3.5	-	12.0	-	25	20	3	16	-	17000	17	3.3	F, 1m	74	26	Cement 2nd stage on 13 3/8 csq. lost 145 bbl. while displacing	
14.11	9089	15.3	57	7.8	-	TR	3.7	-	12.0	-	26	19	3	16	-	300	18.5	2.8	TR	72	28	Temp survey - WOC	

BASIC DATA
DAILY MUD PROPERTIES

PHASE II



BAROID DIVISION
N L INDUSTRIES, INC.

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 16 inch at 1360 m
 WELL 1/9-3 COUNTY Offshore 13 3/8 inch at 2761 m
 DATE 1978 CONTRACTOR Dyvi LOCATION North Sea inch at _____
 STOCKPOINT Tanager BAROID ENGINEER Smith/ Lamberth/ Evans/ Beasley SEC _____ TWP _____ RNG _____ TOTAL DEPTH 5,000 m

DATE	DEPTH	WEIGHT	VISCOSITY	FILTRATION			SALT		pH	VISCOSITY			GELS		FILTRATE ANALYSIS				RETORT ANALYSIS			REMARKS AND TREATMENT	
				cc	Coke 32nd	%	NaCl ppm	Cl pom		cp	Pv	Yp	in	10 min	Cl ppm	Ca ppm	SO ₄ ppm	Alk Pf	Oil %	Water %	Solids %		
25.5	2761	1.01	100+		2+				7.6						500								Mixing mud.
26.5	2761	1.01	100+	12.1	3				7.6						500								Mixing mud.
27.5	2761	1.01	38	7.8	1				9.5	10	18	0	1	15000	600		.02	0	98	2		Drill cement plug.	
28.5	2761	1.26	41	11.3	2	TR			9.8	13	9	1	3	16000	640		.03	0	89	11		Drill cement.	
29.5	2771	1.65	57	9.0	2	1			11.5	38	8	1	3	12400	640		1.9	0	78	22		Drill cement.	
30.5	2771	1.65	43	8.1	2	1			11.4	39	7	1	3	12500	640		1.7	0	78	22		Leak off test.	
31.5	2880	1.65	49	8.1	2	TR			11.3	27	9	1	7	10000	440		.75	0	78	22		Drilling ahead.	
1.6	2920	1.66	58	6.6	2	1/2			11.4	34	14	1	18	10000	400		.35	0	76	24		Drilling ahead.	
2.6	2939	1.66	48	6.4	2	1/2			11.0	29	10	1	14	10000	400		.4	0	76	24		Pull for new bit.	
3.6	3025	1.67	48	7.0	2	1/2			9.8	26	11	3	21	12000	600		.25	0	75	25		Drilling ahead.	
4.6	3044	1.67	52	7.0	2	1/2			10.0	34	17	3	22	12000	600		.21	0	75	25		Pull for new bit.	
5.6	3066	1.66	60	7.2	2	1/2			9.8	35	15	3	21	13000	680		.21	0	75	25		Pull out to core.	
6.6	3077	1.66	57	7.2	2	1/2			11.0	34	16	3	26	12000	680		.17	0	76	24		Coring.	
7.6	3082	1.66	50	7.0	2	1/2			11.0	33	16	3	25	12000	680		.18	0	76	24		Pressure test.	
8.6	3105	1.66	47	7.0	2	1/2			11.0	30	10	3	11	12000	680		.25	0	75	25		Open core hole - drilling	
9.6	3105	1.66	54	7.1	2	1/2			11.0	30	11	3	12	12000	680		.25	0	75	25		Work on BOP.	



**BAROID DIVISION
N L INDUSTRIES, INC.**

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 16 inch ot 1360 m
 WELL 1/9-3 COUNTY Offshore 13 3/8 inch ot 2761 m
 DATE 1978 CONTRACTOR Dyvi LOCATION North Sea inch ot _____
 STOCKPOINT Tanager BAROID ENGINEER Smith/ Lamberth/ Evans/ Beasley SEC _____ TWP _____ RNG _____ TOTAL DEPTH 5,000 m

DATE	DEPTH METERS	WEIGHT S.G.	VISCOSITY Sec	FILTRATION		SAND %	SALT		pH	VISCOSITY			GELS				FILTRATE ANALYSIS				RETORT ANALYSIS				REMARKS AND TREATMENT
				cc	Coke 32nd		NaCl ppm	Cl ppm		cp	Pv	Yp	in	10min	Cl ppm	Co ppm	SO ₄ ppm	Alk Pf	Oil %	Water %	Solids %				
10.6	3105	1.66	48	7.0	2	TR			10.8	33	10	3	10	12000	680		.22	0	75	25	Work on BOP.				
11.6	3123	1.66	46	7.1	2	1/4			10.8	31	12	3	10	12000	600		.20	0	75	25	Coring.				
12.6	3136	1.69	50	6.7	2	1/2			10.4	36	12	4	21	13000	600		.15	0	73	27	Drilling ahead.				
13.6	3164	1.68	46	6.2	2	1/4			10.6	32	12	3	24	13000	600		.20	0	74	26	Coring.				
14.6	3180	1.68	50	7.2	3	1/4			10.8	30	16	4	28	13200	700		1.0	0	74	26	Coring.				
15.6	3191	1.70	47	8.0	3	1/4			10.5	24	10	2	17	13000	720		.28	0	74	26	Recover core.				
16.6	3218	1.69	67	8.0	3	1/4			12.0	29	11	3	12	14000	640		.20	0	74	26	Coring.				
17.6	3221	1.67	48	4.3	3				11.0	33	11	2	7	13000	420		.90	0	75	25	Coring.				
18.6	3221	1.66	47	4.1	3				11.0	33	10	1	7	12500	400		.8	0	74	26	Recover core.				
		1.66	47	3.9	3				11.0	34	12	1	8	12500	380		1.1	0	75	25	Recover core.				
19.6	3323	1.67	51	4.2	2	TR			11.4	30	10	1	7	13000	360		1.3	0	75	25	Drilling ahead.				
		1.67	48	4.4	2	TR			11.2	35	12	1	8	13000	380		1.1	0	75	24	Drilling ahead.				
20.6	3405	1.68	48	4.3	2	TR			11.0	31	10	1	6	13000	380		1.2	0	75	25	POH for E-logs.				
	3405	1.68	49	4.2	2	TR			11.0	32	10	1	6	13000	380		1.1	0	75	25					
21.6	3405	1.68	49	4.2	2	TR			11.0	32	10	1	6	13000	380		1.1	0	74	25	RIH to drill.				
	3405	1.68	51	3.9	2	TR			11.0	32	11	1	6	13000	400		1.1	0	75	25					



**BAROID DIVISION
N L INDUSTRIES, INC.**

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 16 inch at 1360 m
 WELL 1/9-3 COUNTY Offshore 13 3/8 inch at 2761 m
 DATE 1978 CONTRACTOR Dyvi LOCATION North Sea inch at _____
 STOCKPOINT Tanager BAROID ENGINEER Smith/ Lamberth/ Evans/ Beasley SEC _____ TWP _____ RNG _____ TOTAL DEPTH 5,000 m

DATE	DEPTH METERS	WEIGHT S.G.	VISCOSITY Sec	FILTRATION		SAND %	SALT		pH	VISCOSITY			GELS		FILTRATE ANALYSIS				RETORT ANALYSIS			REMARKS AND TREATMENT
				cc	Cake 32nd		NaCl ppm	Cl ppm		cp	Pv	Yp	in	10min	Cl ppm	Ca ppm	SO ₄ ppm	Alk Pf	Oil %	Water %	Solids %	
22.6	3461	1.67	53	4.2	2	TR			11.2	33	11	1	7	13000	360		1.1	0	75	25	Drilling ahead.	
		1.67	51	3.2	2	TR			11.3	35	10	1	6	12500	240		.5	0	75	25		
	3461	1.69	50	3.7	2	TR			11.0	34	14	2	9	12500	300		.6	0	74	26		
23.6	3549	1.68	51	3.2	2	TR			11.0	35	14	1	6	12500	280		.8	0	74	25	Drilling ahead.	
	3549	1.68	50	3.3	2	TR			11.0	35	12	3	10	12500	300		1.0	0	74	26		
24.6	3614	1.69	53	4.2	2	TR			10.6	33	14	3	8	12500	240		.9	0	74	26	Drilling ahead.	
	3614	1.69	52	4.2	2	TR			10.9	35	13	3	9	12500			1.0	0	74	26		
25.6	3675	1.69	53	4.1	2	TR			11.0	36	13	3	10	12500	200		.8	0	73	27	Drilling ahead.	
	3675	1.69	54	4.0	2	TR			11.1	35	13	3	11	12500	180		.9	0	72	28	Drilling ahead.	
26.6	3721	1.70	60	3.9	2	TR			11.2	35	12	3	10	13000	200		1.0	0	73	27	Clay content too high.	
	3721	1.68	71	4.2	2	TR			11.1	48	20	3	5	13500	200		1.0	0	74	26		
27.6	3758	1.68	54	3.8	2	TR			11.3	34	13	3	9	14500	180		.85	0	75	25	Circulate to condition mud	
	3758	1.68	49	4.0	2	TR			11.2	33	11	3	9	15000	180		1.0	0	75	25		
28.6	3817	1.68	46	3.8	2	TR			11.2	35	11	2	9	15000	180		1.1	0	75	25	Drilling ahead.	
	3817	1.68	50	4.0	2	TR			11.2	34	11	3	10	15500	180		1.2	0	75	25		
29.6	3835	1.70	47	4.0	2	TR			11.3	34	10	2	8	16000	180		1.2	0	75	25	POH to log.	



BAROID DIVISION
N L INDUSTRIES, INC.

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 16 inch at 1360 m
 WELL 1/9-3 COUNTY Offshore 13 3/8 inch at 2761 m
 DATE 1978 CONTRACTOR Dyvi LOCATION North Sea _____ inch at _____
 STOCKPOINT Tananger BAROID ENGINEER Smith/ Lamberth/ Evans/ Beasley SEC _____ TWP _____ RNG _____ TOTAL DEPTH 5,000 m

DATE	DEPTH METERS	WEIGHT S.G.	VISCOSITY Sec	FILTRATION		SAND %	SALT		pH	VISCOSITY			FILTRATE ANALYSIS				RETORT ANALYSIS			REMARKS AND TREATMENT	
				cc	Coke 92nd		NaCl ppm	Cl ppm		cp	Pv	Yp	In	10min	Cl ppm	Ca ppm	SO ₄ ppm	Alk Pf	Oil %		Water %
29.6	3835	1.70	48	4.0	2	TR			11.2	34	11	2	9	16500	180		1.1	0	75	25	
30.6	3835	1.70	48	4.0	2	TR			11.2	33	8	2	8	16500	180		1.0	0	75	25	Logging.
	3835	1.70	48	4.0	2	TR			11.2	32	10	2	9	16500	180		1.0	0	75	25	
1.7	3835	1.70	51	5.0	2	TR			11.0	36	18	4	10	16500	180		1.0	0	75	25	RIH. Circulate bottoms-up
	3835	1.70	48	5.0	2	TR			11.0	34	15	4	10	16500	180		1.1	0	75	25	POH to log again.
2.7	3835	1.70	48	5.0	2	TR			11.0	27	6	2	4	16500	180		1.1	0	75	25	Logging.
	3835	1.69	49	5.0	2	TR			11.0	28	7	2	6	16500	180		1.1	0	75	25	Shooting cores.
3.7	3835	1.69	47	4.5	2	TR			11.0	26	9	3	9	16500	180		1.1	0	75	25	Circulate to condition mud.
	3835	1.69	49	4.6	2	TR			11.0	27	10	3	10	16500	180		1.0	0	75	25	Begin running casing.
4.7	3835	1.70	51	5.0	2	TR			11.0	28	10	3	10	16500	180		1.0	0	75	25	Running 9 5/8" casing.
	3835	1.71	50	4.8	2	TR			11.0	28	10	3	10	16500	180		1.1	0	75	25	Same.
5.7	3835	1.71	50	5.0	2	TR			11.0	32	10	3	12	16000	180		1.1	TR	75	25	Stuck casing at 3348 m.
6.7	3835	1.69	51	5.0	2	TR			11.0	32	10	3	12	16000	180		1.1	TR	75	25	Work on casing.
	3835	1.70	50	5.0	2	TR			11.0	31	10	3	11	16000	160		1.1	0	75	25	Spot Imco Spot pill.
7.7	3835	1.68	64	4.6	2	TR			11.0	44	24	6	28	15500	200		.6	6	69	25	Casing, came free & stuck
8.7	3835	1.65	56	5.0	2	TR			10.0	31	12	3	10	16000	160		1.0	9.5	64.5	26	Reduce mud weight.



BAROID DIVISION N L INDUSTRIES, INC.

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 16 inch at 1360 m
 WELL 1/9-3 COUNTY Offshore 13 3/8 inch at 2761 m
 DATE 1978 CONTRACTOR Dyvi LOCATION North Sea 9 5/8 inch at 3834 m
 STOCKPOINT Tanager BAROID ENGINEER Smith/ Lamberth/ Hadley/ Beasley SEC TWP RNG TOTAL DEPTH 5,000 m

DATE	DEPTH METERS	WEIGHT S.G.	VISCOSITY Sec	FILTRATION		SAND %	SALT		pH	VISCOSITY			GELS				FILTRATE ANALYSIS				RETORT ANALYSIS				REMARKS AND TREATMENT
				cc	Cake 32nd		NaCl ppm	Cl ppm		cp	Pv	Yp	in	10min	Cl ppm	Ca ppm	SO ₄ ppm	Alk Pf	Oil %	Water %	Solids %				
8.7	3835	1.66	61	4.8	2				10.0	32	12	4	18	16000	180		.9	9.5	64.5	26	Spot Imco Spot pill.				
9.7	3835	1.65	100	5.2	3	TR			10.0	50	38	10	19	16000	210		.7	12	62	26	Casing cemented.				
10.7	3835	PREPAIRING MUD FOR 8 1/2" HOLE.							-	MIXING CHEMICALS.															
11.7	3835	1.85	61	3.0	2	TR			10.2	47	18	6	12	10000	100		1.1	5	66	29	Drill out shoe.				
12.7	3835	1.84	96	2.4	2	TR			11.5	74	23	9	30	12000	190		1.1	11	59	30	Finished drilling cement.				
	3834	1.84	74	2.1	2	TR			11.0	52	20	8	27	12000	200		1.0	10	59	31	Circulate to condition mud.				
13.7	3876	1.85	73	2.0	2	TR			11.0	51	22	8	18	12000	180		.9	8	61	31	Mixing additional mud.				
14.7	3962	1.86	75	1.8	2	TR			11.0	35	18	6	17	12000	180		.9	6	67	27	Mixing dilution mix to add				
	3962	1.87	68	1.8	2	TR			11.2	40	22	7	18	11000	180		.5	6	67	27	to mud for viscosity.				
15.7	4023	1.94	50	1.6	2	TR			10.0	40	10	2	4	12000	60		.5	5	65	30	Drilling ahead.				
	4023	1.95	51	1.8	2	TR			10.0	40	10	2	5	10000	28		.4	3	64	33	Adding Q-Mix.				
16.7	4067	1.97	55	1.8	2	TR			10.8	44	10	3	7	10000	28		.9	4	63	33	Added Q-Mix to mud.				
	4067	2.02	60	2.0	2	TR			10.8	48	16	5	11	10000	12		.6	2	65	33	Adding drill water.				
17.7	4067	2.02	60	2.0	2	TR			10.7	48	12	3	7	14000	12		.5	3	64	33	Adding Walnut to system				
	4067	2.04	58	2.0	2	TR			10.7	47	12	3	8	11000	8		.6	3	64	33	while drilling.				
18.7	4088	2.04	60	2.2	2	TR			10.7	51	15	4	7	12000	18		.5	3	64	33	Circulate to condition mud.				



BAROID DIVISION
N L INDUSTRIES, INC.

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 16 inch at 1360 m
 WELL 1/9-3 COUNTY Offshore 13 3/8 inch at 2761 m
 DATE 1978 CONTRACTOR Dyvi LOCATION North Sea 9 5/8 inch at 3834 m
 STOCKPOINT Tanager BAROID ENGINEER Smith/ Lamberth/ Hadley/ Beasley TWP sec RNG sec TOTAL DEPTH 5,000 m

DATE	DEPTH METERS	WEIGHT S.G.	VISCOSITY Sec	FILTRATION		SAND %	SALT		pH	VISCOSITY			GELS				FILTRATE ANALYSIS				RETORT ANALYSIS			REMARKS AND TREATMENT
				cc	Cake 32nd		NaCl ppm	Cl ppm		cp	Pv	Yp	in	10min	Cl ppm	Ca ppm	SO ₄ ppm	Alk Pf	Oil %	Water %	Solids %			
18.7	4099	2.04	60	2.2	2	TR			10.8	50	14	4	7	12000	18		.7	3	64	33	Adding Aktaflo-S.			
19.7	4099	2.04	59	2.8	2	TR			10.3	55	18	5	11	10000			.3	3	65	32	Start mixing lime to treat			
	4099	2.04	59	2.8	2	TR			10.3	53	11	5	10	13000			.3	3	65	32	CO ₃ + HCO ₃ out.			
20.7	4099	2.04	55	1.9	2	TR			11.2	46	13	5	9	10000			.5	2	65	33	Drilling ahead.			
	4100	2.04	59	2.0	2	TR			11.5	48	14	6	10	12000	280		1.7	2	65	33	Still treating out			
	4127	2.04	59	1.9	2	TR			12.0	49	13	6	9	12000	280		1.7	2	65	33	CO ₃ + HCO ₃			
21.7	4140	2.04	60	2.4	1	1/2			12.0	50	14	6	10		50		.4	2	65	33				
	4140	2.04	60	3.4	1	1/2			12.0	48	12	6	10	8000	120		.6	2	65	33				
					1	1/2			11.8				4	10										
22.7	4206	2.04	60	2.4	1	1/2			11.2	50	15	4	12	11000	160		.4	2	65	33	Drilling ahead.			
	4206	2.04	58	2.6	1	1/2			11.6	49	14	3	11	11000	160		.8	2	65	33	Adding lost circulation			
	4206	2.04	59	2.6	1	1/2			11.5	50	14	4	12	11000	160		.7	2	65	33	material while drilling.			
23.7	4217	2.03	55	3.2	1	1/2			11.5	46	10	4	14	17400	200		.7	4	60	36	Drill salt stringer.			
	4217	2.04	57	3.0	1	1/2			11.6	46	13	4	12	13000	200		.7	3	63	34	Circulate to condition mud			
	4217	2.04	57	2.9	1	1/4			11.6	48	14	4	12	13000	200		.7	3	64	33	POH to log.			
24.7	4217	2.04	57	3.0	1	1/4			11.5	48	13	4	11	12000	180		.7	3	64	33	RIH to drill ahead.			



BAROID DIVISION N L INDUSTRIES, INC.

