



PETROLEUM DIVISION

16 MAR 1993

APPENDIX-3

NALANGIL-1

DRILLING FLUID RECAP

W1035

GAS & FUEL EXPLORATION
DRILLING FLUIDS RECAP
NALANGIL NO. 1
PEP 100, OTWAY BASIN, VICTORIA

Prepared by: M Olejniczak

Dated : October 1990

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GAS & FUEL EXPLORATION
 NALANGIL NO. 1
 PEP 100, OTWAY BASIN, VIC.

WELL SUMMARY

Operator : Gas & Fuel Exploration
 Well Name : Nalangil No. 1
 Location : PEP 100, Otway Basin, Victoria
 Contractor/Rig : Fletcher Drilling / Rig 1
 Rig on Location : 21 July, 1990
 Spud Date : 4 August, 1990
 RKB Elevation : 3.2m
 Total Depth : 363m
 Date Reached TD : 9 August, 1990 (start testing)
 Total Days Drilling : 6 Days
 Rig Off Location : -
 Total Days on Well : -

<u>Drilling Fluid Type</u>	<u>Interval</u>	<u>Hole Size</u>	<u>Cost (A\$)</u>
Freshwater Aquagel	Surf - 68.8m	12 1/4"	\$ 472.45
FW/Aquagel/Polymer	68.8m - 363m	8 1/2"	\$ 801.92

Mud Materials Charged to Drilling \$ 1,274.37

Engineer on Location from Jul 21 to Jul 25
 and 4 days shared with Pine Lodge No. 1)
 Drilling Fluid Engineering: 7 days @ \$410.00 \$ 2,870.00
 Mileage shared with Pine Lodge No. 1: 1000km & 48.7c/km \$ 487.00

Total Cost Drilling Materials & Engineering \$ 4,631.37

Mud materials not charged to drilling \$

Casing Programme : 9 5/8" @ 64.2m
 Drilling Supervisor : Ken Smith
 Baroid Drilling Fluid Engineer: Manfred Olejniczak

**GAS & FUEL EXPLORATION
NALANGIL NO. 1
PEP 100, OTWAY BASIN, VIC.**

INTRODUCTION

Nalangil No. 1 was drilled for Gas and Fuel Exploration by Fletcher Drilling Rig 1, in PEP 100, near Colac, Victoria in August 1990.

Although the rig and all other associated Service and Company personnel were on site on the 21st of July, the actual spud-in only occurred on the 4th of August. The delay was due to problems experienced by Fletcher Drilling in bringing the rig up to a satisfactory operational standard. Meanwhile Service Company personnel were released on the 25th of July, and re-mobilised on the 3rd of August when the rig was accepted as being ready to spud.

The well was then spudded on the 4th of August and drilled to its TD of 363m on the 7th of August with 9 5/8" casing set at 64m.

After running wireline logs it was decided to run a drill stem test. Rather than run a straddle test, as the interval to be tested was higher up the hole, a cement plug was set on bottom and a conventional test string was run in the hole.

However, industrial action by Fletcher Drilling delayed the running of the test, so that it could not be started before dark, and was abandoned.

The well was then plugged and abandoned on the 9th of August, 1990.

GAS & FUEL EXPLORATION
NALANGIL NO. 1
PEP 100, OTWAY BASIN, VIC.

DISCUSSION BY INTERVAL

12 1/4" Hole (Surface to 68.8m) (2 Days)
9 5/8" Casing Set at 64.2m

The 12 1/4" hole was spudded in at 02.00 hours on the 4th of August using a high viscosity prehydrated AQUAGEL-Lime spud mud.

Only half of the surface system was used initially to give room for rapid dilution if necessary, as the near surface lithology was quite uncertain.

Drilling progressed steadily through very firm sticky claystone, which was not very dispersive, but gave a large volume of large sticky cuttings at the shakers. The mud viscosity was maintained at 45-55 seconds, and each single was reamed and circulated to clean the hole and avoid a mud ring. The mud system was gradually extended by dilution so that the sand trap was included, but no dumping to control weight or viscosity was required despite the very small surface volume of only 100 bbl.

At 68m the hole was circulated clean and a wiper trip run without problems. After circulating the hole clean again, the 9 5/8" casing was run in, having to be worked through several minor tight spots.

The casing was then cemented with neat cement with returns to the surface.

