DRILLING PROGRAM

MOBIL EXPLORATION NORWAY, INC.

BLOCK 33/9 - (APPRAISAL WELL)

PREPARED 20-6-1977

25/1
33/9-9

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Drilling Engineer

for Drilling Engineering Supervisor

Recommended By: A. L. Smith
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Drilling Superintendent

Jan D. Kleka
for Engineering Manager

6 July 1977
Drilling Manager

Approved By:

Exploration Manager

Producing Manager

DRILLING PROGRAM
MOBIL EXPLORATION NORWAY INC.

BLOCK 33/9 - (APPRAISAL WELL)

PREPARED 20.6.77

Location coordinates	Latitude 61°17'10.032" N. Longitude 01°54'27.592"E. Shotpoint 615 on Line MNG - 22.5
KBE	25 meters (estimated)
Water Depth	145 meters
Proposed Total Depth	3025 meters RKB
Anticipated Starting Date	1 August 1977
Contractors	
Rig	'Borgny Dolphin'
Drilling Contractor	Dolphin Services A/S 4056 Tananger
Electric Logging	Schlumberger Offshore Services P.O. Box 129, 4051 Sola
Cementing & DST Service	Halliburton Manufacturing & Services Ltd. P.O. Box 67, 4056 Tananger
Mud Logging	NEC Gas Analytic Service Int. Ltd. 2/4 Simpson Place, Nethermains, Kilwinning, Ayrshire, KA136PT England

Mud Services	N.L. Baroid U.K. Ltd. 4056 Tananger
Marine Services	Grieg Offshore Marine P.O. Box 234, 4001 Bergen M/V's 'Ibis Seven', 'Rig Mate', and 'Norindo Sun', 'Ibis Two'*, 'Ibis Six'*.
Location and Navigation Service	Fairfield Aquatronics Ltd. 111 Windmill Road, Sunbury on Thames Middlesex, TW16 7EF, England
Well Testing	Otis Overseas Inc. Dusevik Base, P.O. Box 5025 4001 Stavanger
Diving Service	Three X Diving Company Ltd. c/o Aker Norsco Oil Base, 4056 Tananger
Sub Sea System	Cameron Iron Works P.O. Box 5005, 4001 Stavanger
Helicopter	Helicopter Service A/S. 4033 Forus
Blowout Preventers - 18-3/4"	4 - Cameron Type U, API 10,000 2 - Shaffer Annular Preventers, API 5,000
Diverter	Regan KFDS
30" Connector	Cameron
Manifold	3" API 10,000
Standby Vessels	K/S Bugge Supply Ships V A/S Storegate 20, Tønsberg M/V's 'Sea Panther'* and 'Sea Piper'*.

* Shared with Statfjord "A" Platform.

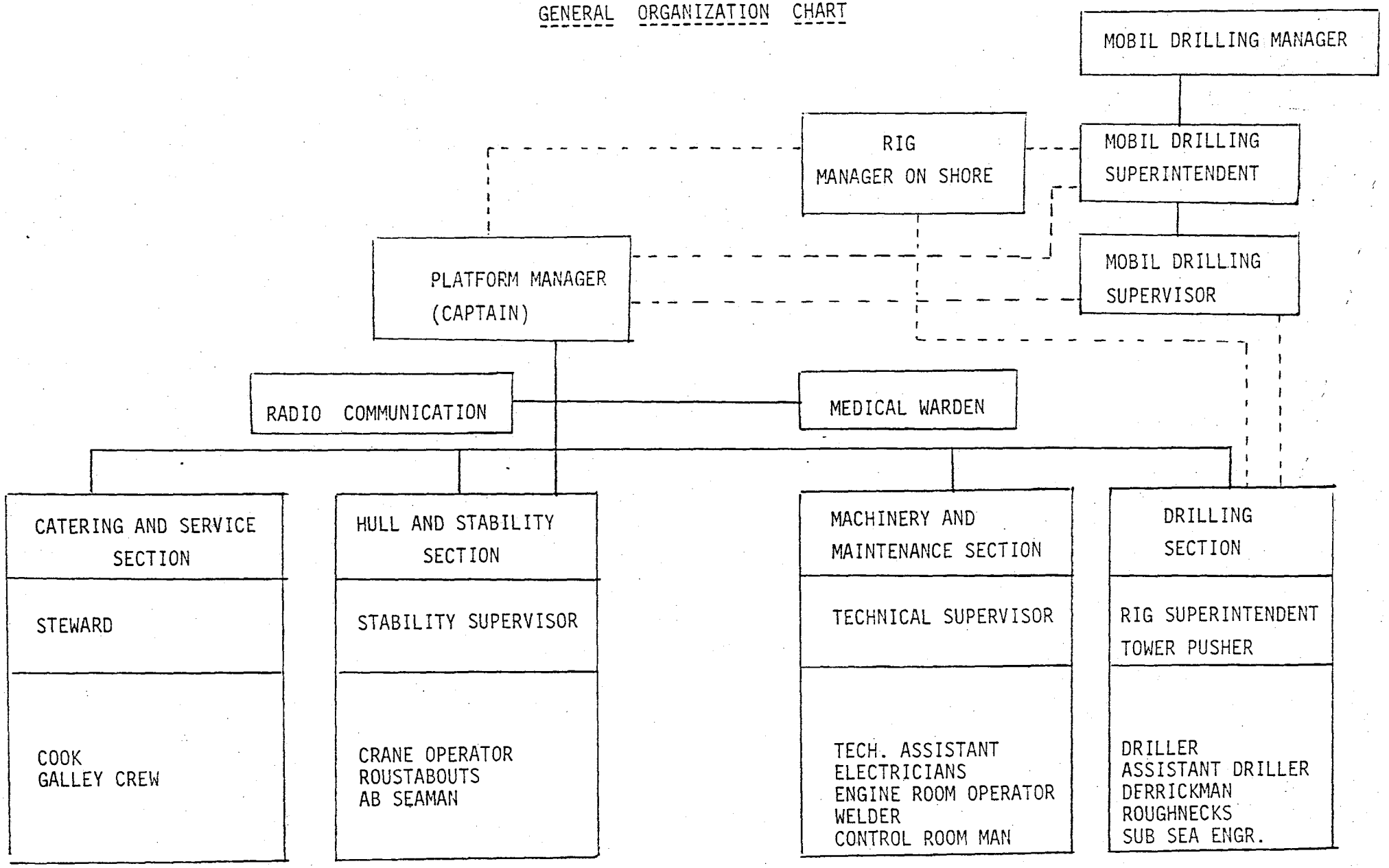
Confidential Information

All Mobil and Contractor personnel are cautioned that any information about the activities and results of this operation are confidential and are not to be discussed with other parties. Release of data will be made only with the formal approval of the Mobil Exploration Norway, Inc. Management and Norwegian Petroleum Directorate.