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 13 3/8 inch at 2761 m.
 WELL 1/9-3 COUNTY Offshore 9 5/8 inch at 3834 m
 DATE 1978 CONTRACTOR Dyvi LOCATION North Sea _____ inch at _____
 STOCKPOINT Tananger BAROID ENGINEER Lamberth/ Hadley/ Smith/ Beasley SEC _____ TWP _____ RNG _____ TOTAL DEPTH _____

DATE	DEPTH	WEIGHT	VISCOSITY	FILTRATION		SAND	SALT		pH	VISCOSITY			FILTRATE ANALYSIS				RETORT ANALYSIS				REMARKS AND TREATMENT
				cc	Cake 32nd		NoCl ppm	Cl ppm		cp	Pv	Yp	in	10min	Cl ppm	Ca ppm	SO ₄ ppm	Alk Pf	Oil %	Water %	
25.7	4234	2.04	60	3.2	1	1/2			11.2	46	30	4	12	12500	160		.6	4	64	32	Reduce mud weight slowly
	4234	2.03	56	3.2	1	1/2			11.4	48	13	3	11	12500	180		.6	3	64	33	from 2.04 to 2.02 and
	4234	2.02	57	3.0	1	1/2			11.6	47	12	3	11	12000	160		.7	4	63	33	check for flow.
26.7	4266	2.02	56	3.4	1	1/2			11.5	48	16	3	10	12000	160		.6	4	63	33	Reduce mud weight to
	4266	2.01	63	2.4	1	1/2			11.4	50	13	4	12	11000	160		.6	3	64	33	2.01 - Statoil orders -
	4266	2.01	60	2.4	1	1/2			11.2	49	13	3	12	11000	160		.7	2	65	33	Reduce filtrate and vis- cosity.
27.7	4273	2.01	57	2.5	1	3/4			11.5	50	10	3	10	11300	160		.5	2	66	32	Reduce water loss by
	4276	2.01	57	2.6	1	1/2			11.4	46	10	4	12	12000	160		.9	2	66	32	adding Q-Broxin, Aktaflo-S
	4297	2.01	70	2.0	1	1/2			11.3	52	15	4	14	12000	200		.7	6	62	32	Diesel and water diesel 6%
28.7	4297	2.01	73	1.6	1	1/2			11.1	54	16	5	16	12000	200		.7	6	62	32	Adding diesel.
29.7	4340	2.02	66	1.6	1	1/2			11.3	56	12	4	12	10000	320		1.2	7	58	35	Adding Lime.
30.7	4405	2.02	60	2.9	2	1/2			11.8	49	11	3	11	11000	1200		1.3	7	59	34	Adding Lime.
31.7	4439	2.03	61	3.2	2	1/2			11.9	48	10	3	9	10000	2000		1.0	6	59	35	Circulating prior to logging.
1.8	4439	2.03	58	3.1	2	TR			11.7	49	9	2	9	10000	2000		1.0	6	59	35	Logging.
2.8	4439	2.03	69	3.0	2	TR			11.2	50	13	3	13	10000	2100		1.1	6	58	36	Conditioning trip.



**BAROID DIVISION
N L INDUSTRIES, INC.**

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 13 3/8 inch at 2761 m
 WELL 1/9-3 COUNTY Offshore 9 5/8 inch at 3834 m
 DATE 1978 CONTRACTOR Dyvi LOCATION North Sea inch at _____
 STOCKPOINT Tanager BAROID ENGINEER Lamberth/ Hadley/ Smith/ Beasley SEC _____ TWP _____ RNG _____ TOTAL DEPTH _____

DATE	DEPTH	WEIGHT	VISCOSITY	FILTRATION		SAND	SALT		pH	VISCOSITY			GELS		FILTRATE ANALYSIS				RETORT ANALYSIS			REMARKS AND TREATMENT
				cc	Coke 32nd		NaCl ppm	Cl ppm		cp	Pv	Yp	in	10min	Cl ppm	Ca ppm	SO ₄ ppm	Alk Pf	Oil %	Water %	Solids %	
3.8	4452	2.03	72	3.1	2	TR			11.1	51	13	3	14	10000	2100		1.0	6	58	36	RIH drilling ahead.	
4.8	4507	2.03	76	3.1	2	TR			10.8	55	14	5	19	10000	1600		.8	5	58	37	Drilling ahead.	
5.8	4550	2.03	72	3.4	3	TR			11.5	51	11	3	13	10500	1400		1.5	6	54	35	Circulating, treat bicarbonate contamination.	
6.8	4570	2.05	68	2.2	2	TR			11.2	49	10	3	12	10000	600		1.1	8	57	35	Lost circulation.	
7.8	4570	2.04	53	1.4	2	TR			11.1	49	12	3	13	9000	120		1.2	8	57	35	RIH in stages, cut weight.	
8.8	4570	2.04	60	1.8	2	TR			11.3	50	10	3	12	9000	120		1.8	8	57	35	Circulating condition mud.	
9.8	4570	2.04	64	1.8	2	TR			11.0	50	15	3	15	9000	120		1.8	8	57	35	Logging.	
10.8	4570	2.04	61	1.6	2	TR			11.5	56	14	4	9	9000	230		1.5	8	57	35	Conditioned mud. POOH to log.	
11.8	4570	2.04	61	1.6	2	TR			11.5	56	14	4	9	9500	250		1.5	8	57	35	Conditioned mud. Log.	
12.8	4570	2.04	62	1.8	2	TR			10.5	52	14	4	14	10000	320		1.6	8	57	35	Same as above.	
13.8	4570	2.04	58	1.5	2	TR			11.0	53	13	5	11	9600	180		1.4	8	57	35	Same - treat mud.	
14.8	4570	2.04	56	1.4	2	TR			11.1	55	15	4	11	10000	160		1.2	7	58	35	Same. Log.	
15.8	4570	2.04	56	1.4	2	TR			11.0	54	14	4	10	10000	160		1.2	8	58	34	Same. Log.	
16.8	4570	2.04	56	1.4	2	TR			11.0	52	14	4	12	9800	180		1.2	8	57	35	Circulate. Log.	
17.8	4570	2.04	58	1.5	2	TR			11.0	52	15	4	11	9600	180		1.1	8	57	35	Circulate. Log.	



**BAROID DIVISION
N L INDUSTRIES, INC.**

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 16 inch at 1360 m
 WELL 1/9-3 COUNTY Offshore 13 3/8 inch at 2761 m
 DATE 1978 CONTRACTOR Dyvi LOCATION North Sea 9 5/8 inch at 3834 m
 STOCKPOINT Tananger BAROID ENGINEER Lamberth/ Smith/ Hadley/ Beasley SEC _____ TWP _____ RNG _____ TOTAL DEPTH 5,000 m

DATE	DEPTH	WEIGHT	VISCOSITY	FILTRATION		SAND	SALT		pH	VISCOSITY			GELS				FILTRATE ANALYSIS				RETORT ANALYSIS			REMARKS AND TREATMENT
				cc	Coke 32nd %		NoCl ppm	Cl ppm		cp	Pv	Yp	in	10min	Cl ppm	Ca ppm	SO ₄ ppm	Alk Pf	Oil %	Water %	Solids %			
18.8	4570	2.04	58	1.5	2	TR			11.0	54	13	4	12	9600	180		1.1	8	57	35	Log.			
19.8	4570	2.04	57	1.5	2	TR			11.0	53	14	4	11	9600	180		1.1	8	58	34	Log. SWC.			
20.8	4570	2.04	54	1.4	2	TR			11.0	53	16	4	12	9600	160		1.2	7	58	35	Circulate plug no. 1.			
21.8	4570	2.04	56	1.4	2	TR			11.0	51	16	4	11	9600	180		1.3	6	59	35	Plug no. 2.			
22.8	4570	2.04	55	1.6	2	TR			10.8	52	16	4	11	10000	200		1.5	61	5	34	Plug no. 3.			
23.8	3852	2.04	58	1.6	2	TR			11.0	52	16	4	11	10000	200		1.6	61	5	34	Tag no. 3. Run retainer.			
24.8	3720	1.99	51	1.8	2	TR			10.6	50	13	3	10	9000	160		1.3	64	4	32	Squeeze cement at retaine:			
25.8	3357	1.68	45	4.8	2		4000		11.0	32	15	3	11	22.5	80		1.5	1	72	27	Cut mud weight to 1.68.			
26.8	3357	1.68	48	2.0	2		4000		11.0	32	15	3	10	22.5	120		1.5	1	75	24	Test BOP's.			
27.8	3357	1.68	40	2.0	2		4000		11.0	17	15	2	8	20.0	120		1.4	1	74	25	Running logs/ perforating			
28.8	3357	1.68	40	2.0	2		3200		11.0	16	15	2	8	17.5	120		1.3	1	74	25	Testing/ squeeze.			
29.8	3216	1.68	40	2.0	2		3000		11.0	16	15	2	8	17.5	120		1.3	TR	75	25	Perforate.			
30.8	3216	1.68	43	2.4	1		3000		11.0	16	14	2	8	20.0	TR		1.0	TR	74	26	Squeeze 3216.			
31.8	3216	1.68	48	2.4	1		3000		11.0	18	16	2	10	20.0	80		1.0	TR	74	26	Mix 400 bbl. new mud.			
1.9	3216	1.68	50	2.4	1		2800		11.0	18	16	2	10	20.0	80		1.0		74	26	Mix 400 more bbl. mud.			
2.9	3216	1.68	51	2.6	1		2400		11.0	19	16	2	10	20.0	TR		.9		74	26	Testing.			



BAROID DIVISION N L INDUSTRIES, INC.

DRILLING MUD RECORD

COMPANY STATOIL STATE Norway CASING PROGRAM: 13 3/8 inch at 2761 ft.
 WELL 1/9-3 COUNTY Offshore 9 5/8 inch at 3834 ft.
 DATE 1978 CONTRACTOR Dyvi Beta LOCATION North Sea _____ inch at _____ ft.
 STOCKPOINT Tanager BAROID ENGINEER Lamberth/ Hadley SEC _____ TWP _____ RNG _____ TOTAL DEPTH 4570 m ft.

DATE	DEPTH	WEIGHT	VISCOSITY	FILTRATION		SAND	SALT		pH	VISCOSITY			GELS		FILTRATE ANALYSIS				RETORT ANALYSIS			REMARKS AND TREATMENT
				cc	Cake 32nd		NoCl ppm	Cl ppm		cp	Pv	Yp	In	10min	MBT	Ca ppm	SO ₄ ppm	Alk Pf	Oil %	Water %	Solids %	
3.9	3216	1.68	52	2.4	1		2600	11.0		19	16	2	10	20.0	TR		.9		75	25	Flow well 1 1/2 hours.	
4.9	3216	1.68	51	2.2	1		2400	11.0		18	16	2	8	20.0	1.6		1.6		74	26	Flow well 1 1/2 hours.	
5.9	3202	1.68	60	2.4	1		2400	11.0		34	20	2	12	22.5	TR		1.8		74	26	Squeezed.	
6.9	3202	1.68	60	2.4	1		2400	11.0		34	19	2	12	22.5	80		1.8		74	26	Testing.	
7.9	3202	1.68	60	2.4	1		2600	11.0		34	20	2	12	22.5	80		1.9		74	26	Testing.	
8.9	3202	1.68	62	2.4	1		2400	11.0		28	20	2	10	22.5	TR		1.9	TR	74	26	Circulate. Testing.	
9.9	3202	1.68	61	2.5	1		2500	11.0		27	19	2	10	22.5	NIL		1.8	TR	74	26	Perforating.	
10.9	3202	1.68	62	2.5	1		2500	11.0		27	19	2	10	22.5			1.9		74	26	Squeezing.	
11.9	3202	1.68	60	2.5	1		2500	11.0		29	20	2	11	22.5			1.5	TR	76	24	Drill 40 m of cement.	
12.9	3020	1.68	65	2.5	1		2000	11.0		31	20	3	12	TR			1.6		76	24	Drill cement. Pressure test	
13.9	3020	1.68	66	2.5	1		2000	11.0		31	20	3	12	22.5			1.5		76	24	Pressure test cement job. Test.	
14.9	3126	1.68	66	2.5	1		2000	11.0		30	20	3	12	22.5	TR		1.5		76	24	Testing.	
15.9	3126	1.68	66	2.5	1		2000	11.0		30	20	3	12	22.5	TR		1.5		76	24	Testing.	
16.9	3115	1.68	72	2.6	1		5000	11.0		32	21	3	12	22.5	TR		1.6		76	24	Finish 3rd zone. RIH to cement 3rd.	
17.9	3111	1.68	65	2.6	1		5000	11.0		30	20	3	12	22.5	TR		1.5		76	24	Circulate. Squeeze cement. Begin 4th zone.	

VI TESTING SUMMARY

1. SUMMARY OF THE TESTING OF 1/9-3.

1/9-3 was tested from September 1st to September 22nd 1978. Four intervals were tested.

A detailed test report were issued at the PL 044 technical meeting in November, however, the following is a summary of test objectives and interpreted test results.

DST no. 1.

The main objective of this test was to investigate the kind of fluids which could be produced from right above an obvious transition zone in the Tor formation.

Table 1 gives a summary of test performance. The well was brought to surface without acid stimulation. Only one of the downhole pressure gauges were working properly.

Results were:

- pure water was produced with no measureable traces of hydrocarbons
- the second buildup indicates that a hydraulic fracture has developed with $X_f = 35$ ft. Only 2.2 bbls were injected back to the formation before the second flow
- the 2. buildup was long enough to develop a semi-log straight line corresponding to a $kh = 340$ md·ft. This is equivalent to a k in the range 10 md. This must imply that a certain amount of natural fractures are contributing to the flow.

DST no. 2.

The initial objectives of this test were to:

- investigate formation properties
- collect fluid samples
- evaluate acid frac stimulation effectiveness

This was planned to be a fairly long test. We did expect a certain water cut, but were surprised by the amount of water which was produced. For this reason the test was aborted after the second buildup.

Table 1 gives a summary of test performance.

Results from the test were:

- only 5% hydrocarbon were produced
- the formation permeability is about 1 md, hence there are no natural fractures contributing to flow.

DST no. 3.

The objective of this test was to evaluate if the hydrocarbons in the tight zone of the Ekofisk formation, might be included in the pay zone.

Table 1 gives a summary of test performance. The well was not really brought to surface. It was decided not to stimulate this well because one felt one might create communication with the DST 4 interval.

Results are:

- slight indications of hydrocarbons
- absolutely no natural fractures
- formation permeability in the range .015 md
- no contribution to the pay from the tight zone in Ekofisk formation.

DST no. 4.

The objectives of this test were:

- evaluate productivity of the Ekofisk formation
- collect samples from Ekofisk formation
- evaluate the feasibility of acid frac stimulation.

Table 1 gives a summary of test performance. The stimulation equipment broke down after the first stage, the

well was then flowed with a buildup and a new stimulation job was performed the next day. A long flow and a long buildup after the complete acid frac job was not achieved due to leaks on surface flow lines, but we feel that the results from the analysis are conclusive.

Results are:

- the Ekofisk formation have no natural fractures
- the average formation permeability is of the order .5 md
- the first incomplete acid frac job created a hydraulic fracture of the order $X_f = 55$ ft. The complete acid frac job created a fracture with X_f larger than 105 ft.

2. DST No. 1.

1. Test summary sheet
2. Teststring
3. Testsequence
4. Pressure, choke and rate diagram
5. Flow data

1. TEST SUMMARY SHEET

Well: 1/9-3

DST no.: 1

Date: 1/9-3/9-78

Formation: TOR

Perforations: 3205-3214 m RKB

Time [hrs]	event.	Rates			Pressure	
		oil STB/D	gas MMSCF/D	Water BBL/D	Well- head	bot- tomh.
0.5	1. flow	-	-	360	0	4800
3.25	1. build-up	-	-	-	-	6978
12.0	2. flow	-	-	1850	40	4630
12.0	2. build-up	-	-	-	-	6945

2. Teststring

The following is the layout of the teststring:

ID	OD	Description	length (m)	depth (m)
		DST 1		
		3½ TDS TBG.		
2.75	6.00	3½ TDS Box-3½ IF Pin	.28	2911.37
2.00	5.00	Slip Joint	5.58	2911.65
2.00	5.00	Slip Joint	4.80	2917.23
2.00	5.00	Slip Joint	4.02	2922.03
2.68	6.12	3½ IF Box-4½ IF Pin	.20	2926.05
2.81	6.50	3 Std of drill	85.16	2926.25
3.12	6.12	9 5/8 RTTS Circulating Valve	.97	3011.41
2.81	6.50	1 Std. of Drill Collars	28.45	3012.38
2.68	6.12	4½ IF Box-3½ IF Pin	.20	3040.83
2.00	5.00	Slip Joint	4.02	3041.03
2.75	6.12	3½ IF Box-4½ IF Pin	.20	3045.05
2.81	6.50	1 Std. Drill Collars	24.85	3045.25
2.75	6.12	4½ IF Box-3½ IF Pin	.20	3070.10
2.00	4.63	APR-A Reverse Valve	.91	3070.30
2.00	4.63	APR-N Tester Valve	4.16	3071.21
2.37	4.63	Big John Jars	1.58	3075.37
2.68	6.12	3½ IF Box-4½ IF Pin	.20	3076.95
3.12	6.12	9 5/8 RTTS Circulating Valve	.97	3077.15
3.12	6.12	9 5/8 RTTS Safety Joint	1.10	3078.12
3.75	8.25	9 5/8 RTTS Packer (Model II)	.68	3079.22
			1.10	3181.00
2.50	6.06	4½ IF Box-2 7/8 EUE Pin	.25	3182.10
2.44	2.87	Tubing Pup Joint	1.86	3182.35
2.44	2.87	Perforated Tubing	1.22	3183.57
1.81	2.87	No-Go Nipple	.63	3184.20
2.44	2.87	2 Joint Tubing/W/Plug	18.73	

