statoil

WELL 1/9-3, PHASE II

DRILLING PROGRAM

27. APRIL 1978

Den norske stats oljeselskap a.s

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S T A T O I L

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WELL 1/9-3 PHASE II

NOTE: This program is designed to supplement STATOIL's WELL 1/9-3 DRILLING PROGRAM, issued July 7, 1977, JACK-UP DRILLING OPERATIONS MANUAL, and JACK-UP BLOWOUT PREVENTION MANUAL.

The procedures as presented in this program will be followed in cases where differences exist between this program and the abovementioned procedures.

CONTENTS.

Figures.

DRILLING PROGRAM.

Well Designation:		1/9-3
Vessel	:	Dyvy Beta
Air Gap	:	18.2 m
KBE to MSL	:	36 m
Water Depth	:	76.2 m
Depths	:	Referred to KBE except where specified otherwise.

I LOCATION.

See Geological Progam

II MOVE, NAVIGATING, POSITIONING AND RE-ENTRY.

See separate program.

III GEOLOGICAL PROGNOSIS.

See Geological Program.

IV GENERAL DRILLING.

Total depth Phase I	:	2771 m
Estimated total depth Phase II:		5000 m

OPERATIONAL PHASE.

Stab and land the 36" casing with the 44" OD overshot onto the remaining cut off 36" casing at mudline as described in chapter 5.26, STATOIL PROCEDURE FOR RE-ENTRY OF WELL 1/9-3.

Remove the 2" OCT Back Pressure Valves for the 20", 16" and 13 3/8" casings and tie the abovementioned casings back to surface (See fig. 1 p.25)

Drill out cement abandonment plugs from Phase I (See fig. 2 p.26)

Drill 12 1/4" hole to approx. 3800 m. Core and log as programmed.

NOTE: The 9 5/8" casing is to be set into the pressure transition zone in the Lower Cretaceous in order to drill the Jurassic Formations safely.

Drill 8½" hole to T.D. Core and log as programmed. 7" casing or liner is only to be run if needed for drilling or well testing purposes.

REMARKS (DRILLING CONSIDERATIONS).

The Danian and Maastrichtian formations are to be drilled with approx. 1.68 g/cm^3 mud weight, which should provide sufficient overbalance. The formation pore pressures obtained from the 1/9-1 Drill Stem Tests varied from 0.156 bar/m to 0.160 bar/m (1.59 - 1.63 sp.gr.)

A pressure transition zone starting at Cenomanian/Lower Cretaceous can be expected. In order to obtain a sufficient formation integrity for drilling the Jurassic formations, the 9 5/8" casing is to be set into this transition zone. This should be safely accompplished within the allowable mud weight tolerance from 1.68 - 1.78 g/cm^3 for this section of the hole (formation integrity $\pm$ 1.88 g/cm^{3}equivalent).

For optimum drilling performance and for an easier detection of the expected pressure transition zone, it is recommended to drill the Cenomanian and Lower Cretaceous in one bit run with a rotary diamond bit (MD 311 or equivalent).

The formation integrity below the 9 5/8" casing is expected to be equivalent to $\pm$ 0.210 bar/m (2.14 g/cm^3). The maximum expected pore pressure gradient for the Jurassic formations is $\pm$ 0.190 bar/m, which should be safely controlled by $\pm$ 200 g/cm^3 mud weight. The 1/9-3 control wells 2/7-1, 2/7-9 and 2/8-3 all drilled Jurassic formations with mud weights less or equal to 2.00 g/cm^3.

Due to the close tolerance between loosing and gaining mud, it is an absolute necessity to optimize solids removal (mud cleaners and centrifuge) and to apply high temperature thinners in order to prevent mud gelation and excessive mud circulating density.

A single shot directional survey will be run every 90 m if hole conditions permit.

Check the mud for H_2S content in 100 m intervals by means of Garrett's H_2S Gas Train (use fresh filtrate from the filter press only!).

V MUD PROGRAM.

Interval (m)	Hole size	Mud type	Weight (g/cm^3)	PV	YP	H.T.H.P. W.L.	pH
2771 - ± 3800	12 1/4"	Seawater - Surfactant - HT - Thinners	1.65-1.75	low	8-15	15 or less	10-11
± 3800 - 5000	8½"	Seawater - Surfactant - HT - Thinners	1.85-2.00	low	8-15	15 or less	10-11

Remarks: - See separate Mud Program for details.

- Rheological properties will be tested and reported at 50°C. Reported mud weight is to be measured using a "Pressurized Mud Balance."

- Maintain drill solids content at minimum by means of "mud cleaners" (150 - 120 mesh screens)

- Utilize the centrifuge for viscosity control.

VI HYDRAULICS/BITS.

Interval (m)	Hole size	Bit type	Nozzles (32nds)	WOB (tonne)	RPM	Circ. (m^3/min)	Pump Pressure (bar)
2771 - ± 3800	12 1/4"	XIG, XV, MD 311	3x16(15)	15-25	80-140	2.4-2.0	200
3800 - 5000	8½"	MD 311	-	10-20	± 150	1.5-1.0	150 - 200

Remarks:
- Hydraulics and Drilling Parameters will be optimized on the rig according to actual mud properties and hole conditions. Surface pressure is to be recorded at different circulating rates before pulling the bit.
- Bit type does not necessarily indicate actual make of bit. Equivalent bit types may be used.

VII WELL LOGGING PROGRAM.

See Geological Program.

VIII CASING.

Set casing as per general procedures.