GAS & FUEL EXPLORATION
NALANGIL NO. 1
PEP 100, OTWAY BASIN, VIC.

DISCUSSION BY INTERVAL (cont.)

8 1/2" Hole (68.8m to 363m) (4 Days)

After nipling up and pressure testing the B.O.P. stack and pressure testing. The 9 5/8" float collar, cement and casing shoe were drilled out with the old mud from the 12 1/4" hole diluted with water to control viscosity.

Five metres of new hole was then drilled to 73m and a formation leak off pressure test run, yielding a 16.9 ppg equivalent weight.

Drilling then continued slowly through claystone and siltstone adding water only to control viscosity and maintain mud volume; no filtration control was run initially. The desilter was run continuously as the rig didn't have a desander, and S20 and S40 shaker screens were run on the single deck shakers. The solids control system worked quite adequately for the small mud system, which had only a maximum 150 bbl surface volume.

From about 275m, prior to reaching the prognosed target, the filtration control was rapidly reduced by additions of CMC HV and DEXTRID while simultaneously dumping 50 bbl of active volume and diluting with water to reduce solids content and control viscosity. By 290m the mud properties were:

Weight	8.8 ppg
Viscosity	43 seconds
Yield Point	15 lb/100 ft ²
Filtrate	5.5 cc
pH	10.5

The mud was also circulated for half an hour at 290m, without drilling, to even out the rheology and minimise losses over the shaker screens. The sloping single deck shakers easily lost mud over them as the viscosity increased.

Drilling then continued to the original 350m TD. It was then decided to drill a little further, to 363m, the final TD. After circulating the hole clean, a wiper trip was run, with 4m of fill encountered on running back to bottom. The hole was circulated out again and wireline logs were then run. No problems were experienced with the hole during logging, with hole very close to the 8 1/2" gauge, except that the loggers only reached 350m. This was despite the mud viscosity being increased to 47 seconds, with the yield point up to 18 lb/100 ft² during the circulation prior to logging.

GAS & FUEL EXPLORATION
NALANGIL NO. 1
PEP 100, OTWAY BASIN, VIC.

DISCUSSION BY INTERVAL (cont.)

8 1/2" Hole (cont.)

It was then decided to run a drill stem test using a conventional bottom hole test string, on top of a cement plug. So after running in open ended, a cement plug was set at 350m. The bit and 8 1/2" assembly was then run and the cement plug dressed down to 260m. Meanwhile, the mud was treated with additional water, Q-BROXIN and PAC-R to control cement contamination and maintain filtration control. After testing the plug for weight the drill string was pulled to run the drill stem test.

However, as stated, in the introduction, industrial action by Fletcher Drilling during the running of the test string led to the abandonment of the test, and plugging of the well on the 9th of August, 1990.

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MATERIAL RECAP

COMPANY	Gas & Fuel Exploration	HOLE SIZE	12 1/4"
WELL	Nalangil No. 1	CONTRACTOR/RIG	Fletcher Drilling / Rig 2
LOCATION	PEP 100, Otway Basin, Victoria	MUD TYPE	FW Aquagel Spud Mud

INTERVAL TO (m)	68.8	DRILLING DAYS	2	COST/DAY	\$236.23
FROM (m)		ROTATING HRS.		COST/M	\$6.87
DRILLED (m)	68.8			COST/BBL	\$2.58
DATE	Aug 10, 1990	MUD CONSUMPTION FACTOR (bbl/m)			2.66

MATERIAL	UNIT	UNIT COST	QUANTITY		CONC (ppb)		TOTAL COST (A\$)	
			EST	ACT	EST	ACT	ESTIMATE	ACTUAL
Barite								
AQUAGEL	100lb	18.64	15	22	12.0		279.60	410.08
Caustic Soda	25kg	27.93	1	2	0.6		27.93	55.86
Lime	25kg	6.51	1	1	0.3		6.51	6.51

DIESEL	Bbls							
CHEMICAL VOLUME	Bbls			3				
FRESH WATER	Bbls		129	180				
SEA WATER	Bbls							
TOTAL MUD MADE	Bbls			183				
COST LESS BARYTES							\$314.04	\$472.45
COST WITH BARYTES							\$314.04	\$472.45

COMMENTS Actual mud consumption would have been lower, except that about 40 bbl of the mud originally mixed for spud in on 24/7/90, was lost testing and repairing mud pumps during the period 24/7/90 to 3/8/90 while the rig was mechanically unsatisfactory to spud.