3. Testsequence

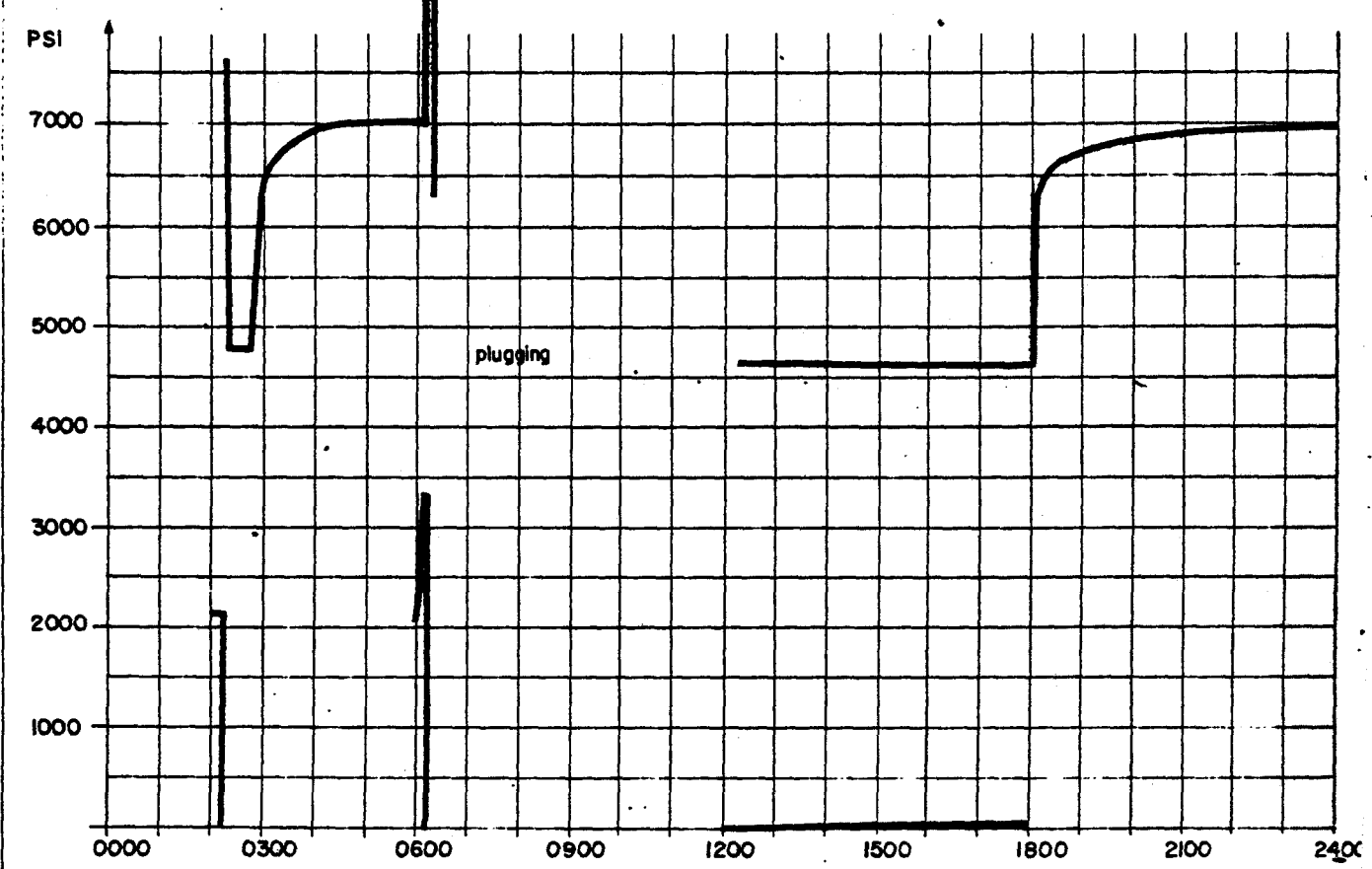
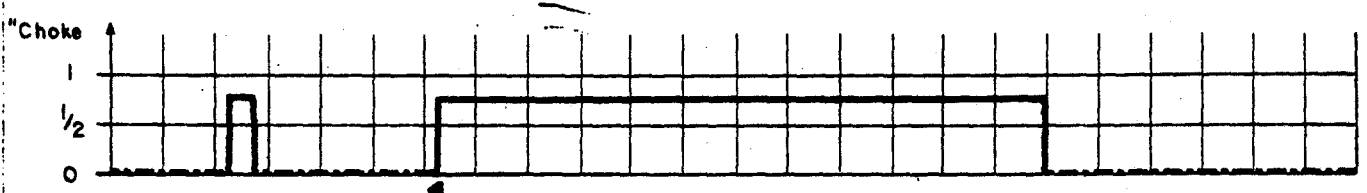
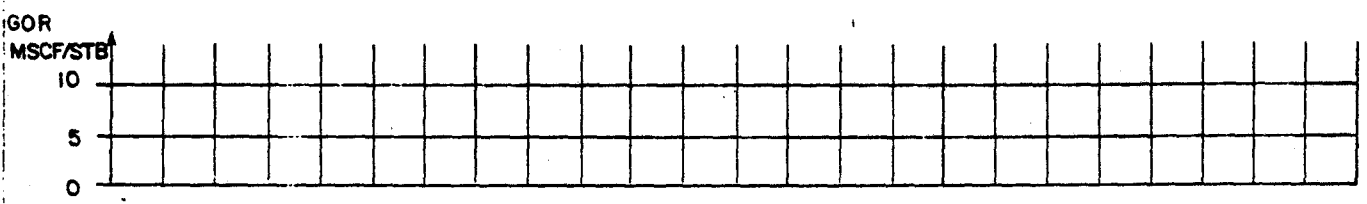
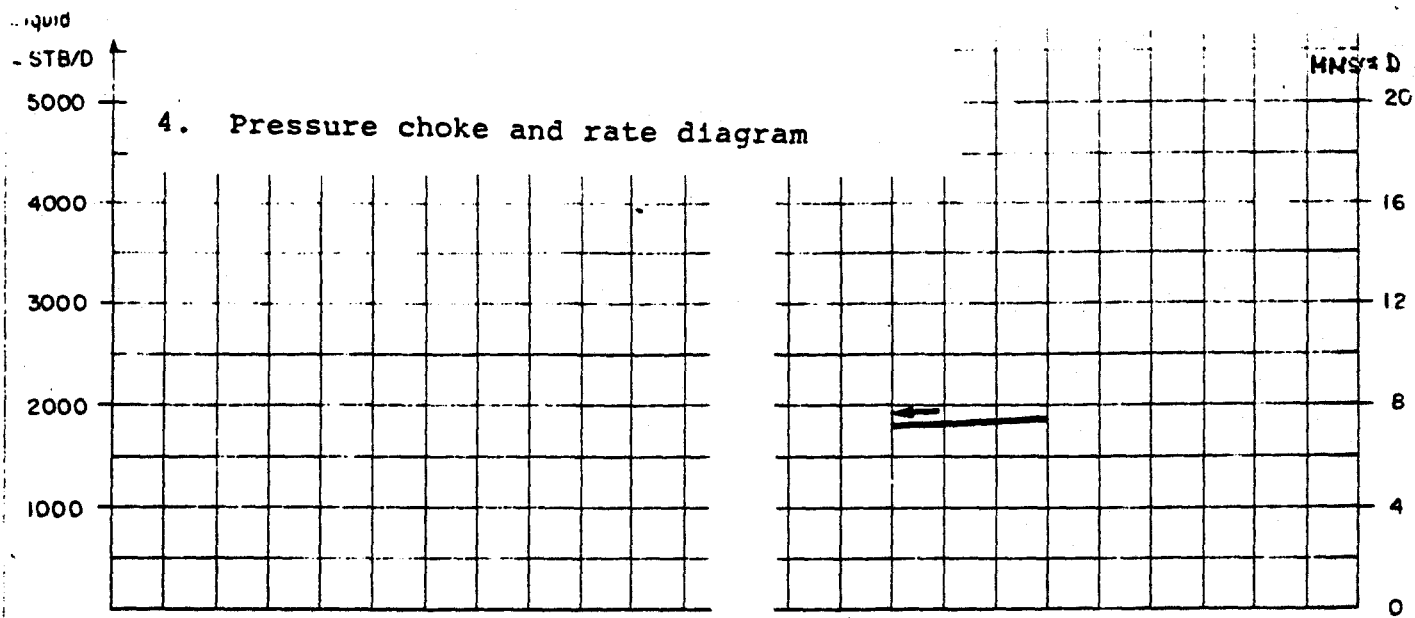
DIARY OF EVENTS		WELL No <u>-1/9-3</u>	DST No: <u>1</u>
		ZONE TESTED: <u>TOR</u>	PERFS. : <u>3205-3214m RKB</u>
DATE	TIME	OPERATIONS	
31.8.78	1700	Rih w/perf gun, perf 3205-3214m RKB.	
		w/4sh/ft, no misfire, pooh w/perf gun	
	1900	Pick up flopetrol test tree, tighten jts	
		w/rightong	
	2000	Pick up howco testring with gauges as follows	
		<u>Gauge</u>	<u>No</u>
		<u>Max pressure</u>	<u>Clock hrs</u>
		<u>Clock No</u>	<u>Depth m</u>
		Amerada 36405	12000 psi
		120	6842
		3196.5	
		Amerada 41677	12000 psi
		120	17277
		3198.4	
		Amerada 36396	12000 psi
		72	5570
		3200.4	
		Kuster 41680	100-2000C
		120	17276
		3201.3	
1.9.78	0130	Pressure tested howco string to	
		4000 psi	
	0230	Rih w/test string gatorhawking all connections	
		to 8000 psi - 6500 psi	
	1700	Made up test tree and surface lines	
		set packer at 3181 m	
	1830	Pressure tested surface lines, test tree,	
		valves, choke manifold and string	
	2330	Displaced string with water cushion-74 bbls	
2.9.78	00.30	Closed rrts circ. valve and pressure tested	
		surface lines and string against apr-n	
		to 6000 psi	
COMMENTS :			
PE : _____			

DIARY OF EVENTS	WELL No	1/9-3	DST No	1
	ZONE TESTED:	TOR	PERFS.	3205-3214m RKB

DATE	TIME	OPERATIONS
	0200	Pressured tubing to 1790 psi
	0215	Opened apr-n valve, pressure increased to 2100 psi, flowed well to bj-unit.
		wellhead pressure bled down to zero
		flowrate 7.5 bbl/30 mins.
	0245	Closed apr-n, closed on surface for 1. build-up
	0601	Pressured tubing to 1750 psi
	0604	Opened apr-n valve, positive indication
	0606	Pumped back to the formation, .8 bbl were pumped when the formation broke down at 3600 psi, 2.2 bbl were injected at a pressure 3500 psi
	0616	Started 2. flow, monitored rates at the bj-unit, flowed 13 bbls/21 mins.
		zero wellhead pressure
	0640	Switched flow to burner, clean-up line. water cushion was produced
	0800	Mud to surface
	0930	Produced a brownish water phase, well was slugging
	1400	Flowed through flopetrol gauge tank
	1759	Closed apr-n valve for 2 build up closed on surface.
3.9.78	0613	Opened apr-n valve, good indication
	0623	Started to bullhead well.

COMMENTS :

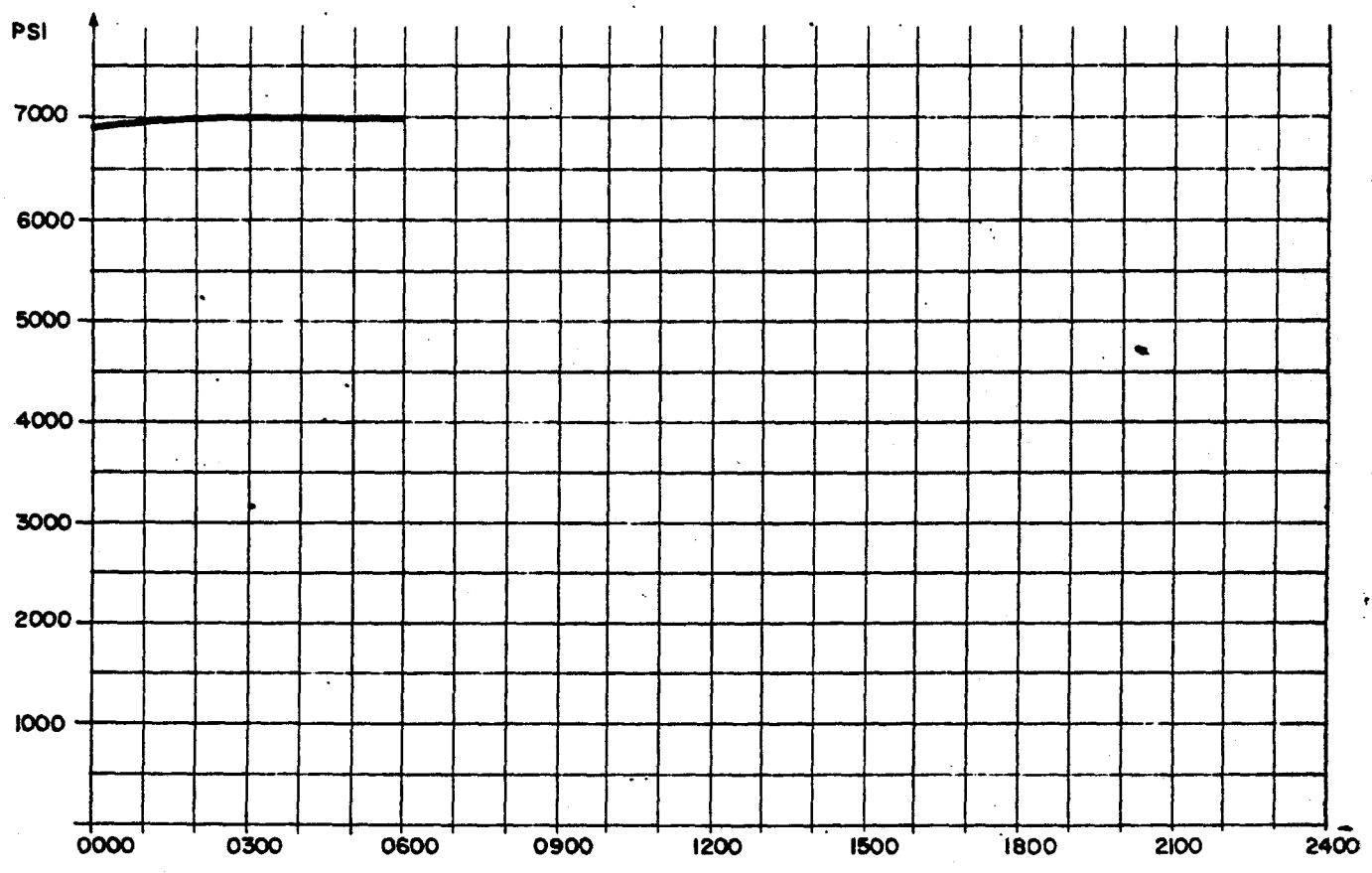
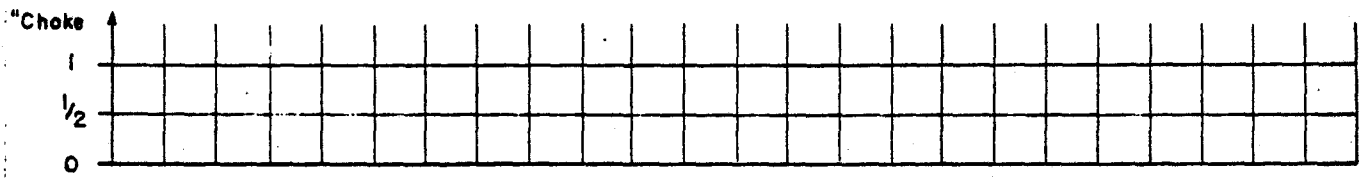
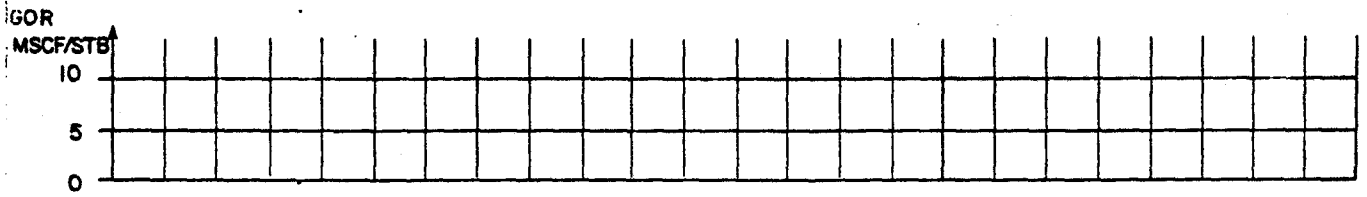
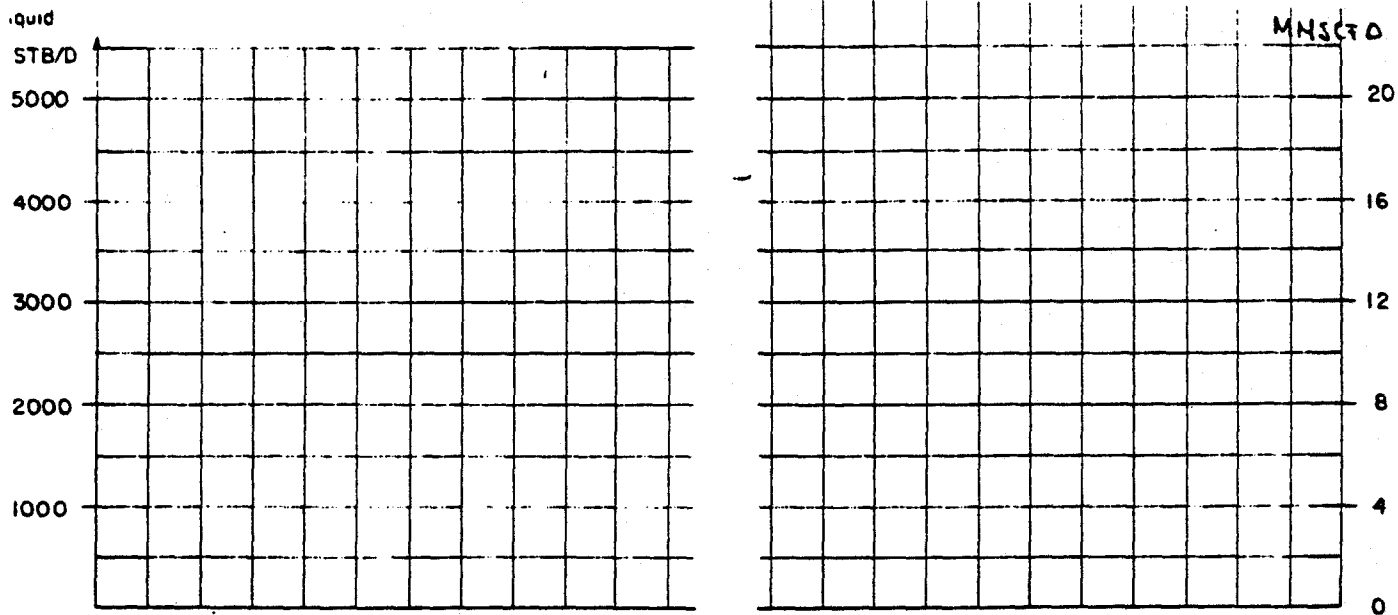
PE : _____



WELL: 1/9-3

DST NO: 1

DATE: 020978



WELL: 1/9-3

DST NO: 1

DATE: 030978

DATO: 2.9.78		OPERASJON: 2. FLOW											Ark nr.: 1 av 2						
BRØNN: 1/9-3		DST nr.: 1		Perforet interval: 3205-3214m RKB					Trykkmåler: dybde:										
Tid	Operasjon	DST D	WHP DN	WHT F	BHP DN	BHT F	Sep. tryk pas	Sep. temp. F	Geomet. AN/SCFD	Vann STØFD	GOR SCF/STB	Gjo API	Gsm L.P.	Væskeanalyse på rigg					Merknad
														Sted	Vann MUS	Sediment %	Cl-ppm	Gjo API	
0900		48	15	90		252.3								b.h.	66	34			
0930		"	<12	91										b.h.	84.5	15.5			
1000		"	<12	97		253.8											17800		
1015		"	<12	98										b.h.	89	11.0			
1030		"	<12	100										"	90	10.0			
1045		"	<12	96										"	92	8			
1100		"	13	104		255.4								"	85	15.0	22700		
1115		"	13	107										"	93	7			
1130		"	13	109										"	97.5	2.5	22500		
1145		"	18	111										"	97	3			
1200		"	19	111		255.6								"	93	7	24800		
1215		"	20	114	4641									"	99	1	24400		
1230		"	22	117	4639									"	99	1	25600		
1245		"	22	119	4619									"	98.5	1.5	26800		
1300		"	21	120	4613	255.6								"	99.2	0.8	29400		
1330		"	17	121	4613									"	99.3	0.7	34000		
1400		"	28	125	4627	255.6								"	99.6	0.4	34000		
1445		"	35	129	4634					2004				"	99.65	0.35	36000		
1500		"	35	129	4624	255.7				1953				"					
1515		"	35	131	4624					1522				"	99.75	.25	36000		
1530		"	36	132	4635					1877				"					
1545		"	37	133	9635					2004				"	99.8	.2	40000		
1600		"	28	132	4590	255.9				1927				"					
1615		"	29	132	4614					1648				"	99.8	.2	40000		
1630		"	30	134	4620					1547				"					
1645		"	39	135	4600					1978				"	99.85	.15	42000		