Casing program: (phase I and II):

Size	Depth (m)	Weight (lb/ft)	Grade	Thread	Operational phase
36"	0 - 162	1½" wall	B	Vetco ALT	Phase I
20"	0 - 434	133	K 55	Buttress	
16"	0 - 1345	75	N 80	Buttress	
13 3/8"	0 - 2761	72	N 80	Buttress	
9 5/8"	0 - 2950	47	N 80	Buttress	Phase II
	2950 - 3300	53.5	N 80	Buttress	
	3300 - ± 3800	47	N 80	Buttress	
If required					
7" liner		29 or 32	P 110	X-line or BDS	
7" tie back		32	P 110	BDS	

NOTE: - 9 5/8" casing is to be set into the pressure transition zone above the Jurassic formations. Estimated setting depth ± 3800 m.

- 9 5/8" N 80, 53.5 lb/ft with special drift 8.50"

- See "Casing Calculations" for casing properties.

IX CEMENTING.

As per general procedures. See "Cement Calculations" for slurry composition and slurry amounts. A cement bond log will be run to check the quality of the cement for the 9 5/8" and 7" (if run) casings.

X BOP TESTING.

As per general procedures.

XI PRESSURE INTEGRITY TESTS.

As per general procedures.

XIII ABNORMAL PRESSURE DETECTION.

The most effective abnormal pressure detection operation will be the result of team effort involving the Drilling Supervisor, Drilling Engineer, Wellsite Geologist, and Mud Logging Engineer. Pressure indicators will be monitored continuously and any deviation investigated immediately. The reliablility of each abnormal pressure indicator will have to be established during the course of operation.

A Mud Logging Unit will be utilized below the 30 inch casing shoe to collect and monitor abnormal pressure parameters. This unit will be programmed to record and plot the following parameters relating to abnormal pressure:

a) On a depth scale:
   1. Drillability
   2. ROP
   3. "d" exponent

b) On a time scale:
   1. Rotary torque
   2. Mud temperature in
   3. Mud temperature out
   4. Lagged differential temperature
   5. Mud flow in
   6. Mud flow out

7. Mud weight in
8. Mud weight out
9. Pit volume
10. Pit volume total change
11. Mud gas

In addition, below the 20" casing shoe, manual plots will be recorded and reviewed continuously by the Drilling Engineer and Drilling Supervisor. These plots will include ROP, "d"-exp., Gas Units, and Shale Density.

Abnormal pressure detection data will be forwarded into the Stavanger Operations Office twice daily on a routine basis and more frequently if drilling a suspect transition zone. Any change in abnormal pressure detection parameters will be immediately reported by the rig to the Stavanger Operations Office.

XIV PRODUCTION TESTS.

A detailed testing program will be issued prior to each production test.

XV PLUG AND ABANDONMENT.

As per general procedures.

Approved:

Expl. Manager Statoil

Drilling and Production Manager.

CALCULATIONS.

KICK CONTROL.

13 3/8" Casing: Setting depth: 2761 m. Estimated formation integrity: equiv. 0.185 bar/m. From Fig.3 p.27 it can be seen that a 78 m column of gas (equiv. volume:5.0 m^3) is the maximum that can be circulated our at the 13 3/8" casing shoe if the required mud weight increase is 0.05 g/cm^3, (1.78 + 0.05) g/cm^3.

Note: The pore pressure in the Danian/Maastrichtion pays is known to be 0.157 - 0.160 bar/m. The only place kick control possibly occure with a 1.78 g/cm^3 mud weight in the transition zone above Jurassic.

9 5/8" Casing: Setting depth: $\pm$ 3800 m. Estimated formation integrity: 0.210 bar/m. From Fig. 3 p.27 it can be seen that 170 m column of gas (equiv. volume: 4.1 m^3) is the maximum that can be circulated out at the 9 5/8" casing shoe if the required mud weight increase is 0.05 g/cm^3, (2.00 + 0.5) g/cm^3.

Note: The control wells 2/7-1, 2/7-9 and 2/8-3 all drilled Jurassic with mud weights less or equal to 2.00 sp.gr. There is no reason to believe that a higher mud weight than 2.00 sp.gr. should be necessary for this well.

CASING CALCULATIONS.

Co = Collapse load (bar)
Gf = Fracture gradient (bar/m)
G gas = Gas gravity gradient (bar/m)
Gi = Mud gradient at casing setting depth (bar/m)
G'i = Maximum mud gradient below casing shoe (bar/m)
Gp = Normal pore pressure gradient - 0.1 bar/m
G'p = Normal pore pressure gradient (collapse) (bar/m)
G"p = Actual pore pressure gradient (bar/m)
Mc = Casing mass-gradient (coupled) (kg/m)
Pb = Burst load (bar)
Pbw = Burst load at wellhead (bar)
RESb = Burst resistance (bar)
RESc = Collapse resistance (bar)
RESt = Tension resistance (10^3 daN)
S.F.b. = Safety factor, burst = 1.10
S.F.c. = Safety factor, collapse = 1.25
S.F.t. = Safety factor, tension = 1.50
T = Tension (10^3 daN)
Wd = Well depth (m)
X = Casing seat depth (m)
Y = Depth (m) to top of fluid column if mud is lost to a formation at the bit

9 5/8" CASING.

The following parameters are used:

Wd = 5000 m
X = 3800 m
Gp = 0.10 bar/m (sea water)
G"p Danian = 0.157 bar/m (1.60 sp.gr.)
G gas Danian = 0.027 bar/m ($\bar{p}$ = 440 bar, γ = 0.70, $\bar{T}$ = 80°C
Gi = 0.175 bar/m (1.78 sp.gr. mud)
G'i = 0.196 bar/m (2.00 sp.gr. mud)
G_f, 3800 = 0.210 bar/m (2.14 sp.gr)
G"p, Jurassic = 0.190 bar/m (1.94 sp.gr.)

The 9 5/8" casing calculations are done for two cases:

- Production casing for Danian/Maastrichtian.
- Intermediate casing for drilling the Jurassic formations.

Production casing for the Danian/Maastrichtian pays.

