DRILLING REPORT

15/3-2

(Phase I)

elf norge a/s

DRILLING DEPARTMENT

ORIGINAL

WELLFILE

DRILLING REPORT

15/3-2

(Phase I)

TIME-SHARING

F 6/2-67

COMPANY	LEASE	WELL	RIG	CONTRACTOR	MONTH
F NORGE	15/3	2	POLYGLOMAR	RGML	october 1976

Days of the month	Number of days since starting drilling	Moving, rigging up	1 Drilling	2 Coring	3 Trips drilling	4 Trips - coring	5 Reaming	6 Opening hole	7 Tests	8 Logging - surveys	9 Completions	10 Casing - cementation	11 Circulation conditiong MUD	12 Fishing jobs	13 Shutting well	14 Repair greasing maintenance	15 Waiting, various	16 Clearance	17
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22	Start the 15/3-2 well the 25- 10- 76 at 02, 00 hour																		
23																			
24																			
25	1	22																	
26	2	24																	
27	3	24																	
28	4	24																	
29	5	8 45	11 30			2 15						1 30							
30	6									0 15		23 45							
31	7	8 30	8 30			5 00				0 45		7 30	2 15						
TOTAL		102 45	20	/	7 15	/	/	/		1 00	/	32 45	2 15	/	/	/	/	/	

TIME-SHARING

F 6/2-67

COMPANY	LEASE	WELL	RIG	CONTRACTOR	MONTH
ELF NORGE	15/3	2	POLYGLOMAR	RGML	November 76

Days of the month	Number of days since starting drilling	Moving, rigging up	1 Drilling	2 Coring	3 Trips drilling	4 Trips - coring	5 Reaming	6 Opening hole	7 Tests	8 Logging - surveys	9 Completions	10 Casing - cementation	11 Circulation conditioning MUD	12 Fishing jobs	13 Shutting well	14 Repair greasing maintenance	15 Waiting, various	16 Clearance	17
1	8			6 30		5 45					3 45			2 30			5 30		
2	9			0 15		7 00			13 45		0 30			2 30					
3	10							14 30					9 30						
4	11							1 00					23 00						
5	12	5 00											18 00						
6	13												22 30				1 30		
7	14												11 15				12 45		
8	15												24 00						
9	16			14 30		1 00					0 45		6 45	1 00					
10	17			4 45		10 30		5 15					1 15				2 15		
11	18			19 00		2 15		0 30			0 30						1 45		
12	19			15 00		6 15					2 00						0 45		
13	20			13 00		7 45					0 15						3 00		
14	21			13 45		8 00					0 45						1 30		
15	22			15 15		8 30					0 15								
16	23			8 45		10 15					0 15		4 30				0 15		
17	24			16 30		7 15					0 15								
18	25			15 15		7 45					0 15						0 45		
19	26			24 00															
20	27			22 00		1 15					0 45								
21	28			22 45													1 15		
22	29			21 30		1 30					1 00								
23	30			6 30		10 45		1 00			0 15		5 30						
24	31			11 30							0 30						12 00		
25	32			12 45													11 15		
26	33			18 45		4 45					0 30								
27	34			16 15		5 45		0 30			0 15						1 15		
28	35			15 15		8 45													
29	36			24 00															
30	37			21 00		1 30					1 00						0 30		
31																			
TOTAL		5		358 45	/	116 30	/	22 45	13 45	/	13 45	/	126 15	6 00	/	/	56 15	1 00	/

TIME-SHARING

F 6/2-67

COMPANY	LEASE	WELL	RIG	CONTRACTOR	MONTH
LFNORGE	15/3	2	POLYGLOMAR	RGML	DESEMBER 76

Days of the month	Number of days since starting drilling	Moving, rigging up	1 Drilling	2 Coring	3 Trips drilling	4 Trips - coring	5 Reaming	6 Opening hole	7 Tests	8 Logging - surveys	9 Completions	10 Casing - cementation	11 Circulation conditioning MUD	12 Fishing jobs	13 Shutting well	14 Repair greasing maintenance	15 Waiting, various	16	17 Clearance
1	38			17 45		6 00											0 15		
2	39					5 30		3 15			12 00			3 15					
3	40										7 30		15 45				0 45		
4	41												21 00				3 00		
5	42												24 00						
6	43					3 00					4 00		8 00				9 00		
7	44					4 15							4 30				15 15		
8	45			14 00		9 45					0 15								
9	46			19 00		5 00													
10	47			11 15		12 15					0 15						0 15		
11	48			24 00															
12	49			22 15		1 15					0 30								
13	50			23 00													1 00		
14	51			21 15		1 30					0 30						0 45		
15	52			24 00															
16	53			22 00		1 30					0 30								
17	54			24 00															
18	55			9 45		5 30					0 15						8 30		
19	56												4 45				19 15		
20	57			18 00		4 30											1 30		
21	58			23 30													0 30		
22	59			21 30		1 45					0 45								
23	60			24 00															
24	61			20 30		2 15					1 15								
25	62			24 00															
26	63			7 15		5 15					11 30								
27	64			12 00		5 15					1 00		5 30				0 15		
28	65			24 00															
29	66			20 15		3 00					0 45								
30	67			23 00													1 00		
31	68			16 00		3 30					1 30						3 00		
TOTAL		/		466 15	/	81 00	/	3 15	/	/	42 30	/	83 30	3 15	/	/	64 15	/	/

TIME-SHARING

F 6/2-67

COMPANY	LEASE	WELL	RIG	CONTRACTOR	MONTH
F-NORGE	15/3	2	POLYGLOMAR	RGML	JANUARY 77

Days of the month	Number of days since starting drilling	Moving, rigging up	1 Drilling	2 Coring	3 Trips drilling	4 Trips - coring	5 Reaming	6 Opening hole	7 Tests	8 Logging - surveys	9 Completions	10 Casing - cementation	11 Circulation conditioning MUD	12 Fishing jobs	13 Shutting well	14 Repair, greasing maintenance	15 Waiting, various	16 Clearance	17
1	69			24 00															
2	70			10 00		7 15					0 15		3 15	2 45			0 30		
3	71			13 30		7 00							2 15				1 15		
4	72			21 45		0 30					0 15			0 30			1 00		
5	73			21 00		2 00					0 30						0 30		
6	74			16 15		2 00					1 15			2 15			2 15		
7	75			24 00															
8	76			7 00		5 30					6 30			3 00			2 00		
9	77							9 15			12 30			1 30			0 45		
10	78										23 00			1 00					
11	79							2 00			13 30		8 30						
12	80							0 30						2 30	21 00				
13	81														24 00				
14	82							4 00							20 00				
15	83							4 45					10 45		8 30				
16	84												24 00						
17	85										5 00		10 30			8 30			
18	86												6 30			17 00	0 30		
19	87												19 30			4 30			
20	88												2 45				15 15	6 00	
21	89																	24 00	
22	90																	24 00	
23	91		15 00															9 00	
24	92		6 00																
25																			
26																			
27																			
28																			
29																			
30																			
31																			
TOTAL			21 00	137 30	/	24 15	/	20 30	/	/	62 45	/	88 00	13 30	73 30	30 00	24 00	63 00	

COMPLEMENTARY OFF-SHORE TIME SHARING CHART

F 6/3-68

Well: 15/ 3-2 MONTH OCTOBER 1976

Day of the month	1 – MOVING (1)				11 – CASING AND CEMENTATIONS			15 – MAINTENANCE			16 – WAITING (Various)			
	Duration of moving	Anchor handling	W.O.W.	TOTAL, to be reported on F.6	Casing, cementation, W.O.C.	Put underwater equipment into work	TOTAL, to be reported on F.6	Repair on underwater equipment	Other repairing Lubrication Maintenance	TOTAL, to be reported on F.6	W.O.W.	Waiting due to repositioning of platform and repairing on anchor equipm.	Waiting, various reasons.	TOTAL, to be reported on F.6
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23		START THE 15/3-2 WELL THE 25-10-76 AT 02.00 HOUR												
24														
25	22^{00}			22^{00}										
26			24	24										
27			24	24										
28			9	24										
29		8^{45}		8^{45}	1^{30}		1^{30}							
30					13^{15}	10^{30}	23^{45}							
31					5^{30}	2^{00}	7^{30}							
TOTAL (H)	a 22^{00}	b 23^{45}	c 57^{00}	d 102^{45}	e 20^{15}	f 12^{30}	g 32^{45}	h /	i /	j /	k /	l /	m /	n /

(1) The time spent on a single well corresponds to the duration of the rig contract in the event of several wells in succession the starting up moment takes place at the preceeding drilling site:
– when the test anchor has been picked up (semisub, Drillship).
– when the jacking down operations are completed and the rigg is afloat.

COMPLEMENTARY OFF-SHORE TIME SHARING CHART

F 6/3-68

Well: 15/ 3-2 MONTH NOVEMBER 1976

Day of the month	1 – MOVING (1)				CASING AND 11 – CEMENTATIONS			REPAIR 15 – MAINTENANCE			WAITING 16 – (Various)			
	Duration of moving	Anchor handling	W.O.W.	TOTAL, to be reported on F.6	Casing, cementation, W.O.C.	Put underwater equipment into work	TOTAL, to be reported on F.6	Repair on underwater equipment	Other repairing Lubrication Maintenance	TOTAL, to be reported on F.6	W.O.W.	Waiting due to repositioning of platform and repairing on anchor equipm.	Waiting, various reasons.	TOTAL, to be reported on F.6
1									5 30	5 30				
2														
3						9 30	9 30							
4					23 00		23 00							
5		5 00		5 00	1 00	17 00	18 00					1 00		1 00
6						22 30	22 30	1 30		1 30				
7						11 15	11 15	12 45		12 45				
8					10 45	13 15	24 00							
9					6 45		6 45							
10					1 1/4		1 1/4		2 15	2 15				
11									1 45	1 45				
12									0 45	0 45				
13									3 00	3 00				
14									1 30	1 30				
15														
16						4 30	4 30		0 15	0 15				
17														
18									0 45	0 45				
19														
20														
21									1 15	1 15				
22														
23						5 30	5 30							
24									12 00	12 00				
25									11 15	11 15				
26														
27									1 15	1 15				
28														
29														
30									0 30	0 30				
31														
TOTAL (H)	a /	b 5 00	c /	d 5 00	e 42 45	f 83 30	g 126 15	h 14 15	i 42 00	j 56 15	k /	l 1 00	m /	n 1 00

(1) The time spent on a single well corresponds to the duration of the rig contract in the event of several wells in succession the starting up moment takes place at the preceeding drilling site:
– when the test anchor has been picked up (semisub, Drillship).
– when the jacking down operations are completed and the rigg is afloat.

COMPLEMENTARY OFF-SHORE TIME SHARING CHART

F 6/3-68

Well: 15/3-2

MONTH DECEMBER 1976

Day of the month	1 – MOVING (1)				11 – CASING AND CEMENTATIONS			15 – REPAIR MAINTENANCE			16 – WAITING (Various)			
	Duration of moving	Anchor handling	W.O.W.	TOTAL, to be reported on F.6	Casing, cementation, W.O.C.	Put underwater equipment into work	TOTAL, to be reported on F.6	Repair on underwater equipment	Other repairing Lubrication Maintenance	TOTAL, to be reported on F.6	W.O.W.	Waiting due to repositioning of platform and repairing on anchor equipm.	Waiting, various reasons.	TOTAL, to be reported on F.6
1									0 15	0 15				
2					15 45		15 45		0 45	0 45				
3					21 00		21 00		3 00	3 00				
4					18 45	5 15	24 00							
5					7 00	1 00	8 00		9 00	9 00				
6					4 30		4 30		15 15	15 15				
7														
8														
9									0 15	0 15				
10														
11														
12									1 00	1 00				
13									0 45	0 45				
14														
15														
16														
17														
18								7 30	1 00	8 30				
19						4 45	4 45	19 15		19 15				
20									1 30	1 30				
21									0 30	0 30				
22														
23														
24														
25														
26														
27						5 30	5 30		0 15	0 15				
28														
29														
30									1 00	1 00				
31									3 00	3 00				
TOTAL (H)	a /	b /	c /	d /	e 67 00	f 16 30	g 83 30	h 26 45	i 37 30	j 64 15	k /	l /	m /	n /

(1) The time spent on a single well corresponds to the duration of the rig contract in the event of several wells in succession the starting up moment takes place at the preceeding drilling site:
– – when the test anchor has been picked up (semisub, Drillship).
– when the jacking down operations are completed and the rigg is afloat.

COMPLEMENTARY OFF-SHORE TIME SHARING CHART

F 6/3-68

Well: 15/3-2

MONTH JANUARY 1977

Day of the month	1 – MOVING (1)				11 – CASING AND CEMENTATIONS			15 – REPAIR MAINTENANCE			16 – WAITING (Various)			
	Duration of moving	Anchor handling	W.O.W.	TOTAL, to be reported on F.6	Casing, cementation, W.O.C.	Put underwater equipment into work	TOTAL, to be reported on F.6	Repair on underwater equipment	Other repairing Lubrication Maintenance	TOTAL, to be reported on F.6	W.O.W.	Waiting due to repositioning of platform and repairing on anchor equipm.	Waiting, various reasons.	TOTAL, to be reported on F.6
1														
2						3 15	3 15		0 30	0 30				
3						2 15	2 15		1 15	1 15				
4									1 00	1 00				
5									0 30	0 30				
6									2 15	2 15				
7														
8									2 00	2 00				
9									0 45	0 45				
10														
11					8 30		8 30							
12														
13														
14														
15					10 45		10 45							
16					24 00		24 00							
17					10 30		10 30							
18						6 30	6 30		0 30	0 30				
19						19 30	19 30							
20						2 45	2 45	15 15		15 15	6 00			6 00
21											24			24
22											24			24
23		15 00		15 00							9 00			9 00
24		6 00		6 00										
25														
26														
27														
28														
29														
30														
31														
TOTAL (H)	a	b 21 00	c	d 21 00	e 53 45	f 34 15	g 88 00	h 15 15	i 8 45	j 24 00	k 63 00	l	m	n 63 00

(1) The time spent on a single well corresponds to the duration of the rig contract in the event of several wells in succession the starting up moment takes place at the preceeding drilling site:
– when the test anchor has been picked up (semisub, Drillship).
– when the jacking down operations are completed and the rigg is afloat.

