

WELL HISTORY & OPERATIONS REPORT

MOBIL EXPLORATION NORWAY, INC.

33/9-9

LICENSE AREA 037

Approvals:

Engineering Manager

*Jan A. Steber*  
for W.M. Lenamon

Drilling Manager

*Gerry*  
G.W. Perry

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## TABLE OF CONTENTS

	<u>PAGE</u>
I GENERAL INFORMATION	2
II OPERATIONS SUMMARY	3
III SUMMARY OF TESTING OPERATIONS	8
IV HOLE, CASING AND CEMENT DATA	10
V PLUG BACK AND ABANDONMENT	11
VI COST SUMMARY	14
VII TIME DISTRIBUTION	15
VIII DRILLING SUMMARY	20
IX DRILLING TIME CURVE	24
X WELL DEFLECTION SURVEY DATA	27
XI WELL STATUS SKETCH	28
XII WELLHEAD RECOVERY SKETCH	29
XIII METEOROLOGICAL DATA	30

GENERAL INFORMATION

WELL	33/9-9
CLASSIFICATION	Appraisal
FINAL COORDINATES	
LATITUDE	61°17'10.194"N
LONGITUDE	01°54'26.049"E
KELLY BUSHING ELEVATION	25 m
CONTRACTOR / RIG	Dolphin Services / Borgny Dolphin
OBJECTIVE	Jurassic Sandstones
RESULT	Oil Well
PRESENT STATUS	Abandoned
TOTAL DEPTH	3100 m
SPUD DATE	1200 hrs 27.07.77
ABANDONED	2300 hrs 15.11.77
DATE RIG ON LOCATION	2055 hrs 23.07.77
DATE RIG RELEASED	1155 hrs 18.11.77

OPERATIONS SUMMARY 33/9-9

The rig "Borgny Dolphin" was released from Conoco 2030 hrs. 22.07.77 and towed to the location of 33/9-9 where the first anchor was set at 2055 hrs. 23.07.77.

The rig was brought into position utilizing Motorola Mini Ranger navigation with transponders on the Brent "D", Statfjord "A" and Thistle platforms. Final position was determined by satellite positioning equipment, and was 61°17'10.194" N, 01°54'26.049" E. This was 23.5 meters at 282° from the intended location. The water depth was 145 m, providing 170 m from RKB to sea floor.

The temporary guide base was run and 36" hole drilled to 249 m using 26" bit and 36" hole opener. 30" casing with permanent guide base was run and set with shoe at 244 meters and 30" casing cemented back to sea floor.

The marine riser with 30" pin connector was run and 17½" hole was drilled to 486 meters using sea water. The hole was displaced to mud, and Schlumberger ran ISF/Sonic and Gamma Ray logs.

The hole was underreamed to 26" and 20" casing was set with shoe at 475 m and cemented back to seabed.

The BOP stack, choke and kill manifolds were tested to 10,000 psi prior to running the stack. Kill and choke lines were tested to 7500 psi as the riser was run. The stack was landed on the 18 3/4" wellhead and rams were tested to 7500 psi, annular preventors to 2500 psi.

17½" hole was drilled to 491 meters and the formation was tested to leak off at 350 psi, equivalent to 13.1 ppg mud weight. Drilling of 17½" hole continued to 1993 m with a sea water - lignosulfonate mud system. The mud weight was gradually raised from 9.2 ppg and was 10.5 ppg at 1350 m. The mud weight was raised to 11.5 ppg after reaching 1993 m, and Schlumberger ran ISF/Sonic and FDC logs.

The 13 3/8" casing became differentially stuck while running. The mud weight was reduced to 10.4 ppg while circulating through the casing, and a chemical pipe freeing agent was spotted in the annulus. The casing was pulled free after being stuck for 56 hours, and after conditioning the hole with 10.9 ppg mud, the casing was rerun and set with shoe at 1984 m. The casing was cemented back to seabed in two stages.

13 3/8" seal assembly was set and tested to 5500 psi. 13 3/8" casing shoe and 5 meters of new formation was drilled, and the hole displaced to 13.5 ppg mud.

The formation was tested to leak off at 600 psi, equivalent to 15.3 ppg mud weight.

The mud weight was raised to 14.4 ppg and 12 1/4" hole was drilled to 2402 m with a fresh water - lignosulfonate mud system.

Cores were cut as follows:

<u>Core no.</u>	<u>Cored</u>	<u>Section</u>	<u>Recovery</u>
1	2402.7	- 2421.0 m	100%
2	2421.0	- 2433.0 m	97%
3	2433.0	- 2435.0 m	25%
4	2435.0	- 2444.0 m	100%
5	2444.0	- 2457.0 m	85%
6	2457.0	- 2471.0 m	93%
7	2471.0	- 2489.3 m	100%
8	2489.3	- 2506.5 m	95%

12 1/4" hole was drilled to 2707 m where coring was resumed.

Cores were cut as follows:

<u>Core no.</u>	<u>Cored</u>	<u>Section</u>	<u>Recovery</u>
9	2707.0	- 2711.0 m	63%
10	2711.0	- 2721.0 m	80%
11	2721.0	- 2729.0 m	81%
12	2729.0	- 2743.5 m	90%
13	2743.5	- 2757.3 m	90%
14	2757.3	- 2763.0 m	9%
15	2763.0	- 2775.3 m	97%
16	2775.3	- 2781.7 m	100%

The hole was conditioned and Schlumberger ran FDC/CNL and ISF/Sonic logs.

The depth recording was adjusted in consistency with the log run, and coring was continued as follows:

<u>Core no.</u>	<u>Cored</u>	<u>Section</u>	<u>Recovery</u>
17	2793.0	- 2807.5 m	47%
18	2807.5	- 2818.4 m	80%
19	2818.4	- 2826.2 m	100%
20	2826.2	- 2837.5 m	88%
21	2837.5	- 2853.5 m	94%
22	2853.5	- 2866.0 m	96%
23	2866.0	- 2876.5 m	100%

All cores were taken using a 12 7/32" diamond core head.

Drilling of 12 1/4" hole was continued to TD, 3100 meters maintaining 14.4 ppg mud weight. The total on bottom drilling and coring time for the 12 1/4" (drilled) and the 12 7/32" (cored) hole sections was 371.5 hrs, averaging an overall ROP of 3.0 m/hr. The average ROP for the cored sections was 1.3 m/hr, versus 5.0 m/hr for the drilled sections.

Schlumberger ran ISF/Sonic, FDC/CNL, DLL/MSFL, HDT, Long Base Sonic, GR-Spectrograph, RFT and Seismic Check Shot Surveys.

Sidewall cores were taken at following intervals:

Run I

<u>Shot no.</u>	<u>Depths</u>	<u>Remarks</u>	<u>Shot no.</u>	<u>Depth</u>	<u>Remarks</u>
1	2866.0		16	2771.0	
2	2853.0		17	2770.0	
3	2837.0		18	2768.0	
4	2818.0		19	2757.0	
5	2817.0		20	2756.0	
6	2807.5		21	2754.0	
7	2806.0		22	2739.5	
8	2804.5		23	2732.0	
9	2803.0		24	2731.0	
10	2801.5		25	2722.0	
11	2800.0		26	2719.0	
12	2786.5		27	2718.0	
13	2774.0		28	2717.0	
14	2773.0		29	2716.0	
15	2772.0		30	2715.0	

Run II

<u>Shot no.</u>	<u>Depths</u>	<u>Remarks</u>	<u>Shot no.</u>	<u>Depth</u>	<u>Remarks</u>
1	2563.0	No Recovery	16	2535.0	
2	2560.0	No Recovery	17	2533.0	
3	2555.0		18	2532.0	
4	2552.0	No Recovery	19	2531.0	
5	2548.5		20	2530.0	No Recovery
6	2547.0	No Recovery	21	2529.0	
7	2545.0		22	2528.0	No Recovery
8	2544.0		23	2527.0	No Recovery
9	2542.0		24	2482.0	
10	2541.0		25	2468.0	
11	2540.0		26	2467.0	
12	2539.5		27	2446.0	No Recovery
13	2538.0		28	2433.5	
14	2537.0		29	2413.0	No Recovery
15	2536.0		30	2412.5	

9 5/8" casing was set with shoe at 3067 m and cemented. Loss of return was recognized during cementing, and the CBL-log indicated the cement top to be at 2415 m.