Select the following 9 5/8" production casing: 0 - 2950 m, N 80 47 lb/ft, 2950 - 3300 m, N 80 , 53.5 lb/ft, 3300 - 3800 m, N 80, 47 lb/ft, all Buttress.

9 5/8" casing properties:

	N 80, 47 lb/ft	N 80, 53.5 lb/ft
RESc, bar	328	456
RESb, bar	474	547
RESt, 10^3 daN	482	552
Mc, kg/m	69.89	79.74

Burst.

The casing is designed to withstand the static wellhead burst pressure over the entire length, i.e.

Pbw = (G"p, Danian - Ggas, Danian) · X Danian

= (0.157 - 0.027) · 3085 = 401 bar

Safety against burst (N 80, 47 lb/ft:

$$SFb = \frac{RESb}{Pbw} = \frac{474}{401} = 1.18 \ (> 1.10)$$

Collapse.

The part of the casing above a production packer is designed to with stand the hydrostatic difference between mud and sea water.

Co, 2950 m = $(G_i - G_p)$ · X,(N 80, 47 lb/ft)

= (0.175 - 0.01) · 2950 = 221 bar

$$SFc = \frac{RESc}{Co,\ 2950} = \frac{328}{221} = 1.48 \ (> 1.25)$$

The part of the casing between a production packer and the plug back depth (2950 - 3300 m) is designed for minimum allowable flowing pressure for N 80, 53.5 lb/ft casing).

$$Pwf,\ min = Pmud - \frac{RESc}{SFc}$$

$$= 0.175 \cdot 3300 - \frac{456}{1.25}$$

$$= 213 \text{ bar } (\approx 3100 \text{ psi})$$

This is equivalent to approx. 277 bar drawdown at 3200 m

Tension.

$$T = Mc \cdot X \cdot \frac{0.981}{1000} \qquad (10^3 \text{ daN})$$

$$= 69.89 \cdot (2950 - 0) + (3800 - 3300) \cdot \frac{0.981}{1000}$$

$$+ 79.74\ (3300 - 2950) \cdot \frac{0.981}{1000}$$

$$= 264 \cdot 10^3 \text{ daN}$$

$$SFt = \frac{RESt}{T} \text{ (N 80, 47 lb/ft)}$$

$$= \frac{482 \cdot 10^3}{264 \cdot 10^3}$$

$$= 1.83\ (> 1.50)$$

The proposed 9 5/8" production casing:

0 - 2950 m, N 80, 47 lb/ft Buttress
2 950 - 3300 m, N 80, 53.5 lb/ft, Buttress
3 300 - 3800 m, N 80, 47 lb/ft, Buttress

fulfils all requirements.

Intermediate casing for drilling the Jurassic formations.

Burst.

A design kick of 15 m^3 volume necessitating a 0.10 sp.gr. mud weight increase is assumed at T.D. Maximum casing burst pressure is equal the internal pressure at the mud/gas interface when circulating out the kick less the hydrostatic pressure of the mud the casing was set in. (in this case the danian pore pressure gradient 0.157 bar/m or 1.60 sp.gr. is used).

Annular capacity 8.5" hole - 5" DP: 24 l/m

Height of kick: $H_K = \frac{15\ m^3}{0.024\ m^3/m} = \underline{625\ m}$

BHP after kick: $Pp = (G'i + 0.01) \cdot Wd$

$= (0.196 + 0.01) \cdot 5000$

$= \underline{1030\ bar}$

Determination of internal casing pressure while circulating our the kick using equations from the BOP Mannual:

1. $Pg + (WD - Hg) \cdot G'i = Pp$

2. $\frac{Pp \cdot V_1}{T_1 \cdot Z_1} = \frac{Pg \cdot Vg}{T_2 \cdot Z_2}$

Where Pg = pressure of gas bubble at surface, bar
Hg = heigh of gas bubble at surface, m
Vg = volume of gas bubble at surface, m^3
Pp = pressure of gas bubble at bottom, 1020 bars
V_1 = volume of influx , 15 m^3
T_1 = bottom hole temperatur, 170°C, (443°K)
T_2 = surface temperatur, 50°C, (323°K)
Z_1 = gas compr. factor at bottom, 1.55
Z_2 = " surface, 0.85

Equation 2: $\frac{1030 \cdot 15}{433 \cdot 1.55} = \frac{Pg \cdot Vg}{323 \cdot 0.85}$

where $Vg = Hg \cdot 0.024$

$$Hg = \frac{1030 \cdot 15 \cdot 323 \cdot 085}{443 \cdot 1.55 \cdot Pg \cdot 0.024} = \frac{257397}{Pg}$$

Substitute for Hg in equation 1:

$$Pg + (5000 - \frac{257397}{Pg}) \cdot 0.196 = 1030$$

Pg = 251 bar

$$Hg = \frac{257397}{Pg} = \frac{257397}{251} = 1025 \text{ m}$$

From graphical solution, p.
Pb max = 310 bar at 3800 m

$$SFb = \frac{RESb}{Pbmax} \quad (N\ 80,\ 47\ lb/ft)$$

$$= \frac{474}{310}$$

= 1.53 (> 1.10)

Collapse.

See collapse calculations for production casing p. which is stricter than for an intermediate casing.

Tension.