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MATERIAL RECAP

COMPANY	Gas & Fuel Exploration	HOLE SIZE	8 1/2"
WELL	Nalangil No. 1	CONTRACTOR/RIG	Fletcher Drilling / Rig 2
LOCATION	PEP 100, Otway Basin, Victoria	MUD TYPE	FW Aquagel - Aquagel Polymer

INTERVAL TO (m)	363	DRILLING DAYS	4	COST/DAY	\$200.48
FROM (m)	68.8	ROTATING HRS.		COST/M	\$2.73
DRILLED (m)	294.2			COST/BBL	\$3.33
DATE	Aug 8, 1990	MUD CONSUMPTION FACTOR (bbl/m)			0.82

MATERIAL	UNIT	UNIT COST	QUANTITY		CONC (ppb)		TOTAL COST (A\$)	
			EST	ACT	EST	ACT	ESTIMATE	ACTUAL
Barite								
AQUAGEL	100lb	18.64	47	2	0.8		876.08	37.28
Caustic Soda	25kg	27.93	4	1	0.2		111.72	27.93
CMC HV	25kg	67.17	9	5	1.1		604.53	335.85
DEXTRID	50lb	37.96	19	8	1.7		721.24	303.68
PAC-R	50lb	97.18		1	0.2			97.18
Soda Ash	25kg	14.06	2				28.12	

DIESEL	Bbls							
CHEMICAL VOLUME	Bbls			1				
FRESH WATER	Bbls		470	240				
SEA WATER	Bbls							
TOTAL MUD MADE	Bbls			241				
COST LESS BARYTES							\$2,341.69	\$801.92
COST WITH BARYTES							\$2,341.69	\$801.92

COMMENTS Daily mud cost calculated up to plug and abandon date of 9/8/90

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MATERIAL SUMMARY

COMPANY	Gas & Fuel Exploration			CONTRACTOR/RIG	Fletcher Drilling / Rig 2	
WELL	Nalangil No. 1			MUD TYPES	FW Aquagel Spud Mud FW Aquagel - Aquagel Polymer	
LOCATION	PEP 100, Otway Basin, Victoria					
INTERVAL	DRILLED	DAYS	HOURS			
12 1/4"	68.8	2				
8 1/2"	294.2	4				
				COST/DAY	\$212.40	
				COST/M	\$3.51	
				COST/BBL	\$3.01	
TOTALS	363	6		MUD CONSUMPTION FACTOR (bbl/m)	1.17	

MATERIAL	UNIT	UNIT COST	QUANTITY		TOTAL COST (A\$)	
			ESTIMATE	ACTUAL	ESTIMATE	ACTUAL
Barite						
AQUAGEL	100lb	18.64	62	24	1,155.68	447.36
Caustic Soda	25kg	27.93	5	3	139.65	83.79
Lime	25kg	6.51	1	1	6.51	6.51
CMC HV	25kg	67.17	9	5	604.53	335.85
DEXTRID	50lb	37.96	19	8	721.24	303.68
PAC-R	50lb	97.18		1		97.18
Soda Ash	25kg	14.06	2		28.12	

DIESEL	Bbls					
CHEMICAL VOLUME	Bbls			4		
FRESH WATER	Bbls		599	420		
SEA WATER	Bbls					
TOTAL MUD MADE	Bbls		599	424		
COST LESS BARYTES					\$2,655.73	\$1,274.37
COST WITH BARYTES					\$2,655.73	\$1,274.37

COMMENTS

Total days on well calculated from spud to Plug & Abandon.

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PROPERTY RECAP

COMPANY Gas & Fuel Exploration
 WELL Nalangil No. 1
 LOCATION PEP 100, Otway Basin, Victoria