BIT RECORD

F 11/2-61

OPERATOR:	WELL:	CONTRACTOR:	RIG:	PUMPS AND LINERS:
ELF-NORGE	15/3-2	RGML	POLYGLOMAR	2 PUMPS NATIONAL 1600 7 1/4 x 12

Bit Nº	Ø Bit Dia	Make	Type	Jets	Serie Nº	Reaming Time (h)	Opening Length (m)	Opening Time (h)	Drilling Length (m)	Drilling Time (h)	Drilling Prog. m/h	Depth out (m)		Parameters W.O.B. (T)	Parameters R.P.M.	Parameters Pump press	Parameters Flow rate	Mud S.G.	Mud Vis	Bit wear T	Bit wear B	Bit wear G	Bit wear RG	Type of formation
1	26"	Hughes	osc3AJ	3 3/4	gto98	HO" +36	51	11 1/2	51	11 1/2	4,43	186		8	90	psi 750	liter 4000	1,06	110	good	conditon			
2	17 1/2	SFAC	TS3J	20/32	2280	HO" +26	7	2	1	1/4		187	1/2	7	130	2400	4000	sea water		1	0	0	ok	cement
3	17 1/2	SFAC	TS2J	20/30	2493	/	/	/	588	14 45	39,9	775		7+	130	2400	4000	1,12	66	2	4	1		Clay- Sand - Clay
2R	27 1/2	SFAC	TS3	"	2280	+U.R 26"	588	13 45	9	0 15	36 00	784	1 0	5+ 10+	130	2400	4000	1,18	64	under reamer 2	2	1		Clay
1R	26"	Hughs	OSC3A	/	0T098	0 45	/	/	/	/		784		5+	130	1200	300	1,18	64	GOOD	CONDIT			/
4	17 1/2	SCAF	TS2	20/30	/2499	/	/	/	540	19 15	28,9	1324	1/4	015 /20	150 180	3000	4000	1,15	42	6	6	1		Clay- sand- silt
5	17 1/2	SCAF	TS3	20/32	2549	5 3/4	/	/	205	19 00	10,78	1529	1/4	15 /20	160	3000	3850	1,18	42	8	8	1	LC	SHALE-SILTONE
6	17 1/2	SCAF	TS5	20/30	2617	/	/	/	284	22 00	12,90	1813	1 0	20/25	115 120	3000	3500	1,23	60	6	6	1		Stringer of dolomite Shale- Sand
7	17 1/2	Security	S4T	22/32	502443	/	/	/	348	28 00	12,43	2161	3/4 0	20+	130	3000	3500	1,26	46	3	6	1		SHALE String of dolomite
8	17 1/2	SCAF	TS3	22/32	2548	/	/	/	141	15 45	8,95	2302	1 0	20+	130	3000	3500	1,25	50	7	4	1		SAND- SHALE
9	17 1/2	SCAF	TM2K	22/32	7333	/	/	/	75	8 30	8,82	2377	1 0	23/30	110 120	3000	3400	1,25	43	7	5	1		" "
10	17 1/2	SCAF	TM8K	22/32	7342	/	/	/	45	14 15	3,16	2422	0 45	20/27	110 ~~115~~	3000	3400	1,25	46	8	6	1		" "
11	17 1/2	SMITH	2JS	22/32	950ER	/	/	/	260	101 00	2,57	2682	1 0	21/23	45/50	3000	3300	1,25	46	3	6	1		SAND- SHALE.
12	17 1/2	SMITH	2JS	22/32	475 ET	1 00	/	/	53	47 45	1,10	2735		20/30	50/70	3000	3200	1,26	45	4	4	1	BT	SHALE-SAND.LIMSTONE
13	17 1/2	SMF	TM2	22/32	7332	1/2	/	/	16	16 15	0,98	2751	1/2	30	90/100	3000	3200	1,26	45	5	5	1	BT	SHALE-SAND.LIMSTONE
14	17 1/2	SMITH	2JS	22/32	809EP	3 15	/	/	124	78 00	1,59	2875	0 45	27+	60	2900	3100	1,27	45	20 BT	0	1		SHALE- CLAY- CALC
14RR	17 1/2	SMITH	2JS	/	809EP	CHECK 17 1/2 HOLE BEFORE RUN 13 3/8 CSG.																		
				TOTAL ➤		11 15/60	646	27 15/60	2740	396 30/60														

BIT RECORD

F 7/2-67

OPERATOR:	WELL:	CONTRACTOR:	RIG:	PUMPS AND LINERS:
ELF NORGE	15/3-2	RGML	POLYGLOMAR	2 PUMPS NATIONAL 1600: 6 1/4 x 12"

Bit Nº	Ø Bit Dia	Make	Type	Jets	Serie Nº	Reaming Time (h)	Opening Length (m)	Opening Time (h)	Drilling Length (m)	Drilling Time (h)	Drilling Prog. m/h	Depth out (m)		Parameters W.O.B. (T)	Parameters R.P.M.	Parameters Pump press	Parameters Flow rate	Mud S.G.	Mud Vis	Bit wear T	Bit wear B	Bit wear G	Bit wear RG	Type of formation
15	12 1/8	Hughes	OWV	16/32	EH551				DR	LG	0	UT	DV	at 848 m										
16	12 1/8	"	OWC	16/32	OV925				DRL	G - OUT		FLOAT - COLLAR, CMT AND SHOE.												
"	"	"	"	"	"				29	14^{00}	2.07	2904	$1^{0}\frac{1}{2}$	23T	110/120	1900	2100	1,26	41	5	6	I		Limestone shale
17	12 1/8	TSK	3MHZ	16/32	4911				50	26^{45}	2,01	2954		23T	110	2750	2400	1,26	45	4	3	I		" "
18	11 15/16	Christ	MD311	"	P1648G				400	173^{45}	2,30	3354	$2\frac{1}{2}^{0}$	30/32	150/170	3000	2500	1,29	43	WASHED				MRC/CALC Shale
19	"	RUCKHYC	WARC 75P	"	15680				361	138^{45}	2,60	3715	$3\frac{1}{4}$	"	180	2500	2400	1,35	51	WASHED				LIMESTONE MARCE
20	"	Christ	MD311	"	P1649G				239	129^{15}	1,85	3954	3^{0}	25/32	180	2500	2700	1,38	51	Flattened				MARC SHALE
21	"	Christ	MD311	"	P1679G				304	103^{30}	2,94	4258	3^{0}	"	170/175	3500	2250	140/160	52	Shows of washout				SHALE - MARCE
21R	"	"	"	"	"	9^{15}			Check $11\frac{15}{16}$ hole for logs															"
22	12"	Smith	DS	"	BT494	2^{30}			Ream from 4247m to 4258m									1,59	53	3	8	1/4		"
23	12"	Smith	DS	"	BT430	8^{45}			Ream from 4227m to 4258m									1,60	56	6	6	I		"
		TOTAL >				$20^{h}30$			meters 1383	586^{h}														

CORING AND DRILL BIT PERFORMANCE

WELL: 15/3-2

Nº	TYPE OF BIT	Dia. Ø	From..... To.....		W.O.B. T	R.P.M.	Footage m	Time s H	Progress m/H
1	Hughes OSC3a J.+HO36"	26"	135	136	8	90	51	11½	4.43
2	SFAC T53 J. +HO 26"	17½	156	137	7	130	1	1/4	4
3	SFAC T52 J. 20/21	17½	137	775	7	130	533	14 3/4	39.40
2R	SFAC T53 J. 20/32 HO26"	17½	775	734	5/10	130	9	1/4	36
1R	Hughes OSC 3 A J.	26"		734	5	130	/	/	/
4	SFAC T52, 20/32	17½	734	1324	15/20	150/150	540	19 1/4	25.05
5	SFAC T53 J. 20/32	17½	1324	1529	15/20	160	205	19 00	10.78
6	SFAC T35 J. 20/32	17½	1529	1813	20/25	115/120	284	22 00	12.90
7	SECUR T4 J. 22/32	17½	1813	2161	20	130	348	28 00	12 43
8	SFAC Y53 22/32	17½	2161	2302	20	130	141	15 45	8.95
9	SFAC -TM2K 22/32	17½	2302	2377	23-30	110-120	75	8 30	8.82
10	SFAC-TM8K 22/32	17½	2377	2422	20-27	110-115	45	14 15	3.16
11	Smith 2JS 22/32	17½	2422	2682	21-23	45-50	260	101 00	2.57
12	Smith 2JS - 22/32	17½	2682	2735	20-30	50/70	53	47 45	1.10
13	SMF - TM2 - 22/32	17½	2735	2751	30	90/100	16	16 15	0.93
14	Smith 2JS - 22/32	17½	2751	2875	27	60	124	78 00	1.59
14RR	Smith 2JS /	17½	Check 17½ hole before run 13" 3/8 Csg.						
15	Hughes - OWN 16/32	12 1/8	DRLG - out DV at 848 m.						
16	Hughes - OWC 16/32	12 1/8	DRLG - out Float Collar, cmt and shoe.						
"	" " "	"	2875	2904	23T	110-120	29	14 00	2.07
17	TSK - 3MHZ - 16/32	12 1/8	2904	2954	23T	110	50	26 45	2.01
18	Christensen - MD 311	11 15/16	2954	3354	30-32T	150-170	400	173 45	2.30
19	Rucker Hydr.log. ward	11 15/16	3354	3715	30-32	180	361	138 45	2.60
20	Christensen - MD 311	11 15/16	3715	3954	25-32	180	239	129 15	1.85
21	Christensen - MD 311	11 15/16	3954	4258	25-32	170-175	304	103 30	2.94
21R	" " "	"	Check 11" 15/16 hole for logs.						
22	Smith DS - Open	12"	Ream from 4247 m to 4258 m.						
23	Smith DS - Open	"	Ream from 4227 m to 4258 m.						

CASING AND CEMENTING REPORT

F5/2-67

OPERATOR	COUNTRY	WELL	CONTR.	RIG	DIAMETER	DATE
LF-NORGE	NORWAY NORTH SEA	SOUTH VIKING 15/3-2	GLOBALMARIN	POLYGLOMAR DRILLER	30"	THE 30/10/ 76

IMPORTANT. - All depths calculated from RKB

WELL CONDITION

Open hole size 36" Deviation: Max 1½ ° at 186 m. Min: ° at m

Cavings (depths - size....)

Mud losses during drilling (depth - quantities)

Nº of reamings Reamer at: m from bit

Last casing diameter: shoe at: m

BOP-stack during RIH (type, equipm., test pressure):

MUD: TYPE Spud mud S.G = 1,06 VIS. = 110 f? 12

OBSERVATIONS OR REMARKS

Drilled 36" hole w/sea water and high viscosity mud plug.

CASING DETAILS

ELEMENTS	TYPE	WALL THICKNESS m m.	GRADE	WEIGHT P.P.F.	VOLUME INSIDE	LENGTH (m)	Nº OF JOINTS
SHOE	BAKER FLOAT WELDED			in liter		0,50	X
FLOAT COLLAR	NONE						X
Joint	Squnch ATD	0750	x52	234	411,6	12,36	x
Joint	Squnch ATD	0750	x52	234	411,6	12,72	x
Joint	Squnch ATD	0750	x52	234	411,6	12,75	x
Joint	Squnch ATD	0750	x52	234	411,6	12,57	
Housing	Welded Vetco 30" Ass.No 110684					1,10	x
LANDING STRING	Drill Pipe 5"					133,00	X
					TOTAL >	185,00 m.	

DRIFT DIAMETER: 20" ½

MAX ALLOWED TENSION: 795 10^3 DAN

WEIGHT OF CASING STRING: in air 13 tons in mud 11,2 tons

CASING EQUIPMENT

CENTRALIZERS	SCRATCHERS	SPECIAL EQUIPMENT (SPECIFICATION — DEPTH)
TYPE	TYPE	Housing 30" vetco ass.no.110684
QUANTITY	QUANTITY	
DEPTH — RKB	DEPTH — RKB	Permanentbase plate W/4x12ft
		Guide partsAss.no.130610
		48 KHZ.TRANSPINGER FIXED
		ON BASE PLATE AT 133m.

R.I.H.

TYPE OF POWER TONG (Squnch joint)
THREAD DOPE
MAKE UP TORQUE lbs. ft or m kg
FILLING UP EACH .... JOINTS
CIRCULATION WHILE RIH (duration-depth)

TOTAL RIH TIME (circ. included) 1,35 h. RATE joints/h
CASING SHOE SET AT → 185,00 m
DISTANCE,RKB-MUD LINE 135m.
DATUM OR DATE PLAN DEFINITION Water depth 109,95m
Top 30 Housing- RBK 133m.

CIRCULATED AT TD: Hours 0,45 Flow Rate 12001. Pressure 400PSI
HANDLING CASING: Hours Cadence Amplitude
M.D. READINGS AFTER CIRCULATION
OBSERVATIONS (OR REMARKS) Set conductor pipe on button 185m.

FIRST STAGE OR ONE STAGE CEMENT

CEMENTING OPERATOR: Halliburton
MIXING PUMP Centrifugal
SLURRY PUMP Twin unit HT400
SLURRY DISPLACEMENT PUMP HT 400

STARTED SLURRY FABRICATION AT 07,00 h.
ENDED SLURRY PUMPING AT 07,45 h.
ENDED DISPLACEMENT AT 08,00 h.
BLEEDED OFF AT 08,05 h.

TYPE OF CEMENT	SACKS, BULK	% ADDITIONAL CEMENT	ADDITIVES USED	d SLURRY	QUANTITY
					T.
					T.
					T.

WATER PLUG, TYPE Hole and casing full w/ water VOLUME ADDITIVES
SLURRY FLOW RATE 560kg./m minute DISPLACING FLOW RATE
TYPE OF DISPLACING FLUID Sea water PUMPED VOLUME 10 bbl
DISPLACING PRESSURE START END BUMPED PLUG AT: kg/cm²
ESTIMATED LOSSES
TESTED CASING TO RESULT
EVENT. PRESSURE AFTER BLEED OFF ok no return

CASING ON SPOOL

M.D. READING AFTER DISPLACEMENT
M.D. READING AFTER WOC Casing tension on spool → T.
AID DOWN CASING ON SPOOL h. after displacement
SPOOL: TYPE Housing VETCO DIMENSION 30 SERIE Ass.NO. 110 6 P H
TYPE OF SLIPS AND PACK ASSY.
SUPPLEMENTARY PACK OFF (SEAL)
DISTANCE «SPOOL-ROTARY TABLE» Top 30 housing at 133m.
CUT CASING cm OVER SPOOL

TEST CASING

TEMP. LOGGING h. after woc
CBL h. after woc Cement Top annulus → ML 135 m
RESULTS: Jump diverse to check and sample cement return aroundhousing on MLok

TEST CASING AND BOP (hydril and rams) Pressure test →
PACKER SET AT:
RESULTS:

CASING STRING COMPOSITION

F 5ter/2-67

well	15/3-2	casing diameter	30"	distance RKB mud-line	135,00m.

JOINT NO.	WEIGHT GRADE	THREAD JOINT	LENGTH OF JOINT	CUMUL. LENGTH	JOINT NO.	WALLTHICK-NESS AND GRADE	THREAD	LENGTH OF JOINT	CUMUL. LENGTH
Top of housing		VetcoAT	133,00						
	Housing Welded x52- 0750		1,10	134,10					
1	Squnch joint x52-0750	VetcoATD	12,57	146,67					
2	Squnch joint x52-0750	VetcoATD	12,75	159,42					
3	Squnch joint x52-0750	VetcoATD	12,72	172,14					
4	Squnch joint	VetcoATD	12,36	184,50					
Shoe	BAKER FLOAT WELDED		0,50	185,00					

IMPORTANT. - THE CASING STRING COMPOSITION BEGINS WITH THE LANDING STRING LENGTH FROM RRB TO WELL HEAD, THEN ADD THE LENGTH JOINT BY JOINT FROM THE WELLHEAD.

CASING AND CEMENTING REPORT

F5/2-67

OPERATOR	COUNTRY	WELL	CONTR.	RIG	DIAMETER	DATE
ELF-NORGE	NORWAY	15/3-2	RGML	PGD	20"	THE 04-11-76

IMPORTANT. - All depths calculated from RKB

WELL CONDITION

Open hole size 26" Deviation: Max 1 ½ at 187 m. Min: 0 ½ at 552 m

Cavings (depths - size....) No caliper log

Mud losses during drilling (depth - quantities) None

Nº of reamings None Reamer at: / m from bit

Last casing diameter: 30" shoe at: 185 m m

BOP-stack during RIH (type, equipm., test pressure): No obturators

MUD: TYPE Prehydrated Bentonite in Fresh Water S.G = 1.18 VIS. = 64 f? 6.6

OBSERVATIONS OR REMARKS: Drill 17½ rat-hole from 187m to 775m W/Marine riser on 30" housing 26" opening hole from 187m to 784m W/26" under reamer.

CASING DETAILS

ELEMENTS	TYPE	WALL THICKNESS m m.	GRADE	WEIGHT kgs/m	VOLUME INSIDE	LENGTH (m)	Nº OF JOINTS
SHOE	BAKER Float-shoe	16.13	K55			0.44	×
20" Joint	Casing Buttress 133#	16.13	K55	197.50	177.76	4.96	
FLOAT COLLAR	BAKER Float-Collar	16.13	K55			0.61	1
20" Joint	Casing Buttress 133#	16.13	K55	197.50	177.76	4.85	
20" Joints	Casing Buttress 133#	16.13	K55	197.50	177.76	604.90	52
20" Joint	X-Over Csg-Butt. 133# - Vetco "L"	16.13	K55	197.50	177.76	12.19	1
20" Joint	exten. + 18¾-15000 Vetco housing	16.13	K55	197.50	177.76	13.84	1
LANDING STRING	5" H.W. DP 50# and 20" housing Running-Tool VETCO					132.00	×
					TOTAL →	773.79 m.	55

Welded

DRIFT DIAMETER: 470.9 mm

MAX ALLOWED TENSION: 850 tons W/SF 1.1

WEIGHT OF CASING STRING: in air 126 tons tons in mud 1.185G = 107 tons tons

CASING EQUIPMENT

CENTRALIZERS	SCRATCHERS	SPECIAL EQUIPMENT (SPECIFICATION — DEPTH)
TYPE	TYPE	
QUANTITY	QUANTITY	
DEPTH — RKB	DEPTH — RKB	

R.I.H.