Responsibility

The man immediately responsible for all operations on the rig, in accordance with this program and the drilling contracts, will be the Mobil designated Drilling Supervisor, who will be aboard and in charge at all times. He will be advised by a Well Site Geologist and report to the Drilling Superintendent. The Superintendent will report to the Drilling Manager. The Manager will report to the Mobil Producing Manager. Any change in this program will be approved by the Producing Manager.

GENERAL ORGANIZATION CHART



Well Objectives

As noted in the geological program.

Hole Deviation

The hole will be as straight as practical through the use of stabilizers. No deviation problems are anticipated. Single Shot Magnetic surveys will be made at each bit change or at 90 m intervals, whichever is less. Additional or fewer surveys may be made at the discretion of the Drilling Supervisor.

Dog leg severity should be limited to 1^0 per 30 m.

Well Control Procedure

The Drilling Supervisor will be responsible for well control procedures. Mobil's Blow-Out Prevention Rig Guide for Floating Rigs will be followed.

Oil Spill Pollution Control

The Drilling Supervisor is responsible for Oil Spill Pollution Control procedures and drills aboard the rig. The primary control measure for small oil spills will be the use of dispersants. Mobil's Manual on Oil Spill Control and API publication No. 4024, System Study of Oil Spill Clean-Up Procedures, will be used as guides and expert advice will be immediately solicited in case of a disaster situation.

Well Evaluation Program

Sample Logging

A mud logging unit will be aboard the rig. The mud logging company will operate a unit capable of monitoring the following parameters in addition to normal logging services:

- Shale density
- Shale factor
- Compensated kelly height
- Standpipe pressure
- Hook load (weight on bit)
- Rotary speed (total bit rotations)
- Torque
- Mud volume
- Mud weight
- Mud temperature
- Mud resistivity
- Ditch flow
- Pumps strokes/minute

Coring

As noted in the geological program.

Testing

A detailed program will be prepared when the well reaches the proposed depth.

Electric Logging

As noted in the geological program.

Operational Sequence

Prior to towing rig on to the location, a location survey will be run by a surveying company on a 3 KM x 3 KM square centered on the intended location. The following surveys will be run:

Side scan sonar
Bathymetric survey
Boomer/sparker survey

The rig will be brought on to location utilizing satellite navigation integrated with Decca Main Chain. All anchors will be run out 2700 feet or more. The rig will be positioned with a heading of 315^{0} true north. After anchors have been set, mooring will be tested to 400000 lbs. After satisfactory mooring test, approximately 200000 lbs tension will be held on all mooring lines. The location coordinates will be determined with an accuracy of $\pm$ 10 meters (RMS).

36" Hole

1. Run the temporary guide base with two guidelines installed.

2. Run 26" bit on 36" hole opener to sea bed. Drill 36" hole with sea water to 75 meters sea bed penetration. Spot viscous gel mud in hole at each connection if required. Make a wiper trip and spot 250 barrels of viscous gel mud prior to pulling out to run casing. Bit weights should be kept at a minimum while drilling this section. Survey measurements should be taken after 6, 15 and 30 meters sea bed penetration and at total depth (75 meters penetration).

3. Casing Program

Diameter (inches)	Section (meters)	Length (meters)	Weight/ Thickness	Joint Type	Remarks
30	±170-182	12	1½ wall	Squnch	30" Housing welded on this section.
30	±182-243	61	1" wall	Squnch	Shoe welded on bottom section.

Run 30" conductor with permanent guide base and 30" housing and stab into temporary guide base. Land permanent guide base in temporary guide base. Regan Level indicator will be installed on camera side of the guide structure. Level indicator must be checked before and after cementing.

4. Cementing

Casing to be cemented back to sea bed.
Cement with 700 sacks "G" neat followed by 600 sacks class "G" with 2 percent Calcium Chloride. Mix both slurries with sea water.

26" Hole

1. Run 30" connector, marine riser, and diverter. Latch on to the 30" wellhead.

2. Drill 17½" hole with water to 485 meters RKB (315 meters sea bed penetration). Spot gel mud at each connection if required by hole conditions. Pull up 30' - 60' off bottom and check for gas flow. If no flow, make a wiper trip to sea floor keeping the hole full of sea water. Observe well again for gas flow. If there are no indications of flow, return to bottom and spot gel mud in hole before pulling out. If gas flow is observed, mix mud of sufficient weight to control flow, circulate and advise Stavanger office before pulling out of hole to log.

3. Log the open hole as per the attached Geological Program.

4. If there are no indications of gas, disconnect the 30" pin connector from the 30" housing and pull riser. Run in the hole with a 26" hole opener and open up to 26". Spot gel mud as required and before pulling out to run 20" casing. No welding or open flares will be permitted while operating with open hole unprotected by BOP's.

5. If gas is indicated, open the hole with hydraulic underreamer. Spot weighted gel mud as required and before pulling out to run 20" casing. Disconnect 30" pin connector and pull riser. No welding or open flares will be permitted while operating with open hole unprotected by BOP's.

26" Hole (Cont'd)

7. Casing Program

Diameter (inches)	Section (meters RKB)	Length (meters)	Grade	Weight (ppf)	Joint Type
20	± 170-475	305	X-52	91.5	Vetco "L"

18-3/4" housing welded on top joint. Shoe locked on bottom joint. Centralizers to be run as follows: 1 on bottom joint; 2 at bottom of 30" casing. Run 20" casing on 18-3/4", API 10000 psi housing. Install 40' of solid centralizers on 20" casing below 18-3/4" housing. Latch into 30" housing.

8. Cementing: Casing to be cemented back to sea bed. Cement with 1000 sacks class "G" cement with 8 percent gel plus 2% $CaCl_2$ mixed with fresh water, followed by 1000 sacks class "G" neat, mixed with sea water. T.V. camera to be run to observe returns to sea floor.

17½" Hole

1. Pressure test 18-3/4" BOP stack on test stump prior to running. Test rams and wing valves to 10000 psi, bag preventers to 3500 psi. Test all surface manifold valves to 10000 psi. This and all BOP, line and surface manifold tests to be run with water.

