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WELL COMPLETION REPORT

LANGLEY-1

PPL 1 OTWAY BASIN, VICTORIA

compilediby

Kevin Lanigan

January, 1996

VOLUME 1

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PETROLEUM DIVISION

GFE RESOURCES LTD

31 JAN 1996

PPL1

OTWAY BASIN, VICTORIA

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compiled by

Kevin Lanigan

submitted in

January, 1996

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VOLUME 4

WELL SEISMIC PROCESSING REPORT

SUMMARY

WELL DATA SUMMARY

LANGLEY-1

100%

Permit: PPL1 Otway Basin, Victoria

38° 35' 51.089"S / 142° 56' 10.625"E Lat./Long.:

AMG: 668619.8mE 5726092.3mN

Seismic: Waarre 3-D In-line 7875 Cross-line 4660

Ground Level: 64.0m AHD Elevation:

Kelly Bushing (well datum): 69.7m AHD

Total Depth: Driller 2006.0mKB

Logger 2007.0mKB

Rig: Century Rig 11 Pre-drill Status: Exploration Well

Post-drill Status: Plugged and Abandoned

Participants: GFE Resources Ltd

(Operator)

Spud Date: 1330hrs, 12 May, 1994 TD Reached: 2100hrs, 2 June, 1994

Rig Released: 0830hrs, 9 June, 1994

Engineering

Hole Size Casing

> 121/4" to 340mKB 81/2" to 2006mKB

16" Conductor to 12mGL (pre spud) 9⁵/₈" 36lb/ft STC K55 R3 to 334.43mKB Plugs

1. 1880-1820m (not tested) 2. 1760-1700m (not tested)

3. 940-880m (not tested)

4. 366-306m (tagged at 309m)

5. Surface (≈30 sacks)

Group	Formation/Unit	Depth		Thickness	Two-Way Time	High/Low to Prognosis	
•		(mKB)	(mSS)	(m)	(milliseconds)	Depth	Time
Heytesbury	Port Campbell Limestone	5.7	+64.0	103.3			
	Gellibrand Marl	109.0	-39.3	301.0	43		
	Clifton Formation	410.0	-340.3	10.8	368.9	24m Low	
Nirranda	Narrawaturk Marl	420.8	-351.1	84.2	376.7	7.2m High	
•	Mepunga Formation	505.0	-435.3	50.0	458.4	18m High	6.6ms High
Wangerrip	Dilwyn Formation	555.0	-485.3	235.4	504.6	16m High	5.6ms Low
	Pember Mudstone	790.4	-720.7	51.6	682.3	12.6m High	
	Pebble Point Formation	842.0	-772.3	55.2	720.0	3m High	llms Low
?	"K-T" Shale	897.2	-827.5	19.8	755.5		
Sherbrook	Paaratte Formation	917.0	-847.3	427.0	769.2	14m High	9.2ms Low
***************************************	Skull Creek Mudstone	1344.0	-1274.3	173.0	1063.0	50m High	19ms High
***************************************	Nullawarre Greensand (equiv.)	1517.0	-1447.3	38.8	1174.2	26m Low	42.2ms Low
***************************************	Belfast Mudstone	1555.8	-1486.1	160.0	1198.5	9.2m High	15.5ms Low
***************************************	Waarre Formation Unit D	1715.8	-1646.1	14.6	1304.7		
***************************************	Unit C	1730.4	-1660.7	40.4	1312.8	9.4m Low	34.8ms Low
•••••••••••	Unit B	1770.8	-1701.1	31.7	1337.5		
•••••••••••	Unit A	1802.5	-1732.8	23.5	1353.5		
Otway	Eumeralla Formation	1826.0	-1756.3	181.0+	1366.1	17m Low	14.1ms Low
	Total Depth (logger)	2007.0	-1937.3	:	:	······	

Key Hydrocarbon Indications

Nullawarre Greensand: gas (C_1-C_2) readings of 2 - 3 units, very patchy pinpoint very dull white fluorescence in SWC.

Waarre Formation Unit C: gas (C₁-C₄) readings up to 20.5 units, patchy to common dull white and yellow-orange fluorescence in SWC's.

Waarre Formation Units A & B: gas (C₁-C₄) readings up to 21 units, trace to sparse pinpoint dull yellow fluorescence in SWC's.