TYPE OF POWER TONG: ECKEL model 20"
THREAD DOPE: Jet Lube 21
MAKE UP TORQUE: 17,000 ft/lbs (lbs. ft or m kg)
FILLING UP EACH ..1. JOINTS: 20" Csg. and each 1stand of 5" HWDP to landing string
CIRCULATION WHILE RIH (duration-depth): NONE

TOTAL RIH TIME (circ. included): 11 h. 30 RATE: 4,8 joints/h
CASING SHOE SET AT → 774.00 m
DISTANCE,RKB-MUD LINE: 135m00
DATUM OR DATE PLAN DEFINITION: RKB - Mud line = 135m00
RKB - Sea level = 25m00
Water depth = 110m00

CIRCULATED AT TD: Hours 00H30 Flow Rate 500 l/mn Pressure 450 psi
HANDLING CASING: Hours NONE Cadence / Amplitude /
M.D. READINGS AFTER CIRCULATION: 18 3/4 housing set and locked down in 30" housing
OBSERVATIONS (OR REMARKS):

FIRST STAGE OR ONE STAGE CEMENT

CEMENTING OPERATOR: HALLIBURTON
MIXING PUMP: DEMING CENTRIFUGAL 4"x4"
SLURRY PUMP: HT 400 - 4½ x 8"
SLURRY DISPLACEMENT PUMP: National 16DO : 12"x7¼

STARTED SLURRY FABRICATION AT: 15H48 h.
ENDED SLURRY PUMPING AT: 18H40 h.
ENDED DISPLACEMENT AT: 19H55 h.
BLEEDED OFF AT: 24H00 h.

TYPE OF CEMENT	SACKS, BULK	% ADDITIONAL CEMENT	ADDITIVES USED	d SLURRY	QUANTITY
"G"	Bulk	130%	12% gel - 0.3% HR7 - Dril Water	1.51 SG	130 T.
"G"	Bulk	130%	0.03 gal/sx D81 - Dril Water	1.72 SG	24 T.
"G"	Bulk	130%	0.03 gal/sx D81 - Dril water	1.85 SG	10 T.

WATER PLUG, TYPE: None VOLUME: / ADDITIVES: /
SLURRY FLOW RATE: 1300 l/min DISPLACING FLOW RATE: 1500 l/min
TYPE OF DISPLACING FLUID: Mud: 52650 liters followed W/ 59570 liters of sea water
DISPLACING PRESSURE START: 900 Psi END: 1200 Psi BUMPED PLUG AT: 800 Psi kg/cm²
ESTIMATED LOSSES: None
TESTED CASING TO: 1000 PSI RESULT: OK
EVENT. PRESSURE AFTER BLEED OFF: Flowing back - Hold 800 Psi on Csg. Bleed off at 24H00 : OK

CASING ON SPOOL

M.D. READING AFTER DISPLACEMENT: 18 3/4 housing set in 30" housing
M.D. READING AFTER WOC: 18 3/4 housing set in 30" housing
Casing tension on spool → / T.
AID DOWN CASING ON SPOOL: / h. after displacement
SPOOL: TYPE: 18 3/4 housing VETCO DIMENSION: 18 3/4 SERIE: 15000 Psi WP
TYPE OF SLIPS AND PACK ASSY.: /
SUPPLEMENTARY PACK OFF (SEAL): /
DISTANCE «SPOOL-ROTARY TABLE»: RKB to top 18 3/4 housing = 132m00
CUT CASING: / cm OVER SPOOL: /

TEST CASING

TEMP. LOGGING: h. after woc
CBL: h. after woc
Cement Top annulus → Sea bed m
RESULTS:

TEST CASING AND BOP (hydril and rams) Pressure test →
PACKER SET AT:
RESULTS:

CASING STRING COMPOSITION

F 5ter/2-67

well: 15/3-2 | casing diameter: 20" | distance RKB mud-line: 135m00

JOINT NO.	WEIGHT GRADE	THREAD JOINT	LENGTH OF JOINT	CUMUL. LENGTH	JOINT NO.	WALLTHICK-NESS AND GRADE	THREAD	LENGTH OF JOINT	CUMUL. LENGTH
5" H.W. DP 50#					37	133#. K55	Butt.	9,95	562,32
Top part 20" housing Running-tool			132.00		38			9,87	572,19
					39			9,92	582,11
1 Housing 18¾+20" joint			13,84	145,84	40			8,32	590,43
2 X-Over "L" Vetco-Butt.			12,19	158,03	41			9,18	599,61
3	133#-K55	Butt.	12,63	170,66	42			11,55	611,16
4			12,22	182,88	43			12,50	623,66
5			12,65	195,53	44			12,54	636,20
6			12,16	207,69	45			12,88	649,08
7			12,34	220,03	46			12,68	661,76
8			13,00	233,03	47			12,20	673,96
9			12,60	245,63	48			12,74	686,70
10			11,75	257,38	49			13,21	699,91
11			12,83	270,21	50			12,13	712,04
12			12,27	282,48	51			12,58	724,62
13			10,80	293,28	52			12,75	737,37
14			12,57	305,85	53			12,70	750,07
15			11,73	317,58	54			12,86	762,93
16			12,82	330,40				4,85	
17			12,57	342,97	55		Welded	0,61	
18			12,03	355,00				4,96	
19			9,28	364,28				0,44	773,79
20			9,12	373,40					
21			12,19	385,59					
22			12,76	398,35					
23			12,69	411,04					
24			11,75	422,79					
25			9,68	432,47					
26			9,08	441,55					
27			8,56	450,11					
28			9,06	459,17					
29			12,59	471,76					
30			12,29	484,05					
31			11,98	496,03					
32			12,23	508,26					
33			12,72	520,98					
34			12,92	533,90					
35			9,87	543,77					
36			8,60	552,37					

IMPORTANT. - THE CASING STRING COMPOSITION BEGINS WITH THE LANDING STRING LENGTH FROM RRB TO WELL HEAD, THEN ADD THE LENGTH JOINT BY JOINT FROM THE WELLHEAD.

CASING AND CEMENTING REPORT

F5/2-67

OPERATOR	COUNTRY	WELL	CONTR.	RIG	DIAMETER	DATE
ELF-NORGE	NORWAY	15/3-2	RGML	PGD	13 3/8	THE 04-12-76

IMPORTANT. - All depths calculated from RKB

WELL CONDITION

Open hole size 17 1/2 Deviation: Max 1 ° 45 at 2029 m. Min: 0 ° 15 at 1529 m

Cavings (depths - size....) 774-785m=27" - 795-825m=20" - 825-848m=18"
2875 to 2687m=18" - 2687 to 2663m=19" - 2175 to 2130m=19" - 2130 to 2000m=18"

Mud losses during drilling (depth - quantities) NONE

N° of reamings NONE Reamer at: / m from bit

Last casing diameter: 20" shoe at: 774m m

BOP-stack during RIH (type, equipm., test pressure): 18 3/4 10000 PSI WP H4 connector lower - 2 double 18 3/4 10000 PSI WP "U" ram type preventer, 2 Hydril "GL" 18 3/4 5000 PSI WP bag preventer - Blind shear ram upper and 3 pipe ram 5" lower - Test: Pipe-ram 5000 PSI. Hydril: 2500 PSI

MUD: TYPE Prehydrated bentonite - FCL S.G = 1,27 VIS. = 50 f? 3,6

OBSERVATIONS OR REMARKS

CASING DETAILS

ELEMENTS	TYPE	WALL THICKNESS m m.	GRADE	WEIGHT Kgs/m	VOLUME INSIDE	LENGTH (m)	N° OF JOINTS
SHOE	BAKER Float-Shoe 72#	13,06	N80			0,50	X
13 3/8 Joints	Casing Buttress 72#	13,06	N80	106,60	77,24	25,63	2
FLOAT COLLAR	BAKER Float-Collar 72#	13,06	N80			0,52	X
							X
13 3/8 Joints	Casing Buttress 72#	13,06	N80	106,60	77,24	1336,74	109
13 3/8 X-OVER	Butt pin - VAM box 72#	13,06	P110	106,65	77,24	5,78	X
13 3/8 Joints	Casing VAM 72#	13,06	P110	106,65	77,24	644,51	54
DV	BAKER Stage collar 72#	13,06	P110		77,24	0,70	X
13 3/8 Joints	Casing VAM 72#	13,06	P110	106,65	77,24	708,12	59
13 3/8 X-OVER	VAM pin - Butt pin 72#	13,06	P110	106,65	77,24	5,98	X
	13 3/8 Csg. hanger SG5 VETCO					0,47	X
LANDING STRING	13 3/8 Casing VAM 72# and 13 3/8 Running-tool VETCO					133,07	X
					TOTAL >	2862,02 m.	224

DRIFT DIAMETER: 309,7mm

MAX ALLOWED TENSION: 752 t - 72# N80 Buttress

WEIGHT OF CASING STRING: in air 293t tons in mud 1,27 SG = 246t tons

CASING EQUIPMENT

CENTRALIZERS
WEATHERFORD
TYPE ST II
QUANTITY 10
DEPTH — RKB
2857m - 2853m - 2844m
2840m - 2831m - 2827m
2816m
850m) DV
846m)
760m above 20" Shoe

SCRATCHERS
TYPE
QUANTITY
DEPTH — RKB

SPECIAL EQUIPMENT
(SPECIFICATION — DEPTH)

R.I.H.

TYPE OF POWER TONG: ECKEL model 13 3/8
THREAD DOPE: Jet Lube 21
MAKE UP TORQUE: N80 Buttress: 12,000 ft. lbs. - P110 VAM = 13,000 ft. lbs (lbs. ft or m kg)
FILLING UP EACH .. /. JOINTS: 13 3/8 Csg. less the last 500m-RKB Filling up when 13 3/8 Csg hanger set
CIRCULATION WHILE RIH (duration-depth): NONE

TOTAL RIH TIME (circ. included): 25 h. 30 — RATE: 9.25 joints/h
CASING SHOE SET AT → 2862 m
DISTANCE, RKB-MUD LINE: 135 m 00
DATUM OR DATE PLAN DEFINITION: RKB - Mud line = 135 m 00
RKB - Sea level = 25 m 00
Water depth = 110 m 00

CIRCULATED AT TD: Hours: 02 H 00 — Flow Rate: 2500 l/min — Pressure: 700 PSI
HANDLING CASING: Hours: NONE — Cadence: / — Amplitude: /
M.D. READINGS AFTER CIRCULATION: 13 5/8 Csg. hanger set in 18 3/4 housing before circulation
OBSERVATIONS (OR REMARKS):
Included in RIH time 3 hours work on Weatherford power tong and hydr. unit
+ 1 hour free up and grease up 500t elevator slips
+ 2 hours Rig up to run casing

CASING ON SPOOL / FIRST STAGE OR ONE STAGE CEMENT

CEMENTING OPERATOR: HALLIBURTON
MIXING PUMP: DEMING CENTRIFUGAL 4" x 4"
SLURRY PUMP: HT 400 : 4 1/2 x 8"
SLURRY DISPLACEMENT PUMP: National 1600: 12" x 6 1/4

STARTED SLURRY FABRICATION AT: 09 H 24 h.
ENDED SLURRY PUMPING AT: 10 H 40 h.
ENDED DISPLACEMENT AT: 12 H 10 h.
BLEEDED OFF AT: 12 H 25 h.

TYPE OF CEMENT	SACKS, BULK	% ADDITIONAL CEMENT	ADDITIVES USED	d SLURRY	QUANTITY
"G"	Bulk	W/Caliper	12% Gel-0.3% HR7-DRLG-Water	1.51 SG	32 T.
"G"	Bulk	W/Caliper	CFR2: 0.75% - HR7: 0.3% - Dril Water	1.90 SG	25 T.
					T.

WATER PLUG, TYPE: DRLG Water — VOLUME: 5 m³ — ADDITIVES: NONE
SLURRY FLOW RATE: 610 l/min — DISPLACING FLOW RATE: 2800 l/min
TYPE OF DISPLACING FLUID: DRLG MUD — PUMPED VOLUME: 219516 liters
DISPLACING PRESSURE START: 1950 PSI — END: 2150 PSI — BUMPED PLUG AT: 1500 PSI kg/cm²
ESTIMATED LOSSES: NONE
TESTED CASING TO: 2500 PSI - 15 min — RESULT: SATISFACTORY
EVENT. PRESSURE AFTER BLEED OFF: NONE

M.D. READING AFTER DISPLACEMENT: 13 5/8 hanger set in 18 3/4 housing
M.D. READING AFTER WOC: 13 5/8 hanger set in 18 3/4 housing — Casing tension on spool → / T.
AID DOWN CASING ON SPOOL: / h. after displacement
SPOOL: TYPE: 18 3/4 housing VETCO — DIMENSION: 18 3/4 — SERIE: 15 000 PSI WP
TYPE OF SLIPS AND PACK ASSY.: 13 3/8 - SGV type "T" Csg. hanger + 13 3/8 - SGV type "T" Pack-off
SUPPLEMENTARY PACK OFF (SEAL): /
DISTANCE «SPOOL-ROTARY TABLE»: RKB to top 13 5/8 hanger = 133 m 07
CUT CASING: / cm OVER SPOOL

TEST CASING

TEMP. LOGGING: / h. after woc
CBL: 24 H 00 h. after woc — Cement Top annulus → / m
RESULTS: CBL recording before DRLG-out Float-collar
From Float Collar to 2700m: between 1 to 3 millivolts corresponding at neat cmt 1.90 SG
Above 2700m no clear top of cmt. Blended cmt 1.51 SG. Too early for CBL
TEST CASING ~~AND BOP (hydril and ram)~~ — Pressure test → 3000 PSI
PACKER SET AT: 18 3/4 SG5 type "T" direct drive Csg hanger run. tool in 13 3/8 hanger
RESULTS: Upper + Middle pipe-ram + Choke and Kill-lines: 5000 PSI - 10 min - OK
Upper and Lower Hydril: 2500 PSI - 10 min - OK

I

CASING STRING COMPOSITION

F 5ter/2-67

well: 15/3-2 | casing diameter: 13 3/8 | distance RKB mud-line: 135 m.

JOINT NO.	WEIGHT GRADE	THREAD JOINT	LENGTH OF JOINT	CUMUL. LENGTH	JOINT NO.	WALLTHICK-NESS AND GRADE	THREAD	LENGTH OF JOINT	CUMUL. LENGTH
	P110	VAM	4.94		23	72# P110	VAM	12.32	418.33
			12.46		24			11.61	429.94
			12.19		25			12.78	442.72
STRING			12.19		26			11.78	454.50
			12.23		27			12.33	466.83
			11.88		28			12.58	479.41
			11.97		29			12.60	492.01
			12.51		30			11.56	503.57
LANDING			11.78		31			11.20	514.77
			11.75		32			12.25	527.02
			11.89		33			12.04	539.06
			6.12		34			12.19	551.25
	RUNNING TOOL		1.16	133.07	35			10.87	562.12
					36			11.47	573.59
RKB	- TOP CSG HANGER			133.07	37			12.27	585.86
13 3/8	CSG HANGER		.47	133.54	38			11.99	597.85
VAM	PIN X BUTT PIN		5.98	139.52	39			11.98	609.83
1	72# P110	VAM	12.54	152.06	40			11.65	621.48
2			12.11	164.17	41			10.17	631.65
3			9.88	174.05	42			12.13	643.78
4			12.36	186.41	43			12.55	656.33
5			11.97	198.38	44			11.70	668.03
6			12.67	211.05	45			11.78	679.81
7			12.12	223.17	46			11.77	691.58
8			12.73	235.90	47			11.75	703.33
9			12.73	248.63	48			11.86	715.19
10			11.64	260.27	49			12.25	727.44
11			12.03	272.30	50			11.63	739.07
12			12.78	285.05	51			11.65	750.72
13			12.39	297.47	52	1 CENT.		11.68	762.40
14			12.31	309.78	53			11.50	773.90
15			11.35	321.13	54			12.93	786.83
16			12.12	333.25	55			12.52	799.35
17			11.67	344.92	56			12.38	811.73
18			11.29	356.21	57			11.75	823.48
19			12.78	368.99	58			11.85	835.33
20			12.28	381.27	59	1 CENT.		12.31	847.64
21			12.33	393.60		DV		.70	848.34
22			12.41	406.01	60	1 CENT.		11.46	859.80

IMPORTANT. - THE CASING STRING COMPOSITION BEGINS WITH THE LANDING STRING LENGTH FROM RRB TO WELL HEAD, THEN ADD THE LENGTH JOINT BY JOINT FROM THE WELLHEAD.