2. Run the BOP stack on the marine riser. Latch stack onto the 18-3/4" housing.

3. Test rams and wing valves to 7500 psi, sphericals to 2500 psi, using water.

4. Test 20" casing to 1200 psi for 15 minutes. Drill out 20" float and shoe with 17½" bit. Drill 5 meters of new formation. Establish formation bleed off pressure. Expected fracture gradient 12.3 ppg. Squeeze if less than 12.0 ppg.

5. Drill 17½" hole to 1990 meters or until mud weight required to stablilize the formation reaches 1.0 ppg less than the leak-off equivalent mud weight at the 20" shoe. Conduct weekly pressure tests of BOP using test plug and water. Test pressures to be 5500 psi on pipe rams and all wing valves and 2500 psi on bag preventers. Pipe rams shall be function tested at least once each day. Conduct weekly kick drill followed by "hang-off" drill. Pressure test shall be operated from alternate control panels and alternate control lines. Pit drill shall be conducted once on each tour.

6. Mud Program

This section will be drilled with a sea water, ferrochrome lignosulfonate mud system having the following basic properties.

Interval (meters)	Weight (ppg)	Plastic Viscosity CP	Yield Point Lbs/100 sq.ft	API Fluid Loss cc.
485-1200	Minimum	Minimum	8 - 12	N/A
1200-1990	9.0 -10.5	15	30	15 by 1500 m

Above 1200 m. the viscosity will be adjusted to give a PV/YP ratio equal to or less than 1 in order to maximize hole cleaning. Plastic viscosity will be kept at a minimum by efficient use of the solids control equipment.

17½" Hole (Cont'd)

6. Mud Program (Cont'd)

Use viscous slugs (100 - 120 funnel sec. viscosity) if hole cleaning problems are suspected. Mud weight should be 10.0 ppg or greater while drilling below 1500 meters.

7. The open hole will be logged as per the attached Geological Program.

8. Casing Program

Diameter (inches)	Section (meters RKB)	Length (meters)	Grade	Weight (ppf)	Joint Type
13 3/8"	± 170-1980	1810	N-80	72	Buttress

Shoe locked on bottom joint, float locked on top of bottom joint. Centralizers to be run as follows: 5 turboflow centralizers on bottom 5 joints, 3 regular centralizers on 3 joints across the 20 inch shoe. 13 3/8" D.V. tool with buttress threads will be placed 30 meters up from the 20" casing shoe. 2 cementing baskets will be installed below the D.V. tool.

9. Cementing: Casing to be cemented back to sea floor in 2 stages:
1st stage: Cement with 1750 sx class "G" with 8% gel + 0.75% CFR-2+ 0.2% HR-7 followed by 1000 sx class "G" + 0.75%CFR-2 + 0.2%HR-7. Mix both with freshwater. Open D.V. tool and circulate out excess cement and clean ports in D.V. tool.
2nd stage: Cement with 800 sx class "G" + 0.5% CFR-2. Mix with sea water.

10. Run 13 3/8" x 18-3/4" seal assembly. Activate seals and test to 5500 psi. Test pipe rams and wing valves to 5500 psi and bag preventers to 2500 psi. Use water as test fluid.

12-1/4" Hole

1. Prior to drilling out cement of the 13-3/8" casing, pressure test the casing and blind rams to 4200 psi for 15 minutes. Use the mud weight the casing was set in.

2. Drill out 13-3/8" float and shoe with a 12-1/4" bit. Drill 5 meters of new formation. Establish formation bleed off pressure. Squeeze cement shoe if leak-off test is less than equivalent of 15.2 ppg mud.

3. Drill 12 1/4" hole to such a depth as dictated by the well site geologist. Cut rubber-sleeve and full-hole cores as directed by geologist. Drill ahead to 3025 meters. Conduct weekly pressure tests of BOP using test plug and water. Test pressure to be 5500 psi on pipe rams and wing valves. Bag preventers to be tested to 2500 psi. Pipe rams shall be function tested at least once a day. Conduct weekly kick drill followed by "hang-off" drill. Pressure tests shall be operated from alternate control panels and alternate control lines. Pit drills shall be conducted once on each tour.

4. Mud Program.

This section will be drilled with a fresh water ferrochrome lignosulfonate mud system having the following basic properties:

Interval (meters)	Weight (ppg)	Plastic Viscosity CP	Yield Point lbs/100 sq ft	API Fluid Loss cc.
1990-2250	10.0-12.0	20	15-20	8-10
2250-3025	14.4	Less than 30	12	5-6

Below 2250 m. maintain HT-HP Fluid Loss from 12-15 cc. The viscosity will be adjusted in order to maximize hole cleaning. An overbalance of 300 psi should be maintained.

5. The open hole will be logged as per the attached Geological Program.

12-1/4" Hole (Cont'd)

6. Casing Program

Diameter (inches)	Section (meters)	Length (meters)	Grade	Weight (ppf)	Joint Type
9-5/8"	170-1700	1530	S-95	43.5	Buttress
	1700-2500	800	S-95	47	Buttress
	2500-3025	525	S-95	53.5 ¥	Buttress

Shoe will be locked on the bottom joint. Float to be installed 2 joints up from the shoe. Centralizers to be run as follows: 1 Turboflow on each joint from bottom to 15 meters above the Statfjord sand, 1 Turboflow on each joint from 15 meters below to 15 meters above the Brent sand, and 3 regular centralizers across 13 3/8" shoe. Total of 48 Turboflow and 3 regular centralizers required. 9-5/8" D.V. tool with buttress threads to be kept available on the rig.

¥ S-95 53.5 ppf to be drifted to 8.500" prior to delivery.

7. Cementing

Casing to be cemented to 1500 meters RKB. Cement with 1600 sx class "G" + 0.3 % HR-7 + 1.0% CFR-2. Mix with fresh water.

8. Run 9-5/8" x 18-3/4" seal assembly. Activate seals and test to 7500 psi. Test pipe rams and wing valves to 7500 psi and bag preventer to 2500 psi.

9. Run cement bond log after drilling out any excess cement above the float collar. Pressure test casing and blind rams to 6000 psi for 15 minutes.

Note: Run cement bond log before conducting pressure test.

TEMPORARY SUSPENSION OF THE WELL

The well may be temporarily suspended for later sub-sea completion and tie-in to the Statfjord "A" platform. In this event temporary suspension will be accomplished as follows:

1. Perforations shall be isolated by means of a cement retainer and squeeze cemented, and cement dumped on top of the retainer.