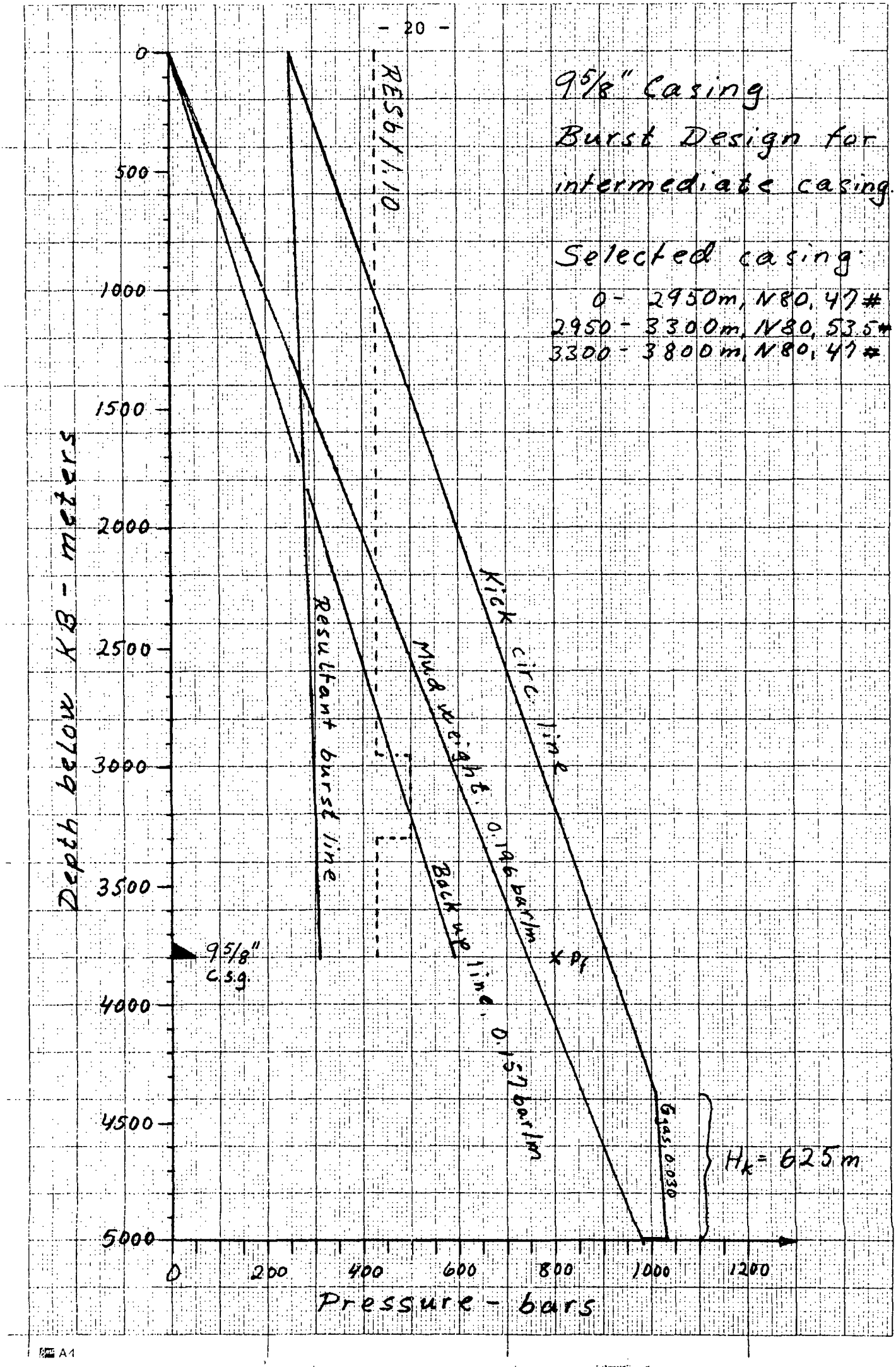
See calculations for production casing p. which are the same as for an intermediate casing.

Result.

The prososed 9 5/8" casing:

0 - 2950 m, N 80, 47 lb/ft, Buttress
2950 - 3300 m, N 80, 53.5 bl/ft, Buttress
3300 - 3800 m, N 80, 47 lb/ft, Buttress

Fulfill all requirements for Danian/Maastrichtian production casing and for an intermediate casing for drilling the Jurassic formations T.D. (5000 m).


9 5/8" Casing
Burst Design for
intermediate casing.
Selected casing:
0 - 2950m, N80, 47#
2950 - 3300m, N80, 53.5#
3300 - 3800m, N80, 47#
RESG 1.10
Kick circ. line
Mud weight 0.196 bar/m
Back up line 0.157 bar/m
Resultant burst line
9 5/8" C.S.g.
Gas 0.030
H_k = 625m
Depth below KB - metres
Pressure - bars
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
0
200
400
600
800
1000
1200

7" CASING.

A 7" casing/liner will only be run in case it should become necessary for drilling or well testing purposes.

7" liner.

The liner will either be P110, 29 lb/ft, X-line or P110, 32 lb/ft, Mannesmann BDS with special clearance couplings, (OD = 7.37") depending upon acutal conditions (well depth, drilling or testing liner etc.)

7" liner properties:

	29 lb/ft, P110, X-line	32 lb/ft, P110, BDS sp. clearance
RESc, bar	587	742
RESb, bar	774	859
REST, 10^3 daN	401	277
Mc, kg/m	42.87	47.07

7" tieback.

In case it should become necessary to tie back a 7" liner to surface for well testing purposes, the tieback string will be P110, 32 lb/ft, Mannesmann BDS threads, which has the following properties:

	7" P110, 32 lb/ft, BDS
RESc, bar	742
RESb, bar	859
REST, 10^3 daN	441
Mc, kg/m	47.50

NOTE: All of the proposed 7" casing strings have a burst resistance above 690 bar (10000 psi) with a 1.1 safety factor.

9 5/8" CASING CEMENT DATA AND CALCULATIONS, WELL 1/9-3.

GENERAL: The casing is to be cemented 500 m above the 13 3/8" casing shoe with 25% excess on theoretical volume.