II

CASING STRING COMPOSITION

F 5ter/2-67

well: 15/3-2 | casing diameter: 13 3/8 | distance RKB mud-line: 135 m

JOINT NO.	WEIGHT GRADE	THREAD JOINT	LENGTH OF JOINT	CUMUL. LENGTH	JOINT NO.	WALLTHICK-NESS AND GRADE	THREAD	LENGTH OF JOINT	CUMUL. LENGTH
61	72# P110	VAM	12.24	872.04	100	72# P110	VAM	11.97	1340.87
62			11.36	883.40	101			11.85	1352.72
63			10.28	893.68	102			12.36	1365.08
64			12.45	906.13	103			11.76	1376.84
65			12.47	918.16	104			11.59	1388.43
66			12.82	931.42	105			12.37	1400.80
67			10.39	941.81	106			11.07	1411.87
68			10.71	952.52	107			12.01	1423.88
69			11.75	964.27	108			11.45	1435.33
70			12.07	976.34	109			10.86	1446.19
71			12.23	988.57	110			11.09	1457.28
72			11.90	1000.47	111			12.31	1469.59
73			12.33	1012.80	112			11.86	1481.45
74			11.85	1024.65	113.			11.40	1492.85
75			12.37	1037.02		VAM Box-BUTT. PIN		5.78	1498.63
76			12.28	1049.30	114	72# N80 BUTTRESS		12.62	1511.25
77			12.31	1061.61	115			12.65	1523.90
78			12.29	1073.90	116			11.88	1535.78
79			11.78	1085.68	117			11.91	1547.69
80			12.34	1098.02	118			12.62	1560.31
81			12.07	1110.09	119			11.42	1571.73
82			12.28	1122.37	120			11.75	1583.48
83			12.63	1135.00	121			12.59	1596.07
84			11.40	1146.40	122			12.03	1608.10
85			12.42	1158.82	123			12.31	1620.41
86			12.31	1171.13	124			12.43	1632.84
87			12.09	1183.22	125			12.63	1645.47
88			11.70	1194.92	126			11.99	1657.46
89			11.97	1206.89	127			11.87	1669.33
90			12.00	1218.89	128			12.55	1681.88
91			12.21	1231.10	129			11.45	1693.33
92			12.44	1243.54	130			12.64	1705.97
93			12.32	1255.86	131			12.37	1718.34
94			11.95	1267.81	132			10.86	1729.20
95			12.36	1280.17	133			11.44	1740.64
96			11.70	1291.87	134			12.62	1753.26
97			12.25	1304.12	135			12.51	1765.77
98			12.58	1316.70	136			12.79	1778.56
99			12.20	1328.90	137			12.65	1791.21

IMPORTANT. - THE CASING STRING COMPOSITION BEGINS WITH THE LANDING STRING LENGTH FROM RRB TO WELL HEAD, THEN ADD THE LENGTH JOINT BY JOINT FROM THE WELLHEAD.

III

CASING STRING COMPOSITION

F 5ter/2-67

well	15/3-2	casing diameter	13 3/8	distance RKB mud-line	135 m.

JOINT NO.	WEIGHT GRADE	THREAD JOINT	LENGTH OF JOINT	CUMUL. LENGTH	JOINT NO.	WALLTHICK-NESS AND GRADE	THREAD	LENGTH OF JOINT	CUMUL. LENGTH
138	72#N80	BUTTRESS	12.64	1803.85	177	72#N80	BUTTRESS	11.12	2286.27
139			12.81	1816.66	178			10.41	2296.68
140			12.57	1829.23	179			11.78	2308.46
141			11.51	1840.74	180			11.20	2319.66
142			12.55	1853.29	181			12.71	2332.37
143			12.62	1865.91	182			12.41	2344.78
144			12.75	1878.66	183			11.56	2356.34
145			12.64	1891.30	184			11.11	2367.45
146			12.14	1903.44	185			12.81	2380.26
147			11.40	1914.84	186			11.29	2391.55
148			12.58	1927.42	187			11.25	2402.80
149			12.45	193987	188			11.92	2414.72
150			12.74	1952.61	189			12.54	2427.26
151			12.81	1965.42	190			12.75	2440.01
152			11.40	1976.82	191			11.75	2451.76
153			12.65	1989.47	192			11.86	2463.62
154			12.73	2002.20	193			13.05	2476.67
155			10.32	2012.52	194			12.52	2489.25
156			12.75	2025.27	195			11.39	2500.64
157			12.78	2038.05	196			11.83	2512.47
158			12.75	2050.80	197			12.67	2525.14
159			12.30	2063.10	198			12.68	2537.89
160			12.67	2075.77	199			11.86	2549.68
161			12.33	2088.10	200			11.69	2561.37
162			12.70	21oa80	201			12.72	2574.09
163			12.68	2113.48	202			12.54	2586.63
164			12.75	2126.23	203			12.81	2599.44
165			13.08	2139.31	204			12.77	2612.21
166			12.47	2151.78	205			12.84	2625.05
167			12.98	2164.76	206			12.63	2637.68
168			12.46	2177.22	207			12.38	2650.06
169			12.70	2189.92	208			11.53	2661.59
170			12.70	2202.62	209			10.87	2672.46
171			11.34	2213.96	210			12.56	2685.02
172			12.83	2226.79	211			12.91	2697.93
173			11.54	2238.33	212			12.08	2710.01
174			11.34	2249.67	213			12.69	2722.70
175			12.67	2262.34	214			12.81	2735.51
176			12.81	2275.15	215			13.11	2748.62

IMPORTANT. - THE CASING STRING COMPOSITION BEGINS WITH THE LANDING STRING LENGTH FROM RRB TO WELL HEAD, THEN ADD THE LENGTH JOINT BY JOINT FROM THE WELLHEAD.

IV

CASING STRING COMPOSITION

F 5ter/2-67

well: 15/3-2 | casing diameter: 13 3/8 | distance RKB mud-line: 135 m

JOINT NO.	WEIGHT GRADE	THREAD JOINT	LENGTH OF JOINT	CUMUL. LENGTH	JOINT NO.	WALLTHICK-NESS AND GRADE	THREAD	LENGTH OF JOINT	CUMUL. LENGTH
216	72# N80	BUTTRESS	12.62	2761.24					
217			13.13	2774.37					
218			12.71	2787.08					
219			12.46	2799.54					
220			10.69	2810.23					
221	1 CENT.		12.72	2822.95					
222	2 CENT.		12.42	2835.37					
FLOAT COLLAR W/SEAL OFF PLATE			.52	2835.89					
223	2 CENT.		12.74	2848.63					
224	2 CENT.		12.89	2861.52					
	SHOE		.50	2862.02					

IMPORTANT. - THE CASING STRING COMPOSITION BEGINS WITH THE LANDING STRING LENGTH FROM RRB TO WELL HEAD, THEN ADD THE LENGTH JOINT BY JOINT FROM THE WELLHEAD.

MULTISTAGE CEMENTING REPORT _____ | F 5/2-67

WELL: 15/3-2 | CASING DIAMETER: 13 3/8 | Date 04-12-76

BEFORE CEMENTATION

depth of ~~perforations~~ D.V. (Stagging Tool) → 848m

Type, Grade, DV Model "G" - 72# - VAM

DV OPENING ~~PERFORATIONS DONE~~ 00H30 AFTER DISPLACING FIRST STAGE CEMENT

DV OPENING PRESSURE: 800 PSI

CIRCULATION BEFORE CEMENTATION: _____ duration 01H00 Flow rate 2600 l/m Pressure 1500 PSI

OBSERVATIONS OR REMARKS _____

CEMENTATION

OPERATOR HALLIBURTON

MIXING PUMP DEMING CENTRIFUGAL 4"x4"

SLURRY PUMP HT 400 : 4½ x 8"

SLURRY DISPLACEMENT PUMP: Rig 12" x 6¼

STARTED SLURRY FABRICATION AT: 14H20 h.

ENDED SLURRY PUMPING AT: 14H41 h.

ENDED DISPLACEMENT AT: 15H12 h.

BLEED OFF AT: 15H27 h.

Type of cement	Sacks, Bulk	% Additional Cement	Additive used	S.G. Slurry	Quantity
"G"	Bulk	W/Caliper	0.75% CFR2 - 0.3% HR7 DRLG-Water	1.80 SG	26 T

WATER PLUG: Type DRLG-Water Volume 5 m³ Additive NONE

SLURRY PUMPING RATE 1050 l/min DISPLACING FLOW RATE 3000 l/min.

TYPE OF DISPLACING FLUID: DRLG-MUD, PUMPED VOLUME 66040 liters

DISPLACING, PRESSURE, START: 2050 PSI AT THE END: 2150 PSI

CLOSED DV at 2500 PSI kg/cm² _____

ESTIMATED LOSSES NONE

CHECK

TEMPERATURE LOG AFTER ~~_____~~ h. after cementation

CBL 21H30 h. after cementation

top of cement in annulus → 590 m

RESULTS OF LOGGING: from 850m (DV depth log) to 590m : between 5 to 7 millivolts

TESTING DV OR PERFORATION AFTER DRILLING OUT

DURATION 15 min. PACKER SET. AT 12 ⅛ DRLG-bit on Float Collar

test pressure → 3000 PSI

RESULTS OF TEST SATISFACTORY

13 3/8 Csg test at 3000 PSI - 15 min. OK W/12 ⅛ DRLG-bit on Float-Collar and Upper pipe-ram close.

CASING AND CEMENTING REPORT

F5/2-67

OPERATOR	COUNTRY	WELL	CONTR.	RIG	DIAMETER	DATE
ELF-NORGE	NORWAY	15/3-2	RGML	PGD	9 5/8	THE 16-01-77

IMPORTANT. - All depths calculated from RKB

WELL CONDITION

Open hole size 12" Deviation: Max 3 °½ at 4165 m. Min: 1 °½ at 2904 m

Cavings (depths - size....) 4040 to 3990m: 13"½ - 3970 to 3925m: 14" - 3925 to 3825m: 13" 2915 to 2877m: 14" - 2877 to 2862m: 18"

Mud losses during drilling (depth - quantities) NONE

N° of reamings NONE Reamer at: / m from bit

Last casing diameter: 13 3/8 shoe at: 2862 m m

BOP-stack during RIH (type, equipm., test pressure): 18¾-10000 PSI WP H4 connector lower-2 double 18¾10000# WP "U" ram type preventer, 2 Hydril "GL" 18¾ 5000 PSI WP bag preventer. Blind shear ram upper and 3 pipe ram 5" lower. Test: pipe-ram: 5000 PSI - Hydril: 2500 PSI

MUD: TYPE Prehydrated bentonite with FCL S.G = 1.60 VIS. = 56 ft? 2.2

OBSERVATIONS OR REMARKS Broke 5" DP Grade "G" on mid. body while POOH bit to wipe hole before to run 9 5/8 Csg. Bit was at 44m above bottom. RIH W/ 8 ½ OVERSHOT W/ 4 7/8 grapple. Top Fish at 138m - Pick-up, POOH and lay down Fish. Wipe hole W/ 12" new bit before to run 9 5/8 Csg.

CASING DETAILS

ELEMENTS	TYPE	WALL THICKNESS m m.	GRADE	WEIGHT P.P.F.	VOLUME INSIDE	LENGTH (m)	N° OF JOINTS
SHOE	BAKER Float-Shoe 53#.5	13.84	P110			0.49	X
9 5/8 Joints	Casing VAM 53#.5	13.84	P110	78.54	36.92	39.76	3
FLOAT COLLAR	BAKER Float-Collar 53#.5	13.84	P110			0.49	X
9 5/8 Joints	Casing VAM 53#.5	13.84	P110	78.54	36.92	1600.93	122
9 5/8 Pup Jt	Casing VAM 58#.4	13.95	Q125	85.16	36.14	5.55	X
9 5/8 Joints	Casing VAM 58#.4	13.95	Q125	85.16	36.14	2462.06	212
9 5/8 Pup Jt	Casing VAM 58#.4	13.95	Q125	85.16	36.14	5.74	X
	9 5/8 Csg. hanger SGS VETCO					0.47	
LANDING STRING	9 5/8 Casing VAM 58#.4 and 9 5/8 Running-Tool VETCO					132.60	X
					TOTAL >	4248.09 m.	337

DRIFT DIAMETER: 214 mm

MAX ALLOWED TENSION: 774 t - 53#.5 - P110 - VAM

WEIGHT OF CASING STRING: in air 339 t.7 tons in mud 1.60 SG = 270 t.4 tons

CASING EQUIPMENT

CENTRALIZERS

WEATHERFORD

TYPE NW Spiral

QUANTITY 10

DEPTH — RKB

4244m - 4239m - 4230m

4226m - 4216m - 4211m

4203m - 4199m

2845m } above 13 3/8 Shoe

2841m }

SCRATCHERS

TYPE

QUANTITY

DEPTH — RKB

SPECIAL EQUIPMENT

(SPECIFICATION — DEPTH)

R.I.H.

TYPE OF POWER TONG: ECKEL model 13 3/8
THREAD DOPE: Jet Lube 21
MAKE UP TORQUE: 53#5 VAM = 9100 ft.lbs W/F: 0.7 - 58#4 VAM = 9800 ft.lbs W/F = 0.7 lbs. ft or m kg
FILLING UP EACH ..1.. JOINTS: 9 5/8 Csg less the last 600m-RKB Filling up when 9 5/8 Csg hanger set
CIRCULATION WHILE RIH (duration-depth): NONE

TOTAL RIH TIME (circ. included): 21 h. 30 RATE: 15.67 joints/h
CASING SHOE SET AT → 4248 m
DISTANCE,RKB-MUD LINE: 135 m 00
DATUM OR DATE PLAN DEFINITION: RKB - Mud line = 135 m 00
RKB - Sea level = 25 m 00
Water depth = 110 m 00

CIRCULATED AT TD: Hours 02 H 00 Flow Rate 2400 l/min Pressure 2300 PSI
HANDLING CASING: Hours NONE Cadence / Amplitude /
M.D. READINGS AFTER CIRCULATION: 9 5/8 Csg hanger set in 18 3/4 housing before circulation
OBSERVATIONS (OR REMARKS):
Included in RIH time 1hour to lay down 2 Jts 58#4 Q125 with bad thread.

FIRST STAGE OR ONE STAGE CEMENT

CEMENTING OPERATOR: HALLIBURTON
MIXING PUMP: DEMING CENTRIFUGAL 4" x 4"
SLURRY PUMP: HT 400 - 4 1/2 x 8"
SLURRY DISPLACEMENT PUMP: National 1600: 12" x 6 1/4

STARTED SLURRY FABRICATION AT 05 H 31 h.
ENDED SLURRY PUMPING AT 06 H 12 h.
ENDED DISPLACEMENT AT 07 H 40 h.
BLEEDED OFF AT 07 H 55 h.

TYPE OF CEMENT	SACKS, BULK	% ADDITIONAL CEMENT	ADDITIVES USED	d SLURRY	QUANTITY
					T.
"E"	Bulk	W/Caliper	CFR2: 0.5% - DRLG-Water	1.98 SG	69 T.
					T.