5. FLOW data

3. DST No. 2.

1. Test summary sheet
2. Teststring
3. Testsequence
4. Pressure, choke and rate diagram
5. Flow data

1. TEST SUMMARY SHEET

Well: 1/9-3

DST no.: 2

Date: 6.9.78 - 7.9.78

Formation: Tor

Perforations: 3157-3180m RKB

Time [hrs]	event.	Rates			Pressure	
		oil STB/D	gas MMSCF/D	Water BBL/D	Well- head	bot- tomh.
.50	1. flow	-	-	418	0	5050
3.02	1. build up	-	-	-	-	6997
10.78	2. flow	50	.17	1100	200	3700
11.22	2. build up	-	-	-	-	6850

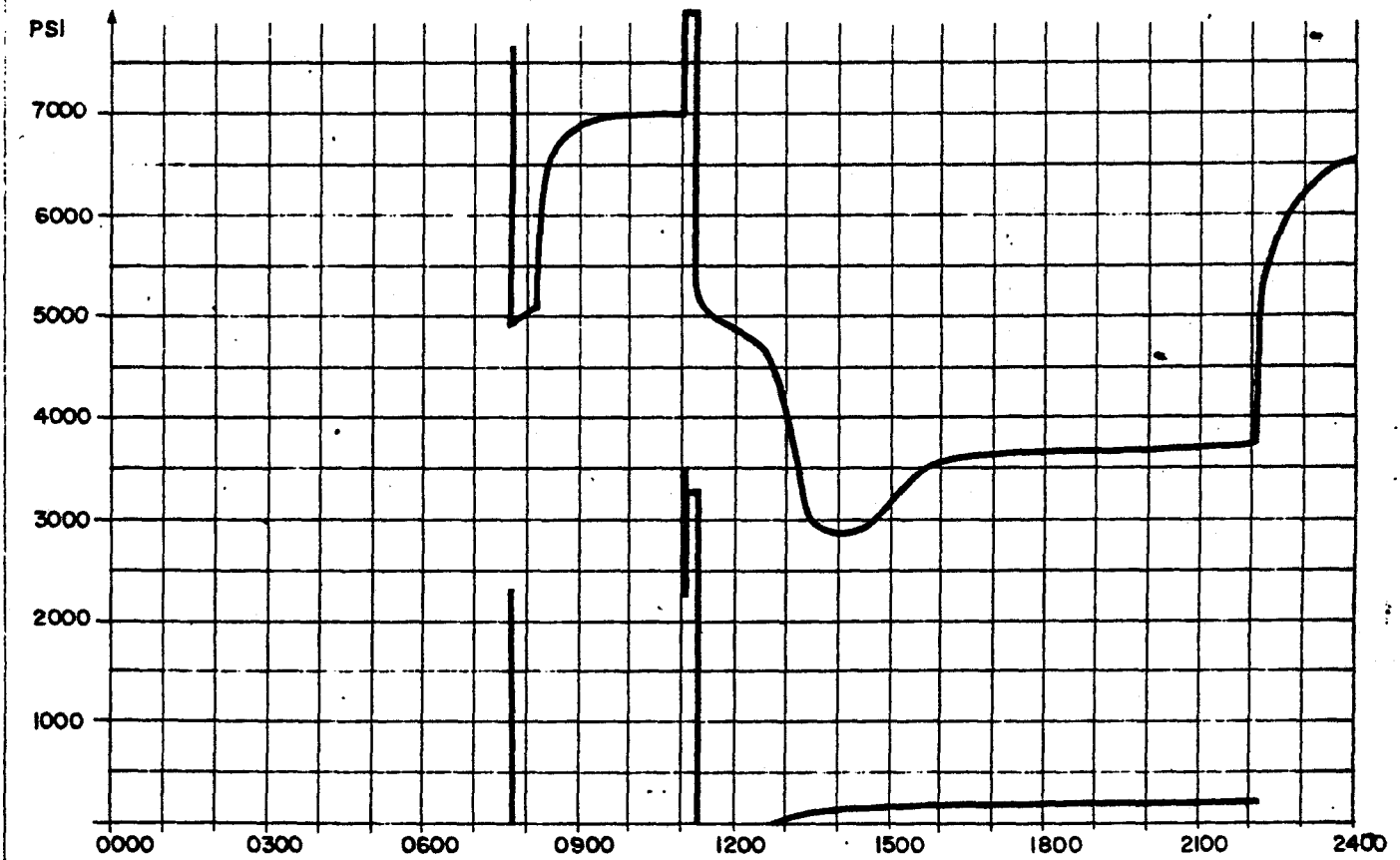
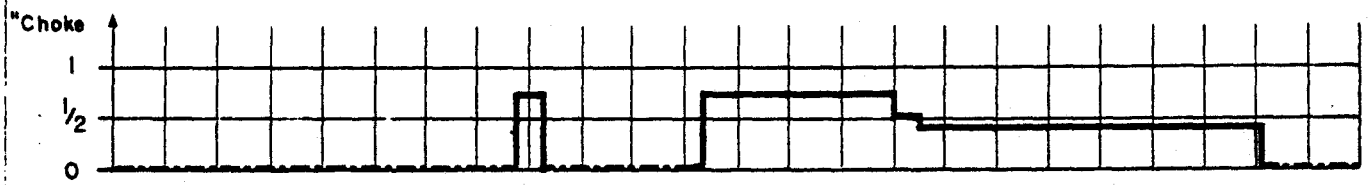
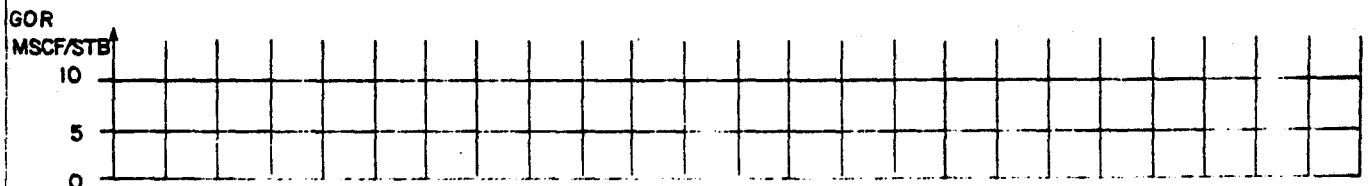
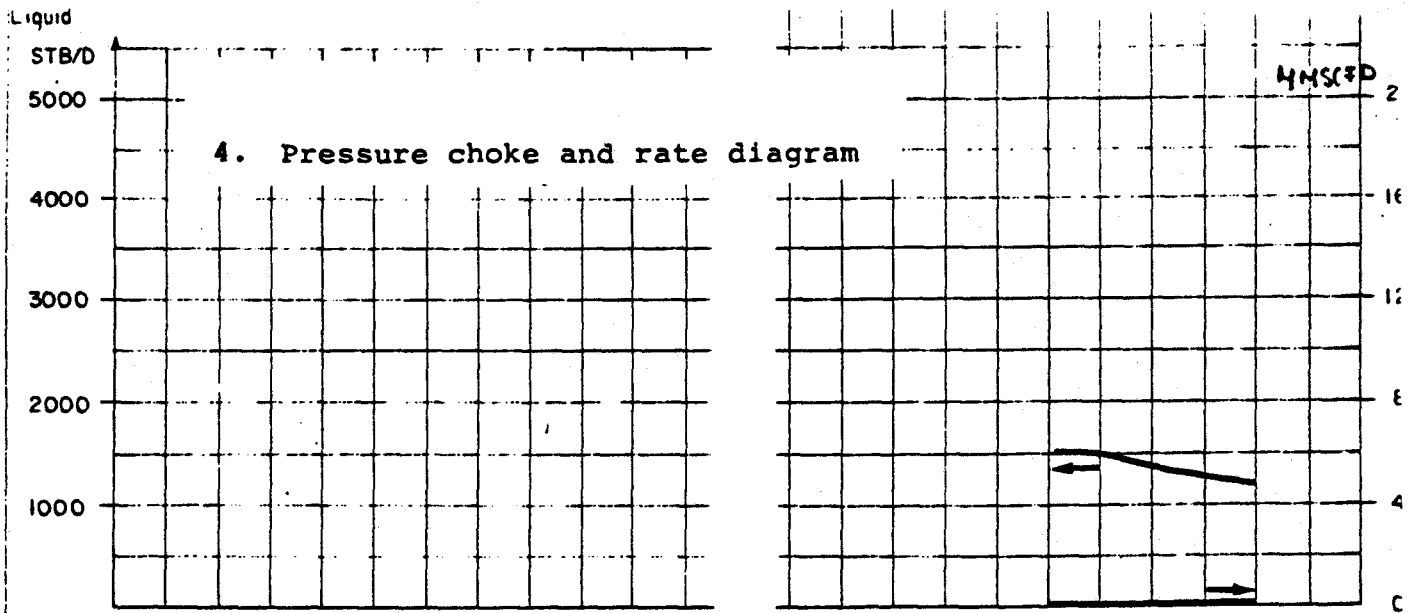
2. Teststring

The following is the layout of the teststring:

ID	OD	Description	length(m)	depth (m)
		DST No 2		
		3½ TDS TBG.		2964.87
2.75	6.00	3½ TDS Box-3½ IF Pin	.28	2965.15
2.00	5.00	Slip Joint	5.58	2970.73
2.00	5.00	Slip Joint	4.80	2975.53
2.00	5.00	Slip Joint	4.02	2975.55
2.68	6.12	3½ IF Box-4½ IF Pin	.20	2979.75
2.81	6.50	3 Std of drill	85.16	3064.91
3.12	6.12	9 5/8 RTTS Circulating Valve	.97	3065.88
2.81	6.50	1 Std. of Drill Collars	28.45	3094.33
2.68	6.12	4½ IF Box-3½ IF Pin	.20	3094.53
2.00	5.00	Slip Joint	4.02	3098.65
2.75	6.12	3½ IF Box-4½ IF Pin	.20	3098.75
1.11	6.50	1 Std. Drill Collars	24.85	3127.20
2.75	6.12	4½ IF Box-3½ IF Pin	.20	3127.4
2.00	4.63	APR-A Reverse Valve	.91	3128.31
2.00	4.63	APR-N Tester Valve	4.16	3132.47
2.37	4.63	Big John Jars	1.58	3134.05
2.68	6.12	3½ IF Box-4½ IF Pin	.20	3134.25
3.12	6.12	9 5/8 RTTS Circulating Valve	.97	3135.22
3.12	6.12	9 5/8 RTTS Safety Joint	1.10	3136.32
3.75	8.25	9 5/8 RTTS Packer (Model II)	.68 1.10	3137 3138.1
2.50	6.06	4½ IF Box-2 7/8 EUE Pin	.25	3138.35
2.44	2.87	Tubing Pup Joint	1.86	3140.21
2.44	2.87	Perforated Tubing	1.22	3141.43
1.81	2.87	No-Go Nipple	.63	3142.06
2.44	2.87	2 Joint Tubing/W/Plug	18.73	3160.79

3. Testsequence

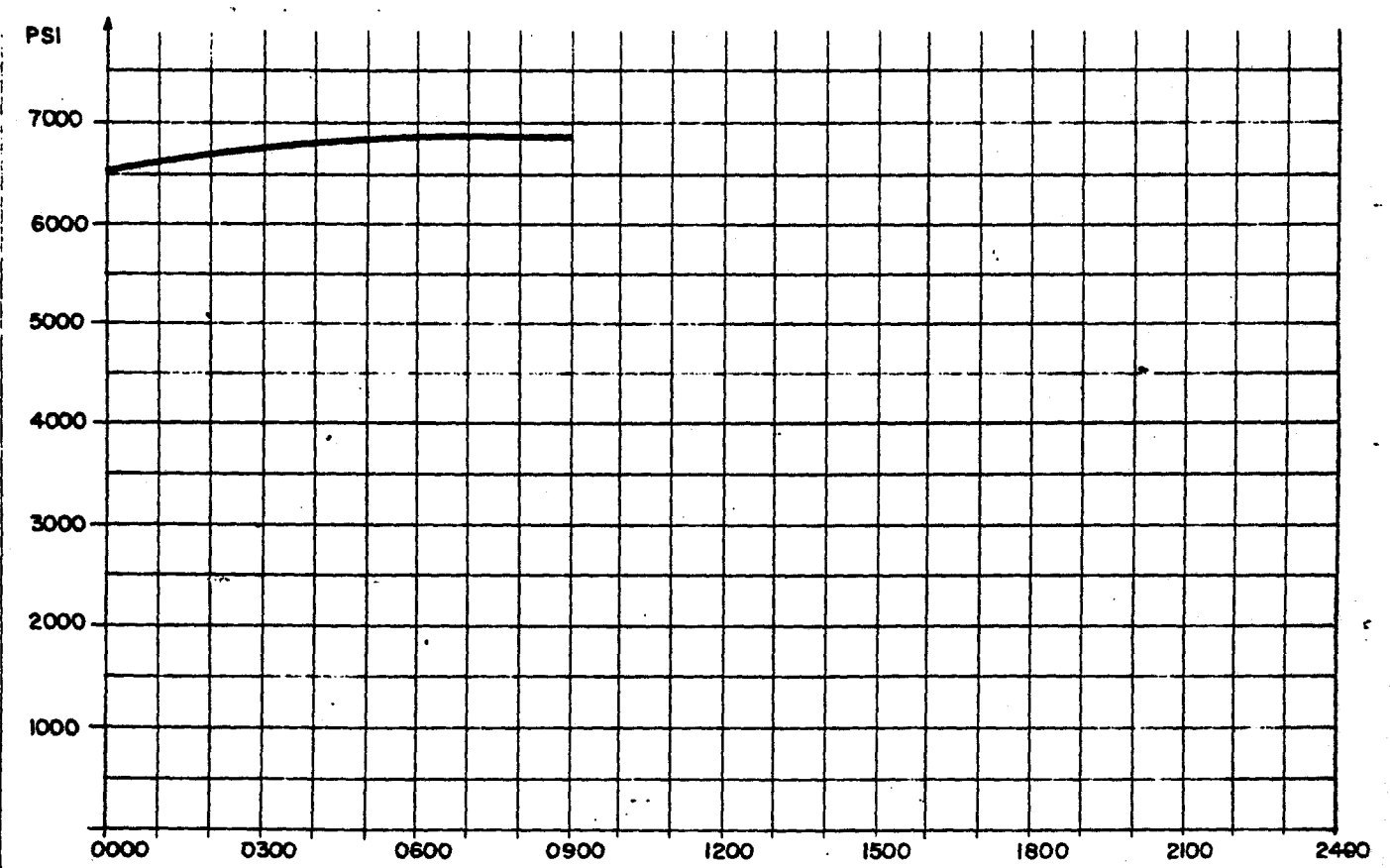
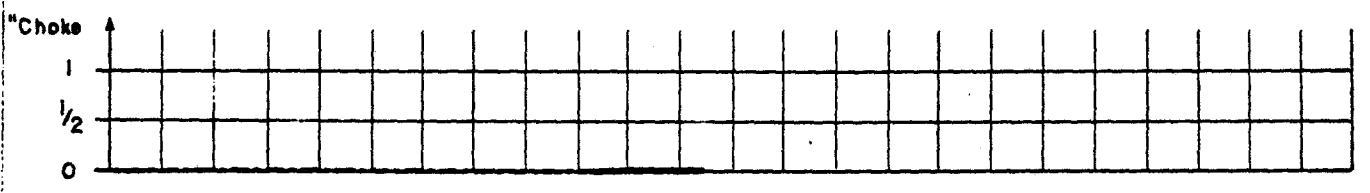
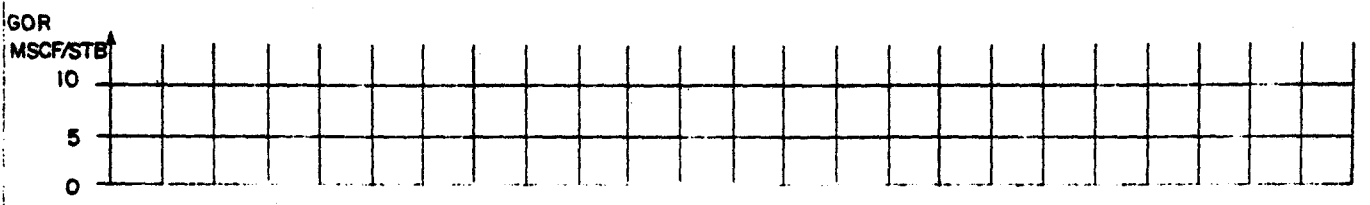
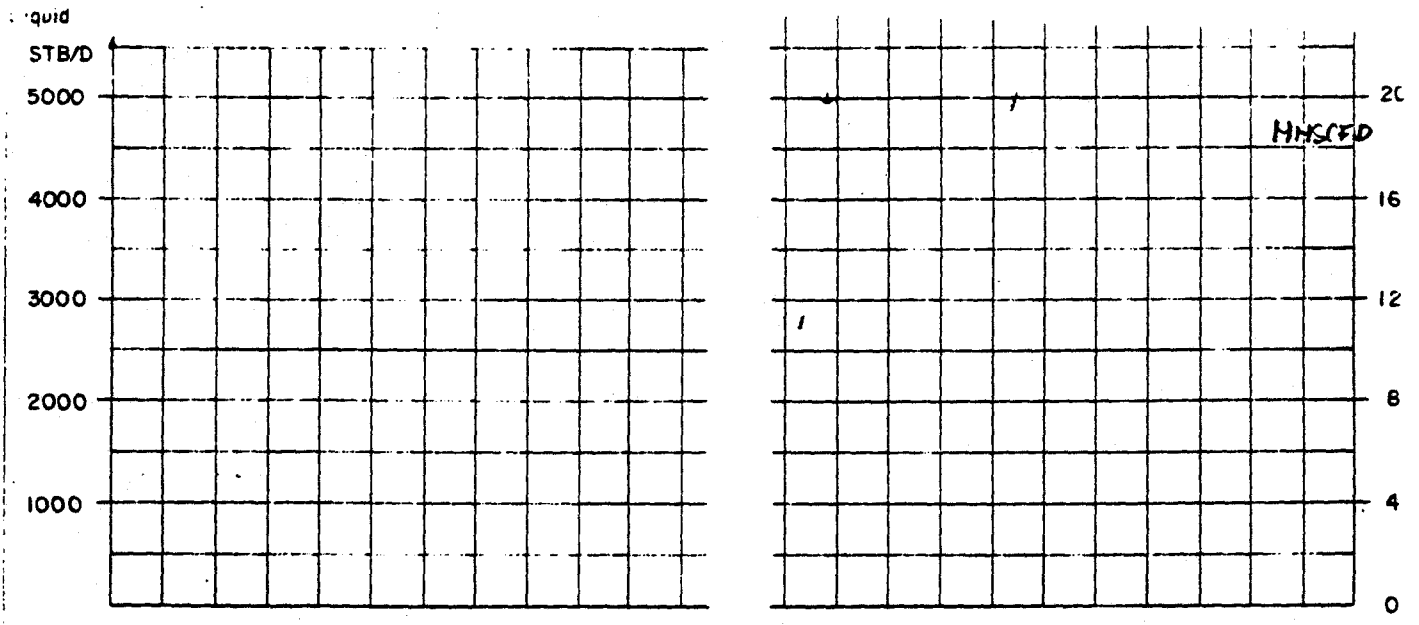
DIARY OF EVENTS		WELL No. <u>1/9-3</u>	DST No. <u>2</u>
		ZONE TESTED: <u>Tor</u>	PERFS. : <u>3157-3180m RKB</u>
DATE	TIME	OPERATIONS	
5.9.78			
	0600	Rigged up dresser atlas, made 3 run with perforating gun, 4 spf from 3157 to 3180m RKB	
	1630	Made up test tree and laid same back down	
	1730	Made up bottom hole assembly, tested to 4000 psi. The following gauges were run:	
		<u>Gauge</u>	<u>Clock</u> <u>Depth [m]</u>
		Amerada 36405-12000 psi	120 hrs 3154.9
		Amerada 41611-12000 psi	120 hrs 3152.9
		Amerada 36396-12000 psi	72 hrs 3157.0
		Kuster 41680-100-200°C	120 hrs 3158.9
	2200	Rih W/test string	
6.9.78			
	0632	Set packer at depth 3137.2m RKB	
	0647	Displaced tubing with water	
	0721	Close rtts circulating valve, tested tubing	
	0739	Tubing pressure 1865 psi	
	0742	Opened apr-n valve, pressure increased to 2300 psi	
	0742	Flowed well to b-j unit, 8.7 bbls were produced in 30 mins, zero wellhead pressure.	
COMMENTS :			
PE : _____			