2. Two cement plugs of at least 30 meters each shall be placed in the 9 5/8" casing string. One plug shall be placed at the level of the 13 3/8" casing shoe, and the other at the level of the 20" shoe.

3. A bridge plug will be placed in the casing 200 - 300 meters below sea bottom.

4. A corrosion cap will be installed on the wellhead housing.

5. A recall buoy or pinger will be placed at the wellhead.

6. The location will be marked with a surface buoy with appropriate signal devices.

7. A specific suspension program will be prepared.

Appendix

I. Estimated Pore Pressure Graph

II. Casing design graphs.

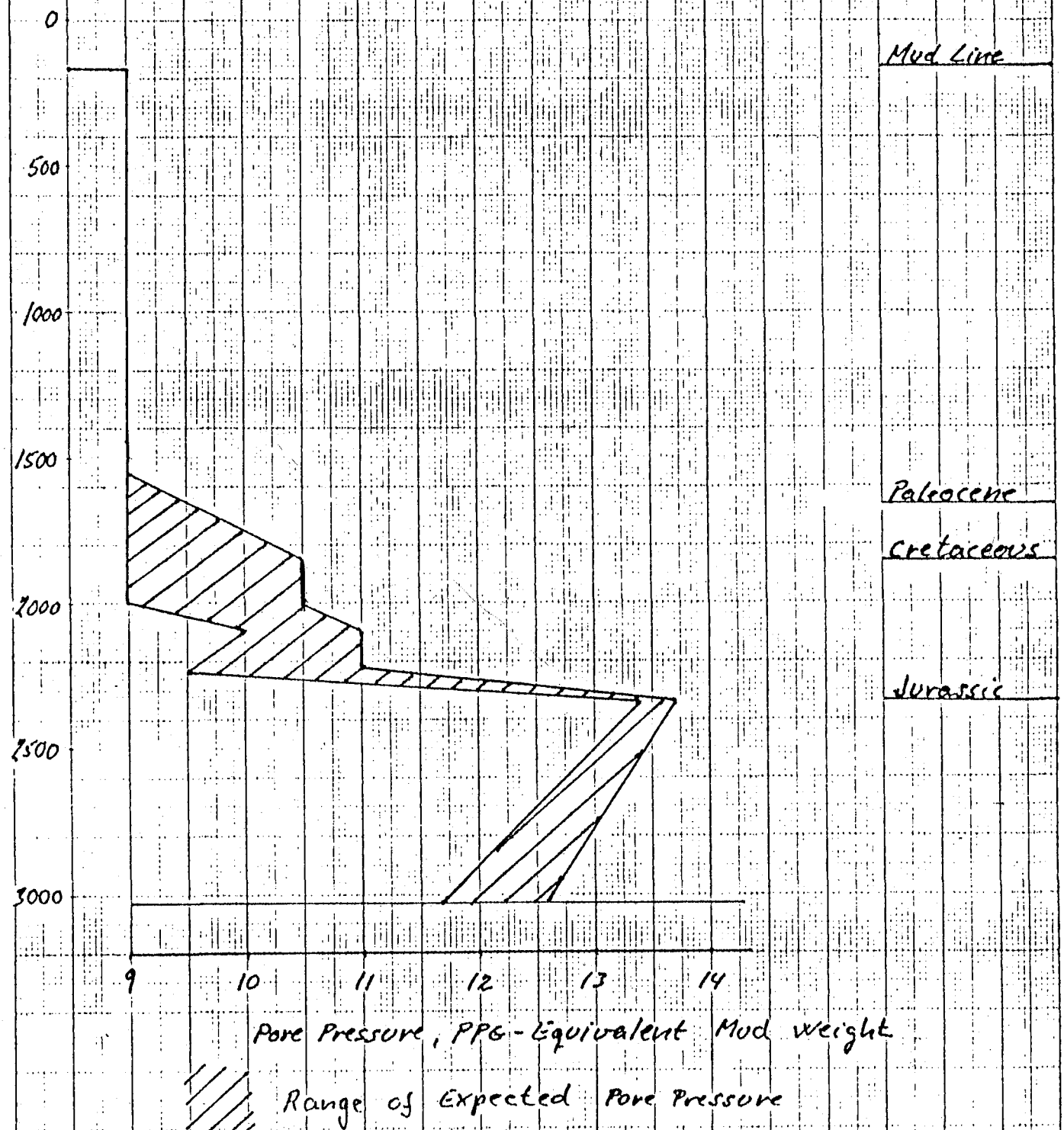
III. Cementing calculations.