WATER PLUG, TYPE: DRLG Water VOLUME: 10 bbls ADDITIVES: NONE
SLURRY FLOW RATE: 1180 l/min DISPLACING FLOW RATE: 1970 l/min
TYPE OF DISPLACING FLUID: DRLG - MUD PUMPED VOLUME: 153.570 liters
DISPLACING PRESSURE START: 950 PSI END: 1500 PSI BUMPED PLUG AT: 2000 PSI kg/cm²
ESTIMATED LOSSES: NONE
TESTED CASING TO: 3500 PSI - 15 min RESULT: SATISFACTORY
EVENT. PRESSURE AFTER BLEED OFF: NONE

CASING ON SPOOL

M.D. READING AFTER DISPLACEMENT: 9 5/8 hanger set in 18 3/4 housing
M.D. READING AFTER WOC: 9 5/8 hanger set in 18 3/4 housing
Casing tension on spool → / T.
AID DOWN CASING ON SPOOL: / h. after displacement
SPOOL: TYPE: 18 3/4 housing VETCO DIMENSION: 18 3/4 SERIE: 15000 PSI WP
TYPE OF SLIPS AND PACK ASSY.: 9 5/8 - SGS type "T" Csg hanger + 9 5/8 SGS type "T" Pack-off
SUPPLEMENTARY PACK OFF (SEAL): /
DISTANCE «SPOOL-ROTARY TABLE»: RKB to top 9 5/8 hanger = 132 m 60
CUT CASING: / cm OVER SPOOL

TEST CASING

TEMP. LOGGING: 03.15 h. after woc
CBL: / h. after woc
Cement Top annulus → 2760 m
RESULTS:

TEST CASING AND BOP (hydril and rams) Pressure test → 5000 PSI
PACKER SET AT: 18 3/4 SGS type "T" direct drive Csg hanger run tool in 9 5/8 hanger
RESULTS:
Test 9 5/8 SGS type "T" Pack-off at 5000 PSI

CASING STRING COMPOSITION

F 5ter/2-67

well: 15/3-2 | casing diameter: 9⅝ | distance RKB mud-line: 135m,00

JOINT NO.	WEIGHT GRADE	THREAD JOINT	LENGTH OF JOINT	CUMUL. LENGTH	JOINT NO.	WALLTHICK-NESS AND GRADE	THREAD	LENGTH OF JOINT	CUMUL. LENGTH
	58#4-Q125	VAM	4,50		23	58#4-Q125	VAM	11,77	406,72
			11,75		24			11,78	418,50
			11,86		25			11,75	430,25
			12,05		26			10,87	441,12
			11,79		27			11,71	452,83
			12,17		28			11,75	464,58
			11,90		29			11,76	476,34
			11,81		30			11,46	487,80
			11,80		31			11,86	499,66
			11,81		32			11,40	511,06
			5,55		33			11,94	523,00
			11,75		34			11,93	534,93
	X-OVER Butt.pin-Yambox		2,66		35			11,79	576,42
	9⅝ Running-Tool		1,20	132,60	36			11,26	557,98
					37			11,19	569,17
9⅝ Casing-hanger			0,47	133,07	38			10,29	579,46
up-Jt	58#4-Q125	VAM	5,74	138,81	39			11,17	590,63
1			11,86	150,67	40			11,81	602,44
2			11,63	162,30	41			11,69	614,13
3			11,73	174,03	42			11,32	625,45
4			11,91	185,94	43			11,73	637,18
5			11,52	197,46	44			11,82	649,00
6			11,64	209,10	45			11,76	660,76
7			11,35	220,45	46			11,87	672,63
8			11,47	231,92	47			11,89	684,52
9			10,94	242,86	48			11,63	696,15
10			11,56	254,42	49			11,16	707,31
11			11,90	266,32	50			11,69	719,00
12			11,62	277,94	51			11,55	730,55
13			11,81	289,75	52			11,69	742,24
14			10,78	300,53	53			11,64	753,88
15			11,78	312,31	54			11,73	765,61
16			11,71	324,02	55			11,43	777,04
17			11,56	335,58	56			11,25	788,29
18			11,75	347,33	57			11,54	799,83
19			12,08	359,41	58			11,77	811,60
20			12,11	371,52	59			12,47	824,07
21			11,95	383,47	60			11,99	836,06
22			11,48	394,95	61			11,75	847,81

IMPORTANT. - THE CASING STRING COMPOSITION BEGINS WITH THE LANDING STRING LENGTH FROM RRB TO WELL HEAD, THEN ADD THE LENGTH JOINT BY JOINT FROM THE WELLHEAD.

CASING STRING COMPOSITION

F 5ter/2-67

well: 15/3-2 | casing diameter: 9 5/8 | distance RKB mud-line: 135m,00

JNT).	WEIGHT GRADE	THREAD JOINT	LENGTH OF JOINT	CUMUL. LENGTH	JOINT NO.	WALLTHICK-NESS AND GRADE	THREAD	LENGTH OF JOINT	CUMUL. LENGTH
2	58#4-Q125	VAM	11.85	859.66	101	58#4-Q125	VAM	11,56	1308.19
3			11.79	871.45	102			11.87	1320.06
4			11.27	882.72	103			11.80	1331.86
5			11.55	894.27	104			11.87	1343.73
6			11.75	906.02	105			12.06	1355.79
7			12.05	918.07	106			11.68	1367.47
8			10.71	928.78	107			11.57	1379.04
9			11.58	940.36	108			11.94	1390.98
10			11.74	952.10	109			11.42	1402.40
11			11.36	963.46	110			12.05	1414.45
12			11.51	974.97	111			11.95	1426.40
13			11.50	986.47	112			11.60	1438.00
14			12.15	998.62	113			11.67	1449.67
15			10.93	1009.55	114			11.83	1461.50
16			11.27	1020.82	115			12.15	1473.65
17			11.93	1032.75	116			11.86	1485.51
18			11.58	1044.33	117			11.06	1496.57
19			11.59	1055.92	118			12.08	1508.65
80			11.88	1067.80	119			11.29	1519.94
81			11.19	1078.99	120			11.72	1531.66
82			11.35	1090.34	121			11.49	1543.15
83			11.77	1102.11	122			11.47	1554.62
84			11.76	1113.87	123			11.49	1566.11
85			11.69	1125.56	124			11.45	1577.56
86			11.07	1136.63	125			11.38	1588.94
87			11.60	1148.23	126			11.71	1600.65
88			10.64	1158.87	127			11.20	1611.85
89			11.09	1169.96	128			11.68	1623.53
90			11.84	1181.80	129			11.75	1635.28
91			11.75	1193.55	130			11.63	1646.91
92			11.39	1204.94	131			11.75	1658.66
93			11.21	1216.15	132			12.11	1670.77
94			11.71	1227.86	133			11.95	1682.72
95			11.38	1239.24	134			11.56	1694.28
96			11.37	1250.61	135			11.71	1705.99
97			11.38	1261.99	136			11.48	1717.47
98			11.77	1273.76	137			11.92	1729.39
99			11.47	1285.23	138			12.05	1741.44
00			11.40	1296.63	139			11.58	1753.02

IMPORTANT. - THE CASING STRING COMPOSITION BEGINS WITH THE LANDING STRING LENGTH FROM RRB TO WELL HEAD, THEN ADD THE LENGTH JOINT BY JOINT FROM THE WELLHEAD.

CASING STRING COMPOSITION

F 5ter/2-67

well	15/3-2	casing diameter	9 5/8	distance RKB mud-line	135m,00

JOINT NO.	WEIGHT GRADE	THREAD JOINT	LENGTH OF JOINT	CUMUL. LENGTH	JOINT NO.	WALLTHICK-NESS AND GRADE	THREAD	LENGTH OF JOINT	CUMUL. LENGTH
40	58,#4-Q125	VAM	11.85	1764.87	179	58,#4-Q125	VAM	11.56	2216.46
41			11.61	1776.48	180			11.85	2228.31
42			11.71	1788.19	181			11.68	2239.99
43			11.63	1799.82	182			11.84	2251.83
44			11.62	1811.44	183			11.83	2263.66
45			11.83	1823.27	184			11.92	2275.58
46			11.67	1834.94	185			11.78	2287.36
47			11.02	1845.96	186			11.40	2298.76
48			11.30	1857.26	187			11.87	2310.63
49			11.79	1869.05	188			10.69	2321.32
50			11.55	1880.60	189			11.46	2332.78
51			11.64	1892.24	190			11.52	2344.30
52			11.67	1903.91	191			11.69	2355.99
53			11.92	1915.83	192			11.63	2367.62
54			11.42	1927.25	193			11.72	2379.34
55			11.57	1938.82	194			11.95	2391.29
56			11.40	1950.22	195			11.87	2403.18
57			11.73	1961.95	196			11.57	2414.75
58			10.87	1972.82	197			11.75	2426.50
59			11.89	1984.71	198			11.50	2438.05
60			11.67	1996.38	199			11.87	2449.92
61			11.44	2007.82	200			11.77	2461.69
62			11.40	2019.22	201			12.10	2473.79
63			11.80	2031.02	202			11.86	2485.65
64			11.82	2042.84	203			10.55	2496.20
65			11.52	2054.36	204			11.42	2507.62
66			11.54	2065.90	205			11.63	21519.25
67			11.56	2077.46	206			11.57	2530.82
68			11.80	2089.26	207			11.53	2542.36
69			11.43	2100.67	208			11.55	2553.91
70			11.34	2112.03	209			11.98	2565.89
71			11.35	2123.38	210			11.49	2577.38
72			11.83	2135.21	211			11.78	2589.16
73			11.70	2146.91	212			11.71	2600.87
74			11.98	2158.89		PUP JOINT		5.55	2606.42
75			10.85	2169.74	213	53,#5-P110	VAM	12.85	2619.27
76			11.85	2181.59	214			12.86	2632.13
77			11.81	2193.40	215			13.03	2645.16
78			11.50	2204.90	216			13.20	2658.36

IMPORTANT. - THE CASING STRING COMPOSITION BEGINS WITH THE LANDING STRING LENGTH FROM RRB TO WELL HEAD, THEN ADD THE LENGTH JOINT BY JOINT FROM THE WELLHEAD.

CASING STRING COMPOSITION

F 5ter/2-67

well: 15/3-2 | casing diameter: 9 5/8 | distance RKB mud-line: 135,m00

JOINT NO.	WEIGHT GRADE	THREAD JOINT	LENGTH OF JOINT	CUMUL. LENGTH	JOINT NO.	WALLTHICK-NESS AND GRADE	THREAD	LENGTH OF JOINT	CUMUL. LENGTH
217	53,#5-P110	VAM	13.09	2671.45	256	53,#5-P110	VAM	13.13	3175.69
218			12.84	2684.29	257			13.50	3189.19
219			12.99	2697.28	258			13.15	3202.34
220			11.39	2708.67	259			13.43	3215.77
221			11.34	2720.01	260			13.58	3229.35
222			10.40	2730.41	261			13.46	3242.81
223			13.31	2743.72	262			13.28	3256.09
224			13.12	2756.84	263			13.26	3269.35
225			12.05	2768.89	264			13.25	3282.60
226			13.08	2781.97	265			13.19	3295.79
227			13.24	2795.21	266			13.07	3308.86
228			13.03	2808.24	267			13.25	3322.11
229			13.40	2821.64	268			13.30	3335.41
230			12.97	2834.61	269			13.08	3348.49
231	2 CENTR.		13.38	2847.99	270			13.09	3361.58
232			13.16	2861.15	271			13.28	3374.86
233			13.23	2874.38	272			13.40	3388.26
234			13.45	2887.83	273			12.95	3401.21
235			13.35	2901.18	274			13.10	3414.31
236			13.20	2914.38	275			13.31	3427.62
237			12.39	2926.77	276			13.38	3441.00
238			13.49	2940.26	277			13.19	3454.19
239			13.35	2953.61	278			13.61	3467.80
240			12.41	2966.02	279			13.34	3481.14
241			13.25	2979.27	280			13.20	3494.34
242			13.42	2992.69	281			13.39	3507.73
243			12.95	3005.64	282			13.24	3520.97
244			11.46	3017.10	283			13.26	3534.23
245			13.46	3030.56	284			13.43	3547.66
246			13.42	3043.98	285			13.31	3560.97
247			13.26	3057.24	286			13.21	3574.18
248			12.98	3070.22	287			13.34	3587.52
249			12.80	3083.02	288			13.29	3600.81
250			13.04	3096.06	289			13.19	3614.00
251			13.39	3109.45	290			13.36	3627.36
252			13.42	3122.87	291			12.85	3640.21
253			13.33	3136.20	292			13.13	3653.34
254			13.49	3149.69	293			13.40	3666.74
255			12.87	3162.56	294			13.02	3679.76

IMPORTANT. - THE CASING STRING COMPOSITION BEGINS WITH THE LANDING STRING LENGTH FROM RRB TO WELL HEAD, THEN ADD THE LENGTH JOINT BY JOINT FROM THE WELLHEAD.

F 10 - 1/4 - 68

TECHNICAL STATUS - END OF DRILLING

WELL: 15/3-2

COUNTRY:	OPERATOR:	CONTRACTOR:	RIG:	T.D.:
NORWAY	ELF-NORGE	RGML	POLYGLOMAR	FIRST STAGE 4258 m

GENERALIZATIONS

- Wildcat ☒
- Extension drilling ☐
- Development drilling ☐
- Injection well ☐
- Onshore ☐
- Offshore (water depth 110m00) ☒
- Oil well ☐
- Gas well ☐
- Oil shows ☐
- Gas shows ☐
- Dry ☐
- Completion ☐
- Tubing completion ☐
- Abandon ☐

OPEN HOLES		CASING OF OPEN HOLES		
ø	TO	ø	SHOE	CEMENTED FROM..... ....TO.....
36"	186m	30"	185m	185m-Sea bottom
26"	784m	20"	774m	774m-Sea bottom
17½	2875m	13⅜	DV: 848m Shoe: 2862m	CBL: 848m-590m CBL: 2862-2700
12"	4258m	9⅝	Shoe: 4248	CBL: 4248-2760

All depths calculated from RKB

FOOTAGE

HOLE ø	LENGHT pr. DIAMETER	DRILLED ø	DRILLED FOOTAGE m	CORING ø	CORING FOOTAGE	OPENING	TURBINE-DRILLING	DIRECTIONAL DRILLING	AIR-DRILLING	LENGHT ABANDONED
36"	186	36"				51,00				
		26"	51,00							
26"	598	26"				598,00				
		17½	598,00							
17½	2091	17½	2091,00							
12"	1383	12¼	79,00			1383,00				
		11"⅝	1383,00							
TOTAL	4258	X	4202,00	X		2032,00				

TESTS

Numbers of tests	EXECUTED	NOT SUCCEEDED	Reason for failure	n°
Open hole	0		Packer leakage	
Casing	0		Formation plugged	
			Failed to open	
TOTAL	0			

FISHING JOBS

DURATION \ CAUSES	object dropping into hole	DP stuck	Twist off	DRILL BIT	CORE BARREL	CASING	LOGGING	TOTAL
Less than 24h.								
From 1 to 5 days			1					1
More than 5 days								
Not succeeded								
NUMBERS TOTAL			1					1

TIME SHARING

	HOURS	%
1 Moving	128 45	5,89
2 Drilling	982 30	44,91
3 Coring	0 00	0,00
4 Trips, drilling	229 00	10,47
5 Trips, coring	0 00	0,00
6 Reaming	46 30	2,13
7 Opening	13 45	0,63
8 Test	0 00	0,00
9 Logging. Survey.	120 00	5,49
10 Completion	0 00	0,00
11 Set casing-Cementation	330 30	15,09
12 Circulation	25 00	1,14
13 Fishing	73 30	3,36
14 Shutting in well	30 00	1,37
15 Repair Rig	144 30	6,61
16 Waiting, various	64 00	2,93
TOTAL	2187,5 H	100 %
RIG UTILISATION	3,04 month / rig	

EQUPMENT FINAL WELL STATUS

WELL: 15/3-2

RIG

DRAW WORKS: CONTINENTAL EMSCO C-3
DERRICK CAPACITY: GLOBAL MARINE: 160'x40'
TOTAL HP: 8800HP (4 Hedemora V18A/12G)
AVAILABLE HYDRAULIC POWER: 3200 HP
DISTANCE RKB-MUDLINE: 135m.00

PUMPS

NO	MANUFACTURE	TYPE
2	EMSCO	Triplex FA1600 7½ x 12"
4	IR-MIR-150	Centrifugal mixing

DRILLING STRING

FROM....TO....	DRILLPIPE (Ø, grade, thickness, «TJ»	DRILLCOLLARS Ø. length .....)
135 to 186	NO DP	10"x3": 58m - 8"x2 13/16: 28m - 5"HW50#: 100m
186 to 784	5" DP. Grade "E". 19#. 5. TJ 6½. 4½ IF	10"x3": 56m. 8x2 13/16: 57m. 5"HW50#: 56m
784 to 2875	5" DP. Grade "E" and "G". 19#. 5. TJ 6½. 4½ IF	10"x3": 64m. 8x2 13/16: 142m. 5"HW50#: 139m
2875 to 4258	5" DP - Grade "E" and "G" 19#. 5 - TJ 6½ - 4½ IF	8"x2 13/16: 208m. 5" HW-50#: 139m

BOP

FROM....TO....	MANUFACTURE - TYPE - SERIE
135m to 784m	Without obturators
784m to 4258	BOP stack 18¾-10000#WP - H4 Vetco Connector for 18¾-10000#WP lower - 2 double 18¾-10000#WP CIW double "U" rams type preventers - 2 Hydril "GL" 18¾-5000#WP Bag preventer - Blind Shear rams Upper and 3 pipe-rams 5" lower.