Eumeralla Formation: gas (C₁-C₄) readings mostly 2 - 5 units with peaks up to 87 units (especially from 1887 to 1907m), trace to sparse

pinpoint dull yellow fluorescence in two SWC's.

Logging DLL-MSFL-GR-SP-Cal: 2002.5 - 312.0m (GR to surface) Core #1 19m (1745 - 1764m driller) BHC-GR-Cal: 2002.5 - 312.0m Cut: LDL-CNL-GR-Cal: 2006.0 - 1360.0m Recovered: 15.94m (83.9%) SHDT-GR (Dipmeter): 2006.5 - 1432.0m RFT-GR: 1920 - 1731.5m (27 pre-tests - 13 good, no samples taken) WST-A (Checkshots): 2005.0 - 350.0m (20 levels) CST-GR (Sidewall cores): 1990 - 836 (Shot 60, Recovered 53)

Processed: Array Sonic 1340 - 2000m Mean Square Dip 1430 - 2003m **Formation Tests**

Conventional bottom-hole test. Total flow time 67 minutes. GTS in 3½ minutes into Main Flow. DST-1: 1715.22-1745m

Final Flow 4.7 mmcfd (two thirds CO₂). Recovered 1.2 bbls mud.

DST-2: 1875-1910m Closed chamber bottom-hole test. Misrun. Tool did not open properly on Pre-Flow and packer seat failed on

Main Flow opening. Recovered 10 bbls mud, partly gas cut.

DST-3: 1883.07-1909.13m Closed chamber inflate straddle test. Closed-in surface pressure rose 16.4 psig in Pre-Flow (7 mins.) and

24.8 psig in Main Flow (80 mins.). Final flow rate estimated 8 - 10 mcfd (no CO₂). Recovered 2.2 bbls mud.

INTRO PUCTION

1. INTRODUCTION

The Langley-1 exploration well is located in the south of Petroleum Production Licence One (PPL1), approximately 7.5 kilometres northwest of Port Campbell and 1.8 kilometres southwest of the Grumby-1 gas discovery (Figure 1). The prospect was delineated and the well location pin-pointed as a result of the 1993 Waarre 3D Seismic Survey, the first onshore 3D seismic survey acquired in Victoria.

Commercial gas was first discovered in the Port Campbell area in 1979 (North Paaratte-1) and subsequent drilling has resulted in delineation of the North Paaratte field and discovery of the Wallaby Creek and Grumby gas fields in what is now PPL1 and the Iona gas field in the adjacent PPL2.

The Langley structure is an elongate tilted fault block (ENE-WSW) with crests at either end. The western crest, the site of Langley-1, is fault bounded to the southeast and southwest with no fault independent closure. The main objective, the Waarre Formation, is interpreted to be juxtaposed against the Belfast Mudstone in hanging wall block and, therefore, laterally sealed to the south. The eastern crest is down thrown relative to the northern bounding fault and therefore perceived as having a higher associated lateral seal risk.

A bright amplitude anomaly is apparent on seismic data associated with the Waarre Formation over the western crest, possibly indicating the presence of gas. The main risk associated with this prospect was the presence of CO₂. Hydrocarbon charge was not considered a high risk due to the abundant intersections of both gas and oil in the region. Reservoir quality was also considered low risk based on the intersection at Grumby-1, where the Waarre Formation is at a similar depth and thickness. The Belfast Mudstone was interpreted to provide an excellent seal, as indicated by nearby discoveries reservoired in the Waarre Formation.

In the pre-drill interpretation the closing contour for the Langley structure at top Waarre Formation Unit C level was interpreted to be in the range 1680 - 1690 metres SubSea, with areal closure ranging 0.46 - 1.68 square kilometres, and possible recoverable reserves of between 6.3 and 23 BCF.

PE906683

This is an enclosure indicator page. The enclosure PE906683 is enclosed within the container PE900949 at this location in this document.