IV. Well schematic.

33/9 - Appraisal

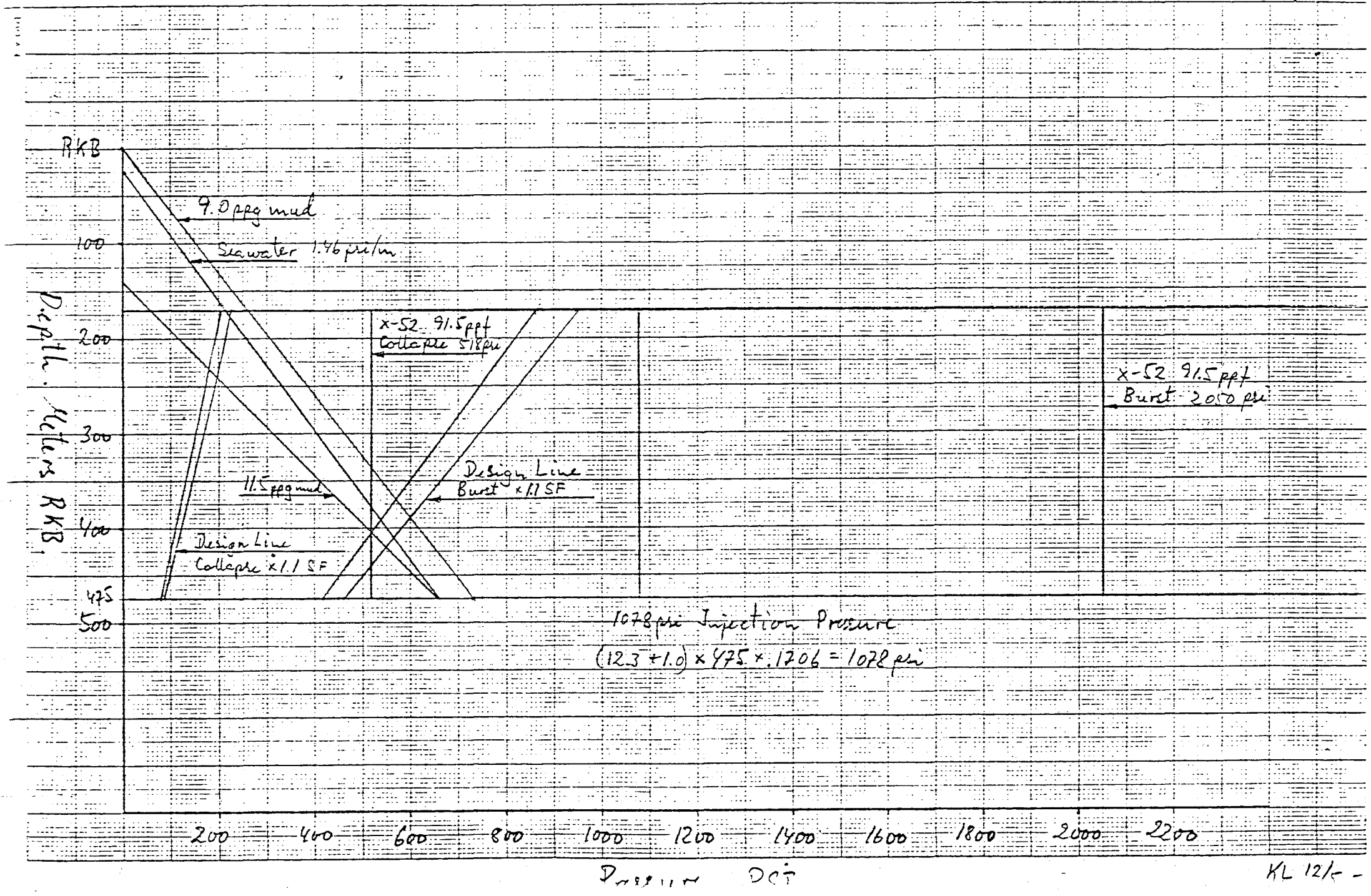
Estimated Pore Pressure v.s Depth

Prepared 2/6-77 PH.U.

