OFFSHORE NORWAY

PL 201 - BLOCK 7019/1

Report title:

WELL 7019/1-1

FINAL WELL REPORT

Abstract:

This report deals with the geological and drilling results of well 7019/1-1.
In section 1 general information is reported. Section 2 comprises a geological summary and a description of the acquisition of data with their interpretation. Section 3, the drilling report, details all drilling operations and results.
Enclosed are the composite log, the computer processing interpretation of the reservoir section and the well test report.

Note:

Date: January 2001	**Report no.:**	
Prepared by:	**Verified by:**	**Approved by:**
D. Stensland (Subs. Geol.)	J. Seldal (project leader)	F. Conticini (Exploration Manager)
T. Austlid (Drilling Eng.)		M. Zuvo (Drilling Manager

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1. GENERAL

1.1 INTRODUCTION

Well 7019/1-1 was drilled as an exploration well on the Gamma prospect located in the central-western part of block 7019/1.

The objectives of drilling this well were:

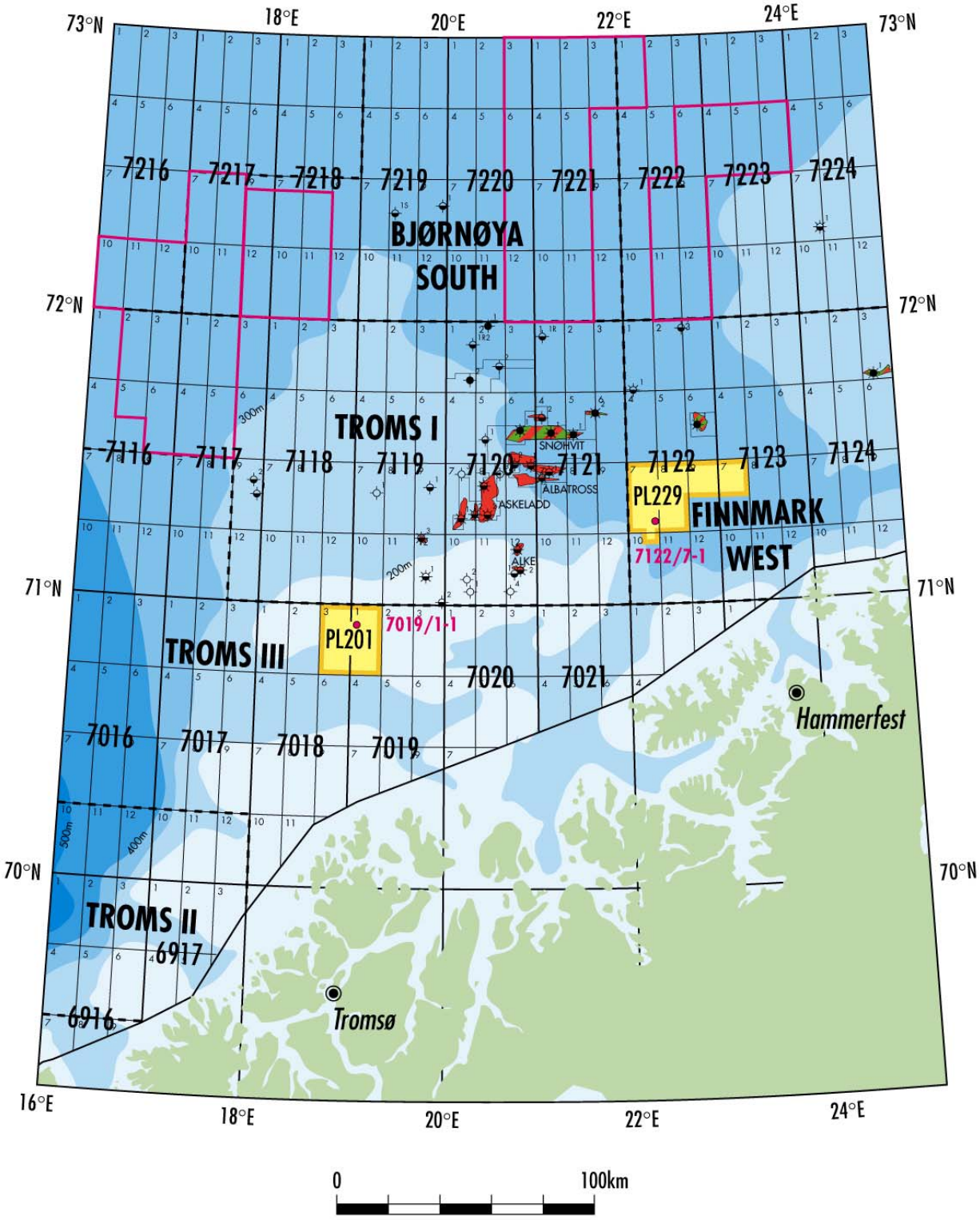
- Test the hydrocarbon potential of the Middle Jurassic through Upper Triassic sandstone reservoir series of the Realgrunnen group.
- Lower Cretaceous inferred clastics at the base of Nordvestbanken Group.

Costs of this well were shared in the following percentages:

Norsk Agip:	35%
Enterprise Oil:	25%
Statoil/SDFI:	25%
Fortum	15%

The 7019/1-1 well was drilled to total depth of 3003 meters BRT.

1.2 Map Location



1.3 Basic Well Data

COUNTRY	:	Norway	
AREA	:	Barents Sea	
PRODUCTION LICENCE No.	:	PL 201	
BLOCK	:	7019/1	
WELL NAME	:	7019/1-1	
PROSPECT	:	Gamma	
SEISMIC REFERENCE	:	94TRM3D	
		Inline 1026, crossline 1050	
COORDINATES (ED-50)	:	N 70deg 55min 05,14	
	:	E 019deg 04min 22,44	
	:	429 692,3 East, 7 869 591,0 North	
TOLERANCE	:	50 m in any direction	
DISTANCE	:	173 km from Shore Base	
SPUDDING CLASSIFICATION	:	Wildcat	
WATER DEPTH	:	190m	
RKB ELEVATION	:	24m	
RKB-SEA FLOOR	:	214m	
TOTAL DEPTH	:	3003 m BRT	
PRIMARY TARGET	:	Stø Formation	
DEPTH TO PRIMARY TARGET	:	2447m BRT	
TARGET TOLERANCE	:	Radius of 50 m	
DRILLING RIG	:	Transocean Arctic	
OPERATOR	:	Norsk Agip A/S	35%
PARTNERS	:	Enterprise	25%
		Statoil/SDFI	25%
		Fortum	15%

2. GEOLOGY AND GEOPHYSICS

2.1 GEOLOGICAL SUMMARY

The purpose of drilling well 7019/1-1 was primarily, to test the hydrocarbon potential of the sandstones of the Stø Formation in the Gamma prospect. A secondary objective was to test the potential of the Lower Basal Clastics of the Lower Cretaceous.

The Gamma prospect is a northeast-southwest elongated feature roughly coincident with the crestal portion of a tilted fault block. From the main body of the structure a narrow crestal horst extends southwestwards for about 10 km into block 7018/3. The northern portion of the structure displays a small four-way dip/fault closure.
The secondary target consists of an inferred clastic wedge at the base of the Cretaceous Nordvestbanken Group overlaying the Lower Cretaceous unconformity. These lower Basal Clastics display an irregular four-way dip/fault closure.

The top of the main reservoir was found at 2447m BRT, 133m below the prognosis. The primary reservoir was gas bearing. The well was tested, plugged and abandoned after final logging at a TD of 3003m BRT, 141m into the Tubåen Formation.
Most of the depth values stated in this report are measured depth, in meters below the rotary table (BRT); RT was 24m above the Sea level. If any other depth datum is used it will be mentioned.

The stratigraphy is summarized in the following table:

Tops	Progn. Depth (m MSL)	Progn. Depth (m BRT)	Actual Depth (m MSL)	Actual Depth (m BRT)	Post-drill Seismic TWT (sec.)	Actual Log TWT (sec.)
Sea Floor	190	214	190	214	0.257	0.257
Plio-Quaternary Unc.	415	439	424	448	0.499	0,499
Base Tertiary Unc.	575	599	579	603	0.642	0.642
Top Kolmule/ Major Fault	1170	1194	1191	1215	1.146	1.146
Top Knurr Fm			2103	2127	1.825	1.785
Top Lower Basal Clastics	2160	2184	2187	2211	1.876	1.836
Lower Cretaceous Unc./ Top Hekkingen Fm	2265	2289	2321	2345	1.945	1.905
Top Fuglen Fm			2353	2377		1.924
Top Stø Fm.	2290	2314	2423	2447	2.002	1.962
Top Nordmela Fm			2586	2610		2.032
Top Tubåen Fm			2838	2862		2.142
TD	2985	3009	2979	3003		

2.2 MAIN RESULTS

The well was drilled to a total depth of 3003m (driller`s depth) and terminated in the Tubåen Formation. The Gas reservoir of the Stø Formation was encountered at 2447m, 133m below the prognoses depth. (Fig. 2.2.1) The Gas/Water contact was encountered at 2597m. The secondary target Lower Basal Clastics was also found HC bearing at 2211m No HC/water contact was seen in this reservoir.

The Stø Formation was tested.
Main test results

Perforation:	2526 – 2563m
Choke:	40/64”
Gas:	606000 m^3/d
Liquid:	non.
Gas gravity:	1,133 (air = 1)
CO_2:	60 – 70%
H_2S:	6 – 13 PPM.

Comments: The test was stopped during the clean up phase due to high CO_2 production.

After testing the well was plugged and abandoned.

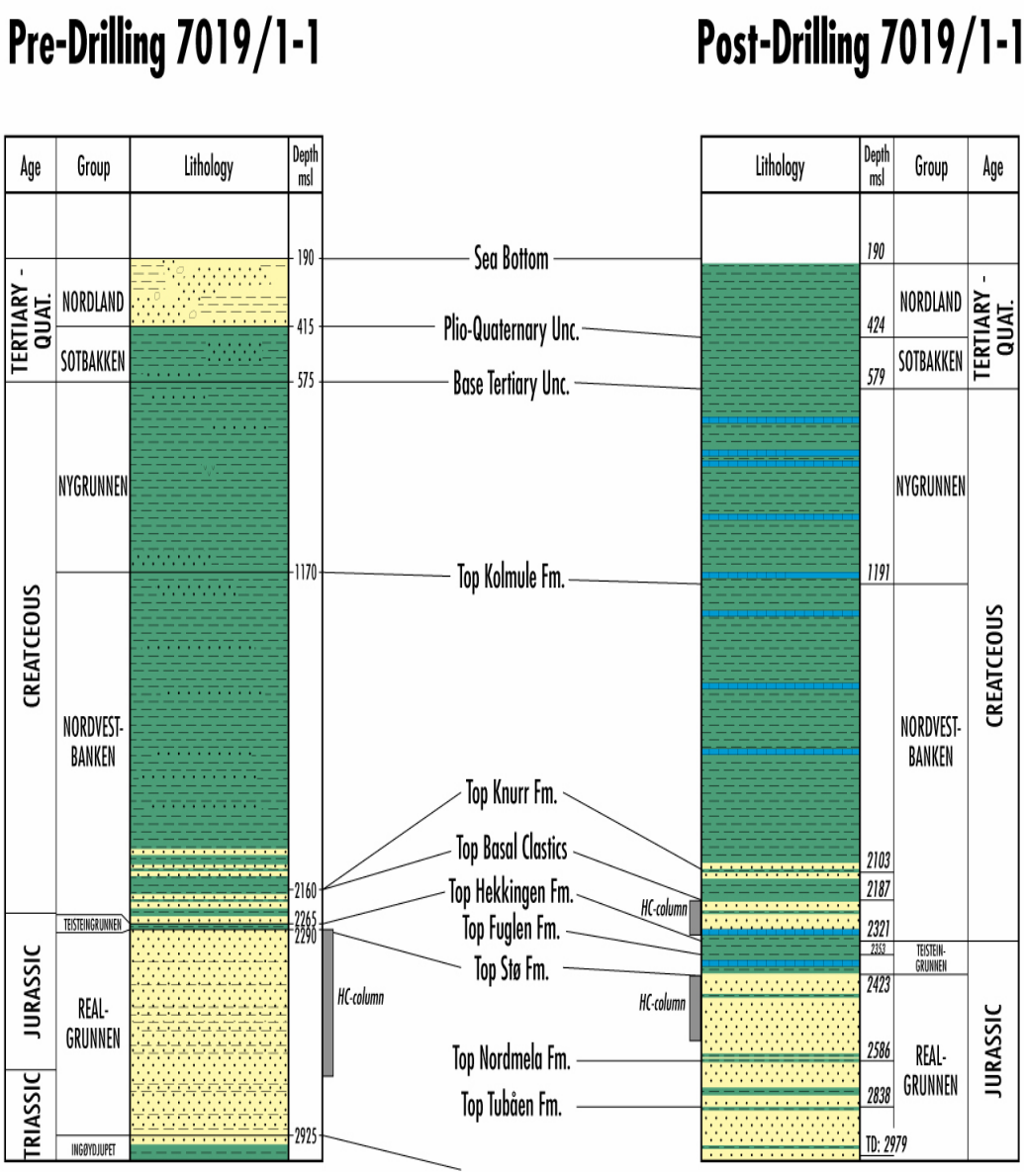

Pre-Drilling 7019/1-1
Post-Drilling 7019/1-1
Age
Group
Lithology
Depth msl
TERTIARY - QUAT.
NORDLAND
SOTBAKKEN
CREATCEOUS
NYGRUNNEN
NORDVEST-BANKEN
JURASSIC
TEISTEINGRUNNEN
REAL-GRUNNEN
TRIASSIC
INGØYDJUPET
190
415
575
1170
2160
2265
2290
2925
Sea Bottom
Plio-Quaternary Unc.
Base Tertiary Unc.
Top Kolmule Fm.
Top Knurr Fm.
Top Basal Clastics
Top Hekkingen Fm.
Top Fuglen Fm.
Top Stø Fm.
Top Nordmela Fm.
Top Tubåen Fm.
HC-column
HC-column
HC-column
424
579
1191
2103
2187
2321
2353
2423
2586
2838
TD: 2979
TEISTEIN-GRUNNEN

Fig 2.2.1

2.3 DATA ACQUISITION

A complete data acquisition program (Fig. 2.2.1) including Mudlog data, coring, MWD and wireline logs, MDT measurements and sampling and sidewall cores was implemented in the well 7019/1-1.

Goeservices provided an ALS2 service from 381m to 3003mBRT (TD). In addition to formation evaluation and conventional mudlogging, automatic real time data monitoring, recording and pressure analysis were carried out.

Pathfinder and BHI, in order to aid identification of shallow gas, lithologies, and hydrocarbons and achieve better well control provided MWD service.
Schlumberger provided Wireline log services; VSP acquisition was by Read.

2.3.1 Routine Sampling

Cuttings were collected and described offshore by Goeservices personnel (see Mudlogging Final Well Report) and revised by the Norsk Agip wellsite geologist.

The cuttings sample interval was:

- Every 10m from 688m (below 20" casing shoe) to 1063m BRT
- Every 3 to 6m from 1063m to 3003m.

Exceptions were made for excessive drill rates to maintain good sampling and descriptions.

Approximately 4kgs of unwashed cuttings were collected off shore and sent to Reslab for preparation and distribution according to NPD and partner's requirements.

Geochemical samples (canned cuttings samples) were collected each 100m from 700m to TD and sent to Reslab for analysis (see paragraph 2.x and separate report.

Biostratigraphical samples were collected cumulatively every 100m from 700m to TD and sent to Stratlab for analysis (see paragraph 2.x and separate report).

Mud samples were taken throughout the well at relevant intervals.

2.3.2 Shows

No indications of shallow gas were noted during the drilling of the pilot hole.

Goeservices using a standard gas trap and digital gas chromatograph from 690m to TD carried out the evaluation of hydrocarbon shows at the wellsite. Gas values were consistent in quality through out the well.

Hydrocarbon shows on cuttings, cores and sidewall Norsk Agip's wellsite geologist evaluated cores.

In the 12 ¼" hole section from 665 m to 2015 mMD totaled gas values predominantly ranged from 0.2% to 0.8% to 1450m. From this depth the background gas increased to 2 % indicative of pore pressure build up in the Kolmule Formation. There were few gas peaks, these generally correlated to increased ROPs.

Gas levels in the 8 ½" section, from 2015m to TD ranged from 0.40% to 3. %. In the Lower Basal clastics from 2211 to 2270 m the total gas reached more than 3%. The total gas in the main Stø reservoir ranged from 0.2 to 1%.

Shows were recorded over a number of intervals during drilling, reference should be made to the composite log, the bottom hole core and sidewall core reports.
The primary Stø sandstone reservoir had shows from 2447m to 2610m. Poor shows were noted through the Nordmela Formation and into the top of the Tubåen Formation to 2865m.

The secondary reservoir of the LowerBasal Clastics had poor shows from 2211m to 2220m.

2.3.3 Measurements while Drilling and Wireline Logs

MWD Logs

Pathfinder provided a CLSS sonic tool in the 12 ¼" hole section, in two runs, from 348m to 2015m behind Baker's Gamma Ray, Resistivity and Directional Survey package, with good log quality and no problems.

Baker provided continued with its package from 2015m to TD in the 8 ½" section. Below is a summary of LWD/MWD tools run:

Run No	Hole Diam	Drilled Intvl.	Tool Type	Logs	Op. Mode
0100	12.25"	348-665m	8" MPR	GR/Dir/Res/Sonic	Drilling
0200	12.25"	670-2015m	8" MPR	GR/Dir/Res/Sonic	Drilling
0300	8 ½"	2015-2095m	63/4"MPR	GR/Dir/Res	Drilling
0400	8 ½"	2095-2200m	63/4"MPR	GR/Dir/Res	Drilling
0500	8 ½"	2200-2209m	63/4"MPR	GR/Dir/Res	Drilling
0600	8 ½"	2209-2220m	63/4"MPR	GR/Dir/Res	Drilling
0700	8 ½"	2235-2335m	63/4"MPR	GR/Dir/Res	Drilling
0800	8 ½"	2335-2433m	63/4"MPR	GR/Dir/Res	Drilling
0900	8 ½"	2433-2457m	63/4"MPR	GR/Dir/Res	Drilling
1000	8 ½"	2464-2550m	63/4"MPR	GR/Dir/Res	Drilling
1100	8 ½"	2550-2565m	63/4"MPR	GR/Dir/Res	Drilling
1200	8 ½"	2566-2569m	63/4"MPR	GR/Dir/Res	Drilling
1300	8 ½"	2569-2727m	63/4"MPR	GR/Dir/Res	Drilling
1400	8 ½"	2727-2794m	63/4"MPR	GR/Dir/Res	Drilling
1500	8 ½"	2794-2875m	63/4"MPR	GR/Dir/Res	Drilling

Fluctuations in the varying potassium content of the formate mud resulted in wide fluctuations of the natural gamma ray readings by Baker Hughes, background readings were also unnaturally high due to the potassium in the mud.

During drilling a correction factor of 14% was used to attempt to bring the apparent gamma values down. For future wells using a potassium formate mud it is suggested that correction factors are not used and that the GR API scale is adjusted to 60 – 210 API to allow for the high readings and fluctuations during mixing of the formate mud. This system worked well with the Schlumberger log.

Wireline Logs

The following is a summary of the 8 ½" hole wireline logs run in the well.

8 ½" RUN NO.	LOGS	RECORDED INTERVAL m	DATE	LOST TIME hrs	B.H.T Deg C
Intermediate Log Run					
1	HALS-PEX	2001.7-2535	02/11/00	-	29.4
2	MDT	2212-2544	03/11/00	0.75	27.1
Final Log Run					
1	HRLA-PEX	3002-2004	13/11/00	-	88
2	CMR	3002-2004	13-14/11/00	7,00	100
3(i)	MDT-Gr	2984-2246	15-17/11/00	24.00	-
3(ii)	MDT-GR	2951-2246	17/18/11/00	-	101.4
3(iii)	MDT-GR	2601	18-18/11/00	-	100.6
4	FMI/DSI	3002-2004	19/11/00	-	-
5(i)	MSCT	2548-2496	19-20/11/00	3.50	-
5(ii)	MSCT	2952	20/11/00	-	-
6	VSP	3001-2002	20/11/00	-	-

Cablehead tension, total tension and borehole temperature was included in all runs.

Total lost time for the intermediate wireline logging was 0.75 hours.
The following problems occurred during the intermediate wireline logging:

- Run No 2: MDT faulty quartz gauge not reading, POOH to correct.

Total lost time for the final wireline logging was 34.50 hours.
The following problems occurred during the TD wireline logging:

- Run No 2: CMR was pulled due to debris on the pad.
- Run No 3(i): MDT became differentially stuck and was fished.
- Run No 5(i): MSCT core pusher jammed after 11 cores.

2.3.4 Formation Pressure

Geoservices performed the pore pressure evaluation while drilling, supervised by the Norsk Agip well site geologist.

No signs of shallow gas were seen during drilling with returns to the seabed.
The predominantly claystone formation remained normally pressured in the 12 ¼" hole to 1550m, where a minor left deflection of the d' exponent indicated an increase in formation pressure to app. 1.25 at 2000m

The 8½" section comprised predominantly sandstones, which made theoretical pore pressure estimates difficult during drilling.

MDT readings indicated a maximum pore pressure of 1.1sg (238.24bar) at 2256m in the Lowe Basal Clastics The deepest MDT taken at 2721m indicated a pore pressure of 1.1 sg (311 bar).

The formation pressure, mud weight and frac. Gradient is illustrated in fig. 2.3.1.

2.3.5 Formation Temperature

The extrapolated static bottom hole temperature (SBHT) from wireline logs is 115 deg C at 3003m (Logger's TD). This value give a geothermal gradient of 4deg C / 100m.
The temperature reading from the DST confirmed the gradient with a temperature of 102 deg. C

The following table summarizes the bottom hole temperature recorded during wireline logging, all times are decimal hours:

Run No	Hole Diam	Logs	Depth m BRT	Circ Time	Time Since Circ	BHT Deg C	SBHT Deg C
Final Log Run							
1	8 1/2"	HRLA-PEX	3002-	32.00	11.30	88.0	
2	8 1/2"	CMR	3002	32.00	24.20	100	
3(i)	8 1/2"	MDT-Gr	2984		-	-	
3(ii)	8 1/2"	MDT-GR	2951	1.50	15.00	101.4	
3(iii)	8 1/2"	MDT-GR	2601	1.50	35.30	100.6	114.8
4	8 1/2"	FMI/DSI	3002		-	-	
5(i)	8 1/2"	MSCT	2548		-	-	
5(ii)	8 1/2"	MSCT	2952		-	-	
6	8 1/2"	VSP	3001		-	-	

2.3.6 Side Wall Cores

Sidewall cores were taken in the Fuglen, Tubåen and Fruholmen Formations. The program was aimed at securing high quality stratigraphic and lithological data.

Sidewall cores were used for biostratigraphical and sedimentological studies (See separate reports)

The following sidewall core descriptions were made at the rig site:

MSCT: Run 5(i)			2471m - 2548m	11 shot: 11 rec: 0 empty: 0 lost
Shot	**Depth** m RKB	**Length**	**Description**	**Shows + Rating+ Porosity**
1	2548	Fragmented	SST: qtz, brn gy-olc gy, trnsl–trnsl, clss grs, loc brn gy, pred f, also vf-m, hd-v hd, fria, sbang-sbrnd, sbspher, occ sbelong, well cmt silic, abnt qtz o'growth in prim/vug, gd tr biot, tr arg mat, rr biot miclam	no HC od, no vis stn, mod mlky brnsh wh diff cut flor, no nat resid ring, dull mlky wh/yel resid ring flor, non – v por vis, v pr show
2	2544	4,1	SST: qtz, lt brn gy – lt olv gy, trnsl-trnsp, clss-mlky, smky gr, m occ f, w srt, hd, brit, crmbly, sbrnd-sbang, sbsph, pr-mod silic cmt, tr biot, tr arg mat	no HC od, no vis stn, v sl wk strmg diff mlky wh cut flor, no vis resid ring, no resid ring flor, pr-mod vis poro, loc vuggy, v pr show
3	2542	Fragmented 3,6	SST: qtz, brn gy–lt olv gy, trnsl-trnsp, clss-mlky, smky gr, f-m, w srt, hd-v hd, brit, crmbly, sbrnd-sbang, sbsph, mod-gd silic cmt, sec qtz infil in pri por/vug, tr arg mat in pore space, nod dissem pyr	v sli HC od, no flor, v slow wk diff strmg mlky wh cut flor, no resid ring, pr vis v pr show
4	2539	3,9	SST: qtz, brn gy–lt olv gy, trnsl-trnsp, clss-mlky, smky gr, f, loc m-vf, w srt, hd-v hd, brit, crmbly, sb-rnd-sbang loc ang, sbsph occ sbelong, gd silic cmt, qtz infl in pri por, occ euh xl faces, tr biot, tr micpyr	v sl HC od, v wk mlky wh diff flor, loc pr vis, v pr show
5	2537	4,7	SST: qtz, lt gy, trnsl-trnsp, clss-mlky, smky gr, predom f, com m, w srt, hd-v hd, brit, crmbly, sbrnd-sbang loc ang, sbsph occ sbelong, gd silic cmt, sec qtz infil in pri por/vug, rr arg gr	v wk HC od, nil vis stn, dull yel grn flor, nil nat cut, pa wh diff crsh cut, nil vis resid ring, v wk resid ring flor, mod vis, v pr show
6	2535	4,3	SST: qtz, wh-lt gy, trnsl-trnsp, predom clss, predom m, com f, w srt, mod hd, fria, sbrnd-sbang loc ang, sbsph occ sbelong, mod silic cmt, rr lith gr	v wk HC od, nil vis stn, dull yel grn flor, nil nat cut, pa wh diff crsh cut, nil vis resid ring, v wk resid ring flor, mod-gd vis, mud/filt inv, v pr show
7	2532	4,5	SST: qtz, wh-lt gy, trnsl-trnsp, predom clss, predom m, com f, w srt, mod hd, fria, sbrnd-sbang loc ang, sbsph occ sbelong, mod silic cmt, rr lith gr	v wk HC od, nil vis stn, dull yel grn flor, nil nat cut, pa wh diff crsh cut, nil vis resid ring, v wk resid ring flor, mod-gd vis, mud/filt inv, v pr show
8	2529	3,0	SST: qtz, wh-lt gy, predom trnsl, clss, predom m, occ f, w srt, mod hd, fria, sbrnd-sbang loc ang, sbsph occ sbelong, mod silic cmt, rr lith gr	v wk HC od, nil vis stn, dull yel grn flor, nil nat cut, pa wh diff crsh cut, nil vis resid ring, v wk resid ring flor, mod-gd vis, mud/filt inv, v pr show
9	2527	4,2	SST: qtz, lt gy, trnsp-trnsl, clss-mlky wh gr, f-predom m, mod srt, sbang-occ ang, sbsph occ sbelong, mod silic cmt, hd, fria, rr arg gr	nil nat col, v dull grn flor, vv wk diff wh flor crsh cut, nil nat resid ring, nil flor resid ring, mod-gd vis, mud/filt inv, v pr show
10	2495	4,0	SST: qtz, lt gy, trnsp-trnsl, clss-mlky wh gr, f-predom m, mod srt, sbang-occ ang, sbsph occ sbelong, well silic cmtd, hd-v hd, fria, rr arg gr	nil vis nat col, dull ylsh grn flor, nil vis cut, fst diff wh cut flor, nil vis resid ring, wk wh resid ring, mod-gd vis, filt inv, v pr show

11	2471	Fragmented 2,0	SST: pr sample, qtz, lt gy, trnsp-trnsl, clss-mlky wh gr, f-predom m, mod srt, sbang-occ ang, sbsph occ sbelong, well silic cmtd, hd-v hd, fria, rr arg gr	nil nat col, v pa wh flor, nil vis nat cut, nil cut flor, nil nat resid ring, nil resid ring flor, mod-gd vis, mud/filt inv, v pr show
Remarks: Run 5 (i) POOH due to jammed core pusher.				

MSCT: Run 5(ii)			2345m - 2956m	27 shot: 26 rec: 1 empty: 0 lost
Shot	**Depth** m RKB	**Length**	**Description**	**Shows + Rating+ Porosity**
1	2956	4,0	SST: qtz, lt brnsh gy, trnsl-trnsp, clss gr, predom f, rr m, mod-w srt, sbang, sbsphr, gd silic, sl calc cmt, v hd, extensive qtz o'growth intbd w/ SLST: m gy, v hd, no shows, v sl calc, grdg – vf SST	NO SHOWS
2	2952	4,5	SST: qtz, lt brnsh gy, trnsl-trnsp, clss gr, predom f, rr m, mow-w srt, sbang, sbsphr, gd silic, v hd, extensive qtz o'growth, com CLST/biot ? 1mm intlams	NO SHOWS
3	2455	4,0	SST: qtz, lt gy, trnsp, clss, f-m, w srt, ang, sbsphr, gd silic cmt, v hd, extensive qtz o,growth in pore spaces, occ arg gr	NO SHOWS
4	2945,7	4,5	SST: qtz, lt brnsh gy, trnsp, clss, f-m, w srt, ang, sbsphr, com euh xls, gd silic cmt v hd, extensive qtz o,grwth in pore space	NO SHOWS
5	2934	4,5	SST: qtz, lt brnsh gy, trnsp, clss, f-m, w srt, ang, sbsphr, com euh xls, gd silic cmt, v rr calc ip, v hd, extensive qtz o,grwth in pore spaces, occ arg gr	NO SHOWS
6	2920	4,5	SST: qtz, lt brnsh gy, trnsp, clss, vf-f, w srt, ang, sbsphr, com euh xls, gd silic cmt, v hd, extensive qtz o,growth in por spaces, w/ < 1mm biot intlams ip	NO SHOWS
7	2917	4,5	SST: qtz, dk brnsh gy, vf-f, w srt, ang, gd silic cmt, v sl calc cmt ip, v hd, abnt biot, lam biot ip, qtz o'growths in por spaces	mod HC od, nil vis stn, 50% patchy pa yelsh grn flor, nil vis cut, inst diff wh cut flor, nil vis resid ring, wh resid ring flor
8	2880	4,5	CLST: m dk gy, v hd, blky, non calc, grdg - SLST, occ biot lam	no shows
9	2859	3,5	SST: qtz, m gy, vf, w srt, ang, gd silic cmt, v rr calc, v hd, dk arg/biot? 1mm lams giving imperm barrier	vv wk HC od, nil vis stn, 50% patchy grnsh wh flor, strmg fst, unimodal wh cut flor, nil vis resid ring, pa grnsh wh resid ring flor poor show
10	2855,2	4,0	SST: qtz, lt brnsh gy, trnsl-trnsp, clss, mlky, vf, w srt, ang, gd silic/mod calc cmt, v hd, occ lith frags	mod strong HC od, v wk vis stn, 90% bri grnsh wh flor, nil vis cut, inst strmg mlky wh flor, nil vis resid ring, mod strong grnsh wh resid ring poor show
11	2755	4.9	SST: qtz, m lt gy, trnsp-trnsl, smky gy wh, vf-f, w srt, sbang-sbrnd, sbsph, v hd, gd silic cmt, w/abdt qtz overgrth infill prim pore/vug,rr arg, tr lam lith/biot , tr lithic incl	v wk HC od, no vis stn, no nat flor, slw stmg dull blu-wh cut flor, no nat resid ring, v wk mlky wh resid ring flor very poor show

12	2759	4.7	SST: qtz, lt brn gy, trnsl, smky brn, f-m,occ vf –m, mod w srt, sbang-sbrnd, occ ang, sbsph, v hd, gd silic cmt, w/abdt qtz overgrth infill prim pore/vug, rr arg mat (sli calc), tr lithic incl	v wk HC od, no vis stn, no nat flor, slw diff wk blu-wh cut flor, incr sli w/crsh cut, no nat resid ring, v wk mlky wh resid ring flor very poor show
13	2733.3	4.5	SST: qtz, lt md gy, trnsl, smky brn gy, f, occ vf, w srt, sbang-sbrnd, sbsph, v hd, gd silic cmt, w/abdt qtz overgrth infill prim pore/vug, tr lithic incl, tr turbated lam biot/arg mat	v wk HC od, no vis stn, no nat flor, wk blu-wh crsh cut flor, no nat resid ring, v wk mlky wh resid ring flor very poor show
14	2726	4.5	SST/SLTST: qtz, md gy, lt-md olv gy, trnsl, smky brn gy, f-vf, w srt, sbang-sbrnd, sbsph, v hd, gd silic cmt, tr lithic incl, tr turbated lam biot/arg mat	no show
15	2716	4.5	SST/SLTST: qtz, brn gy, trnsl, vf, grdg SLTST,w srt, sbang-sbrnd, sbsph, v hd, gd silic/calc cmt, occ argil, tr lithic incl, tr biot	v wk HC od, 60% ptchy dull orng /gld flor, inst slw strmg blu-wh cut flor, no nat resid ring, gd mlky yel wh resid ring flor v pr show
16	2671	4.7	SST: qtz, lt md gy, trnsl, smky brn gy, f, occ vf, w srt, sbang-sbrnd, sbsph, v hd, gd silic cmt, w/abdt qtz overgrth infill prim pore/vug, tr lithic incl, tr turbated lam biot/arg mat	v wk HC od, no vis stn, no nat flor, wk blu-wh crsh cut flor, no nat resid ring, v wk mlky wh resid ring flor v pr show
17	2661	Frag 3.1	SST/SLTST: qtz, brn gy, vf, grdg SLTST,w srt, sbang-sbrnd, sbsph, v hd, gd silic cmt, argil, tr lithic incl, tr biot	v wk HC od, no vis stn, no nat flor, slw stmg mlky wh cut flor, no nat resid ring, dull blu wh resid ring flor v poor show
18	2640.5	3.4	SST: qtz, brn gy, trnsp-trnsl, f, occ m, w srt, sbang-sbrnd, sbsph, rr sbelong, v hd, gd silic/calc cmt, tr lithic incl, tr arg mat	v wk HC od, no vis stn, no nat flor, inst diff mlky wh cut flor, no nat resid ring, v wk mlky wh resid ring flor very pr show
19	2601.5	4.7	SST: qtz, lt brn gy,lt olv gy, trnsp-trnsl, f-vf, w srt, sbang-sbrnd, sbsph, v hd, gd silic cmt, loc calc cmt, tr lithic incl, tr arg mat, tr biot	v wk HC od, no vis stn, no nat flor, blu wh crsh cut flor, no nat resid ring, v wk mlky wh resid ring flor, v pr show
20	2502	Frag 2.7	SH: blk, gy blk, hd, brit, sbfiss, mmic, tr dissem micpyr	v wk HC od, no vis stn, no nat flor, mod fst blmg blu wh cut flor, no nat resid ring, pa yel wh resid ring flor, v pr show
21	2377	4.8	SH: blk, gy blk, hd, brit, sbfiss, v mmic, tr dissem micpyr	v wk HC od, no vis stn, no nat flor, inst diff blmg blu yel wh cut flor, no nat resid ring, wk mlky wh resid ring flor, v pr show
22	2375	4.5	SH: blk, gy blk, blk, hd, brit, sbfiss, v mmic	v wk HC od, no vis stn, no nat flor, inst diff blmg blu yel wh cut flor, no nat resid ring, no resid ring flor, v pr show
23	2373	4.6	SH: brn blk, blk, v hd, brit, sbfiss, v mmic, tr mic dissem pyr, sli slty	v wk HC od, no vis stn, no nat flor, inst diff strmg blu yel wh cut flor, no nat resid ring, no resid ring flor, v pr show
24	2352.5	3.5	SH: gy blk, blk, v hd, brit, sbfiss, v mmic, tr mic dissem pyr, sli slty	v wk HC od, no vis stn, no nat flor, inst diff strmg blu wh cut flor, no nat resid ring, dull mlky wh resid ring flor, v pr show
25	2350	3.9	SH: brn gy, v hd, brit, sbfiss, v calc grdg Arg Lst, mmic	no show

26	2345	4.6	SLTST: dk gy-blk, v hd, brit, mmic, non calc, argil grdg slty sh	no HC od, no vis stn, no nat flor, slw diff strmg mlky wh cut flor, no nat resid ring, dull mlky wh resid ring flor, v poor show
27	2340		Not retrieved	

2.3.7 Bottom Hole Cores

Three bottom hole cores were cut according to the programme. The coring programme was intended to acquire petrophysical, stratigraphic, and sedimentological data in the potential reservoir. Conventional core was cut with a 27m aluminum sleeved core barrel. A full core analysis was made onshore (see separate report).

Below is the wellsite core report summary:

Core No: 1 **Interval:** 2220m - 2235m **Cored:** 2220m – 2234,47m **Recovery:** 100%		
Group: Nordvestbanken (Lower Basal Clastics) **Age:** Cretaceous **Barrel size and type:** 6 ¾" x 4" HT 30 **Core purpose:** Exploration, wildcat		
Depth	**Description**	**Shows + Porosity**
mRKB		
2220	SLTST w/ 40mmx800m SST pbL, rnd, elong inclusion SLTST: dk gy, v hd, blky – splnty, non calc SST pbl: qtz, lt brnsh gy, f-m, w srt, ang-sbang, gd calc/dol cmt, v hd, rr orng lithg inclsn,	SST: nil HC od, lt brn (oil?) stn wk dull gld flor, nil nat col, fst strmg bimodal, pa wh cut flor, nil vis resid ring, pa grnsh wh resid ring flor, v pr vis poro
2221	SST: qtz, lt brnsh gy, f-m, w srt, ang-sbang, gd calc/dol cmt, v hd	nil HC od, lt brn (oil?) stn wk dull gld flor, nil nat col, fst strmg bimodal, pa wh cut flor, nil vis resid ring, pa grnsh wh resid ring flor, v pr vis poro
2222	SST: qtz, lt brnsh gy, f-m, w srt, ang-sbang, gd calc/dol cmt, v hd	nil HC od, lt brn (oil?) stn wk dull gld flor, nil nat col, fst strmg bimodal, pa wh cut flor, nil vis resid ring, pa grnsh wh resid ring flor, v pr vis poro
2223	CLYST: dk gy, v hd, blky-splnty, non calc w/ minor CLYST elong lens (0.5x4mm), lt grnsh gy, non calc	nil vis poro
2224	SST: qtz, lt brnsh gy, v hd, ang, f -m, occ c, mod srt, gd silic/v sl calc cmt, v hd	nil HC od, nil vis stn, intlam v wk grnsh flor, nil vis cut, nil cut flor, nil vis resid ring, nil flor resid ring, nil vis poro
2225,08	SST: qtz, lt brnsh gy, Predom f – m, w srt, sbang-sbrnd, gd silic cmt, hd	v wk HC od? v lt brn oil stn, vv dull brn flor, v sl pa grnsh wh flor, nil vis nat cut, nil vis resid ring, nil dull pa grnsh wh resid ring, v pr vis poro
2226	SST: qtz, lt brn gy, trnsp-trnsl, hd, brit, f occ m, sbrnd-sbang, occ ang, sbsphr, w srtd, pr silic cmt, tr lithic incl	v wk HC od, no vis flor, slw strmg mlky wh cut flor, nil vis nat cut, no vis resid ring flor, v wk pa mlky wh resid ring flor, v pr vis poro
2227	SST: qtz, lt brn gy, trnsp-trnsl, lt brn gy, hd, brit, f, sbang-sbrnd, sbsphr, w srtd,pr silic cmt	v wk HC od, no vis flor, slw strmg mlky wh cut flor, nil vis nat cut, no vis resid ring flor, v wk pa mlky wh resid ring flor, v pr vis poro
2228	SST: qtz, lt brn gy, trnsp-trnsl, lt brn gy, hd, brit, sbang-sbrnd, sbsphr, wsrtd, pr silic cmt	v wk HC od, no vis flor, slw strmg mlky wh cut flor, nil vis nat cut, no vis resid ring flor, v wk pa mlky wh resid ring flor, v pr vis poro

2229	SST: qtz, dk brn gy, dk olv gy, trnsl, lt brn gy, rr trnsp, v hd, f occ m, sbang-sbrnd, sbsphr, w srtd, gd calc cmt, tr lithic incl	mod HC od, 80% sample w/spt pa yel org flor, mod pinprick wk blu wh cut flor, no nat resid ring flor, wk blu wh resid ring flor, nil vis poro
2230	CLYST: dk gy, v hd, ind, sbfiss, ang, mmic, splint, non calc	nil HC od, no nat flor, v pa mlky wh crush cut, no nat resid ring flor, wk mlky wh resid ring flor, no vis poro
2231	CLYST: dk gy, v hd, ind, sbfiss, ang, mmic, splint, non calc	nil vis poro
2232	CLYST: med olv gy-dk gy, v hd, sbfiss,ang, mmic,splint, non calc	nil vis poro
2233	CLYST: brn gy-md dk gy, v hd, sbfiss,ang, mmic,splint, sli dol	nil vis poro
2234	CLYST: brn gy-md dk gy, v hd, sbfiss,ang, mmic,splint, sli dol	nil vis poro
2234,47	CLYST: v dk brnsh gy, hd, blky, fiss, splnty in pt , non calc	nil vis poro
Core Head	CLYST: v dk brnsh gy, sft, fiss, non calc, w/ calc (foss?) inclsns	v strong HC od
Remarks: pulled core barrel due to low ROPs		

Core No: 2	**Interval:** 2457m - 2464m	**Cored:** 2457m – 22463,58m	**Recovery:** 94%
Group: Realgrunnen (Stø Formation)		**Age:** Upper Jurassic	
Barrel size and type: 6 ¾" x 4" HT 30		**Core purpose:** Exploration, wildcat	
Depth mRKB	**Description**		**Shows + Porosity**
2457	SST: v lt gy, v hd, brit, comprising clss, transl- clr, rr brnsh gy qtz, f-m, subang-sunrnd occ ang, subsph, wsrtd, mod w cmtd w/ silic, abndt qtz ovrgrwths occlud por, (frac grns on chip srfc due ovrgrwths) com euhed xls & stri xl fac, loc w/ lams dk brnsh blk-blk mod hd, earthy carb matl/micrxln pyr, occ micrxl pyr cmt		v wk HC od, v ptchy v wk dull orng gld flor, v pr mlky brnsh wh crsh cut, no resid ring, pr vis intgran por.
2458	SST: v lt gy, hd-v hd, comprising clss-occ lt gy, clr-transl qtz, m-occ f, subrnd-subang, subsph, mod wcmtd w/ silic, com w/ qtz ovrgrwths occlud por, tr f-m musc mica, tr micrxln pyr		no HC od, no dir flor, no cut, pr vis intgran por.
2459	SST: v lt gy-pa brnsh gy, hd-v hd, brit, comprising clss, clr-transl qtz, m occ f, subrnd-subang, subsph, w srtd, v w cmtd w/ silic, com w/ qtz ovrgrwths, stri xl fac, occ euhed qtz xls in primary por, now pr vis intgran por, tr f-m musc, tr micrxln pyr		no HC od or dir flor, v pa yell wh crsh cut w/ dichloro-methane (no cut w/ n-hexane), wk yell-wh flor resid, pr vis intgran por.