WELL: 1/9-3

DST NO: 2

DATE: 060978



WELL: 1/9-3

DST NO: 2

DATE: 070978

DATE:

OPERASJON: 2. Flow

Ark nr. 1 av 2

BRØNN: 1/9-3

DST nr.: 2

Perforet interval: 3157-3180m RKB

Trykkmåler: dybde:

Tid	Operasjon	L O 3	WHP DN	WHT P	BNP DN	BHT F	Sep. trykk pda	Sep. temper. P	Gassrate MBCFD	Liquid STBOPD	GOR SCF-STB	Ose API	Gass s. s.	Væsteanalyse på rigg					Merknad		
														Sted	Vann %	Sediment %	Ose %	Ose API			
1200		48	<12		4891	239.2															
1300		"	<12		4316	242.6															
1315		"	70		3816																
1330		"	60	88	2901																
1345		"	160	89	2716																
1400		"	150	97	2816	242.4										50	5	45			
1415		"	120	85	3011																
1430		"	195	85	3127											67	5	28			
1445		"	110	91	3087											80	3	17			
1500		"	130	87	3118	247.8															
1515		32	110	87	3237											95.5	2	2.5			
1530		24	95	87	3431																
1545		"	155	88	3567											79.7	1.3	20			
1600		"	209	90	3578											88	2	10			24000 ppm cl-
1615		"	187	91	3619																
1630		"	200	92	3629																
1645		"	156	93	3670																
1700		"	161	93	3712	248.9										90.8	1.2	9			35000 ppm cl-
1715		"	206	96	3694																
1730		"	209	96	3670		75	80	.171				.725		89.5	.5	10				
1745		"	197	96	3667		75	85	.170	1470			"								
1800		"	196	96	3667	250.2	73	90	.174	1490			"		89.6	.4	10				37000 ppm cl-
1815		"	209	98	3673		73	92	.170	1494			.750								
1830		"	213	99	3680		75	93	.171	1448			"		89.5	.5	10				
1845		"	203	99	3666		75	94	.170	1586			"								
1900		"	205	100	3666	250.9	75	94	.169	1505			"		94	1.0	5				39000 ppm cl-

5. Flow data

4. DST. No. 3.

1. Test summary sheet
2. Teststring
3. Testsequence
4. Pressure, choke and rate diagram
5. Flow data

Table 1

1. TEST SUMMARY SHEET

Well: 1/9-3

DST no.: 3

Date: 9-14.9

Formation: Ekofisk

Perforations: 3126-3135m RKB

Time [hrs]	event.	Rates			Pressure	
		oil STB/D	gas MMSCF/D	Water BBL/D	Well- head	bot- tomh.
0.50	1. flow			19.2	0	4620
3.40	1. buildup			-	-	6889
29.80	2. flow			16.2	0	4749

2. Teststring

The following is the layout of the teststring:

ID	OD	Description	length (m)	depth (m)
		DST 3		
		3½ TDS TBG.		
2.75	6.00	3½ TDS Box-3½ IF Pin	.28	2926.73
2.00	5.00	Slip Joint	5.58	2927.01
2.00	5.00	Slip Joint	4.80	2932.59
2.00	5.00	Slip Joint	4.02	2937.39
2.68	6.12	3½ IF Box-4½ IF Pin	.20	2941.41
2.81	6.50	3 Std of drill	85.16	2941.61
3.12	6.12	9 5/8 RTTS Circulating Valve	.97	3026.77
2.81	6.50	1 Std. of Drill Collars	28.45	3027.74
2.68	6.12	4½ IF Box-3½ IF Pin	.20	3056.28
2.00	5.00	Slip Joint	4.02	3056.48
2.75	6.12	3½ IF Box-4½ IF Pin	.20	3060.20
2.81	6.50	1 Std. Drill Collars	24.85	3060.70
2.75	6.12	4½ IF Box-3½ IF Pin	.20	3089.24
2.00	4.63	APR-A Reverse Valve	.91	3089.44
2.00	4.63	APR-N Tester Valve	4.16	3090.35
2.37	4.63	Big John Jars	1.58	3094.51
2.68	6.12	3½ IF Box-4½ IF Pin	.20	3096.09
3.12	6.12	9 5/8 RTTS Circulating Valve	.97	3096.29
3.12	6.12	9 5/8 RTTS Safety Joint	1.10	3097.26
3.75	8.25	9 5/8 RTTS Packer (Model II)	.68 1.10	3098.36 3099.04
2.50	6.06	4½ IF Box-2 7/8 EUE Pin	.25	3100.14
2.44	2.87	Tubing Pup Joint	1.86	3100.39
2.44	2.87	Perforated Tubing	1.22	3102.25
1.81	2.87	No-Go Nipple	.63	3104.10
2.44	2.87	2 Joint Tubing/W/Plug	18.73	3122.83

3. Testsequence

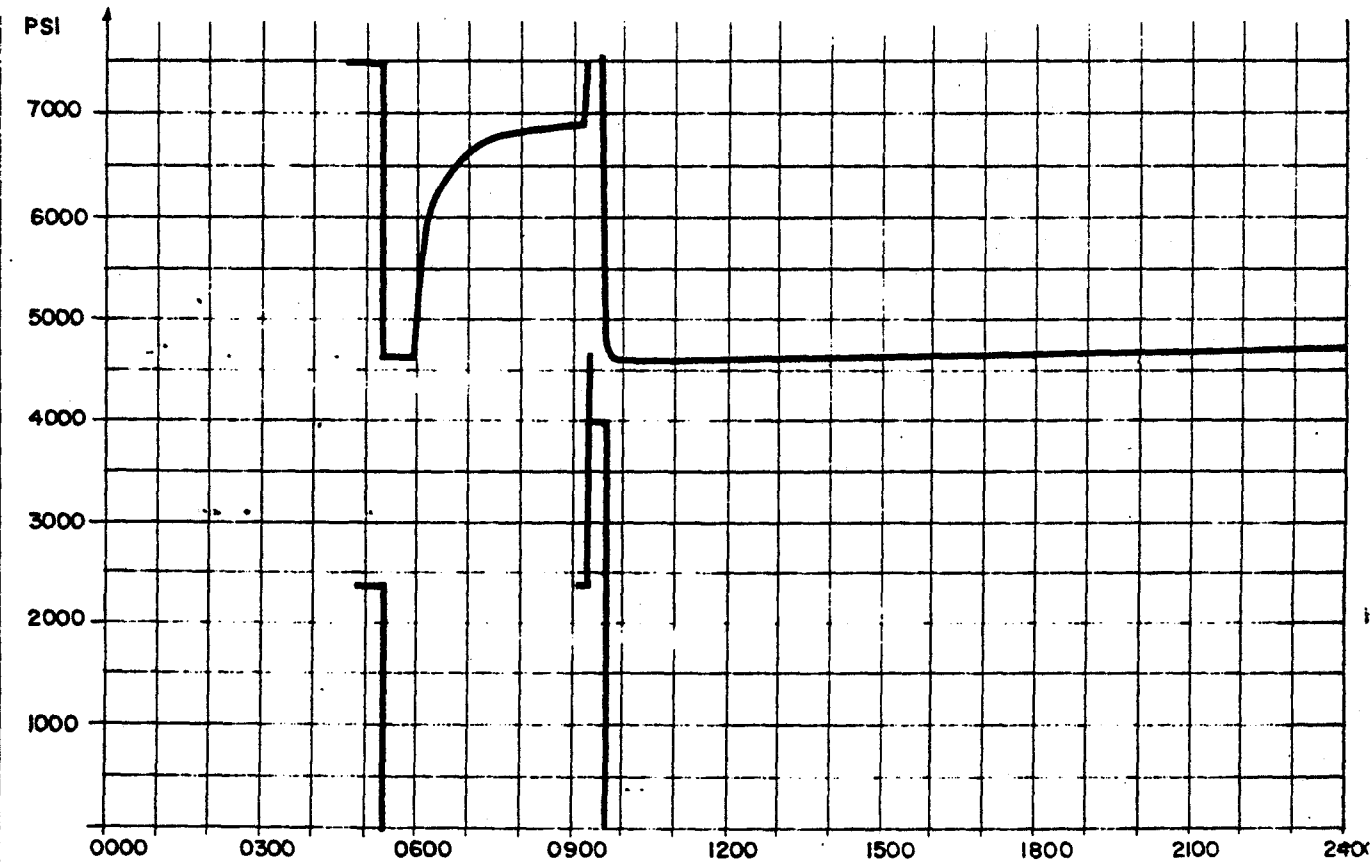
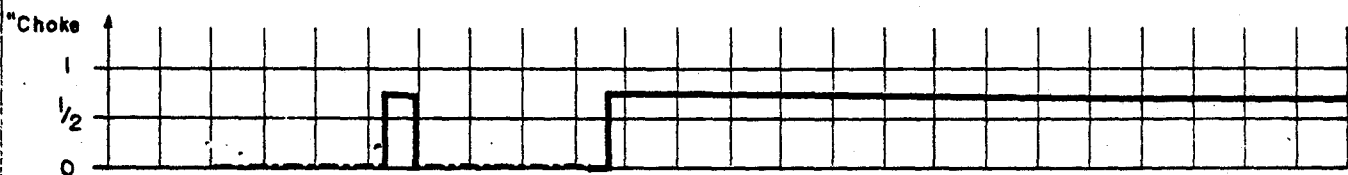
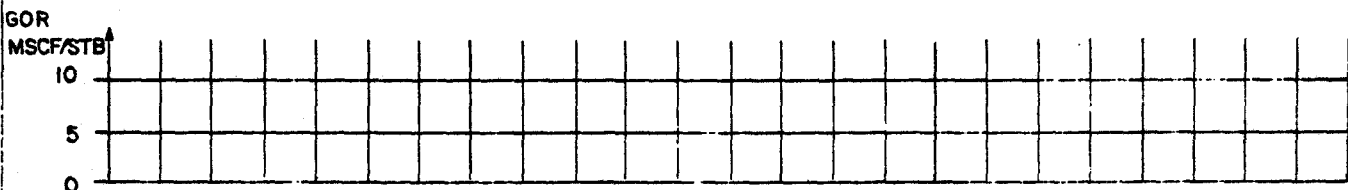
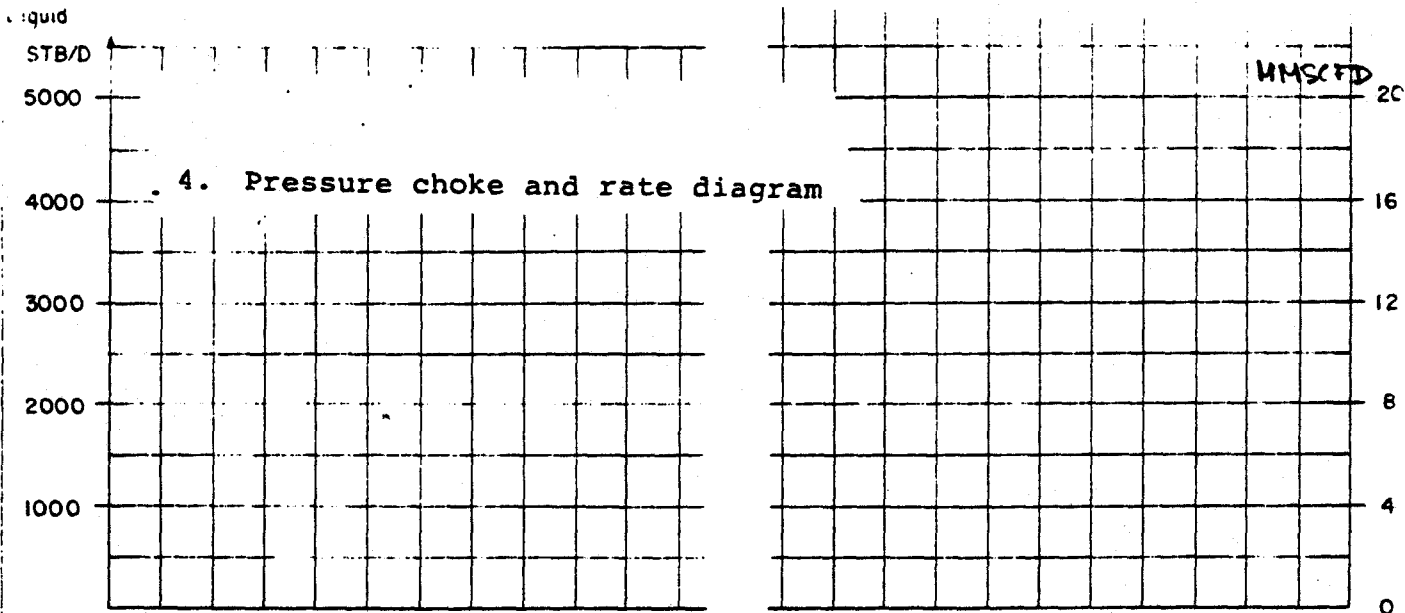
DIARY OF EVENTS		WELL No <u>- 1/9-3</u>	DST No <u>3</u>
		ZONE TESTED: <u>Ekofisk</u>	PERFS. <u>3126-3135 RKB</u>
DATE	TIME	OPERATIONS	
12.9.78			
	1030	Rigged up Dresser Atlas, perforated w/4spf from 3126-3135m RKB, rigged down	
	1430	Made up bottom hole assembly with the following gauges:	
		<u>Gauge</u>	<u>No</u> <u>Clock no/hrs</u> <u>Depth(m)</u>
		Amerada 12000psi	36405 1942/120 3116.9
		Amerada 12000psi	41677 1943/120 3114.9
		Amerada 12000psi	36396 5570/72 3118.9
		Kuster 100-200°C	41680 17276/120 3112.9
		Tested against apr-n to 4000 psi, rih with teststring	
13.9.78			
	0200	Rigged up test tree and surface lines, pressure tested to 8000 psi	
	0230	Set packer, closed circulating valve and tested string to 4000 psi. Displaced string with water, closed circulating valve and tested string to 7000 psi.	
	0500	Tubing pressure 2200 psi	
	0522	Opened apr-n, tubing pressure increased to 2360 psi	
	0526	Flowed through 3/4" choke to Flopetrol surge tank, pressure decreased to zero in 20 sec.	
COMMENTS :			
PE : _____			

DIARY OF EVENTS	WELL No <u>-1/9-3</u>	DST No <u>3</u>
	ZONE TESTED: <u>Ekofisk</u>	PERFS. <u>3126-3135 PKB</u>

DATE	TIME	OPERATIONS
	0529	Closed choke manifold, flowed through
		bubble hose, rate .4 bbl/30 mins
	0557	Closed apr-n valve for l. buildup
	0921	Opened apr-n
	0925	Injected back to formation, formation broke
		down at 4650 psi, injected 1.5 bbl at a
		pressure of 4000 psi, injection rate
		0.3 bbl/min
	0942	Tubing pressure 3750 psi, opened well
		for flow through 3/4", pressure
		dropped to zero
	0943	Flowed through bubble hose to
		a barrel on the floor
	1800	Run in hole with bottom hole sampler, run no 1
	1940	Sampler closed at -1530m, pooh. Content
		drillwater and 2-3 ml oil
	2025	Rih with sampler, run no 2
	2210	Sampler closed at -3075m, pooh. Content
		mud, drillwater and 1-3 ml crude oil
14.9.78	0800	Rih with sampler, run no 3
	0950	Sampler closed at -3075m, pooh. Content
		mud, drillwater and traces of oil
	1200	Rih with sampler, run no 4
	1330	Sampler closed at -3075m,
		pooh. Content mud bleeding gas
	1515	Closed apr-n valve
	1530	Reverse circulated content of tubing

COMMENTS :