9 5/8" seal assembly was set and tested to 7500 psi.

The 9 5/8" casing shoe would not hold pressure, and an EZ-SV squeeze packer was set at 3020 m. The formation was tested to leak off at a pressure equivalent to 15.5 ppg mud weight. The casing shoe was squeeze cemented and the casing was pressure tested to 5000 psi.

Drill stem tests were performed in the following intervals:

<u>DST no.</u>	<u>Perforated Interval (m)</u>	
1 & 2	2847.5	- 2852.5
3	2800.0	- 2803.5
4,5&6	2742.0	- 2745.0
7	2531.0	- 2537.0
8	2458.0	- 2460.7
9	2426.0	- 2432.8

The drill stem tests are described in detail by the separate report "Drill Stem Test Report, Well 33/9-9" March 1978.

Each perforated test interval was isolated with an EZ-SV packer and squeeze cemented.

The casing was perforated at 2300 m and the annulus was squeeze cemented through an EZ-SV packer set at 2292 m.

The 9 5/8" x 13 3/8" annulus was filled with cement by squeezing through perforations at 1300 m having return through perforations at 550 m.

The possibility of entrapped gas was checked by perforating the 9 5/8" as well as the 13 3/8" casing at 220 m. There was no evidence of entrapped gas. The hole was plugged back to 200 m.

The riser and BOP stack was pulled, and the casing was cut mechanically 6 meters below original sea floor. The casing stubs, temporary and permanent guide base were retrieved, and the borehole and its immediate vicinity was inspected by lowering the TV-camera down on guide lines. The area inspected was seen to be free of any debris.

The anchors were pulled, and the rig was released from location at 1155 hrs., 18 November 1977.

The rig was moved to CCB for demobilization.



SUMMARY OF TESTING OPERATIONS

WELL 33/9-9

OCT/NOV 1977

The purpose of the tests was to obtain information from six separate zones in the Brent, Dunlin and Statfjord Sands in order to further evaluate the reservoirs. The tests for the first two zones were designed primarily for production data, bottom hole pressures and formation fluid samples, with sustained sand production expected only if very thin unconsolidated sand stringers were present. The last four zones where sand bonding was weak, as calculated from the well log data, had the additional test requirement of measuring the oil rate at which the formation sand broke down. The six separate zones were successfully tested, requiring a total of nine attempts.

A summary of the drill stem tests is shown on the next page. For more details of the testing operations refer to the separate report "Drill Stem Test Report, Well 33/9-9" March 1978.

SUMMARY OF DRILL STEM TESTS

WELL 33/9-9

CONDUCTED OCT/NOV 1977

<u>DST. NO.</u>	<u>FORMATION/INTERVAL</u>	<u>MECHANICAL PERFORMANCE</u>	<u>PRODUCTION FLUID</u>	<u>SUSTAINED SAND PRODUCTION</u>	<u>BOTTOM HOLE FLUID SAMPLES<sup>(1)</sup></u>
1.	Statfjord/2847.5-2852.5	Misrun	None	-	-
2.	Statfjord/2847.5-2852.5	Successful	Water/Trace of Oil	Yes (2)	None
3.	Statfjord/2800.0-2803.5	Successful	100% Oil	No	One BH Sample
4.	Statfjord/2742.0-2745.0	Misrun	None	-	-
5.	Statfjord/2742.0-2745.0	Successful	100% Oil	Yes, at 7577 BOPD	None
6.	Statfjord/2742.0-2745.0	Successful	100% Oil	No (3)	None
7.	Dunlin/2531.0-2537.5	Successful	100% Oil	Yes, at 8314 BOPD	Two BH Samples
8.	Brent/2458.0-2460.7	Successful	100% Oil	No	None
9.	Brent/2426.0-2432.8	Successful	100% Oil	No	One BH Sample

- 1) Pressurized oil and gas separator samples and stock tank crude samples taken for each successful oil test.
- 2) Sand was produced but due to low velocity of fluid in test string and relatively short producing time the well did not "clean up" before it was shut in.
- 3) Producing rate was held below that rate at which sand production was expected- based on DST No. 5 in the same interval.

HOLE, CASING AND CEMENT DATA

WELL 33/9-9

HOLE SIZE (IN)	CASING DEPTH (mRKB)	CASING SIZE (IN)	CASING LENGTH/WEIGHT m/ppf	GRADE	CONNECTION	CEMENT TYPE	SACKS (no.)	REMARKS
36	244	30	64 /310	1"	Vetco Squnch	Class G neat	700	Returns to sea floor
			12 /456	1½"	Vetco Squnch	Class G + 2% CaCl <sub>2</sub>	600	
26	475	20	27.5/91.5	Spiral weld	Vetco L	Class G + 8% gel + 2% CaCl <sub>2</sub>	1000	Returns to sea floor
			280.3/91.5	X-52	Vetco L	Class G neat	1000	
17½	1984	13 3/8	13.2/68	K-55	Buttress	Class G + 8% gel + 0.75% CFR-2 + 0.2% HR-7	1750	Returns to sea floor
			1803.4/72	N-80	Buttress	Class G + 0.75% CFR-2 + 0.2% HR-7 Class G + 0.5% CFR-2	1000 730	D.V. tool at 439 mRKB
12 1/4	3067.5	9 5/8	567.9/53.5	S-95	Buttress	Class G + 1% CFR-2 + 0.4% HR-7	2350	Planned to displace 3150 sacks of cement, with cement top at 1500 mRKB, being 484m above 13 3/8 casing shoe. Bulk cement lines plugged after 2350 sacks. Cement top at 2415 mRKB, being 431m below 13 3/8 casing shoe. EZ drill SV set at 3020 mRKB. Squeezed 450 sacks below retainer. Dumped 50 sacks on top of retainer. Cement top at 3002 mRKB.
			814.1/47	S-95	Buttress			
			1517.9/43.5	S-95	Buttress	Class G + 0.5% D-13 + 1% CFR-2	500	

PLUG BACK AND ABANDONMENT

WELL 33/9-9

HOLE SIZE (IN)	PLUG DEPTH (m) BOTTOM - TOP	METHOD OF PLACEMENT	PLUG TYPE	SACKS	REMARKS
9 5/8	3020	Drill Pipe	EZ Drill SV		
9 5/8	3067.5-3002	Squeezed	Class G + 0.5% D-13 + 1.0% CFR-2	500	Plug set after unsatisfactory primary cement job. Squeezed 450 sacks below retainer. Dumped 50 sacks on top of retainer.
9 5/8	2842.5	Drill Pipe	EZ Drill SV		
9 5/8	2852.5-2824	Squeezed	Class G + 0.5% D-13 + 1.0% CFR-2	100	Casing perf. 2847.5-2852.5 Squeezed 75 sacks below retainer. Dumped 25 sacks on top of retainer.
9 5/8	2792.5	Drill Pipe	EZ Drill SV		
9 5/8	2803.5-2770	Squeezed	Class G + 0.5% D-13 + 1.0% CFR-2	100	Casing perf. 2800.0 - 2803.5 Squeezed 70 sacks below retainer. Dumped 30 sacks on top of retainer.
9 5/8	2735	Drill Pipe	EZ Drill SV		
9 5/8	2745-2691	Squeezed	Class G + 0.4% D-13 + 1.0% CFR-2	100	Casing perf. 2742.0-2745.0 Squeezed 50 sacks below retainer Dumped 50 sacks on top of retainer.