2460	SST: v pa brnsh gy-pa gy, v hd, wl ind, brit, compris-ing dom clss, clr-transl occ sl mlky wh, rr pnk, qtz, vf-f loc m, ?subang-?subrnd, ?subsph (diff due qtz ovrgrwths obscur grns), v w cmtd w/ silic, com qtz ovrgrwths occlud por, com stri xl fax, occ euhed xl prisms in remnant prim por, loc w/ rr lt brn arg mtx, rr vf-f dk brnsh blk-blk rnd ?carb grns, tr vf occ c musc mica, loc w/ micrxln pyr	no HC od, no dir flor, v wk blu-wh crsh cut w/ dichloromethane (no cut w/ n-hexane), no resid, no-v pr vis intgran por, loc pr vug por.
2461	SST: as for 2460 (v pa brnsh gy- v pa gy, v hd, wl ind, brit, comprising clss-rr pnk, clr-transl, loc mlky wh, occ opq qtz, subang-subrnd, subsph (diff due qtz ovrgrwths obscur grns), vf-f occ m-c, v w cmtd w/ silic, com qtz ovrgrwths, abndt stri xl fac & occ euhed xls grwn in prim por, loc w/ f-m occ c musc mica, occ dk brn-blk earthy ?carb laths & r r vf-m rnd grns, r r mod grn ?chlor flks, loc w/ irreg mass micrxln pyr, r r w/ pyr cmt)	as for 2460 (no HC od, no dir flor, v wk blu-wh crsh cut w/ dichloro-methane (no cut w/ n-hexane), no vis resid, yell-wh flor resid (dichlor), no-v pr vis intgran por, loc pr vug / frac por
2462	SST: as for 2460 (v pa brnsh gy- v pa gy, v hd, wl ind, brit, comprising clss-rr pnk, clr-transl, loc mlky wh, occ opq qtz, subang-subrnd, subsph (diff due qtz ovrgrwths obscur grns), vf-f occ m-c, v w cmtd w/ silic, com qtz ovrgrwths, abndt stri xl fac & occ euhed xls grwn in prim por, loc w/ f-m occ c musc mica, occ dk brn-blk earthy ?carb laths & r r vf-m rnd grns, r r mod grn ?chlor flks, loc w/ irreg mass micrxln pyr, r r w/ pyr cmt).	as for 2460 (no HC od, no dir flor, v wk blu-wh crsh cut w/ dichloro-methane (no cut w/ n-hexane), no vis resid, yell-wh flor resid (dichlor), no-v pr vis intgran por, loc pr vug / frac por
2463	SST: sli finer, else as for 2460m (v pa brnsh gy- v pa gy, v hd, wl ind, brit, comprising clss-rr pnk, clr-transl, loc mlky wh, occ opq qtz, subang-subrnd, subsph (diff due qtz ovrgrwths obscur grns), vvf-f, r r m, v wcmtd w/ silic, com qtz ovrgrwths, abndt stri xl fac & occ euhed xls grwn in prim por, loc w/ f-m occ c musc mica, occ dk brn-blk earthy ?carb laths & r r vf-m rnd grns, r mod grn ?chlor flks, loc w/ irreg mass micrxln pyr, r w/ pyr cmt).	as for 2460 (no HC od, no dir flor, v wk blu-wh crsh cut w/ dichloro-methane (no cut w/ n-hexane), no vis resid, yell-wh flor resid (dichlor).
2463.8	SST: as for 2463m (v pa brnsh gy- v pa gy, v hd, wl ind, brit, comprising clss-rr pnk, clr-transl, loc mlky wh, occ opq qtz, subang-subrnd, subsph (diff due qtz ovrgrwths obscur grns), vvf-f, r r m, v wcmtd w/ silic, com qtz ovrgrwths, abndt stri xl fac & occ euhed xls grwn in prim por, loc w/ f-m occ c musc mica, occ dk brn-blk earthy ?carb laths & r r vf-m rnd grns, r r mod grn ?chlor flks, loc w/ irreg mass micrxln pyr, r r w/ pyr cmt).	as for 2460 (no HC od, no dir flor, v wk blu-wh crsh cut w/ dichloro-methane (no cut w/ n-hexane), no vis resid, yell-wh flor resid (dichlor), no-v pr vis intgran por, loc pr vug / frac por
Remarks: Pull CB due to low ROP,core-catcher split with half in catcher-sleeve and half at top core.		

Core No: 3	**Interval:** 2561m - 2568m	**Cored:** 2561m – 2568m	**Recovery:** 100%
Group: Realgrunnen (Stø Formation)		**Age:** Upper Jurassic	
Barrel size and type: 6 ¾" x 4" HT 30		**Core purpose:** Exploration, wildcat	

Depth mRKB	**Description**	**Shows + Porosity**
2561	SST: v lt gy, v lt brn gy, hd, brit, comprising clss, transl- clr, rr brnsh gy qtz, f-m, subang, occ ang-subrnd, subsph, wsrtd, loc sacc tex, mod-w cmtd w/ silic, loc qtz ovrgrwths occlud prim por, tr loc nod mic pyr cmt	wk HC od, no vis flor, v pr mlky brnsh wh cut flor, no nat resid ring, dull mlky wh resi ring flor, mod vis intgran por.

2562	SST: v lt gy,v lt brn gy, hd-v hd, comprising clss-occ lt gy, clr-transl qtz, vf-f, subrnd-subang, subsph, (qtz ovrgrwths loc obscur grns), mod wcmtd w/ silic, com w/ qtz ovrgrwths occlud por, tr f-m musc mica, tr mic nod pyr, rr tr lith incl	mod HC od, no dir flor, pr mlky brnsh wh crsh cut flor, no nat resid ring, dull mlky wh resi ring flor, pr vis intgran por
2563	SST: v lt gy-pa brnsh gy, hd, brit, comprising clss, clr-transl, lt pa brn gy, qtz, f occ vf – m, subrnd-subang, occ ang, subsph, wsrtd, rr sacc tex, wcmtd w/ silic, com w/ qtz ovrgrwths, loc grn str obsc, rr euhed qtz xls in prim por, pr vis intgran por, tr f biot, tr micrxln pyr	sli-mod HC od, no dir flor, pr mlky brn wh crsh cut, wk mlky wh resid ring flor. , pr vis intgran por
2564	SST: v pa brnsh gy, v hd, brit, comprising dom clss, clr-transl occ pa brn-orng gy, qtz, f- m, subang-subrnd, occ ang, subsph, loc sacc tex, wcmtd w/ silic, com qtz ovrgrwths occlud por, rr euhed xl prisms in remnant prim por, tr vf occ c biot mica, rr tr w/ micrxln pyr	mod HC od, no dir flor, wk mlky brn wh cut flor, no nat resid ring, dull mlky wh resid ring flor, pr-mod vis intgran por
2565	SST: lt gy, pa brnsh gy, trnsl, hd, brit, comprising dom clss, transl, occ lt brn gy, lt gy, qtz, f- vf, rr m, subang-subrnd, subsph, wcmtd w/ silic, com qtz ovrgrwths occlud prim por, occ euhed xl prisms w/striated xln fac in por, tr vf occ c biot, rr tr w/ micrxln pyr	mod HC od, no dir flor, pr wk mlky brn wh crsh cut flor, no nat resid ring, dull mlky wh resid ring flor, pr vis intgran por
2566	SST: lt gy, pa brnsh/orng gy, trnsl, hd, brit, comprising dom clss, transl, occ lt brn/orng gy, lt gy, qtz, , f occ vf, pred subang, occ ang-subrnd, subsph, wcmtd w/ silic, com qtz ovrgrwths occlud prim por, occ euhed xl prisms, tr vf occ c biot, rr tr w/ micrxln pyr	mod HC od, no dir flor, mod mlky wh crsh cut flor, no nat resid ring, mod blu wh resid ring flor, pr-mod vis intgran por
2567	SST: lt gy, trnsl, hd, brit, comprising dom clss, transl, lt gy, qtz, f occ vf, subang-subrnd, occ ang, subsph, wcmtd w/ silic, com qtz ovrgrwths occlud prim por, occ euhed xl prisms, tr dk brn blk lam (styl?) poss biot, rr tr w/ micr nod pyr	sli-mod HC od, no dir flor, mod mlky wh crsh cut flor, no nat resid ring, pr mlky wh resid ring flor, pr vis intgran por
2568	SST: lt gy, trnsl, hd, brit, comprising dom clss, transl, lt gy, rr yell/orng qtz, pred f, occ m, subang-subrnd, loc ang, subsph, wcmtd w/ silic, com qtz ovrgrwths occlud prim por, occ euhed xl prisms, rr tr w/ micr nod pyr	wk HC od, no dir flor, sli mlky brn wh crsh cut flor, no nat resid ring, dull mlky wh resid ring flor, v pr vis intgran por
Remarks: Pulled core barrel due to low ROPs		

Well 7019/1-1
Formation pressure

Pressure gradient in specific gravity (sg)

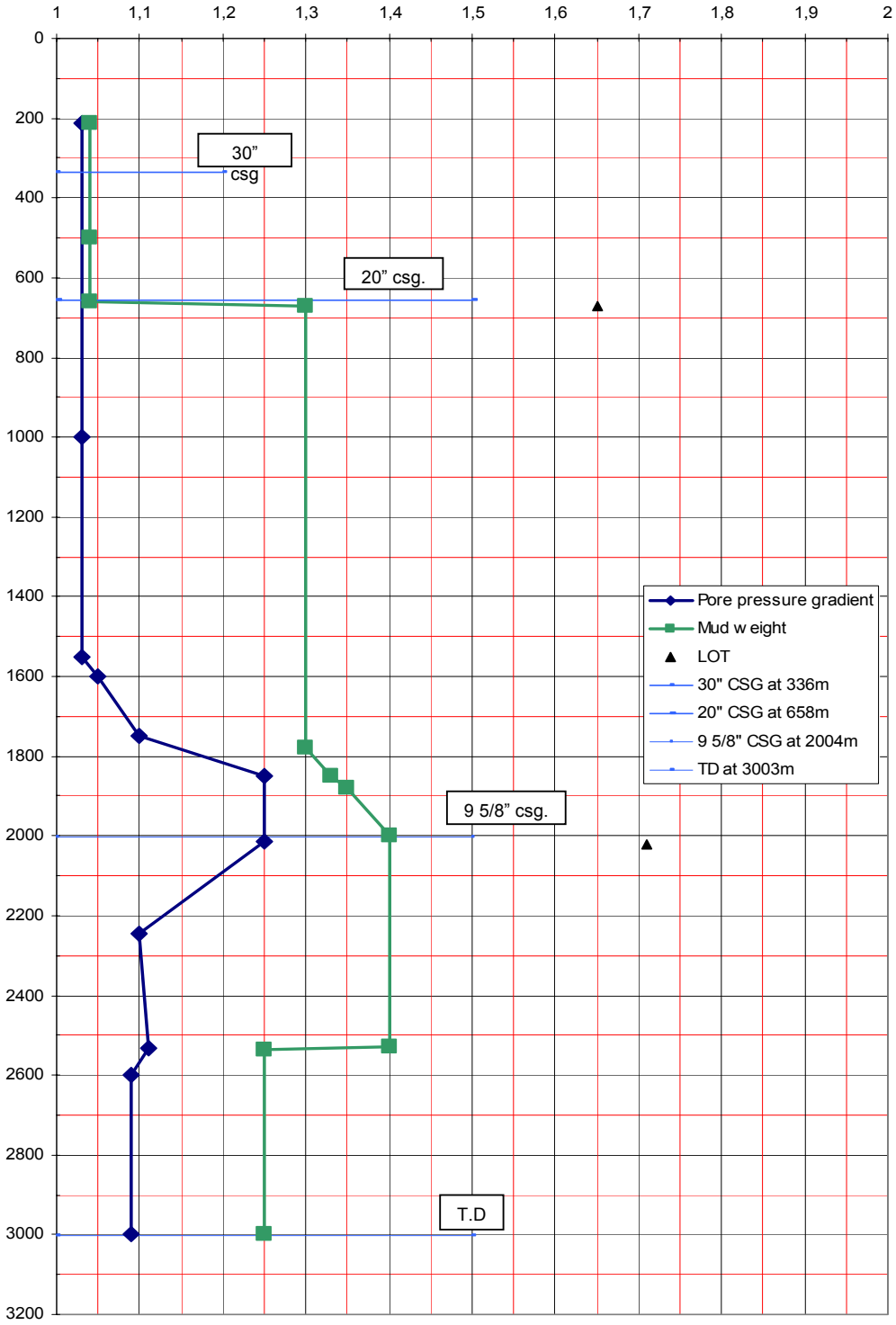
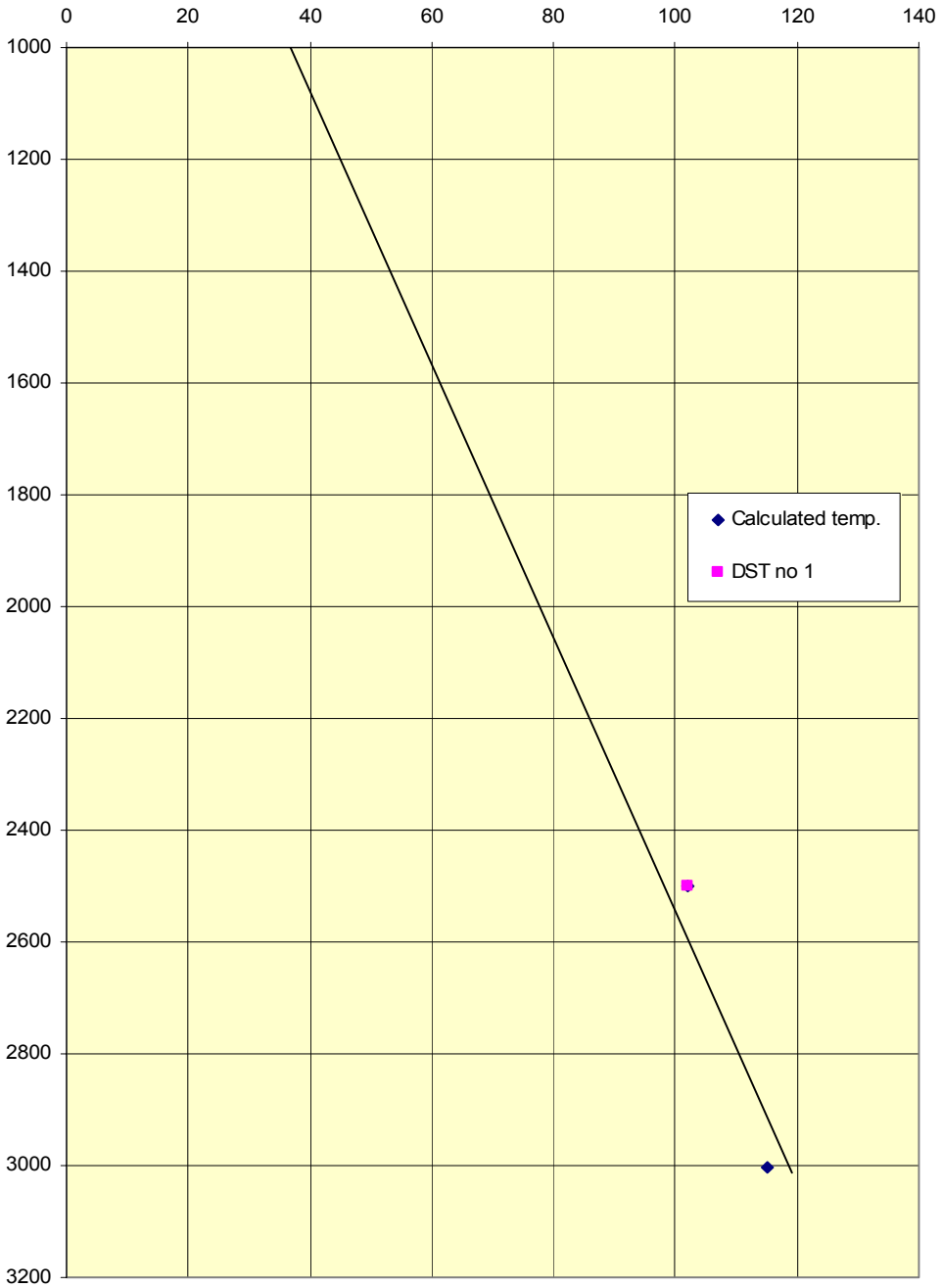


Fig.2.3.1

Well 7019/1-1

Formation Temperature



2.4 STRATIGRAPHY

2.4.1 Biostratigraphy

Stratlab carried out the biostatigraphical evaluation of Well 7122/7-1.
The analysis was based on studies of lithology, micropaleontology, palynology and nannofossils, which were made on ditch cuttings and sidewall core covering the interval 670m to 3003m BRT (TD).
Fig. 2.4.1 shows a summarised chronostratigraphic and lithostratagraphic subdivision of the well.
Further details may be found in the report ”Norsk Agip Well 7019/1-1, Biostratigraphic analysis of the interval 665m – 3003m.

2.4.2 Lithostratigraphy

The following summary is compiled predominantly from ditch cuttings descriptions. Sidewall cores were available from 2455m to 2956m. Three conventional cores were recovered from this well. Wireline and MWD logs were used to aid lithological interpretation and the picking of formation boundaries.
The well was drilled with returns to seabed from 190m to 665m before setting the 30” conductor pipe. The first drill cuttings sample was taken from 670m with descriptions below starting from this point
All depth values stated below are measured depth, in metres below the rotary table (BRT), RT was 24m above Sea Level.

Nordwestbanken Group (670m – 2345m)
Age: Cretaceous

Upper Cretaceous 690m – 1215m

The gamma ray trace was quite consistent over the interval becoming more erratic in the last 13m due to a fault around 1215m.
The Upper Cretaceous predominantly consisted of clays with rare limestone stringers and even rarer sandstone stringers around 1180m.

The **clay** was predominantly medium to dark grey, olive grey in part, soft to firm, blocky to subblocky, non to slightly calcareous, micromicaceous, rarely micropyritic and silty in part.
The **limestone** was light grey occasionally yellowish grey, firm, and blocky with a wackestone texture.
The **sandstone** stringers were quartzose, light grey, clear, colourless to light brown grains, very fine to fine, subrounded, subspherical, well sorted, soft to firm, weak slightly calcareous cement with common lithic grains, There was no visible porosity and no shows.

Kolmule Formation 1215m – 2127m

The gamma ray and resistivity returned to smoother traces following the fault zone

This formation consisted predominantly of claystone with limestone and rare dolomite stringers. The last part 18m of the Kolmule was siltstone.

The **clay** was predominantly medium to dark grey to dark greyish black, soft to firm, becoming hard, blocky to subblocky, non-to slightly calcareous, micromicaceous and rarely micropyritic.
The **dolomite** was dark yellowish, microcrystalline texture, hard, brittle and angular.
The **limestone** was light grey, blocky to angular, soft to firm, microcrystalline angular and argillaceous.
The **siltstone** was clean, very pale brown to dark grey, firm to moderately hard, blocky, non calcareous, grading to a very fine sandstone, there were very weak shows.

Knurr Formation (2127m – 2211m)
Age: Cretaceous

Upper Boundary: shows a progressive decrease in ROPs with a small increase in gamma ray. The resistivity curve initially showed a small cutback.
The lithology comprised claystone interbedded with sandstone, siltstone with minor limestone and dolomite stringers to the base of the section.

The **claystone** was brownish grey to dark grey to black, hard, blocky, non-calcareous, trace micropyritic and interlaminated with siltstone in part.
The **sandstone** was quartzose, light grey with clear, colourless, predominantly medium grains; these were subrounded and well sorted. It was firm to occasionally hard, with a weak silicic cement, micropyritic with poor visible porosity and poor shows in part
The **siltstone** was light brownish grey, firm to hard, blocky, non-to slightly calcareous and graded to very fine sandstone with poor shows.
The **limestone** was dark grey, hard, blocky and angular with a mudstone texture.
The **dolomite** trace was medium brown grey, hard, brittle, and angular.

Lower Basal Clastics (2211m – 2345m)
Age: Cretaceous

Upper Boundary: The secondary target of the well was denoted by penetration of sandstone, as indicated by gamma ray. ROPs remained low, resistivity increased significantly.
The lithology comprised four sandstone beds interbedded with claystones, limestone and dolomite were also noted with a minor siltstone to the base of the section.

For a full description of the **sandstone** see Core No.1 Report above.
The **claystone** was medium brownish grey to medium dark grey, predominantly firm to hard, rarely very hard, blocky, non calcareous, subblocky to blocky, slightly micromicaceous with nodular pyrite and grading to siltstone in part.
At the base of this formation the **siltstone** was medium dark grey, brown grey, firm to hard, subblocky to blocky and slightly calcareous.

Teistengrunnen Group (2345m – 2447m)
Age: Jurassic

Hekkingen Formation (2345m – 2377m)
Age: Jurassic

Upper Boundary: The top of the Jurassic is represented by a sharp increase in resistivity with a significant increase in gamma ray.
The formation was characterised by dark claystones with poor shows and traces of limestone.

The **claystones** were dark grey to grey black to olive black, firm to hard, occasionally very hard, subblocky to blocky, non-to very slightly calcareous, micromicaceous with traces of nodular pyrite. There were poor shows in this claystone.
The **limestone** stringers were light grey to light grey white, soft to firm, occasionally hard, subblocky to blocky, argillaceous with a mudstone texture.

Fuglen Formation (2377m – 2447m)
Age: Jurassic

Upper Boundary: This can be distinguished by a sharp cutback in the gamma ray, the resistivity decreases. The major lithology was claystone with limestone stringers.
The **claystone** was brownish grey to brownish black, hard to very hard, occasionally firm, blocky, non-to slightly calcareous, micaceous with common pyrite nodules.
The **limestone** was light to yellowish grey, soft to firm, occasionally hard, blocky, argillaceous in part and occasionally dolomitic.

Realgrunnen Group (2447m – 3003m TD)
Age: Jurassic

Stø Formation (2447m – 2610m)
Age: Jurassic

Upper Boundary: Indicated a sharp cutback of gamma ray indicated sandstone, the resistivity also increases greatly in the hydrocarbon bearing formations. ROPs did not increase significantly from the slow rate of the previous formation.
The sequence was predominantly sandstones with claystone and siltstone interbeds. Reference should also be made to the Core Reports Nos. 2 and 3 above.
The **sandstones** were quartzose, very pale brownish grey to pale grey with clear, colorless occasionally milky grains, these were subangular to sub rounded, subspherical, very fine to fine to medium, moderately sorted, hard, locally brittle, good silicic cement with quartz overgrowth, rare black lithic grains, occasional muscovite, occasional micropyrite, poor visible intergranular porosity. Poor shows were recorded.
The **claystones** were medium to medium dark grey, firm to soft, blocky, sticky in part, slightly to very calcareous, grading to marl in part, silty in part.
The **siltstone** was mottled dark purple brown, very hard, blocky with a white/off white calcareous/dolomite matrix.

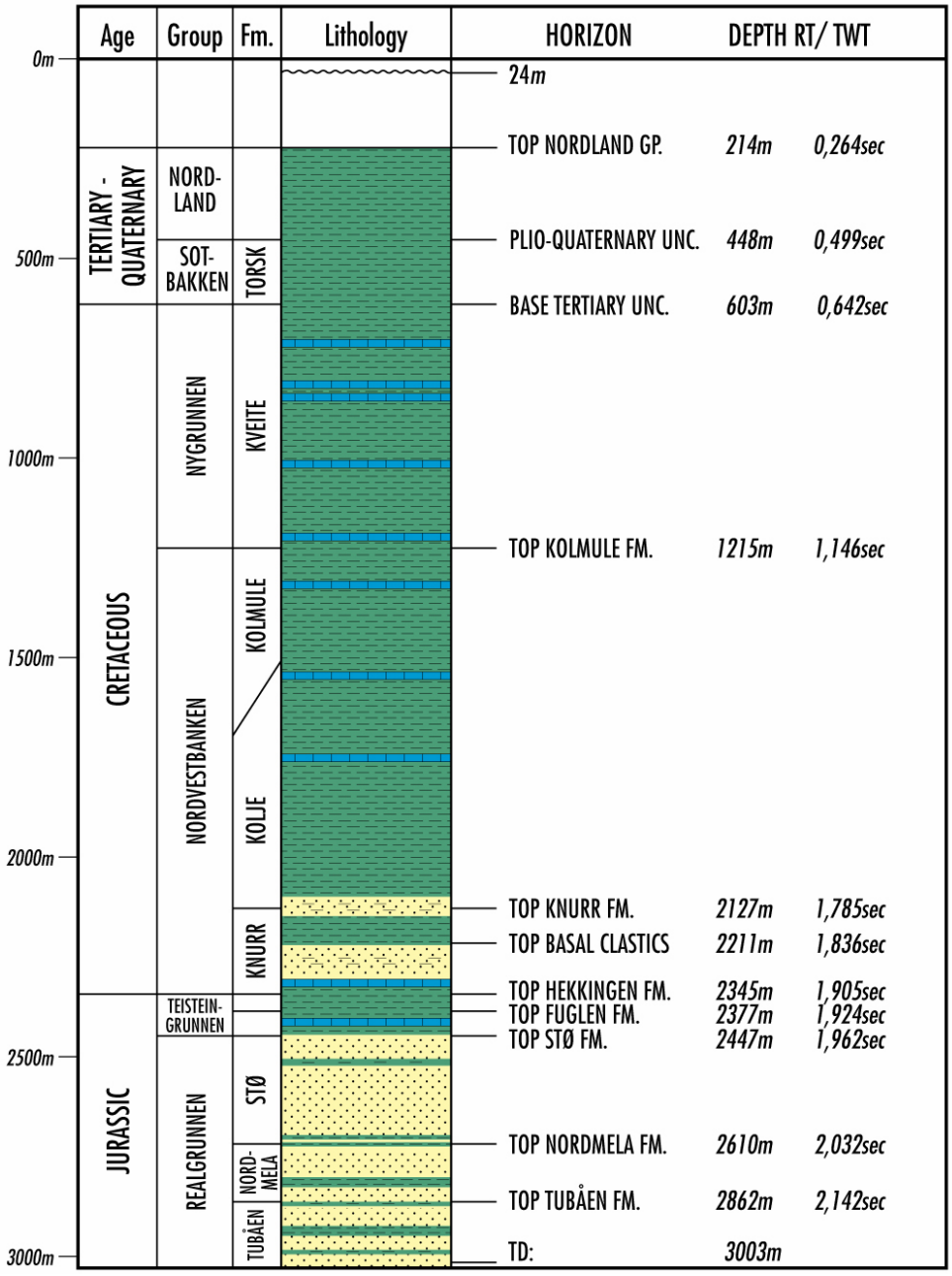
Nordmela Formation (2610m – 2862m)
Age: Jurassic

Upper Boundary: Gamma ray levels increased from the previous reservoir sands, the resistivity values increased and separated.
The formation consisted of massive sandstone with minor siltstones and limestone stringers.
The **sandstone** was quartzose, brown grey, translucent to transparent, fine to occasionally medium, subrounded to subangular, subspherical to subelongated, well sorted, very hard, good silicic/calcareous cement in part, with traces of lithic inclusions and argillaceous materiel. Porosity was nil to moderate with poor shows.
Siltstones were medium to dark grey, firm to moderately hard, blkocky to subblocky and slightly calcareous with subangular grains, muscovite mica, very argillaceous, grading to claystone.
The **Limestone** stringers were off white to pale grey brown, firm, blocky, microcrystalline, friable, slightly argillaceous, with very, very fine sand grains, also occasionally pale brown, very soft and very argillaceous with a microcrystalline texture.

Top Tubåen Formation (2862m – 3003m TD)
Age: Jurassic

Upper Boundary: Indicated by an increase in gamma ray and resistivity.
The formation comprised interbedded sandstones, claystones and siltstones.
The **sandstones** were quartzose, light brownish grey, transparent, colorless grains, very fine to fine, becoming fine to medium with depth, subrounded to angular, subspherical, well sorted, good silicic cement, poor to nil visible porosity with poor shows recorded in the upper part of the formation.
Siltstones were medium grey, very hard, blocky, very slightly calcareous, grading to very fine sandstone.
The **claystones** were dark grey black, hard, blocky occasionally splintery, subfissile, non calcareous, micropyritic and commonly carbonaceous, grading to coal in part.

Well 7019/1-1
Litho Stratigraphy



FI•EP•06•PL201•7019/1-1 Litho•eyv•011101•ds

Fig. 2.4.1

2.5 WELL VELOCITY

A VSP survey was recorded in well 7019/1-1. The main aims of this were to provide a correlation between the well logs and the seismic data and to obtain seismic velocities for depth conversion purposes.

2.5.1 V.S.P.

Full details of the vertical seismic profile are given in the report by Read Well Services entitled “Zero Offset VSP, 7019/1-1”.

The VSP survey was recorded on 20th November 2000 from 2995 m to 1205 m RKB using a 4 level receiver assembly with 20 m spacing between the receivers. The seismic source was a cluster of three 150 cu.in. sleeve airguns. The horizontal offset of the source from the wellbore was 62 m in direction 177 degrees. In the bottom part of the well, below 1965 m RKB, the recording positions were interleaved to give measurements every 10 m.

At the onshore processing centre, full processing of the data was performed, to produce the “Enhanced Deconvolved Upgoing Wavefield” and corridor stacks. Figure 2.5.1 shows the positions of the main formation tops where they intersect the first arrival curve of the VSP display.

2.5.2 Synthetic Seismogram

Wireline sonic and density logs are available in well 7019/1-1 between 2004 m RKB and TD. MWD sonic is available between 336 m and 2004 m RKB. A density log for this interval was computed from the sonic using Gardner’s formula. The sonic log was calibrated and used with the density log to calculate the acoustic impedance log and reflection coefficients.

Figure 2.5.1 shows the logs and the synthetic seismogram which has been filtered to match the frequency content of the surface seismic data from the 94TRM3D survey. The 3D seismic data have a low dominant frequency and the heavy processing is believed to be the cause of a 40 ms delay compared to the times of the reflections on the synthetic seismogram. The VSP has a higher dominant frequency due to the one way raypaths giving less absorption. Both the VSP and the synthetic seismogram are zero phase.

The sandstone interbeds within the Cretaceous gas reservoir are too thin to be resolved by the VSP or 3D seismic data. Within the gas column in the Stø Fm. the VSP shows internal reflections which are related to lithology, while a faint reflection from the gas water contact can be seen on the 3D seismic data at the well location.

VSP fig.

2.6 GEOCHEMISTRY

The full geochemical study is found in the report **"Well 7019/1-1: Gamma field Geochemical study"** Edited by R. Galimberti.
The main conclusions can be summarized as follows:

The gas samples taken during the MDT test from the Cretaceous reservoir and during the PT test from the Jurassic reservoir give unreliable results, probably due to sampling problems.

- Gas sample from Cretaceous reservoir is unusually rich in organic derived CO_2. A possible contamination from artifact CO_2 during the MDT or in the bottle is suggested.
- Measurements of CO_2 concentration in three samples from the Jurassic reservoir differ a lot among them and in respect of the well head measures; again a possible sampling problem is suggested.
- On basis of the isotopic signature, the origin of the CO_2 can be defined as volcanic.

Interesting concentration of residual (liquid) HCs can be detected in the following intervals:

- 2355-2391 m (indigenous HCs associated with the source rock level of the Hekkingen Fm)
- Kolje – Knurr Fms. (indigenous HCs)
- Stø Fm. 2553 – 2571 m, 2628 – 2682 m, 2709 m, 2820 m, 2838 m, 2874 m (migrated HCs)

The migrated HCs in the Stø Fm. are generated by a shaly, marine source rock and show a good correlation with the Barents Sea oils.
The thermal maturity level is responsible for the main variations observed in the samples and can be defined as variable between the peak of the oil window up to the late oil window.

The good correlation of the oil traces in this well with the known accumulations in the Barents Sea seems to confirm the migration model proposed in the previous studies: The Gamma structure was filled by the HC migration coming from the western part of the basin. The first part of less mature HC was probably displaced by increasingly more mature HCs resulting in the present time gas accumulation. The lower maturity oil was probably displaced towards the shallower structures towards the eastern part of the basin.

The source rock analysis indicates:

- Very good petroleum potential (S2 from 4-10 Kg HC/Ton rock) and TOC content (3-9%) are detected in the samples from Hekkingen Fm.
- Fair to good petroleum potential (S2 1,5-5 kg HC/Ton of rock) and TOC content (1-2%) are detected in the intervals 2100 – 2238 m (Knurr – Kolje Fms) and in some scattered samples from Stø Fm (2709, 2820 and 2838 m)
- The biomarker profile of two samples coming from the Hekkingen Fm. Shows that the depositional environment of the source rock in well 7019/1-1 is slightly different from that generating the main oils in the Barents Sea.

2.7 FORMATION EVALUATION

Two HC bearing reservoirs were encountered in well 7019/1-1. The upper reservoir at 2211 m was of Barremian age and the lower reservoir at 2447 m was the Middle Jurassic Stø Fm.

The GeoFrame PetroViewPlus program was run for this interpretation, using a simple shaly-sand model. The model calculates porosity and shale volume from selected logs and then derives the volume of sand as the difference between the cumulative volumes (porosity and shale) and unity.
The lithology model was constructed using core data, by constructing Neutron-Density cross plots and by interpretation of the openhole logs (HRLA*, DSI*, PEX*, FMI* and CMR+* logs).
The dual water model was used for saturation determinations.

The parameters used for the saturation calculations were the following:
a = 1
m = 2
n = 2
Rw = 0.06 ohm-m at 90° (BHT)
Rmf = 0.064 at 6°

Lower Cretaceous Reservoir.

Top : 2211 m
Base : 2263 m

One core was cut from 2220 m to 2234.47 m. Maximum core porosity sas 19,7% and the average porosity was 15% (tab. 7.1.1).
Log interpretation of the Cretaceous reservoir is presented in fig. 2.7.1. No HC/ water contact was reached in this interval of the well and it was not possible to estimate the R_w from the logs. A R_w of 0.06 at 90^0C was selected based on regional information.

Main results:
Gross pay: 52 m
Net pay: 25.2 m
Average porosity: 14%
Average Sw: 15%

Net pay cut off:
Porosity: > 0.6
Vshale: < 0.35
Sw: <0.65

This reservoir was not tested, but a MDT sampling was performed at 2248 m.

2.7.1 Middle Jurassic Stø reservoir.

Top: 2447 m
Gas/Water contact: 2597 m

Two cores were cut in the Stø reservoir. Maximum porosity was 14.8% and the average porosity 8%.
Log interpretation of the Stø reservoir is presented in the figures 2.7.2

Main results.

Upper Stø: 2447 – 2263m
Gross pay: 44m
Net pay: 44m
Net/gross: 1
Average porosity: 0.08
Average Sw: 0.13

Lower Stø: 2520 – 2597m
Gross pay: 77m
Net pay: 67.80m
Net/gross: 0.88
Average porosity: 0.1
Average Sw: 0.23

Net pay cut off:
Porosity: > 0.04
Vshale: < 0.35
SW: < 0.65

CPI plot
Lower Cretaceous Sandstone

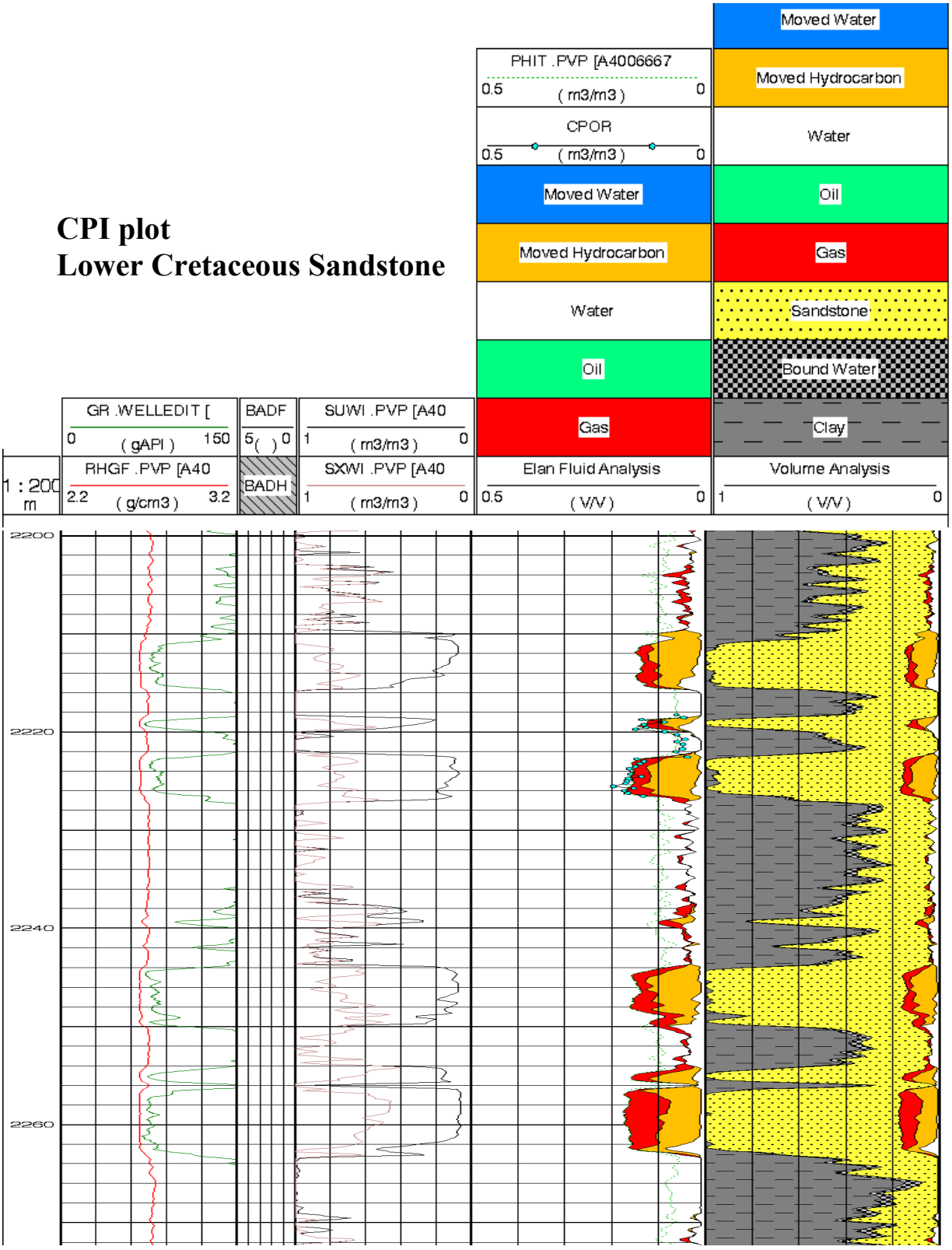


Fig.2.7.1

CPI plot Jurassic

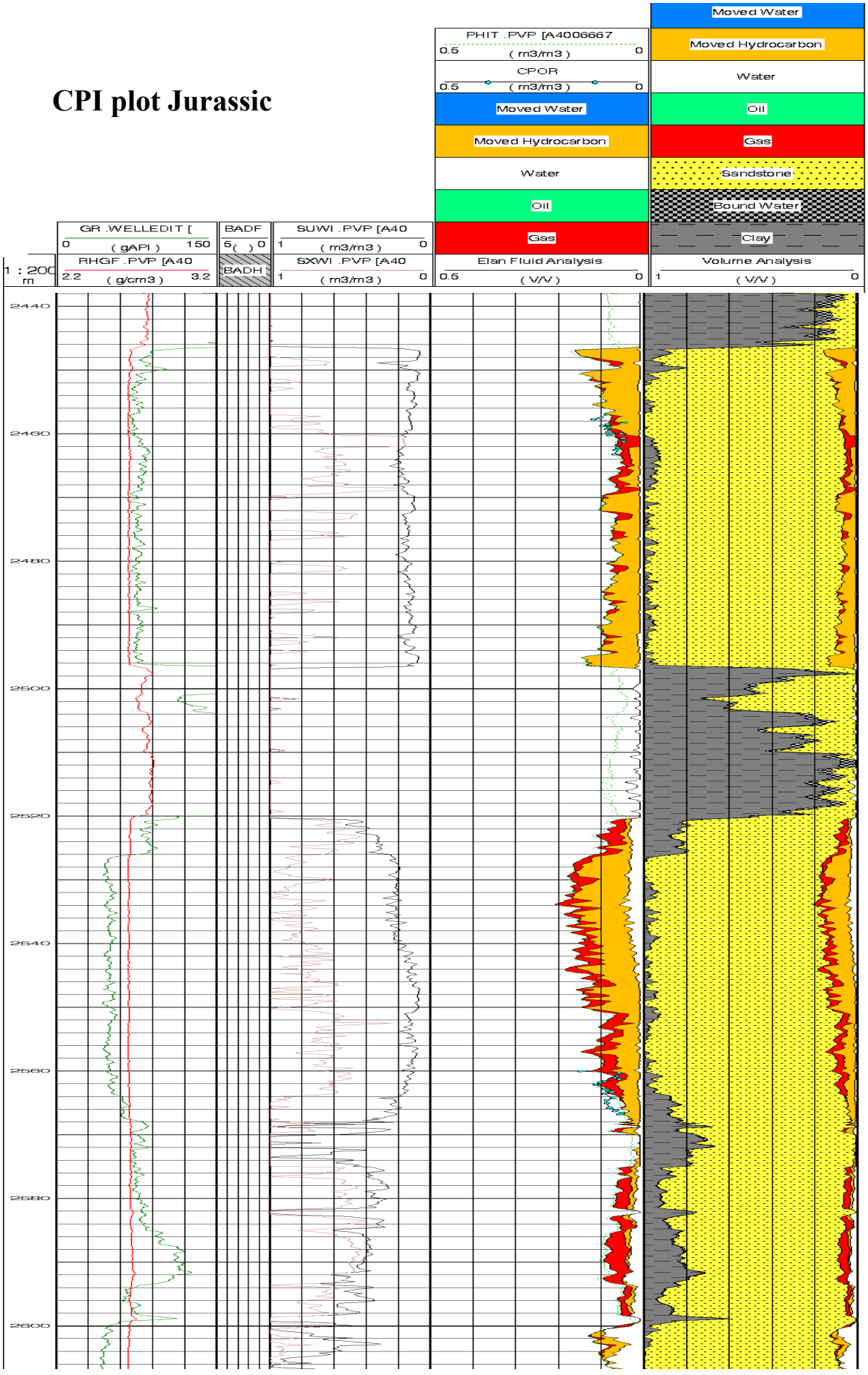


Fig.2.7.2

Conventional core analysis,

Core no.	Sample no.	Depth (m)	Kg, hor. (mD)	1/Pm, hor.	Kl, hor (mD)	Por., hor. (%)	Gr.dens. hor. (g/cc)
1	2	2220.25	2.50	0.495	1.92	6.2	2.74
1	3	2220.55	0.202	0.495	0.125	4.6	2.70
1	4	2220.75	272	0.948	250	13.6	2.65
1	5	2221.00	5.96	0.495	4.94	8.7	2.65
1	6	2221.25	219	0.936	200	13.2	2.65
1	7	2221.55	26.4	0.710	22.7	12.5	2.65
1	8	2221.75	276	0.951	254	15.0	2.65
1	9	2222.00	2.44	0.495	1.87	8.6	2.66
1	10	2222.30	1.17	0.495	0.806	6.0	2.65
1	12	2222.75	0.816	0.495	0.548	4.4	2.75
1	13	2223.00	NMP		NMP	6.1	2.72
1	14	2223.25	0.561	0.495	0.369	4.7	2.70
1	16	2223.75	0.130	0.495	0.078	4.9	2.78
1	17	2224.05	1.63	0.495	1.14	6.4	2.76
1	19	2224.55	0.343	0.495	0.219	3.9	2.69
1	20	2224.75	199	0.936	182	14.6	2.65
1	21	2225.00	127	0.907	114	13.2	2.66
1	22	2225.25	124	0.907	111	14.0	2.65
1	23	2225.55	194	0.936	177	14.9	2.65
1	24	2225.75	227	0.945	208	16.2	2.66
1	25	2226.30	181	0.936	165	15.9	2.65
1	26	2226.55	99.1	0.880	88.6	13.6	2.65
1	27	2226.75	262	0.951	241	16.4	2.65
1	28	2227.00	305	0.958	282	16.7	2.65
1	29	2227.25	340	0.961	315	17.0	2.65
1	30	2227.55	306	0.954	283	19.6	2.66
1	31	2227.75	96.8	0.880	86.4	15.3	2.66
1	32	2228.00	181	0.936	164	17.2	2.65
1	33	2228.25	185	0.936	169	16.6	2.65
1	34	2228.55	52.6	0.819	46.0	13.3	2.65
2	35	2457.00	47.8	0.797	41.8	8.8	2.65
2	37	2457.50	124	0.907	112	10.2	2.65
2	38	2457.75	298	0.954	275	11.7	2.64
2	40	2458.25	0.741	0.495	0.495	4.6	2.64
2	41	2458.55	28.5	0.728	24.5	8.4	2.65
2	42	2458.75	88.1	0.880	78.4	9.6	2.64
2	43	2459.00	35.1	0.808	30.1	8.2	2.64
2	44	2459.25	32.4	0.746	28.0	8.7	2.65
2	46	2459.75	NMP		NMP	8.3	2.64
2	47	2460.00	0.366	0.495	0.234	5.2	2.65
2	48	2460.25	15.8	0.634	13.4	8.1	2.65
2	50	2460.75	0.079	0.495	0.046	4.9	2.66
2	52	2461.25	0.054	0.495	0.031	4.7	2.66
2	56	2462.25	0.180	0.495	0.110	6.0	2.66
2	57	2462.55	0.244	0.495	0.153	6.5	2.66
2	59	2463.25	NMP		NMP	6.8	2.66
3	61	2561.00	161	0.922	146	14.8	2.65
3	62	2561.25	0.688	0.495	0.457	5.9	2.65
3	64	2561.75	NMP		NMP	6.2	2.65
3	65	2562.00	1.01	0.495	0.687	6.8	2.65
3	66	2562.25	0.191	0.495	0.118	5.9	2.65
3	67	2562.55	10.9	0.561	9.19	9.3	2.65
3	68	2562.75	26.3	0.710	22.6	10.3	2.65
3	69	2563.10	36.8	0.766	31.9	11.3	2.65
3	71	2563.80	16.8	0.662	14.2	9.2	2.65
3	72	2564.05	6.15	0.495	5.10	8.4	2.66
3	73	2564.25	NMP		NMP	7.5	2.65
3	74	2564.50	11.7	0.595	9.78	9.3	2.65
3	76	2565.25	2.17	0.495	1.64	7.3	2.66
3	77	2565.55	4.96	0.495	4.05	8.8	2.66
3	79	2566.00	5.26	0.521	4.27	8.6	2.65
3	82	2566.75	3.55	0.495	2.82	8.0	2.67

Tabel 2.7.1

2.7.2 FMT Pressure Interpretation

A total of 85 pressure points were attempted in this well. 27 were good formation pressure points and 58 points failed either due to tight formation or no seal. Very low permeable sandstones below 2600m caused the high number of failures.
All pressure points are listed in tables 7.2.2, 7.2.3 and 7.2.4.