SPECIAL EQUIP.

(TURBINE, BUMPERSUB, AIR INSTALATIONS, DEVIATION DRILLING.....)

CONTRACT

(TYPE OF CONTRACT)
Daily contract

FINAL OPERATION FIRST STAGE

(GIVE A RESUME OF OPERATIONS FOR THE COMPLETION, TESTING, OR ABANDONMENT, tubing, plugs, recovering wellhead etc.....)

TD: 4258m. 9⅝ CSG SHOE AT 4248 m. RUN TEMPERATURE SURVEY→ TOP CEMENT IN ANNULUS AT 2760 METERS. BRIDGE PLUG SET AT 4200 m. CEMENT PLUG SET BETWEEN 2885 AND 2835 m. 2,5 TON CLASS "G" CEMENT USED. SG 1.90 ANOTHER CMT. PLUG SET FROM 200 TO 150 m. 2,4 TON CLASS "G" CMT. USED SG 1.90 PULLED RISER AND BOP STACK. CORROSION CAP SET ON WELL HEAD. BASE PLATE WAS FOUND WITH COVER PLATE LOCK RING GONE. BASE PLATE BODY CRACKED. BASE PLATE WAS THEN LAID ON SEA FLOOR AND LEFT THERE. A MARKER BUOY WAS THEN ATTACHED TO THE PAD EYE (BY WIRE) ON THE BASE PLATE, AND A PINGER FIXED TO THE BASE PLATE AT BOTTOM.

TYPE OF MUD LEFT IN HOLE: LFC SG 1.60

MAJOR WELL CONSUMPTIONS

WELL: 15/3-2

CASING AND CEMENTATION

CASING USED

DIA. Ø	FROM ....TO....	LENGTH	WALL THICKNESS	GRADE	THREAD	TYPES AND WEIGHTS OF CEMENT PER. CASING STRING
30"	135 - 185	48m50	0"750	X.52	Squnch Joint VETCO	G : 23 tons
20"	132 - 774	772 m	16,13	K55	Buttress	G : 164 tons
13 3/8	133 - 1499	1365m	13,06	P110	VAM	at DV: G: 26 tons
13 3/8	1499 - 2862	1362 m	13,06	N80	Buttress	at Shoe: G: 57 tons
9 5/8	133 - 2602	2469 m	13,95	Q125	VAM	E: 69 TONS
9 5/8	2602 - 4248	1646 m	13,84	P110	VAM	
	TOTAL COST $ 317.615					

MUD PRODUCTS

TYPE OF PRODUCT	QUANTITIES
BENTONITE	148 t
CAUSTIC	27,5 t
LFC	100 t
LC	10 t
DRISPAC	5,8 t
CMC Hi-vis	3,15 t
H921	3,2 t
DEXTRID	7,6 t
CALCIUM Chloride	0,85 t
SODA ASH	5,8 t
SODIUM - BICARBONATE	2 t.
LUBRICANT	77 DRUMS
DETERGENT	37 DRUMS
DEFOAMER	75 CANS
MUD - LOSSES	0 m3
WATER	2203 m3
OIL OR FUEL OIL	m3
BARITE	949 t

OTHER CEMENTATIONS

FOR.	TYPE AND CLASS OF CEMENT	WEIGHT
LOST CIRCULATION		
PLUGGING HOLE. VARIOUS	2885-2835 m. 2,5 T "G"	1.9
	200 - 150 m. 2,4 T "G"	1.9
	BRIDGE PLUG AT 4200 m	

WELLHEAD

DIMENSIONS-SERIES-TYPES of WELLHEAD

- 30" Vetco housing + permanent base plate W/4 x 12 Ft guide-posts - Transpinger 48 KHZ Fixed on base plate
- 18 3/4 Vetco housing W/20 Casing exten.
- 18 3/4 10000# WP BOP-stack. H4 connect 18 3/4 10000 WP lower. 2 double 18 3/4 10000# WP double rams "U" 2 Hydril "GL" 18 3/4 5000# WP. Blind Shear rams Upper and 3 pipe-rams 5" lower. 22" ball-joint REGAN.
- 22" Riser W/C.-K. line 10.000# WP. Regan diverter
- 13 5/8 Csg hanger SG5 Vetco
- 9 5/8 Csg. hanger SG5 Vetco

INFORMATION ON OFFSHORE OPERATIONS | F 15/3-68

ell: 15/3-2 | Rig: POLYGLOMAR DRILLER

1. Time sharing percentages due to marine operations.

Items	Duration (h)	% of total time of well
MOVING+ OTHER OPERATIONS BEFORE SPUDDING IN AND AFTER ENDED DRILLING (a+b)	71 45	3.28
WORKING ON UNDERWATER EQUIPMENT (f+h)	203 00	9.28
WOW (c+k)	120 00	5.49
WAITING DUE TO REPOSITIONING OF PLATFORM AND REPAIRING ANCHORS EQUIPMENT (1)	1 00	0.05

2. Further or additional information
Specificate on offshore drilling - Interesting the Elf Graup

Subject	Observation	Reference
BOP stack	18¾ BOP-Stack 10.000#WP: H4 Vetco connector 18¾ 10000#WP lower 2 double 18¾ 10.000#WP CIW double "U" rams type preventer 2 Hydril "GL" 18¾ 5000#WP Bag preventer.	
[redacted]	Blind Shear rams Upper and 3 pipe-rams 5" lower.	
ser + CL + KL	22"OD Regan ball-joint 50'x 22"OD riser joint assy W/integral CL and KL 10000#WP and booster line. Slip joint W/40' stroke	
ids	Subsea Control System RHCS-42-DF	
DP Control	KOOMEY model air-electric	
HOKE Manifold	10.000#WP manifold Fitted W/H2S trim 2 Swaco Super Chokes and 2 Thornhill	
UIDE Line Tensioner	Four Western Gear Units ¾" 16000 lbs pull capacity each and 50' travel	
ser Tensioner	Six Western Gear Units 1"¾ 80000 lbs pull capacity each and 50' travel	
Miscellaneous		

CASING STRING COMPOSITION

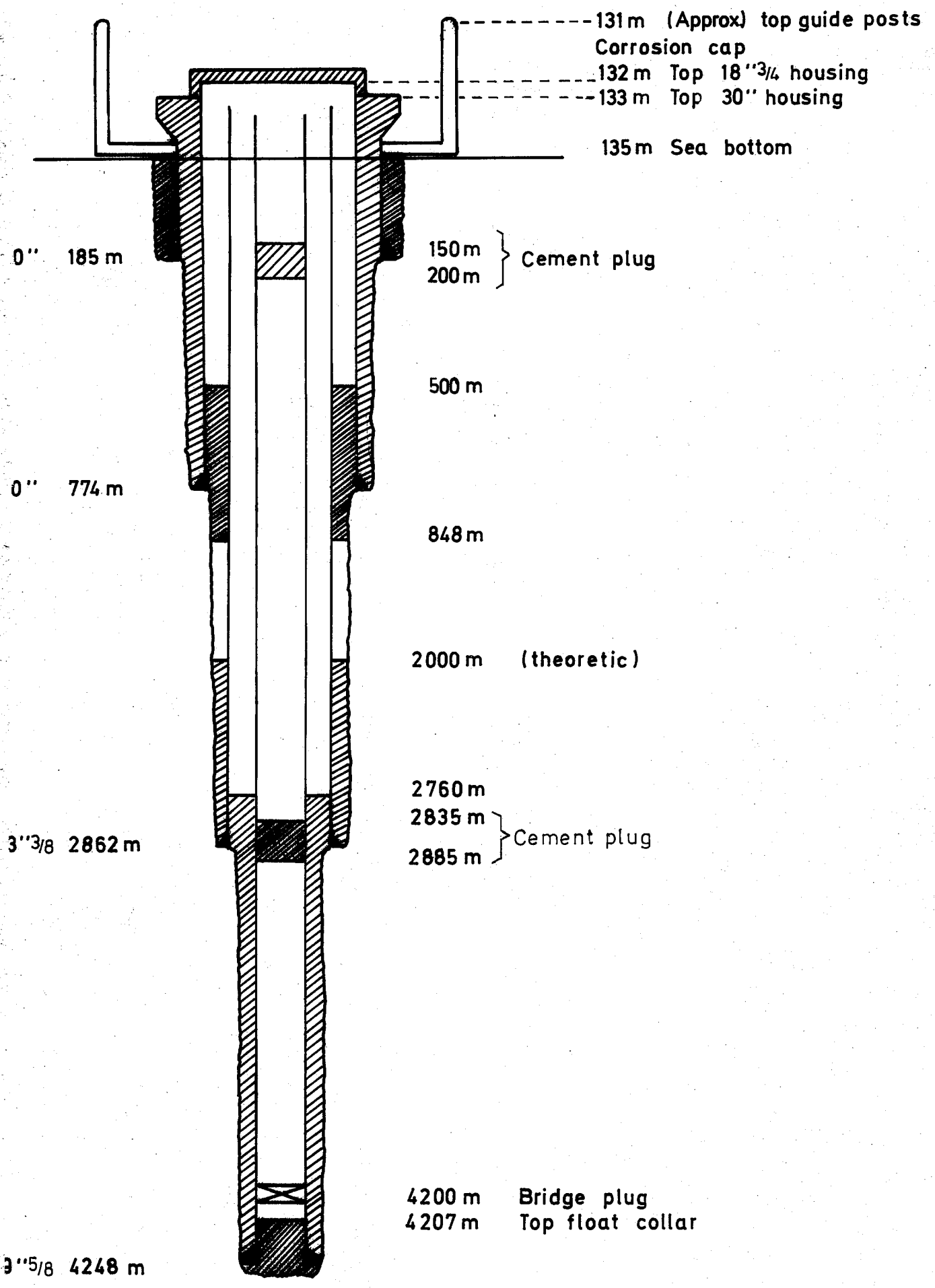
F 5ter/2-67

well 15/3-2 | casing diameter 9 5/8 | distance RKB mud-line 135,m00

JOINT NO.	WEIGHT GRADE	THREAD JOINT	LENGTH OF JOINT	CUMUL. LENGTH	JOINT NO.	WALLTHICK-NESS AND GRADE	THREAD	LENGTH OF JOINT	CUMUL. LENGTH
75	53,#5-P110	VAM	12.99	3692.75	334	2 CENTR.		13.04	4207.35
96			13.24	3705.99		FLOAT		0.49	4207.84
97			13.18	3719.17	335	2 CENTR.		13.20	4221.04
98			12.67	3731.84	336	2 CENTR.		13.18	4234.22
99			13.24	3745.08	337	2 CENTR.		13.38	4247.60
00			13.09	3758.17		SHOE		0.49	4248.09
01			13.08	3771.25					
02			13.05	3784.30					
03			13.18	3797.48					
04			12.18	3809.66					
05			13.39	3823.05					
06			13.38	3836.43					
07			13.50	3849.93					
08			13.20	3863.13					
09			13.35	3876.48					
10			13.04	3889.52					
11			13.34	3902.86					
12			13.31	3916.17					
13			13.14	3929.31					
14			12.98	3942.29					
315			13.17	3955.46					
16			13.18	3968.64					
17			13.40	3982.04					
18			12.98	3995.02					
319			13.28	4008.30					
320			13.28	4021.58					
321			13.30	4034.88					
322			13.37	4048.25					
323			13.25	4061.50					
324			13.32	4074.82					
325			13.15	4087.97					
326			13.03	4101.00					
327			13.24	4114.24					
328			13.04	4127.28					
329			13.27	4140.55					
330			13.26	4153.81					
31			13.51	4167.32					
32			13.61	4180.93					
333			13.38	4194.31					

IMPORTANT. - THE CASING STRING COMPOSITION BEGINS WITH THE LANDING STRING LENGTH FROM RRB TO WELL HEAD, THEN ADD THE LENGTH JOINT BY JOINT FROM THE WELLHEAD.

SUBJECT	OBSERVATIONS	REFERENCES
DRILLING RIG esign. anchoring .....))LYGLOMAR cation: 58°59' 00".6 01°47' 12".6 ater depth: 110m.00	-Semisubmersible drilling platform selfpropelled length: 355' - Width: 221' -Propulsion: Twin screw, steerable Kort nozzles each driven by two BROWN BOVERI 1700 horse power electric motors. -8 anchors: 30,000 LWT each 8 anchor chains: 3"x 3000' 1 Piggy-back anchor on #3 anchor -Rig heading: 295°	
ERATIONS ON WELL AND DRILLING EQIPMENT rilling, coring, reaming, ting, SPE .....)	36" DRILLED TO 186m. 30" CSG SET AT 185m. 26" DRILLED TO 784m. REAMING BETWEEN 520 AND 660 m BEFORE SETTING CSG 20" AT 774m. RUN STACK. LEAK OFF TEST: EQUIVELENT MUD WEIGHT 1.50 DRILLING 17" HOLE TO 2875 m. REAM AND WASH DOWN FROM 2657 TO 2682 m, FROM 2756 TO 2837 m, AND FROM 2865 TO 2875 m. RUN ISFL-6R-SP, RUN HDT, RUN TWICE SWC-30 SHOTS. RUN 13 3/8 CSG, SETTING DEPTH 2862 m. TWO STAGE CEMENTING, DV AT 848 m. RUN CBL. DRILLING 12" HOLE WITH DIAMOND BIT TO 4258 m. GREATEST INCLINATION MEASURED SO FAR: 1° ABOVE 13 3/8 CSG SHOE AND 3 1/2° BELOW 13 3/8 CSG SHOE. FRACTURE GRADIENT AT THE 13 3/8 CSG SHOE = 1.85. FOUND BY LEAK OFF TEST. WHILE DRILLING AT 3954 m OPERATION WAS STOPPED DUE TO PUMP PRESSURE INCREASE. POOH AND FOUND WASH OUT IN 5" DP MID BODY. AFTE FINISHING DRILLING TO 4258 m, LOGS WERE RUN: SPE, ISF-SONIC-GR, FDC-CNL-GR, MLL-ML, HDT. REAMING AND WASHING FROM 4135 TO 4258 m. RAN 3 times SWC-30 SHOTS. WHILE POOH BEFORE RUNNING CSG 9 5/8", the 5" GRADE "G" DP BROKE AT MID BODY, BIT AT 44 m ABOVE BOTTOM. FISHING, POOH BENT PIPE, CONDITIONING AND REAMING THE HOLE BEFORE SETTING 9 5/8 CSG AT 4248 m. TOP CMT AT 2760 m. 9 5/8 CSG TESTED TO 5.000 psi. OK.	
MOVING JPPLY gistic upply boats, Helicopters, stance: base — cation)	Distance average speed in moving. 8.6 Kts Total power used 6800 HP Selfpropelled Name on tugs Bollard pull -Distance Stavanger. 15/3-2 = 124 miles Distance 30/7-3 - 15/3-2 = 82 miles -Crew change by Helicopter-Service A/S Stavanger with SIKORSKY S 61 -Supply-boats: SEA BRUTE : 8000 HP BEN VIKING : 9000 HP -Stand by boat: ØYVIND BJORØY	



15/3-2 - Temporary abandonment scheme.