The enclosure PE906683 has the following characteristics:

ITEM_BARCODE = PE906683

CONTAINER_BARCODE = PE900949

NAME = Location Map

BASIN = OTWAY

PERMIT = PPL1

TYPE = GENERAL

SUBTYPE = MAP

DESCRIPTION = Location Map, Figure 1(enclosure from

WCR vol.1) showing Langley-1

REMARKS =

DATE_CREATED =

DATE_RECEIVED = 31/01/96

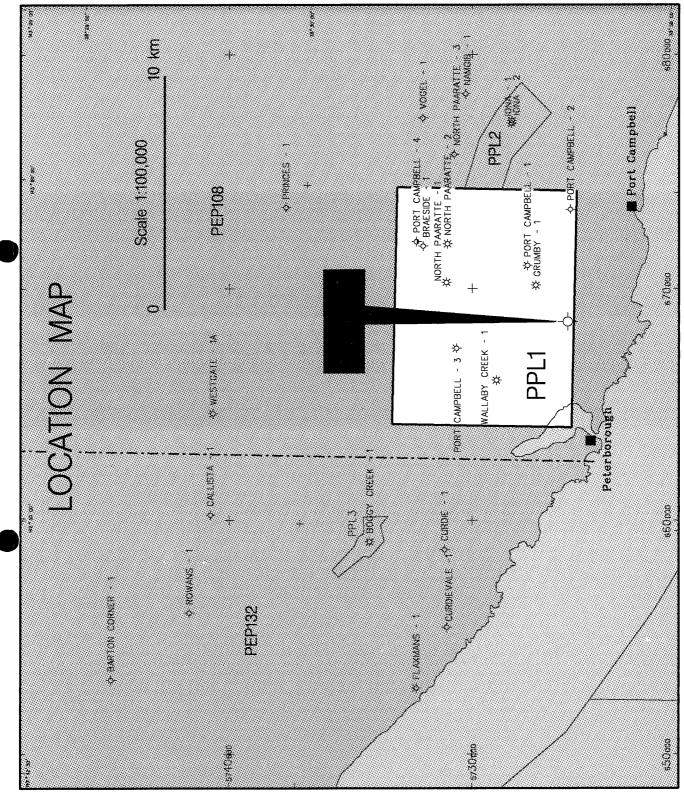
 $W_NO = W1099$

WELL_NAME = LANGLEY-1

CONTRACTOR =

CLIENT_OP_CO = GFE RESOURCES LTD

(Inserted by DNRE - Vic Govt Mines Dept)





WELL HISTORY

2. WELL HISTORY

2.1 LOCATION

Surface Location:

Latitude:

38° 35' 51.089"S

Longitude:

142° 56' 10.625"E

AMG:

668619.8mE

5726092.3mN

Seismic:

Waarre 3D

In-line 7875

Cross-line 4660

Property Title:

County:

Heytesbury

Parish:

Paaratte 6

Section:
Allotment:

15

Property Owner:

M.J. & T.M. Smith

2.2. GENERAL DATA

Well Name:

Langley-1

Permit:

PPL1 Otway Basin, Victoria

Operator:

GFE Resources Ltd

Level 6, 6 Riverside Quay

South Melbourne Victoria 3205

Participants:

GFE Resources Ltd 100%

Elevation:

Ground Level (GL): 64m AHD*

Kelly Bushing (KB): 69.7m AHD* (datum)

* AHD = Australian Height Datum

(All depths are Drilled/Measured Depths relative to KB unless otherwise stated)

Total Depth:

Driller:

2006.0mKB

Logger:

2007.0mKB

Drilling Commenced:

1330 hours, 12 May, 1994

Total Depth Reached:

2100 hours, 2 June, 1994

Rig Released:

0830 hours, 9 June, 1994

Well Status:

Plugged and Abandoned

2.3. DRILLING DATA

2.3.1 Drilling Contractor

Century Drilling Limited

2.3.2 Drilling Rig

Century Rig 11 (see Appendix 1)

2.3.3 Casing and Cementing Details

A 16" Conductor pipe was cemented at 12mGL prior to rig up.