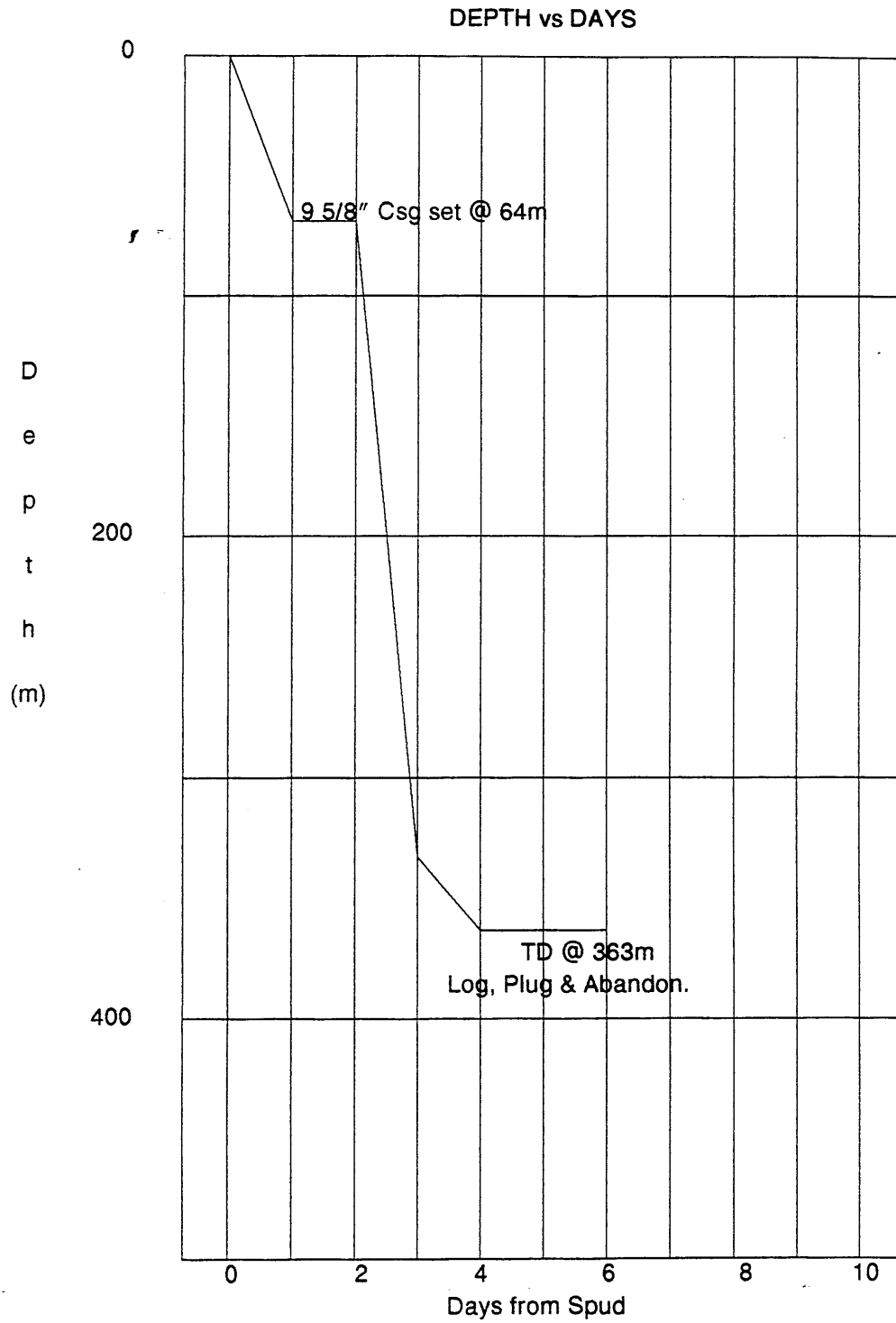
CONTRACTOR/RIG Fletcher Drilling / Rig 2

DATE	DEPTH m	HOLE SIZE in	F'LNE TEMP C	MUD WT ppg	VIS sec	PV	YP	GELS		FILTRATION			pH	PF	MF	Cl mg/l x1000	Ca mg/l	K+ xWT %	SAND %	RETCPT			MBC	REMARKS/TREATMENT/FORMATION
								10 sec	10 min	API ml	HHP ml	CAKE 32nd								TEMP C	SOL %	H2O %		
1990																								
Aug 4	68.78	12 1/4		8.90	55							10.5												Drill, set 9/58" csg - Clyst
5	38.78	12 1/4		8.70	34																			Wait on Cement, Nipple up
6	332.5	8 1/2		8.80	43	12	15	6	10	5.5	1	10.5	0.20	0.25	1.0	40			tr	3	97	10		Drill 8 1/2" - clyst, sd
7	363	8 1/2		8.90	47	15	18	8	12	6.0	2	10.0	0.20	0.25	0.7	60			tr	3	97			Drill to TD, Log - clyst, sd
8	363	8 1/2		8.60	36	8	9	2	4	7.0	2	11.0	0.80	0.90	1.5	60			tr	2	98			Wiper trip, set cmt plug
9	363	8 1/2		8.60	36	8	9	2	4	7.0	2	11.0	0.80	0.90	1.5	60			tr	2	98			Dress plug, POH to DST.