The MDT pressure plot (fig.2.7.4) is showing the main MDT trends. The pressure points taken in the Lower Cretaceous reservoir are giving a gradient of 0.1786 Bar/10m indicating a light gas. There is no contact between the Cretaceous and Jurassic reservoirs.
The Stø reservoir contains a gas with a gradient of 0.3219 Bar/10m. The pressure points are also indicating a G.W.C at 2597 m.

2.7.3 Fluid Sampling

The Lower Cretaceous reservoir was sampled with MDT at 2246m. The chemical analysis of the sample is described in detail in the report " Well 7019/1-1: Gamma Field Geochemical study".
Samples of the Jurassic Stø formation were taken during the DST. The analysis of these samples is also described in the report mentioned above.

CHEMICAL ANALYSIS OF GAS

	Prof. (m)	C1 %	C2 %	C3 %	i-C4 %	n-C4 %	i-C5 %	n-C5 %	C6+ %	%CH4 Vol. tot.	N2	CO2	i/n-C4
MDT	2246	49,21	1,60	0,63	0,06	0,14	0,05	0,06	0,28	0,19	4,42	43,56	0,43
Test 1	2550	65,96	1,90	0,59	0,10	0,14	0,05	0,06	0,23	0,56	16,04	14,94	0,71

The CO_2 content is high in both the Stø and Lower Cretaceous. However detailed study of the C^{13} isotope indicates an organic source for the CO_2 in the Cretaceous reservoir and an inorganic source for the Jurassic reservoir. The Potassium formate mud used in this well can develop CO_2 when heated (see geochemical report for details). The high content of organic CO_2 in the Cretaceous MDT sample can partly be a result of mud contamination

The CO_2 found in the samples from the Jurassic reservoir has probably a vulcanic source.

MDT pressure

Well: 7019/1-1 **Date:** 15-nov-00 PS2 to Tool Zero =

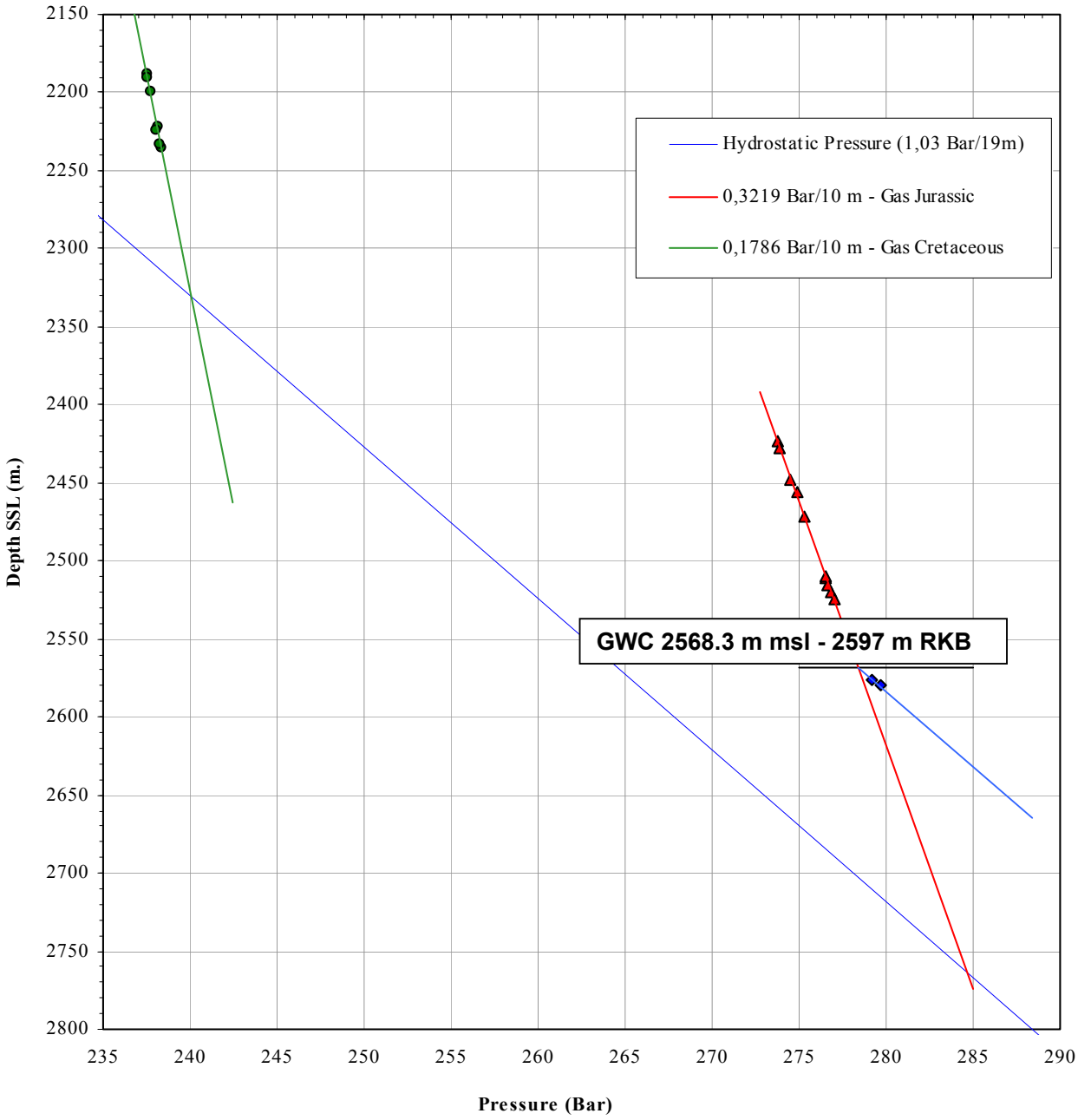
Test	Depth	TVD	Devi.	D.O.	MRPS #	Stop depth	Reset depth	DLIS	PTIM	Hydro.	Other Hydro.	Rate	Vol.	Form.*	Mob.	Remarks
1	2535	2533,33		0	2	2537,4		200	200	313,022		60	20	276,517	978,5	DD 200 bar
2	2550	2548,19		0	2	2552,4		201	201	314,844		60	20	277,03	26	DD 200 bar
3	2565	2563,04		0	2	2567,4		202	202	316,683		60	x	x	x	DD 200 bar
4	2564,4	2562,54		0	2	2566,8		203	203	316,572		60	x	x	x	Tight
5	2580	2577,91		0	2	2582,4		204	204	318,481		60	x	x	x	Tight
6	2583	2580,88		0	2	2585,4		207	207	318,86		60	x	x	x	Tight
7	2589	2586,82		0	1	2589		209	209	319,5327		60	x	x	x	No Seal
8	2594	2591,77		0	1	2594		212	212	320,171		60	x	x	x	Tight
9	2598	2595,74		0	1	2598		213	213	320,586		60	x	x	x	Tight
10	2602	2599,7		0	2	2604,4		214	214	321,118		60	20	279,219	30,5	Good
11	2606	2603,66		0	2	2608,4		215	215	321,607		60	20	279,646	15,9	Good
12	2615	2612,58		0	2	2617,4		216	216	322,68		60	x	x	x	Tight
13	2619	2616,55		0	2	2621,4		219	219	323,11		60	x	x	x	Tight
14	2625	2622,48		0	1	2625		221	221	323,766		60	x	x	x	Tight
15	2635	2632,39		0	2	2637,4		222	222	325,021		60	x	x	x	Tight
16	2640,5	2637,34		0	2	2642,9		223	223	325,662		60	x	x	x	Super…
17	2649,3	2646,55		0	2	2651,7		224	224	326,72		60	x	x	x	Super…
18	2660,5	2657,65		0	2	2662,9		225	225	328,073		60	3	301,775	0,4	Good
19	2664,8	2661,92		0	2	2667,2		226	226	328,588		60	x	x	x	Tight
20	2670,8	2668,08		0	2	2673,2		227	227	329,297		60	3,5	316,282	0,3	Good
21	2672,5	2676,02		0	2	2674,9		228	228	329,483		60	x	x	x	Super…
22	2679	2676,02		0	2	2681,4		229	229	330,232		60	x	x	x	Tight
23	2681,7	2679,03		0	2	2684,1		230	230	330,53		30	x	x	x	Tight
24	2693,5	2689,92		0	2	2695,9		231	231	331,978		20	x	x	x	Tight
25	2703,2	2710,77		0	2	2705,6		233	233	333,121		20	x	x	x	Tight
26	2711,5	2712,75		0	2	2713,9		235	235	334,873		20	x	x	x	Tight
27	2716	2719,2		0	2	2718,4		236	236	334,719		20	x	x	x	No Seal
28	2722,5	2718,71		0	2	2724,9		237	237	335,578		20	7,7	319.1??	0	Good/Dry
29	2725	2721,69		0	2	2727,4		238	238	335,789		20	13,3	311,939	0,1	Good
30	2729,7	2726,65		0	2	2732,1		239	239	336,418		20	x	x	x	Tight
31	2731,7	2728,64		0	2	2734,1		240	240	336,608		20	x	x	x	Tight
32	2733,3	2729,63		0	2	2735,7		242	242	336,843		20	x	x	x	No Seal
33	2733,8	2730,4		0	2	2736,2		243	243	336,851		20	x	x	x	No Seal
34	2735,3	2731,9		0	2	2737,7		244	244	337,128		20	x	x	x	No Seal
35	2735,3	2731,9		0	1	2735,3		245	245	337,174		20	x	x	x	Tight (PS1)
36	2734,8	2731,4		0	1	2734,8		246	246	337,113		20	x	x	x	Tight (PS1)
37	2738,5	2735,03		0	1	2738,5		247	247	337,48		20	x	x	x	Tight (PS1)
38	2741	2737,55		0	1	2741		248	248	337,77		20	x	x	x	Tight (PS1)
39	2742,5	2739		0	1	2742,5		250	250	338,071		20	x	x	x	Tight (PS1)
40	2743,5	2740		0	1	2743,5		249	249	338,078		20	x	x	x	Tight (PS1)
41	2758	2754,47		0	1	2758		251	251	339,845		20	x	x	x	Tight (PS1)
42	2827	2823		0	1	2827		252	252	348,218		20	3,4	x	x	Tight (PS1)
43	2856,5	2852,3		0	1	2856,5		253	253	351,812		20	3	x	x	Tight (PS1)
44	2859	2854,7		0	1	2859		254	254	352,11		20	x	x	x	Tight (PS1)
45	2905	2900,4		0	1	2905		255	255	357,709		20	4,9	x	x	Tight (PS1)
46	2926,5	2921,8		0	1	2926,5		256	256	360,307		20	x	x	x	Tight (PS1)
47	2926,5	2921,8		0	2	2928,9		258	258	360,38		20	x	x	x	PS2 No Seal
48	2930,5	2925,7		0	1	2930,5		259	259	360,842		20	3,8	x	x	Tight (PS1)
49	2933,6	2928,8		0	1	2933,6		260	260	361,191		20	x	x	x	Tight (PS1)
50	2946,5	2941,7		0	1	2946,5		261	261	362,755		20	x	x	x	Tight (PS1)
51	2951	2946,2		0	1	2951		263	263	363,425		20	x	x	x	Tight (PS1)
52	2983,5	2978,4		0	1	2983,5		265	265	367,241		20	x	x	x	Tight(PS1)
53	2601	2598,7		0	1	2601		268	268	320,843		20	20	278,991	73,7	Good
54	2529	2527,3		0	1	2529		269	269	312,131		20	20	276,063	3	Good
55	2257	2256,7		0	1	2257		270	270	279,133		20	20	238,238	11,6	Good
56	2248	2247,7		0	1	2248		271	271	278,063		20	20	238,039	50,9	Good
57	2215	2214,7		0	1	2215		272	272	274,074		20	20	237,528	48,62	Good
58																

MDT pressure

Well: 7019/1-1 **Date:** 17-nov-00 PS2 to Tool Zero = **2,4**

Test	Depth	TVD	Devi.	D.O.	MRPS #	Stop depth	Reset depth	DLIS	PTIM	Hydro.	Other Hydro.	Rate	Vol.	Form.*	Mob.	Remarks	Eng.
1	2660,7	2657,85		0	2	2663,1		372	372	330,348		60	2,1	298,724	0,5	Super??	TH
2	2660,3	2657,15		0	2	2662,7		373	373	330,263		60	10	291,19	6,5	Good	TH
3	2659,5	2656,65		0	2	2661,9		374	374	330,198		60	x		x	No Seal	TH
4	2605,2	2602,9		0	2	2607,6		376	376	323,64		60	20	279,527	41,3	Good	TH
5	2602,6	2601,3		0	2	2605		377	377	323,28		60	20	279,284	31,9	Good	TH
6	2601,2	2600,4		0	2	2603,6		378	378	323,118		60	20	279,128	25,3	Good	TH
7	2605,3	2602,9		0	2	2607,7		379	x	323,608		60	20	279,538	x	Tight	TH
8	2660,5	2657,65		0	2	2662,9		385	385	330,284		40	2,4	291,497	0,2	Tight	TH
9	2951			0	2	2953,4		387	x	365,478		40	20		x	Lost Seal	TH
10	2950			0	2	2952,4		388	x	365,369		40	20		x	Lost Seal	TH
11	2950			0	1	2950		390	x	365,297		40	x		x	Dry	TH
12																	TH
13																	TH
					* Enter 1 or 2									* Leave Blank if dry/tight			

Well 7019/1-1
MDT pressure plot



2.7.4 Well testing.

TEST 1 – LOWER STØ FORMATION – (2526 – 2563 m)

TEST DESCRIPTION

After descending the TCP string, a Gamma Ray log was recorded in order to exactly correlate the depth of the guns with the depth of the radioactive markers placed both in the 7" liner and into the TCP string, and the formation.

The packer was set at 2505 m according to the TCP string layout (see Annex A). After displacing the brine into the string (1250 g/l) with N_2 up to 1000 mRKB, the firing head was activated increasing the THP to 350 bars. Then the THP was immediately bled off to 18 bars in order to apply approximately 70 bars of underbalance pressure to the formation at the moment of the firing (delayed 30 minutes after the firing head activation).

The well was flowed with adjustable choke at first, increasing from 1/4" to 5/8" (with intermediate steps 3/8", 1/2"; then after recovering the theoretical fluid left into the well, with a 3/4" fixed choke (see Annex B). Since with the latter choke it was impossible to establish critical flow through the choke, the well was then choked back to a 5/8" fixed choke.

Continuous sampling of the produced gas revealed a very high percentage of CO_2 (up to 78%), thus explaining the extremely erratic behaviour of the flare.
Due to the low hydrocarbon content of the produced gas, the impossibility to burn it and the almost completed clean up of the well (no liquid production after recovering the remaining brine into the well), it was decided to stop the test after the well clean up phase and to close the LPRN Valve to record the final bottom hole build up.
After 14 hours of bottom hole build up, the well was killed, the TCP string pulled out and the memory gauges recovered.

INPUT PARAMETERS FOR INTERPRETATION

For test interpretation the following input data were used:

Ø [%]	S_g [%]	S_w [%]	S.G.	CO_2 [%]	C_1 [%]	C_2 [%]
14	60	40	1.133	60	39	1

INTERPRETATION

During the test, eight memory gauges were placed at bottom hole inside two separate gauge carriers into the test string. Of all these eight gauges, the data from gauge MQGX-331 placed at 2471.06 m were used for the interpretation.

Based on the analysis of the PPD Curve (Primary Pressure Derivative), the shape of the derivative curve in the log log plot was considered representative of reservoir response. In fact, according to literature (SPE 24729, Critical Evaluation and Processing of Data Prior to Pressure-Transient Analysis, Louis Mattar, SPE, Fekete Assocs. Inc. and The Journal of Canadian Petroleum Technology, April 1992, Vol. 31,

No. 4, The Primary Pressure Derivative (PPD) – a new diagnostic tool in well test interpretation, L. Mattar and K. Zaoral, Fekete Assocs. Inc.; both articles can be downloaded from www.fekete.com), when the pressure derivative changes from monotonically decreasing to monotonically increasing, the corresponding form of the *m(p)* derivative is representative of a well phenomenon; viceversa, it is due to reservoir phenomena.

A Partial Penetration model indicated by the presence of two separate stabilizations separated by a line with slope –1/2 was then adopted. This model can be explained as the contribution of the Stø Formation to the flow from the Nordmela Formation, based on their hydraulic communication shown by the MDT pressure measurements (see Annex D). Moreover, if a Homogeneous model were adopted, the resulting total skin value should be extremely high (≈52). But since after recovering all the theoretical liquid into the well, only dry gas was produced, and the bottom hole pressure tended to stabilize, the well clean up phase could be considered almost completed and the resulting high total skin could be explained as the effect of the contribution of a consistent geometrical effect.

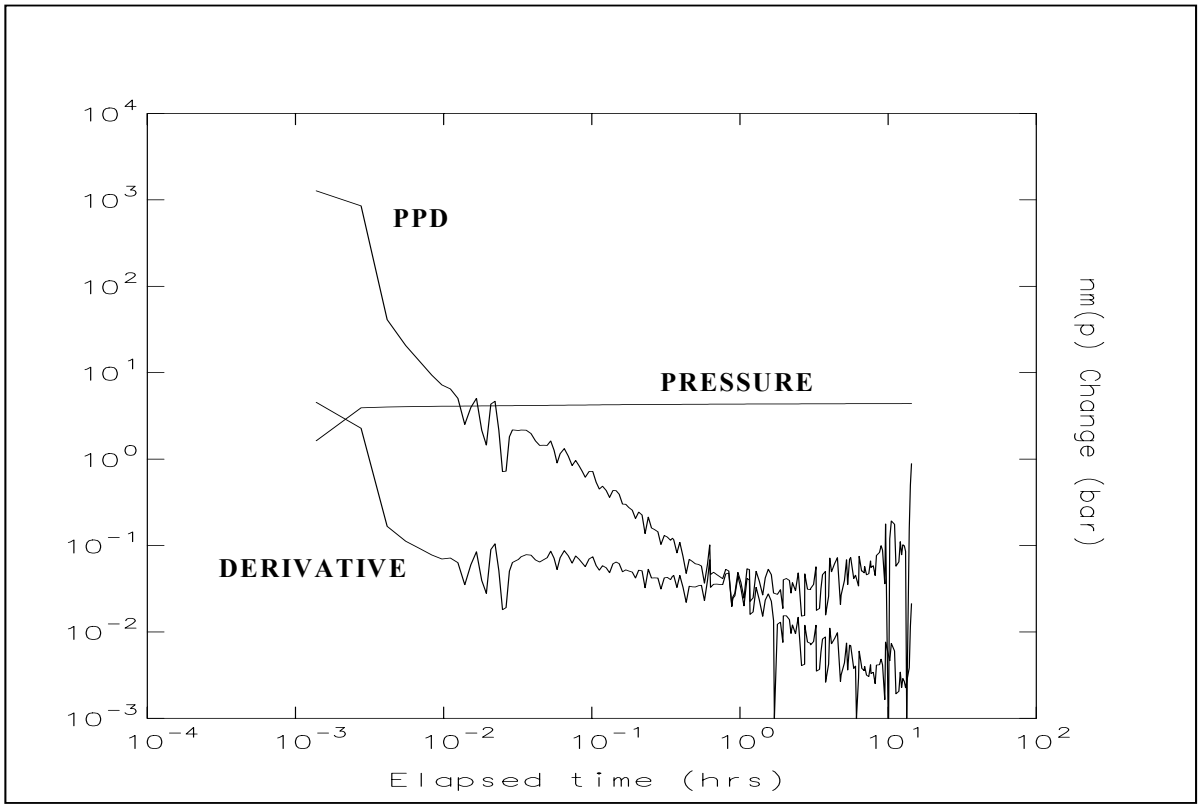
The calculated high Well Skin value S_w could be explained by the hypothesis that not all the perforations were opened, while in the interpretation, the entire perforated interval was supposed to be opened to the flow. Therefore, the partial penetration effect could be underestimated and a part of this skin S_w could be attributed, instead, to the completion skin S_c. In fact, even if the well was perforated in underbalance conditions (91.5 bar of underbalance), the short clean up phase and the low bottom hole drawdown during the flowing (1.5% of the reservoir static pressure) could not be sufficient to allow all the perforations to be thoroughly cleaned.

The shape of the last part of the derivative was related to the presence of a sealing boundary effect. Its distance from the well (270 m) is consistent with the indications from the map and seismic section in Annex E.
The other parameters obtained from the interpretation (K_z, H_w/H, H_w, Z_w) must be considered only as matching parameters, and not as real values of the reservoir geometry and vertical permeability. Nevertheless, these values are consistent with the length of both the perforated interval (Nordmela Formation) and the Stø Formation.

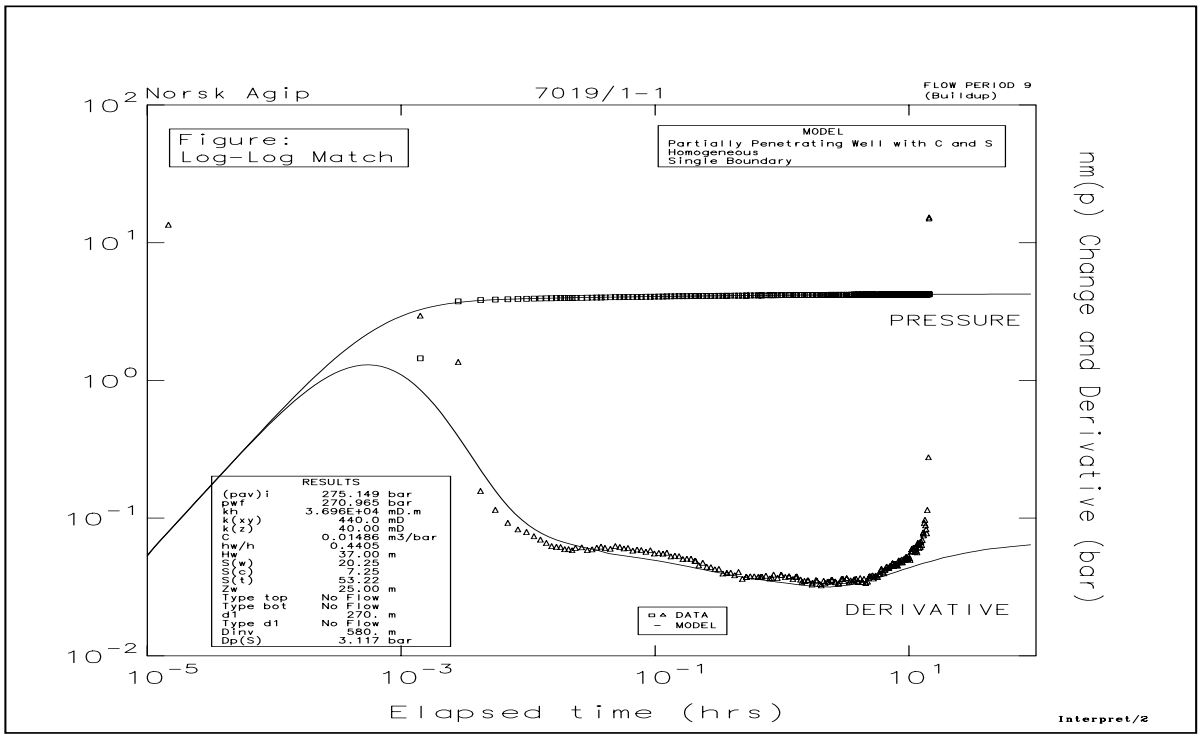
The well showed a high gas permeability (440 mD) and the extrapolated reservoir static pressure (275.15 bar) was consistent with the MDT measurements.

The main results from the interpretation are reported in the following table:

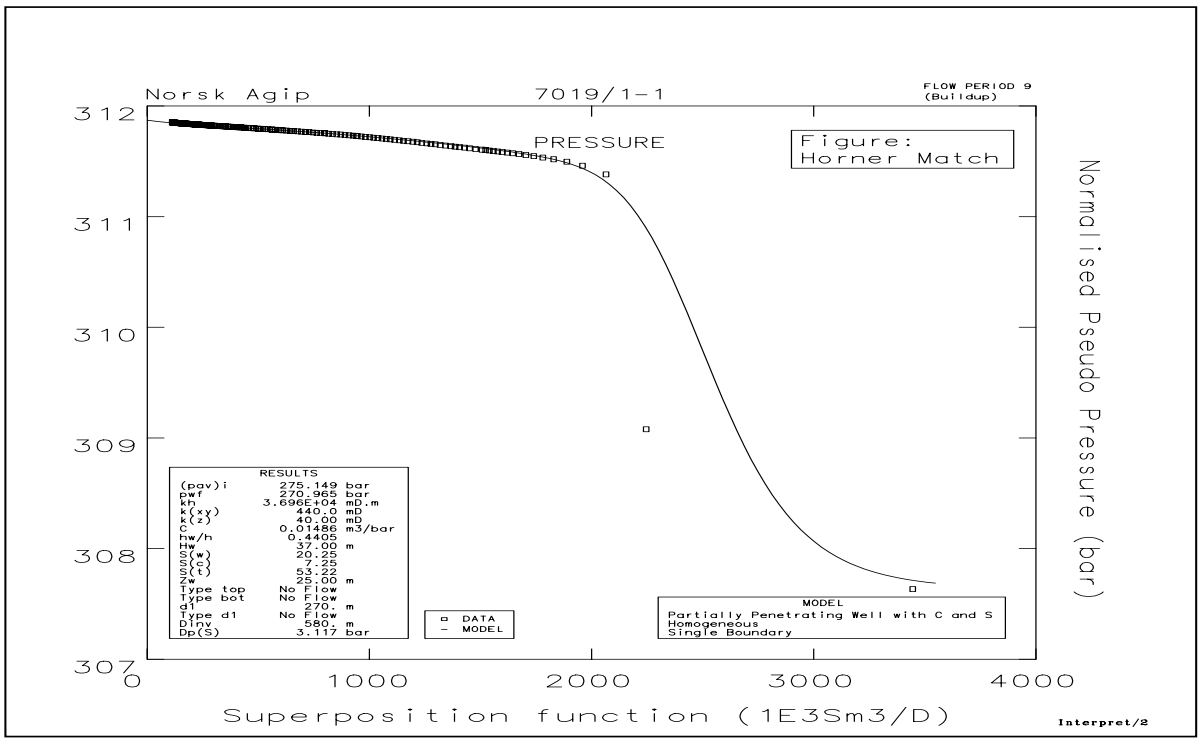
P_s [bar]	**Kh** [mD*m]	**K_{xy}** [mD]	**K_z** [mD]	**C** [m^3/bar]	**H_w/H**	**H_w** [m]	**S_w**	**S_c**	**S_t**	**Z_w** [m]	**d_1** [m]	**D_{inv}** [m]
275.15	36960	440	40	0.01486	0.44	37	20.25	7.25	53.22	25	270	580



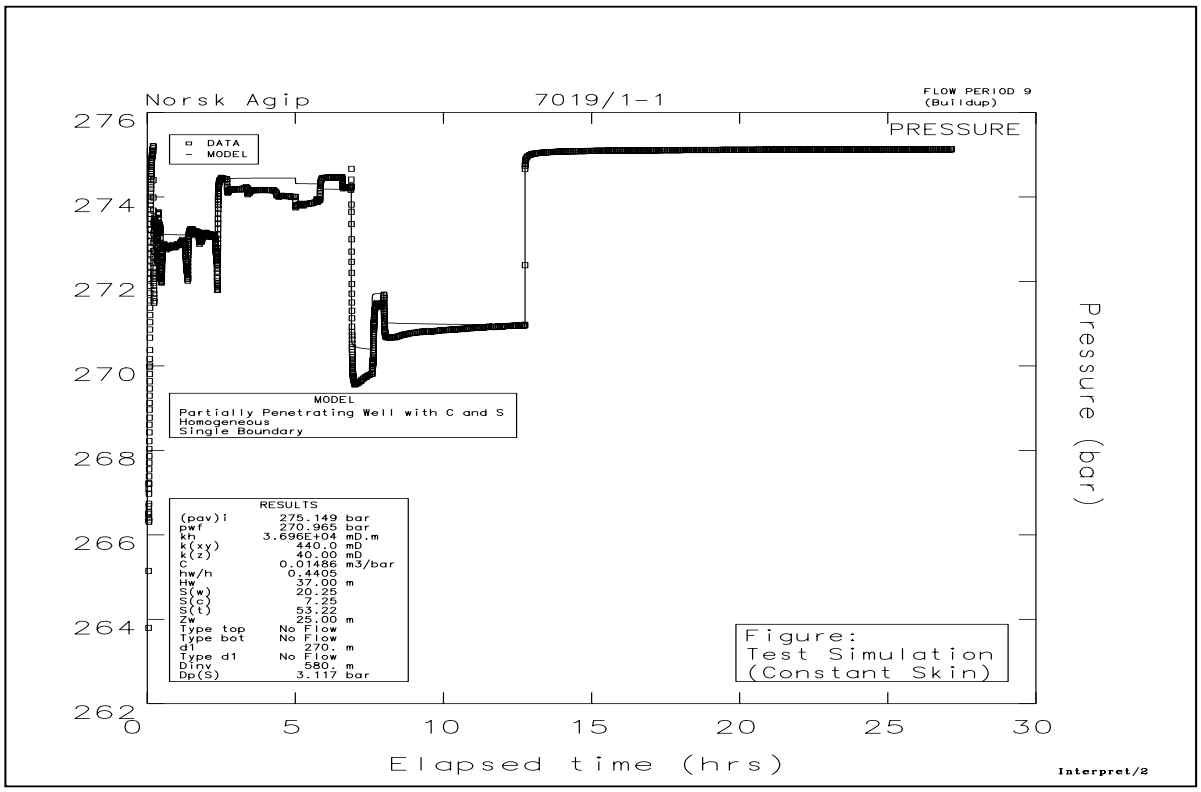
Primary Pressure Derivative



Log Log Plot



Horner Plot



Test Simulation

3. DRILLING

3.1 Introduction

Norsk Agip A/S drilled the exploration well 7019/1-1 in the PL 201, Block 7019/1 in the Barents Sea with the semi-submersible drilling rig “Transocean Arctic”. The well was flow tested. The total time on the well was 58.7 days, consisting of 49.8 days used for drilling related operations and 8.9 days for operations related to the well testing. The cost for the drilling related operations was 172 MM NOK (61671 NOK/m), and the cost for the testing phase was 41.8 MM NOK.

Of the total well time, the drilling operation time amounted to 49%, evaluation time (coring and logging) to 17%, and the flow testing operations to 11%. The unproductive time was 8.4 % of the total time.

Well 7019/1-1 started on 5 October 2000 at 2320 hrs. Transocean Arctic was assigned to the well after having finished the preceding well 7122/7-1, also drilled by Agip in the Barents Sea. The rig was towed to the 7019/1-1 drilling location where the anchors were set and the rig ballasted down to drilling draft; these operations were completed in 0.75 days. At drilling draft the distance from the rotary table to the sea surface (RT – MSL) was 24 m.

After picking-up drill pipe and 36” bottom hole assembly, the well was spudded on 6 October 2000 at 1830 hrs. The distance from the rotary table to the seabed (RT – seabed) was 214 m. The seabed soil/formation was found to be very hard with embedded boulders and the drilling progress was slow. It was therefore decided to re-spud the well. The rig was moved 10 m aft and the well was re-spudded with a 17 ½” bottom hole assembly. The 17 ½” hole was drilled to 343 m and then opened up to 36”. The 30” conductor pipe was set at 336 m and cemented on 9 October 2000.

The well 7019/1-1 was drilled to a total depth of 3003 m MD RT (2998 m TVD RT). After reaching TD the well was logged, and then flow tested. Permanent abandoned of the well was finished on 3 December and the rig left location on 3 December 2000 at 1700 hrs.

The purpose of drilling well 7019/1-1 was to investigate the hydrocarbon potential of the Middle Jurassic through Upper Triassic sandstone reservoir series of the Realgrunnen Group in the Gamma Prospect.

3.1.1 Well Data summary

Well 7019/1-1

HOLE SECTION	1	2	3	4	5
Hole size	36" hole to 343 m (seabed at 214m)	12 1/4" pilot hole to 665 m	26" hole to 665 m	12 ¼" hole to 2015 m	8 1/2" hole to 3003 m (TD of well)
Drilling fluids	Type: Seawater / High Viscous Sweeps with prehydrated bentonite mud Viscous Sweeps: Density: 1.05 - 1.20 sg	Type: Seawater / High Viscous Sweeps with prehydrated bentonite mud Viscous Sweeps: Density: 1.05 - 1.20 sg	Type: Seawater / High Viscous Sweeps with prehydrated bentonite mud Viscous Sweeps: Density: 1.05 - 1.20 sg	Type: Formate brine / XC Polymer / Pac Density: 1.30 – 1.40 sg	Type: Formate brine / XC Polymer / Pac Density: 1.40 – 1.25 sg
Coring					Core no. 1: 2220 m – 2235 m Core no. 2: 2457 m – 2464 m Core no. 3: 2561 m – 2568 m
Logging	Drilling: None Logging in open hole: None	Drilling: MWD-GR	Drilling: None Logging in open hole: None	Drilling: MWD-GR-Resistivity-Sonic Logging in open hole: None	Drilling: MWD-GR-Resistivity Logging in open hole: Two intermediate log runs were made at 2550 m: Run A: TDL/CNL/HRLA/GR Run B: MDT/GR At TD (3003 m) the following log runs were made: Run no. 1: HRLA/PEX Run no. 2: CMR Run no. 3: MDT (tool became stuck – fishing operation to recover tool) Run no. 4: MDT Run no. 5: MDT Run no. 6: DSI-FMI Run no. 7: MSCT Run no. 8: VSP
Casing	30" casing, shoe at 336m. Vetco MS-700 Wellhead System 18 ¾" x 15000 psi. 30", 310 lbs/ft, grade X-52, ST-2B Squnch conn.		20" casing, shoe at 658 m. 20", 133 lbs/ft, grade X-56, RL-4S threads.	9 5/8", shoe at 2004 m. 9 5/8", 53.5 lbs/ft, grade P-110, Antares MS threads.	7" liner, shoe at 2004 m. 7", 29 lbs/ft, grade N-80, Antares MS threads.
Cement	Cement type: Norcem Class G Mixwater: Seawater (lead & tail) Density: 1.56 sg lead, 1.95 sg tail Top cement: Lead: Seabed Tail: 323 m		Cement type: Norcem Class G Mixwater: Seawater (lead & tail) Density: 1.56 sg lead, 1.95 sg tail Top cement: Lead: Seabed Tail: 561 m	Cement type: Norcem Class G Mixwater: Fresh water (only one slurry used for cementing the 9 5/8" casing string) Density: 1.92 sg Top of cement: 1495 m	Cement type: Norcem Class G Mixwater: Fresh water (only one slurry used for cementing the 7" liner) Density: 1.90 sg (tail slurry) Top of cement at liner hanger depth: 1801 m

3.1.2 Operational Achievements

The well was drilled to TD in an efficient manner.
The planned “dry hole” time (time on well excluding well testing operations) was planned to 57 days. Actual well time for drilling related operations was only 49.8 days, which was 7.2 days less than planned.
(The well testing phase took 8.9 days).

3.1.3 Operational problems

When spudding the well the seabed soil/formation was found to be very hard with embedded boulders, and the drilling progress of the 36” hole was slow. It was therefore decided to re-spud the well. The rig was moved 10 m aft and the well was re-spudded with a 17 ½” bottom hole assembly. The 17 ½” hole was drilled to 343 m and then opened up to 36”. The re-spudding of the well resulted in 9.5 hours unproductive time.

Very hard formations were encountered in the 8 ½” section from 2200 m down to TD. The average ROP from 2200 m to 2600 m was approx. 2 m/hr, from 2600 m to 2850 m approx. 3.8 m/hr, and from 2850 to TD approx. 2.5 m/hr.

In the 8 ½” hole section at 2095 m the MWD signal was lost. Attempts to restart the MWD were negative and the string had to be pulled in order to install a new MWD. The MWD failure resulted in 25.5 hours of unproductive time.