WELL DATA:

Depth kb-sea bed	112	m
Depth kb-last shoe	± 2761	m
Depth kb-casing set point	± 3800	m
Open hole dia	12 1/4	"
Annulus capacity, cased hole	30.14	l/m
Annulus capacity, open hole	28.94	l/m
Internal capacity, " casing	38.19	l/m
Mud weight, max	1.78	g/cm^3
Bottom hole hydrostatic pres. (BHHP)	665	bar
Est. bottom hole static temp. (BHST)	140	°C
Est. bottom hole circulating temp. (BHCT)	100	°C
Est. formation integrity	0.210	bar/m

CEMENT SLURRY DATA, STAGE: ONE OF ONE

CEMENT SLURRY COMPOSITION		SLURRY CLASS G+ 30% Silica Sand	SLURRY CLASS G+ 30% Silica Sand
Mix water	l/100 kg	55 fresh	(6.22 gal/sx)
Total liquid	l/100 kg	-	
Slurry weight	g/cm^3	1.88	(15.7 ppg)
Slurry yield	l/100 kg	100	(1.504 ft^3/sx)
TEST DATA @ BHCT			
Thickening time @ BHHP, hr:min		Test	
Crit. Turb.Flow rate: m/s (l/min)		data	
Fluid loss, ml/30 min, 70 bar		not	
TEST DATA @ BHST, BHHP		complete	
Compr. strength, N/mm^2,	hr		
N/mm^2,	hr		
SPECIAL TESTS:			
Additives specified later.			

Volume calculations.

24 m plug at shoe:	0.03819 m^3/m · 24 m	= 0.92 m^3
12 1/4" hole - 9 5/8" csg:	0.02894 m^3/m · (3800-2761)	= 30.07 m^3
13 3/8" csg. - 9 5/8" csg:	0.03014 m^3/m · 500 m	= 15.07 m^3
Theoretical volume		46.06 m^3
25% open hole excess: 30.07 m^3 · $\frac{25}{100}$ =		7.52 m^3
Total slurry volume:		53.58 m^3

USE.

Class G + 30% Silica Sand:

54 000 kg cement 1266 sx) + 16 200 kg silica sand equal to 54.0 m^3 slurry requiring 29.7 m^3 (187 bbl) liquid (fresh water + additives) to mix the cement slurry.

Note: Amount of additives (retarder, dispersant and fluid loss control) will be specified when the cement slurry test data are available.

Estimated time for cement mixing and cement displacement.

Mixing:	54 000 kg/1000 kg/min	=	54 min
Displacing:	54.0 m^3/1.1 m^3/min	=	49 min
Total			103 min or 1 hr 43 min

Formation pressure integrity.

The critical interval is thought to be Paleocene sands, approx 100 m below the 13 3/8" casing shoe. Hydrostatic pressure at this point:

Pressure of mud:	0.175 bar/m · 2000 m	=	350 bar
Pressure of cement:	0.185 bar/m · 850 m	=	157 bar
Hydrostatic pressure at 2850 m			507 bar
Pressure gradient:	507 bar/2850 m	=	0.178 bar/m
Estimated formation integrity:			0.185 bar/m

7" CASING/LINER CEMENT DATA AND CALCULATIONS.

Will be issued in a separate program in case 7" casing is run.