PLUG BACK AND ABANDONMENT

WELL 33/9-9

HOLE SIZE (IN)	PLUG DEPTH (m) BOTTOM - TOP	METHOD OF PLACEMENT	PLUG TYPE	SACKS	REMARKS
9 5/8	2520	Drill Pipe	EZ Drill SV		
9 5/8	2537.5-2476	Squeezed	Class G + 0.4% D-13 + 1.0% CFR-2	100	Casing perf. 2531.0-2537.5 Squeezed 50 sacks below retainer. Dumped 50 sacks on top of retainer.
9 5/8	2454	Wireline	EZ Drill SV		
9 5/8	2460.7-2454	Squeezed	Class G + 0.4% D-13 + 1.0% CFR-2	60	Casing perf. 2458.0-2460.7 Squeezed 60 sacks below retainer. Final squeeze pressure 1150 psi.
9 5/8	2418	Drill Pipe	EZ Drill SV		
9 5/8	2432.8-2374	Squeezed	Class G + 0.4% D-13	110	Casing perf. 2426.0-2432.8 Squeezed 60 sacks below retainer. Final squeeze pressure 1000 psi. Dumped 50 sacks on top of retainer.
9 5/8	2292	Drill Pipe	EZ Drill SV		
9 5/8	2301-2248	Squeezed	Class G + 0.4% D-13	350	Casing perf. 2300.0-2301.0 Squeezed 300 sacks below retainer. Final squeeze pressure 1200 psi. Dumped 50 sacks on top of retainer.
9 5/8	1842	Drill Pipe	EZ Drill SV		
9 5/8	1842-1759	Balanced	Class G + 1.0% D-13 + 0.75% CFR-2	100	Casing perf. at 1850 m Perf. held 2000 psi. Dumped 100 sacks on top of retainer.

PLUG BACK AND ABANDONMENT

WELL 33/9-9

HOLE SIZE (IN)	PLUG DEPTH (m) BOTTOM - TOP	METHOD OF PLACEMENT	PLUG TYPE	SACKS	REMARKS
9 5/8	1750-1650	Balanced	Class G + 0.1% HR-7 + 0.75% CFR-2	120	Casing perf. at 1700.0-1701.0m Rev. circ. Could not circ. through perf. at 3000 psi.
9 5/8	1640-1599	Balanced	Class G + 0.1% HR-7 + 0.75% CFR-2	50	
9 5/8	1212	Drill Pipe	EZ Drill SV		
9 5/8	1301-1168	Squeezed	Class G + 0.1% HR-7 + 0.75% CFR-2	350	Casing perf. at 1301m Rev. circ. through perf. at 2000 psi. Squeezed 300 sacks below retainer. Cement top in 13 3/8 x 9 5/8 annulus calculated to be at 1092.5m. Dumped 50 sacks on top of retainer.
9 5/8	620- 510	Balanced	Class G neat	110	Casing perf. at 550 and 570m.
9 5/8	505- 415	Balanced	Class G neat	110	Casing perf. at 465m.
9 5/8	290- 200	Balanced	Class G neat	110	13 3/8 and 9 5/8 perf. at 220m. No pressure.

COST SUMMARY

	<u>AFE Cost Estimate Original Appropriation 1. M\$</u>	<u>AFE Plus Estimated Deficiency M\$</u>	<u>Accumulated Well Cost to Apr. 1978* M\$</u>
Drilling Contractors	2,287.7	2,442.0	2,189.1
Diving Services	189.0	328.0	359.9
Location Survey	63.5	134.0	133.4
Electric Logging	220.0	379.0	428.6
Cementing and D.S.T.	} 179.6	188.0	143.5
Cement and Cementing Access			137.3
Wellhead Equipment	} 613.0	725.0	120.5
Casing and Tubulars			534.6
Transportation and Marine Support	456.0	1,144.0	926.5
Mud Logging	87.8	151.0	63.6
Mud, Additives and Services	299.7	300.0	441.6
Well Testing Equipment and Services	} 111.7	376.0	79.9
Equipment Rental			148.5
Other Contract Services	98.5	275.0	108.3
Fuel and Suspension	275.0	613.0	192.5
Bits, Reamers, Coreheads and Stab.	68.9	132.0	218.2
Formation Testing	617.0	650.0	545.9
Supervision	299.6	693.0	535.5
Mob. - Demob.	<u>500.0</u>	<u>500.0</u>	
Total Cost	6,367.0	9,030.0	<u>7,307.4</u>

\* NOTE: These numbers are based on April, 1978, Joint Interest Report.

DATE 1977	DEPTH m	MOVING FUNCTION						DRILLING FUNCTION										EXPLORATION FUNCTION						REMARKS	
		PULL ANCHRS.	TOW	RUN ANCHRS.	WO WTHR.	SET CONDUCTOR	OTHER	DRILL	TRIP	Riser RUN & CEMENT CASING	BOPS RUN TEST	Cond. Hole +Circ	Fish +work Stuck Csg.	REPAIRS	REAM	WO WTHR	OTHER	LOG	CORE	CIRC. SAMPLE	COND. HOLE	REPAIRS	OTHER		
July 22			3½																						Last anchor on bolster at 2030 hrs. Rig under tow to 33/9-9 location.
23			16½	3½	4																				Under tow. WOW at new location. Start anchor handling at 2100 hrs.
24				24																					Ballast down and tension up anchors. Not holding. Wait on piggy-back anchors.
25				24																					Wait on piggy-back anchors.
26				24																					Running piggy-back anchors.
27	205			8½				8½	4½																Tension up anchors to 400,000. Run temporary guide base. Spud in at 1200 hrs. RKB-sea bed 170 m. Surveys 2½ hrs.
28	249							5	2½	12		3½													Surveys 1 hr. Run and cement 30" casing.
29	249								6½	1½	11	½													Run riser and pin connector. Drill cement and shoe 4½ hrs.
30	438							6	3½		11	1													Pin connector failed. Pull riser and repair. Run riser and drill ahead. Surveys 2½ hrs.
31	486							1	6			1½		11		1½	3								Drill to 486 m. Observe well. No flow. Displace the hole to mud. Schlumberger logs. Open hole to 26".
Aug. 1	486								1	8	6½	3½		5											Open hole to 26". Pull riser and pin connector. Run and cement 20" casing.
2	486								1	2	20	1													Cement 20" casing. Run and test BOP stack.
3	635							7½	4		7														Test stack. Drill out cement and shoe 5 hrs. Bleed-off test equal to 13.1 ppg mud. Drill ahead. Survey ½ hr.
4	1011							14½	4½			2½	½												Drill to 1011. Surveys 2 hrs.
5	1303							12½	8			2													Drill to 1303. Surveys 1½ hrs.
6	1351							11½	12				½												Drill to 1351.
7	1550							17½	3½			2½													Drill to 1550. Survey ½ hr.
8	1757							14½	6			1½													Drill to 1757. Survey 2 hrs.
9	1993							13½	6			3½													Drill to logging depth 1993. Slip and cut drilling line 1 hr.
10	1993								8			5						11							Schlumberger logging.
11	1993								6			10½						6½							Schlumberger logging. RIH and clean hole. Wait on cement tests 1 hr.
12	1993								2½	14½			5½												Wait on cement test results. POOH and run 13 3/8" casing. Stuck at 1301 m. Circ. casing.
13	1993												24												Work stuck casing.
14	1993												24												Work stuck casing.
15	1993								½	18½			5												Work stuck casing. Came free. Pull and lay down casing.
16	1993								4½			5½		13		1									Ream and circulate. Slip and cut drilling line 1 hr.
17	1993								10			14													Circulate and condition hole. POOH to run casing.
18	1993								3	16½		4½													Run casing. Circulate casing. Cement.
19	1993								6½	9½	6	2													Cement 13 3/8" casing. Run seal assembly. Test seal assembly and BOP stack.
20	1999							1	5½		3½	1½													Test stack OK. Drill cement 9½ hrs. Drill to 1999 and take leak-off test. No definite leak-off.