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GRAPH

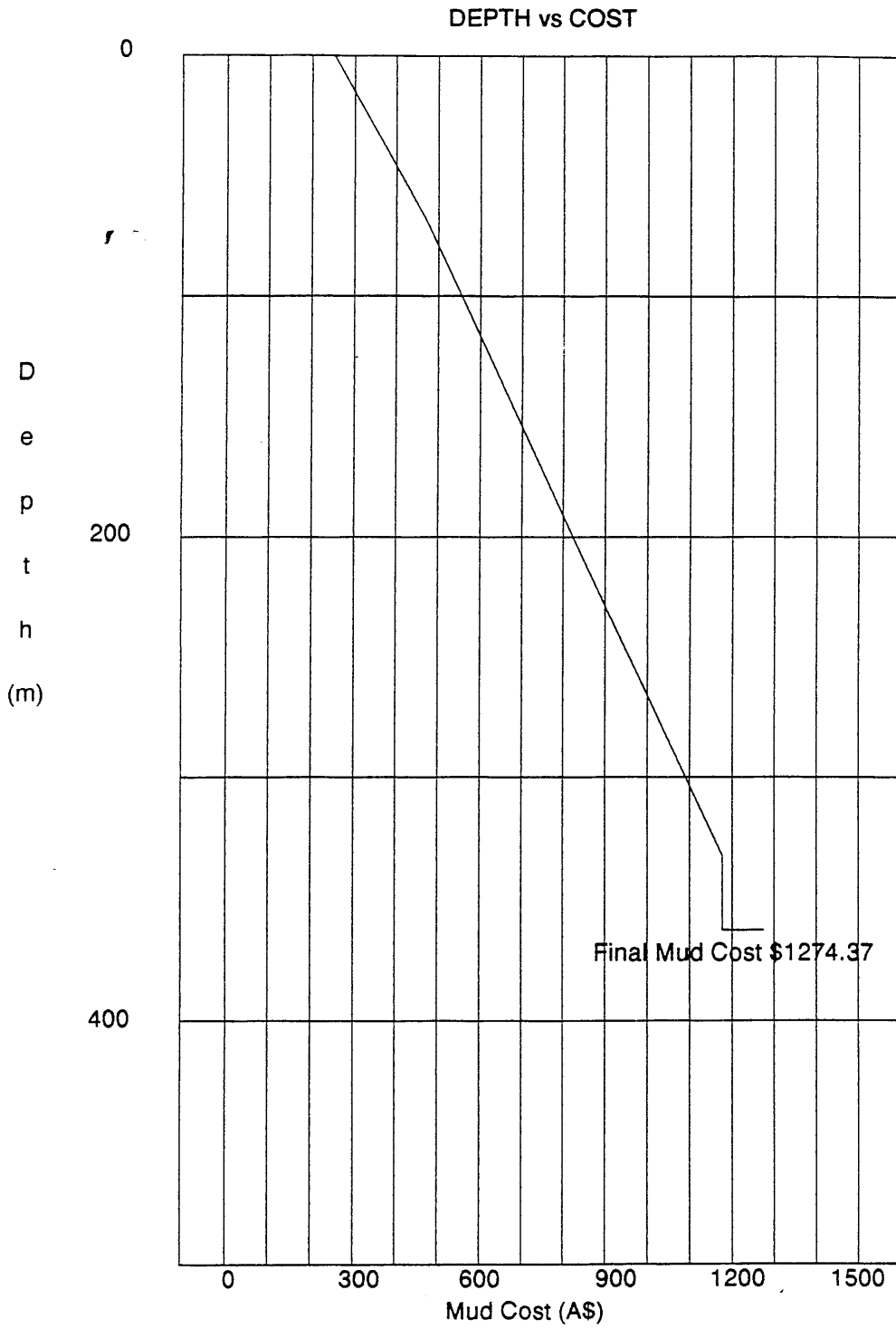
COMPANY Gas & Fuel Exploration
WELL Nalangil No. 1
LOCATION PEP 100, Otway Basin, Victoria