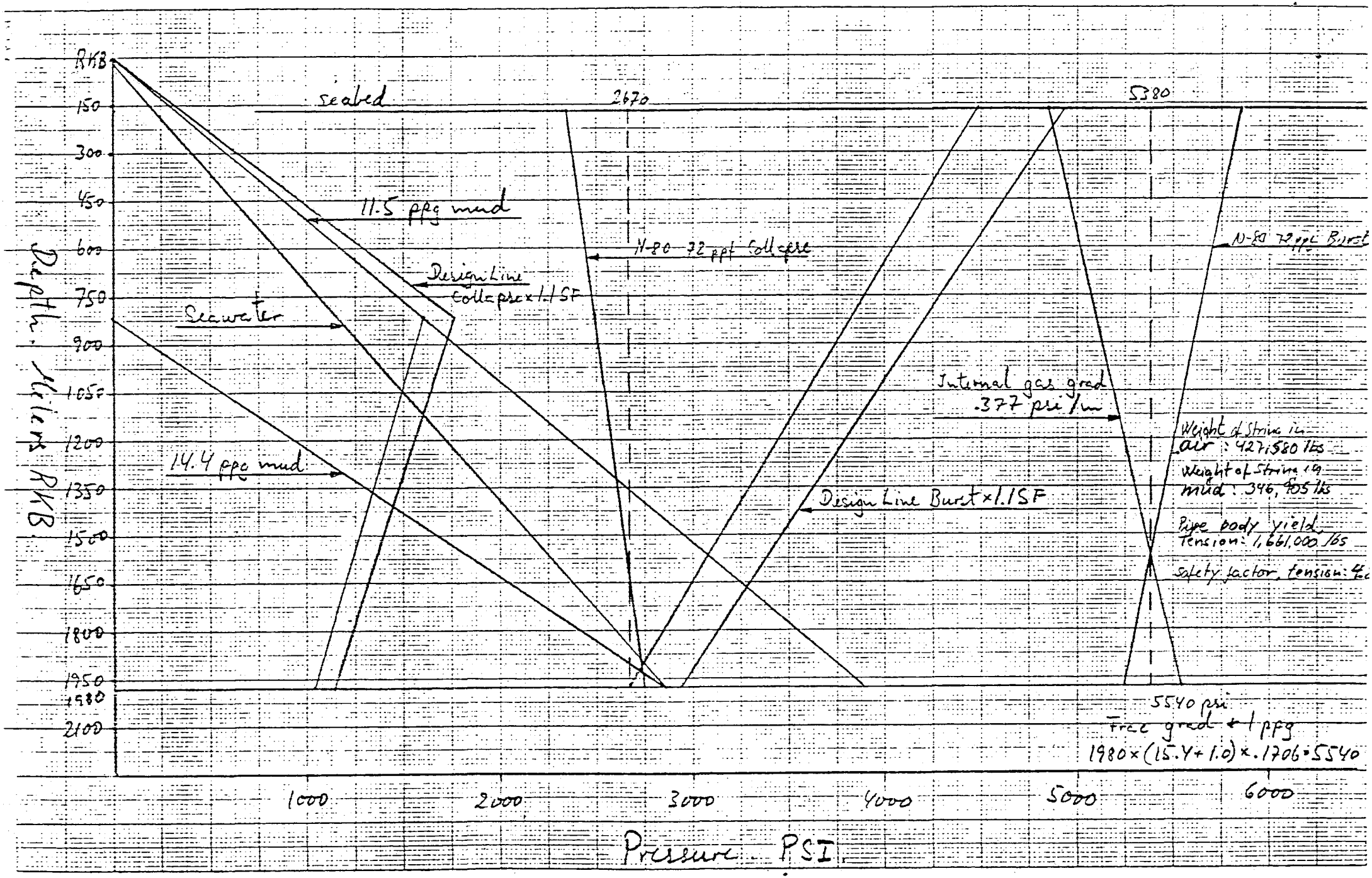


Mobil Exploration Norway Inc. Well 33/9-Appraisal

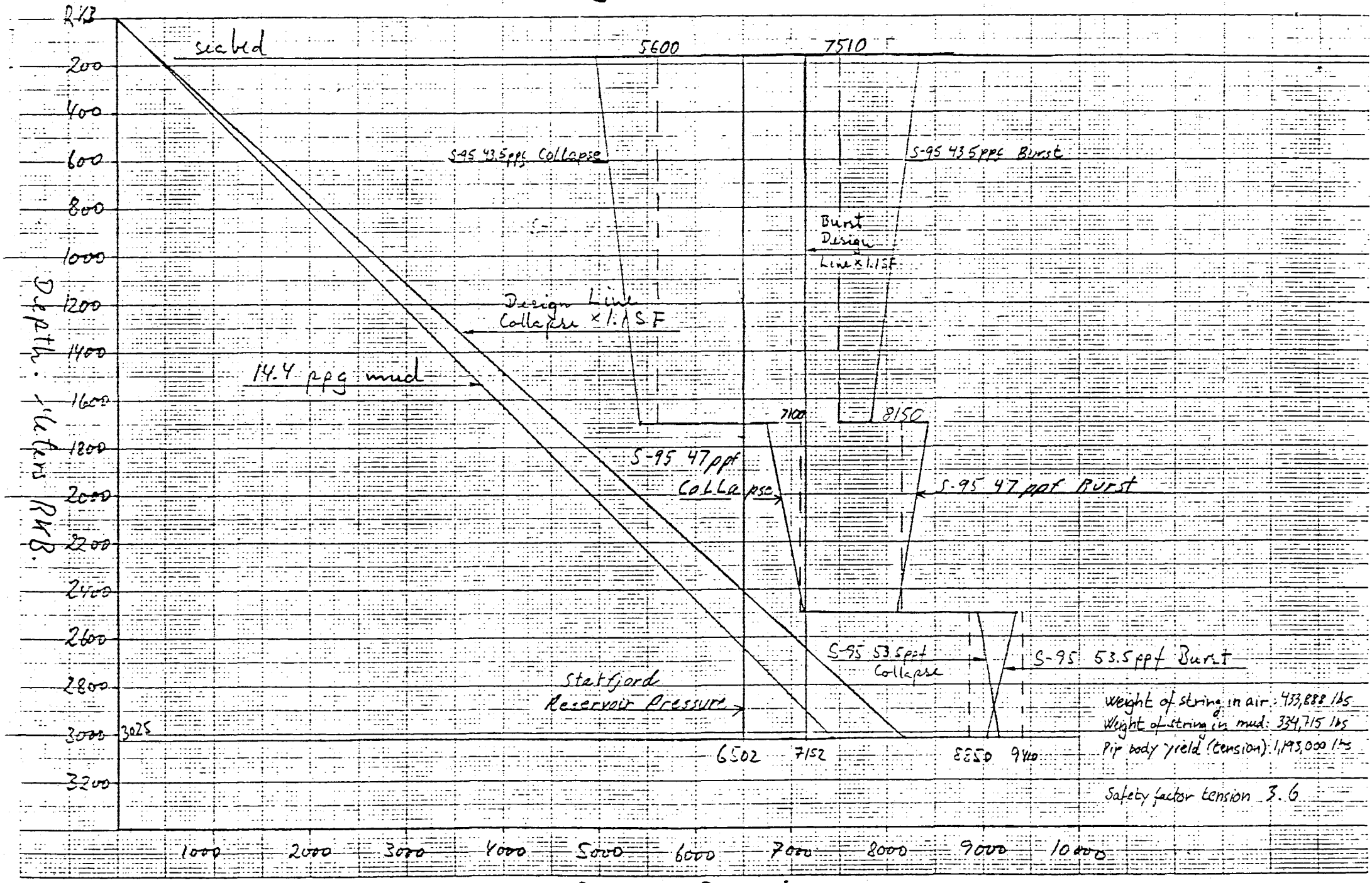
20" casing set at 475m RKB



Mobil Exploration Norway Inc. Well 33/9-Appraisal 9-7/8 Casing set at 1980 m RKB



Mobil Exploration Norway Inc. Well 33[illegible]-Appraised 7-5/8" casing set at 3025' m RKB



Weight of string in air: 433,888 lbs
Weight of string in mud: 334,715 lbs
Pipe body yield (tension): 1,193,000 lbs
Safety factor tension 3.6

KL 17/[illegible]-[illegible]

CASING CEMENT CALCULATIONS

1. 30" conductor in 36" hole

	BBLS/METER	CU.FT/METER
30" x 36" annular volume	1.26172	7.08441
30" x 1½" wall casing volume	2.32290	13.0416
30" x 1" wall casing volume	2.4980	14.0256

Cement Data Using Sea water	Neat Class "G"	Class "G" + 2% $CaCl_2$
Gallons water per sack	5.0	5.0
Slurry weight, ppg.	16.1	16.1
Yield, cu.ft. per sack	1.15	1.15
Thickening time, hr.min	5:09	2:51
Compressive strength psi.,		
8 hrs at 95° F	975	1500
24hrs at 50° F	475	750

Casing cemented full length to sea bed

Annular volume	= 1.26172 x 73	= 92.1 bbls
6 meter plug in shoe joint	= 2.4980 x 6	= 15.0 bbls
		107.1 bbls
(107.1 bbls x 5.62 ft^3/bbl)		= 602 cu.ft.
Excess of 150%		=1505 cu.ft.

Use

(Lead) 700 sacks neat class "G"	= 805 cu.ft.
(Tail-in) 600 sacks class "G" +2% $CaCl_2$	= 690 cu.ft.
	=1495 cu.ft.

2. 20" Casing in 26" hole

	BBLS/METER	CU.FT/METER
20" x 26" annulus volume	0.8794	4.9374
20" x 91.5 ppf casing volume	1.1641	6.5426

Cement Data	Neat Class "G"	Neat + 8% Gel + 2% $CaCl_2$
Gallons of water per sack	5.0 (sea water)	10.0 (fresh water)
Slurry weight, ppg	16.1	13.3
Yield, cu.ft. per sack	1.15	1.83
Thickening time, hr:min	5:09	5:45
Compressive strength, psi,		
8 hrs at 95^{o} F	975	250
24hrs at 50^{o} F	475	125

Casing cemented full length to sea bed

Annular volume	= 0.8794 x 305	= 268.2 bbls
10 meter plug in casing	= 1.1641 x 10	= 11.6 bbls
		= 279.8 bbls

(279.8 bbls x 5.62 ft^3/bbl) + 80% excess = 2830 cu.ft.