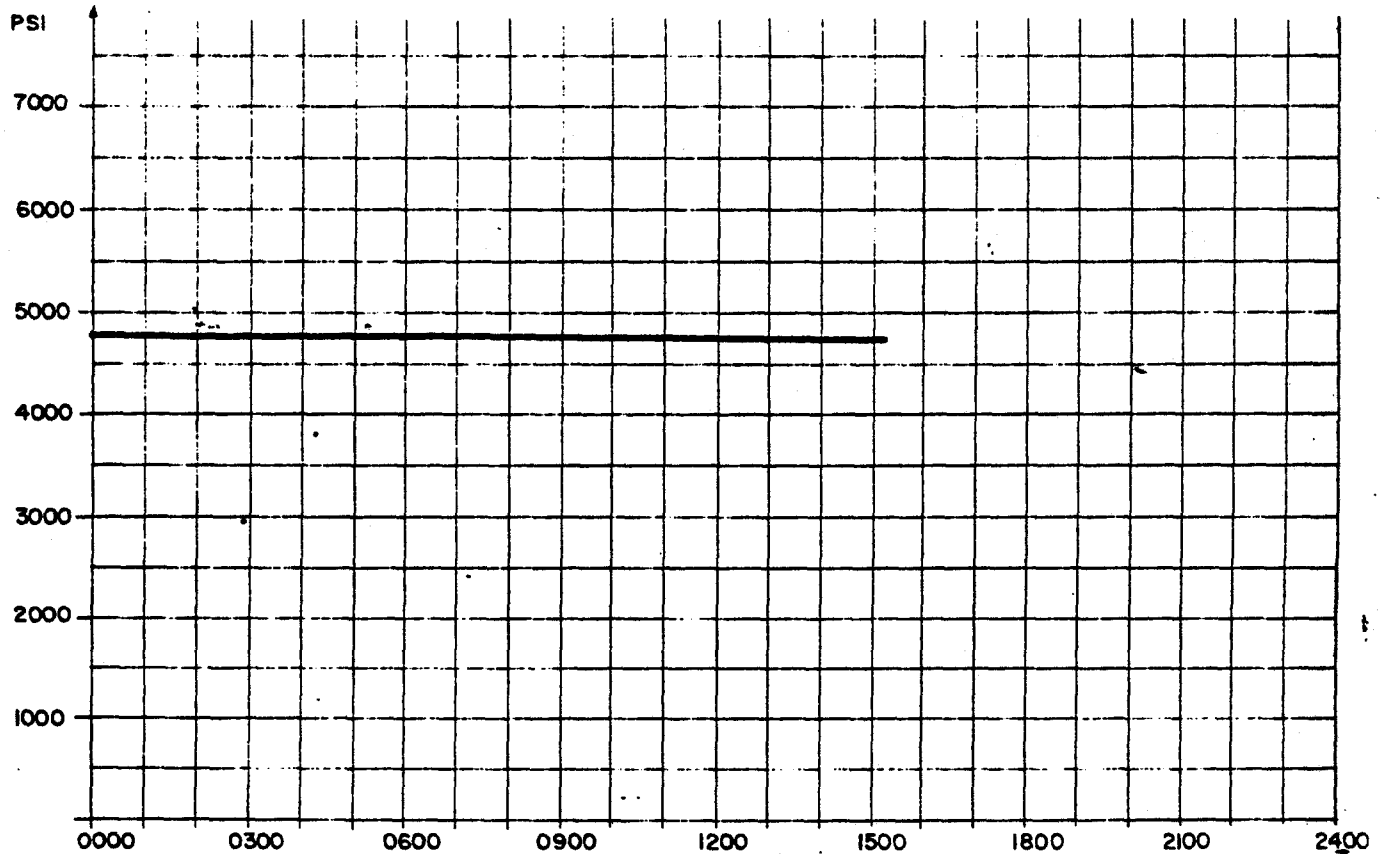
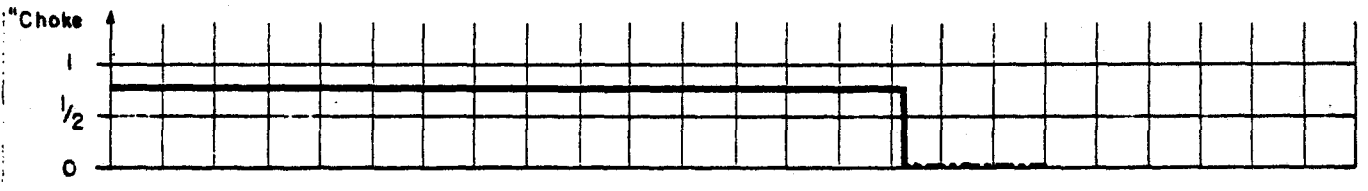
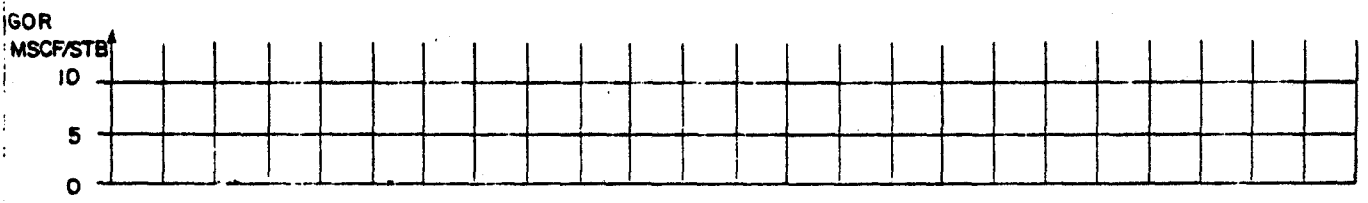
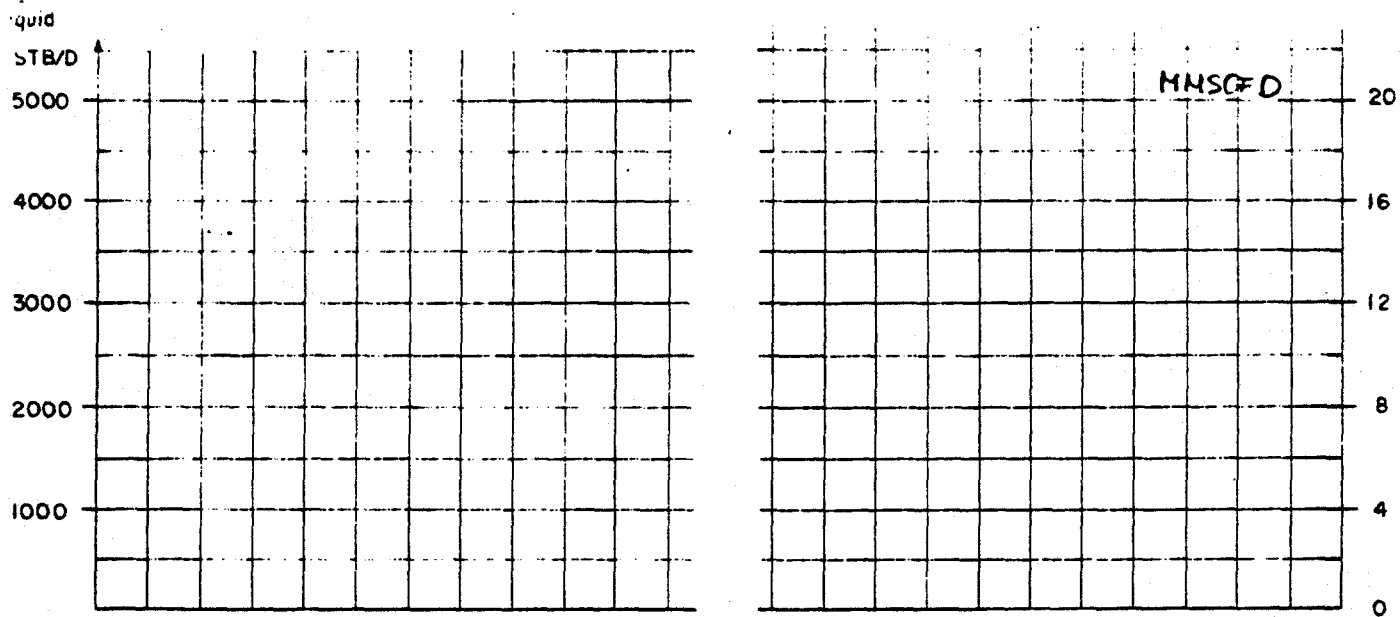
PE : _____



WELL: 1/9-3

DST NO: 3

DATE: 130978



WELL: 179-3

DST NO: 3

DATE: 140978

5. DST No. 4.

1. Test summary sheet
2. Teststring
3. Testsequence
4. Pressure, choke and rate diagram
5. Flowdata

Table 1

1. TEST SUMMARY SHEET

Well: 1/9-3

DST no.: 4

Date: 18.9-21.9 1978

Formation: Ekofisk

Perforations: 3094-3112m RKB

Time [hrs]	event.	Rates			Pressure	
		oil STB/D	gas MSCF/D	Water BBL/D	Well- head	bot- tomh.
.53	initial flow	-	-	456	0	4800
3.20	initial buildup					6953
16.38	2. flow	300	4.1	-	300	1095
24.18	2. buildup					6806
7.22	stimulation, wirelinework					
8.53	3. flow	1400	18.5	-	1100	3800
13.18	3. buildup					6202
13.00	wireline work, complete stimulation program					
2.20	Opened/closed well, leaks					
7.50	4. flow	2500	23.0	-	1500	5170
2.0	Closed/opened well, leaks					

2. Teststring

The following is the layout of the teststring:

ID	OD	Description	length (m)	depth (m)
		DST 4		
		3½ TDS TBG.		
2.75	6.00	3½ TDS Box-3½ IF Pin	.28	2893.36
2.00	5.00	Slip Joint	5.58	2893.64
2.00	5.00	Slip Joint	4.80	2899.22
2.00	5.00	Slip Joint	4.02	2904.02
2.68	6.12	3½ IF Box-4½ IF Pin	.20	2908.04
2.81	6.50	3 Std of drill	85.16	2908.24
3.12	6.12	9 5/8 RTTS Circulating Valve	.97	2993.40
2.81	6.50	1 Std. of Drill Collars	28.45	2994.32
2.68	6.12	4½ IF Box-3½ IF Pin	.20	3022.82
2.00	5.00	Slip Joint	4.02	3023.02
2.75	6.12	3½ IF Box-4½ IF Pin	.20	3027.04
.81	6.50	1 Std. Drill Collars	24.85	3027.24
2.75	6.12	4½ IF Box-3½ IF Pin	.20	3055.69
2.00	4.63	APR-A Reverse Valve	.91	3055.83
2.00	4.63	APR-N Tester Valve	4.16	3056.80
2.37	4.63	Big John Jars	1.58	3060.95
2.68	6.12	3½ IF Box-4½ IF Pin	.20	3062.54
3.12	6.12	9 5/8 RTTS Circulating Valve	.97	3062.74
3.12	6.12	9 5/8 RTTS Safety Joint	1.10	3063.71
3.75	8.25	9 5/8 RTTS Packer (Model II)	.68 1.10	3064.81 3066.59
2.50	6.06	4½ IF Box-2 7/8 EUE Pin	.25	3066.84
2.44	2.87	Tubing Pup Joint	1.86	3068.70
2.44	2.87	Perforated Tubing	1.22	3069.92
1.81	2.87	No-Go Nipple	.63	3069.92
2.44	2.87	2 Joint Tubing/W/Plug	18.73	3089.28

3. Testsequence

0

DIARY OF EVENTS		WELL No <u>1/9-3</u>	DST No <u>4</u>
		ZONE TESTED: <u>Ekofisk</u>	PERFS. : <u>3094-3112m RKB</u>
DATE	TIME	OPERATIONS	
16.9.78	1230	Rigged up. Dresser Atlas wire line head and perforated from 3094 to 3112m RKB in two runs. Rigged down	
	1900	Made up howco bttm hole assembly with the following gauges	
		<u>Gauge</u>	<u>No</u> <u>Clock hrs</u> <u>Clock no</u> <u>Final depth</u>
		Amerada	36405 120 1942 3082.9
		Amerada	41677 120 1943 3080.9
		Amerada	36396 72 5570 3084.9
		Kuster	41680 120 17276 3086.9
		Rih with teststring	
17.9.78	0730	Picked up test tree, rigged up and tested surface lines	
	0916	Set packer at 3065.5m RKB	
		Closed rtts circulating valve and tested tubing	
	1044	Opened rtts circulating valve and displaced mud in tubing with water.	
	1123	Closed rtts circulating valve and tested tubing, bled down pressure to 1800 psi	
	1142	Opened apr-n valve, tubing pressure 2300 psi	
	1143	Opened flopetrol choke to 48/64", flowed to gaugetank. Produced 9.3 bbls in 30 mins	
COMMENTS :			
PE : _____			

DIARY OF EVENTS		WELL No <u>1/9-3</u>	DST No <u>4</u>
		ZONE TESTED: <u>Ekofisk</u>	PERFS. <u>3094-3112m RKB</u>
DATE	TIME	OPERATIONS	
	1215	Closed choke on surface, then apr-n. was closed. 1. shut in for 3 hours	
	1515	Repaired leak on bubblehose, pressured tubing to 1800 psi.	
	1527	Opened apr-n, injected 5bbls back Formation broke down at 3400 psi, injection rate 1bbl/min at a pressure 3200 psi, closed wing valve on kill side	
	1538	Opened choke on 3/4", flowed to gauge tank, rate 3bbls/5 mins	
	1600	Flowed to clean-up line	
	1645	Mud to surface, wellhead pressure increasing, gas to surface	
	1715	Flare lit	
	2237	Flowed through 7/8" adjustable choke	
	2307	Increased to 1" choke as an attempt to improve the well's capacity to lift mud	
18.9.78	0210	Switched flow through separator, had problems with the Barton gas meter. Monitored rates from 0500	
	0801	Shut well in on surface, surface pressure slowly increased.	
	0822	Surface pressure 1725 psi, closed apr-n, 2. shut in for 24 hours	
COMMENTS :			
PE : _____			

DIARY OF EVENTS		WELL No <u>- 1/9-3</u>	DST No <u>4</u>
		ZONE TESTED: <u>Ekofisk</u>	PERFS. <u>3094-3112m RKB</u>
DATE	TIME	OPERATIONS	
19.09.78	0812	Opened apr-n	
	0830	Started acid job, bj equipment	
		failed after the first stage of the	
		acid program, displaced the acid	
		in the tubing with seawater	
	1115	Rigged up Flopetrol lubricator, run	
		the following gauges	
		<u>Gauge</u>	<u>Pressure</u> <u>Clocks</u> <u>Final depth (m RKB)</u>
		32328	10.000 psig 72 hrs 3073.8
		41676	10.000 psig 72 hrs 3071.8
		41675	10.000 psig 120 hrs 3075.8
	1435	Latched bombs in Baker no-go nipple,	
		p.o.o.h	
	1520	Rigged down lubricator	
	1525	Opened the well slowly to 3/4" adjustable,	
		gauged rate, 20bbbls/5 min. Flowed to clean-up	
		line, pressure increase	
	1533	Gas to surface	
	1620	Bypassed heater, not required	
	1655	Flowed through separator	
	2355	Bypassed separator	
	2357	Closed choke on surface, pressure	
		increased to 2520 psi, closed apr-n for	
		3. build-up	
20.9.78	1307	Opened master valve, pressure 2035 psi	
	1318	Opened apr-n, pressure in tubing	
		increased to 4430 psi	
COMMENTS:			
PE: _____			

DIARY OF EVENTS		WELL No <u>- 1/9-3</u>	DST No <u>4</u>
		ZONE TESTED: <u>Ekofisk</u>	PERFS. <u>3094-3112m RKB</u>
DATE	TIME	OPERATIONS	
	1325	Displaced content in tubing with 117 bbls,	
		2100 psi on surface	
	1400	Rigged up Flopetrol lubricator to recover	
		bombs in Baker nipple	
		1. run: didn't recover bombs	
		2. run: latched on to the bombs,	
		jarred for approx. 1 hour, sheared	
		of and r.o.o.h. No bombs recovered.	
	1900	Fracture acidizing according to program	
	2202	Closed wing valve on kill side	
	2207	Opened the well slowly on floor	
		manifold	
	2210	Closed well on choke due to a leak	
		in flowline between choke and heater,	
		wellhead pressure 2285 psi.	
		Repaired leak, pressure tested lines	
		to 5000 psi	
	2251	Opened the floor choke again	
		very slowly	
	2253	3/4" adjustable choke	
	2300	Gas to surface, lit the flare	
	2315	Closed the well in on the choke due to	
		a leak in flowline to burner,	
		repaired leak, wellhead pressure 3950 psi	
	2329	Opened well to 3/4" adjustable	
	2338	Sudden gas leak developed in chicksans (swivel)	
		between test tree and flopetrol choke	
COMMENTS :			
PE : _____			

DIARY OF EVENTS		WELL No <u>-1/9-3</u>	DST No. <u>4</u>
		ZONE TESTED: <u>Ekofisk</u>	PERFS. <u>3094-3112m RKB</u>
DATE	TIME	OPERATIONS	
		manifold, closed fail safe valve on test	
		tree. Closed wing valve to flowline, replaced	
		leaking swivel.	
		Flushed water through lines, tested to	
		8000 psi to choke manifold	
21.09.78	0019	Opened well again on 3/4" choke	
	0210	Flowed through separator	
	0748	Bypassed separator, leaking	
		chicksan on floor	
	0749	Closed fail safe valve on test tree,	
		closed master valve, replaced	
		leaking chicksans. Flushed through lines	
		and pressure tested line	
		to choke manifold to 8000 psi	
	0839	Opened mastervalue	
	0841	Opened choke again to 3/4" adjustable,	
		bypassed separator	
	0847	Leaking check valve on separator, closed	
		fail safe valve on test tree once more.	
		Repaired separator	
	0935	Two more chicksans were leaking in the floor	
		when fail valve was opened, close fail safe	
		valve again	
	0945	Decided to abort the test and	
		started to bullhead with 110 bbl mud	
COMMENTS :			
PE : _____			