WELL 15/3-2

SUMMARY OF DRILLING REPORTS

POLYGLOMAR DRILLER

Well started	:	25/10/76.
Well temporarily abandoned	:	24/01/77.
Total depth	:	4258 m.

Time sharing.

Shutting in well + moving	:	6.58 days
Drilling	:	54.03 "
Logging + surveys	:	5.00 "
Casing setting	:	13.77 "
Fishing	:	3.06 "
Repair	:	6.02 "
WOW	:	2.67 "

Highlights.

6/11-76: After having run the 20" csg, the BOP stack followed. When testing the BOP, it came up that lower hydril was leaking on the open side. Both the yellow and the blue pod was tried, but there was still a leakage. Divers changed out the shuttle valve on open side of lower hydril, but still no good result was obtained. The blue pod was then pulled and tested on stump. Found OK. Run back the blue pod on the BOP, and on testing , it was found that the open side of the hydril was still leaking. The result was negativ when trying to pull the yellow pod. The BOP stack was pulled and landed on stump. It turned out to be the yellow pod hose that was damaged. It was stripped, probably by the guide lines, when setting the BOP stack the first time. 90' were cut back. A broken nipple on lower annular "pressure modulator" shuttle valve was found and replaced. When testing; all functions OK.

Still on the stump, while testing upper rams at a pression of 10.000 psi, the VX ring in the lower H4 connector gave way (what a big bang that was!) The VX ring was changed, the BOP tested again and all functions found OK.

6/12/76 The rod packer on the heave compensator had from time to time a leakage. It was necessary to tighten it. Piston fluid was sporting all over the rig by the wind. Later on the compensator rod the packer were completely changed.

8/12/76 The FA 1600 mud pumps had their fluid ends changed.

18/12/76 On testing the BOP stack a leak on the choke line was discovered. The TV was run, and a leakage located on the stab sub chokeline 1, joint above the stack. The riser was disconnected and pulled, and loose connections on the choke and kill line thightened.

2/1/77 Drilling was stopped due to increase in pump pressure and slower penetration rate. The drill string was pulled, and a wash out in the 5" DP at mid body of one joint was found. This has to be seen in connection with the written report on broken drillstring that follows.

12/1/77 When pulling out of the hole to set the 9 5/8 csg, the drill string broke. Please see attached report.

19/1/77 After having pulled the BOP stack it was discovered that guide posts no 2 and 3 were loose from the base plate. Divers also found that the coverplate that first the base-plate to the 30" housing was loose and had dropped to the sea floor. The baseplate was held in place only by the two guide lines no 1 and no 4. Guidelines no 3 and no 4 were hooked on to pad eyes on baseplate into correct position was made. But to refix the baseplate on to the 30" housing turned out impssible. The baseplate was then laid on the sea floor.

20/1/77 A marker buoy was intalled.
Pennant wire between the buoy and the baseplate lying on the sea floor.

23/1/77 Pulling anchors.

Report from Polyglomar Driller on broken drill string.
Well I5/3-2
January I2. I977

After having circulated and conditioned the hole, the pipe was slugged, and the drill string was ready to be pulled. The actual depth of the hole was 4258m. Bit at bottom. One stand was pulled, and just before setting the pipe in the slips, the drill string broke with the bit 44 m. above bottom.

The hook load at the actual moment of the accident was 4I0.000 lbs. included 60.000 lbs. overpull. With the weight of the travelling block equal to 70.000 lbs., which is also included in the hook load, the tension on the drill string should be:

Hook load	= 4I0.000 lbs
-Travelling block	= 70.000 lbs
Tens. on dr. str.	= 340.000 lbs

It turned out to be a grade "G" pipe that broke at mid body, just below the BOP. This grade "G" pipe is build for a tension up to 499.000 lbs. With a safetyfactor of I.I allowable tension is 453.000 lbs., which should have been more than enough to hold the 340.000 lbs. that was the load at the actual moment of the accident.

At the spot where the drill pipe broke it is clearly shown that the pipe submittet only traction. The diameter of the joint diminishes towards the edge of the fracture. There are no visible signs of torque.

It is to be noted that the pipes have not at any time during the drilling of this well been put under stress near to the tension limit.

It has on previous occasions been observed that several joints of drill pipe have been bent. This has been remarked in the daily reports. On these occasions there has been no reason whatsoever that this should happen. On one occasion there has been a washout through the wall of the mid body on one drill pipe joint.

The age of the grade "G" drill pipe joint concerned is about 20 months.

It is recommended that the broken joint is taken to a laboratory research for further examination. Only this way it is possible to dtermine the steel quality of the grade "G" drill pipe, and from the results of this test consider whether it is safe to use the same set of joints for the future.

C. Fougner.

:F NORGE A/S
:E 77/105/CF/RN

Polyglomar Driller January 12. 1977.

From: Fougner /Bernadi.
To: Drilling Manager- SCIFO.

Fishing job on Polyglomar Driller.

Rig: Polyglomar Driller
Well: 15/3-2
NORWAY
Date: January 12. 1977

Well situation:
Depth: 4258m.
Last casing: 13 3/8 " at 2862 m.
Mud weight: 1.60
Hole size: 12"

Rig position: ready to pull out the drillstring to set the 9 5/8 casing.

Personnel abord:
Rasmussen Global Marine Ldt: Superint. Oliver
Elf Norge A/S: Supervisor Bernadi
Elf Norge A/S: Drlg.Eng. Fougner

The accident:
Afther having circulated and conditioned the hole, the pipe was slugged, and the drill string was ready to be pulled. The actual depth of the hole was 4258m. Bit at bottom. One stand was pulled, and just before setting the pipe in the slips, the drill string broke with the bit 44m. above bottom.

The hook load at the actual moment of the accident was 410.000 lbs. included 60.000 lbs. overpull. With the weight of the travelling block equal to 70.000 lbs. wich is also included in the hook load, the tension on the drill string should be:

Hook load = 410.000 lbs
\- Travelling block= 70.000 lbs
Tens. on dr.str.=340.000 lbs

It turned out to be a grade "G" pipe that broke at mid body, just

below the BOP. This grade "G" pipe is bild for a tension up to 499.000lbs. With a safetyfactor of 1.1 allowable tension is 453.000 lbs., wich should havebeen more than enough to hold the 340.000 lbs. that was the load at the actual moment of the accideent.

Fishing:
The part of the drillsrting still hanging in the block afther the accident was pulled out. It turned out to be:

3 stands "G" dp	:	29.49 m
		29.23 m
		28.96 m
"G" dp	:	9.62 m
		9.93 m
		9.64 m
Broken "G" dp	:	6.02 m
Kelly	:	15.00 m
Top fish	:	137.89 m

For the fishing job was used a 11 3/4 overshot w/5" Grapple. The overshot was run over the fish, but it slipped when trying to heave the fish. The 11 3/4 overshot was then pulled out.

An 81/2 Bowen overshot 150-FS w/4 7/8" Basket Grapple was then used. The fishing string consisted of :

8 1/2" overshot + extension sub:			2.20 m
1 x 8" DC	:		9.47 m
8" Bumper sub (open)	:		6.26 m
2 stands 8" DC	:		28.80 m
			28.63 m
X- over	:		0.82 m
6 jts. HW	:		55.40 m
			131.58 m
Kelly	:		15.72 m
			147.30 m

Run in hole and got hold of the fish almost immediately. Working pipe out of hole w/circul. and 100.000 lbs. overpull.

The overshot was laid down, and the bent drillstring pulled out with an overpull of 90.000 lbs. It was necessary to circulate and condition the mud seeral times on the way up before the bit was recovered.

Visual cheking of the overshot showed no deformtion of the body or change in diameter of the grapple.

Most of the grade "G" drill pipe was bent. Parts of the grade "E" drill pipe was bent. The drill collars and the H.W. were undammaged when viually examined.

Conclusion:

At the spot where the drill pipe broke it is clearly shown that the pipe submittet only traction. The diameter of the joint diminishes towards the edge of the fracture. The are no visible signs of torque.

It is to be noted that the pipes have not any time during the drilling of this well been put under stress near to the tension limit.

It has on previous occasions been observed that several joints of drill pipe have been bent. This has been remarked in the dayly reports. On these occasions there has been no reason whatsoever that this should happen. On one occasion there has been a washout through the wall of the mid body on one drill pipe joint.

The age of the grade "G" drill pipe joint concerned is about 20 months.
The broken joint has been taken to a laboratory research for further examination. Only this way it is possible to determine the steel quality of the grade "G" drill pipe, and from the results of this test consider whether it is safe to use the set of joints for the future.

Time sharing:
It took 16.5 hours from the time of the accident until the overshot had been pulled, laid down and the fish was set in the slips.

For pulling up the fish, circulating and conditioning themud, 15.5 hours were required.
6 hours to break down the fishing tool, make up drillcollars and stabilizer, magnaflux inspection of the x-over and junk sub.

Run in hole with new bit, new drillstring, reaming, circulating and wiping the hole:49 hours

Total time loss because of the broken drillstring: 87 hours.

DP 5" E - Tordue après chute de 44m

15/3-2

12 Janvier 77

Instrumentation : Rupture 5" DP "G"

15/3-2

12 Janvier 77

DP 5" E - Tordue après chute de 44m

15/3-2

12 Janvier 77

ELF Norge a/s

Phase Report

FIELD:

WELL NO: 15/3-2

PHASE NO: 1-36"

RIG: Polyglomar

MUD COMPANY: Milchem

MUD ENGINEERS: Zurdo

HOLE ∅ 36 in TO: 186 m

CASING ∅: in TO: m

TIME DISTRIBUTION

DATE FROM: 29/10 DATE TO: 30/10/76

Drilling: 11.30 H Survey: 0.15 H

Circul: 2.15

Trips: 2.15 H Casing/Cement: 32.45

MUD TYPE: Bentonite/CMC

EQUIPMENT	TYPE
PUMP SIZE X IN	Centrifuge
7 1/4 x 12	Degasser
PUMP MAKE	Desander
Emsco	Desilters x
MODEL	Shaker x
Triplex	Other 20 x 30

MUD PROPERTIES

Depth	185				
Weight (kg/m³)	1.06				
Mud Gradient	–				
Equivalent Circul. Density	–				
Funnel Viscosity	110				
Plastic Viscosity	–				
Yield Point	–				
Gel Strength (10 sec./10 min.)	–				
Filtrate API 30 min.	12				
Filtrate HT/HP	–				
Cake (mm)	–				
Alkalinity, Mud (Pm)	–				
Alkalinity, Filtrate (Pf / Mf)	–				
PH ☒ STRIP ☐ METER	9				
Salt Content (g/l) NaCl	–				
Salt Content $CaCl_2$	–				
Salt Content KCl	–				
Calcium-Magnesium (g/l)	–				
Solids Content (% by vol.)	–				
Oil Content (% by vol.)	–				
Water Content (% by vol.)	–				
Sand Content (% by vol.)	–				
Methylene blue capacity	–				
Flow Rate (L/mn)	3650				
Annular Velocity (opposite Drill-Coll.)	–				
Critical Velocity (opposite Drill-Collars)	–				

MUD VOLUMES

Initial vol.	0	Total added	150
Hole	0	Dilution	–
Active Tank	0	Fabrication	150
In Storage	150	In Flow	–
		Losses vol.	150
Final vol.	0	Formation	–
Hole	0	Surface	lost
Active Tank	0	Ejections	return
In Storage	0	Flow depth	–
		Loss depth	–

CALIPER		LITHOLOGIE
Depth	Inches	
/	/	SANDS

CEMENTING OPERATIONS

FIRST STAGE				SECOND STAGE			
Cement	additives	d.slurry	tons	Cement	additives	d.slurry	tons
"G"	Bento 8%	1.60	23				
	Ca Cl_2 2%						
Mixt Water:	Volume: 21			Mixt Water:	Volume:		
Slurry volume: 29m³				Slurry volume:			
Slurry flow rate: 560 l/mn				Slurry flow rate:			
Type of displacing fluid: Sea Water				Type of displacing fluid:			
Displacing fluid volume: 1600 l				Displacing fluid volume:			
Pressure start:	end:			Pressure start:	end:		
Estimated losses:				Estimated losses:			
Bumped plug at:				Bumped plug at:			

PRODUCTS M/T	Issue	unit price	total price
Barite			
Bentonite	10.0	176.4	1764
Caustic soda	0.4	592.96	237
FCL			
LC			
~~Hi 321 or~~ CMC HV	3.15	2243.5	7067
Drispac			
Lubricant			
Detergent			
Defoamer			
Soda ash			
Sodium Bicarb			
Calcium Chloride			
Pipe free			
Mica Fine			
Mica Medium			
Nut - Plug			
Salt			
PHASE COST	US$ 9068		

OBSERVATIONS

ELF Norge a/s

Phase Report

FIELD:

WELL NO: 15/3-2

PHASE NO: 2 - 26"

RIG: Polyglomar

MUD COMPANY: Milchem

MUD ENGINEERS: Zurdo

HOLE ∅ 26 in TO: 784 m

CASING ∅: 30 in TO: 185 m

MUD PROPERTIES

TIME DISTRIBUTION

DATE FROM: 30/10 DATE TO 4/11/76

Drilling: 29 H Survey: 4.15 H

Circul 5 h

Trips: 17.45 H Casing/Cement: 108.15 H

MUD TYPE: Q.Mix -

EQUIPMENT

EQUIPMENT	TYPE
PUMP SIZE X IN: 7 1/4 x 12	Centrifuge: -
	Degasser: -
PUMP MAKE: Emsco	Desander: x
	Desilters: x
MODEL: Triplex	Shaker: 30 x 30
	Other: -

Depth	650	770	784
Weight (kg/m³)	1.10	1.18	1.18
Mud Gradient	-	-	-
Equivalent Circul. Density	-	-	-
Funnel Viscosity	50	64	64
Plastic Viscosity	15	18	18
Yield Point	10	14	16
Gel Strength (10 sec./10 min.)	0/10	4/26	4/26
Filtrate API 30 min.	6.4	6.4	6.6
Filtrate HT/HP	-	-	-
Cake (mm)	0.5	0.5	0.5
Alkalinity, Mud (Pm)			
Alkalinity, Filtrate (Pf/Mf)	0.1	0.1	0.1
PH ☒ STRIP ☐ METER	9.5	9.5	9.5
Salt Content (g/l) NaCl	28	28	28
Salt Content $CaCl_2$			
Salt Content KCl			
Calcium-Magnesium (g/l)	0.3	0.3	0.3
Solids Content (% by vol.)	8	11	12
Oil Content (% by vol.)	0	0	0
Water Content (% by vol.)	92	89	88
Sand Content (% by vol.)	3	3	3
Methylene blue capacity	-	-	-
Flow Rate (l/mn)	4200	4200	4200
Annular Velocity (opposite Drill-Coll.)			
Critical Velocity (opposite Drill-Collars)			

MUD VOLUMES

Initial vol.	0	Total added	460
Hole	Sea Wat	Dilution	20
Active Tank	0	Fabrication	440
In Storage	160	In Flow	-
		Losses vol.	460
Final vol.	0	Formation	-
Hole	Sea Wat	Surface	20
Active Tank	0	Ejections	440
In Storage	0	Flow depth	-
		Loss depth	-