The circulation was partially lost in the 8 ½” hole when drilling at 2530 m with a mud weight of 1.40 sg (loss rate 18 m^3 hour). By reducing the mud weight to 1.35 sg full circulation was re-established. This caused 12 hours of unproductive time.

When drilling in the 8 ½” hole at 2550 m the drill string twisted off. The twisted off drill string was retrieved without particular problems, but this twist-off and fishing operation resulted in 15.5 hours of unproductive time.

3.1.4 BOP Sketch

18 5/8" 15000 psi BOP

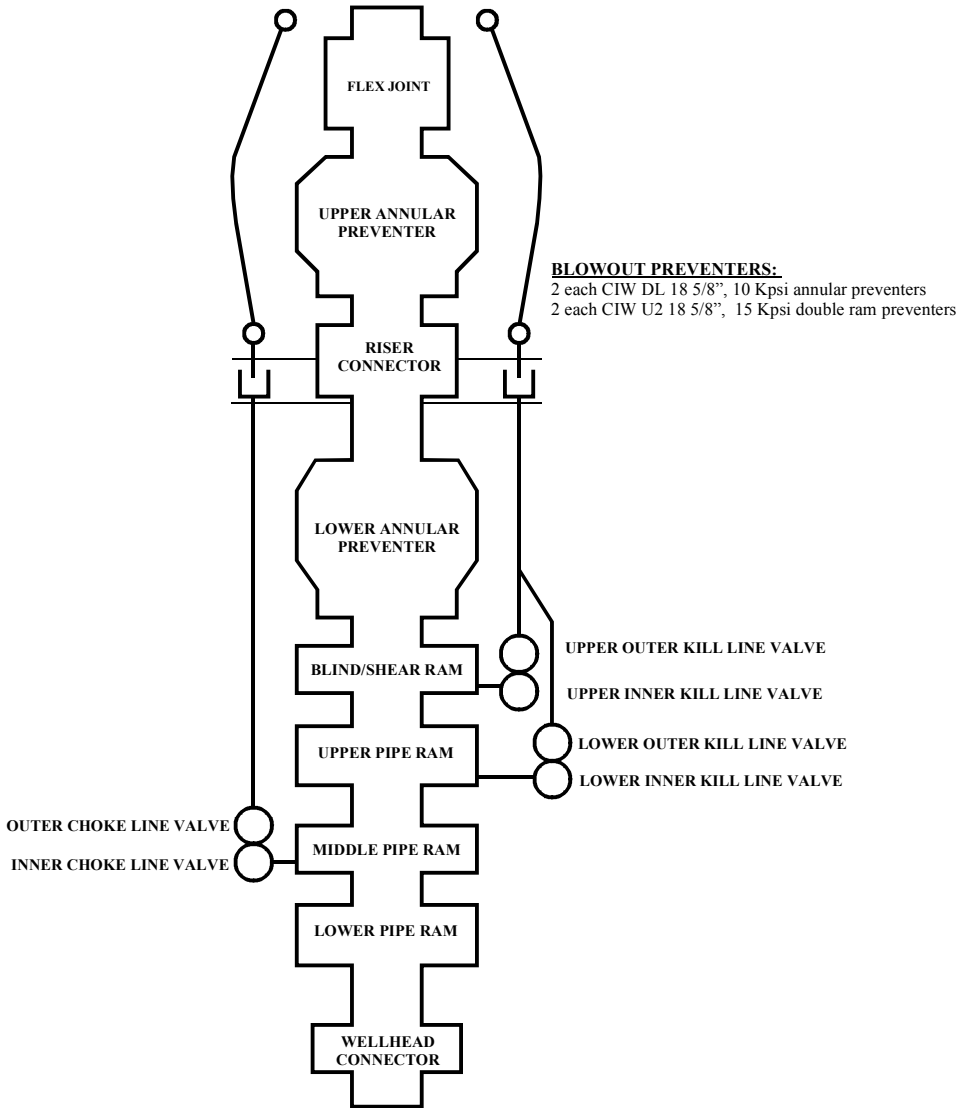
BOP Testing

EQUIPMENT	BEFORE INSTALLATION	FIRST TEST ON WELLHEAD	BEFORE DRILLING OUT OF CASING	BI-WEEKLY IN OPEN HOLE
BAGS,LMRP CONNECTION	500psi / 7000 psi	None	500 psi/ 70% of csg. burst pressure (max. 5000 psi)	500 psi/ 70% of csg. burst pressure (max. 5000 psi)
SHEAR RAMS	500 psi/ 7000 psi	None	500 psi/ casing test pressure	
PIPE RAMS, FAIL SAFES	500 psi/ 7000 psi	None	500 psi/ 70% of csg. burst pressure (max. 5000 psi)	500 psi/ 70% of csg. burst pressure (max. 5000 psi)
WELLHEAD CONNECTION	500 psi/ 7000 psi	500 psi/ 5000 psi	500 psi/ 70% of csg. burst pressure (max. 5000 psi)	500 psi/ 70% of csg. burst pressure (max. 5000 psi)
K/C-LINES, HOSES	None	500 psi/ 5000 psi	500 psi/ 70% of csg. burst pressure (max. 5000 psi)	**WEEKLY:** 500 psi/ 70% of csg. burst pressure (max. 5000 psi)

TRANSOCEAN ARCTIC

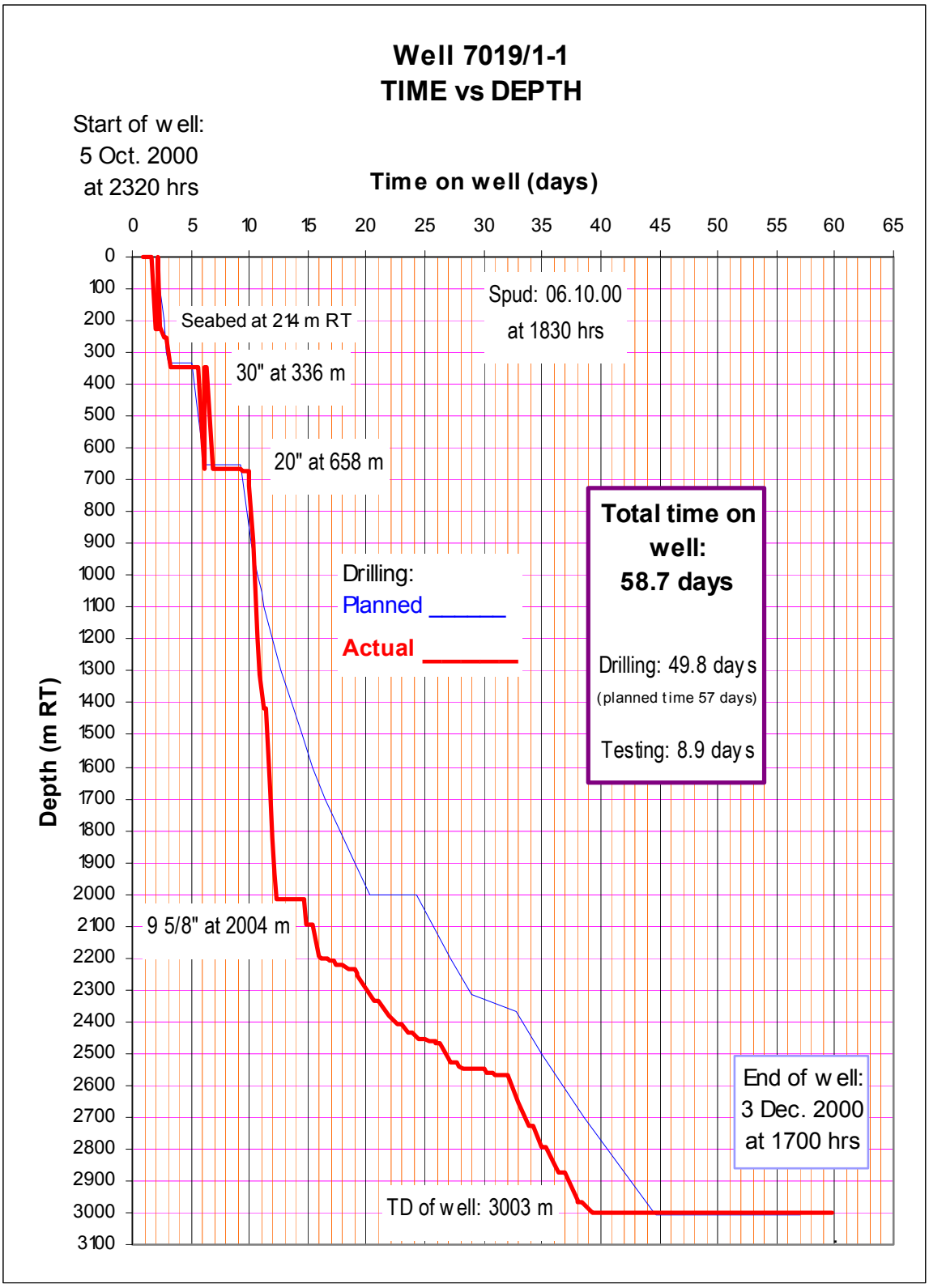
BOP STACK ARRANGEMENT

20.06.00

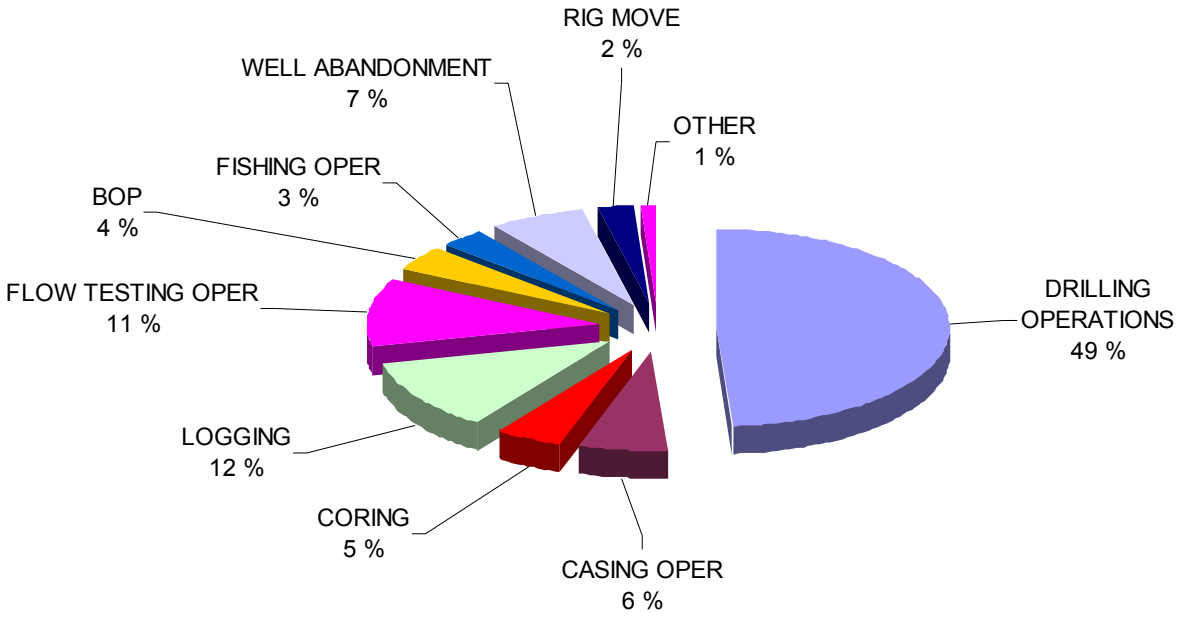


3.2 Time and Cost Analysis

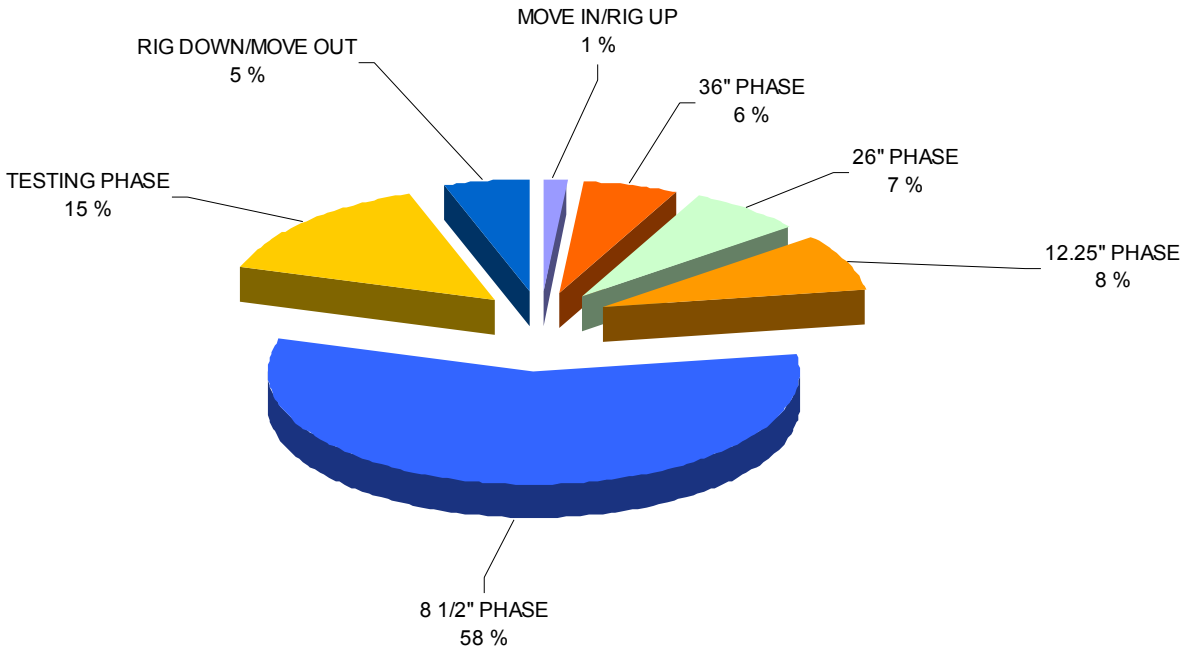
3.2.1 Days vs. Depth



3.2.2 Total Well Time Breakdown by Function



3.2.3 Time by phase

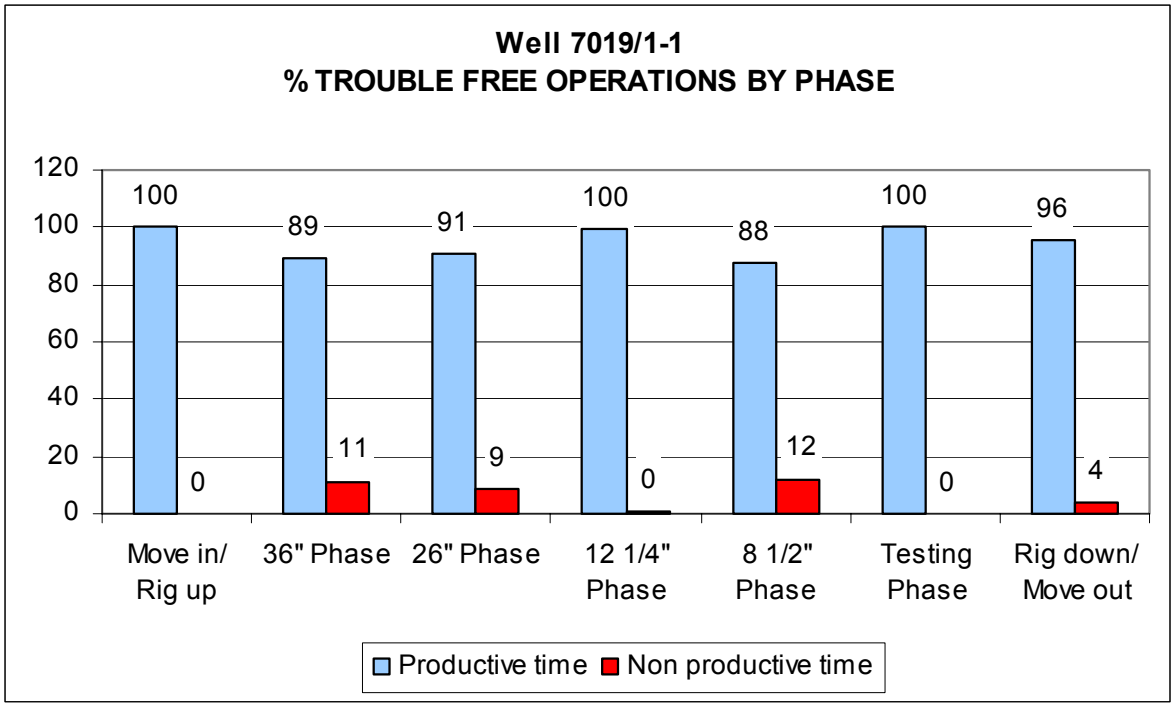


Time Breakdown by Phase

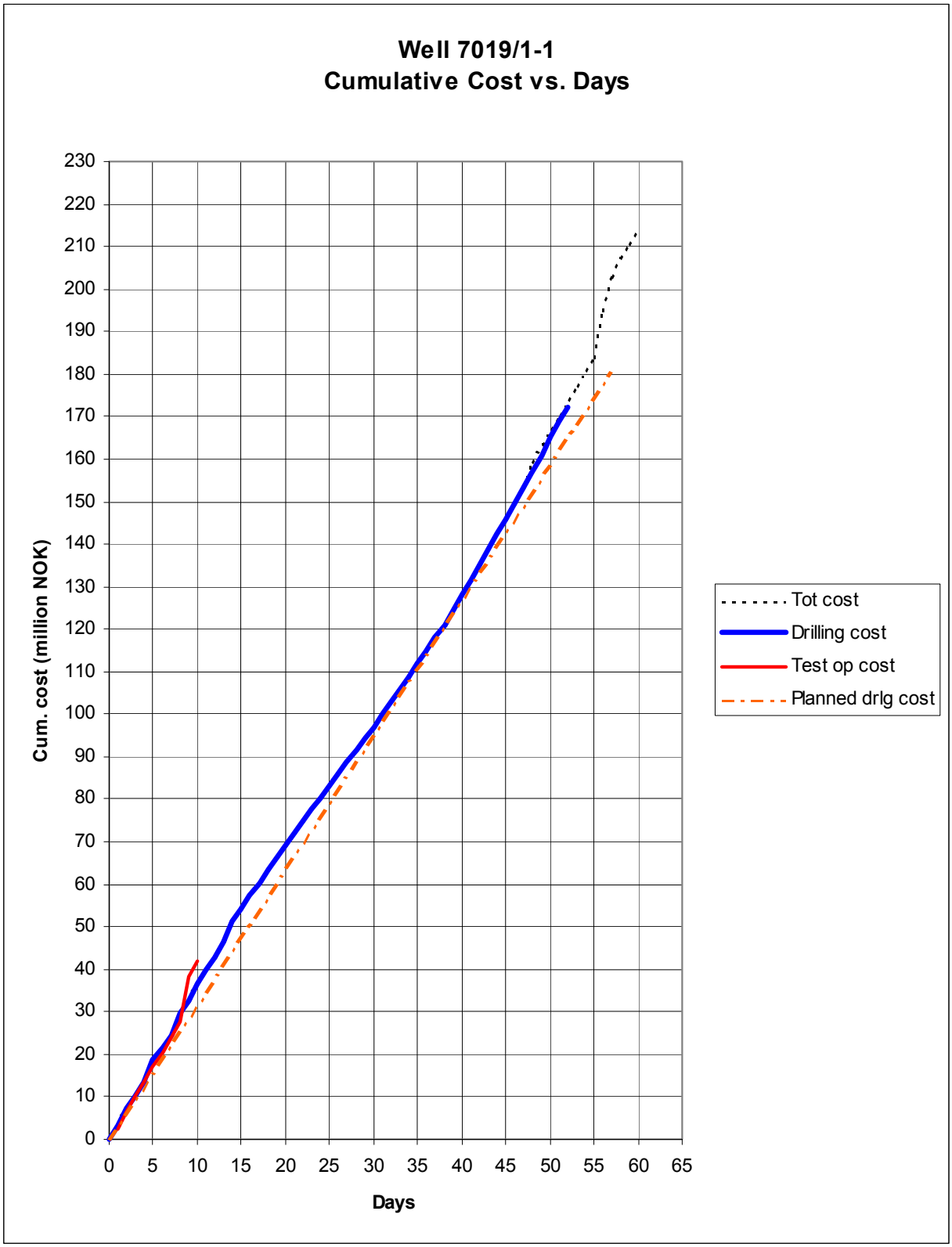
WELL 7019/1-1 TIME BREAKDOWN

	Start	End	Days	Tot. hrs	Tot. m	m/Day
	Year 2000	Year 2000				
Move In/Rig Up	Oct. 5 2000	Oct. 6 1730	0.75	18	n / a	n / a
36" Phase	Oct. 6 1730	Oct.10 0700	3.56	85.5	129	36.2
26" Phase	Oct.10 0700	Oct. 14 0530	3.94	94.5	322	81.7
				12 1/4" pilot hole: 19	322	406.7
12.25" Phase	Oct. 14 0530	Oct. 19 0330	4.92	118	1350	274.4
8.5" Phase	Oct. 19 0330	Nov. 21 1800	33.60	806.5	988	29.4
Testing Phase	Nov. 21 1800	Nov. 30 1530	8.90	213.5		n / a
Rig Down/Move Out	Nov. 30 1530	Dec. 3 1700	3.06	73.50	n / a	n / a
Total time Drilling Operations Phases			*49.83*	*1196*	*2789*	*56.0*
Total time on well	2000 hrs Oct. 5 Year 2000	1700 hrs Dec. 3 Year 2000	58.73	1409.5	2789	47.5

3.2.4 Non-Productive vs. Productive Time

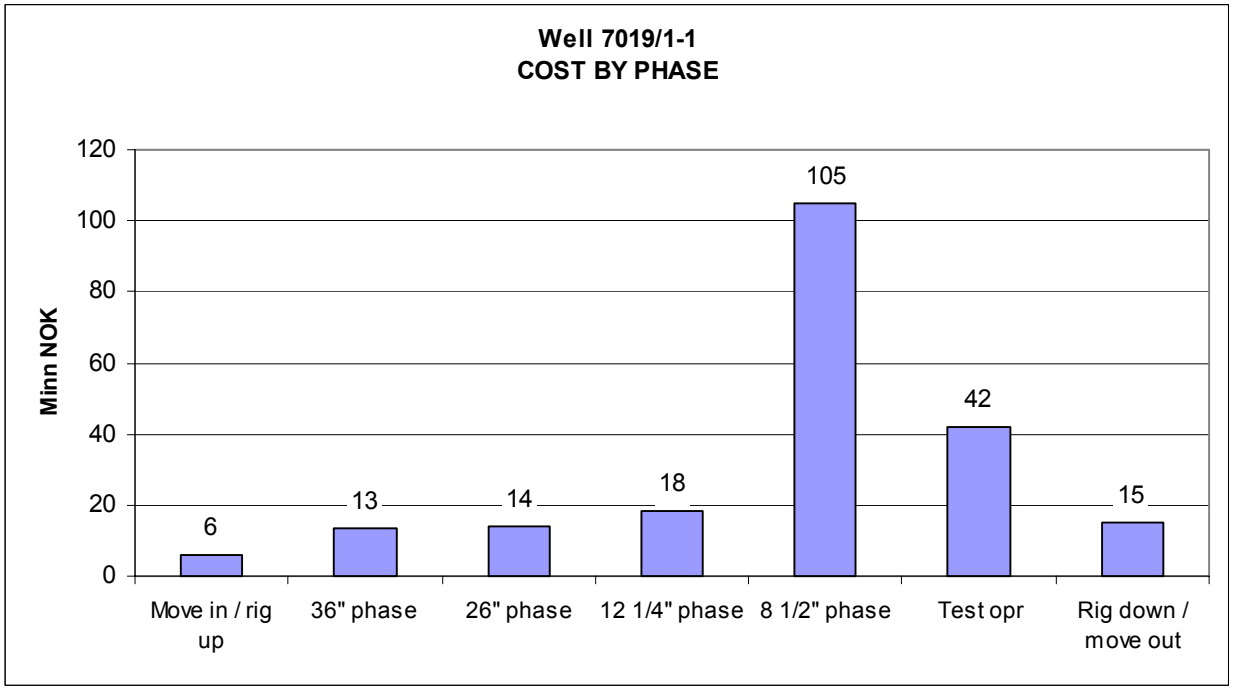


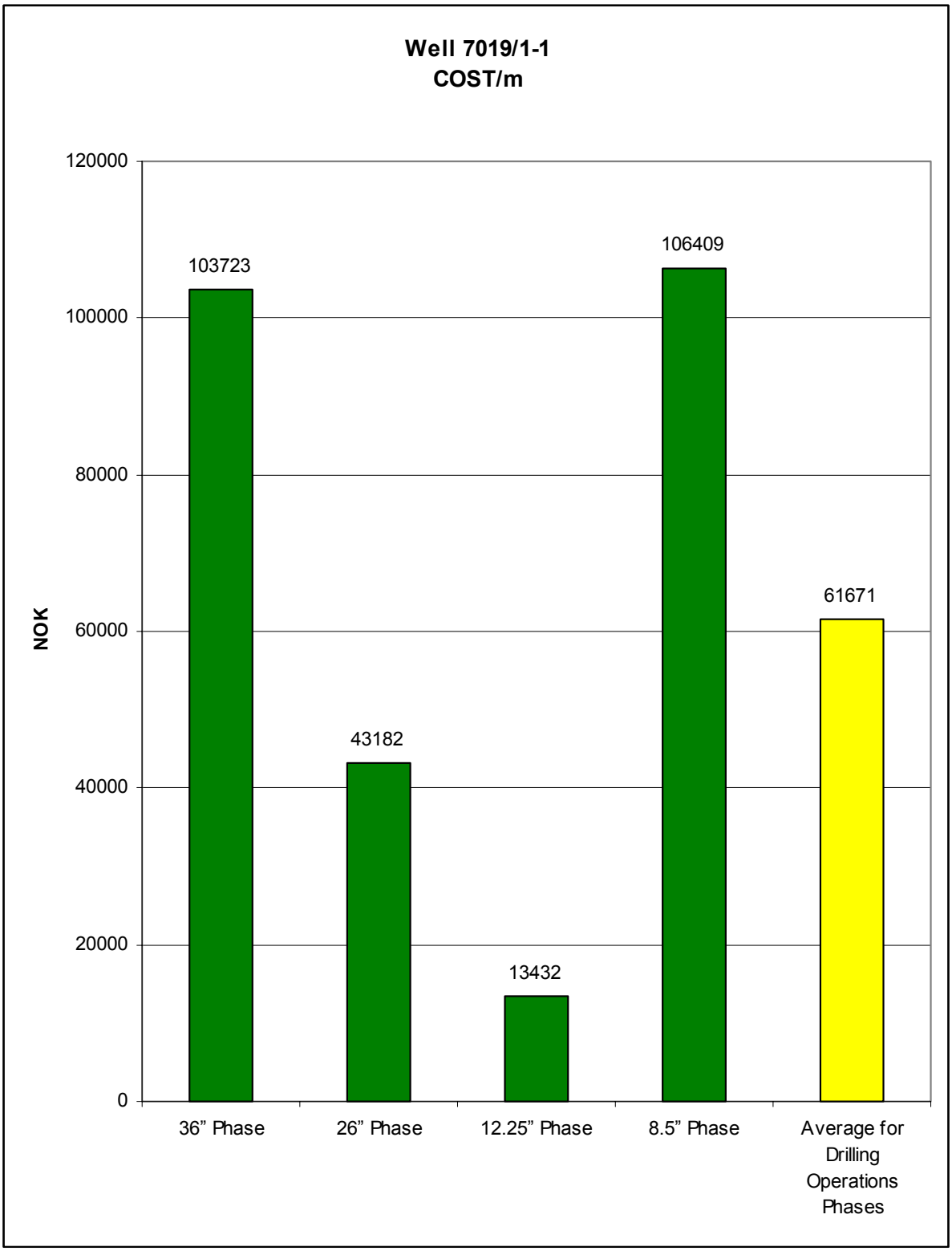
3.2.5 Cost vs. Depth



3.2.6 Cost per Phase

Well 7019/1-1 COST BY PHASE	Start	End	Days	PHASE Cost	Meter	Cost/Meter
	Year 2000	Year 2000		MMNOK		NOK
Move In / Rig Up	Oct. 5 2000	Oct. 6 1730	0,75	6,1		
36" Phase	Oct. 6 1730	Oct.10 0700	3,56	13,4	129	103723
26" Phase	Oct.10 0700	Oct.14 0530	3,94	13,9	322	43182
12.25" Phase	Oct.14 0530	Oct.19 0330	4,92	18,1	1350	13432
8.5" Phase	Oct.19 0330	Nov. 21 1800	33,60	105,1	988	106409
Testing Phase	Nov. 21 1800	Nov. 30 1530	8,90	41,8		
Rig Down / Move Out	Nov. 30 1530	Dec. 3 1700	3,06	15,3		
Total time Drilling Operations Phases			*49,83*	*172,0*	*2789*	*61671*
TOTAL TIME ON WELL	Nov. 30 1530	Dec. 3 1700	58,73	213,8	2789	76653





3.2.7 Itemized Cost by Service

3.3 Operations

3.3.1 Unplanned Events

During the entire well operations the unplanned/ unproductive time amounted to 118.5 hours (8.4% of total time). Of this unplanned time 57% was related to equipment problems, 30% to general drilling related problems, 8% was due to the re-spudding of the well and 5% was caused by various other problems.

3.3.2 Drilling Summary

Move In & Mooring Operations:

The rig "Transocean Arctic" started the operations on well 7019/1-1 on 5 October 2000 at 2320 hrs, after having finished the well 7122/7-1. The rig was towed to the drilling location where the anchors were set and the rig ballasted down to drilling draft, these operations were completed in 18 hours. At drilling draft the distance from the rotary table to the sea surface (RT – MSL) was 24 m.

Final rig Geographical Location:

Lat. = 70 deg. 55 min 05.14" N
Long. = 19 deg. 04 min 22.44" E

UTM Location:
X = 429692.3 m Easting
Y = 7869591.0 m Northing

The co-ordinates above refer to the European Datum 1950 (ED50), UTM projection, Zone 34 with Central Meridian 21 degrees East.

36" Hole section /30" Conductor

DEPTH INTERVAL: Seabed (at 214 m RT) – 336 m RT

General:
The major goals established for drilling the 36" hole section was to drill the hole quickly, use a high viscosity/weighted drilling fluid to keep the hole open, run casing as quickly as possible, and cement it up to seabed.

The total cost for the 36" phase, from spud of the 36" hole to start of the 26" phase, was
13.4 MM NOK or 103723 NOK/m. The total time for the 36" phase was 3.56 days with 9.5 hours of unscheduled events caused by the well having to be re-spudded due to boulders causing low drilling progress.

Drilling:
The 36" hole section was spudded using a 17 ½" bit and 2-stage 36" hole opener. Due to hard seabed formations and to boulders encountered below the seabed the drilling progress was very slow – 1.8 m/hour. Due to the boulders and slow drilling progress it was decided to re-spud the well. The rig was moved 10 m aft and the well was re-spudded. The 17 ½" bit and 36" hole opener was used to drill down to 250 m.

The drilling progress was still slow – 2.25 m/hr. The 36" hole opener was therefore pulled and a 17 ½" bit was used to continue the hole down to
343 m. The 17 ½" hole was then opened up to 36" down to 336 m. This section was drilled with seawater, using high viscosity sweeps to clean the hole. Once the 36" hole had been drilled to the depth of 336 m, the hole was displaced to high viscosity bentonite slurry. A wiper trip was made without encountering any tight spots. Finding 2 m fill on bottom, the hole was circulated until clean and displaced with 1.2 sg high viscosity fluid prior to pulling out of hole to run 30" casing.

Bits/BHA:
In the first attempt to spud the well a 17 ½" Smith 10MPD bit was used on bottom of the 36"
2-stage hole opener. When re-spudding the well the 17 ½" bit was used to drill a pilot hole that was afterwards opened to 36" with the hole opener assembly. The two bottom hole assemblies used were slick assemblies without stabilizers. The detailed assembles are described in the BHA report section.

Mud/Solids Control:
Seawater was used to drill the 36" hole section. High viscosity sweeps were employed to help clean the hole. Upon displacement, a high viscosity mud was used to ensure good cleaning of the hole. Prior to pulling out of the hole before running the 30", the mud was displaced to a high viscosity/weighted system to improve hole stability while running the casing.

Casing/Cementing:
The 30" casing string consisted of 10 joints of 310 lbs/ft (including wellhead joint and shoe joint), grade X-52 casing with ST-2B connections. The wellhead used was a Vetco MS-700
18 ¾" x 15000 psi subsea wellhead.

The 30" casing string was run on drillpipe with the RGB installed around the 30" wellhead and with the cementing stinger installed on bottom of the wellhead running tool.

The 30" casing was cemented up to seabed with 51.8 m^3 of 1.56 sg lead slurry and 6 m^3 of 1.95 sg tail slurry. While cementing the 30" casing the ROV was used to observe for cement returns to the seabed. The 30" casing was run and cemented without problems. (It was later checked that the 30" casing had been cemented up to seabed by running a stinger through the grouting funnels on the RGB and tag the cement on the outside of the 30").

26" Hole section / 20" Casing

DEPTH INTERVAL: 336 – 665 m RT

General:
The 26" hole section was drilled with the intention to set the 20" casing deep enough to achieve a leak-off sufficient for drilling to the next casing point. To check for shallow gas a 12 1/4" pilot hole was first drilled from the 30" shoe and down to 665 m. No shallow gas was observed. The pilot hole was then opened up to 26". The 20" casing was set at 658 m. Total time for the 26" interval was 3.94 days. 8.5 hours of this time was due to unscheduled events. The cost for the 26" phase was 13.9 MM NOK or 43182 NOK/m.

Drilling:
A 26" bit was used to drill out the 30" shoe. With a 12 ¼" bit, and with MWD in the BHA, a pilot hole was drilled down to 665 m to check for shallow gas. A flow check was made at section TD, no shallow gas was observed.

The pilot hole was then opened up to 26". The hole was displaced to 1.2 sg mud and a wiper trip was made. The hole was circulated clean and again displaced to 1.2 sg high viscosity mud prior to pulling out for running 20" casing.

Bits/BHA:
In this hole section one 26" bit and one 12 ¼" bit were used. The 26" Smith MSDSSHC (IADC Code 115) was used for drilling out cement in the 30" shoe and opening up the pilot hole.

The pilot hole was drilled with a 12 ¼" Smith MSDGHOCD (IADC Code 135) and came out with the teeth approx. 20% worn.

The drilling assembles are described in the BHA report section.

Mud/Solids Control:
Seawater was used to drill both the 12 ¼" pilot hole and the 26" hole, with high viscosity sweeps employed to help clean the hole.

A 1.20 sg seawater/bentonite mud with ilmenite used as the weighting material was used to displace the 26" hole prior to the wiper trip. Prior to pulling out of the 26" hole to run 20" casing the hole was again displaced with the 1.20 sg seawater/bentonite mud.

Casing/Cementing/ install BOP & riser:
The 20" casing was run drill pipe, and the 18 ¾" wellhead housing was landed in the 30" wellhead. The 20" casing was cemented up to seabed with 95 m^3 1.56 sg lead slurry and
16 m^3 1.95 sg tail slurry. The 20" casing was run and cemented without problems. The ROV, stationed at the seabed during the cementing, observed returns during the entire cement job.

The BOP stack was run on the marine riser and installed on the 18 ¾" wellhead. The diverter was installed, and the choke and kill line were pressure tested. The BOP test tool was run, and the BOP stack was pressure and function tested.

12 1/4" Hole section / 9 5/8" Casing

DEPTH INTERVAL: 665 – 2015 m RT

General:
The 12 1/4" hole section was drilled with the intention to set the 9 5/8" casing shoe fairly close to the top of the expected reservoir formation to achieve a fracture gradient that was as high as possible before drilling into the reservoir. The 9 5/8" casing was run and cemented without problems. The entire 12 ¼" interval was drilled with one bit. The total time for the 12 ¼" phase was 4.92 days with 0.5 hours of unscheduled events. Total cost for the 12 ¼" phase was 18.1 MM NOK or 13432 NOK/m.

Drilling:
A 17 1/2" bit was used to drill out the 20" shoe. The drilling fluid was then changed to a 1.30 sg Formate brine mud and a LOT was performed to an equivalent mud density of 1.65 sg. The
12 ¼" hole was then drilled to section TD at 2015 m in one bit run using SDD (Straight-hole Drilling Device) . The hole had to be backreamed due to tight spots from 930 m to 800 m. After tripping back to bottom the hole was cleaned by circulating weighted, high viscosity sweeps prior to pulling out to run 9 5/8" casing.

Bits/BHA:
In this hole section one 17 1/2" bit and one 12 ¼" bit were used. The 17 1/2" Smith 10MPD (IADC Code 435) was only used for drilling out the cement in the 20" shoe.

The 12 1/4" DPI SD646 was used to drill the entire 12 ¼" hole section and came out with the cutters 10% - 20% worn.

The drilling assembles are described in the BHA report section.

Mud/Solids Control:
After having drilled out the cement in the 20" casing shoe the well was displaced with a drilling fluid consisting of 1.30 sg Formate brine where XCpolymer and PAC was used for obtaining viscosity and to maintain rheology. This Formate mud was used to drill the 12 ¼" hole section. After hole section TD was reached the mud weight was increased to 1.40 sg.

The Formate brine was in itself heavy enough not to require any general addition of weighting materials. For mud pills and other were additional weight was required the weighting material used was ilmenite.

Casing/Cementing:
The 9 5/8" casing was run on drill pipe and the 9 5/8" hanger was landed in the 18 ¾" wellhead housing, with the shoe set at 2004 m. The 9 5/8" casing was cemented up to 1495 m with
16.4 m^3 of 1.92 sg slurry.

8 1/2" Hole section/Logging/P&A

DEPTH INTERVAL: 2004 – 3003 m RT

General:
After drilling out of the 9 5/8" casing shoe, the 8 1/2" hole was drilled to TD at 3003 m. Three cores were taken in this hole section. The drilling of this section was slow due to very hard formations. Drilling problems in the form of partial lost circulation and drill pipe twist-off occurred during the drilling of this section. The total time for the 8 1/2" phase was 33.6 days. 100 hours of this time was due to unscheduled events. The interval cost was 105.1 MM NOK or 106409 NOK/m.

Drilling:
A 12 1/4" bit was run to drill out the 9 5/8" shoe and clean out the rat hole to 2015 m. The 8 ½" hole was then drilled to 2020 m where a LOT was performed to an equivalent mud density of 1.73 sg. The drilling of the 8 1/2" hole section continued down to 2220 m where Core no. 1 was taken from 2220 m to 2235 m with a core recovery of 97%. After drilling down to 2457 m Core no. 2 was taken from 2457 m to 2464 m with a core recovery of 97%. At 2530 m the circulation was partially lost and the mud weight was reduced to 1.35 sg – full circulation was re-gained. While drilling at 2550 m the drill string parted; a broken pin connector on the 5" drillpipe was found when pulling out. In the subsequent fishing operation the parted drill string in the hole was successfully retrieved. Two intermediate wireline log runs were made, and the mud weight was reduced to 1.25 sg prior to continuing the drilling of the 8 ½" hole. At 2561 m Core no. 3 was taken in the interval 2561 - 2568 m, core recovery was 100%. The drilling of the 8 1/2" hole continued down to 3003 m which was TD of the well. The time required for the coring operations in well 7019/1-1 was 2.85 days (the coring time is included in the total time for the 8 1/2" Phase).

Logging
Schlumberger was the logging contractor. The time required for the wireline logging in the 8 ½" hole was 6.83 days (the logging time is included in the total time for the 8 1/2" Phase).

Two intermediate log runs were made when the well was drilled to 2550 m:
Run A: TDL/CNL/HRLA/GR
Run B: MDT/GR

At TD (3003 m) the following log runs were made:
Run no. 1: HRLA/PEX
Run no. 2: CMR
Run no. 3: MDT (tool became stuck – fishing operation to recover tool)
Run no. 4: MDT
Run no. 5: MDT
Run no. 6: DSI-FMI
Run no. 7: MSCT
Run no. 8: VSP

Bits/BHA:
Due to the very hard formations encountered in the 8 ½" hole section, 15 drill bits and 2 core bits were used to drill this section. The bits are listed in the Bit Record.

The drilling assembles are described in the BHA report section.

Mud/solids control:

The mud used for the 8 1/2" hole section was the same as for the 12 ¼" section: 1.40 sg Formate brine where XCpolymer and PAC was used for obtaining viscosity and to maintain rheology. The mud weight was reduced to 1.35 sg at 2530 m, and again reduced to 1.25 sg at 2550 m.
No problems with the mud were experienced during the drilling of the 8 ½" hole section.

Testing Phase Summary:

(Ref. also Section 4 ENCLOSURES – "ENCLOSURE 2 Well 7019/1-1 Summary of Well Testing Operation").
The total time for the Testing Phase was 8.9 days. No unscheduled events occurred.
The cost of the Testing Phase was 48.1 MM NOK.

A 7" liner was run and cemented with the shoe at 2645 m and the liner hanger set inside the 9 5/8" casing at 1801 m (top of PBR at 1795 m). After clean-out of the liner the test string with TCP guns on bottom was run and the fluted hanger was landed in the wellhead. The test string was displaced with nitrogen down to above the test packer. The test packer was set at 2505 m and the 7" liner was perforated in the interval 2526m – 2563 m by firing the pressure activated TCP guns. The well was opened for clean-up flow. The well flowed gas at a rate of approx. 600000 m^3/day at a choke size of 40/64 and a WHP of 145 bar, gas temperature at surface was 22 ^{o}C. Due to the high CO_2 content in the gas (60 – 80%), it was not possible to flare the gas. After flowing the well for 12.5 hours, the well was shut in for a build-up period of 13 hours. After the build-up had ended the testing of the well was terminated by bull-heading and killing the well and retrieving the test string.

A cement retainer was set above the perforated interval at 2506 m and a high pressure cement squeeze was performed to seal off the perforations. After this had been done the final work to permanently plug and abandon the well followed.