Use

(Lead) 1000 sx class "G" + 8% gel	= 1830 cu.ft.
(Tail in) 1000 sx class "G" neat	= 1150 cu.ft.
	= 2980 cu.ft

3. 13 3/8" casing in 17½" hole

	BBLS/METER	CU.FT/METER
13 3/8" x 20 annulus	0.5941	3.3388
13 3/8" x 17½" annular volume	0.4057	2.2783
13 3/8" x 72 ppf casing volume	0.4854	2.7267

3. 13 3/8" Casing (Cont'd)

Cement Data Using Fresh water	Class "G" + 0.2% HR-7 + 0.75% CFR-2	Class "G" + 8% gel + 0.2% HR-7 + 0.75% CFR-2
Gallons of water per sack	5.0	10.0
Slurry weight, ppg	16.0	13.2
Yield, cu.ft. per sack	1.14	1.82
Thickening time, hr:min	5:00	6:07
Compressive strength, psi,		
12 hrs at 170° F	1250	NS
24 hrs at 170° F	3850	1125

1st stage (30 m inside 20" casing)

30 meters between 20" and 13 3/8"	= 30 x 0.5941	= 17.8 bbls
Annular volume	1505 x 0.4057	= 610.6 bbls
30 m plug in casing	30 x 0.4854	= 14.6 bbls
	Total volume	= 643.0 bbls

(643.0 bbls x 5.62 cu.ft/bbl) + 20% excess = 4336 cu.ft.

Use

Lead 1750 sx class "G" + 8% gel + 0.2% HR-7 + 0.75% CFR-2 = 3185 cu.ft.
Tail in 1000 sx class "G" + 0.2% HR-7 + 0.75% CFR-2 = 1140 cu.ft.
Total = 4325 cu.ft.

2nd stage (D.V. tool to surface)

Annular volume	275 x 0.5941	= 163.4 bbls
163.4 bbls x 5.62 cu.ft.		= 918.2 cu.ft.

Use

800 sx class "G" + 0.5% CFR-2 = 920 cu.ft.
Mix with sea water.

4. 9 5/8" casing in 12 1/4" hole (no allowance for washout)

	BBLS/METER	CU.FT/METER
9 5/8" x 13 3/8" - 72 ppf annular volume	0.1906	1.0713
9 5/8" x 12 1/4" annular volume	0.1830	1.0273
9 5/8" x 43.5 ppf casing volume	0.2440	1.3714
9 5/8" x 47.0 ppf casing volume	0.2402	1.3485
9 5/8" x 53.5 ppf casing volume	0.2320	1.3037

Cement Data	"G" + 1.0% CFR-2
Using Fresh water	+ 0.3% HR-7
Gallons of water per sack	5.0
Slurry weight, ppg	16.0
Yield, cu.ft. per sack	1.14
Thickening time hr:min	7:00+
Compressive strength psi 12 hrs at 230° F	4725

Casing cemented to 1500 meters

480 meter between 13 3/8" and 9 5/8":	480 x 0.1906	= 91.5 bbls
Annular volume:	1045 x 0.1830	= 191.2 bbls
30 meter plug in casing:	30 x 0.2320	= 7.0 bbls
	Total volume	= 289.7 bbls

(289.7 bbls x 5.62 cu.ft./bbl) + 20% excess in the open hole = 1843 cu.ft.

Use

1600 sx class "G" + 1.0% CFR-2 + .3% HR-7 = 1824 cu.ft.

Mobil Exploration Norway Inc.

Norwegian Sector North Sea

Well 33/9 - Appraisal Well

Prepared 20-6-77

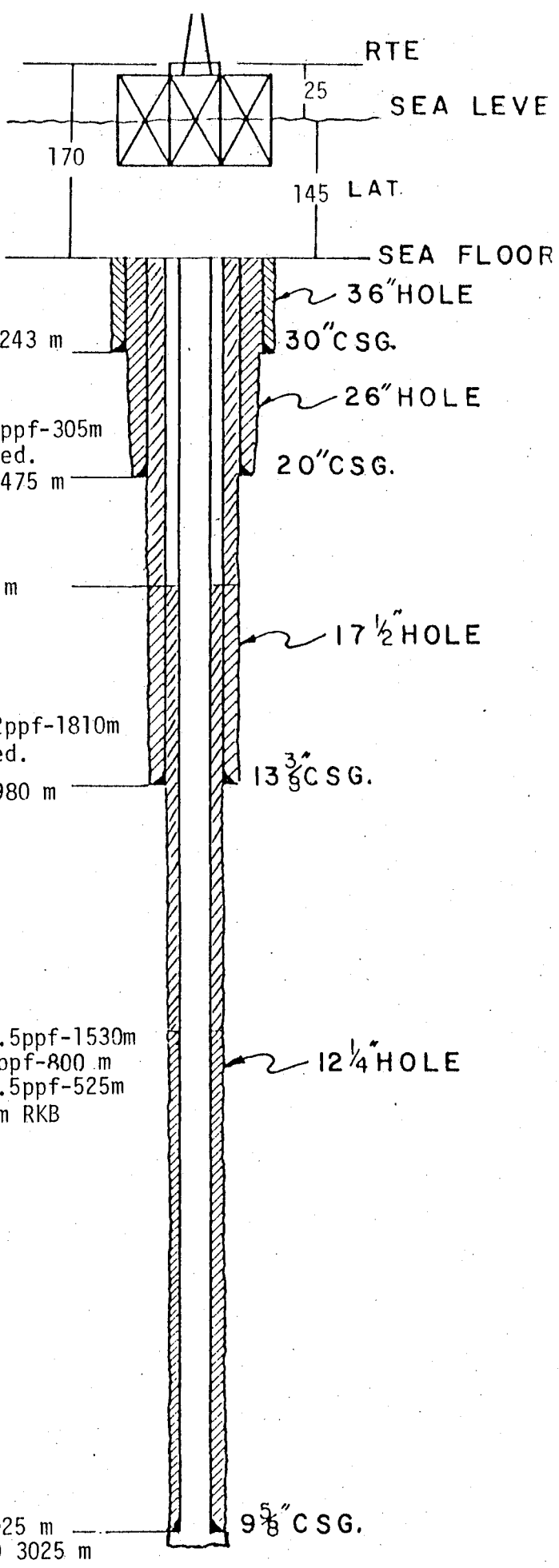
NOT TO SCALE

ORIGINAL CEMENT

CEMENT

ABANDONMENT CEMENT PLUG

PERFORATED INTERVALS



GEOLOGICAL PROGRAM

STATFJORD UNIT

MOBIL (OPERATOR), CONOCO, ESSO, SAGA GROUP, SHELL, STATOIL, CNSL, BNOC, GULF

33/9- (APPRAISAL WELL)