DATE 1977	DEPTH m	MOVING FUNCTION						DRILLING FUNCTION								EXPLORATION FUNCTION					REMARKS			
		PULL ANCHRS.	TOW	RUN ANCHRS.	WO WTHR.	SET CONDUCTOR	OTHER	DRILL	TRIP FOR BIT CHANGE	RUN & CEMENT CASING	BOPS RUN TEST	Cond. Hole +Circ	FISH	REPAIRS	REAM	WO WTHR	OTHER	LOG	CORE	CIRC. SAMPLE		COND. HOLE	REPAIRS	OTHER
Aug. 21	2132							14				7½						2½						Displace hole to 13.5 ppg mud. Leak-off test 1 hr. (15.4 ppg). Drill ahead. Survey 1½ hr.
22	2254							14	8			1½												Drill 12 1/4" hole. Survey ½ hr.
23	2388							22				½	½					1						Drill 12 1/4" hole. Survey 1 hr.
24	2420							2										1	21					Drill to 2402. POOH to core. Cut core no. 1, 2402 - 2420, 3 hrs.
25	2433																		24					Cut core no. 2, 2421 - 2433, 5½ hrs.
26	2435										9								15					Cut core no. 3, 2433 - 2435, 5 hrs. Test BOP stack OK.
27	2456																		24					Cut core no. 4, 2435 - 2444, 7½ hrs. Cut core no. 5, 2444 - 2456, 5 hrs.
28	2471																		24					Cut core no. 5, 2456 - 2457, 1 hr. Cut core no. 6, 2457 - 2471, 6 hrs.
29	2489																		24					Cut core no. 7, 2471 - 2489, 8 hrs.
30	2506													½				4	19½					Cut core no. 8, 2489 - 2507, 10½ hrs. Make up new BHA and RIH to drill ahead.
31	2604							20½				2½						1						Drill 12 1/4" hole. Survey 1 hr.
Sept. 1	2646							12	7			2½						2½						Drill 12 1/4" hole, Slip and cut line 1 hr. Survey 1½ hrs.
2	2707							12	4		2	5½						½						Drill 12 1/4" hole. Survey ½ hr. Prepare to test BOP.
3	2707										7													Attempt to test BOP. Leak in choke line. Rerun wear bushing, RIH to shoe and hang off. Pull upper package.
4	2707															14								Test BOP on surface. WOW. RIH with upper package.
5	2707															14								RIH with upper package. Attempt to test kill and choke line. Leaking. WOW.
6	2707															8½								WOW. Pull upper package. Test on surface. Run top package.
7	2707								2½		10	4½	4½						2½					Test choke and kill line, OK. Test BOP, OK. Retrieve hung off string, RIH to clean up hole, POOH.
8	2718																		24					Cut core no. 9, 2707 - 2711, 4½ hrs. Cut core no. 10, 2711 - 2718, 3½ hrs.
9	2729																		24					Cut core no. 10, 2718 - 2721, 2½ hrs. Cut core no. 11, 2721 - 2729, 8½ hrs.
10	2744																		24					Cut core no. 12, 2729 - 2743, 9 hrs.
11	2760																		24					Cut core no. 13, 2743 - 2757, 11 hrs. Cut core no. 14, 2757 - 2760, 2½ hrs.
12	2775																		24					Cut core no. 14, 2760 - 2763, 2 hrs. Cut core no. 15, 2763 - 2775, 12 hrs.
13	2781																		24					Cut core no. 16, 2775 - 2781, 10½ hrs.
14	2781								4½		7½					½			11½					Test BOP, OK. RIH with core barrel. Tight hole. POOH to ream with rock bit and roller reamer. RIH to shoe. Hang off and WOW.
15	2781															24								WOW.
16	2781								½			1½				22								WOW to reset no. 2 anchor. Retrieve string and RIH.
17	2781								4½			3½		4				11½	½					Ream to TD. POOH. Schlumberger logs. Service core barrel.
18	2812																		24					Cut core no. 17, 2794.5 - 2807, 7 hrs. Cut core no. 18, 2807 - 2812, 2 hrs.
19	2824																		24					Cut core no. 18, 2818.4, 4 hrs. Cut core no. 19, 2818.4 - 2824, 9½ hrs.

NOTE depth change, 2781 - 2794.5.

DATE 1977	DEPTH m	MOVING FUNCTION						DRILLING FUNCTION							EXPLORATION FUNCTION					REMARKS				
		PULL ANCHRS.	TOW	RUN ANCHRS.	WO WTHR.	SET CONDUCTOR	OTHER	DRILL	TRIP	RUN & CEMENT CASING	BOPS RUN TEST	Cond. Hole Circ.	FISH	REPAIRS	REAM	WO WTHR	OTHER	LOG	CORE		CIRC. SAMPLE	Cond. Hole Circ.	REPAIRS	OTHER
Sept. 20	2833																	24						Cut core no. 19, - 2826.2, 1 hr. Cut core no. 20, 2826.2 - 2833, 12 hrs.
21	2841																	24						Continue cut core no. 20, - 2837.5, 7½ hrs. Cut core no 21, 2837.5 - 2841, 6 hrs.
22	2854																	24						Continue cut core no. 21, - 2853.5, 17 hrs.
23	2866																	24						Cut core no. 22, 2853.5 - 2866, 11½ hrs.
24	2876								4		3½			2				14½						Cut core no. 23, 2866 - 2876, 8½ hrs. Test BOP stack. Make up BHA + RIH. Reaming to BTM.
25	2934							22						2										Running to BTM. Drilling 12 1/4" hole.
26	2984							14½	8½							1								Survey ½ hr.
27	3039							15	7							2								Survey 1 hr.. Cut and slip drilling line 1 hr.
28	3100							19	2½			2				½								Drill to TD 3100 m. Survey ½ hr.
29	3100								2									22						Schlumberger logs.
30	3100																	24						Schlumberger logs.
Oct. 1	3100															½		12		11½				Schlumberger logs. Wiper trip. Survey ½ hr.
2	3100																	3½		20½				Schlumberger stuck at 2953. Work line. Strip over line with overshot.
3	3100																	10½		2		11½		Fishing log ( 11½ hrs ). Schlumberger log.
4	3100														3½			7		5½		8		Schlumberger logs. Slip and cut drilling line and change rollers on compensator ( 2½ hrs ). Service rig ( 1 hr ).
5	3100								3			2						14½		1		3½		Schlumberger logs. Condition hole for 9 5/8" casing.
6	3100								5½	4		3	8		3½									Condition hole for 9 5/8" casing. Pull wear bushing ( 1 hr ). Dropped casing on closed pipe rams. Fishing with spear ( 7½ hrs). Checking casing shoe - OK ( ½ hr ). Run 9 5/8" casing ( 3 hrs ).
7	PB 3067									15		2				7								Run 9 5/8" casing ( 8 hrs ). Casing shoe set at 3067 m. Wash BOP ( 2 hrs ). Could not get seal assembly through BOP ( 3½ hrs ). Check trip with wear bushing setting, tool OK ( 1½ hrs ).
8	PB 3067										3	3½				17½								RIH and set seal assembly. Rig up and RIH with 9 5/8" casing scraper. POOH.
9	PB 3067															20	4							Schlumberger log. CBC. Scraping from 229 - 243 m. Run gage ring ( 4 hrs ). Slip and cut drilling line ( ½ hr ). Pressure test casing, OK. EZ drill packer set at 3020 m. Prepare for cementing.
10	PB 3002															8						16		Cementing with 450 sx below and 50 sx above retainer. Test plug to 5000 psi, OK. ( 1 hr ). Perforate 2847.5 - 2852.5m ( 3 hrs ). Starting on DST no. 1
11	PB 3002																					24		DST no. 1. Parker set at 2832.7 m.
12	PB 3002																					24		Finish DST no. 1. RIH with DST no. 2 ( 8½ hrs ).
13	PB 3002																					24		DST no. 2. Packer set at 2832 m.
14	PB 2824																					24		Finish DST no. 2 ( 6 hrs ). Run and set EZ drill at 2842.5. Cementing with 75 sx below and 25 sx above retainer.
15	PB 2824														1							23		Perforate 2800 - 2803.5 m. ( 4 hrs ). Cut and slip drilling line ( 1 hr ). Starting on DST no. 3.
16	PB 2824																					24		DST no. 3. Packer set at 2784.4 m.