Plug and Abandonment Summary:

The time required for the permanent plugging and abandonment operations for well 7019/1-1 was 3.92 days (where 0.98 days is included in the Testing Phase and 2.94 days in the Rig Down & Move Out time).

Plug no. 1: Cement from 3003 m up to 2647 m.

Plug no. 1a: Cement retainer set at 2506 m and a high pressure cement squeeze of the perforated interval below from 2526 m to 2563 m.

Plug no. 2: Cement from 1895 m up to 1600 m.

Plug no. 3: Cement from 900 m up to 700 m.

9 5/8" casing was cut at 652 m (488 m below seabed) and retrieved.

Plug no. 4: Cement from 658 m up to 450 m.

Plug no. 5: Cement from 450 m and up to 260 m (46 m below seabed).

The 20" and 30" casing strings were cut at 219 m (5 m below seabed) and retrieved.

Note: There was cement behind both the 30” and 20” casing strings up to seabed at 214 m.
Top of cement behind the 9 5/8” casing was calculated to be at 1495 m.

See also the attached figure of P & A.

Rig down/Move out

The Rig down/Move out Phase began on 30 November, 2000, after having finished the Testing Phase. The total time used for the Rig down/Move out Phase was 3.06 days with 3 hours of unscheduled events, and the cost of this phase was 15.3 MM NOK. The operations under “Rig down/Move out” includes the well abandonment, pulling of the BOP stack and riser, the cutting & retrieval of the 30” and 20” casing, and the pulling of the anchors.
Operations on well 7019/1-1 ended on 3 December 2000 at 1700 hours.

3.3.3 Daily Operations

NORSK AGIP
Operations Summary Report

Well Name: 7019/1-1 Start: 05.10.00
Contractor Name: TRANSOCEAN End: 03.12.00
Rig name: TRANSOCEAN ARCTIC Spud: 06.10.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
05-okt-00	23:30	00:00	0,5	M	P	B	MIRU	Started transit to well 7019/1-1
06-okt-00	00:00	12:00	12	M	P	B	MIRU	Rig in transit to new location, well 7019/1-1.
	12:00	17:30	5,5	M	P	D	MIRU	Anchor handling. Anchor # 4 on bottom at 1300 hrs. Anchor # 8 on bottom at 1300 hrs. Anchor # 1 on bottom at 1415 hrs. Anchor # 5 on bottom at 1415 hrs. Anchor # 2 on bottom at 1525 hrs. Anchor # 6 on bottom at 1525 hrs. Anchor # 7 on bottom at 1635 ballasted rig and made 140 t tension test on anchors.
	17:30	18:30	1	A	P	B	DRLCON	Ran in and tagged seabed at 214 m.
	18:30	00:00	5,5	A	P	A	DRLCON	Spudded well and drilled 36" hole from 214 - 224 m. Boulders causing slow progress.
07-okt-00	00:00	00:30	0,5	A	P	A	DRLCON	Drilled 36" hole from 224 - 225 m. Slow drilling.
	00:30	01:00	0,5	A	U	B	DRLCON	Pulled above seabed and inspected bit and hole opener w/ ROV, OK.
	01:00	03:30	2,5	A	U	D	DRLCON	Stabbed back into well. Took weight at 217 m. Reamed/redrilled 36" hole from 217 - 222 m.
	03:30	04:00	0,5	M	U	C	DRLCON	Pulled above seabed and moved rig 10 m aft due slow progress.
	04:00	10:00	6	A	U	A	DRLCON	Re-spudded well and drilled 36" hole from 214 - 222 m.
	10:00	20:00	10	A	P	A	DRLCON	Continued to drill 36" hole from 222 - 250 m.
	20:00	21:00	1	A	P	C	DRLCON	Displaced hole to 1,2 sg mud and dropped single shot. ROV positioned marker buoys.
	21:00	22:00	1	A	P	B	DRLCON	POOH, laid down bit and hole opener.
	22:00	23:30	1,5	A	P	B	DRLCON	Made up new 17 1/2" bit and RIH. Stabbed in hole and cont. RIH. 2 m fill.
	23:30	00:00	0,5	A	P	A	DRLCON	Drilled 17 1/2" hole from 250 - 253 m.
08-okt-00	00:00	07:00	7	A	P	A	DRLCON	Drilled 17 1/2" hole from 253 - 343 m.
	07:00	07:30	0,5	A	P	C	DRLCON	Swept hole w/ 10 m^3 hi-vis pill and displaced hole to 1,2 sg mud. Dropped single shot.
	07:30	09:00	1,5	A	P	B	DRLCON	POOH. Retrieved survey (0,5 deg) and broke bit.
	09:00	10:30	1,5	A	P	B	DRLCON	Picked up hole opener and RIH. Stabbed into hole and RIH to 250 m. No tight spots.
	10:30	00:00	13,5	A	P	D	DRLCON	Opened up hole to 36" from 250 - 310 m.
09-okt-00	00:00	04:30	4,5	A	P	D	DRLCON	Opened hole to 36" from 310 - 336.
	04:30	05:00	0,5	A	P	C	DRLCON	Swept hole with 40 m^3 hi-vis pill.
	05:00	05:30	0,5	A	P	B	DRLCON	Made wiper trip to seabed and back. 2 m fill.
	05:30	06:00	0,5	A	P	D	DRLCON	Reamed bottom of hole twice.
	06:00	06:30	0,5	A	P	C	DRLCON	Swept with hi-vis pill and displaced hole to 1,2 sg mud.
	06:30	08:00	1,5	A	P	B	DRLCON	POOH and racked BHA.
	08:00	13:00	5	C	P	B	CSGCON	Held safety meeting, rigged up and ran 10 joints of 30" casing. Landed housing in rotary.
	13:00	14:30	1,5	C	P	B	CSGCON	Ran 5" DP cement stinger inside 30" casing. Made up running tool to housing.
	14:30	16:00	1,5	C	P	B	CSGCON	Connected housing to RGB and ran landing string. Stabbed shoe into hole and ran csg to bottom. No tight spots.
	16:00	16:30	0,5	C	P	C	CSGCON	Circulated one casing volume with seawater. Observed returns.
	16:30	18:00	1,5	C	P	c	CSGCON	Pressure tested cement line. Mixed and pumped 51,8 m^3 lead slurry @ 1,56 sg and 6,0 m^3 tail slurry @ 1,95 sg. Displaced same with 6,1 m^3 seawater. Observed returns throughout complete job. Checked for backflow, OK.
	18:00	00:00	6	C	P	d	CSGCON	Adjusted RGB height and WOC. RGB at 1/4 degree.

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Operations Summary Report

Well Name:	7019/1-1	Start:	14.09.00
Contractor Name:	TRANSOCEAN	End:	05.10.00
Rig name:	TRANSOCEAN ARCTIC	Spud:	16.09.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
10-okt-00	00:00	02:00	2	C	P	d	CSGCON	WOC
	02:00	03:30	1,5	C	P	b	CSGCON	Released 30" running tool and POOH. RGB bullseyes at 0 and 1/4 degree. L/D running tool and pulled stinger.
	03:30	04:30	1	A	P	b	CSGCON	L/D 36" BHA.
	04:30	07:00	2,5	A	P	b	CSGCON	M/U 26" bit on slick BHA and RIH. Stabbed into wellhead and RIH. Tagged TOC at 331m.
	07:00	09:30	2,5	A	P	f	DRLSUR	Drilled out cement and shoe. Cleaned rathole and opened same to 26" down to TD at 343 m.
	09:30	10:00	0,5	A	P	a	DRLSUR	Drilled 26" hole from 343 - 348 m.
	10:00	11:00	1	A	P	b	DRLSUR	POOH and broke bit.
	11:00	16:00	5	A	P	a	DRLSUR	M/U 12 1/4" BHA and RIH. Stabbed into wellhead and cont. RIH. Washed down from shoe to TD at 348 m.
	16:00	00:00	8	A	P	a	DRLSUR	Drilled 12 1/4" pilot hole from 348 - 564 m.
11-okt-00	00:00	03:00	3	A	P	a	DRLSUR	Drilled 12 1/4" pilot hole from 564 665 m.
	03:00	03:30	0,5	A	P	c	DRLSUR	Swept hole w/ 10 m^3 hi-vis pill.
	03:30	04:00	0,5	A	P	f	DRLSUR	Flow checked well, OK.
	04:00	05:00	1	A	P	b	DRLSUR	POOH. Occasional minor tight spots, 15 ton overpull.
	05:00	06:00	1	A	P	b	DRLSUR	L/D 2 stabilizers, dumped MWD memory and racked back same.
	06:00	08:00	2	C	P	b	CSGSUR	Made up wiper plug and R/T to 18 3/4" wellhead housing and racked back same.
	08:00	10:00	2	A	P	b	DRLSUR	L/D 12 1/4" bit and stabilizer. M/U 26" BHA.
	10:00	11:00	1	A	P	b	DRLSUR	RIH, stabbed into wellhead and cont. RIH.
	11:00	22:30	11,5	A	P	a	DRLSUR	Opened pilot hole to 26" from 348 - 665 m.
	22:30	00:00	1,5	A	P	c	DRLSUR	Rotated string in rotary sweeping hole with 20 m^3 hi-vis pill followed by spotting 60 m^3 1,2 sg mud. Meanwhile, changed leaking intermediate sub on top drive stem.
12-okt-00	00:00	01:30	1,5	A	P	b	DRLSUR	Made wiper trip to 30" shoe. Worked tight spot at 465m - not tight RIH. Washed down last stand.
	01:30	02:30	1	A	P	c	DRLSUR	Pumped 20 m^3 hi-vis pill, 70 m^3 seawater followed by 150 m^3 1,2 sg mud.
	02:30	04:30	2	A	P	b	DRLSUR	POOH, no tight spots. Jetted wellhead/RGB on way out.
	04:30	05:30	1	C	P	b	CSGSUR	Made up and racked back cement head assy.
	05:30	06:00	0,5	C	P	b	CSGSUR	Held safety meeting and rigged up for casing.
	06:00	13:00	7	C	P	b	CSGSUR	Ran 36 joints 20" csg. Filled each joint with seawater.
	13:00	13:30	0,5	C	P	b	CSGSUR	Changed elevator and made up wellhead housing.
	13:30	15:00	1,5	C	U	b	CSGSUR	Started to run landing string. Took weight at 465 m. Washed and worked through tight spots down to 513 m. Max 40 ton weight down, 3500 lpm.
	15:00	16:00	1	C	P	b	CSGSUR	Cont. RIH. Landed casing and made 25 ton overpull test, OK.
	16:00	17:00	1	C	P	c	CSGSUR	Circulated one casing volume at 2500 lpm. Observed returns at seabed. Pressure tested cement hose to 200 bar, OK.
	17:00	19:00	2	C	P	c	CSGSUR	Mixed and pumped 95 m^3 lead slurry at 1,56 sg and 16 m^3 tail slurry at 1,95 sg.
	19:00	20:30	1,5	C	P	c	CSGSUR	Dropped dart, sheared wiper plug with 180 bar and displaced cement at 3000 lpm. Bumped plug with 48 bar, building to 62 bar. Pressure increased 26 bar during displacement. Observed returns to seabed. Checked for backflow, OK.
	20:30	21:30	1	C	P	b	CSGSUR	Released running tool and POOH. L/D running tool. Bullseyes at 0 and 1/2 degree.
	21:30	23:00	1,5	C	U	c	CSGSUR	RIH with 1 stand 3 1/2" DP. Stung into both grouting funnels on RGB. Took weight at seabed. POOH.
	23:00	00:00	1	I	P	b	CSGSUR	Rigged up to run BOP.
13-okt-00	00:00	02:30	2,5	I	P	b	CSGSUR	Made up 2 joints of riser, skidded BOP underneath rotary and prepared same for running.

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Operations Summary Report

Well Name:	7019/1-1	Start:	05.10.00
Contractor Name:	TRANSOCEAN	End:	03.12.00
Rig name:	TRANSOCEAN ARCTIC	Spud:	06.10.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
13-okt-00 (cont.)	02:30	08:30	6	I	P	b	CSGSUR	Ran riser/BOP. Tested choke- and kill lines to 35/483 bar. Picked up slipjoint. Landed BOP, closed wellhead connector and made overpull test, OK.
	08:30	10:30	2	I	P	b	CSGSUR	Installed diverter and cleared rig floor.
	10:30	11:30	1	I	P	d	CSGSUR	M/U and RIH with wellhead isolation test tool.
	11:30	14:00	2,5	I	P	d	CSGSUR	Pressure tested wellhead connector and function tested BOP.
	14:00	15:00	1	I	P	d	CSGSUR	Pulled test tool.
	15:00	15:30	0,5	A	P	b	CSGSUR	L/D 26" BHA.
	15:30	16:00	0,5	A	P	b	CSGSUR	M/U slick 17 1/2" BHA. Test casing against shear ram to 138 bar, no go. Leaking off 15 bar in 10 min. Tested casing to expected Leak off pressure of 45 bar OK.
	16:00	19:00	3	I	U	d	CSGSUR	Ran wellhead isolation test tool and retested wellhead connector to 345 bar, OK.
	19:00	19:30	0,5	I	P	d	CSGSUR	P/U drilling stand, break same and connect testing hose below kelly cock.
	19:30	21:00	1,5	I	D	d	CSGSUR	Attempted to test kelly cock, no go. Tested cement unit, OK. Attempted to test IBOP, no go.
	21:00	21:30	0,5	I	P	d	CSGSUR	Tested DDM/mud hose to 345 bar, OK.
	21:30	22:30	1	I	D	d	CSGSUR	Attempted to test spare kelly cock, no go.
	22:30	23:00	0,5	C	P	b	CSGSUR	L/D cement stand and broke off kelly cock.
	23:00	00:00	1	I	P	d	CSGSUR	Tested cement stand kelly cock to 35/345 bar, OK.
14-okt-00	00:00	00:30	0,5	I	P	d	CSGSUR	Close I BOP manually and attempt P test same unable to test due to failure on Cmt Unit. Repair failure on diesel engine (air bubbles into diesel inlet).
	00:30	01:00	0,5	I	P	d	CSGSUR	Perform Pressure test to 35/345 bar OK.
	01:00	02:00	1	I	P	d	CSGSUR	Changed open/close sleeve pin and retest I BOP in auto-closed system without success.
	02:00	02:30	0,5	A	P	e	CSGSUR	Lay down Testing equipment and rig up drilling stands.
	02:30	04:30	2	A	P	a	CSGSUR	RIH with 17 1/2" BHA and tagged Float Collar at @ 644m. Pumped 5 m^3 of HV pill and displace it.
	04:30	05:30	1	A	P	a	CSGSUR	Perform Casing Pressure Test in steps. Test OK at 45 bar. At 90 bar pressure drop down to @ 85 bar in 5 minutes.
	05:30	06:00	0,5	A	P	a	DRLIN1	Perform choke drill with crew.
	06:00	08:30	2,5	A	P	a	DRLIN1	Drill out float collar and shoe track from 644m to 658m. Clean rat hole.
	08:30	09:00	0,5	A	P	a	DRLIN1	Drill 17 1/2" hole from 665m to 670m. Pump HV pill.
	09:00	11:30	2,5	A	P	c	DRLIN1	Displace hole to Formate mud 1,30 SG and circulated to condition mud.
	11:30	12:30	1	A	P	a	DRLIN1	Perform L.O.T. No Leak Off obtained, stop at EMW of 1,65 sg.
	12:30	14:30	2	A	P	e	DRLIN1	POOH and lay down bit sub, x/o and bit
	14:30	17:30	3	A	P	e	DRLIN1	Make up 9 5/8" casing hanger w/wiper plugs plus cement head and racked back to the derrick.
	17:30	22:30	5	A	P	a	DRLIN1	Make up 12 1/4" drilling assembly with SDD 8 tool and verified function of it. Reaming and Logging from 658m to 670m TD.
	22:30	00:00	1,5	A	P	a	DRLIN1	Drilling 12 1/4" section from 670m to 721m.
15-okt-00	00:00	07:00	7	A	P	a	DRLIN1	Drilling and sliding from 721m to 894m. Max gas: 0,9%.
	07:00	19:00	12	A	P	a	DRLIN1	Drilling and sliding from 894m to 1200m. Max gas: 0,7%
	19:00	00:00	5	A	P	a	DRLIN1	Drilling and sliding from 1200m to 1311m. Max gas: 1,63%.
16-okt-00	00:00	05:30	5,5	A	P	a	DRLIN1	Drilling and sliding from 1311m to 1419m. Max gas: 1,6%.
	05:30	06:30	1	A	P	c	DRLIN1	Pumped 5 m^3 of High Viscous pill and circulated same out.
	06:30	08:00	1,5	A	P	b	DRLIN1	Slugged pipe and perform wiper trip: no problem.
	08:00	08:30	0,5	A	P	b	DRLIN1	RIH to 1389m.
	08:30	09:00	0,5	A	U	d	DRLIN1	Wash down from 1389m to TD. At the bottom find 2m of fill.

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Operations Summary Report

Well Name:	7019/1-1	Start:	05.10.00
Contractor Name:	TRANSOCEAN	End:	03.12.00
Rig name:	TRANSOCEAN ARCTIC	Spud:	06.10.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
16-okt-00	09:00	19:00	10	A	P	a	DRLIN1	Drilling and sliding from 1419m to 1677m. Max gas: 1,2%.
(cont.)	19:00	00:00	5	A	P	a	DRLIN1	Drilling and sliding from 1677m to 1821m. Max gas: 1,33%.
17-okt-00	00:00	04:30	4,5	A	P	a	DRLIN1	Sliding 12 1/4" hole from 1821m to 1937m. Start increase MW to 1,35 SG due to increasing of Total Gas. Max gas: 2,9%
	04:30	08:00	3,5	A	P	a	DRLIN1	Sliding 12 1/4" hole from 1937m to 2015m. Continue increase MW from 1,35 SG to 1,40 SG due to increasing of Total Gas and Gas connection. Max gas: 3,1%.
	08:00	09:30	1,5	A	P	c	DRLIN1	Circulation bottom up. Max gas: 3,1%.
	09:30	11:30	2	A	P	b	DRLIN1	Pump slug and POOH to 1400m. No overpull. RIH to TD.
	11:30	13:30	2	A	P	c	DRLIN1	Circulate bottom up. Max gas: 0,7%. Flow check: OK.
	13:30	20:00	6,5	A	P	b	DRLIN1	Pump slug and POOH. Lay down: accelerator, jar, sonic, MWD and SDD tool. Dump memory from MWD: full data recovered.
	20:00	21:30	1,5	A	P	f	DRLIN1	Make up running tool for wear bushing, RIH and wash wellhead area.
	21:30	22:00	0,5	A	P	f	DRLIN1	Record depth using Vetco method (for reference) and pull seat protector w/20 ton.
	22:00	23:00	1	A	P	f	DRLIN1	Drop rabbit to drift landing string and POOH. Lay down running tool.
	23:00	00:00	1	C	P	b	DRLIN1	Prepare to RIH 9 5/8" casing and perform safety meeting.
18-okt-00	00:00	07:00	7	C	P	b	CSGIN1	Running 9 5/8" casing.
	07:00	13:30	6,5	C	P	b	CSGIN1	Held safety meeting with crew. Continue run 9 5/8" casing and fill every joint with 1,40 sg mud.
	13:30	15:30	2	C	P	b	CSGIN1	Make up hanger and RIH with landing string. Landing 9 5/8" casing @ 2004 m at @ 15:15 hrs.
	15:30	17:00	1,5	C	P	c	CSGIN1	Circulated w/1700 lpm @ 72 bar. Total circulation volume 87 m^3. Pump 10 m^3 spacer. Perform cement lines test to 200 bar with cement Unit. Drop Bottom Plug Ball.
	17:00	18:00	1	C	P	c	CSGIN1	Mix and pump cement as per program, 16,4 m^3 of 1,92 SG slurry. Release Top Plug Dart @ 17:50 hrs. Shear Top Plug w/180 bar.
	18:00	19:00	1	C	P	c	CSGIN1	Displace cement with rig pump. Bump plug after 4788 strokes with 35 bar above final circulation pressure. Continue pressure up to 209 bar w/cement unit. Casing pressure test: OK.
	19:00	20:00	1	C	P	c	CSGIN1	Bleed off Pressure and check for back flow: negative. Set seal assembly and test same to 35/345 bar
	20:00	23:00	3	I	P	d	CSGIN1	Test BOP to 35/345 bar, function test same.
	23:00	00:00	1	I	P	d	CSGIN1	Release running tool from seal assembly, jet wellhead for 5 min prior to POOH.
19-okt-00	00:00	01:00	1	I	P	d	CSGIN1	Test I BOP on 35/345 bar.
	01:00	02:00	1	I	P	d	CSGIN1	Run and set wear bushing.
	02:00	02:30	0,5	I	P	d	CSGIN1	POOH with running tool and lay down same.
	02:30	03:30	1	I	P	d	CSGIN2	Lay down cement head.
	03:30	09:30	6	A	P	e	DRLPRO	Make up 8 1/2" BHA and RIH to 1952m.
	09:30	10:30	1	A	P	f	DRLPRO	Held kick/choke drill w/crew. Function test Lower Pipe Ram. Change wash-pipe due to hours.
	10:30	15:30	5	A	P	a	DRLPRO	Drill cement/plug/float shoe from 1960m to 2004m. Clean rat hole.
	15:30	16:00	0,5	A	P	a	DRLPRO	Drill 8 1/2" hole from 2015m to 2020m.
	16:00	17:00	1	A	P	c	DRLPRO	Circulate bottom up. Max gas: 0,25%.
	17:00	18:00	1	A	P	f	DRLPRO	PO to the shoe and perform LOT: 1,73 SG EMW.
	18:00	19:00	1	A	P	a	DRLPRO	Drilling 8 1/2" hole to 2030m. Flow check at 2029m due to drilling break, negative.

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Operations Summary Report

Well Name:	7019/1-1	Start:	05.10.00
Contractor Name:	TRANSOCEAN	End:	03.12.00
Rig name:	TRANSOCEAN ARCTIC	Spud:	06.10.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
19-okt-00 (cont.)	19:00	22:30	3,5	A	P	a	DRLPRO	Continue drilling 8 1/2" from 2030m to 2095m. At same depth lost 15 bar on MWD tool.
	22:30	23:30	1	A	U	c	DRLPRO	Attempt to restart MWD tool without success. Circulate bottom up and perform flow check: OK.
	23:30	00:00	0,5	A	U	b	DRLPRO	POOH to 1978m.
20-okt-00 (cont.)	00:00	00:30	0,5	A	U	b	DRLPRO	Cut and slip 33m of drilling line.
	00:30	03:00	2,5	A	U	b	DRLPRO	Continue POOH.
	03:00	06:30	3,5	A	U	e	DRLPRO	Attempt to re-start MWD signals: negative. Lay down MWD and Pick up new OBSV. Failure on MWD. Change complete MWD tool and bit as well.
	06:30	09:30	3	A	U	b	DRLPRO	Make up 8 1/2" BHA. RIH and fill drilling string @ 1050m.
	09:30	00:00	14,5	A	U	d	DRLPRO	Wash down from 2067m to TD. Drilling 8 1/2" hole from 2095m to 2200m. Max gas at 2129: 1%.
21-okt-00	00:00	03:00	3	A	P	a	DRLPRO	Drill from 2195m to 2200m
	03:00	06:00	3	A	P	b	DRLPRO	Flow check & slug pipe, POOH for Bit change
	06:00	06:30	0,5	A	P	e	DRLPRO	Dump MWD tool.
	06:30	11:00	4,5	A	P	b	DRLPRO	L/down N/B reamer and string reamer, P/up and replace with stabilizer. RIH to 2154m.
	11:00	11:30	0,5	A	P	d	DRLPRO	Wash down f/ 2154m to 2185m.
	11:30	17:00	5,5	A	U	f	DRLPRO	Lost suction on mud pumps, Trouble shoot same, open suction manifolds & discharge strainers & suctions. Pump w/ cmt. unit through stand pipe manifold to string OK. Pump seawater through pumps and suction lines. MP # 1 & #3 OK.
	17:00	18:00	1	A	P	d	DRLPRO	Wash down f/ 2185m to 2200m. Lost suction on # 3 pump, cont. to wash down with # 1 pump.
	18:00	20:30	2,5	A	P	a	DRLPRO	Drill F/ 2200 m to 2207 m.
	20:30	22:30	2	A	T	f	DRLPRO	Lost suction on pumps, Check & clean out pumps found big cutting inside pumps under seats.
	22:30	00:00	1,5	A	P	a	DRLPRO	Drill f/ 2207m to 2208 m.
22-okt-00	00:00	01:00	1	A	P	a	DRLPRO	Drill 8.5" hole from 2208 m to 2209 m.
	01:00	04:00	3	A	U	b	DRLPRO	Flow check, pump slug, POOH for bit change.
	04:00	04:30	0,5	A	P	e	DRLPRO	Dump MWD tool & l/ down bit, NB stab, & string stab.
	04:30	07:30	3	A	P	b	DRLPRO	M/up bit #9 NB roller reamer & string roller reamer, and RIH to 2154 m. Fill pipe @ 2000 m.
	07:30	08:00	0,5	A	P	d	DRLPRO	Wash down from 2154m to 2209 m. No fill.
	08:00	12:00	4	A	P		DRLPRO	Drill from 2209m to 2220m. Max gas 0.4%.
	12:00	13:30	1,5	A	P	c	DRLPRO	Circ. bottom hole sample for Geologist.
	13:30	17:30	4	A	P	b	DRLPRO	Flow check, pump slug, POOH to pick up Core BBL #1. Dump MWD tool, L/D bit.
	17:30	22:30	5	B	P	b	EVALPR	Held safety meeting prior to running core Bbl. M/ up core head & core assy, & RIH
	22:30	23:30	1	B	P	c	EVALPR	Circ. wash to bottom, drop ball
	23:30	00:00	0,5	B	P	a	EVALPR	Cut core #1 from 2220m to 2223m.
23-okt-00	00:00	13:30	13,5	B	P	a	EVALPR	Cut Core # 1 from 2223m to 2235m.
	13:30	17:30	4	B	P	b	EVALPR	Flow check, POOH w/ Core # 1. From 500m to 200m pulling speed 3 min/std, from 200m to surface 6min./ std.
	17:30	18:30	1	B	P	f	EVALPR	Held safety meeting, L/down core 14.5m =97% recovery, rack back core bbl in derrick, clean floor area.
	18:30	22:00	3,5	A	P	b	DRLPRO	M/up 8 1/2" bit & BHA, load MWD-Tool, RIH 2200m.
	22:00	23:00	1	A	P	f	DRLPRO	Log from 2200m to 2235m with MWD.
	23:00	00:00	1	A	P	a	DRLPRO	Drill from 2235m 2236m.
24-okt-00	00:00	04:00	4	A	P	a	DRLPRO	Drill 8 1/2" hole from2236m to2247m.
	04:00	04:30	0,5	A	P	c	DRLPRO	Circ. bottom hole sample from geologist.
	04:30	06:30	2	A	P	a	DRLPRO	Drill from 2247m to 2254m.
	06:30	07:30	1	A	P	c	DRLPRO	Circ. Bottom hole Sample from Geologist.
	07:30	00:00	16,5	A	P	a	DRLPRO	Drill from 2254m to 2298m looking for core point.

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Operations Summary Report

Well Name:	7019/1-1	Start:	05.10.00
Contractor Name:	TRANSOCEAN	End:	03.12.00
Rig name:	TRANSOCEAN ARCTIC	Spud:	06.10.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
25-okt-00	00:00	17:30	17,5	A	P	a	DRLPRO	Drill from 2298m to 2334m. Std. pipe press. dropped 60 bar @ 1600hrs. cont. to drill from 2334m to 2335m.
	17:30	21:00	3,5	A	P	b	DRLPRO	Flow check, pump slug. POOH to check on Bit due to pressure drop & low penetration rate. Pressure drop due to the loss of one jet.
	21:00	21:30	0,5	A	P	e	DRLPRO	Attempt to dump memory from MWD tool - negative.
	21:30	23:00	1,5	A	U	e	DRLPRO	Lay down MWD tool & pick up new MWD tool & load same.
	23:00	00:00	1	A	P	b	DRLPRO	M/ up new bit & change out NB roller reamer for NB stab, change out 2 x String Roller Reamer to String Stab. & RIH . Changed out roller reamers due to ware & under gauged. Held kick drill.
26-okt-00	00:00	02:30	2,5	A	P	b	DRLPRO	RIH, take weight @ 2277m. Wash & ream f/ 2277m to 2288m. Cont. to RIH to 2335m, no fill.
	02:30	00:00	21,5	A	P	a	DRLPRO	Drill 8 1/2" hole from 2335m to 2382m.
27-okt-00	00:00	15:00	15	A	P	a	DRLPRO	Drill from 2382m to 2408m. Max. gas .63 %.
	15:00	16:30	1,5	O	U	e	DRLPRO	Change out wash pipe, test, found gooseneck wash out.
	16:30	18:00	1,5	O	U	e	DRLPRO	Pump slug, POOH to shoe. Tight spots @ 2285m & 2250m. Max. overpull 30 ton.
	18:00	22:00	4	O	U	e	DRLPRO	Conn. circ. hose & circ. while repairing goose neck. Repair & pressure test to 280 bar OK.
	22:00	23:30	1,5	O	U	e	DRLPRO	RIH to 2408m. No fill.
	23:30	00:00	0,5	A	P	a	DRLPRO	Drill from 2408m to 2409m.
28-okt-00	00:00	14:00	14	A	P	a	DRLPRO	Drill from2409m to 2433m. Pressure loss on std. pipe 50 bar.
	14:00	15:00	1	A	U	b	DRLPRO	Flow check, POOH to shoe.
	15:00	16:00	1	A	P	f	DRLPRO	Cut & Slip 33m drlg. line.
	16:00	19:00	3	A	U	b	DRLPRO	POOH to check on pressure loss. Pressure loss due to missing nozzle. Break off bit.
	19:00	20:00	1	A	P	e	DRLPRO	Install STB: between MWD tool & Load MWD tool.
	20:00	22:00	2	A	P	b	DRLPRO	M/up bit & RIH to 1370m.
	22:00	22:30	0,5	A	P	f	DRLPRO	Function test BOP using blue Pod.
	22:30	00:00	1,5	A	P	b	DRLPRO	RIH to Bottom. No Fill.
29-okt-00	00:00	12:30	12,5	A	P	a	DRLPRO	Drill 8 1/2" hole from 2433m to 2455m.
	12:30	13:00	0,5	A	P	c	DRLPRO	Circ.
	13:00	14:00	1	A	P	a	DRLPRO	Drill 8 1/2" hole from 2455m to 2457m.
	14:00	15:30	1,5	A	P	c	DRLPRO	Circ. bottoms hole sample, for geologist.
	15:30	19:30	4	A	P	b	EVALPR	POOH for Core Run #2. Dump Memory form MWD tool.
	19:30	00:00	4,5	B	P	e	EVALPR	M/up 27m Core BBL & RIH to 2457m.
30-okt-00	00:00	11:30	11,5	B	P	a	EVALPR	Cut core #2 from 2457m to 2464m.
	11:30	17:00	5,5	B	P	b	EVALPR	Flow check, POOH w/ Core #2, From 500m to 300m pull stds at a rate of 3min/std. From 300m to surface, 8 min /std.
	17:00	18:00	1	B	P	f	EVALPR	Recover core #2,6.58 m = 97% recovery.
	18:00	22:00	4	A	P	b	DRLPRO	M/up BHA & RIH to 2457m.
	22:00	22:30	0,5	A	P	f	DRLPRO	Log W/ MWD tool from 2457m to 2464m.
	22:30	00:00	1,5	A	P	a	DRLPRO	Drill 8 1/2" hole from 2464m to 2466m.
31-okt-00	00:00	01:00	1	O	D	a	DRLPRO	POOH to shoe, due to wash in goose neck.
	01:00	05:30	4,5	O	D	e	DRLPRO	Change out goose neck, test to 300 bar. OK.
	05:30	06:00	0,5	O	D	e	DRLPRO	RIH back to bottom 2466m.
	06:00	00:00	18	A	P	a	DRLPRO	Drill 8 1/2" hole from 2466m to 2514m
01-nov-00	00:00	05:30	5,5	A	P	a	DRLPRO	Drill 81/2" hole from 2514m to 2530m
	05:30	09:30	4	A	U	f	DRLPRO	Drilling break, lost partial circ., 18 m^3 per/hr. After 1.5 hrs. losses reduced to 7.5 m^3 per/hr. After another 1.5 hrs losses reduced to 1.9 m^3 per/hr.
	09:30	10:30	1	A	U	b	DRLPRO	POOH to 2000m while observing for losses.
	10:30	11:00	0,5	A	U	f	DRLPRO	Observe well for losses Well static.
	11:00	13:00	2	A	U	c	DRLPRO	Displaced to 1.35sg. mud @ 2000m.
	13:00	13:30	0,5	A	U	b	DRLPRO	RIH to 2300 m.

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Operations Summary Report

Well Name:	7019/1-1	Start:	14.09.00
Contractor Name:	TRANSOCEAN	End:	05.10.00
Rig name:	TRANSOCEAN ARCTIC	Spud:	16.09.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
01-nov-00 (cont.)	13:30	14:30	1	A	U	c	DRLPRO	Circ. bottoms up and reduce mud weight to 1.35sg.
	14:30	15:00	0,5	A	U	b	DRLPRO	RIH back to bottom @ 2530m.
	15:00	15:30	0,5	A	U	c	DRLPRO	Circ. @ 2400 lpm for 30min. No losses.
	15:30	16:00	0,5	A	U	f	DRLPRO	Observe well for 30 min. well static.
	16:00	17:30	1,5	A	U	c	DRLPRO	Circ. bottoms up, no losses. Max gas 18 %.
	17:30	00:00	6,5	A	P	a	DRLPRO	Drill from 2530m to 2539m. Drilling without losses @ 2400 hrs, very erratic torque.
02-nov-00	00:00	05:00	5	A	P	a	DRLPRO	Drill from 2539m to 2550m. Lost 75 bar & 30 ton string weight.
	05:00	08:00	3	E	U	b	DRLPRO	Flow checked, POOH. Observed broken pin- connection on 5" DP after pulling 33 stds of 5 " dp.
	08:00	11:00	3	E	U	e	DRLPRO	M/up 8 1/4" overshot & 6 1/2" bumper sub, pick up 5 jts 6 1/2" DC & Jars.
	11:00	13:00	2	E	U	b	DRLPRO	RIH w/ 8 1/4" overshot to top of fish @ 1854m.
	13:00	13:30	0,5	E	U	a	DRLPRO	Tag & latch on to fish @ 1854m. Pull fish free with 20 ton over pull.
	13:30	17:00	3,5	E	U	b	DRLPRO	POOH w/ fish.
	17:00	20:30	3,5	E	U	b	DRLPRO	Recover 100% of fish, lay out overshot and bad joint of DP & pull and rack rest of string in derrick. Pump test MWD tool, and dump memory.
	20:30	00:00	3,5	F	P	a	EVALPR	Rig up Schlumberger, & run , run #1 TLD/CNG/HRLA/GR.
03-nov-00	00:00	13:00	13	F	P	a	EVALPR	Log w/ Schlumberger, # 1 Run TDL / CNL / HRLA / GR: Run # 2 MDT / GR Rig down Schlumberger.
	13:00	15:00	2	I	P	d	DRLPRO	M / up BOP test tool & jet sub. RIH & wash well head prior to landing BOP test tool in well head.
	15:00	17:30	2,5	I	P	d	DRLPRO	Test BOP to 345 bar on Yellow Pod & function test on Blue Pod
	17:30	20:30	3	I	P	d	DRLPRO	POH w / BOP test tool. Test DDM & Kelly Cocks
	20:30	00:00	3,5	A	P	b	DRLPRO	M / up 8 1/2" bit, change out all stab. to roller reamers. & RIH to 2502 m. Held kick drill, & function test LP Rams on the way in the hole
04-nov-00	00:00	02:00	2	A	P	d	DRLPRO	Ream from 2503m to 2550m.Circ. and cut mud weight back from 1.35sg to 1.30 sg. Flow checked well static
	02:00	03:30	1,5	A	P	c	DRLPRO	Circ. & cut mud weight from 1.30 sg. to 1.25 sg.
	03:30	04:30	1	A	P	c	DRLPRO	Flow checked. Static. Circ. bottoms up. Max gas .03 % .
	04:30	07:30	3	A	P	a	DRLPRO	Drill 8 1/2" hole from 2550m to 2561m.
	07:30	08:00	0,5	A	P	c	DRLPRO	Circ. while checking on Core point.
	08:00	12:30	4,5	A	P	b	DRLPRO	Flow checked. POOH for Coring. Dump memory on MWD tool.
	12:30	13:00	0,5	B	P	e	DRLPRO	M / up Core bbl assy.
	13:00	14:30	1,5	B	P	b	DRLPRO	R I H w/ BHA.
	14:30	15:30	1	O	P	f	DRLPRO	Cut & Slip 33m drill line.
	15:30	17:30	2	B	P	b	EVALPR	Cont. to run in with core bbl.
	17:30	18:30	1	B	P	c	EVALPR	Circ 1 x string volume at 2561m & drop ball.
	18:30	00:00	5,5	B	P	a	EVALPR	Cut Core # 3 From 2561m to 2567m.
05-nov-00	00:00	04:30	4,5	B	P	a	DRLPRO	Cut Core # 3 from 2567m to 2568m.
	04:30	09:30	5	B	P	b	DRLPRO	Flow check, POOH w/ core # 3 from 500m to 300m pulling speed 3 min. / std. from 300m to surface pulling 6min/std.
	09:30	10:30	1	B	P	f	DRLPRO	Recover core 7m =100% Recovery.
	10:30	12:00	1,5	A	U	e	DRLPRO	L/out 8 1/4" Overshot & bumper sub.
	12:00	15:30	3,5	A	P	b	DRLPRO	M/ up Bit # RR10 & RIH to 2561m.
	15:30	16:00	0,5	A	P	f	DRLPRO	LOG w/ MWD Tool from 2561m to 2568m.
	16:00	18:30	2,5	A	P	a	DRLPRO	Drill from 2568m to 2569m. MWD failure, attempted to reset MWD unsuccessfully.
	18:30	21:30	3	A	P	b	DRLPRO	Flow check & POOH for MWD change.

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Operations Summary Report

Well Name:	7019/1-1	Start:	14.09.00
Contractor Name:	TRANSOCEAN	End:	05.10.00
Rig name:	TRANSOCEAN ARCTIC	Spud:	16.09.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
05-nov-00 (cont.)	21:30	23:00	1,5	A	P	e	DRLPRO	Dump memory form NWD tool & pick up and change out MWD tool & verify MWD.
	23:00	00:00	1	A	P	b	DRLPRO	Change bit & RIH, & Pump test MWD tool.
06-nov-00	00:00	02:00	2	A	P	b	DRLPRO	RIH to Bottom.
	02:00	00:00	22	A	P	a	DRLPRO	Drill 8 1/2" hole from 2569m to 2657m. Max Gas 0.77%.
07-nov-00	00:00	20:00	20	A	P	a	DRLPRO	Drilled 8 1/2" hole from 2657m to 2727m. ROP 1-10 m/hr, max gas 1.19 %. High torque readings and low ROP prior pulling out of hole.
	20:00	23:00	3	A	P	b	DRLPRO	Flowchecked and POOH.
	23:00	00:00	1	A	U	e	DRLPRO	Changed MWD due to a piece from MWD found inside the bit.
08-nov-00	00:00	02:00	2	A	U	e	DRLPRO	Changed MWD tool, NB roller reamer and bit. Verified MWD tool.
	02:00	05:00	3	A	P	b	DRLPRO	RIH to 2705 m. Function tested MWD on way in.
	05:00	05:30	0,5	A	P	d	DRLPRO	Reamed from 2705m to 2727m.
	05:30	23:00	17,5	A	P	a	DRLPRO	Drilled 8 1/2" hole from 2727m - 2794m. Flowchecked well at 2728m, OK. MWD resistively and GR stopped working at 2761m. ROP 2-6 m/hr, max formation gas 0.38%.
	23:00	23:30	0,5	A	U	f	DRLPRO	Pump pressure and torque did suddenly increase. (from 200 bar to 250 bar and from 7000 Nm to 22000 Nm). Attempted to work torque and pressure down, no go.
	23:30	00:00	0,5	A	P	b	DRLPRO	POOH
09-nov-00	00:00	03:00	3	A	P	b	DRLPRO	POOH, checked BHA for wear Found one nozzle plugged w/rubber from MWD, excessive wear on one string roller reamer and track in MWD integrated stabilizer
	03:00	05:00	2	A	P	e	DRLPRO	Changed MWD tool, string roller reamer and bit
	05:00	08:30	3,5	A	P	b	DRLPRO	RIH to 2750m, tested MWD on way in
	08:30	10:00	1,5	A	P	d	DRLPRO	Reamed and logged well from 2750m to 2794m
	10:00	00:00	14	A	P	a	DRLPRO	Drilled 8 1/2" hole from 2794m to 2849m MWD tool stopped pulsing at 2810m ROP 1.5 m/hr - 7 m/hr, max gas 0,64% RPM 90 - 110, WOB 16 - 19 ton
10-nov-00	00:00	09:00	9	A	P	a	DRLPRO	Drilled 8 1/2" hole from 2849m to 2874m one nozzle plugged 1/2 hr while drilling at 2865m ROP 1,5 - 6 m/hr, max formation gas 0.65% Observed pressure drop while drilling at 2874m
	09:00	09:30	0,5	O	D	c	DRLPRO	Pressure tested surface equipment. Found leakage on mud pump no. 1, repaired same.
	09:30	10:00	0,5	A	P	a	DRLPRO	Drilled 8 1/2" hole from 2874m to 2875m. Observed a rapid 10 bar pressure drop
	10:00	12:00	2	A	U	f	DRLPRO	Re-pressure tested surface equipment, OK. Pumped through string and observed that pressure was 45 bar less than normal drilling pressure.
	12:00	16:30	4,5	A	P	b	DRLPRO	POOH wet. Checked string and connections while pulling. Found leakage in drill collar connection. Lay down 2 drill collars.
	16:30	20:30	4	A	P	e	DRLPRO	Laid down bit, 2 ea. roller reamers and MWD. Made up turbine and tested same. Installed bit. Changed jar and accelerator.
	20:30	21:30	1	A	P	b	DRLPRO	RIH to 1300 m.
	21:30	22:30	1	N	P	f	DRLPRO	Cut and slip drilling line.
	22:30	00:00	1,5	A	P	b	DRLPRO	RIH and washed last 10m.
11-nov-00	00:00	00:00	24	A	P	a	DRLPRO	Drilled 8 1/2" hole from 2875m to 2960m.
12-nov-00	00:00	03:30	3,5	A	P	a	DRLPRO	Drilled 8 1/2" hole from 2945m to 2964m. Very low ROP at the end.