CALIPER

Depth	Inches

LITHOLOGIE

185 - 250 m
Sands

250 - 550 m
Sands + Clays

550 - 640 m
Clays

640 - TD
Clays + Sands

CEMENTING OPERATIONS

FIRST STAGE

Cement	additives	d.slurry	tons
G	Bento 12%	1.51	130
G	0.3% D81	1.85	34

Mixt Water: Fresh Volume: 165

Slurry volume: 220 m³

Slurry flow rate: 1300 l/min

Type of displacing fluid: Mud-Sea W

Displacing fluid volume: 112 m³

Pressure start: 900 PSI end: 1200PSI

Estimated losses: None

Bumped plug at: -

SECOND STAGE

Cement	additives	d.slurry	tons

Mixt Water: Volume:

Slurry volume:

Slurry flow rate:

Type of displacing fluid:

Displacing fluid volume:

Pressure start: end:

Estimated losses:

Bumped plug at:

OBSERVATIONS

PRODUCTS M/T	Issue	unit price	total price
Barite	7	102.25	716
Bentonite	31	176,4	5468
Caustic soda	2,2	592,96	1305
FCL	4,0	442	1768
LC	-	-	
H 921 or	3,2	2500	8000
Drispac			
Lubricant			
Detergent			
Defoamer			
Soda ash			
Sodium Bicarb			
Calcium Chloride			
Pipe free			
Mica Fine			
Mica Medium			
Nut - Plug			
Salt			
PHASE COST		US $	17257

ELF Norge a/s

Phase Report

FIELD:

WELL NO: 15/3-2

PHASE NO: 3-17 1/2"

RIG: POLYGLOMAR

MUD COMPANY: MILCHEM

MUD ENGINEERS: ZURDO AZAM

HOLE ∅ 17 1/2 in TO: 2875 m

CASING ∅: 20" in TO: 774 m

TIME DISTRIBUTION

DATE FROM: 5/11 DATE TO: 5/12/76

Drilling: 369.45 H Survey: 33 H

Circul 4.15

Trips: 122.30 H Casing/Cement: 91.15 H

EQUIPMENT TYPE

PUMP SIZE X IN	Centrifuge	
6 1/4 x 12	Degasser	
PUMP MAKE	Desander	
EMSCO	Desilters	
MODEL	Shaker	40 x 40
TRIPLEX	Other	MUD-CLEAN

MUD PROPERTIES

MUD TYPE: LFC/Dextrid

Depth	1200	1720	2610	2875
Weight (kg/m³)	1.15	1.20	1.26	1.27
Mud Gradient	-	-	-	-
Equivalent Circul. Density	-	-	-	-
Funnel Viscosity	42	47	47	47
Plastic Viscosity	18	16	16	16
Yield Point	14	19	12	10
Gel Strength (10 sec./10 min.)	1/3	2/13	2/18	2/12
Filtrate API 30 min.	3	4	4.8	3.2
Filtrate HT/HP	-	-	-	-
Cake (mm)	0.5	0.5	0.5	0.5
Alkalinity, Mud (Pm)	-	-	-	-
Alkalinity, Filtrate (Pf/Mf)	0.1	0.1	0.2	0.1
PH ☐ STRIP ☐ METER	8.5	8.5	9	8.5
Salt Content (g/l) NaCl	29.6	29.6	28	26.5
Salt Content $CaCl_2$	-	-	-	-
Salt Content KCl	-	-	-	-
Calcium-Magnesium (g/l)	1.6	0.7	0.2	0.1
Solids Content (% by vol.)	8	10	13	10
Oil Content (% by vol.)	-	-	-	-
Water Content (% by vol.)	92	90	87	90
Sand Content (% by vol.)	3	3	0.2	0
Methylene blue capacity	32.5	67	120	57
Flow Rate	3500	3500	3300	3200
Annular Velocity (opposite Drill-Coll.)	-	-	-	-
Critical Velocity (opposite Drill-Collars)	-	-	-	-

MUD VOLUMES (M3)

Initial vol.	0	Total added	1161
Hole	-	Dilution	105
Active Tank	-	Fabrication	1056
In Storage	-	In Flow	-
		Losses vol.	792
Final vol.	369	Formation	-
Hole	210	Surface	162
Active Tank	80	Ejections	630
In Storage	70	Flow depth	-
		Loss depth	-

CALIPER

Depth	Inches
774-785	27"
795	18"
825	20"
900	17 1/2
980	21"
2875	17 1/2 - 18"

LITHOLOGIE

775 - 900 SHALES
900 - 1000 SANDS
1000 - 2805 SHALES
2805 - 2875 LIMESTONES SLIGHTILY SHALES

CEMENTING OPERATIONS

FIRST STAGE

Cement	additives	d.slurry	tons
G+Bent.	0.3%HR7	1.50	32
G Neat	0.3%HR7	1.90	25

Mixt Water: Fresh Volume:

Slurry volume: 66 m³

Slurry flow rate: 610 l/min

Type of displacing fluid: MUD

Displacing fluid volume: 319 M3

Pressure start: 1950PSI end: 2150

Estimated losses: NONE

Bumped plug at: 1500 PSI

SECOND STAGE

Cement	additives	d.slurry	tons
G Neat	0.75%CFR2	1.80	20
	0.3%HR7		

Mixt Water: Fresh Volume: 11

Slurry volume: 17 m³

Slurry flow rate: 1050 l

Type of displacing fluid: MUD

Displacing fluid volume: 66 M3

Pressure start: 2050PSI end: 2150

Estimated losses: NONE

Bumped plug at: -

OBSERVATIONS NO PROBLEMS

Total price of the mud for next phase $ 44260

Real price of the phase 17 1/2 = $ 94990

Price per meter drilled = $ 45,43

PRODUCTS M/T	Issue	unit price	total price
Barite	279.0	102	28458
Bentonite	48.0	228	10944
Caustic soda	11.5	593	6820
FCL	58.0	442	25636
LC	-	-	-
H 921 or	-	-	-
Drispac	3.5	5528	18348
Lubricant (DRUMS)	24	588	14112
Detergent (DRUMS)	37	385	14245
Defoamer (CANS)	58	96.1	5574
Soda ash	5.7	259.3	1478
Sodium Bicarb	1.0	264.4	264
Calcium Chloride	-	-	-
Pipe free	-	-	-
Mica Fine	-	-	-
Mica Medium	-	-	-
Nut - Plug	-	-	-
Salt	-	-	-
DEXTRID	7.6	1759	13368
PHASE COST		U.S.$	139247

ELF Norge a/s

Phase Report

FIELD: NORTH SEA-NORWAY

WELL NO: 1532

PHASE NO: IV $11\frac{15}{16}$

RIG: POLYGLOMAR

MUD COMPANY: MILCHEM

MUD ENGINEERS: AZAM-ZURDO

HOLE Ø $11\frac{13}{16}$ in TO: 4258 m

CASING Ø: $9\frac{5}{8}$ in TO: 4248 m

TIME DISTRIBUTION

DATE FROM: 6.12.76 DATE TO: 1. 77

Drilling: H Survey: H

Trips: H Casing/Cement: 30 H

MUD TYPE: LFC+LC IN SEA WATER

EQUIPMENT

	TYPE
PUMP SIZE X IN: 6 1/4 12	
PUMP MAKE	
MODE: FA 1600 TRIPLEX	
Centrifuge	x
Degasser	x
Desander	x
Desilters	x
Shaker	x (1)
Other mud cleaners	x 200

MUD PROPERTIES

Depth	3140	3605	3953	4258
Weight (kg/m³)	1,28	1,31	1,40	1,60
Mud Gradient				
Equivalent Circul. Density				
Funnel Viscosity	42	50	51	56
Plastic Viscosity	16	21	24	24
Yield Point	13	14	14	18
Gel Strength (10 sec./10 min.)	2114	219	2114	4116
Filtrate API 30 min.	4,2	4,1	3	2,2
Filtrate HT/HP				
Cake (mm)	0,5	0,5	0,5	0,5
Alkalinity, Mud (Pm)				
Alkalinity, Filtrate (Pf/Mf)	0,3	0,3	0,4	0,4
PH ☒ STRIP ☐ METER	10	10	10,5	10,5
Salt Content (g/l) NaCl	23	24	23	20
Salt Content $CaCl_2$				
Salt Content KCl				
Calcium-Magnesium (g/l)	0,2	0,2	0,1	0
Solids Content (% by vol.)	11	14	16	24,5
Oil Content (% by vol.)	0	0	3	2
Water Content (% by vol.)	89	86	81	73,5
Sand Content (% by vol.)	3	3	0	0
Methylene blue capacity	100	110		
Flow Rate	2000/2400	2400	2400/2600	2300
Annular Velocity (opposite Drill-Coll.)	59	51	63	57
Critical Velocity (opposite Drill-Collars)	67	80	82	82

MUD VOLUMES

Initial vol.	369	Total added	432
Hole	219	Dilution	100
Active Tank	80	Fabrication	332
In Storage	70	In Flow	0
		Losses vol.	
Final vol.	150	Formation	0
Hole casing	150	Surface	
Active Tank	0	Ejections	
In Storage	0	Flow depth	-
		Loss depth	-

CALIPER

Depth	Inches
	≃ 12 1/8
4268	

LITHOLOGIE

CEMENTING OPERATIONS

FIRST STAGE

Cement	additives	d.slurry	tons
E	CFR 2	1,98	69

Mixt Water: Volume: 26,2 m³

Slurry volume: 48

Slurry flow rate:

Type of displacing fluid: MUD LFC

Displacing fluid volume: 153,5

Pressure start: 2000 end: 2170

Estimated losses: 2,8 m³

Bumped plug at: 4207

SECOND STAGE

Cement	additives	d.slurry	tons

Mixt Water: Volume:

Slurry volume:

Slurry flow rate:

Type of displacing fluid:

Displacing fluid volume:

Pressure start: end:

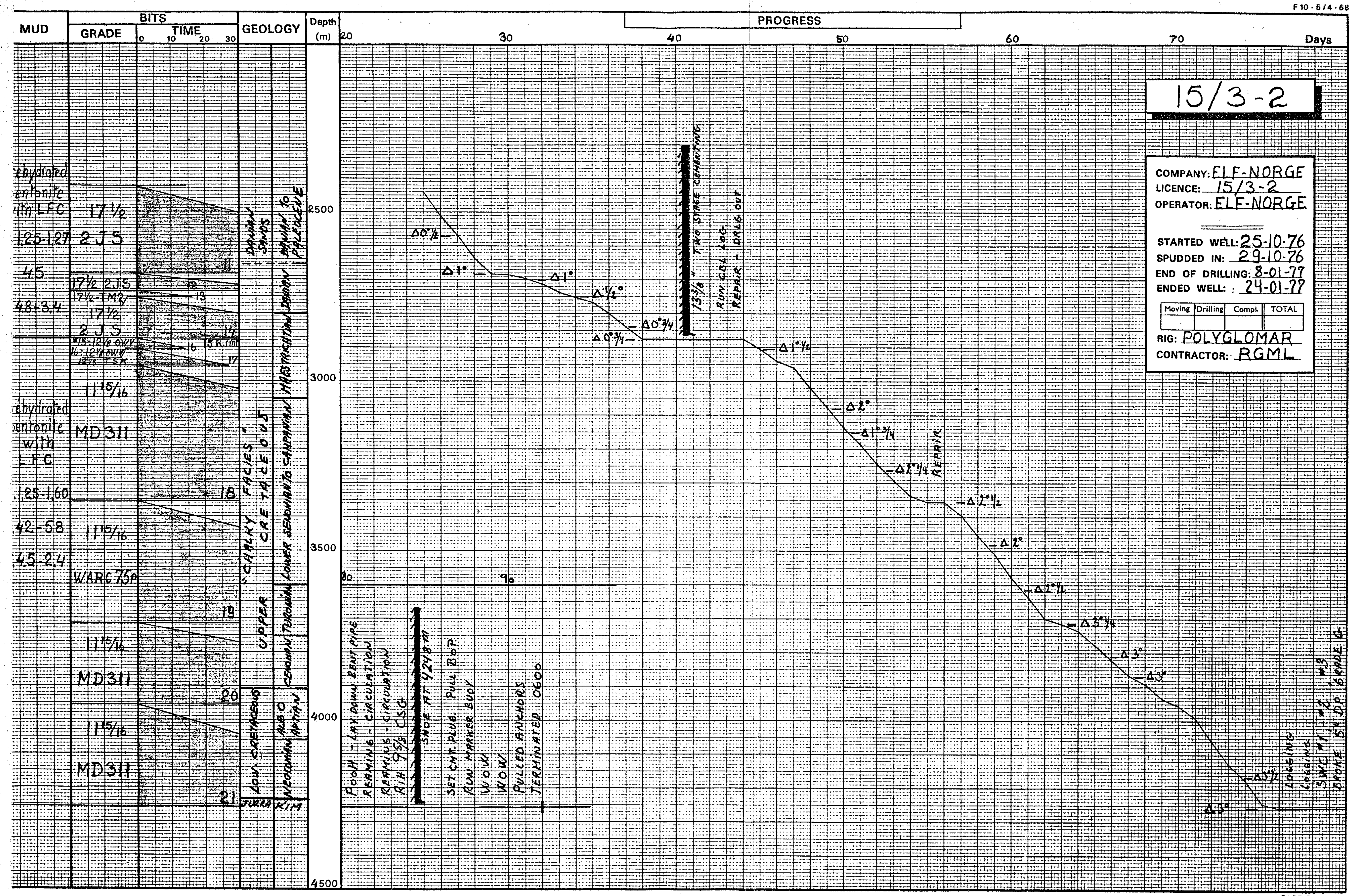
Estimated losses:

Bumped plug at:

OBSERVATIONS

PRODUCTS M/T	Issue	unit price	total price
Barite	663	102,0	67626
Bentonite	59	228,0	13452
Caustic soda	13,4	593,0	7946
FCL	38	442,0	16796
LC	10	626,2	6262
H 921 or	0	-	-
Drispac	2,3	5776,9	13287
Lubricant	53	588	31164
Detergent	0	-	-
Defoamer	17	72	1224
Soda ash	0,1	259,3	26
Sodium Bicarb	1	264,4	264,4
Calcium Chloride	0		
Pipe free	0		
Mica Fine	0		
Mica Medium	0		
Nut - Plug	0		
Salt	0		158047
PHASE COST			

F10-5/4-68


MUD
BITS
GRADE
TIME
GEOLOGY
Depth (m)
PROGRESS
Days
15/3-2
COMPANY: ELF-NORGE
LICENCE: 15/3-2
OPERATOR: ELF-NORGE
STARTED WELL: 25-10-76
SPUDDED IN: 29-10-76
END OF DRILLING: 8-01-77
ENDED WELL: 24-01-77
Moving
Drilling
Compl.
TOTAL
RIG: POLYGLOMAR
CONTRACTOR: RGML
2500
3000
3500
4000
4500
17 1/2
2 JS
MD311
WARC 75P
11 15/16
DANIAN SANDS
DANIAN TO PALEOCENE
MAASTRICHTIAN
CAMPANIAN
LOWER SENONIAN TO
TURONIAN
CENOMAN
"CHALKY FACIES"
UPPER CRETACEOUS
LOW. CRETACEOUS
NEOCOMIAN
ALBO APTIAN
JURRA
13 3/8" TWO STAGE CEMENTING
RUN CBL LOG
REPAIR - DRILL OUT
REPAIR
POOH - LAY DOWN BENT PIPE
REAMING - CIRCULATION
REAMING - CIRCULATION
RIH 9 5/8 CSG
SHOE AT 4248 m
SET CMT PLUG. PULL BOP
RUN MARKER BUOY
WOW
WOW
PULLED ANCHORS
TERMINATED 0600
LOGGING
LOGGING
SWC #1, #2, #3
BROKE 5" DP, GRADE G

15/3-2

COMPANY: ELF-NORGE
LICENCE: 15/3-2
OPERATOR: ELF-NORGE

STARTED WELL: 25-10-76
SPUDDED IN: 29-10-76
END OF DRILLING: 8-01-77
ENDED WELL: 24-01-77

Moving	Drilling	Compl.	TOTAL

RIG: POLYGLOMAR
CONTRACTOR: RGML