DATE 1977	DEPTH m	MOVING FUNCTION						DRILLING FUNCTION						EXPLORATION FUNCTION						REMARKS				
		PULL ANCHRS.	TOW	RUN ANCHRS.	WO WTHR.	SET CONDUCTOR	OTHER	DRILL	TRIP FOR BIT CHANGE	RUN & CEMENT CASING	BOPS RUN TEST	Cond. Hole +Circ	FISH	REPAIRS	REAM	WO WTHR	OTHER	LOG	CORE		CIRC. SAMPLE	COND. HOLE	REPAIRS	OTHER
Oct. 17	PB 2770																						24	Finish DST no. 3 ( 10 hrs ). Run and set EZ drill at 2792.5m. Cement with 70 sx below and 30 sx above retainer. Run perf. tool ( 1½ hrs ).
18	PB 2770																					1½	22½	Perf. 2742.0 - 2745.0 m ( 1½ hrs ). Starting DST no. 4. Replaced safety valve cyl. in surface tree ( 1½ hrs ). Packer set at 2727.47m.
																								No success in opening tool ( 4 hrs ).
19	PB 2770																						24	POOH and service DST tool ( 14½ hrs ). RIH and starting DST no. 5.
20	PB 2770																						24	DST no. 5. Packer set at 2727.5m.
21	PB 2770																						24	Finish DST no. 5. RIH with DST no. 6.
22	PB 2770																						24	DST no. 6. Packer set at 2718.1m.
23	PB 2691																						23	Finish DST no. 6. Slip and cut drilling line ( 1 hr ). WOO ( 2 hrs ). Run and set EZ drill at 2735 m. Cement with 50 sx below and 50 sx above retainer. Perforate 2531.0 - 2537.5 m ( 2½ hrs ).
24	PB 2691																						24	DST no. 7. Packer set at 2520.6 m.
25	PB 2691																						24	DST no. 7.
26	PB 2476																						24	Finish DST no. 7. Run and set EZ drill at 2520 m. Cement with 50 sx below and 50 sx above retainer. Starting to perforate ( 2½ hrs ).
27	PB 2476																						24	Perforating 2458 - 2460.7m ( 1 hr ). Starting on DST no. 8. Waiting on helicopter to remove injured sea man ( 3 hrs ).
28	PB 2476																						24	DST no. 8. Packer set at 2437.6m.
29	PB 2476																					½	23½	DST no. 8. Fixed a leak in Chicksans ( ½ hr ). No success to shut Howco tool ( 2 hrs ). Reverse out form. 1iq to POOH. Riser leaking at Ball joint.
30	PB 2476										4½				6	6							7½	Finish DST no. 8. Hang off DP for riser repair ( 3½ hrs ). Rig up to pull riser ( 2 hrs ). WOW ( 6 hrs ).
31	PB 2476														17	7								WOW ( 8 hrs ). Starting to pull riser ( 7 hrs ). WOW ( 9 hrs ).
Nov. 1	PB 2476														7½	2	14½							WOW ( ½ hr ). Pull 6 joints of riser ( 1 hr ). WOW ( 1½ hrs ). Pull the rest of the riser ( 1½ hrs ). Repairs. Run and land riser. Test BOP.
2	PB 2476									4	1½						13						5½	Slip and cut drilling line ( 1 hr ). Survey ( ½ hr ). Run Junk Basket to 2455 m. Run EZ drill on wireline ( 1½ hrs ).
3	PB 2454																						24	EZ drill set at 2454 m. Squeezed 60 sx below retainer. Perforate 2426 - 2432.8 m. ( 4 hrs ). Starting DST no. 9.
4	PB 2454																						24	DST no. 9. Packer set at 2412 m.
5	PB 2454																						24	DST no. 9.
6	PB 2374																						24	Finish DST no. 9. ( 5½ hrs ). Run and set EZ drill at 2418 m. ( 3½ hrs ). Cement with 60 sx below and 50 sx above retainer. Perforate 2300 - 2301 m ( 3 hrs ). Start to run in EZ drill ( 2½ hrs ).
7	PB 1759																						24	EZ drill set at 2292 m. 300 sx of cement below retainer. Perforate at 1850 m. ( 3½ hrs ). RIH and set EZ drill at 1842 m. Cement with 100 sx above retainer.
8	PB 1759																						24	Flush c/k lines and displace hole w/sea water ( 1 hr ). Perforate at 465 m ( 2 hrs ). Set cement plug at 515 m - 415 m. Make up 8½" bit and casing scraper and RIH. Drill out cement plug to 520 m.
9	PB 1759																						24	Stand of pipe fell out of derrick and cut compensator guard off ( 2 hrs ). Perforate at 550 and 570 m ( 7½ hrs ). Ream through perforation ( ½ hr ). RTTS packer set at 560 m.