liquid

STB/D

5000

4000

3000

2000

1000

4. Pressure choke and rate diagram

MH570

GOR

MSCF/STB

10

5

0

"Choke

1

1/2

0

PSI

7000

6000

5000

4000

3000

2000

1000

0000

0300

0600

0900

1200

1500

1800

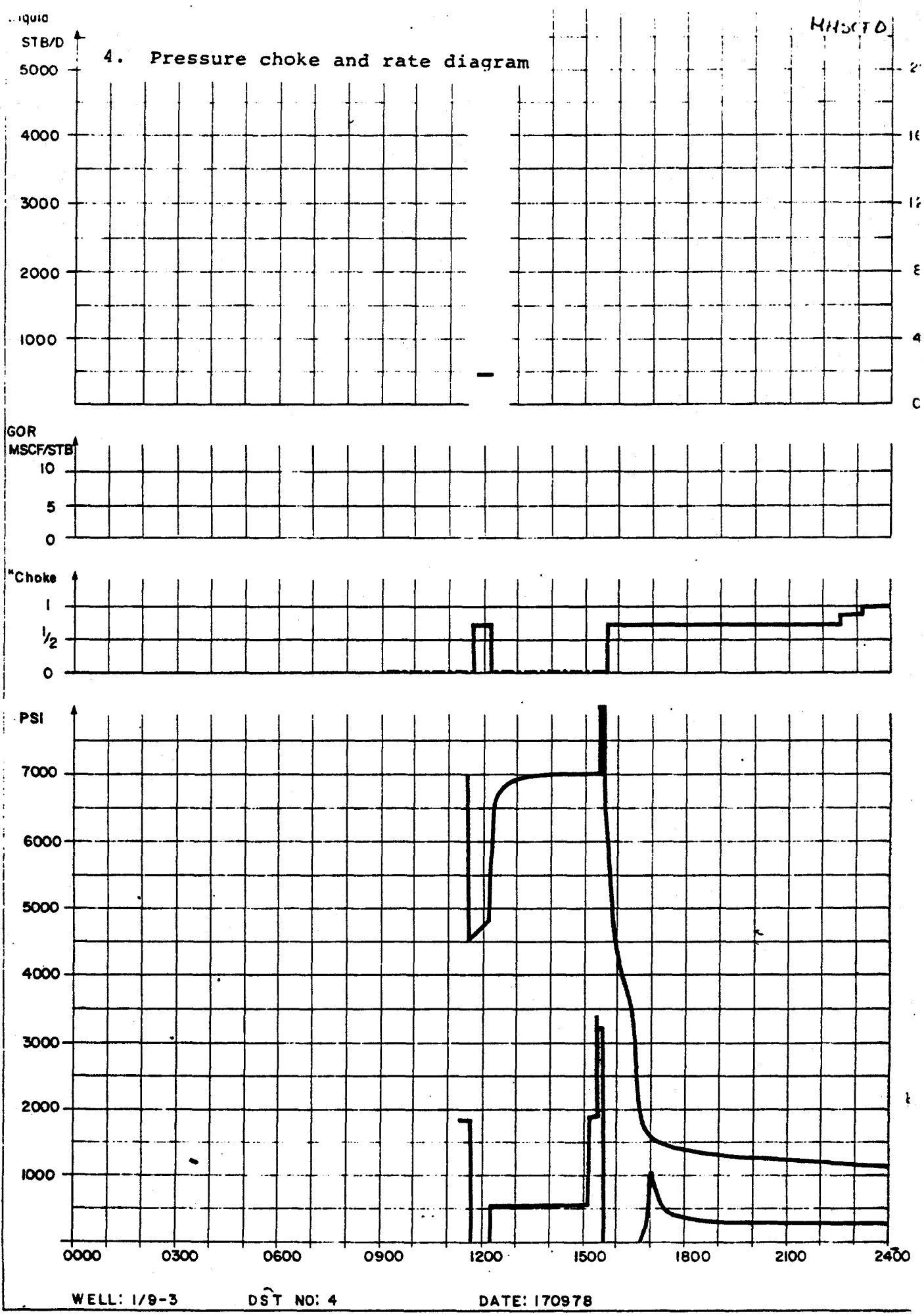
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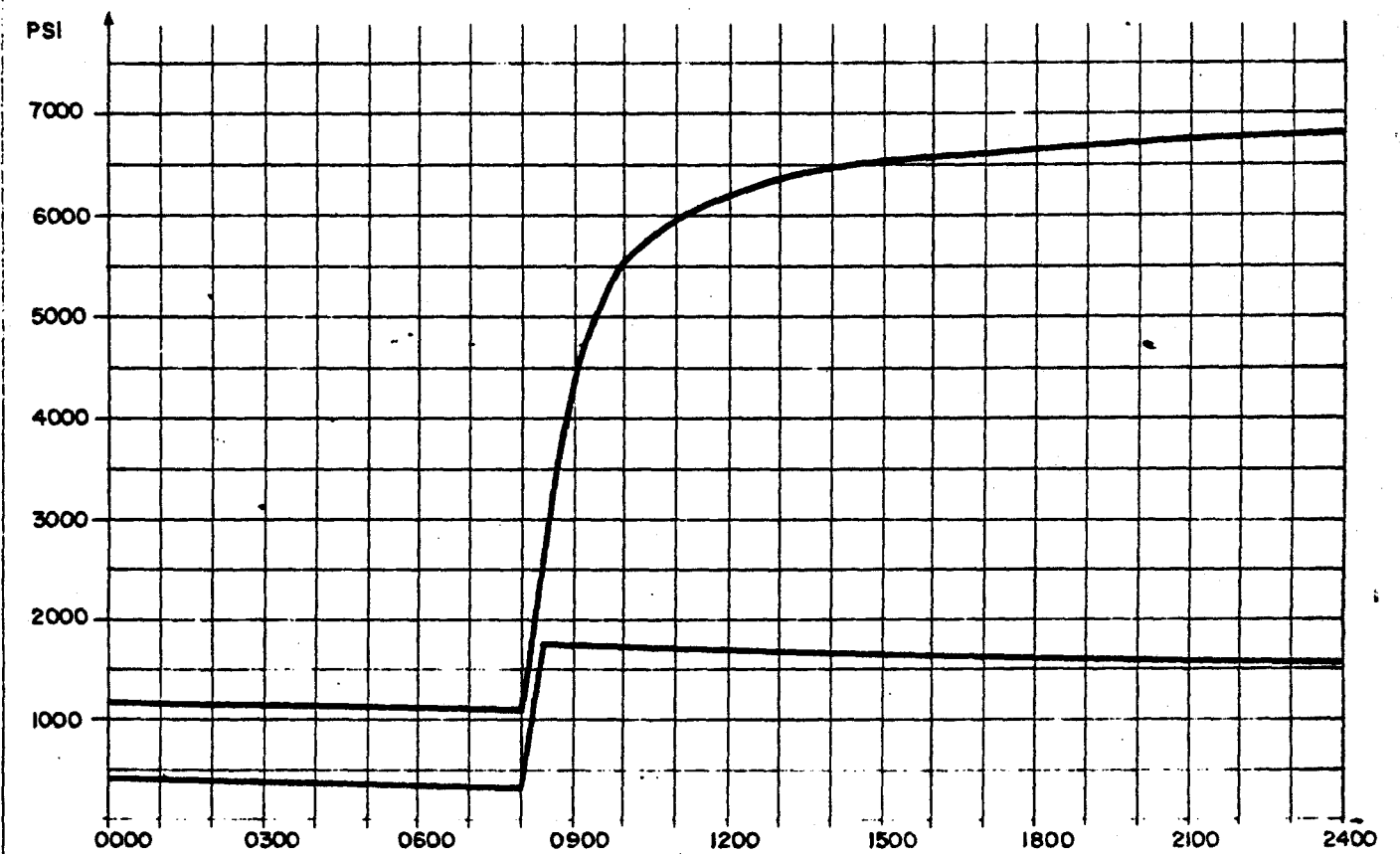
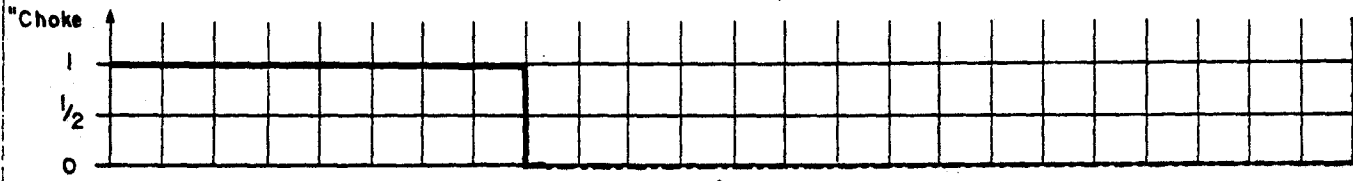
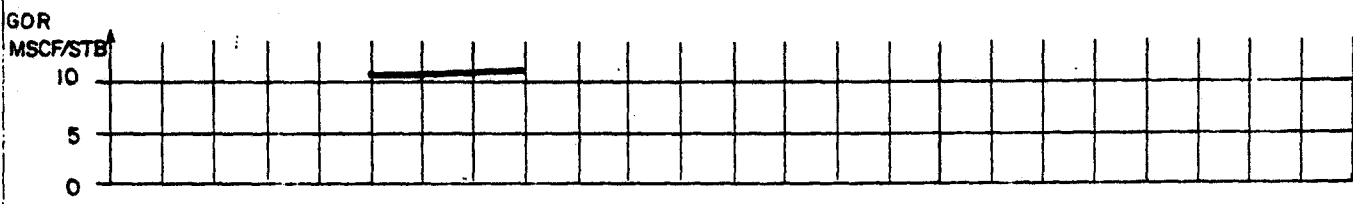
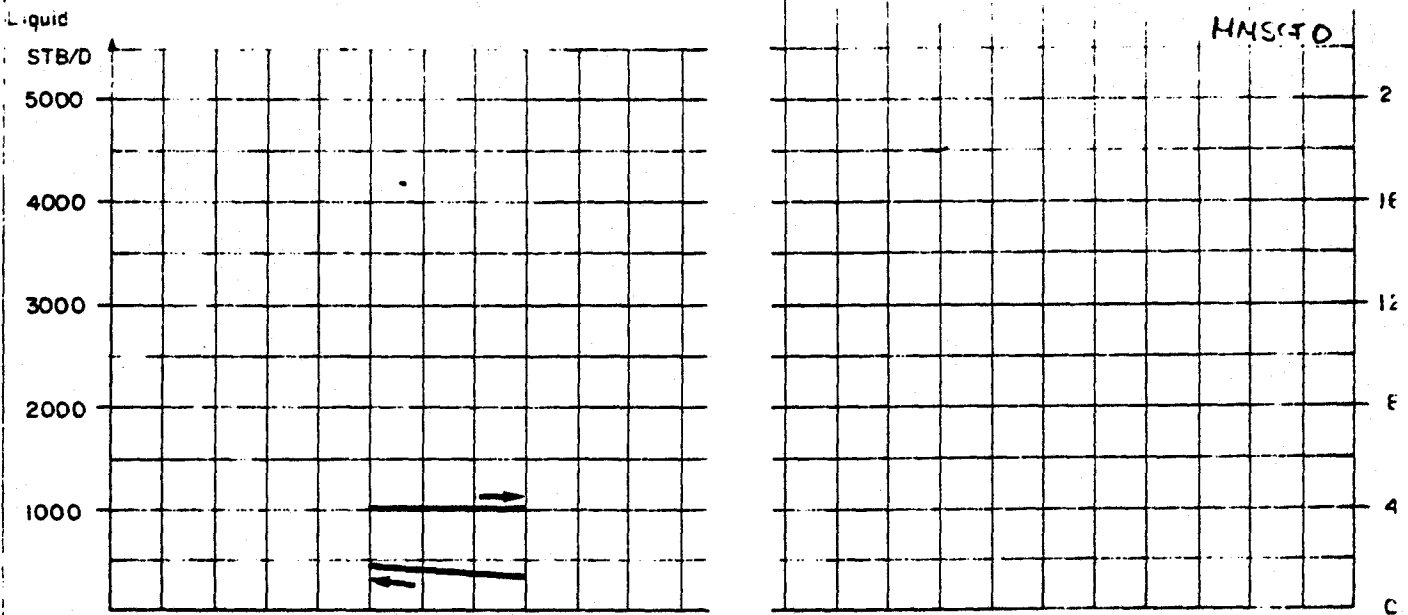
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WELL: 1/9-3

DST NO: 4

DATE: 170978

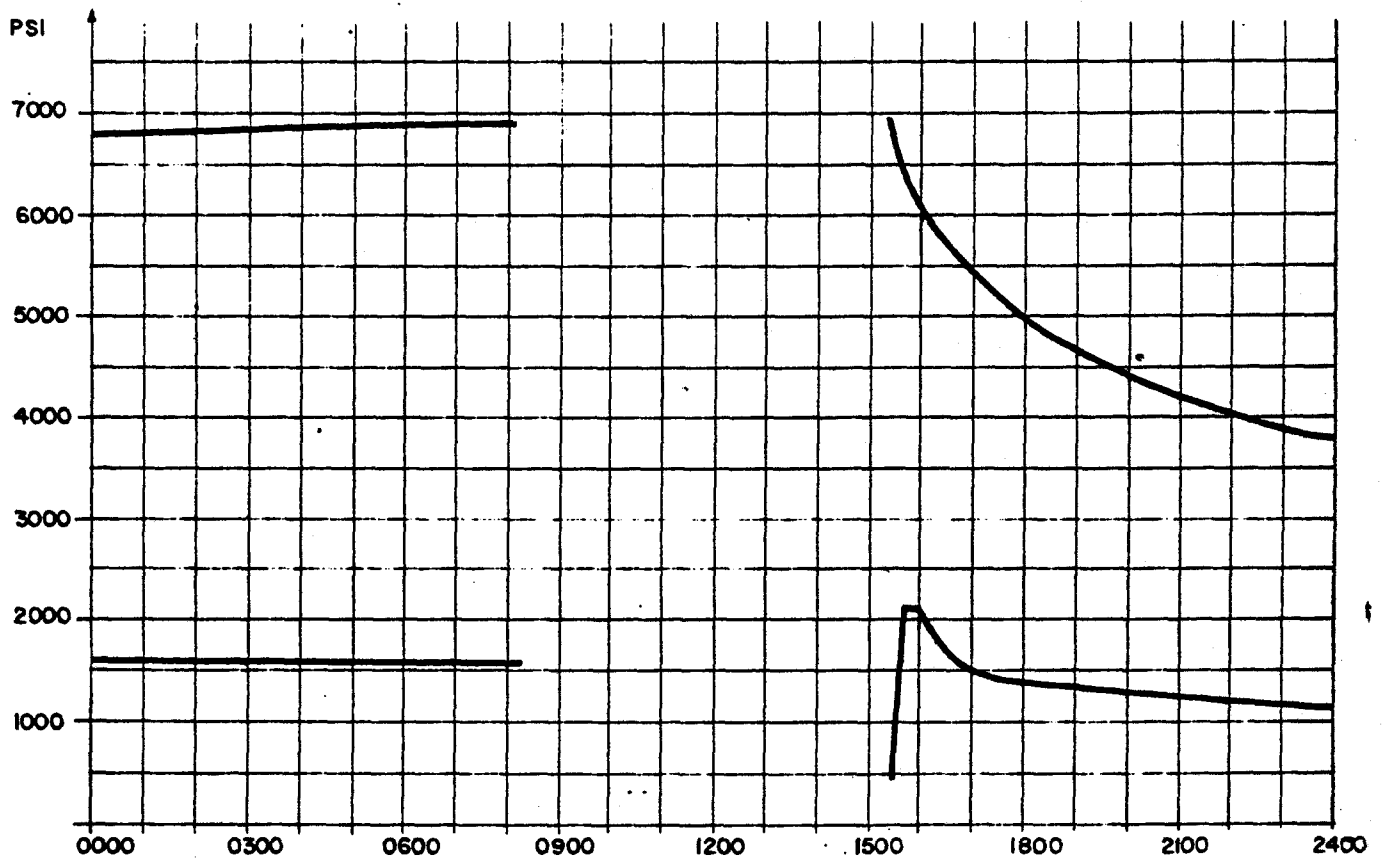
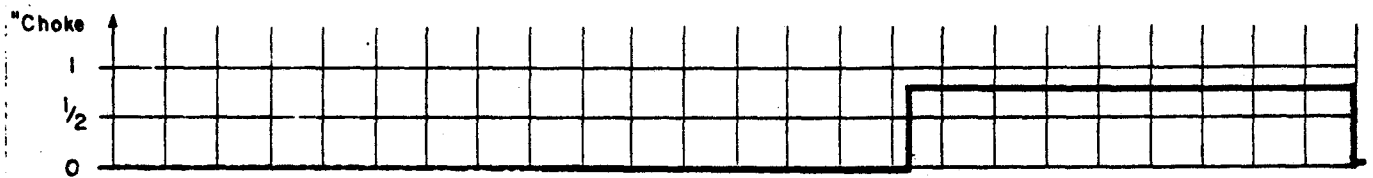
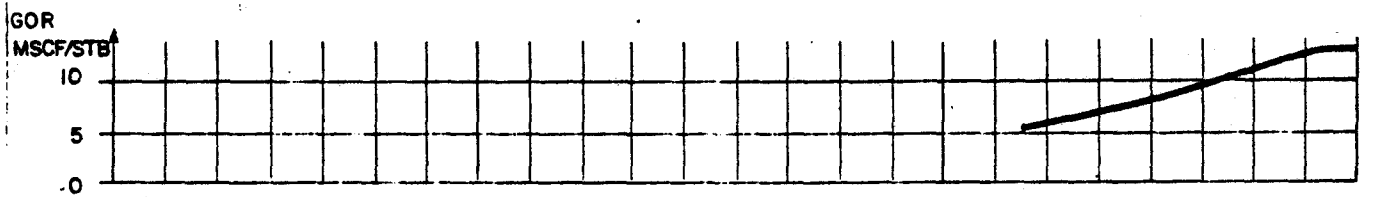
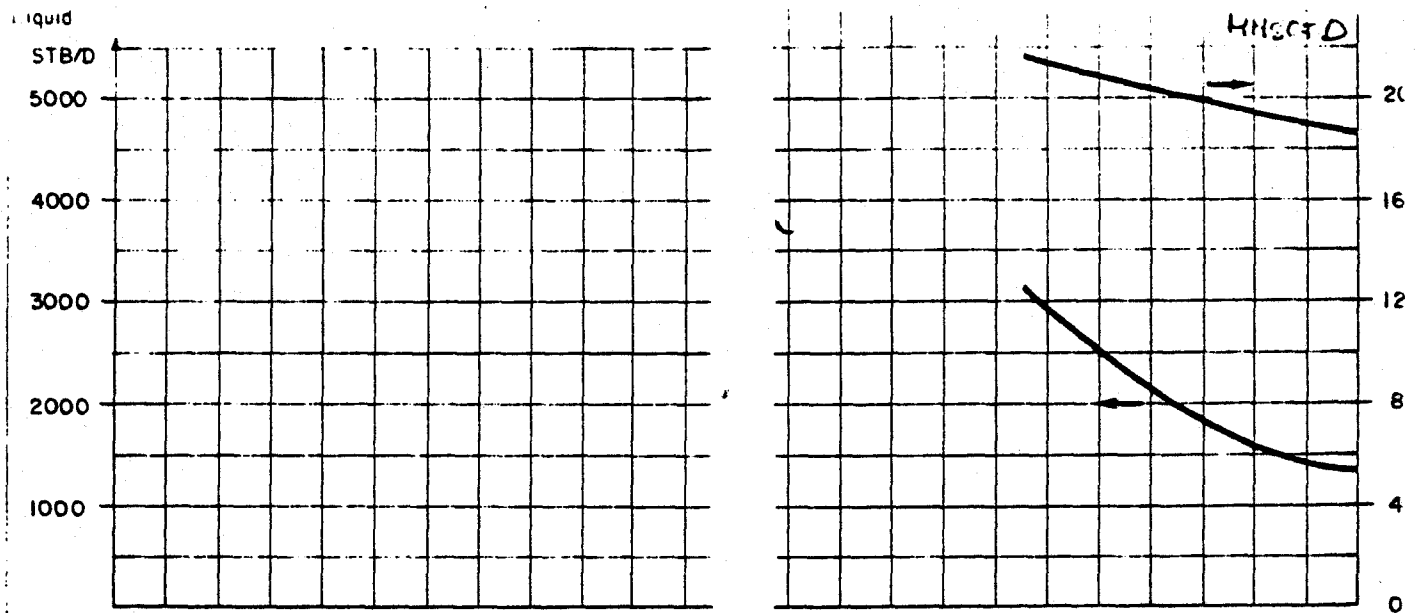