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Operations Summary Report

Well Name:	7019/1-1	Start:	14.09.00
Contractor Name:	TRANSOCEAN	End:	05.10.00
Rig name:	TRANSOCEAN ARCTIC	Spud:	16.09.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
12-nov-00 (cont.)	03:30	08:00	4,5	A	P	b	DRLPRO	POOH, laid down turbine assembly.
	08:00	12:30	4,5	A	P	b	DRLPRO	RIH w/ rotary assembly.
	12:30	00:00	11,5	A	P	a	DRLPRO	Drilled 8 1/2" hole from 2964m to 2988m, ROP 1-4 m/hr, max gas 0,44% 2300 l/min, 55-110 RPM, 15-20 ton WOB.
13-nov-00	00:00	08:00	8	A	P	a	DRLPRO	Drilled 8 1/2" hole 2988m to 3003m.
	08:00	08:30	0,5	O	U	e	DRLPRO	Pressure tested surface equipment due to 14 bar pressure drop, test-OK.
	08:30	13:30	5	A	P	b	DRLPRO	POOH with wet pipe. Found leakage in DC 1stand below jar.
	13:30	14:00	0,5	F	P	f	EVALPR	Rigged up wireline equipment.
	14:00	21:00	7	F	P	a	EVALPR	Schlumberger run log no. 1 HRLA/PEX Held safety meeting prior to install radioactive sources (in 14:45 out 20:30).
	21:00	00:00	3	F	P	a	EVALPR	Schlumberger run log no. 2 CMR (in 21:30). Attempted to calibrate tool.
14-nov-00	00:00	00:00	24	F	P	a	EVALPR	Log with Schlumberger, Run #2 rerun, CMR.
15-nov-00	00:00	19:00	19	F	P	a	EVALPR	Log w/ Schlumberger, Run # 3 MDT, POH w/ MDT.
	19:00	00:00	5	F	P	a	EVALPR	Change seal packer, Rerun # 3 MDT.
16-nov-00	00:00	09:30	9,5	F	P	a	EVALPR	Log with Schlumberger, Run # 3, take a total of 6 fluid samples @ 2246m.
	09:30	12:00	2,5	E	U		EVALPR	Tool stuck @ 2246m. Work to free stuck tool, negative.
	12:00	15:00	3	E	U	e	EVALPR	Held prejob safety meeting. Cut Schlumberger line and prepare over shot on DP.
	15:00	00:00	9	E	P	b	EVALPR	RIH with D P & Overshot to 2015m.
17-nov-00	00:00	01:00	1	E	P	b	EVALPR	RIH to 2224m w/ overshot.
	01:00	02:30	1,5	E	P	c	EVALPR	Circ. bottoms up, max. gas 3.3 %.
	02:30	05:30	3	E	P	a	EVALPR	Engaged fish w/ 6 tons. Pull fish free w / 5 tons over pull. Pull cable free at weak point with 4.5ton. POOH to shoe.
	05:30	06:30	1	E	P	b	EVALPR	L/ out wire line equipment.
	06:30	09:00	2,5	E	P	b	EVALPR	POOH w/ fish & lay out over shot and fish 100% recovery.
	09:00	13:30	4,5	F	P	b	EVALPR	RIH to 3003 m.
	13:30	14:30	1	F	P	c	EVALPR	Circ. bottoms up. Max Gas 2.8%.
	14:30	18:00	3,5	F	P	b	EVALPR	Flow check . Pump slug. and POOH.
	18:00	20:00	2	F	P	f	EVALPR	R/up Schlumberger & prepare to run MDT # 4
	20:00	00:00	4	F	P	a	EVALPR	Log with Schlumberger Run # 4 MDT.
18-nov-00	00:00	08:00	8	F	P	a	EVALPR	Log w/ Schlumberger, # 4 MDT.
	08:00	14:00	6	F	P	f	EVALPR	Retrieve MDT sample chamber. Make up same tool & RIH, Problem with Sample chamber # 2, change out same.
	14:00	00:00	10	F	P	a	EVALPR	RIH & position tool at 2601m. Start pumping and preparing for sampling # 5 MDT.
19-nov-00	00:00	07:00	7	F	P	a	EVALPR	Log w/ Schlumberger, Run # 5 MDT.
	07:00	10:30	3,5	F	P	f	EVALPR	POOH & Rig down MDT complete.
	10:30	16:30	6	F	P	f	EVALPR	Rig up DSI-FMI, RIH and log same, & POOH & R / down tools.
	16:30	21:00	4,5	F	P	f	EVALPR	Rig up MSCT RIH to shoe, test tool, tool had short, POH to surface, change out Cartridge, and verified tool functioning OK. RIH.
	21:00	00:00	3	F	P	a	EVALPR	Log & cut side wall cores MSCT
20-nov-00	00:00	11:30	11,5	F	P	a	EVALPR	Log w/ Schlumberger, MSCT side wall cores, tool failure after 11 cores cut, POH, recover cores & redress tool, RIH, cut side wall cores.
20-nov-00	11:30	20:00	8,5	F	P	a	EVALPR	With Schlumberger wire line run VSP.
	20:00	00:00	4	L	P	b	EVALPR	Make up diverting tool and RIH to set cement plug on bottom.
21-nov-00	00:00	00:30	0,5	L	P	b	EVALPR	RIH w/cmt. stinger to TD.
	00:30	01:30	1	L	P	c	EVALPR	Circ. bottoms up . Max Gas 1.8 %.

NORSK AGIP

Operations Summary Report

Well Name:	7019/1-1	Start:	14.09.00
Contractor Name:	TRANSOCEAN	End:	05.10.00
Rig name:	TRANSOCEAN ARCTIC	Spud:	16.09.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
21-nov-00 (cont.)	01:30	03:30	2	L	P	c	EVALPR	M / up cmt. head, pump 5 m^3 of 11.55sg. spacer ahead, P/test cmt line 200 bar - OK . Mix & pump 18.2 m^3 of 1.9 sg cement slurry, plus additives, pump 6oo l behind to balance plug displace with 25.8 m^3 of 1.25sg.
	03:30	04:30	1	L	P	b	EVALPR	Pull back to 2640m.
	04:30	05:30	1	L	P	c	EVALPR	Circ. bottom up, traces of cmt in returns.
	05:30	08:00	2,5	L	P	b	EVALPR	POOH w/ cmt. stinger & lay out same.
	08:00	09:00	1	L	P	d	EVALPR	M/ up Nodeco cement head & rack back in Derrick.
	09:00	13:00	4	L	P	b	EVALPR	M/up bit & 9 5/8" csg, scraper RIH tag cement at 2647m. circ. for 15 mins.
	13:00	14:00	1	L	P	c	EVALPR	POOH to 2619m. Circ. bottoms up while working scraper at 1800 m.
	14:00	15:00	1	L	P	b	EVALPR	Flow check drop 2 3/4" drift & POOH to 1900 m.
	15:00	16:00	1	L	P	f	EVALPR	Cut & slip 33 m. drilling line
	16:00	18:00	2	L	P	b	EVALPR	Cont. to POOH, lay out scraper
	18:00	19:00	1	C	P	b	TESTOP	Prepare to run 7" liner & held prejob safety meeting
	19:00	00:00	5	C	P	b	TESTOP	Pick up & run 7" liner
22-nov-00	00:00	03:00	3	C	P	b	TESTOP	Cont. to pick up and run 7" liner
	03:00	09:30	6,5	C	P	b	TESTOP	Run 7 " liner w/ drill pipe, filling every std. & break circ. every 1000 m. Tag bottom at 2647, pull back to 2645 m. Test surface line 300 bar.
	09:30	11:00	1,5	C	P	c	TESTOP	Circ., while nipple up cmt. hose, drop ball, land same in ball seat & pressure up to 150 bar to set hanger & release running tool, as per Nodeco specs.
	11:00	12:30	1,5	C	P	c	TESTOP	Pump 15 m^3 of 1.55sg spacer, Mix and pump 18 m3 of 1.90 sg cement slurry, as per recipe. Release dart, displace with 1,25 sg mud, 19.75m^3 to shear wiper plug, then displace another 16.25 m^3, all the time rotating string w/20 rpm. Plug not bumped.
	12:30	13:00	0,5	C	P	c	TESTOP	Set TSP packer as per Nodeco instructions. Nipple down cement hose and pull back 20 m.
	13:00	15:30	2,5	C	P	c	TESTOP	Circ. bottoms up, approx. 5 m^3 of cement/spacer solids discharged at shaker.
	15:30	17:30	2	C	P	**b**	TESTOP	POOH L/ down 12joints HWDP & Liner running tool
	17:30	18:30	1	C	P	e	TESTOP	L/ out Nodeco cmt. Head.
	18:30	00:00	5,5	**G**	**P**	**b**	TESTOP	Lay out 72jts of 5" DP, and 6.5" DCs.
23-nov-00	00:00	04:00	4	G	P	b	TESTOP	Cont. to lay out excess pipe 6.5" DCs.
	04:00	09:00	5	G	P	b	TESTOP	M/ up liner clean out Assy., P/ up 6" bit, 7" scraper, 9 x 4 3/4" DCs, 37 jts. 3 1/2" DP . 11stds 31/2" DP from derrick plus 24 stds 5", break circ. @ 1000m.
	09:00	10:30	1,5	I	P	d	TESTOP	M / up BOP isolation test tool, function test, unable to reset tool to running position. L/ down same. M/ up BOP Test Plug.
	10:30	12:00	1,5	I	P	d	TESTOP	Test kelly hose 35/345 bar. Attempted to test IBOP to 35/345 bar, leaking.
	12:00	14:30	2,5	I	P	d	TESTOP	RIH, with test plug, attempt to test BOP stack, lower press. OK unable to get good test @ 345 bar. POOH to change BOP test plug.
	14:30	18:00	3,5	I	P	d	TESTOP	Rerun BOP isolation test tool after redress, Test BOP Stack 35/345 bar. Use yellow pod, function test w/ blue pod. POOH w/ test tool and lay out same.
	18:00	20:30	2,5	G	P	b	TESTOP	Cont. to RIH w/liner clean out assembly, wash down from 1760 m to 1810 m.
	20:30	21:30	1	G	P	b	TESTOP	Cont. to RIH, work string w/ tieback / top dress mill from 1760 m to top of 7 " PBR @ 1795m. Circ. bottoms up
	21:30	22:30	1	G	P	f	TESTOP	Close MP Rams & pressure test Liner to 35/100 bar 10 min. OK.

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Operations Summary Report

Well Name:	7019/1-1	Start:	14.09.00
Contractor Name:	TRANSOCEAN	End:	05.10.00
Rig name:	TRANSOCEAN ARCTIC	Spud:	16.09.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
23-nov-00 (cont.)	22:30	00:00	1,5	G	P	b	TESTOP	Pump 10 m^3 drill water, pump 8m^3 Hi Vis pill & displace hole to 1.25 sg brine. Displace Choke & kill line & Booster line to 1.25 sg brine.
24-nov-00	00:00	05:00	5	G	P	b	TESTOP	Flow check OK, POOH L/ out PBR mill, bit sub, 9 5/8" scraper, 7" scraper, & bit.
	05:00	14:00	9	G	P	f	TESTOP	R/ up Schlumberger, & run #1 CBL/ USIT , Run#2 Gauge Ring & Junk basket.
	14:00	14:30	0,5	G	P	f	TESTOP	Rig down Schlumberger, close shear rams, test liner & Casing 35/ 345 bar OK.
	14:30	15:00	0,5	G	P	f	TESTOP	Clean up Rig Floor, & prepare to pick up Flow Head.
	15:00	17:00	2	G	P	f	TESTOP	P/ up Flow Head & nipple up same, & L/ down same.
	17:00	18:00	1	G	P	f	TESTOP	Held safety meeting W/ rig crew & Halliburton prior to picking up TCP guns.
	18:00	20:00	2	G	P	e	TESTOP	Change auto release firing head to mech. release fire head. Held safety meeting.
	20:00	23:00	3	G	P	e	TESTOP	P/ up TCP guns & test tools up to the LPR-N valve.
	23:00	23:30	0,5	G	P	e	TESTOP	Pressure test BHA against the TST flapper valve 450 bar. OK.
	23:30	00:00	0,5	G	P	e	TESTOP	Cont. to pick up Test tools # 1.
25-nov-00	00:00	19:00	19	G	P	b	TESTOP	RIH with test string to 1500 m, Test string to 450 bar from 10min. & RIH & test string before picking up fluted hanger to 450 bar. OK.
	19:00	21:00	2	G	P	e	TESTOP	M/ up fluted hanger & RIH w/ 5" DP for dummy run. Not able to land fluted hanger in wellhead.
	21:00	22:00	1	G	P	e	TESTOP	POH W/ 5" landing string, L/ down 1 single 3 1/2" tubing.
	22:00	22:30	0,5	G	P	e	TESTOP	RIH w fluted hanger & 5" DP and land in well head.
	22:30	00:00	1,5	G	P	f	TESTOP	R/ up Maritime wire line, run in & correlate to confirm space out.
26-nov-00	00:00	02:00	2	G	P	f	TESTOP	Run in and correlate to confirm space out.
	02:00	03:00	1	G	P	e	TESTOP	Close & open upper pipe rams to mark pipe, POOH with landing string & fluted hanger.
	03:00	06:00	3	G	P	e	TESTOP	P/up 2 x 3 1/2" pup jts, & SSTT, R/up DST equipment and function test same.
	06:00	08:00	2	G	P	b	TESTOP	RIH with landing string, picking up 4 1/2" tubing.
	08:00	09:00	1	G	P	e	TESTOP	P / up Lubricator valve & install hoses.
	09:00	11:00	2	G	P	e	TESTOP	Fill string w/ brine & pressure test the string against LPR-N to 450 bar, OK.
	11:00	13:00	2	G	P	f	TESTOP	Held safety meeting with crew, & change out bails to 45 ft.
	13:00	17:30	4,5	G	P	e	TESTOP	Pick up S.T.T. & nipple up Flex hose & kill line
	17:30	19:00	1,5	G	P	f	TESTOP	Nipple up surface lines.
	19:00	19:30	0,5	G	P	f	TESTOP	Held safety meeting w/ both crew and Halliburton on rig floor.
	19:30	22:30	3	G	P	f	TESTOP	Pressure test STT & spring to 450 bar, OK. Prepare to set packer.
	22:30	23:00	0,5	G	P	f	TESTOP	Set packer to Halliburton instructions & close middle pipe rams.
	23:00	00:00	1	G	P	f	TESTOP	Pressure up tubing to 20 bar to verify cycling of valves. Open LPR-N. Pressure test above RTTS packer to 120 bar. Function test PSD system & walk the lines & check all out.
27-nov-00	00:00	00:30	0,5	G	P	f	TESTOP	Pressure up tubing to 20 bar to verify cycling of valves. Open LPR-N. Pressure test above RTTS packer to 120 bar. Function test PSD system. Walked the lines & checking all lines.
	00:30	01:00	0,5	G	P	f	TESTOP	Cycle OMNI to circ. position.
	01:00	02:00	1	G	P	f	TESTOP	Prepare Nitrogen pumping unit, & pressure test lines to 450 bar OK.
	02:00	02:30	0,5	G	P	f	TESTOP	Start to spot nitrogen in tubing.

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Operations Summary Report

Well Name:	7019/1-1					Start:	14.09.00	
Contractor Name:	TRANSOCEAN					End:	05.10.00	
Rig name:	TRANSOCEAN ARCTIC					Spud:	16.09.00	

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
27-nov-00 (cont.)	02:30	03:00	0,5	G	P	f	TESTOP	Cycle OMNI in well test position.
	03:00	04:30	1,5	G	P	f	TESTOP	Prepare to detonate, pressure up tubing to 350 bar, guns activated, bleed of pressure, Well perforated @ 04:17 hrs.
	04:30	17:00	12,5	G	P	a	TESTOP	Flow & clean up well. DST # 1 on choke size 40/64 WHP 145 bar, temp. 22 deg. Gas Rate approx. 600000 m^3/d. Unable to flare due to high CO^2 content (70-80%). Hydrocarbons (+-20%). Only traces of H_2S (7ppm).
	17:00	00:00	7	G	P	a	TESTOP	Shut in well at tester valve (LPR-N) for build up.
28-nov-00	00:00	06:00	6	G	P	a	TESTOP	Shut in well at tester valve (LPR-N) for build up
	06:00	06:30	0,5	G	P	a	TESTOP	Held Safety meeting w/ all involved personnel, Bleed of pressure from tubing.
	06:30	07:00	0,5	G	P	a	TESTOP	Close master valve & open kill valve, flush all line w/ seawater to burner.
	07:00	08:00	1	G	P	a	TESTOP	Pressure up annulus to 114 bar, displace tubing with 10.4 m^3 brine. Close upper rams & bullhead 5 m^3 in to formation.
	08:00	09:30	1,5	G	P	a	TESTOP	Flow check observe well for 30 min. Pressure up annulus w/ 240 bar to open single shot RD circ. valve, then bleed off pressure & open Middle pipe rams, and release RTTS packer, Close choke line fail safe valve.
	09:30	11:30	2	G	P	a	TESTOP	Space out & close Upper pipe rams, Bullhead approx. 1.5 m^3. (Open hole volume from below packer to bottom perforations), line up and reverse circ. via choke manifold and mud gas separator.
	11:30	13:30	2	G	P	a	TESTOP	Open UPR Flow check, & circ. long way around, while circ. start to rig down flex hose
	13:30	19:00	5,5	G	P	e	TESTOP	Flow check, L/ down flow head & 45 ft bails, L/ down Lubricator, POOH w/ landing string & lay out SSTT.
	19:00	00:00	5	G	P	b	TESTOP	POOH. L / out 3 1/2" tubing.
29-nov-00	00:00	05:00	5	G	P	b	TESTOP	POOH lay out 3 1/2" tubing.
	05:00	10:30	5,5	G	P	e	TESTOP	POOH w / BHA and lay out same (test tools).
	10:30	16:00	5,5	G	P	e	TESTOP	L/out surface equipment, P / up flow head & SSTT & service break, L/ out landing string, 18 jts of 3 1 /2" tubing.
	16:00	20:30	4,5	L	P	f	TESTOP	Rig up & run EZSV retainer plug, w/ Maritime well Services. Set Retainer Top at 2506m.
	20:30	23:30	3	L	P	b	TESTOP	Make up stinger & RIH w / 3 1/2" & 5 1/2 " drill pipe to top of retainer.
	23:30	00:00	0,5	L	P	c	TESTOP	Displace hole to 1.25 sg mud.
30-nov-00	00:00	00:30	0,5	L	P	c	TESTOP	Displace hole to 1.25 sg mud.
	00:30	02:00	1,5	L	P	c	TESTOP	Test surface lines to 200 bar pre injection rate, 500 l / 79 bar / min. Pump 2 m^3 of fresh water, Mix & pump 3 m^3 of 1.9 sg slurry, displace w/ 4 m^3 water, followed by 15.9 m^3 1.25 sg mud, Sting in and squeeze 2.8 m^3 cmt., 8 m^3 in to formation, pull out.
	02:00	03:00	1	L	P	c	TESTOP	Pull back to 2475m. & circulate bottoms up.
	03:00	04:00	1	L	P	b	TESTOP	POOH to 1895m
	04:00	05:00	1	L	P	c	TESTOP	Pump 10 m^3 spacer, Mix & pump 9.3 m^3 of 1.92 sg slurry, followed by 1 m^3 water plus 11.3 m^3 of 1.25 sg mud
	05:00	05:30	0,5	L	P	b	TESTOP	POOH to 1450m.
	05:30	07:00	1,5	L	P	c	TESTOP	Circ. bottoms up. No cmt. Returns.
	07:00	08:30	1,5	L	P	b	TESTOP	POOH w/ 3 1/2" DP & stinger.
	08:30	13:00	4,5	L	P	b	TESTOP	RIH w/ 3 1/2" DP to 728m, RIH w/ 23 stds. 5 1/" DP & L / out same.
	13:00	14:30	1,5	L	P	b	TESTOP	RIH to 1503 m.
	14:30	15:30	1	L	P	c	TESTOP	Back flow, Circ. bottoms up & RIH & tag top of cmt. at 1600m.Load test plug with 10 ton weight.

NORSK AGIP

Operations Summary Report

Well Name:	7019/1-1	Start:	14.09.00
Contractor Name:	TRANSOCEAN	End:	05.10.00
Rig name:	TRANSOCEAN ARCTIC	Spud:	16.09.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
30-nov-00 (cont.)	15:30	17:00	1,5	L	P	b	RDMO	POOH to 900 m
	17:00	18:00	1	L	P	f	RDMO	Close MPR and pressure tested plug # 2 to 70 bar above 9 5/8" casing shoe test 165 bar.
	18:00	18:30	0,5	L	P	c	RDMO	Cemented plug # 3. Set at 900 m to 700 m. Pumped 5 m^3 FW spacer, mixed and pumped 7.4 m^3 1.25 sg slurry, followed by 0.5 m^3 FW and 7 m^3 1.25 sg mud.
	18:30	19:00	0,5	L	P	b	RDMO	Pulled back to 680 m.
	19:00	20:00	1	L	P	c	RDMO	Circulated bottoms up.
	20:00	22:00	2	L	P	b	RDMO	POOH, L/D excess pipe 42 jts of 3 1/2" drill pipe.
	22:00	00:00	2	L	P	a	RDMO	M/U 9 5/8" casing cutter assembly, RIH and cut casing at 652 m.
01-des-00	00:00	02:30	2,5	L	P	b	RDMO	POOH & lay down 9 5/8" cutter & Rack Marine Swivel in derrick.
	02:30	03:30	1	L	P	b	RDMO	M / up wear bushing retrieving tool RIH & attempt to retrieve wear bushing, negative - due to 2 wiper rubbers lost in hole.
	03:30	06:00	2,5	L	U	f	RDMO	Fish out wiper rubbers from BOP.
	06:00	07:00	1	L	P	e	RDMO	RIH w/ wear bushing running tool & recover wear bushing.
	07:00	11:00	4	L	P	e	RDMO	M / up Seal assy. running tool & W / 1std, & jet sub. below, RIH & wash wellhead seal area, set seal R/ tool &close Annular & test for leak 140 bar, retrieve seal assy. Flow check 10 min. POOH & L / out R/ tool & jet sub.
	11:00	15:30	4,5	L	P	e	RDMO	M / up 9 5/8" csg. spear, RIH. retrieve 9 5/8" casing, pull back 5m, flow check 10 min - POOH casing & rack back spear.
	15:30	16:30	1	L	P	e	RDMO	Prepare to lay down 9 5/8 " csg. & held safety meeting,
	16:30	18:30	2	L	P	e	RDMO	L / out 33 joint plus cut joint and wellhead joint of 9 5/8" casing.
	18:30	19:00	0,5	L	P	e	RDMO	R / down casing equipment.
	19:00	20:00	1	L	P	b	RDMO	RIH w / 5.5 " DP to 658m.
	20:00	20:30	0,5	L	P	c	RDMO	Circ. bottoms up prior to running cmt. Plug.
	20:30	22:00	1,5	L	P	c	RDMO	Pump 10 m^3 SW spacer, Mix & pump 34.7 m^3 of 1.90 sg slurry, pump 7 m^3 SW followed by 3.5 m^3 of 1.25 sg mud.
	22:00	22:30	0,5	L	U	b	RDMO	POOH back to 450m.
	22:30	23:00	0,5	L	P	c	RDMO	Circ. & displace hole & riser to seawater.
	23:00	23:30	0,5	L	P	d	RDMO	POOH w/ stinger.
	23:30	00:00	0,5	L	P	d	RDMO	L / out marine & annular Swivel, & 9 5/8" Casing spear assy.
02-des-00	00:00	03:30	3,5	L	P	d	RDMO	L / out Marine / Annular Swivel, & 9 5/8" casing spear. M / up 20" & 30" Casing cutter & rack back in derrick.
	03:30	04:30	1	L	P	f	RDMO	Cut & slip 33m drilling line.
	04:30	05:00	0,5	L	P	f	RDMO	Pressure test plug # 4 to 113 bar, 70 bar over 20 bar LOT.
	05:00	15:30	10,5	I	P	f	RDMO	Prepare & Pull diverter & marine Raiser, BOP Stack.
	15:30	16:00	0,5	L	P	b	RDMO	RIH w / 5 1/2" DP.
	16:00	17:00	1	I	P	f	RDMO	Set BOP Stack on test stump & tie down.
	17:00	17:30	0,5	L	P	b	RDMO	Stab into well & RIH & tag top cmt. 450m. Weight test plug to 10 ton.
	17:30	18:30	1	L	P	c	RDMO	Plug # 5. Mix & pump 34.7m^3 of 1.90 sg slurry, pump 0.7 m^3 sea water.
	18:30	19:30	1	L	P	b	RDMO	Pull back to 260 m & circ. bottoms up, POOH.
	19:30	21:00	1,5	L	P	e	RDMO	RIH W/ 20/30" casing cutting & retrieving assy.
	21:00	00:00	3	L	P	a	RDMO	Cut 20/30" casing.

NORSK AGIP

Operations Summary Report

Well Name:	7019/1-1	Start:	14.09.00
Contractor Name:	TRANSOCEAN	End:	05.10.00
Rig name:	TRANSOCEAN ARCTIC	Spud:	16.09.00

Date	From	To	Hours	Code 1	Code 2	Sub Code	Phase	Description of Operations
03-des-00	00:00	01:00	1	L	P	a	RDMO	Cut 20"/30" casing at 5 m below seabed. Pulled wellhead free with 25 ton overpull.
	01:00	03:30	2,5	L	P	a	RDMO	Pulled RGB, Wellhead and 20" x 30" casing cut. Completed seabed inspection at well center with ROV.
	03:30	17:00	13,5	M	P	d	RDMO	Pulled anchors: No 2 on bolster at 07:10 No 6 on bolster at 07:11 No 7 on bolster at 09:56 No 3 on bolster at 10:15 No 8 on bolster at 12:00 No 4 on bolster at 12:34 No 1 on bolster at 15:34 No 5 on bolster at 17:00 Off hire at 17:00

3.4 Technical Information and Reports

3.4.1 Bit Record

Well: 7019/1-1 Spud date: Oct. 06, 2000
Rig: Transocean Arctic Release date: Dec. 3, 2000

7019/1-1 Bit Record TABLE 1a

Bit no.	Bit Size Inch	Bit make	Bit type	Serial Number	IADC Code	Depth in m	Depth out m	Drilled interval m	Rotation hours	ROP m/hr	WOB (min/max) ton	RPM (min/max) rpm	I	O	D	L	B	G	O	R
1	17,5	Smith	10MPD	LK8568	111	214	250	36	16,0	2,25	2/9	50/90	2	2	WT	A	E	I	RG	PR
2	17,5	Smith	10MPD	LG4606	435	250	343	93	7,5	12,40	2/7	60/120	0	0	NO	A	E	I	NO	TD
2rr1	17,5	Smith	10MPD	LG4606	435	343	343	0					0	0	NO	A	E	I	NO	TD
3	26	Smith	MSDSSHC	LR4975	115	343	348	5	0,5	10,00	3/6	120/120	2	2	WT	A	E	I	NO	TD
4	12,25	Smith	MSDGHODC	LT6003	135	348	665	317	11,0	28,82	5/13	130/130	2	2	WT	A	E	I	SS	TD
3rr1	26	Smith	MSDSSHC	LR4975	115	348	665	317	11,5	27,57	2/13	140/140	2	2	WT	A	E	I	NO	TD
2rr2	17,5	Smith	10MPD	LG4606	435	665	670	5	0,5	10,00	5/6	120/130	0	0						
5	12,25	DPI	SD 646	1963202A		670	2015	1345	54,0	24,91	2/6	140/150	1	2	CT	T	D	1	WT	TD
6	8,5	DPI	SD946	1963040		2015	2095	80	5,0	16,00	5/12		1	1	BT	N	D	I	BT	DTF
7	8,5	DPI	PDC	1963527		2095	2200	105	14,5	7,24	2/12	100/140	5	1	BT	N	D	I	BT	PR
8	8,5	DPI	PDC	1963528		2200	2209	9	5,0	1,80	8/15	100/150	1	1	BT	N	D	I	BT	PR
9	8,5	Smith	20MFDYPD	LW4169	517	2209	2220	11	4,0	2,75	8/15	100/150	1	1	BT	M	E	I	CT	CP
10	8,5	H/C	URC437G58	1902487		2220	2235	15	12,9	1,16	2/14	60/120	2	1	WT	A	X	I	PN	PR
11	8,5	Smith	20MFD	LW 4167	537	2235	2335	100	41,0	2,44	8/15	100/125	2	6	BT	M	E	I	BT	LN
12	8,5	Smith	20 MFDGPD	LW 1712	537	2335	2433	98	51,0	1,92	10/15	120/180	2	2	NO	A	E	I	NO	LN
9rr1	8,5	Smith	20MFDYPD	LW4169	517	2433	2457	24	13,5	1,78	10/12	130/180	3	3	BT	A	E	I	BT	CP
13	8,5	H/C	ARC 425C3	1209461		2457	2464	7	9,5	0,74	5/15	60 /120	6	6	WT	A	X	I	NO	PR
14	8,5	Smith	DS	LW 1709	537	2464	2550	86	36,5	2,36	10/20	130/170	8	8	BT	A	E	3	FC	TW
15	8,5	Smith	15 MFGD	LW 3149	111	2550	2561	11	3,0	3,67	10/15	130/130	1	1	CT	S	E	I	NO	CP
10rr1	8,5	H/C	URC 437G58	1902487		2561	2568	7	10,0	0,70	31/3	60/120	3	3	WT	A	X	I	NO	PR
16	8,5	DPI	5D944 M	1963528		2568	2569	1	2,5	0,40	3/10	60/170	2	2	WT	N	D	I	WT	DTF
17	8,5	HTC	MX- 35CGDX	FO4DS	547	2569	2727	158	42,0	3,76	2/22	80/160	0	0						
18	8,5	Hughes	MX35CGD	M64DJ	537	2727	2794	67	17,5	3,83			2	2	WT	A	E	1	NO	DTF
19	8,5	Hughes	MX40CGDX	M81DF	637	2794	2875	81	23,5	3,45	16/19	90/110	2	2	WT	A	E	1	NO	WO
20	8,5	Hughes	K33CTX	JR4255	M841	2875	2964	89	27,5	3,24	2/11	60/60	8	8	WT	A	D	2	BT	PR
21	8,5	Hughes	MX35CGD	A18DC	537	2964	3003	39	19,5	2,00	15/20	55/110	1	2	BT	H	E	I	NO	WO
21rr1	8,5	Hughes	MX35CGD	A18DC	537	3003	3003	0					1	2	BT	H	E	1	NO	WO
22	8,5	Hughes	MX35CGD	A18DC	537	3003	3003	0					0	0						
23	6	Smith	XC	LY5012	111	2647	2647	0					0	0						

Well: 7019/1-1 Spud date: Oct. 06, 2000
Rig: Transocean Arctic Release date: Dec. 3, 2000

7019/1-1 Bit Record TABLE 1b

Bit no.	Bit Size In	Jet size in 1/32"	T.F.A. mm2	Pump output Lpm	Pump pressure bar	deltaP Bit bar	Jet vel. m/min	Mud type	Mud weight sg	Mud visc. Cp	Mud Y.P. lb/100ft2	Depth m	Incl. deg.	Az. deg.
1	17,5	18/18/18/15	592,3	4600	125	96	129	Spud Mud	1,03			214	0	0
2	17,5	18/18/18/15	592,3	2100		20		Spud Mud	1,03			242	0,5	359
2rr1	17,5	18/18/18/15	592,3	4600	145	96	129	Spud Mud	1,03					
3	26	22/22/22/18	878,8	4600	145	43	92	Spud Mud	1,03					
4	12,3	20/20/20/13	677,4	3825	140	51	94	Spud Mud	1,03			655	0,8	160,3
3rr1	26	18/18/18/18	641,3	4600	157	82	120	Spud Mud	1,03					
2rr2	17,5	18/18/18/15	592,3	3200	180	58	90	Spud Mud	1,30					
5	12,3	11/11/11/11/11/13/13/13/13	633,9	3600	240	65	95	Formate/Pol	1,30	14	11	1990	1,2	339
6	8,5	11/11/11/11/12/12/12/12	524,5	2600	237	53	83	Formate/Pol	1,40	13	7	2171	2,5	339
7	8,5	11/11/11/11/12/12/12/12	524,5	2500	245	49	79	Formate/Pol	1,40	13	5			
8	8,5	11/11/11/11/12/12/12/12	524,5	2300	250	41	73	Formate/Pol	1,40	12	7			
9	8,5	16/16/16	380,0	2300	230	79	101	Formate/Pol	1,40	11	9			
10	8,5	(Core bit)						Formate/Pol	1,40	12	8	2229	2,7	341
11	8,5	16/16/16	380,0	2300	210	79	101	Formate/Pol	1,40	13	8	2317	3,1	342,9
12	8,5	16/16/16	380,0	2340	225	82	103	Formate/Pol	1,40	11	10			
9rr1	8,5	16/16/16	380,0	2340	230	82	103	Formate/Pol	1,40	14	7	2432	7,2	338,4
13	8,5	(Core bit)		985	0			Formate/Pol	1,40	12	7	2461	7,4	337,8
14	8,5	14/16/18	384,0	2350	265	78	102	Formate/Pol	1,35	13	8	2520	7,7	337,2
15	8,5	16/18/18	447,3	2300	0	53	86	Formate/Pol	1,30	11	9	2548	7,9	337,7
10rr1	8,5	(Core bit)		1000	35			Formate/Pol	1,25	9	9	2577	7,8	338
16	8,5	11/11/11/11/12/12/12/12	524,5	2300	233	37	73	Formate/Pol	1,25	10	9	2605	7,9	338,9
17	8,5	16/16/16	380,0	2300	207	71	101	Formate/Pol	1,25	9	9	2605	7,9	338,9
18	8,5	16/16/16	380,0	2100	179	59	92	Formate/Pol	1,25	11	8	2781	6,7	335,6
19	8,5	16/16/16	380,0	2300	200	71	101	Formate/Pol	1,25	11	8			
20	8,5			2100	200		92	Formate/Pol	1,25	9	9			
21	8,5	16/16/16	380,0	2300	177	71	101	Formate/Pol	1,25	10	8			
21rr1	8,5	16/16/16	380,0				0	Formate/Pol	1,25					
22	8,5	16/16/16	380,0				0	Formate/Pol	1,25					
23	6	25/25/25	927,8				0	Formate/Pol	1,25					

3.4.2 BHA Record

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 36" hole	**1**	**1**	**06-okt-00**	**07-okt-00**	**214**	**250**

Description	Number	OD	ID	Length
17 1/2" Bit	1	17,50	2,81	0,43
36" Hole Opener	1	36,00	2,81	4,26
Bit Sub	1	9,50	3,00	0,86
NMDC	1	9,50	2,81	8,96
Spiral Drill Collar	2	9,50	2,81	18,03
Cross Over	1	9,50	2,81	0,9
Spiral Drill Collar	6	8,00	2,88	54,73
Jar - Eastman Hyd.	1	8,00	2,81	9,78
Spiral Drill Collar	2	8,00	2,81	18,38
Acc – Wilson	1	8,00	2,81	10,25
Spiral Drill Collar	2	8,00	2,81	18,18
Cross Over	1	8,00	3,50	1,17
H.W.D.P.	9	5,50	3,25	82,26
			Total length	**228,19**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 17 1/2" pilot hole	**2**	**2**	**07-okt-00**	**08-okt-00**	**250**	**343**

Description	Number	OD	ID	Length
17 1/2" Bit	1	17,50	2,81	0,43
Bit Sub	1	9,50	2,81	1,3
NMDC	1	9,50	2,81	8,96
Spiral Drill Collar	2	9,50	2,81	18,03
Cross Over	1	9,50	2,81	0,9
Spiral Drill Collar	6	8,00	2,88	54,73
Jar - Eastman Hyd.	1	8,00	2,81	9,78
Spiral Drill Collar	2	8,00	2,81	18,38
Acc – Wilson	1	8,00	2,81	10,25
Spiral Drill Collar	2	8,00	2,81	18,18
Cross Over	1	8,00	3,50	1,17
H.W.D.P.	9	5,50	3,25	82,26
			Total length	**224,37**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Open 17 1/2" pilot hole to 36"	**3**	**2rr1**	**08-okt-00**	**09-okt-00**	**250**	**343**

Description	Number	OD	ID	Length
17 1/2" Bit	1	17,50	2,81	0,43
Bit Sub	1	9,50	2,81	0,87
Cross Over	1	9,50	2,81	0,3
Hole Opener	1	36,00	2,81	4,26
Bit Sub	1	9,50	3,00	0,86
NMDC	1	9,50	2,81	8,96
Spiral Drill Collar	2	9,50	2,81	18,03
Cross Over	1	9,50	2,81	0,9
Spiral Drill Collar	6	8,00	2,88	54,73
Jar - Eastman Hyd.	1	8,00	2,81	9,78
Spiral Drill Collar	2	8,00	2,81	18,38
Acc – Wilson	1	8,00	2,81	10,25
Spiral Drill Collar	2	8,00	2,81	18,18
Cross Over	1	8,00	3,50	1,17
H.W.D.P.	9	5,50	3,25	82,68
			Total length	**229,78**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill out 30" shoe	**4**	**3**	**09-okt-00**	**10-okt-00**	**343**	**348**

Description	Number	OD	ID	Length
26" Bit	1	26,00	2,81	0,65
Bit Sub	1	9,50	2,81	0,87
NMDC	1	9,50	2,81	8,96
Spiral Drill Collar	2	9,50	2,81	18,03
Cross Over	1	9,50	2,81	0,9
Spiral Drill Collar	6	8,00	2,88	54,73
Jar - Eastman Hyd.	1	8,00	2,81	9,78
Spiral Drill Collar	2	8,00	2,81	18,38
Acc – Wilson	1	8,00	2,81	10,25
Spiral Drill Collar	2	8,00	2,81	18,18
Cross Over	1	8,00	3,50	1,17
H.W.D.P.	9	5,50	3,25	82,68
			Total length	**224,58**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
12 1/4" pilot hole	**5**	**4**	**10-okt-00**	**11-okt-00**	**348**	**665**

Description	Number	OD	ID	Length
12 1/4" Bit	1	12,25	2,81	0,31
Stab (IB) 12 ¼" FG	1	8,00	3,00	1,75
M.W.D.	1	8,25	0,00	16,37
Cross Over	1	8,25	3,00	1,01
LWD	1	8,00	0,00	10,2
Stab (IB) 12 ¼" FG	1	8,00	3,00	1,85
Spiral Drill Collar	1	8,00	2,81	9,12
Stab (IB) 12 ¼" FG	1	8,00	2,81	2,05
Drill Collar	8	8,00	2,81	45,61
Jar	1	8,00	2,81	9,78
Drill Collar	2	8,00	2,81	18,38
Accelerator	1	8,00	2,81	10,25
Drill Collar	2	8,00	2,81	18,18
Cross Over	1	8,00	2,81	1,17
H.W.D.P.	9	5,50	3,63	82,68
			Total length	**228,71**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Open pilot hole to 26"	**6**	**3rr1**	**11-okt-00**	**12-okt-00**	**348**	**665**

Description	Number	OD	ID	Length
26” Bit	1	26,00	2,81	0,65
Bit Sub	1	9,50	2,81	0,86
Cross Over	1	9,50	3,00	0,9
M.W.D.	1	8,25	3,00	16,37
Cross Over	1	8,25	3,00	1,01
Spiral Drill Collar	7	8,00	2,81	63,73
Jar - Eastman Hyd.	1	8,00	2,81	9,78
Spiral Drill Collar	2	8,00	2,81	18,38
Acc – Wilson	1	8,00	2,81	10,25
Spiral Drill Collar	2	8,00	2,81	18,18
Cross Over	1	8,00	3,50	1,17
H.W.D.P.	9	5,50	3,25	82,68
			Total length	**223,96**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 12 1/4" hole	**8**	**5**	**14-okt-00**	**17-okt-00**	**670**	**2015**

Description	Number	OD	ID	Length
12 1/4" Bit	1	12,25	0,00	0,53
SDD (Straight Hole Drilling Device)	1	9,50	0,00	10,14
Cross Over	1	9,63	3,00	1,22
Roller reamer	1	12,43	3,00	2,27
Cross Over	1	7,93	2,81	0,65
Bit Sub	1	8,00	2,87	0,86
Spiral Drill Collar	1	8,25	2,87	5,47
M.W.D.	1	8,25	2,87	10,9
Spiral Drill Collar	1	8,25	2,87	1,01
Acc – Wilson	1	0,00	0,00	10,2
Drill Collar	8	8,00	0,00	72,93
Jar - Eastman Hyd.	1	8,37	2,81	9,78
Drill Collar	2	8,00	2,81	18,38
Acc – Wilson	1	8,37	2,81	10,25
Drill Collar	2	8,00	2,81	18,18
Cross Over	1	8,00	3,50	1,17
H.W.D.P.	9	5,50	3,31	82,68
			Total length	**256,62**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	**9**	**6**	**19-okt-00**	**19-okt-00**	**2015**	**2095**

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	0,00	0,42
Roller reamer	1	6,50	2,00	2,29
M.W.D.	1	6,75	2,81	17,59
Roller reamer	1	8,50	2,00	2,22
NMDC	1	6,50	2,81	8,58
Drill Collar	1	6,50	2,81	9,47
Roller reamer	1	8,50	2,00	2,14
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1021,54**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	**10**	**7**	**20-okt-00**	**21-okt-00**	**2095**	**2200**