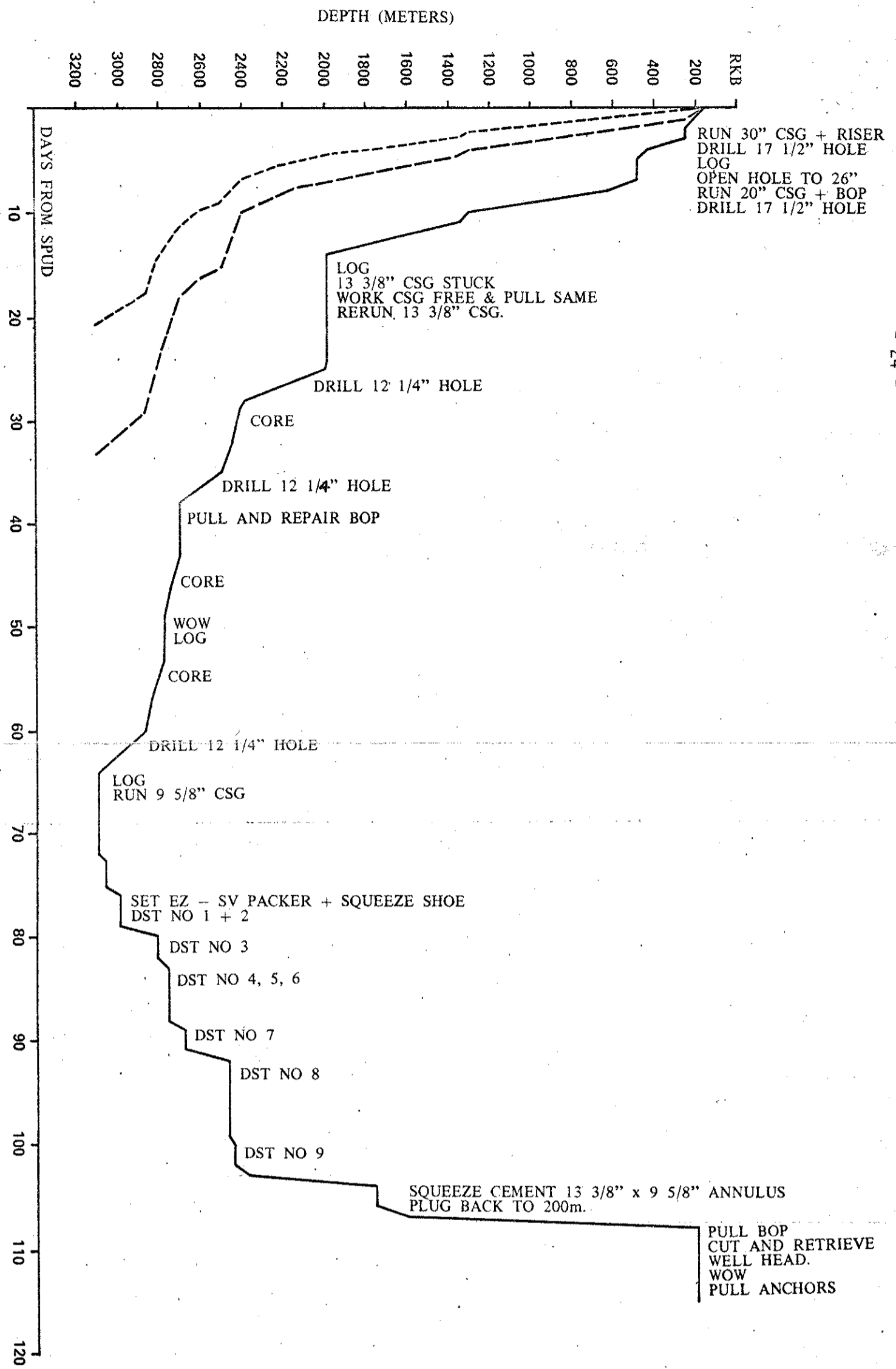




DATE 1977 Mud Report	DEPTH	MUD PROPERTIES											MUD MATERIAL CONSUMPTION														BITS						HYDRAULICS						PARAMETERS		
		WEIGHT LBS/GAL	FUNNEL VIS, SEC	API W.L. CC	PH	% SOLIDS	% SAND	% OIL	CL, PPM	O/W RATIO	HT/HP W.L. CC	FL TEMP.	BARYTE MT	BENT- ONITE 50kg	CMC, 25kg	CAUSTIC 25kg	Ligno- sulfo 25kg	Soda Ash 50kg	Dex- trid 50lb	Mil- plate 55gal	Dris- pac 50lb	Torq- trim 55gal	Sol- tex 50lb	Dexco 25lb	Alum- ste- rate 25kg	Bicarb- of soda 50kg	COND- ITION B T G						G.P.M.	PRE- SURE P.S.I.	ANNL VEL. FT./MIN.	PUMP HHP	ΔP AT BIT	BIT HHP	JET NOZZLE VEL. FT./SEC	WT. ON BIT 1000 LBS	ROTARY R.P.M.
Oct. 22	PB2770	14.4	53	4.6	9.5	24	TR	0	6200		14.8	63	67	11	1	14 <sup>SX</sup>									25kg																
	23	PB2691	14.4	50	4.4	9.5	TR	0	6200		14.6		8	21		10										1															
	24	PB2691	14.4	53	3.8	9.5	TR	0	5600		14.3	6														2															
	25	PB2691	14.4	53	3.7	9.5	TR	0	5800		14.3		3				1								1	2															
	26	PB2476	14.4	53	3.8	9.5	TR	0	5800		14.3	12.5	47																												
	27	PB2476	14.4	54	3.8	9.5	TR	0	5200		14.3	8.5	4	1																											
	28	PB2476	14.4	53	3.6	9.5	TR	TR	5400		14.1	9.4																													
	29	PB2476	14.4	52	3.6	9.5	TR	TR	5400		14.1																														
	30	PB2476	14.4	53	3.6	9.5	TR	TR	5400		14.1	32	4							1																					
	31	PB2476	14.4	53	3.6	9.5	TR	0	5400		14.1	9.7																													
Nov.	1	PB2476	14.4	52	3.6	9.5	TR	0	5800		14.1		5		2																										
	2	PB2476	14.4	54	3.4	9.0	0	0	5200		13.9	24.4	75	6	2	10										2															
	3	PB2454	14.4	54	3.4	9.5	0	0	5200		13.9	28.6			4																										
	4	PB2454	14.4	53	3.4	9.5	0	0	5400		13.9	9.4		2	1				1																						
	5	PB2454	14.4	53	3.4	9.5	0	0	5400		13.9	3.3				1																									
	6	PB2374	14.4	54	3.4	9.5	0	0	5400		14.1																														
	7	PB1754	14.4	54	3.6	9.5	0	0	5400		14.3	19.1							1																						
	8	PB1754	14.4	55	3.6	9.5	0	0	5200		14.3	18.3		1	1																										
	9	PB1754	14.4	65	3.6	9.5	0	0	4800		-	38.2	52	6	2	9				1						5															
	10	PB1599	14.4	60	3.6	9.5	0	0	5200		-	6.4																													
	11	PB 200	14.4	60	3.6	9.5	0	0	5400		-	12.7		1																											

22 8 1/2 SMITH SVH NONE  
 RR 22 " " " DRILL OUT CEMENT PLUG  
 CIRCULATION



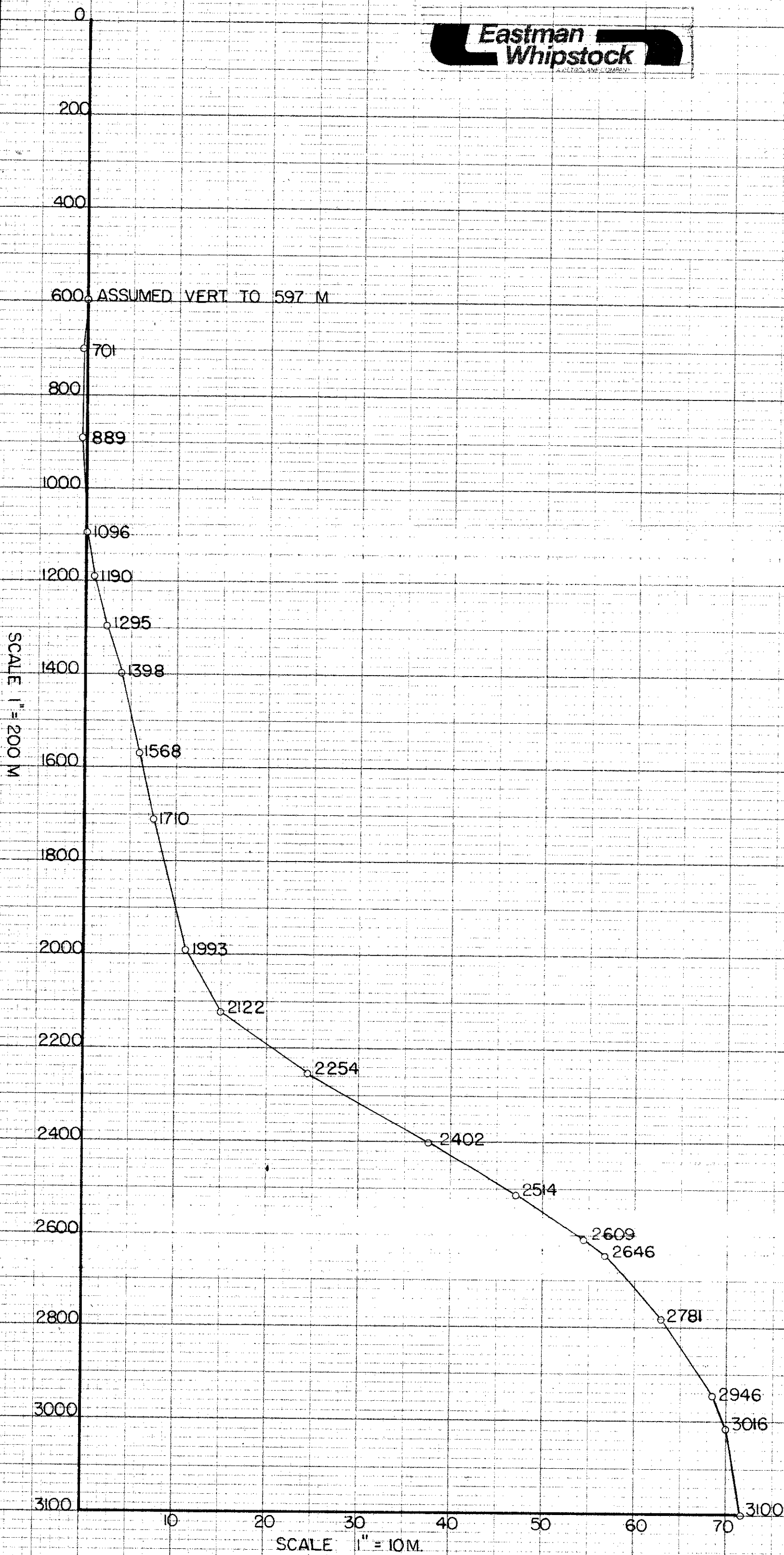


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MUD WEIGHT PPG

<b>Mobil Exploration Norway Inc.</b>	
APPRaisal Well 33/9-9	RIG: "BORGNV DOLPHIN"
Spudded 1200 hours, July 27-77	Released 1200 hours, November 18-77
RKB - S.F. 170m. Water depth: 145m.	
AUTHOR PAUL KLAVENES	DRAWN BY G.HORVE
DATE JAN. -78	MOEX No. 78/178/1852

LEGEND:  
 DRILLING CURVES  
 ———— OVERALL DRILLING PROGRESS  
 - - - - - NORMAL DRILLING/CORING OPERATIONS  
 - - - - - ON BOTTOM ROTATING, DRILLING/CORING.