Surface Casing

Size:

95/8"

Weight & Grade:

36 lb/ft STC K55 R3

(29 Joints)

Centralizers:

331m, 311m, 299m and 288m

Float Collar:

322.6m

Shoe:

334.43m

Hole Depth:

340m

Cement:

520 sacks Class "A" neat cement

Method:

Single plug displacement

(top plug only)

Equipment:

Dowell Schlumberger

Cement plugs

<u>Plug No.1</u> Interval: 1880-1820m

Cement: 84 sacks class "A" cement

Method: Balanced

Tested: No

<u>Plug No.2</u> Interval: 1760-1700m

Cement: 87 sacks class "A" cement

Method: Balanced

Tested: No

Plug No.3 Interval: 940-880m

Cement: 84 sacks class "A" cement

Method: Balanced

Tested: No

Plug No.4 Interval: 366-306m

Cement: 84 sacks class "A" cement

Method: Balanced

Tested: Yes (tagged at 309m)

Surface Plug 30 sacks class "A" cement

2.3.4 Drilling Fluid

The drilling fluid program was designed and recommended by Baroid after consultation with GFE representatives. Details of the mud system and assessment of its performance is contained in the Drilling Fluid Recap (Appendix 2).

2.3.5 Drilling Bits

Six drilling bits were used during the drilling of Langley-1, and a record of their pertinent details is shown in Table 1.

2.3.6 Water Supply

Water for the drilling operations was obtained from an existing dam down hill from the lease and stored in a pit dug near the wellsite.



TABLE 1

BIT RECORD

Century Drilling Contractor:

State:

Victoria

GFE Representative: Ken Smith

Langley-1 Well:

Spud:

12/5/94

2/6/94 Reached T.D.:

Permit:

Retrieve survey Remarks & bit check 12½ T.D. $^{1}/_{16}$ Cond. æ 7 NC NC WL 12 Mud WT VIS 45 40 8.9 8.7 300 450 3x201x11 2x13 Jets Pump 1000 Press. (psi) 450 Dev. Vert 0.75 1.25 ေ 90-110 10-15 5-20 Drlg Accum Hours 12.5 69.5 (m/hr) Rate 19.5 27.2 One insert missing in heel or gauge row of lead and third cone - missing, not broken. Hours 12.5 47 Metres Drilled 340 917 Depth 340) O 1257 Ξ 629176 Serial 88737 IADC 1.1.6 Code 4.1.7 ETD417 S33SF Type Make Sec. 121/4" 81/2" Size

Third cone: 1 insert chipped in nose row, 1 missing in gauge row and 1 missing in middle row. Several inserts have turned up to 90° in cone shells. T.B.G. All bearings indicated wear of around 7 although seal "drag" still appears to be evident. Lead cone: 3 inserts missing in second row and 1 missing in heel or gauge row. Second cone: 1 insert chipped in nose row, 1 chipped in second row and 4 missing. grading disregards missing inserts.

⁹¹/₁>

9

7

38

9.0

300

2x13 1x11

7

90-

5-20

88.5

5.5

19 ***99**

106

1363

Varel | ETD417 | 4.1.7 | 88737

81/2"

1023*

7.5 46 9.0 2x13 1100 **-**08 5-25 5.1 14.5 75 1438 630591 4.3.7 S82F Sec. 81/2"

Bit pulled after being stuck in hole. Bit was changed because down-jarring had been done on it and it was not possible to say of this would have had an effect on its future life.

at top Waarre String torque DST #2 T.D. <1/1e 旦 ĮЦ 4 7 8.9 50 46 9.3 9.3 9.3 300-250 250 300 300 1x11 2x13 2x13 2x13 3x131x1 1150-1100 850 850 1.75 0.75 1.5 1.0 90-69 100 100 85 15-20 15-20 18 25 161.5 223.5 160 203 4.68 6.9 3.6 6 20.5 41.5 43* 25* 57 1.5 159* 478* 394 146 96 13 1732 2006 1745 1910 627533 385911 385911 88735 4.3.7 4.1.7 5.3.7 5.3.7 ETD417 **S82F S86F S86F** Varel Sec. Sec. Sec. 81/2" 81/2" 81/2" 81/2" SRR

* Totals for run and re-run of same bit

2.3.7 Drilling History

A detailed account of the drilling of Langley-1 is provided by the compilation of daily drilling operations reports in Appendix 3, which is also summarized graphically in Figure 2.

2.4 FORMATION SAMPLING AND TESTING

2.4.1 Cuttings

No cutting samples were collected from surface to 110 metres. Cutting samples were then collected at ten-metre intervals from 110 to 340 metres $(9^5/8)$ casing depth) and thereafter at 2.5-metre intervals to total depth. Each sample was washed and air dried and divided into four splits, three of which were stored in labelled plastic bags and the fourth in "Samplex" trays.