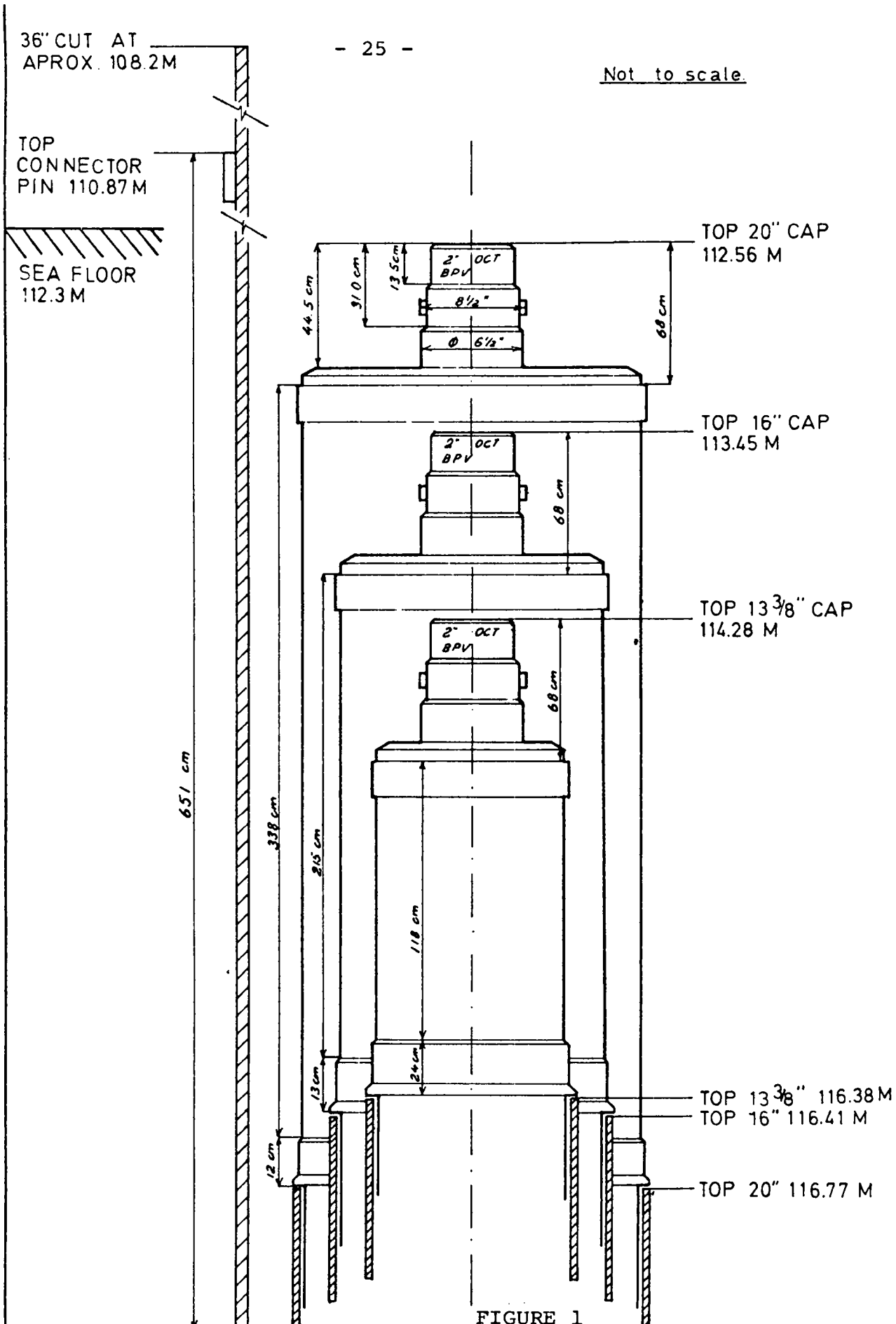


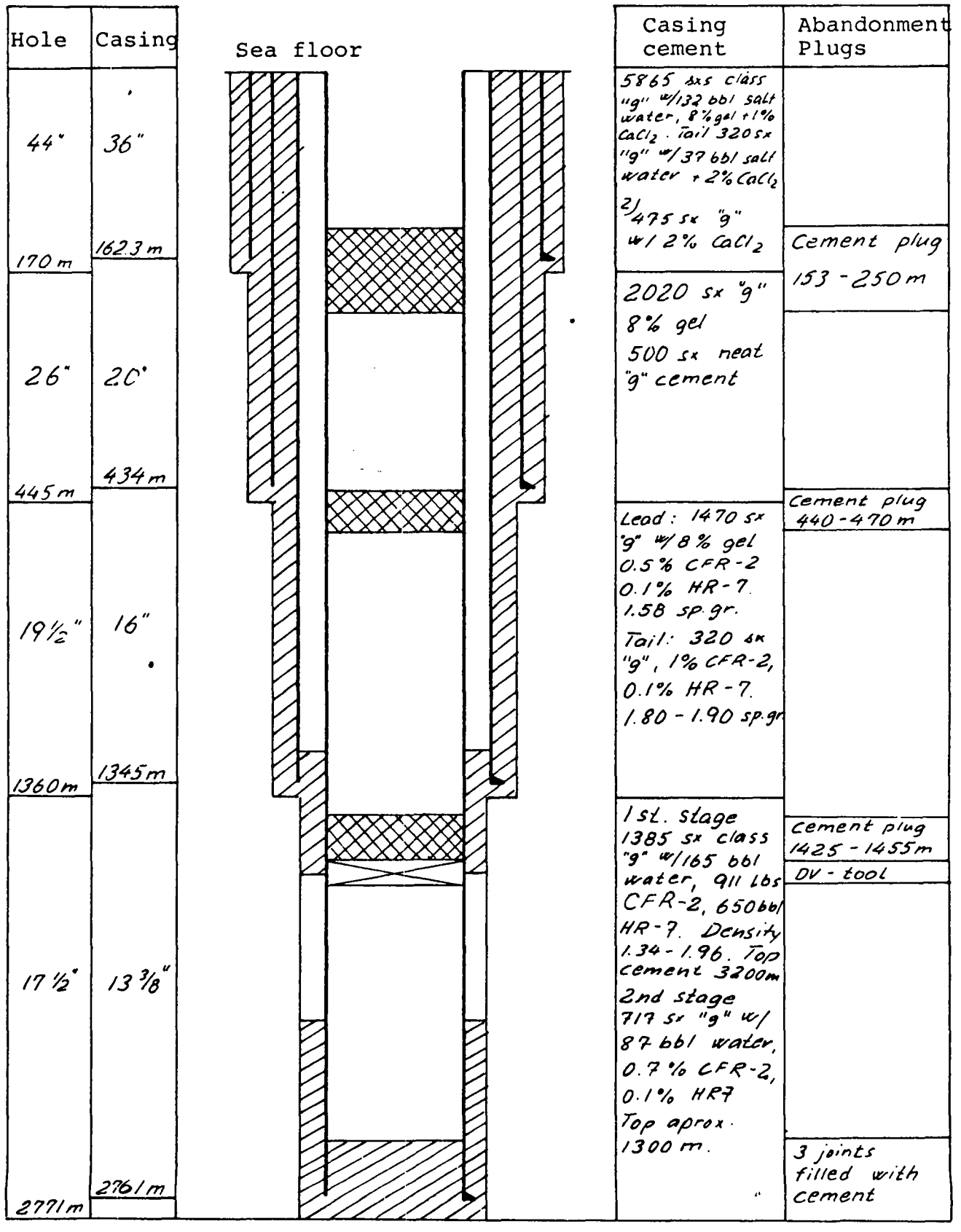
FIGURE 1

1/9 - 3. TEMPORARY ABANDONMENT.
Position of abandonment caps and 36" casing. All depths from RKB.
Top of 13 3/8" csg. tagged and measured

Figure 2. Well 1/9-3 Cement Plugs.