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GRAPH

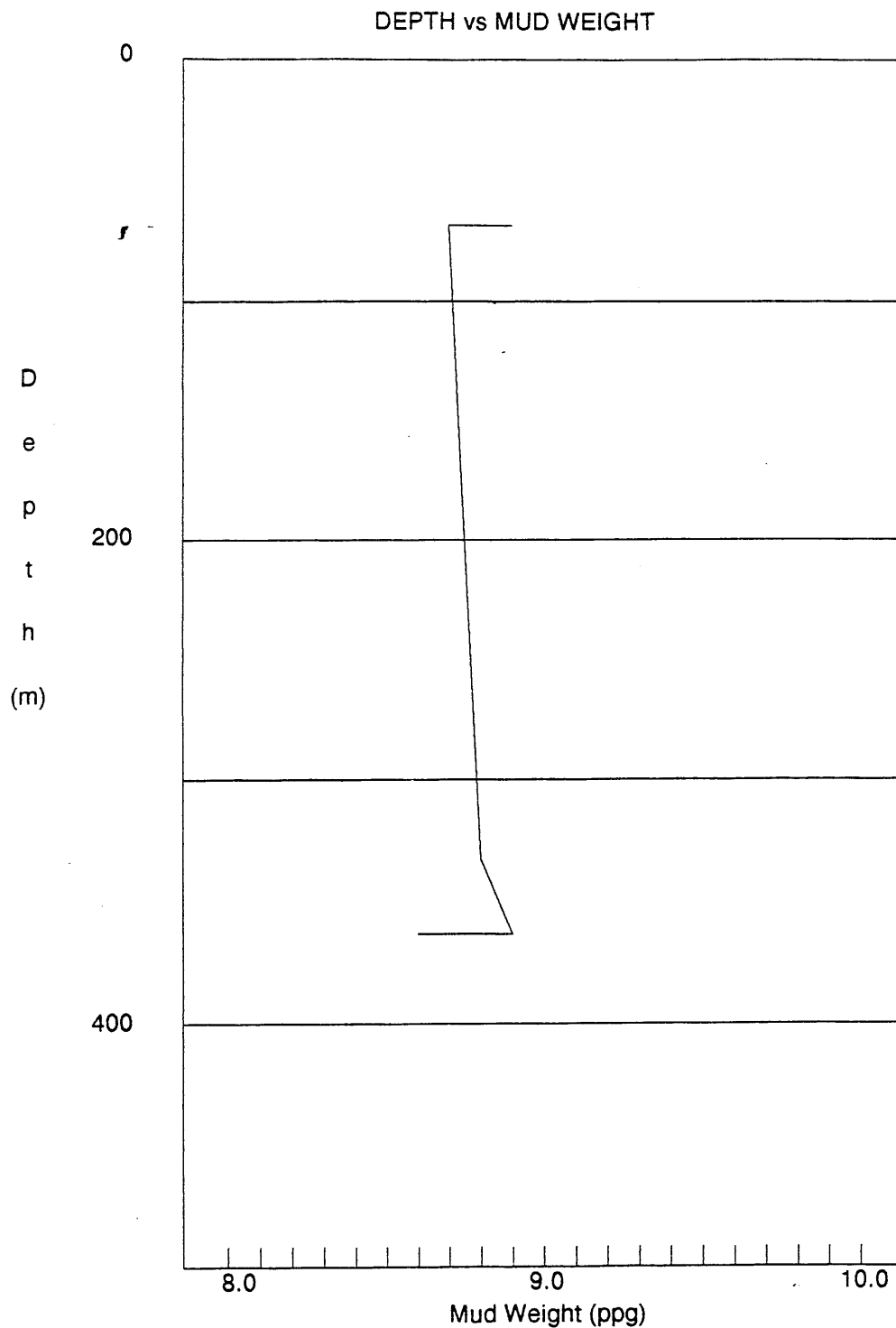
COMPANY Gas & Fuel Exploration
WELL Nalangil No. 1
LOCATION PEP 100, Otway Basin, Victoria



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GRAPH

COMPANY Gas & Fuel Exploration
WELL Nalangil No. 1
LOCATION PEP 100, Otway Basin, Victoria



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CALIPER

COMPANY Gas & Fuel Exploration
WELL Nalangil No. 1
LOCATION PEP 100, Otway Basin, Victoria

APPENDIX A