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	0,00	0,42
Roller reamer	1	6,50	2,00	2,29
M.W.D.	1	6,75	2,81	17,59
Roller reamer	1	8,50	2,00	2,22
NMDC	1	6,50	2,81	8,58
Drill Collar	1	6,50	2,81	9,47
Roller reamer	1	8,50	2,00	2,14
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92

	Total length	**1021,54**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	**11**	**8**	**21-okt-00**	**22-okt-00**	**2200**	**2209**

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	0,00	0,42
Stab (NB) 8 ½"	1	6,50	2,81	1,73
M.W.D.	1	6,75	2,81	17,59
Stab (IB) 8 1/2"	1	8,50	2,81	1,71
NMDC	1	6,50	2,81	8,58
Drill Collar	1	6,50	2,81	9,47
Roller reamer	1	8,50	2,00	2,14
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1020,47**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	**12**	**9**	**22-okt-00**	**22-okt-00**	**2209**	**2220**

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	0,00	0,25
Roller reamer	1	6,50	2,00	2,29
M.W.D.	1	6,75	2,81	17,59
Roller reamer	1	8,50	2,00	2,22
NMDC	1	6,50	2,81	8,58
Drill Collar	1	6,50	2,81	9,47
Roller reamer	1	8,50	2,00	2,14
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1021,37**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
8 1/2" coring	**13**	**10**	**22-okt-00**	**22-okt-00**	**2220**	**2235**

Description	Number	OD	ID	Length
8 1/2" Core Bit	1	8,50	0,00	0,28
Cross Over	1	6,75	5,38	0,3
Core Barrel	3	6,75	5,38	29,84
Cross Over	1	6,75	3,12	0,71
Cross Over	1	6,50	2,00	0,79
Drill Collar	1	6,50	2,81	9,47
Stab (IB) 8 1/2" FG	1	6,50	2,81	2,14
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1022,36**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	**14**	**11**	**23-okt-00**	**25-okt-00**	**2235**	**2335**

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	0,00	0,25
Roller reamer	1	6,50	2,00	2,29
M.W.D.	1	6,75	2,81	17,59
Roller reamer	1	8,50	2,00	2,22
NMDC	1	6,50	2,81	8,58
Drill Collar	1	6,50	2,81	9,47
Roller reamer	1	8,50	2,00	2,14
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1021,37**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	**15**	**12**	**25-okt-00**	**28-okt-00**	**2335**	**2433**

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	0,00	0,25
Stab (NB) 8 ½" FG	1	6,00	2,81	1,98
M.W.D.	1	6,75	2,81	16,95
Stab (IB) 8 1/2" FG	1	6,25	2,25	1,71
NMDC	1	6,50	2,81	8,58
Drill Collar	1	6,50	2,81	9,47
Stab (IB) 8 1/2" FG	1	6,00	2,50	1,46
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1019,23**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	**16**	**9rr1**	**28-okt-00**	**29-okt-00**	**2433**	**2457**

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	0,00	0,25
Stab (NB) 8 ½" FG	1	6,00	2,81	1,98
M.W.D.	1	6,75	2,81	18,15
Stab (IB) 8 1/2" FG	1	6,25	2,25	1,71
NMDC	1	6,50	2,81	8,58
Drill Collar	1	6,50	2,81	9,47
Stab (IB) 8 1/2" FG	1	6,00	2,50	1,46
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1020,43**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
8 1/2" coring	17	13	29-okt-00	30-okt-00	2457	2464

Description	Number	OD	ID	Length
8 1/2" Core Bit	1	8,50	0,00	0,28
Cross Over	1	6,75	5,38	0,3
Core Barrel	3	6,75	5,38	29,81
Cross Over	1	6,75	3,12	0,71
Cross Over	1	6,50	2,00	0,79
Drill Collar	1	6,50	2,81	9,47
Stab (IB) 8 1/2" FG	1	6,50	2,81	2,14
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1022,33**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	18	14	30-okt-00	02-nov-00	2464	2550

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	0,00	0,25
Stab (NB) 8 ½" FG	1	6,00	2,81	1,98
M.W.D.	1	6,75	2,81	16,95
Stab (IB) 8 1/2" FG	1	6,25	2,25	1,71
NMDC	1	6,50	2,81	8,58
Drill Collar	1	6,50	2,81	9,47
Stab (IB) 8 1/2" FG	1	6,00	2,50	1,46
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1019,23**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	19	15	03-nov-00	04-nov-00	2550	2561

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	0,00	0,25
Roller reamer	1	6,50	2,00	1,87
M.W.D.	1	6,75	2,81	18,15
Roller reamer	1	8,50	2,00	1,54
NMDC	1	6,50	2,81	8,58
Drill Collar	1	6,50	2,81	9,47
Roller reamer	1	8,50	2,00	1,62
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1020,31**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
8 1/2" coring	**20**	**10rr1**	**04-nov-00**	**05-nov-00**	**2561**	**2568**

Description	Number	OD	ID	Length
8 1/2" Core Bit	1	8,50	0,00	0,28
Cross Over	1	6,75	5,38	0,3
Core Barrel	3	6,75	5,38	29,81
Cross Over	1	6,75	3,12	0,71
Cross Over	1	6,50	2,00	0,79
Drill Collar	1	6,50	2,81	9,47
Stab (IB) 8 1/2" FG	1	6,50	2,81	2,14
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1022,33**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	**21**	**17**	**05-nov-00**	**08-nov-00**	**2569**	**2727**

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	0,00	0,25
Roller reamer	1	6,50	2,00	1,87
M.W.D.	1	6,75	2,81	18,15
Roller reamer	1	8,50	2,00	1,54
NMDC	1	6,50	2,81	8,58
Drill Collar	1	6,50	2,81	9,47
Roller reamer	1	8,50	2,00	1,62
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1020,31**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	**22**	**18**	**08-nov-00**	**08-nov-00**	**2727**	**2794**

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	0,00	0,25
Bit sub	1	0,00	0,00	0,92
Roller reamer	1	6,50	2,00	1,72
M.W.D.	1	6,75	2,81	18,66
Roller reamer	1	8,50	2,00	1,54
NMDC	1	6,50	2,81	8,58
Drill Collar	1	6,50	2,81	9,47
Roller reamer	1	8,50	2,00	1,62
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1021,59**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	**23**	**19**	**09-nov-00**	**10-nov-00**	**2794**	**2875**

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	0,00	0,25
Bit sub	1	0,00	0,00	0,92
Roller reamer	1	6,50	2,00	1,72
M.W.D.	1	6,75	2,81	17,32
Roller reamer	1	8,50	2,00	2,22
NMDC	1	6,50	2,81	8,58
Drill Collar	1	6,50	2,81	9,47
Roller reamer	1	8,50	2,00	1,62
Drill Collar	11	6,00	2,81	103,24
Jar - Dailey Hyd.	1	6,50	2,50	9,43
Drill Collar	2	6,50	2,81	18,93
Acc – Griffith	1	6,50	2,75	10,19
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	24	5,00	4,28	707,92
			Total length	**1020,93**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	**24**	**20**	**10-nov-00**	**12-nov-00**	**2875**	**2964**

Description	Number	OD	ID	Length
8 1/2" Bit	1	0,00	0,00	0,54
Cross Over	1	6,50	2,81	0,2
Turbine	1	0,00	0,00	12,9
Cross Over	1	6,50	2,81	0,81
Bit Sub	1	6,00	2,81	0,92
Drill Collar	1	6,50	2,81	9,46
Stab (IB) 12 ¼" FG	1	8,25	2,81	1,72
Drill Collar	11	6,50	2,81	103,58
Jar - Dailey Mech.	1	6,25	2,25	9,66
Drill Collar	2	6,50	2,81	18,76
Acc – Griffith	1	6,25	2,25	10,22
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Hang Off Sub	1	6,00	2,81	0,8
Drill Pipe	72	5,00	4,28	707,9
Cross Over	1	6,75	2,81	0,62
			Total length	**1006,41**

Purpose	BHA No	Bit No	Date in	Date out	Depth in	Depth out
Drill 8 1/2" hole	**25**	**21**	**12-nov-00**	**13-nov-00**	**2964**	**3003**

Description	Number	OD	ID	Length
8 1/2" Bit	1	8,50	2,25	0,25
Stab (NB) 8 ½" FG	1	6,00	2,81	1,87
NMDC	1	6,50	2,75	8,58
Stab (IB) 8 1/2" FG	1	6,25	2,25	2,13
Drill Collar	2	6,50	2,81	18,93
Stab (IB) 8 1/2" FG	1	6,00	2,50	1,72
Drill Collar	10	6,00	2,81	94,11
Jar - Dailey Hyd.	1	6,50	2,50	9,66
Drill Collar	2	6,50	2,81	18,76
Acc – Griffith	1	6,50	2,75	10,22
Drill Collar	2	6,50	2,81	18,92
H.W.D.P.	12	5,00	3,00	109,4
Side Entry Sub	1	6,37	3,00	0,8
Drill Pipe	72	5,00	4,28	707,9
Cross Over	1	6,75	3,00	0,62
			Total length	**1003,87**

3.4.3 Casing Data Summary

OD	30"	20"	9 5/8"	7" liner
WEIGHT (PPF)	310	133	53.5	29
GRADE	X-52	X-56	P-110	L-80
CONNECTION	ST-2B	RL-4S	Antares MS	Antares MS
PIPE ID (inches)	27	18.730	8.535	6.184
PIPE DRIFT (inches)	27	18.542	8.5	6.059
CONN. ID (inches)	28	18.63	8.5	6.059
BURST RATING (bar)	N/A	211	751	563
COLLAPSE RATING (bar)	N/A	103	547	484
TENSION RATING (ton)	N/A	964	776	307
BURST S.F.	N/A	2.19	4.23	1.29
MINIMUM S.F.	N/A	1.05	1.10	1.10
COLLAPSE S.F.	N/A	1.45	7.99	4.22
MINIMUM S.F.	N/A	1.10	1.10	1.10
TENSION S.F.	N/A	2.40	8.23	3.53
MINIMUM S.F.	N/A	1.70	1.8	1.70
CASING TOP (m)	214	214	214	1801
CASING BTM. (m)	336	658	2004	2645
CASING LENGTH (m)	122	444	1790	844

3.4.4 Leak-Off Test Results

In well 7019/1-1 the following leak-off tests were made:

1. After drilling out of the 20” shoe set at 658 m a Leak-Off Test was performed to an equivalent mud weight of 1.65 sg. (When the test had reached a pressure against the formation equivalent to 1.65 sg, a leak-off into the formation had still not been achieved and it was at this point decided to terminate the test. This test was therefore the equivalent of a Formation Integrity Test).

2. After drilling out of the 9 5/8” shoe set at 2004 m a Leak-Off Test was performed to an equivalent mud weight of 1.73 sg.

3.4.5 Cementing Reports

3.4.5.1 30" Conductor Pipe

Well 7019/1-1		GENERAL DATA		30" casing
SHOE DEPTH	**336** m-RKB	**30** CSG - I.D.= **28,000**	WT=	**310,00** ppf
SEABED	**214** m-RKB	OH - I.D.= **36,000**		
HOLE SIZE	**36** in			
EXCESS IN OPEN HOLE	**137** %	FRAC.GRAD @ SHOE	**1,33**	SG-EMW
TOP CMT LEAD SLURRY	**214** m-RKB	FG @ ML	**1,20**	SG-EMW
TOP CMT TAIL SLURRY	**323** m-RKB	MUD WEIGHT (SW)	**1,03**	SG
B.H.S.T.	**8** Deg C	WATER DEPTH	**190**	m

TOTAL DRY CMT REQUIRED	**>>>**	**48,3 ton**	**<<<**

SLURRY VOLUME CALCULATION				
ANNULAR VOLUME CSG-OPEN HOLE	200,66 l/m	=	24,48 m3.	864,4 Cuft
EXCESS OVER THEOR. OPEN HOLE ANN.VOLUME	274,90 l/m	=	33,54 m3.	1 184,2 Cuft
ANNULAR VOLUME CSG-CSG	200,66 l/m	=	0,00 m3.	0,0 Cuft
5 m INTERNAL VOL. (SHOE-COLL)	397,26 l/m	=	1,99 m3.	70,1 Cuft
TOTAL SLURRY VOLUME =			**60,00** m3.	2 118,7 Cuft

SPACERS

TYPE : SEA WATER

CEMENT SLURRY COMPOSITION

LEAD SLURRY @	**1,56**	**SG**	**F/**	**323**	**TO**	**214**	**m.**		
SLURRY VOLUME	**109** m of ANNULUS + OPEN HOLE EXCESS							**51,84 m3.**	**1 830,3 Cuft**
"G" CEMENT Yield	**129,42** l/100kg				0,773 ton/m3			40,05 ton	939,3 Sx
NF-6/ANTIFOAM	**0,10** l/100kg							40,05 liter	10,6 Gall
ECONOLITE/EXTENDER	**3,20** l/100kg							1281,67 liter	339,1 Gall
SEAWATER MIXING	**95,07** l/100kg							38,08 m3.	239,5 Bbl
TOTAL MIX FLUID	**98,37** l/100kg							39,40 m3.	247,8 Bbl
ESTIMATED TICKENING TIME @ 70 BC hr.min	**> 6**								

TAIL SLURRY @	**1,95**	**SG**	**F/**	**336**	**TO**	**323**	**m.**		
SLURRY VOLUME	**13** m of ANNULUS							**6,18 m3.**	**218,3 Cuft**
"G" CEMENT Yield	**75,06** l/100kg				1,332 ton/m3			8,24 ton	193,2 Sx
NF-6/ANTIFOAM	**0,10** l/100kg							8,24 liter	2,2 Gall
CaCl2/ACCELERATOR	**4,35** l/100kg							358,28 liter	94,8 Gall
SEAWATER MIXING	**39,56** l/100kg							3,26 m3.	20,5 Bbl
TOTAL MIX FLUID	**44,01** l/100kg							3,62 m3.	22,8 Bbl
ESTIMATED TICKENING TIME @ 70 BC hr.min	**+/- 3**								

CEMENTING TECHNIQUE : **5" DP INNER STRING STAB IN SHOE**

CMT SLURRY HYROSTATIC GRADIENT : EVALUATION

FRACTURE-P @ NEW SHOE	43,82 Bar	636 Psi
HYDRO-P @ MUD LINE	19,19 Bar	278 Psi
CMT HYDRO-P @ NEW SHOE	38,35 Bar	556 Psi
MIN. PRESSURE MARGIN AT NEW SHOE AT THE END OF THE CEMENT JOB	5,47 Bar	79 Psi

3.4.5.2 20" Casing

Well 7019/1-1	GENERAL DATA			20" casing
SHOE DEPTH	**658** m-RKB	**20** CSG - I.D.= **18,730**	WT= **133,00**	ppf
PREVIOUS CASING	**336** m-RKB	**30** CSG - I.D.= **28,000**	WT= **310,00**	ppf
HOLE SIZE	**26,00** in			
EXCESS (Lead slurry)	**88** %	FRAC.GRAD @ SHOE	**1,61** SG-EMW	
TOP CMT LEAD SLURRY	**214** m-RKB	FG @ PREVIOUS CSG	**1,33** SG-EMW	
TOP CMT TAIL SLURRY	**561** m-RKB	MUD WEIGHT	**1,03** SG	
B.H.S.T.	**17** Deg C			

TOTAL DRY CMT REQUIRED >>>	**94,7 ton**	<<<

SLURRY VOLUME CALCULATION			
ANNULAR VOLUME CSG-OPEN HOLE 139,85 l/m =	45,03 m3.	1 590,1 Cuft
EXCESS OVER THEOR. OPEN HOLE ANN.VOLUME	39,63 m3.	1 399,3 Cuft
ANNULAR VOLUME CSG-CSG 194,58 l/m =	23,74 m3.	838,2 Cuft
14 m INTERNAL VOL. (SHOE-COLL) 177,76 l/m =	2,49 m3.	87,9 Cuft
TOTAL SLURRY VOLUME =	**110,89** m3.	3 915,4 Cuft

SPACERS

TYPE: Circulate one casing volume of mud prior to cementing

CEMENT SLURRY COMPOSITION

LEAD SLURRY @ **1,56 SG** **F/ 561** **TO 214 m.**		
SLURRY VOLUME **347** m of ANNULUS + EXCESS	**94,83 m3.**	**3 348,6 Cuft**
"G" CEMENT Yield **129,42** l/100kg 0,773 ton/m3	73,28 ton	1 718,5 Sx
ECONOLITE **3,20** l/100kg	2344,81 liter	620,3 Gall
NF-6/DEFOAMER **0,10** l/100kg	73,28 liter	19,4 Gall
SEAWATER **95,07** l/100kg	69,66 m3.	438,1 Bbl
TOTAL MIX FLUID **98,37** l/100kg	72,08 m3.	453,3 Bbl
ESTIMATED TICKENING TIME @ 70 BC hr.min **> 6**		

TAIL SLURRY @ **1,92 SG** **F/ 658** **TO 561 m.**		
SLURRY VOLUME **97** m of ANNULUS+INT.VOL.(SHOE-COLL)	**16,05 m3.**	**566,9 Cuft**
"G" CEMENT Yield **75,07** l/100kg 1,332 ton/m3	21,39 ton	501,7 Sx
HR-4L/RETARDER **0,70** l/100kg	149,70 liter	39,6 Gall
NF-6/DEFOAMER **0,10** l/100kg	21,39 liter	5,7 Gall
DRLG WATER MIXING **43,22** l/100kg	9,24 m3.	58,1 Bbl
TOTAL MIX FLUID **44,02** l/100kg	9,41 m3.	59,2 Bbl
ESTIMATED TICKENING TIME @ 70 BC hr.min **3 - 4**		

CEMENTING TECHNIQUE : CONVENTIONAL DOUBLE PLUG CEMENTING

CMT SLURRY HYROSTATIC GRADIENT : EVALUATION		
FRACTURE-P @ PREVIOUS SHOE	43,82 Bar	636 Psi
FRACTURE-P @ NEW SHOE	103,88 Bar	1507 Psi
CMT HYDRO-P @ PREV. SHOE	40,29 Bar	584 Psi
CMT HYDRO-P @ NEW SHOE	93,00 Bar	1349 Psi
MIN. PRESSURE MARGIN AT PREV. SHOE AT THE END OF THE CEMENT JOB	3,53 Bar	51 Psi
MIN. PRESSURE MARGIN AT NEW SHOE AT THE END OF THE CEMENT JOB	10,89 Bar	158 Psi

3.4.5.3 9 5/8" Casing

Well 7019/1-1	GENERAL DATA			9 5/8" casing
SHOE DEPTH	**2004** m-RKB	**9,625** CSG - I.D.= **8,535**	WT= **53,50**	ppf
PREVIOUS CASING	**658** m-RKB	**20** CSG - I.D.= **18,730**	WT= **133,00**	ppf
HOLE SIZE	**12,25** in			
EXCESS	**0** %	FRAC.GRAD @ SHOE	**1,72** SG-EMW	
TOP CMT LEAD SLURRY	**N/A** m-RKB	FG @ PREVIOUS CSG	**1,61** SG-EMW	
TOP CMT SLURRY	**1495** m-RKB	MUD WEIGHT	**1,40** SG	
B.H.S.T.	**58** Deg C			

TOTAL DRY CMT REQUIRED >>>	22,3 ton	<<<

SLURRY VOLUME CALCULATION			
ANNULAR VOLUME CSG-OPEN HOLE	29,10 l/m =	14,81 m3.	522,9 Cuft
EXCESS OVER THEOR. OPEN HOLE ANN.VOLUME		0,00 m3.	0,0 Cuft
ANNULAR VOLUME CSG-CSG	130,82 l/m =	0,00 m3.	0,0 Cuft
44 m INTERNAL VOL. (SHOE-COLL)	36,91 l/m =	1,62 m3.	57,3 Cuft
	TOTAL SLURRY VOLUME =	**16,43** m3.	580,3 Cuft

SPACERS				LENGTH
TYPE : **Mud**	**1,55** SG	VOL. =	**10,00** m3.	76,4 m.

CEMENT SLURRY COMPOSITION

LEAD SLURRY @ **N/A** **SG** **F/** **N/A** **TO** **N/A** **m.**			
SLURRY VOLUME		**0,00 m3.**	**0,0 Cuft**
"G" CEMENT Yield **129,40** l/100kg	0,773 ton/m3	0,00 ton	0,0 Sx
ECONOLITE **3,20** l/100kg		0,00 liter	0,0 Gall
NF-6/DEFOAMER **0,10** l/100kg		0,00 liter	0,0 Gall
SEAWATER **95,05** l/100kg		0,00 m3.	0,0 Bbl
TOTAL MIX FLUID **98,35** l/100kg		0,00 m3.	0,0 Bbl
ESTIMATED TICKENING TIME @ 70 BC hr.min **N/A**			

TAIL SLURRY @ **1,92** **SG** **F/** **2004** **TO** **1495** **m.**			
SLURRY VOLUME **509** m of ANNULUS+INT.VOL.(SHOE-COLL)		**16,43 m3.**	**580,3 Cuft**
"G" CEMENT Yield **73,69** l/100kg	1,357 ton/m3	22,30 ton	523,2 Sx
HR-4L/RETARDER **0,70** l/100kg		156,11 liter	41,3 Gall
NF-6/DEFOAMER **0,10** l/100kg		22,30 liter	5,9 Gall
DRLG WATER MIXING **42,53** l/100kg		9,48 m3.	59,7 Bbl
TOTAL MIX FLUID **42,63** l/100kg		9,51 m3.	59,8 Bbl
ESTIMATED TICKENING TIME @ 70 BC hr.min **3 - 4**			

CEMENTING TECHNIQUE: CONVENTIONAL DOUBLE PLUG CEMENTING

CMT SLURRY HYROSTATIC GRADIENT : EVALUATION		
FRACTURE-P @ PREVIOUS SHOE	103,88 Bar	1507 Psi
FRACTURE-P @ NEW SHOE	338,00 Bar	4902 Psi
CMT HYDRO-P @ PREV. SHOE	90,37 Bar	1311 Psi
CMT HYDRO-P @ NEW SHOE	311,90 Bar	4524 Psi
MIN. PRESSURE MARGIN AT PREV. SHOE AT THE END OF THE CEMENT JOB	13,51 Bar	196 Psi
MIN. PRESSURE MARGIN AT NEW SHOE AT THE END OF THE CEMENT JOB	26,10 Bar	379 Psi

3.4.5.4 7” Liner

Well 7019/1-1	GENERAL DATA			7" liner
LINER SHOE DEPTH	**2645** m-RKB	**7** Liner - I.D.= **6,000**	WT=	**29,00** ppf
PREVIOUS CASING	**2004** m-RKB	**9,625** CSG - I.D.= **8,500**	WT=	**53,50** ppf
HOLE SIZE	**8,50** in			
EXCESS (open hole)	**98** %	FRAC.GRAD @ SHOE	**1,97**	SG-EMW
LINER HANGER	**1801** m-RKB	FG @ PREVIOUS CSG	**1,72**	SG-EMW
B.H.S.T.	**77** Deg C	MUD WEIGHT	**1,25**	SG

TOTAL DRY CMT REQUIRED	>>>	23,4 ton	<<<

SLURRY VOLUME CALCULATION			
ANNULAR VOLUME CSG-OPEN HOLE	11,78 l/m =	7,55 m3.	266,6 Cuft
EXCESS OVER THEOR. OPEN HOLE ANN.VOLUME		7,40 m3.	261,3 Cuft
ANNULAR VOLUME CSG-CSG	11,78 l/m =	2,39 m3.	84,4 Cuft
36 m INTERNAL VOL. (SHOE-COLL)	18,24 l/m =	0,66 m3.	23,2 Cuft
TOTAL SLURRY VOLUME =		**18,00** m3.	635,6 Cuft

SPACERS				LENGTH
TYPE : **Mud**	**1,55** SG	VOL. =	**15,00** m3.	1 273,2 m.

CEMENT SLURRY COMPOSITION				
SLURRY @ 1,90 SG F/ 2645 TO 1801 m.				
SLURRY VOLUME	**844** m of ANNULUS+INT.VOL.(SHOE-COLL)		**18,00 m3.**	**635,6 Cuft**
"G" CEMENT Yield	**77,07** l/100kg	1,298 ton/m3	23,36 ton	547,9 Sx
HALAD-99LE+/WATER LOSS ADDIT.	**11,00** l/100kg		2569,15 liter	679,7 Gall
HR-5L/RETARDER	**0,40** l/100kg		93,42 liter	24,7 Gall
NF-6/DEFOAMER	**0,10** l/100kg		23,36 liter	6,2 Gall
CFR-3L/FRICTION REDUCER	**0,70** l/100kg		0,16 m3.	1,0 Bbl
FRESH WATER	**33,81** l/100kg		7,90 m3.	49,7 Bbl
TOTAL MIX FLUID	**46,01** l/100kg			
ESTIMATED TICKENING TIME @ 70 BC	hr.min	**3 - 4**		

CEMENTING TECHNIQUE : CONVENTIONAL DOUBLE PLUG CEMENTING

CMT SLURRY HYROSTATIC GRADIENT : EVALUATION		
FRACTURE-P @ PREVIOUS SHOE	338,00 Bar	4902 Psi
FRACTURE-P @ NEW SHOE	510,96 Bar	7411 Psi
CMT HYDRO-P @ PREV. SHOE	106,53 Bar	1545 Psi
CMT HYDRO-P @ NEW SHOE	225,93 Bar	3277 Psi
MIN. PRESSURE MARGIN AT PREV. SHOE AT THE END OF THE CEMENT JOB	231,47 Bar	3357 Psi
MIN. PRESSURE MARGIN AT NEW SHOE AT THE END OF THE CEMENT JOB	285,03 Bar	4134 Psi

3.4.6 Mud Summary by Phase

Mud summary for the 36" hole section

The 36" hole section was drilled using seawater. High viscosity sweeps were used to keep the hole clean while drilling this section. The first attempt to spud the well was abandoned due to very slow drilling progress. The rig was moved 10 m and the well was re-spudded. A 17 ½" pilot hole was drilled to 343 m. The hole was circulated clean and displaced to 1.20 sg pre-hydrated bentonite mud.

The 17 ½" hole was now opened up to 36" down to 336 m. The hole was circulated clean and a wiper trip was made to the seabed. When running back to bottom, 2 m fill was found. The hole was again circulated with high viscous mud and then displaced to 1.20 sg pre-hydrated bentonite mud prior to pulling out for running the 30" casing string.

Mud summary for the 12 1/4" pilot hole and 26" hole section

After drilling out the 30" casing shoe with a 26" bit, a 12 1/4" pilot hole was drilled from the 30" shoe down to 665 m without any drilling problems using seawater, and with high viscosity sweeps to keep the hole clean. A flow check was made at section TD (no shallow gas detected). Minor tight spots were encountered when pulling out.

The pilot hole was then opening up to 26", using the same drilling fluids as for the pilot hole. When reaching section TD at 665 m the hole was circulated clean and then displaced with 1.20 sg pre-hydrated bentonite mud. A wiper trip was made to the seabed; a tight spot was encountered at 465 m. When running back to bottom, the last stand was washed down. The 26" hole was displaced to 1.20 sg pre-hydrated bentonite mud prior to pulling out for running the 20" casing string.

Mud summary for the 12 ¼" hole section

After having installed the 20" casing (shoe at 658 m), the cement in the shoe was drilled out with a 17 ½" bit. The drilling fluid in the well was then changed to 1.30 sg Formate brine where XC polymer and PAC was used for obtaining viscosity and to maintain rheology. After having displaced the well to the new mud, 12 ¼" hole was drilled down to 2015 m which was section TD. From 1937 m and down, the mud weight increased by adding concentrated formate brine to the mud. At section TD the weight was 1.40 sg.

The Formate brine was in itself heavy enough not to require any general addition of weighting materials. For mud pills were additional weight was required the weighting material used was ilmenite.

High viscous sweeps of Formate mud was used to circulate the hole clean. A wiper trip was made prior to pulling out to run the 9 5"8" casing string.

Mud summary for the 8 1/2" hole section

After drilling out of the 9 5/8" shoe the drilling of the 8 ½" hole section commenced with the same mud as used for the 12 ¼" section, the mud weight was 1.40 sg. Cores were taken in the interval
2220 – 2235 m, 2457 - 2464 m, and 2561 - 2568 m. At 2530 m the circulation was partially lost and the mud weight was reduced to 1.35 sg – full circulation was re-gained. At 2550 the mud weight was reduced to 1.25 sg. The 8 ½" hole was then drill to well TD at 3003 m.

MUD SUMMARY REPORT
Well 7019/1-1

Day no.	TMD (m)	Hole size (in)	Mud type	MW (g/cm3)	Viscosity (s/L)	PV (mPa*s)	YP (Pa)	Gels 10s/10m (Pa)	API WL (mL)	HTHP WL (mL)	HTHP TEMP (deg. C)	pH	Cl- (mg/L)	Sand (%)	TS (%)	LGS (kg/m3)	MBT (kg/m3)	Tot. Hard. (mg/L)	Oil (%)	Tot. Vol. (m3)
2	224	36.00	SW/Bentonite	1.03	110			0/0/0											0	137
3	250	36.00	SW/Bentonite	1.03	110			0/0/0											0	314
4	343	36.00	SW/Bentonite	1.03	110			0/0/0											0	
5	343	36.00	SW/Bentonite	1.03	110			0/0/0											0	
6	564	12.25	SW/Bentonite	1.03	110			0/0/0											0	251
7	665	12.25	SW/Bentonite	1.03	110			0/0/0											0	23
8	665	26.00	SW/Bentonite	1.03	110			0/0/0											0	0
9	665	12.25	FORMATE/POLYMER	1.30	39	8	45	1/2/0	5.2			9.5	4000	0.1		20	5		0	0
10	721	12.25	FORMATE/POLYMER	1.30	40	10	5	2/2/0	4			9	4000			20	5		0	449
11	1311	12.25	FORMATE/POLYMER	1.30	39	10	6	1/2/0	4.8			9	5000			80	12		0	462
12	1821	12.25	FORMATE/POLYMER	1.30	39	11	6	1/2/0	5			9	4500			75	15		0	468
13	2015	12.25	FORMATE/POLYMER	1.40	48	14	11	3/4/0	5			9.1	4500			32	20		0	465
14	2015	12.25	FORMATE/POLYMER	1.40	48	13	8	2/4/0	4.5			9.6	4000			30	26		0	366
15	2095	8.50	FORMATE/POLYMER	1.40	40	13	7	2/2/0	5			11	4000			30	27		0	398
16	2200	8.50	FORMATE/POLYMER	1.40	41	13	5	2/2/0	5			11	4000			35	23		0	394
17	2208	8.50	FORMATE/POLYMER	1.40	40	12	7	2/3/0	4.5			11	4000			35	21		0	393
18	2223	8.50	FORMATE/POLYMER	1.40	40	11	9	2/3/0	4			11	4000			30	19		0	397
19	2236	8.50	FORMATE/POLYMER	1.40	40	12	7	2/4/0	4			11	4000			30	20		0	397
20	2298	8.50	FORMATE/POLYMER	1.40	42	13	8	2/3/0	4.5			9.8	4100			30	18		0	396
21	2335	8.50	FORMATE/POLYMER	1.40	40	13	8	2/4/0	4.8			9.4	4700			30	18	1100	0	391
22	2382	8.50	FORMATE/POLYMER	1.40	52	13	10	2/3/0	3.2			9.6	4500			30	18	1100	0	387
23	2409	8.50	FORMATE/POLYMER	1.40	55	13	9	2/4/0	3.4			9.6	4800	0.1		43	21	1200	0	382
24	2433	8.50	FORMATE/POLYMER	1.40	50	11	10	2/4/0	3.8			9.6	4500	0.1		133	21	1200	0	383
25	2457	8.50	FORMATE/POLYMER	1.40	45	14	7	2/4/0	4.4			9.5	4500	0.1		133	21	1100	0	388
26	2466	8.50	FORMATE/POLYMER	1.40	45	12	7	2/4/0	4.2			9	4000	0.1		43	18	1200	0	388
27	2514	8.50	FORMATE/POLYMER	1.40	44	13	8	2/4/0	4			9	4000	0.1		43	21	1200	0	393
28	2539	8.50	FORMATE/POLYMER	1.35	44	12	8	2/4/0	3.8			9	3200	0.1		43	21	1000	0	378
29	2550	8.50	FORMATE/POLYMER	1.35	44	13	8	2/4/0	3.8			9	3500	0.1		43	18	960	0	366
30	2550	8.50	FORMATE/POLYMER	1.30	40	11	9	2/4/0	4			9	2800	0.1		38	15	880	0	400
31	2567	8.50	FORMATE/POLYMER	1.25	40	9	9	2/4/0	4.4			9	2300	0.1		64	12	800	0	441
32	2569	8.50	FORMATE/POLYMER	1.25	40	10	9	2/4/0	4.2			9	2300	0.1		64	12	800	0	444

(continued next page)

MUD SUMMARY REPORT
Well 7019/1-1
(continued)

Day no.	TMD (m)	Hole size (in)	Mud type	MW (g/cm3)	Viscosity (s/L)	PV (mPa*s)	YP (Pa)	Gels 10s/10m (Pa)	API WL (mL)	HTHP WL (mL)	HTHP TEMP (deg. C)	pH	Cl- (mg/L)	Sand (%)	TS (%)	LGS (kg/m3)	MBT (kg/m3)	Tot. Hard. (mg/L)	Oil (%)	Tot. Vol. (m3)
33	2657	8.50	FORMATE/POLYMER	1.25	40	10	8	2/4/0	5			9	2000	0.1		76	10	880	0	468
34	2727	8.50	FORMATE/POLYMER	1.25	40	9	9	2/4/0	5.2			9	2000	0.1		75	10	800	0	494
35	2794	8.50	FORMATE/POLYMER	1.25	40	11	8	2/3/0	4.5			9	2000	0.1		75	10	880	0	499
36	2849	8.50	FORMATE/POLYMER	1.25	41	10	8	2/3/0	4.5			8.7	2000	0.1		74	7	880	0	555
37	2875	8.50	FORMATE/POLYMER	1.25	43	11	8	2/3/0	4.5			8.7	1900	0.1		74	7	880	0	464
38	2960	8.50	FORMATE/POLYMER	1.25	38	9	9	2/3/0	5			8.7	1850	0.1		74	7		0	470
39	2988	8.50	FORMATE/POLYMER	1.25	38	10	8	2/3/0	4.5			8.7	1850	0.1		75	7		0	465
40	3003	8.50	FORMATE/POLYMER	1.25	37	10	8	2/3/0	4.5			8.7	1850	0.1		70	7		0	460
41	3003	8.50	FORMATE/POLYMER	1.25	37	10	8	2/3/0	4.5			8.7	1850	0.1		70	7		0	455
42	3003	8.50	FORMATE/POLYMER	1.25	37	10	8	2/3/0	4.5			8.7	1850	0.1		70	7		0	454
43	3003	8.50	FORMATE/POLYMER	1.25	37	10	8	2/3/0	4.5			8.7	1850	0.1		70	7		0	454
44	3003	8.50	FORMATE/POLYMER	1.25	45	9	10	2/3/0	5			8.7	2100	0.1		60	7		0	449
45	3003	8.50	FORMATE/POLYMER	1.25	42	9	10	2/3/0	5			8.7	2100	0.1		75	7		0	447
46	3003	8.50	FORMATE/POLYMER	1.25	43	10	9	2/3/0	5			8.7	2400	0.1		75	7		0	456
47	3003	8.50	FORMATE/POLYMER	1.25	45	10	10	3/4/0	5			8.7	2500	0.1		75	8		0	451
48	3003	8.50	FORMATE/POLYMER	1.25	45	10	9	3/4/0	5			9.5	2500	0.1		75	8		0	451
49	3003	8.50	FORMATE/POLYMER	1.25	90		9	4/35/0	6								8			425
50	3003	8.50	FORMATE/POLYMER	1.25	90		9	4/35/1	7								8			396
51	3003	8.50	FORMATE/POLYMER	1.25	90		9	4/35/2	8								8			
52	3003	8.50	FORMATE/POLYMER	1.25	90		9	4/35/3	9								8			

3.4.7 Deviation Summary

Deviation Summary Well 7019/1-1										
TMD (m)	Angle (deg.)	Azimuth (deg.)	CMT	TVD (m)	North (m)	East (m)	Horizontal distance (m)	DLS (deg./30m)	BUR (deg./30m)	TYPE
0	0,0	0	YNN	0	0	0	0	0	0	MWD
242	0,5	359,0	YNN	242,00	1,06	-0,02	1,06	0,06	0,1	MWD
360	0,3	256,5	YNN	360,00	1,50	-0,33	1,53	0,16	-0,1	MWD
390	0,2	124,8	YNN	389,99	1,45	-0,36	1,49	0,46	-0,1	MWD
419	0,4	114,3	YNN	418,99	1,38	-0,23	1,40	0,21	0,2	MWD
449	0,7	98,8	YNN	448,99	1,31	0,05	1,31	0,33	0,3	MWD
478	0,2	57,0	YNN	477,99	1,31	0,27	1,34	0,59	-0,5	MWD
507	0,5	122,1	YNN	506,99	1,27	0,42	1,34	0,47	0,3	MWD
537	0,6	149,1	YNN	536,99	1,06	0,61	1,23	0,27	0,1	MWD
567	0,7	182,8	YNN	566,99	0,75	0,68	1,01	0,39	0,1	MWD
596	0,7	199,6	YNN	595,99	0,40	0,61	0,73	0,21	0,0	MWD
626	1,0	153,4	YNN	625,98	0,00	0,67	0,67	0,72	0,3	MWD
655	0,8	160,3	YNN	654,98	-0,42	0,85	0,95	0,23	-0,2	MWD
813	0,6	239,0	YNN	812,97	-1,88	0,51	1,95	0,17	0,0	MWD
1336	0,1	193,0	YNN	1335,96	-3,74	-1,94	4,21	0,03	0,0	MWD
1945	1,5	209,0	YNN	1944,89	-11,23	-5,92	12,70	0,07	0,1	MWD
1990	1,2	339,0	YNN	1989,88	-11,30	-6,38	12,98	1,63	-0,2	MWD
2171	2,5	339,0	YNN	2170,78	-5,85	-8,47	10,29	0,22	0,2	MWD
2229	2,7	341,0	YNN	2228,72	-3,38	-9,37	9,96	0,11	0,1	MWD
2260	2,9	346,4	YNN	2259,69	-1,92	-9,79	9,98	0,32	0,2	MWD
2289	2,9	342,0	YNN	2288,65	-0,51	-10,19	10,20	0,23	0,0	MWD
2317	3,1	342,9	YNN	2316,61	0,88	-10,63	10,67	0,22	0,2	MWD
2344	3,2	341,1	YNN	2343,57	2,29	-11,09	11,33	0,16	0,1	MWD
2373	4,7	340,0	YNN	2372,50	4,18	-11,76	12,48	1,55	1,6	MWD
2403	6,0	338,6	YNN	2402,37	6,79	-12,75	14,45	1,31	1,3	MWD
2422	6,8	334,5	YNN	2421,25	8,73	-13,60	16,16	1,45	1,3	MWD
2432	7,2	338,4	YNN	2431,17	9,85	-14,08	17,19	1,86	1,2	MWD
2461	7,4	337,8	YNN	2459,94	13,27	-15,46	20,37	0,22	0,2	MWD
2490	7,6	337,5	YNN	2488,69	16,77	-16,90	23,81	0,21	0,2	MWD
2520	7,7	337,2	YNN	2518,42	20,45	-18,44	27,54	0,11	0,1	MWD
2548	7,9	337,7	YNN	2546,17	23,96	-19,89	31,14	0,23	0,2	MWD
2577	7,8	338,0	YNN	2574,89	27,63	-21,39	34,94	0,11	-0,1	MWD
2605	7,9	338,9	YNN	2602,63	31,19	-22,79	38,63	0,17	0,1	MWD
2635	7,1	337,4	YNN	2632,37	34,82	-24,25	42,43	0,82	-0,8	MWD
2664	7,2	333,0	YNN	2661,15	38,10	-25,76	45,99	0,58	0,1	MWD
2693	6,9	337,5	YNN	2689,93	41,33	-27,25	49,50	0,65	-0,3	MWD
2722	6,8	336,7	YNN	2718,72	44,51	-28,60	52,91	0,14	-0,1	MWD
2751	6,9	335,3	YNN	2747,52	47,67	-30,00	56,33	0,20	0,1	MWD
2781	6,7	335,6	YNN	2777,31	50,90	-31,48	59,85	0,20	-0,2	MWD
Estimated values for well TD:										
3003	*5.85*	*335*	*YNN*	*2997.97*	*72.95*	*-41.61*	*83.98*	*0.12*	*-0.11*	*Estimate*

3.5 Plug and Abandonment

3.5.1 P & A Program

Objectives:

The plugging and abandonment program for well 7019/1-1 had the following objectives:

1) Isolation of the perforated interval in the 7" liner.

2) Isolation between the liner hanger and surface inside the 9 5/8" casing to ensure prevention of flow from below the 9 5/8" shoe to surface.

3) Isolation of the 20" x 9 5/8" casing annulus. To cut the casing strings a minimum of 5 m below seabed.

4) Ensure that no obstructions or debris of any kind that might cause damage or impediment to fishing, shipping or other activities would remaining on the seabed at the well site location.

Permanent plugging and abandonment of well 7019/1-1

The well 7019/1-1 was permanently plugged and abandoned as follows (ref. figure "Well 7019/1-1 PERMANENT ABANDONMENT" on next page):

1. Plug no. 1:
   A cement plug was set in the 8 1/2" hole from 3003 m up to 2647 m.

2. Plug no. 1a:
   A cement retainer was set inside the 7" liner at 2506 m and a high pressure cement squeeze of the perforated interval below from 2526 m to 2563 m was performed.