WELL: 1/9-3

DST NO: 4

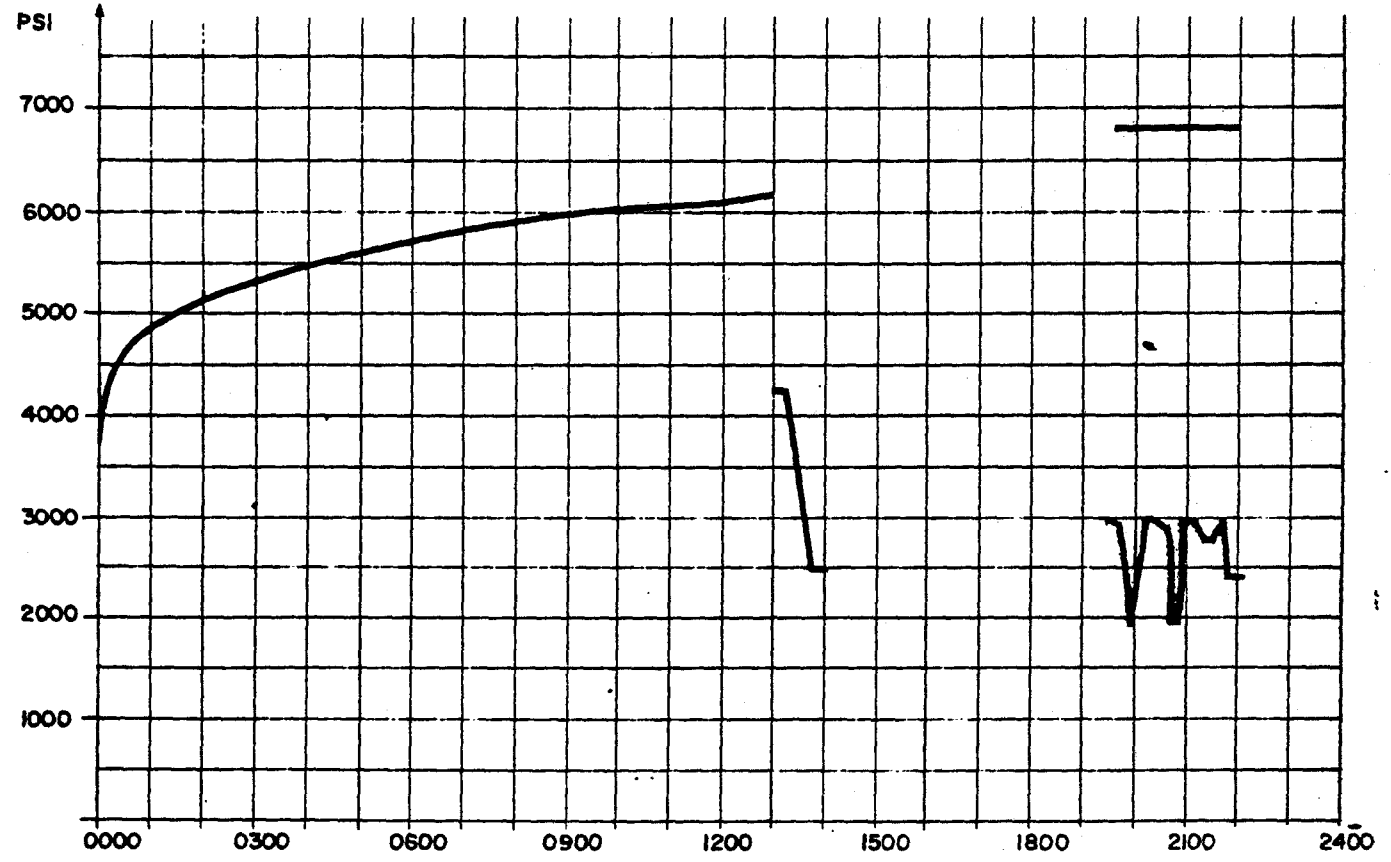
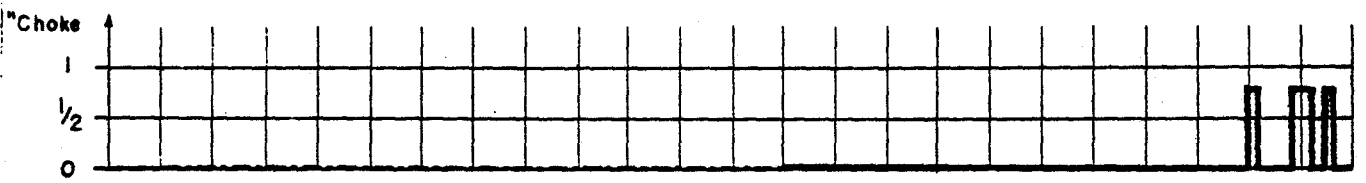
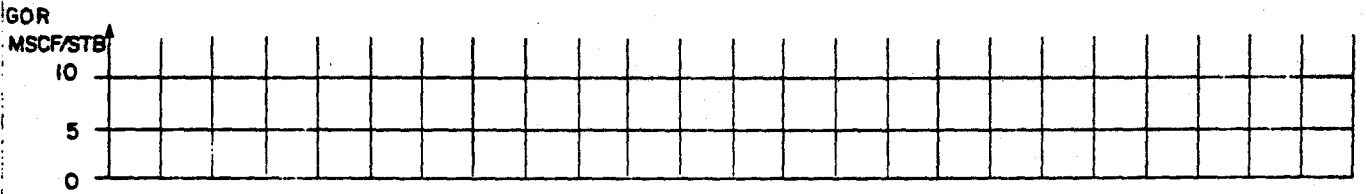
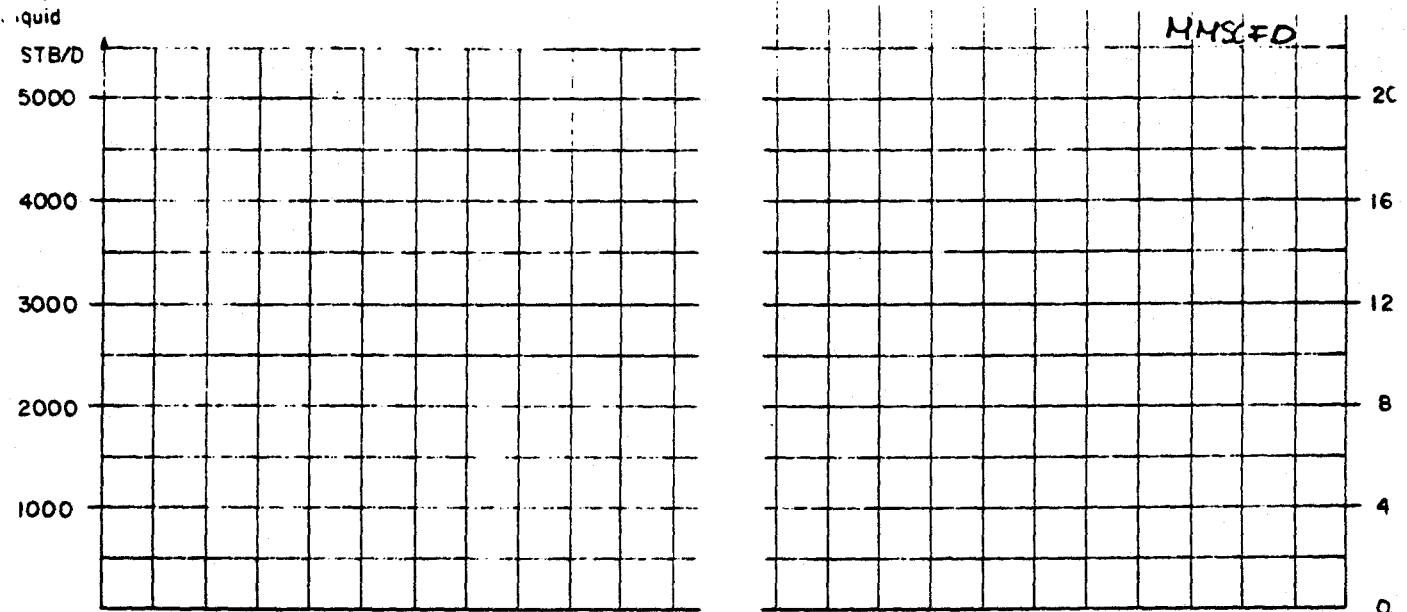
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WELL: 1/9-3

DST NO: 4

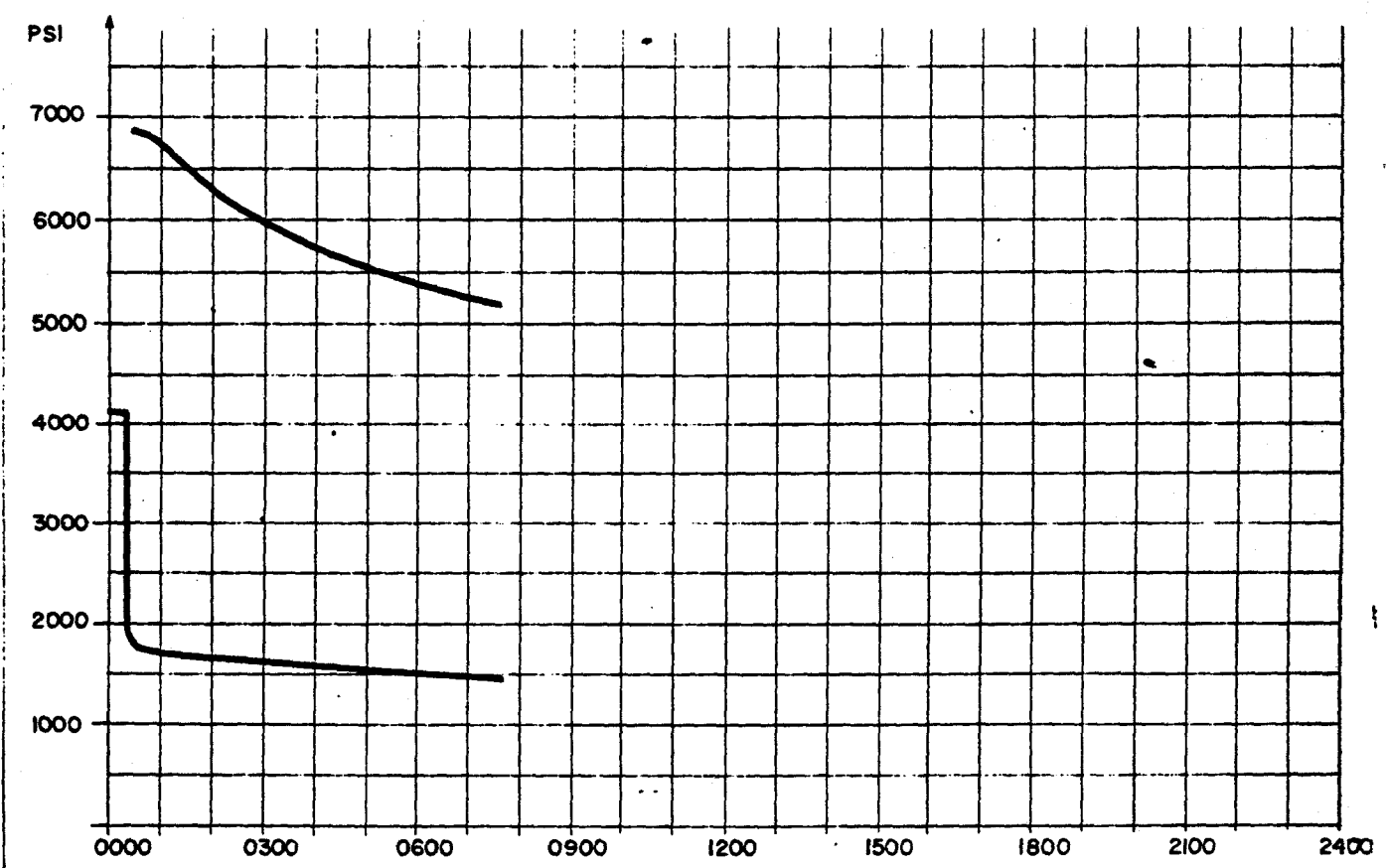
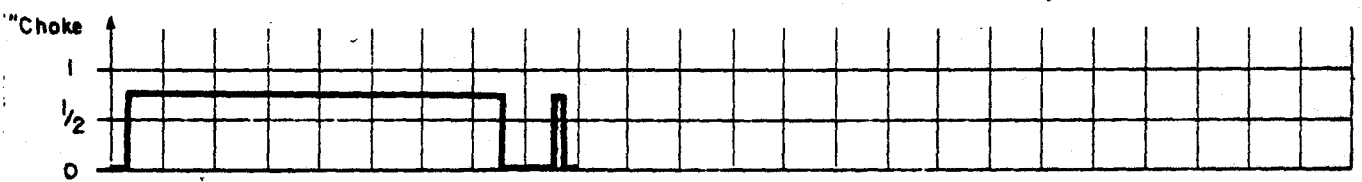
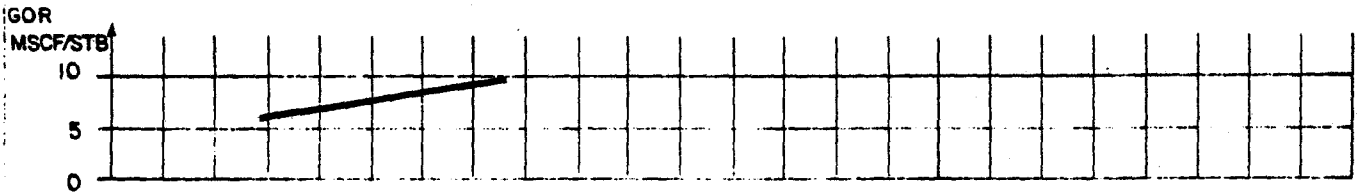
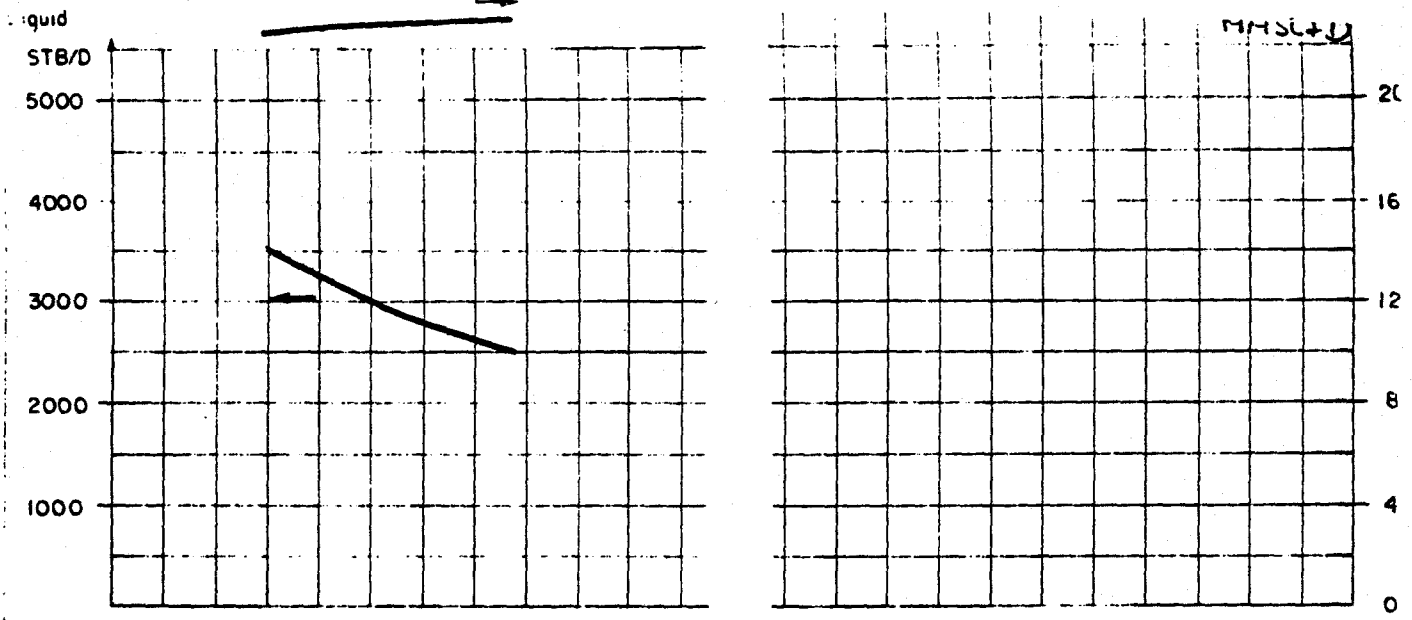
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WELL: 1/9-3

DST NO: 4

DATE: 200978



WELL: 1/9-3

DST NO: 4

DATE: 210978

DATO: 17-18/9 1978		OPERASJON: 2. Flow (Cleanup before acid)												Ark nr.: 1 av 3			
BRØNN:		DST nr.:		Perforert interval:								Trykkmåler: dybde:				Metode	
Tid	Operasjon	WHP psi	WHT °F	BHP psi	BHT °F	Sep. trykk psi	Sep. temp. °F	Generat MASCFO	Oljeres STBOPD	GOR SCF/STB	Oje API	Gass %	Væskeanalyse på rigg				Methode
												Sted	KUO %	VANN %	Oje %	Oje API	
1540		48	<12														
1630		"	<12	74													
1645		"	50	81													
1700		"	660	105	1768	227.8											
1705		"	1050	103													
1710		"	730	93													
1715		"	580	90													
1730		"	400	87	1507												
1745		"	430	89													
1800		"	410	87	1427	228.0							b.h.	30	10	60	cl- 18000 ppm
1815		"	400	87									b.h.	2	18	80	
1830		"	377	87	1359												
1845		"	370	90									b.h.	6	15	79	cl- 13000 ppm
1900		"	360	88	1321	228.6											
1915		"	300	88									b.h.	14	4	82	
1930		"	340	89													
1945		"	325	89									b.h.	17	3	89	49.1 cl- 13000 ppm
2000		"	310	90	1272	228.7											
2015		"	300	90									b.h.	3	17	80	
2030		"	310	90													
2045		"	290	90									b.h.	14	1	85	cl- 15000 ppm
2100		"	310	90	1216	229.1											
2115		"	295	90									b.h.	15	5	80	
2130		"	310	91													
2145		"	305	91									b.h.	11	1	8	
2200		"	290	90	1216	229.1											

S. Flow data

DATO: 17-18/9 1978		OPERASJON: 2. Flow										Art nr.: 2 av 3							
BRØNN: 1/9-3		DST nr.: 4		Perforert Interval: 3094-3112 m RKB					Trykkmåler: dybde:										
Tid	Operasjon	Gj. ut. %	WHP psi	WWT °F	SHP psi	SHT °F	Sep. trykk psi	Sep. temp. °F	Isoperent AN/BCPD	Operent ST/OPD	GOR SCF/STB	Og. API	Gm s. s.	Væsteanalyse på rigg				Merknad	
														Bed	svdt	vænt	Og. %		Og. API
2215		"	300	91										b.h.	8	5	87	48.9	cl 14500 dpm
2230		"																	
2245		56	380	95										b.h.	14	1	85		
2300		"	360	94	1210	229.0													
2315		64	335	92										b.h.	9	1	90		
2330		"	300	92															
2345		"	345	92										b.h.	19	1	80		
2400		"	345	92	1160	229.8													
0015		"	310	92										b.h.	14	1	84	48.4	
0030		"	310	92															
0045		"	330	93										b.h.	7	1	92		
0100		"	300	93	1135	230.0													
0115		"	330	92										b.h.	11	.5	88.5		
0130		"	310	92															
0145		"	320	93										b.h.	8.5	1.5	90	48.7	
0200		"	315	92	1141	230.2													
0215		"	360	93										b.h.	7	.5	92.5		
0230		"	360	93															
0245		"	370	93										b.h.	7.5	.5	92.0		
0300		"	370	93	1160	230.4													
0315		"	370	92										b.h.	7	0	93.0	48.9	
0330		"	355	92															
0345		"	390	92										b.h.	7	.5	92.5		
0400		"	370	94	1141	230.7													
0415		"	385	94										b.h.	7	.2	92.8	49.5	
0430		"	370	94						372		49.9							