NORWEGIAN OFFSHORE

Location:	License No. 037 Block 33/9
Coordinates:	61° 17' 10.032" N
	1° 54' 27.592" E
Shotpoint:	615 on MNG - 22.5
	1.6 km southeast of 33/9-2,3

Water Depth	K.D. Elevation	Total Depth
145 m	25 m approx.	3000 m

OBJECTIVES

The primary purpose of the proposed 33/9 appraisal well is to acquire reservoir control data on the northern portion of the Statfjord accumulation and to test the northern crestal position of the Brent structure in the Statfjord Field. As seismic data at Brent level is not definitive over the crestal portion of the field, well control must be acquired to answer structural interpretation questions.

Data obtained from the proposed test will assist in development planning, particularly in regards to platform location, gas injection scheme and gas sales timing.

DISCUSSION

Brent Formation Interpretation: The top Brent seismic reflection deteriorates over the crest of the structure and in places is nonexistent. As such, the crestal portion of the Brent seismic map is highly interpretive. Mobil's latest interpretatio included a shift of the northern apex of the structure approximately 750 meters southward from the November 1975 Geophysical Subcommittee map. It also shows the Brent crest in the north to be about seven meters higher than the subcommittee map, but the apex contours are structurally tighter.

Such interpretational differences in an area of nebulous data can only be resolved by additional well control. The proposed 33/9 - location would test the northern crestal culmination as it is shown on the latest Mobil interpretation. It may also provide additional control on the truncation of Brent Zones 2 thru 5 on the easterly pinchout of Zone 1.

Statfjord Formation Interpretation: To date, the oil bearing part of the Statfjord Formation has been penetrated by only one well, 33/12-2, which is in the southern portion of the field. The proposed appraisal well is anticipated to be 10 meters low to the 33/12-2 and thus will provide Statfjord reservoir control in the north. This location may also provide and oil/water contact for the Statfjord if the reservoir is as thick as in the 33/12-2 well.

Development Plan Impact: Crestal control is of major importance to the planning of the Statfjord Field gas injection. If gas is injected only into the Brent reservoir, the amount of crestal reservoir volume available for storage is critical. A reduction in crestal volume may necessitate an earlier start of gas sales in order to avoid gas problems at the producing wells. If a miscible gas injection program is proposed for the Statfjord Formation, the additional reservoir control will be of value in determining the reservoir volume available for gas storage. A significant reduction in crestal volume may also influence the platform location.

WELL PROGNOSIS

Stratigraphic Unit	Depth (meters subsea)
Kimmerian Unconformity	2310
Brent Formation	2315
Dunlin Formation	2435
Statfjord Formation	2685
Total Depth	3000

GEOLOGICAL WELL LOGGING

LOGGING SERVICE	30"-20" Csg. pt.	13-3/8" - 20" Csg. pt.	TD -13-3/8" Csg. pt
ISF/Sonic	x	x	x
FDC/CNL	-	2	x
Long Space Sonic	-	-	1
DLL/MSFL	-	-	x
HDT	-	-	x
SWC	-	2	2
Gr/Spectro Log	-	-	x
Check Shot Survey	-	-	x
Gr/CBL/CCL	-	-	x

1. Run over pay zone only

2. Available on the rig for use at the discretion of the wellsite geologist.

MUD LOGGING PROGRAM

Exploration logging Ltd., will be employed to log the well for hydrocarbon shows, collect samples, prepare a sample log and operate certain auxiliary services throughout drilling operations.

The mud logging company will operate a unit capable of monitoring the following parameters in addition to normal logging services:

Shale density	Torgue
Shale factor	Mud volume
Pore pressure	Mud weight
Compensated kelly height	Mud temperature
Standpipe pressure	Mud resistivity
Hook load (weight on bit)	Ditch flow
Rotary speed (total bid rotations)	Pumps strokes/Minute

Ditch samples will be collected from first sample returns to total depth. Sample interval will be from 6 to 10 meters in the Tertiary and 3 meters in Cretaceous and older strata. These sampling intervals may be altered at the wellsite geologist discretion to suit the prevailing drilling conditions.

One cloth bag for trade cut and one set of paleontological samples will be collected from the first sample returns to total depth. Additional samples will be collected as directed by the operator. The operator will distribute all required sample material to partners and the appropriate Norwegain Government Agencies.

CORING PROGRAM

Significant hydrocarbon shows and potential reservoirs should be fully cored. Cores will be permanently stored in States Laboratories in Stavanger. Special core analysis will be done as required by the Mobil Field Research Lab in Dallas, Texas. Assuming the full sections of Statfjord and Brent sands are cored, coring requirements for the northern area should be satisfied.

DST PROGRAM

Drill stem tests for reservoir pressure and productivity, and for Formation Fluid sampling will be run in zones of interest in cased hole.

SAND TESTING

Core, log and test data from the Statfjord Field suggests that sand production may be a serious problem in many wells during the producing life of the field. If a reliable method can be found to identify zones with poor grain bonding, the need for gravel packing could be minimized. Some recently published techniques for calculating formation bonding strength from logs do appear promising. However, to assure that values obtained in this manner are valid, and to properly calibrate the technique, actual test data is mandatory. Such sand testing would necessarily be of short duration and would involve flowing the well at increasing rates until sand breakdown occurs.

Several sand tests are planned for the early Statfjord "A" wells. A test on the proposed well would eliminate one of the Statfjord "A" tests and would give considerably more time for evaluation of the test results. There is a possibility that, if the logging techniques are sucessful, gravel packing might be avoided in some of the early platform wells.

WELL COMPLETION STATUS

The well will be left in a re-enterable condition to allow for later sub-sea completion and platform tie-in. The well could then be used as an early producer/injector or for pressure observation. A simple subsea production system could be installed and the well hooked up by a 4.4 km flowline.

The estimated well capacity is 15 MBD, and the accelerated production over the 3½ year buildup period is 19 MMB. Assuming an $ 18 MM investment for subsea equipment in 1978, $ 1 MM/year annual operating cost, and net production of 8 MBD, NPV at 20% DCF would be approximately $ 15 MM.

CLMc.