Water depth: 76.2 m

RKB - MSL: 36.1 m



Primary cement

Abandonment cement

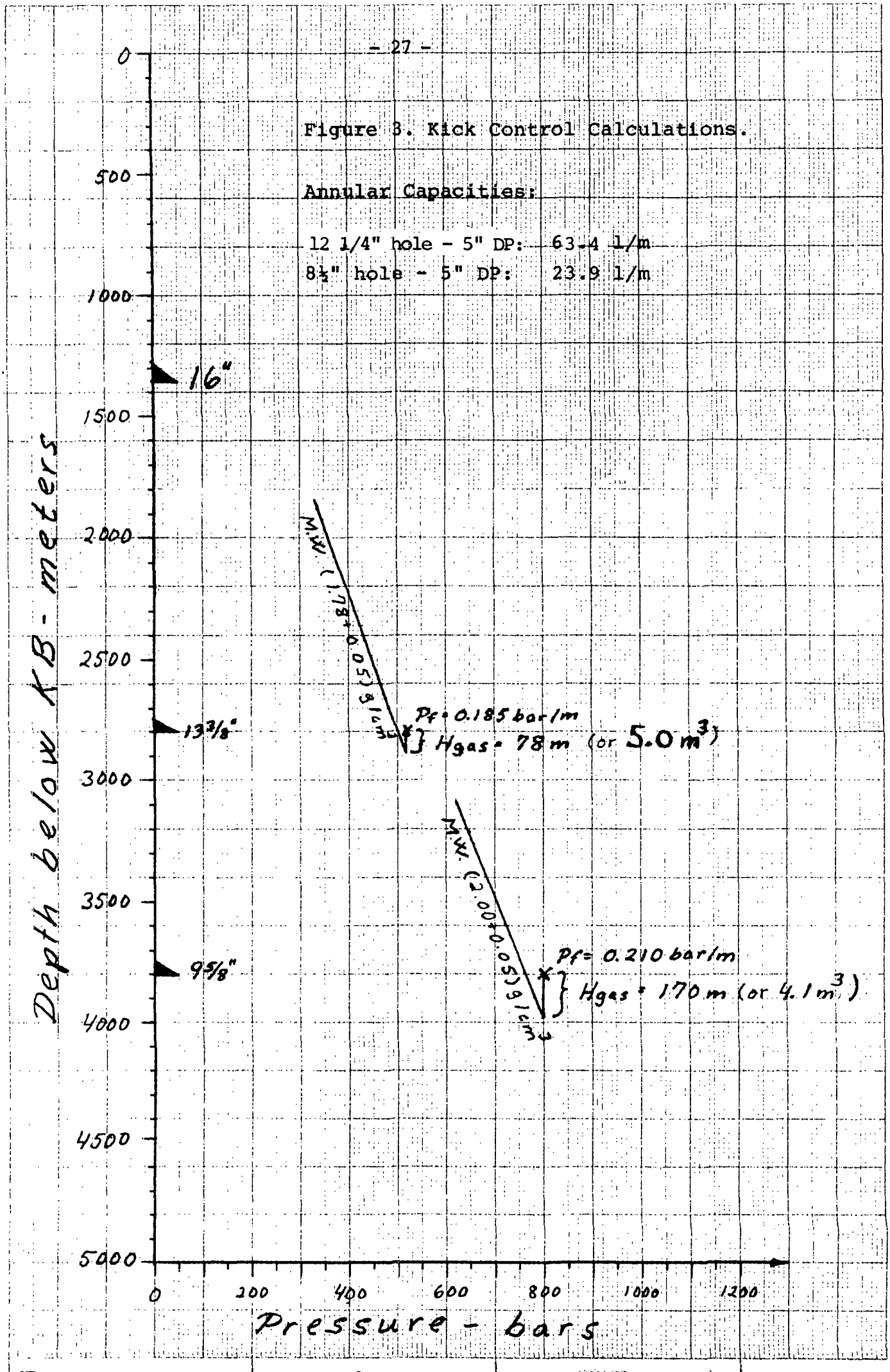


Figure 3. Kick Control Calculations.

Annular Capacities:

12 1/4" hole - 5" DP: 63.4 l/m

8½" hole - 5" DP: 23.9 l/m

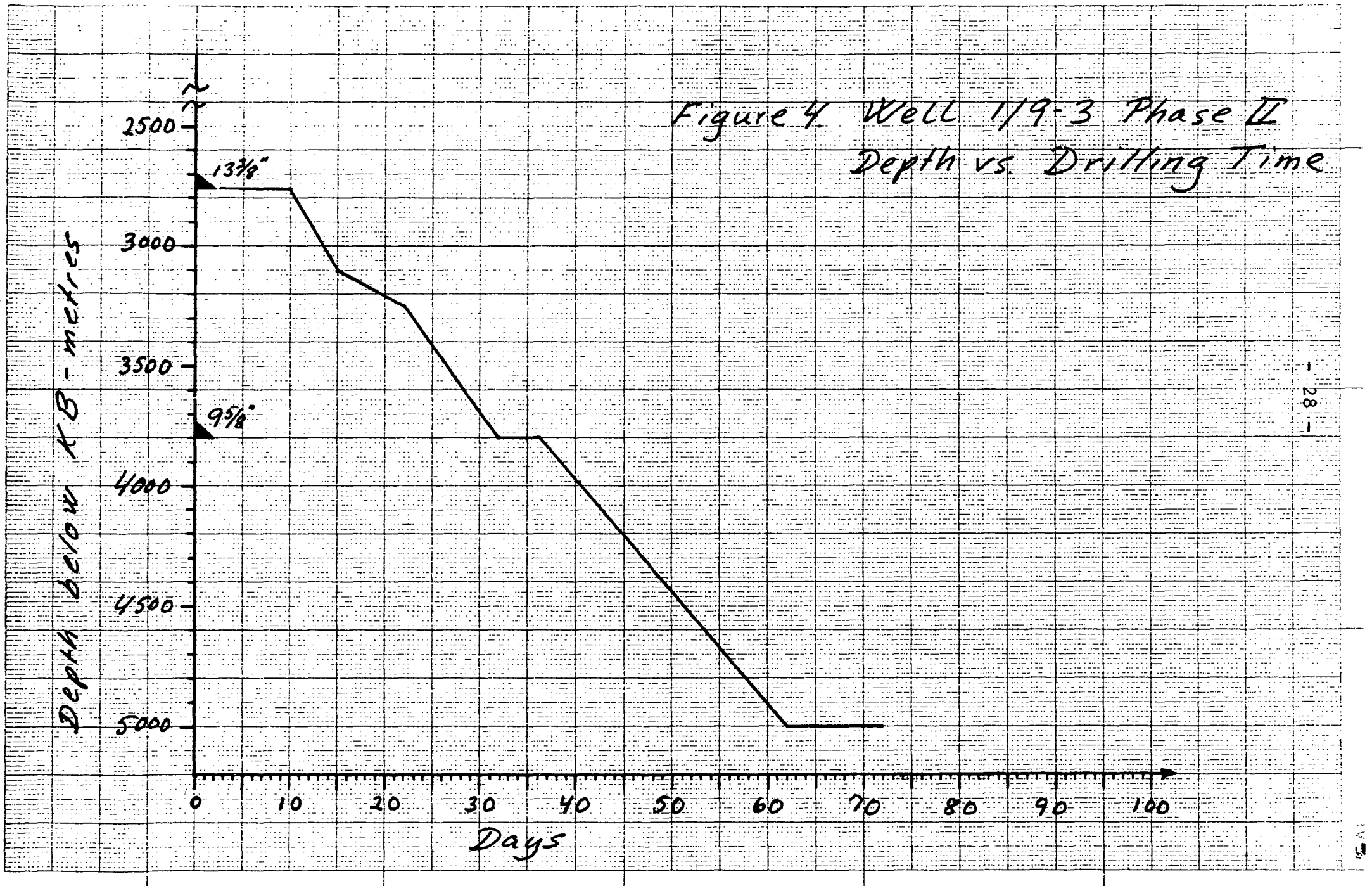


Figure 4 Well 1/9-3 Phase II
Depth vs Drilling Time
Depth below KB - metres
2500
3000
3500
4000
4500
5000
13 3/8"
9 5/8"
0
10
20
30
40
50
60
70
80
90
100
Days

7" CASING CEMENT DATA AND CALCULATIONS, WELL 1/9-3

WELL DATA :

Depth kb-sea bed	~~112m~~
Depth kb-last shoe	3830m
Depth kb-casing set point	± 4500m
Open hole dia	8 15/32"
Open hole capacity	36.61/m
Annulus capacity, cased hole, 9 5/8"-7" csg	13.31 l/m
Annulus capacity, open hole, 8 3/8"-7" csg	11.7 l/m
Internal capacity, 7" casing, 32 lb/ft	18.82 l/m
Internal capacity, 5" drill pipe, 19.50 lb/ft	9.16 l/m
Mud weight	2.04 g/cm^3
Bottom hole hydrostatic pre. (BHHP) 4500m	900 bar
Est. bottom hole circulating temp. (BHCT)	110°C (4200m)
Est. formation integrity	0.201 bar/m

PRELIMINARY SLURRY DATA

The following data were calculated for a setting depth of 4200m (BHCT=110°C). A setting depth of 4500m gives a BHCT of ~~118~~°C which will reduce the thickening time to a more decirable value.

CEMENT SLURRY COMPOSITION	D-8c CLASS G+30% ~~D-80~~+1.5% R11+0.3% R6+1.5% D31	
Mix water 1/100 kg	~~Ferskvann~~ 40 Fresh water	4.51
Total liquid 1/100 kg		
Slurry weight g/cm^3	2.04	17.0 ppg
Slurry yield 1/100 kg	85.28	1.28ft^3/sx
TEST DATA @ BHCT (110°C)		
Thickening time @ BHHP, hr:min	5:10	
Crit. Turb.Flow rate: 1/min	1372	~~1372 l/min~~ 1372 l/min
~~Fluid loss, ml/30 min, 70 bar~~		
TEST DATA @ BHST, BHHP		
Compr. strength, N/mm^2, 12hr		2-3000 psi
N/mm^2, hr		

SPECIAL TESTS:

Fann Readings @ 93°C (200°F)	600	300	200	100
	104	53	34	16

Annular friction loss at 1372 l/m: 40.4 bar/1000m

Consistency: 8 Bc

The additive[3] R11, R6, D31 must be prehydrated in fresh water.

The following additives are used:

R11	High temperature retarder
R6	High temperature retarder
D31	Dispersant
D-8C	Silica Sand (preblended with "Norcem G")

WELLFILE N.11

KOMMENTAR TIL GEOLOGISK PROGNOSE

Vedlegg a)

I vår søknad om tillatelse til å bore 1/9-3 (fase 1) ble vedlagt "Geological Prognosis, Drilling Program, and Drilling Considerations , Date: 7 July 1977".

Den geologiske delen av dette programmet ble prognosert til en total dybde av 5000 m (dvs. fase 2 inkludert).

Resultatene av fase 1 ga oss ingen grunn til endringer av denne prognosen. Vi henviser derfor til den tidligere innleverte geologiske delen av boreprogrammet for 1/9-3 som geologisk vedlegg til søknad om boretillatelse for 1/9-3(fase 2 og anfører endringer med henvisning til nevnte program, som følger:

Side 3:

Drilling Contractor	- k/s Dyvi Drilling II A/S
Drilling Rig	- "Dyvi Beta"
Mudlogging Contractor	- NEC GAS
Type Logging Unit	- NEC GAS Standard Unit

Side 6:

Bare forandring i Mudlogging Contractor og Logging Unit.

Side 7:

"Velocity Survey will be run at TD". (Ikke ved 9 5/8" foringsrør dyp.)

Side 8:

Tillegg: STAFF:

Staff of the Exploration Department, Statoil who are involved on the planning and drilling of well 1/9-3 (phase 2):

Name	Title	TELEPHONE Office	Home	Mobile
P.H. Halstead	Expl.manager	33180	32466	62515
Kj. Helle	Area Geologist	"	25556	-
D.I. Milton	Chief. Exploit.Geol.	"	51264	62513
S.G. Larsen	Sen.Geol.	"	25374	36340
S.O. Syrstad	Well-site-geologist	"	-	57905

SGL/GjI
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