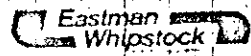
# MOBIL EXPLORATION NORWAY INC. 33/9 - WELL - 9



p-25

MOBIL EXPLORATION NORWAY INC.  
33/9 - WELL 9

SCALE 1" = 2M

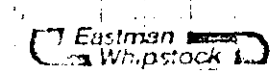
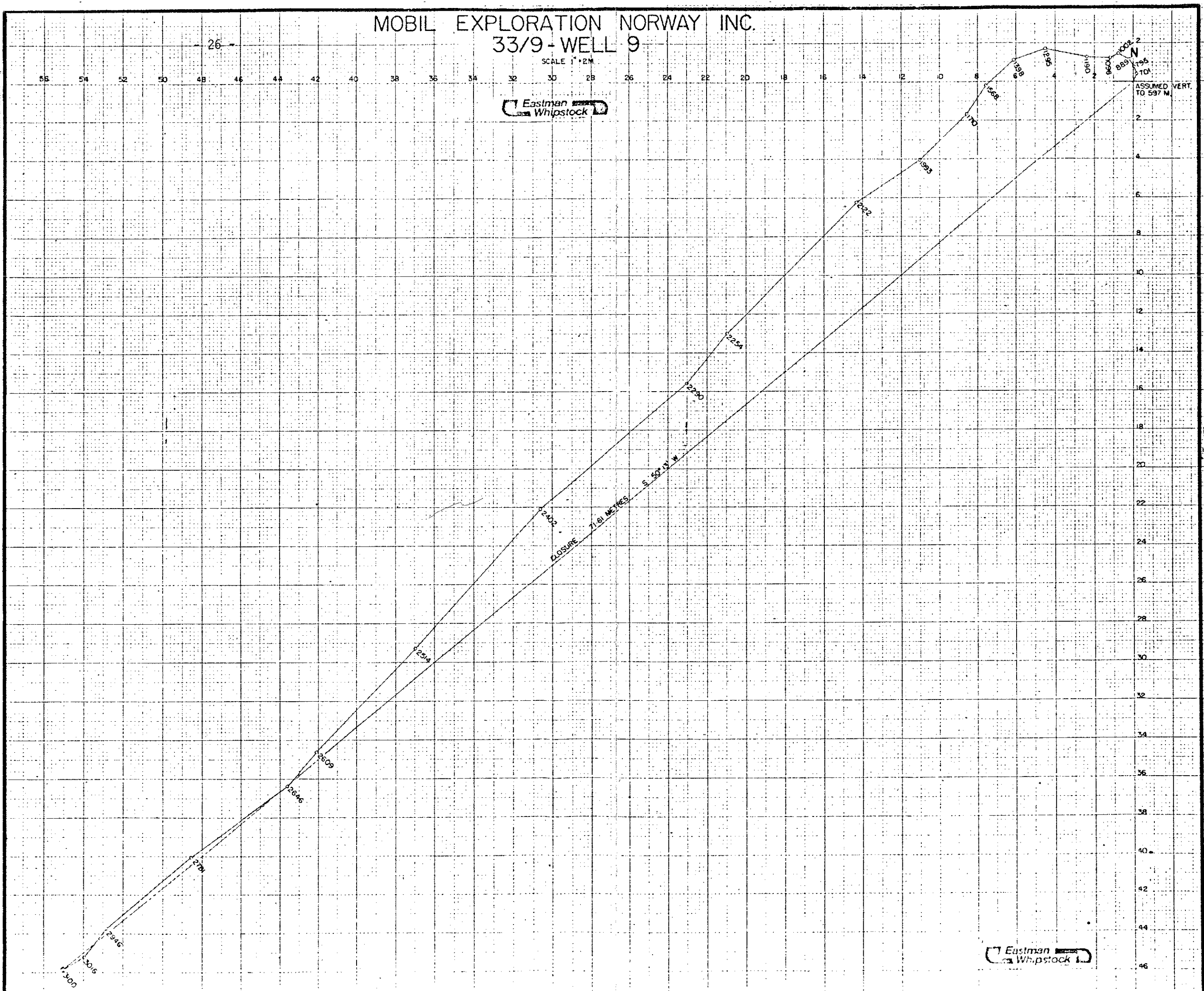


MOBIL EXPLORATION NORWAY INC.

MOBIL EXPLORATION NORWAY INC.

ASSUMED VERT.  
TO 597 M

46



MOBIL EXPLORATION NORWAY, INC.  
 WELL NO. 33/9-9  
 BORGNY DOLPHIN  
 MAGNETIC SINGLE-SHOT

WELL DEFLECTION SURVEY DATA

DRIFT ANGLE	DIRECTION OF DEVIATION	MEASURED DEPTH	VERT. DEPTH	VERT. SECTION	RECTANGULAR COORDINATES	
					NORTH/SOUTH	EAST/WEST
0	0	597	Assumed vertical to this station		0.00N	0.00E
15'	N 25 E	701	701.00	- 0.42	0.41N	0.19E
15'	N 65 W	795	795.00	- 0.55	0.76N	0.06E
20'	N 3 W	889	889.00	- 0.59	1.14N	0.19W
25'	S 63 W	1002	1002.00	- 0.38	1.45N	0.73W
10'	S 67 W	1096	1095.99	0.09	1.25N	1.17W
1°20'	N 62 W	1190	1189.98	0.97	1.30N	2.35W
1°05'	S 83 W	1295	1294.96	2.36	1.69N	4.50W
50'	S 58 W	1398	1397.95	3.96	1.12N	6.11W
30'	S 37 W	1568	1567.93	5.93	0.20S	7.56W
55'	S 31 W	1710	1709.92	7.61	1.66S	8.54W
30'	S 61 W	1993	1992.90	11.06	4.06S	11.03W
3°00'	S 52 W	2122	2121.83	14.97	6.23S	14.31W
5°15'	S 37 W	2254	2253.48	24.39	12.99S	20.95W
5°15'	S 41 W	2290	2289.33	27.62	15.55S	23.02W
5°00'	S 49 W	2402	2400.88	37.58	22.62S	30.09W
4°45'	S 43 W	2514	2512.47	47.04	29.27S	36.93W
4°15'	S 45 W	2609	2607.18	54.48	34.63S	42.11W
3°00'	S 38 W	2646	2644.11	56.79	36.38S	43.66W
2°15'	S 68 W	2781	2778.96	62.89	40.06S	48.54W
1°45'	S 31 W	2946	2943.86	68.55	43.73S	52.84W
1°15'	S 42 W	3016	3013.84	70.33	45.21S	53.93W
0°30'	S 79 W	3100	3097.83	71.61	45.83S	55.03W

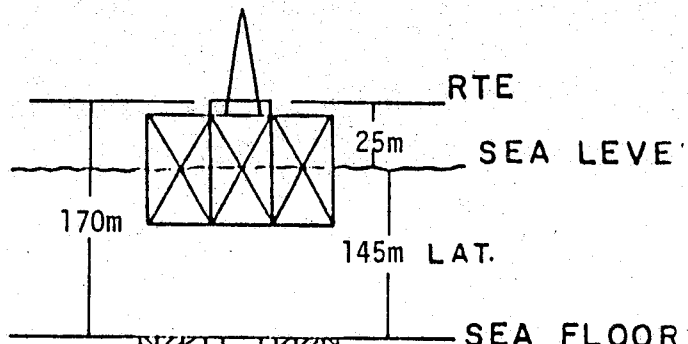
METHOD OF CALCULATION: Radius of curvature obtained from single shots.

Closure calc. along direction of S 50.22°W

All distances and depths noted in Meters.