3. Plug no. 2:
   A cement plug was set across the 7" liner hanger from 1895 m up to 1600 m.

4. Plug no. 3:
   A cement plug was set inside the 9 5/8" casing from 900 m up to 700 m.

5. The 9 5/8" casing was cut at 652 m (488 m below seabed) and retrieved.

6. Plug no. 4:
   A cement plug was set from 658 m up to 450 m.

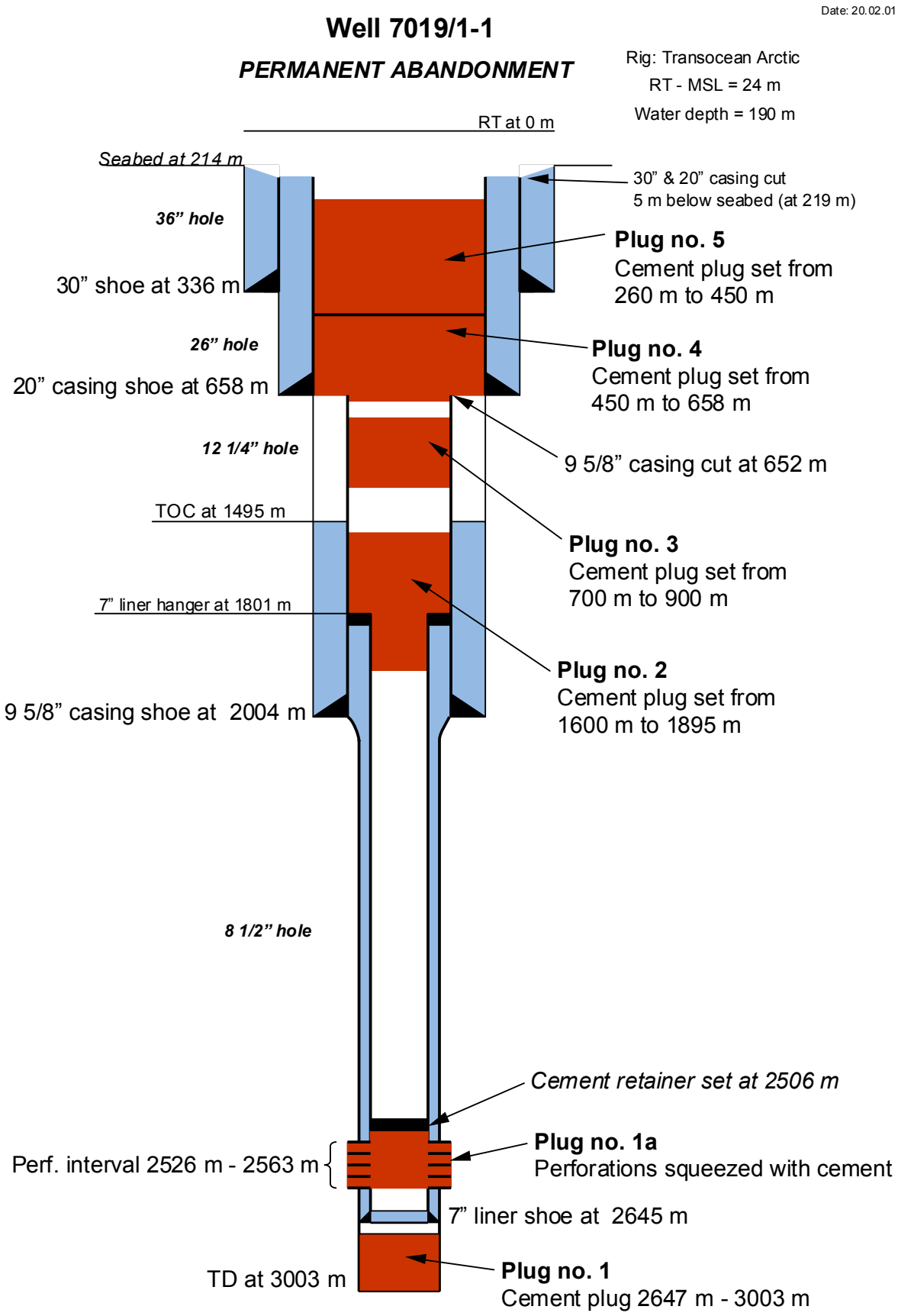
7. Plug no. 5:
   A cement plug was set in the well from 450 m and up to 260 m (46 m below seabed).

8. The 20" and 30" casing strings were cut at 219 m (5 m below seabed) and retrieved.

9. An ROV survey of the seabed within a 50 m radius around the well location was performed to ensure that no debris had been left.

Note: There was cement behind both the 30” and 20” casing strings up to seabed at 214 m.
Top of cement behind the 9 5/8” casing was calculated to be at 1495 m.

3.5.2 P & A Sketch



3.6 Logistics

3.6.1 Offices

The operations office was located at Norsk Agip, Forus. The main logistics coordinator was placed at Polarbase in Hammerfest while a local logistics coordinator was placed at the Aker Base, Tananger. The main logistics coordinator at Polarbase used the local coordinator at the Aker Base to handle shipments of equipment sent from Stavanger to the rig/Polarbase.

3.6.2 Base

The operating base for the rig during the drilling of well 7019/1-1 was Polarbase in Hammerfest. In Stavanger the Aker Base in Tananger was used for shipments of equipment sent from Stavanger to the rig/Polarbase.

3.6.3 Helicopter

The helicopter services were contracted from Norsk Helikopter AS.

Two helicopters were on contract, one of them fully equipped for SAR (Search and rescue).
One helicopter crew and one of the helicopters were always kept ready for operation 24 hours a day.

3.6.4 Boats

During the drilling operations on well 7019/1-1 two supply vessels were used. Changing between the two vessels, on of them was always kept at the rig as standby vessel while the other was used as supply vessel between the rig and Polarbase.

3.7 SAFETY AND ENVIRONMENT

3.7.1 Risk Analysis Summary and Implementation

Before starting the drilling operations on the well 7019/1-1 a risk analysis session was carried out and documented in a report. The report was submitted to the rig for follow-up by the drilling supervisors.

During the drilling of the well, various types of safety meetings and drills were held on the rig:

15	Pre-job Safety Meetings & Safe Job Analysis
4	BOP Drills

General Safety Meetings with the various crews were held frequently, and along with the various safety meetings a general operation meeting was held daily on the rig with key personnel to discuss upcoming operations and improvement of communications on the rig site.

Unintentional Events related to personnel safety during the drilling of the well:

1	Medical Treatment/First Aid cases
6	Near misses (related to personnel safety)

3.7.2 Discharges, Emissions and Waste

Discharges to Sea

Ilmenite	94.803 ton
Bentonite	50.586 ton
Na/K Formate Salt	62.256 ton
Mud chemicals	3.761 ton
Cement chemicals	22.639 ton
Drill cuttings	971.800 ton
Discharges to Sea	1205.844 ton

Emissions to Air

	Total (rig/vessels/helicopter)
CO_2	9 225 ton
NO_x	186 ton
VOC	13 ton
CO	19 ton
N_2O	1 ton
SO_2	7 ton
VOC/CO/N_2O/SO_2	*39.78 ton*

Emissions to Air	9450.016 ton

Waste returned to shore:

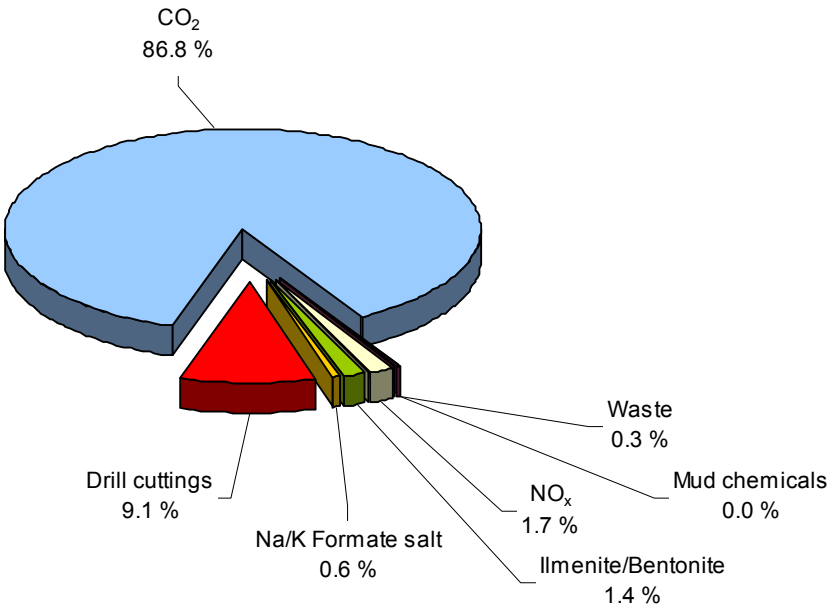
Metal	12.12 ton
Glass	0.16 ton
Wood	2.94 ton
Paper	3.19 ton
General	8.62 ton
Plastic	0.56 ton
Waste	27.59 ton

Special waste to approved contractor for disposal:

Empty drums	0.389 ton
Waste oil	m^3
Oily waste/rags	ton
Paint	ton
Special waste	0.389 ton

Waste total	27.975 ton

Well 7019/1-1
Discharge, Emission & Waste



3.7.3 Requirements – Accounting of Compliance

A set of requirements and goals for the 7019/1-1 operations were established prior to planning the well. The requirements were submitted to involved supervisory personnel.

Following the completion of the operations, an accounting of compliances with the established requirements/goals was made, ref. Section 4 ENCLOSURES – "ENCLOSURE 1 7019/1-1 Requirements accounting"

4. ENCLOSURES

ENCLOSURE 1 7019/1-1 Requirements accounting

ENCLOSURE 2 7019/1-1 Summary of Well Testing Operation

ENCLOSURE 3 7019/1-1 Composite Log

ENCLOSURE 4 7019/1-1 C.P.I.

ENCLOSURE 1 7019/1-1 REQUIREMENTS ACCOUNTING

Period: 05.10.00 to 03.12.00

Item no	Requirement / Goal	Ref. 7019/1-1 Requirement	Comments	Obtained Yes/No
1.	**Health / Medical**			
1.01	An Emergency Doctor shall be available for consultation and advice 24 hours a day.	2.1.3.1, 2.1.3.2, 2.1.3.3, 2.1.3.4,	- Established through contract with Legeberedskapsgruppen i Hammerfest.	**Yes**
	The rig shall have an authorized nurse and a first aid emergency team.	2.1.3.5	- Nurse and team on the rig. Trained in regular drills.	**Yes**
	Initial first aid treatment within 15 minutes, follow-up treatment within 45 minutes and eventual transport to hospital as soon as possible.		- No major accidents experienced. Tested in drills.	**Yes**
1.02	Mobilization of helicopter within 30 mins. from notification.	2.1.4	- Separate SAR helicopter kept standby in Hammerfest.	**Yes**
	Emergency Doctor at heliport within 45 mins. from notification, if required.	2.1.3.8	- Contract requirements both to helicopter and doctor, but not experienced.	**Yes**
1.03	Reporting injuries/occupational diseases to the authorities by the employer within 36 hours. RTV form to NPD and Stavanger Trygdekontor with copy to Norsk Agip within 3 days.	3.5	- One RTV-case experienced; Reported by TO (employer), copy to NA in 1 day	**Yes**
	Follow-up accident reporting by DRL, submitting the RTV report to QSE.		- RTV reported from DRL to QSE in 7 days.	**Yes**
2.	**Safety**			
2.01	The Company shall ensure that operations are performed in compliance with statutory, Company and corporate requirements.	3.1.2.1, 3.1.1.4, 1.2.1, 3.1.1.1	- No major deviations identified.	**Yes**
	Safety evaluations should be carried out on rigs and vessels to be contracted by the Company.	3.1.2.4	Rig ensured through joint inspection and inspection by Drl. Supt.	**Yes**
			- Standby / Supply vessels checked by DRL.	**Yes**
	Accidents and near misses shall be reported to QSE, for further reporting to relevant authorities.	3.5, 4.5	- Some reports were not received by QSE.	**No**
2.02	No single failure shall entail life-threatening situations for personnel nor significant damage to environment, material or cost effectiveness.	8.1.2, 3.1.1.5	- Barriers established in all areas identified as potentially dangerous.	**Yes**
	A person falling into the sea shall be recovered within 8 mins.	2.1.7	- Tested in drills on standby vessel and rig; 4 mins.	**Yes**
2.03	Risk assessment/safety analysis/SJA should be performed on new, critical activities.	3.1.2.3, 3.1.2.4	- Risk analysis of rig and operation performed.	
	SJA should be used on operations not guided by a procedure or when deliberate deviation from a procedure is necessary.	1.3.3, 7.	- Risk reducing measures implemented, reporting remains. - SJA used.	**Yes**
2.04	All Supply Contracts/Service Contracts regarding chemicals or chemical products must include the obligations of the supplier in accordance with Norwegian regulations.	4.3.1.2	- Req. pertaining to supplier obligations included in contracts. All dangerous goods recorded/marked in cargo manifests.	**Yes** **Yes**
	Information about dangerous and health hazardous work and substances shall be provided to the workers. Approved (through OLF's QA system) SHOC Data Sheets (Product Safety Data) and MSDS (Material Safety Data Sheet) shall be available for all chemicals onboard.	1.3.4, 4.3.1.7	- Provided by supplier, handled by Principal Enterprise and nurse (CHESS 98), followed up by Drl. Supv. - Basically OK on the rig. SFT requested ecotox (HOCNF) documentation for some products in closed circuit systems.	**Yes** **Yes**
	Personnel safety and protective equipment (CE approved) shall be available to all personnel according to the place of work.	1.3.6	- Transocean acted as Principal Enterprise and ensured compliance through their quality system.	**Yes**
	Norsk Agip's responsible personnel shall verify through inspection checks that the regulations regarding marking, handling and transportation are complied with.	4.3.1.3, 1.3.6, 4.3.1.1	- Followed up closely as LOG Supt. was situated on the base in Hammerfest.	**Yes**
2.05	The drilling unit shall be certified in accordance with International Maritime Regulations for operations in Cold Climate and hold a "Letter of Compliance" issued by the NMD.	1.3.1, 5.,	- The rig is registered and certified in Norway. Letter of Compliance is not applicable.	**Yes**
	The work places shall be protected against extreme cold and weather.	1.3.9	- Winterization relevant to WE was OK. Winterization relevant to test equipment was not complete before	**Yes**

Item no	Requirement / Goal	Ref. 7019/1-1 Requirement	Comments	Obtained Yes/No
			01.10.00, but ready before equipment was used.	
2.06	No offloading/loading of supply vessels shall take place during/above wind force 20 m/s (Beaufort 8), significant wave height of 6 m (sea state 6) or when Captain/Platform Manager consider work unsafe.	3.2.1	- No loading/offloading took place in bad weather.	**Yes**
2.07	Automated pipe handling shall be used with utmost care and separation of man and machine.	3.3.3	- Was in use. Some deviations/exemptions still apply, ref. NPD consent.	**Yes**
	Icy and/or slippery decks and floors shall be sprayed with sand or other material to protect against slipping.	3.3.4	- Workplaces have a heated deck, heated grating in gangways etc.	**Yes**
3.	**Emergency Preparedness**			
3.01	The Company and Main Contractor shall have compatible and co-ordinated emergency organizations including emergency press information, emergency preparedness analysis shall be performed and contingency plans for the Company's and its contractors' activities shall be prepared	2.1, 3.1.2.5	- Verified through comparisons. Emergency Preparedness Analysis performed and Contingency Plan adjusted to the Barents Sea operations. Emergency Preparedness Analysis - Oil Recovery performed and Oil Spill Contingency Plan prepared jointly under NoBaLeS for the specific wells.	**Yes**
3.02	Blow-out task force from Eni/Agip Division should be established at Norsk Agip (upon request).	2.1.1.1	- This is a formalized arrangement, but has not been tested.	**Yes**
3.03	Continuous updating of status of availability of rigs and emergency equipment should be kept.	2.1.1.2, 2.1.1.3	- "Polar Pioneer" identified for possible assistance, if required. Status list of available vessels kept by Platou and Seabroker. Status on oil recovery resources kept by QSE and NOFO/OSRL.	**Yes**
3.04	Standby vessel shall maintain station within 1 nm. from the platform endeavoring to remain within visual distance at all times and comply with the instructions for standby vessels.	2.1.11	- Standby vessel at station acc. to instructions. Documented in daily drilling reports from the rig.	**Yes**
3.05	Evacuation shall be possible in all expected weather situations during the operation period. Evacuation by helicopter shall be preferred if weather conditions and situation on the rig permit.	2.1.5.2, 2.1.5.3, 2.1.9.1, 2.1.9.2	- Not experienced, but arrangement/plans in compliance with objective. Trained through drills.	**Yes**
	Lifeboats shall be ready for lowering in 15 mins. Drilling unit shall be evacuated within 20 mins.		- Tested in drills on rig (10 mins.) and standby vessel.	**Yes**
	At least one escape way from each working area shall be kept open for 40 mins.		- Rig risk analysis indicates compliance.	**Yes**
3.06	Mobilization of the rig's emergency teams within 15 mins.	2.1.6.1	- Tested/trained through platform drills. Fire team 5 - 10 mins., mustering all personnel 10 mins.	**Yes**
	EOC mobilized and operational within 10 mins. inside office hours, communication established in 30 mins. and operational in 1 hour outside office hours.	2.1.6.2	- EOC standby system established. Mobilization tested.	**Yes**
	EPC operational within 1 hr. inside office hours, 2 hrs. outside office hours.	2.1.6.3	- EPC not tested, but kept arranged.	**Yes**
3.07	Communication facilities shall consist of minimum:	2.1.10	- Verified through 3rd party (Norse Electonics).	**Yes**
	VHF communication with Emergency Teams on the rig. Two satellite lines to shore, one dedicated to emergencies. Dedicated lines to NPD, RCC, EPC, Base, Rig from/to EOC.		- Company satellite communication installed and co-ordinated to comply with requirements. Dedicated EOC lines.	**Yes**
	Tape recording of EOC communication.		- Recording of EOC comm. came in place after malfunction.	**Yes**
3.08	A plan for facing NGO actions of any kind against activities and/or units operated by Norsk Agip shall be developed prior to embarking on drilling activities in the Barents Sea.	2.1.11	- Response Guidelines for NGO Actions established as part of the Norsk Agip Contingency Plan.	**Yes**
	NoBaLes co-operation shall be sought.		- The system is identical to the systems of Hydro and Statoil.	**Yes**
4.	**Working Environment**			
4.01	Agreeing on Principal Enterprise and ensure that a joint working environment committee is established and functioning.	1.1.1, 1.1.2	- Ensured through contract of Principal Enterprise.	**Yes**
	A Company representative (Drl. Supervisor) shall attend safety and working environment committee meetings.	1.3.7, 3.1.1.3	- Compulsory participation for the Drl. Supv. Reported in Daily Drilling Report and documented in minutes.	**Yes**
4.02	Ensure compliance with internal control within working environment area.	1.1.4, 1.1.7, 1.1.8, 1.1.9, 1.2.4, 1.1.6	- Compatible goals and objectives for 2000 established. WE Action Plan followed up.	**Yes**
	Ensure that specific requirements to working environment are in compliance with Company policy.	1.1.3	- Compatible specific requirements to WE.	**Yes**

Item no	Requirement / Goal	Ref. 7019/1-1 Requirement	Comments	Obtained Yes/No
	A working environment survey shall be performed onboard the rig and needed improvements being mapped. Ensuring compliance with working hours and periods of stay requirements.	1.3.10 1.1.5	- Survey carried out and mapped. - Ensured by Principal Enterprise (Transocean).	**Yes** **Yes**
4.03	Noise levels shall be below levels indicated in guidelines to NPD SAM-regulations. Deviations in excess of 3 dBA shall be applied for.	1.3.8	- 7 deviations identified ref. WE Action Plan, and listed in the Application for Consent to Drill.	**Yes**
4.04	Temporary equipment designed as work places shall comply with OLF recommended guidelines for Hired Equipment and relevant parts of Ergonomic Standards.	1.3.2	- N/A.	-
4.05	Ensure prudent safety training of offshore personnel. Training of personnel shall meet the standards described in Norsk Agip qualification requirements. New personnel in DRL and EXP shall be given Introductory Training in acc. with established standard, and training shall be provided prior to commencing job activities. All personnel taking part in planning and execution of offshore-related activities shall be qualified, both in terms of theoretical background and experience.	1.3.5, 3.1.2.2 10. 8.1.5	- Valid safety training of offshore personnel confirmed. - OK. - Personnel were provided Introductory Training according to program. - Qualified acc. to NA Equipment & Services Specification. Key personnel's qualifications verified by DRL.	**Yes** **Yes** **Yes** **Yes**
4.06	Working hours within the various activity areas shall be reported to NPD within 15 days after expiry of each quarter. Time sheets for all contractor personnel shall be approved by drilling supervisor and submitted to DRL for further processing.	9.	- Reported to NPD by Drilling Contr., but some discrepancies. - 3rd quarter: Reported in time. 4th quarter: To be reported by NA. - Time sheets for service contractor personnel handled as described. Invoices processed by DRL.	**Yes** **Yes** **Yes**
5.	**Environment Protection**			
5.01	Acceptance criteria for pollution shall be developed as part of the general risk acceptance criteria.	4.1.2	- Included in general Risk Acceptance Criteria. Established jointly in NoBaLeS.	**Yes**
5.02	An Environment Impact Analysis shall be carried out prior to commencing drilling activities in the Barents Sea, revealing the environmental impact and potential consequences of discharges into the sea and coastal areas. Vulnerable areas which require extra protection shall be identified. Environmental protection shall be based on an evaluation of the environmental effects of discharges into the sea and emissions to the air.	4.2 4.1.2	- Assessed in the Barents Icewater Program and also in the Environmental Risk Analysis performed jointly under NoBaLeS. - Water based formate mud with ilmenite (no heavy metals) and sodium/potassium (no solids) as the weight agent was chosen. Remaining formate mud volumes (855 m3) were taken to shore.	**Yes** **Yes**
5.03	Only standard WBM (Water Based Mud) shall be used during drilling in the Barents Sea. Environmental friendly drilling mud chemicals shall be used. Production of waste and atmospheric emissions should be reduced as much as possible. Discharges of mud should be less than 0,5 m^3 per drilled meter. Emission of CO_2 should be less than 1,2 ton per drilled meter.	3.3.2 4.1.2	- Sodium (Na) / Potassium (K) Formate mud system was used. - Mud progr. was designed to minimize environmental impact and was also focussed in the Discharge Permit Application. - System for segregation of waste in place. - Mud: 0,27 m3 / drilled meter. - CO2 rig: 1,72 ton / drilled meter.	**Yes** **Yes** **Yes** **Yes** **No**
5.04	Operational discharges should be minimized and must at all time be kept within the limits defined in the Discharge Permit from SFT (letter from SFT dated 30.06.00). Some chemicals should be sought phased out according to plan (cement chemicals/rig chemicals).	4.4	- Mud was transferred between the two wells and remaining volumes taken to shore. Monitoring towards the Discharge Permit worked satisfactory. Limits adhered to. - Chemicals not phased out (e.g. NF-6).	**Yes** **No**
5.05	An Oil Spill Contingency Plan should be established based on the results of the Environmental Risk Analysis and Emergency Preparedness Analysis - Oil Recovery for the relevant areas. Supply vessels used must have NOFO class. Standby vessel shall be ready to spray dispersant chemicals on oil slicks within 15 min. if approved.	 2.1.2	- Oil Spill Preparedness established according to plans and statutory requirements. Verified by SFT. - The vessels *Skandi Bergen*, *Normand Jarl* and *Normand Drott* hold NOFO class. - Standby vessel equipped with 1 complete NOFO system incl. tow	**Yes** **Yes** **No**

Item no	Requirement / Goal	Ref. 7019/1-1 Requirement	Comments	Obtained Yes/No
			vessel. Equipment for spraying dispersants not brought onboard the standby vessel.	
5.06	Waste material should be segregated. All waste materials, except food waste, must be shipped ashore for disposal at designated facilities. Transp. of chemicals/petr. products/classified goods together with ordinary waste is prohibited. All waste materials shall be properly documented on the Cargo Manifest. Special waste shall be treated by an authorized contractor. Incinerations shall be reported by **Contractor** to **DRL/QSE.**	4.3.2	- All waste incl. food waste was segregated and sent ashore. - Shipped separately and manifested. - All returned waste was manifested. - Handled by Renovasjon Nord AS - Not experienced.	**Yes** **Yes** **Yes** **Yes** **-**
5.07	Discharges to the sea and emissions to the air must be recorded as part of Norsk Agip Environment Accounting System and shall be reported on a weekly basis. Accidental spills (all kind of discharges/emissions) shall be reported immediately and subsequently included in the weekly reports.	4.5.1 4.5.2	- Reported daily and weekly. - Accidental spills not experienced.	**Yes** **-**
5.08	No drilling must be carried out in oil bearing zones during the period 20 March to 1 August for PL 201.	3.3.1	- Drilled in potentially oil bearing zones between 20.10.00 and 30.11.00.	**Yes**

Prepared by:	Reviewed by:	Approved by:
Morten Andreassen	*Mauro Zuvo*	*Jan Bakka*

Date: *12.01.01*

ENCLOSURE 2 7019/1-1 SUMMARY OF WELL TESTING OPERATION

1. INTRODUCTION

In the period from 24th to 28th November 2000, a test was performed on the well 7019/1-1.
The well 7019/1-1 is located in the Barents Sea, in the Production Licence no PL201, 185 Km offshore of Hammerfest, at coordinates N 70° 55' 05,14" E 19° 04' 22,44". It was drilled by the Transocean Arctic drilling rig on behalf of the joint venture between Norsk Agip A/S 35% (as operator), Enterprise Oil Norge Ltd. 25%, Den norske Stats Oljeselskap a.s. (SDØE) 25%, Fortum Petroleum AS 15%, in a water depth of 190 m, with RKB elevation of 24 m.
The purpose of the well was to test the hydrocarbon potential of the primary target in the Middle Jurassic through Upper Triassic sandstone reservoir series of the Realgrunnen Group in the Gamma Prospect with the following main targets:

- to evaluate the main formation properties (reservoir pressure, permeability, skin damage);
- to evaluate the well productivity and flow equation;
- to determine the proper reservoir model and to verify the presence of boundaries (if any);
- to establish the real mineralization of the tested levels and to collect representative samples of the produced fluid for PVT analysis;
- to assess any water production.

Also Lower Cretaceous at the base of the Nordvestbanken Group represented a shallower secondary target.

At first, two tests were scheduled on the Nordmela and Stø Formations, both belonging to the Jurassic, but as a consequence of the test on the Nordmela Formation, it was decided to abandon the second test in the Stø Formation and the option to test the Cretaceous.
In fact, the abnormal CO_2 content in the gas produced by the Nordmela Formation (60÷80%) was extrapolated also to the Stø Formation as a consequence of their hydraulic communication shown by MDT measurements, and the analysis of the MDT gas samples from the Cretaceous showed a CO_2 percentage higher than 20%. The well was then plugged and abandoned.

2. CONCLUSIONS

The test on the Nordmela Formation was stopped at the end of the clean up phase because the samples of the produced gas showed an abnormal CO_2 content, extrapolated also to the Stø Formation as a consequence of their hydraulic communication confirmed by MDT measurements. This fact led to the decision to abandon the already scheduled test on the Stø Formation. Furthermore, the analysis of the MDT gas samples taken from the Cretaceous showed a CO_2 percentage higher than 20%, thus leading to the decision to abandon also the option to test the Cretaceous.

The pressure build up recorded at the end of the clean up phase was interpreted with a Partial Penetration model on the hypothesis that also the Stø Formation contributed to the flow of the Nordmela Formation. The shape of the last part of the derivative was related to the presence of a sealing boundary effect. Its distance from the well (270 m) is consistent with the indications from the map and seismic section in Annex E.
The well showed a high gas permeability (440 mD) and the extrapolated reservoir static pressure (275.15 bar) was consistent with the MDT measurements.

The main interpretation results are listed herebelow:

Reservoir Static Pressure, P_s @ 2471.06 mRKB	275.15 [bar]

Formation Productivity, Kh	36960 [mD*m]
Formation Horizontal Gas Permeability, K_{xy}	440 [mD]
Total Skin, S_t	53.22
Well Skin, S_w	20.25
Boundary Distance, d_1	270 [m]

The calculated high Well Skin value S_w could be explained by the hypothesis that not all the perforations were opened, while in the interpretation, the entire perforated interval was supposed to be opened to the flow. Therefore, the partial penetration effect could be underestimated and a part of this skin S_w could be attributed, instead, to the completion skin S_c. In fact, even if the well was perforated in underbalance conditions (91.5 bar of underbalance), the short clean up phase and the low bottom hole drawdown during the flowing (1.5% of the reservoir static pressure) could not be sufficient to allow all the perforations to be thoroughly cleaned.

3 SEQUENCE OF EVENTS

DATE [dd/mm]	START TIME	DURATION [hours]	OPERATION
24/11	18^{00}	27	RIH with TCP string
25/11	21^{00}	30^{30}	Correlation with Gamma Ray, Spacing out,
26/11	13^{00}	14^{30}	Rig up surface equipment, pressure test, set packer, displacement with N_2
27/11	03^{30}	1	Pressurized to activate firing head, bled off THP to apply correct underbalance
27/11	04^{30}	12^{30}	Opened well on clean up with adjustable choke, then switched to fixed chokes
27/11	17^{00}	8^{30}	Closed well for build up
28/11	07^{00}	14	Killing of the well, unsetting packer, POOH TCP string, end of test

4. TEST 1 – NORDMELA FORMATION – (2526 – 2563 m) - TEST DESCRIPTION

After descending the TCP string, a Gamma Ray log was recorded in order to exactly correlate the depth of the guns with the depth of the radioactive markers placed both in the 7” liner and into the TCP string, and the formation.
The packer was set at 2505 m according to the TCP string layout (see Annex A). After displacing the brine into the string (1250 g/l) with N_2 up to 1000 mRKB, the firing head was activated increasing the THP to 350 bars. Then the THP was immediately bled off to 18 bars in order to apply approximately 70 bars of underbalance pressure to the formation at the moment of the firing (delayed 30 minutes after the firing head activation).
The well was flowed with adjustable choke at first, increasing from 1/4” to 5/8” (with intermediate steps 3/8”, 1/2”; then after recovering the theoretical fluid left into the well, with a 3/4” fixed choke (see Annex B). Since with the latter choke it was impossible to establish critical flow through the choke, the well was then choked back to a 5/8” fixed choke.
Continuous sampling of the produced gas revealed a very high percentage of CO_2 (≈78%), thus explaining the extremely erratic behaviour of the flare.
Due to the low hydrocarbon content of the produced gas, the impossibility to burn it and the almost completed clean up of the well (no liquid production after recovering the remaining brine into the well), it was decided to stop the test after the well clean up phase and to close the LPRN Valve to record the final bottom hole build up.

After 14 hours of bottom hole build up, the well was killed, the TCP string pulled out and the memory gauges recovered.

Eni Agip E&P Division

NorskAgip

WELL TEST REPORT
(General Data)

DATE: 25-Nov-00 ARPO 10/A

FIELD NAME PL 201 Block 7019/1

WELL NAME 7019/1-1

Cost center

SINGLE COMPLETION	☐	SELECTIVE	☐	SHORT STRING	☐
DUAL COMPLETION	☐	D.S.T.	☒	LONG STRING	☐

Formation Name Nordmela

Pool

Lithology Sandstone

General data

RKB Elevation @ m.	24	Sea Level	Base Flange ☐	Tbg Spool ☐				
Casing Size OD	9.5/8"	Weight (lb/ft)	53.5	From m	211.7	To m	2004	
Liner Size OD	7"	Weight (lb/ft)	29	From m	1795.5	To m	2645	
Tubing Size OD	3.1/2"	Weight (lb/ft)	12.95	From m	211.7	To m	2287.1	
Tubing Size OD	4.1/2"	Weight (lb/ft)	24	From m	Surface	To m	211.7	
Tubing Shoe Ø				@ m.				
Packer Type	RTTS mod 2			@ m.	2504.9			
Packer Type				@ m.				

Test N°: 1 **Start Date** 24-Nov-00 **End Date** 28-Nov-00

Completion Fluid	Packer Fluid
Type Formate Brine	Type
Density (kg/cm³) 1.25	Density (kg/cm³)
NaCl (g/l) pH	NaCl (g/l) pH

Acid Job Performed Yes ☐ No ☑

Open Hole	☐	From (m)	To (m)	
Slotted Casing	☐	From (m)	To (m)	
Gravel Paking	☐	From (m)	To (m)	

Perforation ☒ Wire Line ☐ T.C.P. ☒ Underbalance ☒

Gun Size 4.5/8" HSD Shoots / ft 12

Charge Type 22.7 gr RDX DP Low Debris On date 27-Nov-00

From (m)	To (m)	From (m)	To (m)
2526	2563		

Remarks **Land Off point at 212.03**

Very High percentage CO2 (70-80 %), 7-13 ppm H2S. No flare for all test period

Detected Hydrocarbons amount less than 20% in total gas.

Test suspended after first build up period following clean up period.

BHP = 276 bar at 2530 m

Choke size 5/8" Gas Rate = 600000 SM3/d, Gas gravity 1.13 (air = 1).

C1 = 86510 ppm

C2 = 7240 ppm

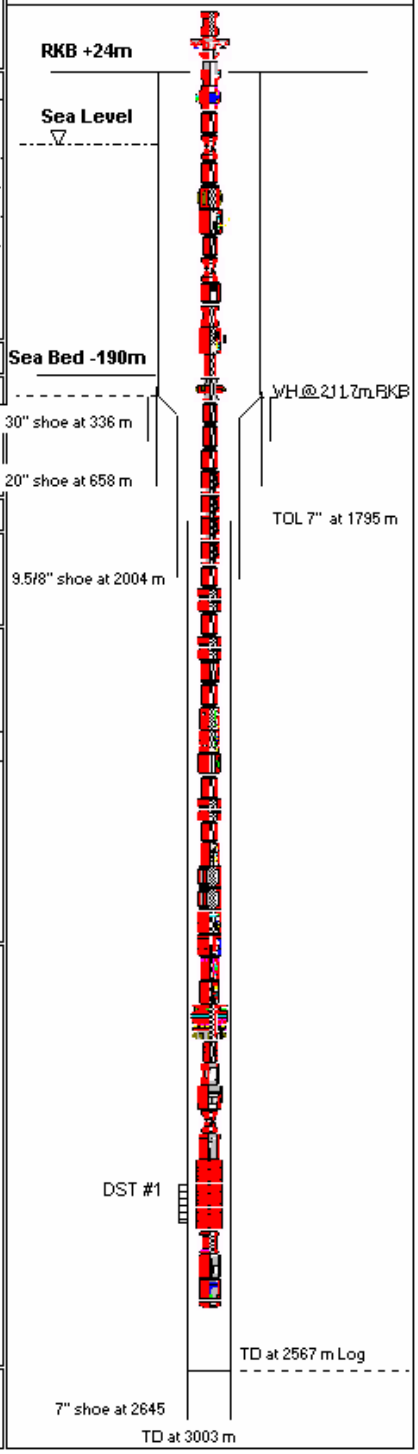
C3 = 3110 ppm

nC4 = 840 ppm.

Supervisor
Emanuele Congia

Superintendent

WELL SCHETCH



Eni Agip E&P Division

NorskAgip

WELL TEST REPORT
(DST Data)

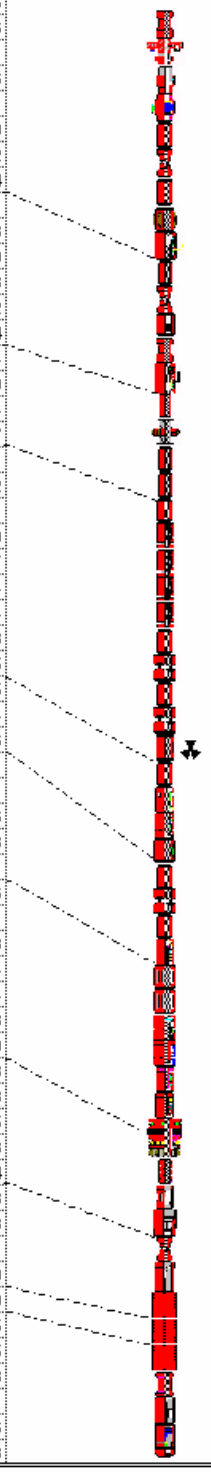
FIELD NAME PL 201 Block 7019/1

WELL NAME 7019/1-1

DATE: 27-Nov-00 ARPO 10/B

Cost center

Test N°: DST #1 (2526 - 2563 m) **Start Date** 25-Nov-00 **End Date** 28-Nov-00



Depth (m)	Lenght (m)	Equipment Description	I.D. (inc)	O.D. (inc)	Capacity (l)
-8.46	1.50	Flow Head	3.00		
-7.56	0.90	Swivel	3.00		
-7.11	0.45	LMV, Manual	3.00		
-6.26	0.85	X-Over	3.00		
12.61	18.87	Landing String 4.1/2" PH4 24# NT-95-SS (2 Joints)	3.38	4.50	
13.09	0.48	X-Over	3.00	5.50	
14.52	1.43	Centralizer	3.00	14.50	
16.34	1.82	**Lubricator Valve 10K**	3.00	10.75	
16.81	0.47	X-Over	3.00	5.50	
203.63	186.82	Landing String 4.1/2" PH4 24# NT-95-SS (20 Joints)	3.38	4.50	
205.00	1.37	Pup Joint 4.1/2" PH6 24# NT-95-SS	3.38	4.50	
205.48	0.48	X-Over	3.00	5.50	
207.02	1.54	Shearable H. Sub	3.00	5.00	
208.74	1.72	**Sub Sea Test Tree 10K**	3.00	13.00	
210.64	1.90	5.1/2" Slick Joint	3.00	5.00	
212.50	1.86	Adjustable Mandrel (**Land Off point at 212.03 m**)	3.00	11.00	1258
213.34	0.84	X-Over 3.1/2" PH6 PxB 4.5" 4A	3.00	5.00	
2287.07	2073.73	**Prod Tubing 3.1/2" PH6 12.95# L80**	2.75	3.50	9207
2287.21	0.14	X-Over 3.1/2" PH6 PxB 3.875" CAS	2.75	4.75	
2287.52	0.31	X-Over 3.875" CAS PxB 3.1/2" IF	2.25	4.75	
2293.61	6.09	Slip Joint Opened (stroke 1.52 m)	2.75	5.03	
2299.70	6.09	Slip Joint Opened (stroke 1.52 m)	2.75	5.03	
2304.27	4.57	Slip Joint Closed (stroke 1.52 m)	2.75	5.03	
2308.84	4.57	Slip Joint Closed (stroke 1.52 m)	2.75	5.03	
2309.04	0.20	X-Over 3.1/2" IF PxB 3.875" CAS	2.25	4.75	
2450.93	141.89	15 Joints 4.3/4" Drill Collar	2.25	4.75	
2451.25	0.32	**R/A Marker Sub (Pip Tag at 2451.11 m)**	2.55	4.75	
2451.45	0.20	X-Over 3.875" CAS PxB 3.1/2" IF	2.55	4.75	
2452.54	1.09	RD Circulating Valve (burst pressure 210 bar)	2.28	5.03	
2459.06	6.52	**OMNI Circulating Valve (Op. Press. = 110 bar)**	2.25	5.03	9647
2460.11	1.05	Sliding Sleeve Drain Valve	2.28	5.03	
2460.31	0.20	X-Over 3.1/2" IF PxB 3.875" CAS	4.75	2.25	
2488.76	28.45	3 Joints 4.3/4" Drill Collar	4.75	2.25	
2488.98	0.22	X-Over 3.875" CAS PxB 3.1/2" IF	4.75	2.25	
2493.81	4.83	**LPR-N Tester Valve (Op. Press. = 10 bar)**	2.25	5.00	
2496.16	2.35	Gauge Carrier w/ 4 Gauges 5 sec Sampling Time	2.25	5.50	
2498.51	2.35	Gauge Carrier w/ 4 Gauges 5 sec Sampling Time	2.25	5.50	
2499.73	1.22	TST Valve	2.28	5.03	
2501.84	2.11	Hydraulic Circulating Valve (Stroke 0.07 m)	2.25	5.00	
2503.44	1.60	Big John Jar closed (stroke 0.25 m)	2.25	5.03	
2504.33	0.89	RTTS Safety Joint	2.44	5.00	
2504.89	0.56	**RTTS mod 2 Packer 7" 29# (Top - Middle Rubber)**	2.40	5.75	9765
2505.93	1.04	**RTTS mod 2 Packer 7" 29# (Middle Rubber - Btm)**	2.40	5.75	
2506.33	0.40	X-Over 2.7/8" EUE BxP 3.1/2" IF	2.25	4.75	
2509.45	3.12	2.7/8" EUE Perforated Tubing	2.00	3.68	
2510.13	0.68	2.7/8" EUE Balancing Isolation Tool w/ Glass Disk	2.44	3.78	
2510.64	0.51	2.7/8" EUE Mechanichal Tubing Release	1.88	3.38	
2519.93	9.29	2.7/8" EUE Tubing	2.44	3.69	
2521.58	1.65	DHF Firing Head (1.35 m from Top Connection)	1.56	3.38	
2522.51	0.93	Detonating Interrupting Device	N/A	3.38	
2526.00	3.49	Gun Carrier Blank Section	N/A	4.63	10085
2563.00	37.00	4.5/8" Gun HSD 12 spf RDX DP 22.7 gr Low Debris	N/A	4.63	10399
2563.15	0.15	Gun Carrier Blank Section	N/A	4.63	
2563.25	0.10	X-O Tandem	N/A	4.63	
2564.18	0.93	Detonating Interrupting Device	N/A	3.38	
2565.51	1.33	Extended Delay n. 4 x 6 min each	N/A	3.38	
2566.06	0.55	TDF Firing Head	N/A	3.38	
2566.23	0.17	Ported Bull Plug	N/A	3.38	

Completion ☐ **Interv.** ☐

Supervisor **Emanuele Congia**

Superintendent

ENCLOSURE 3 7019/1-1 WELL COMPOSITE LOG

ENCLOSURE 4 7019/1-1 C.P.I.