Mobil Exploration Norway Inc.  
Norwegian Sector North Sea

Well

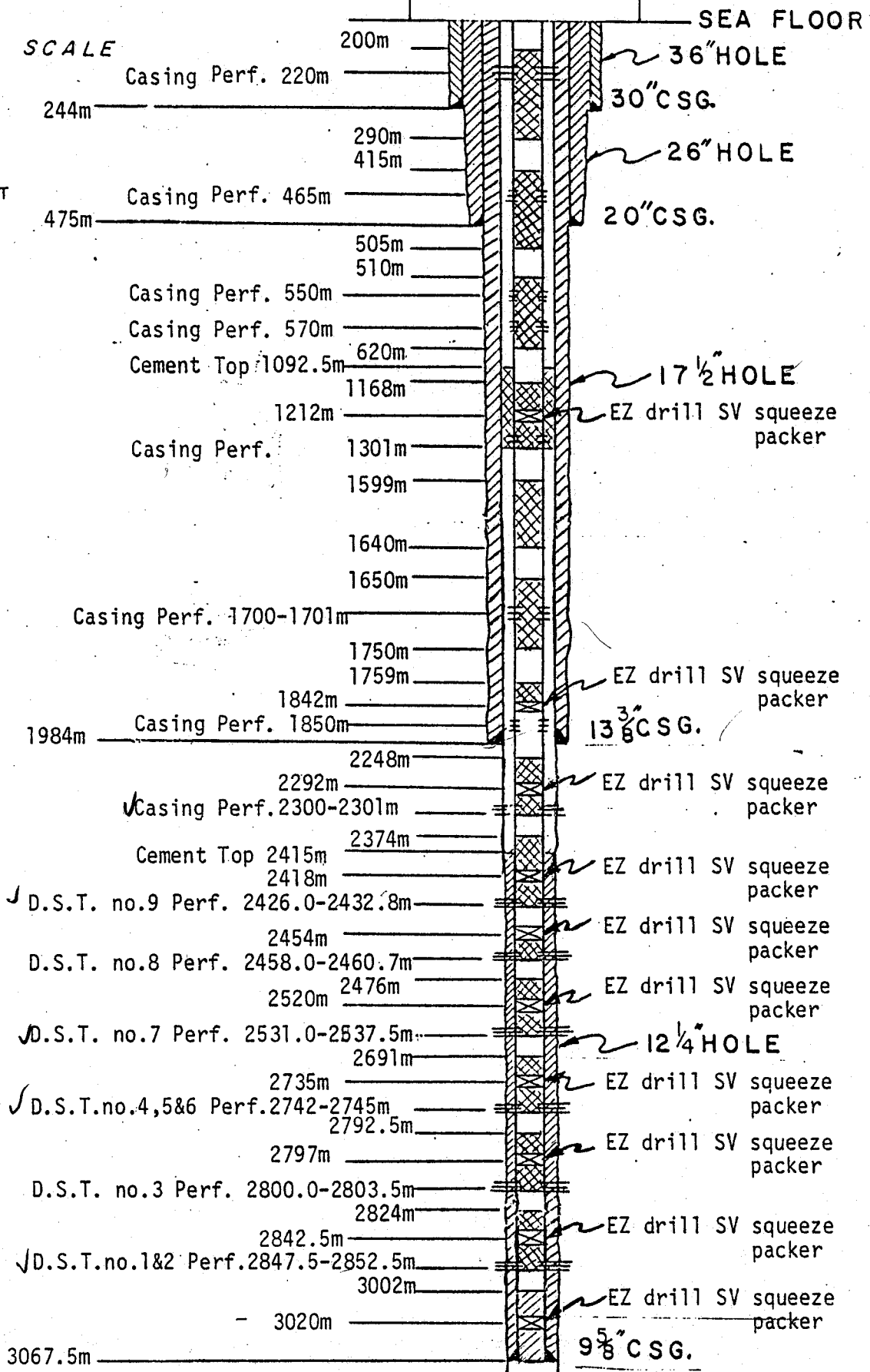


NOT TO SCALE

ORIGINAL CEMENT  
CEMENT

ABANDONMENT CEMENT PLUG

PERFORATED INTERVALS

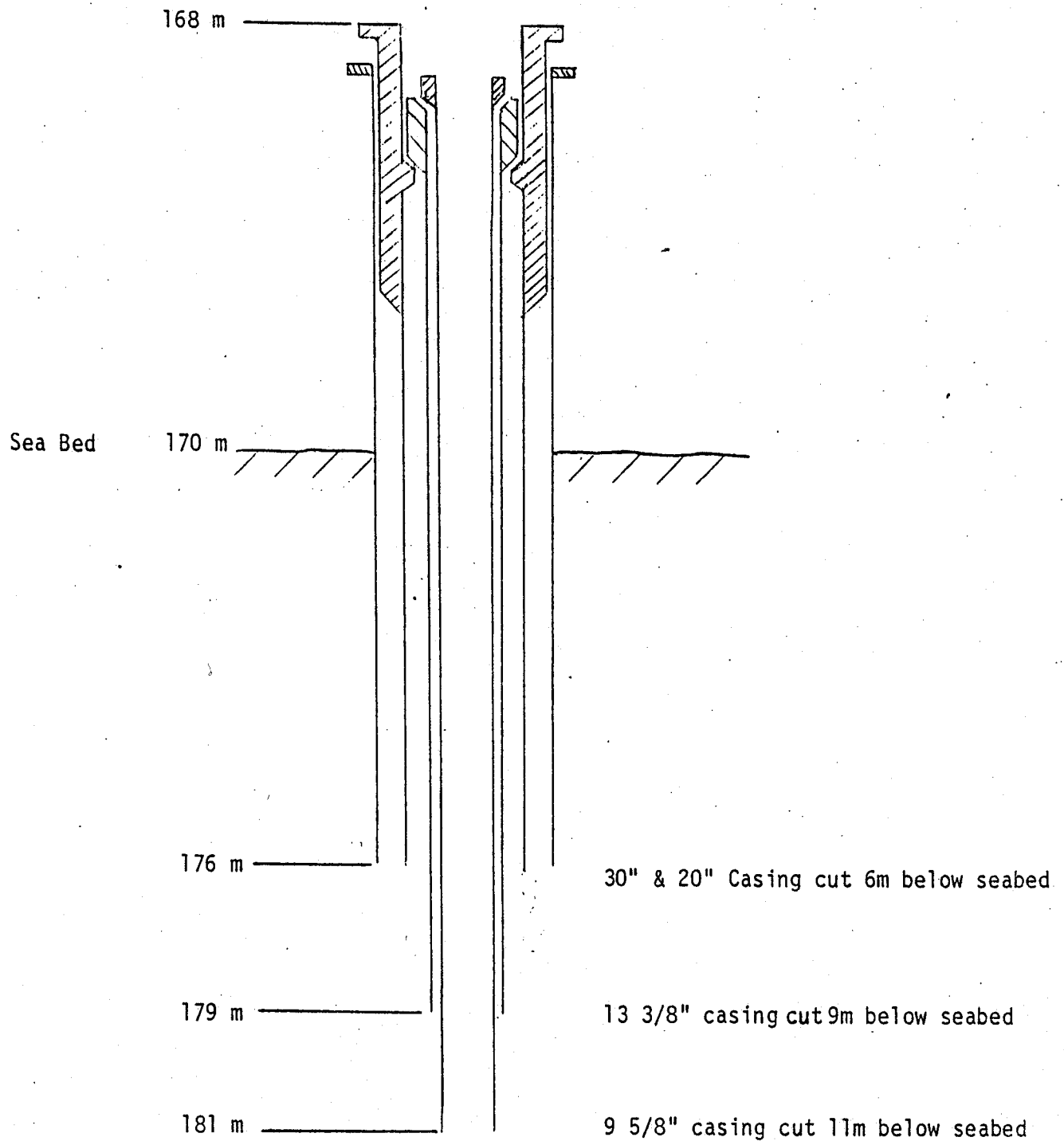


T.D. 3100m

WELLHEAD RECOVERY SKETCH

33/9-9

DEPTH RKB



**WELL 33/9-9 NORWAY 1977 RIG: BORGNY DOLPHIN**