Additionally, one set of 500 gram unwashed samples were collected at tenmetre intervals from 340 metres to total depth and stored in labelled cloth bags. All samples were retained by the operator, except for one set of washed and dried cuttings which were sent to the DEM (Petroleum Division) core store.

Lithological descriptions of cuttings by the wellsite geologist during the drilling of Langley-1 are compiled in Appendix 4A, along with a compilation of the lithological descriptions from daily reports issued during the drilling of the well in Appendix 4B.

2.4.2 Cores

2.4.2.1 Conventional Core

One conventional core was cut in Langley-1 (by Australian DST Co.) over the interval 1745-1760m (driller's depth) within the Waarre Formation Unit C following a drill stem test (DST-1).

The core was cut without a sleeve and the barrel was emptied on the

drilling floor, with the recovered core then laid out on the pipe racks where it was cleaned, measured, examined and briefly described (Appendix 5A) before being packaged and despatched to the laboratory. Of the 19.0 metres cut 15.94 metres (83.9%) was recovered. No scent or trace of hydrocarbons was detected in the core, despite chips being taken at regular intervals and inspected under UV light. As a routine measure selected samples were wrapped in foil and 'seal peeled' to help preserve them for possible future work.

Upon arrival at ACS Laboratories (Adelaide) the core was reassembled, a core gamma log was recorded and plugs were cut for porosity/permeabililty analyses (Appendix 5C). The core was then slabbed $^{1}/_{3}$ - $^{2}/_{3}$ for photography (Appendix 5B). The $^{1}/_{3}$ portion was sent to the DEM (Petroleum Division) core store and the $^{2}/_{3}$ portion was retained by the GFE Resources Ltd.

Subsequent comparison of the core gamma log, core photographs and the down-hole wireline gamma ray log suggests a depth correction is necessary to match the observed sharp sandstone-mudstone contacts, such that a given point on the core log is about 0.25m higher than on the core photos, and about 1.85m higher than on the down-hole log. Thus, to match core plugs to their equivalent position on down-hole logs it is recommended that 1.6m be added to the depths reported from the laboratory.

Selected core plugs were subsequently sent for special core analysis (SCAL) a report of which is contained in Appendix 5D.

2.4.2.2 Sidewall Cores

A total of 60 sidewall cores were attempted (Enclosure 9), of which 53 were recovered.

All recovered sidewall core samples were checked for lithology and hydrocarbon shows and then stored in sealed glass jars. Descriptions of the sidewall cores are contained in Appendix 6 and a summary of subsequent analyses is given in Section 2.4.4.

2.4.3 Testing

2.4.3.1 Drill Stem Testing

Three Drill Stem Tests (DSTs) were run in Langley-1 using Australian DST Co. Data for these tests is included in Appendix 7.

DST-1 1717.22 - 1745 mKB

DST-1 (Appendix 7A) was a conventional bottom-hole test conducted to evaluate the top of the Waarre Formation Unit C, in which a 5-10 fold drilling break and mud gas readings of up to 19 units were recorded (over a background of 1.5-2 units). After an eight-minute Pre-Flow and 47-minute Initial Shut-In, the well was flowed for an hour and achieved a stabilised flow of non-combustible gas (dominantly CO₂) at an estimated rate of 4.7mmcfd through a $^{3}/_{4}$ " down-hole choke and $^{1}/_{2}$ " surface choke. Subsequent analyses of the gas sampled during this test (Table 2) indicated that it was two-thirds carbon dioxide.

DST-2 1875 - 1910 mKB

DST-2 (Appendix 7B) was a conventional bottom-hole test conducted to evaluate gas shows at the top of an intra-Eumeralla Formation sand interval in which ROP and mud gas readings increased substantially. After a nearly seven-minute Pre-Flow and 63-minute Initial Shut-In, the well was flowed for just over 14 minutes in the Main Flow before the packer seat failed and the test was aborted.

DST-3 1883.07 - 1909.13 mKB

DST-3 (Appendix 7C) was an inflate straddle test conducted after wireline logging to evaluate the intra-Eumeralla Formation sand interval which DST-2 had sought to test. Due to the expectation that the interval would comprise tight formation this test was conducted as a Closed Chamber DST.

Subsequent analysis of the gas sampled during this test (Table 2) indicated that it was relatively dry hydrocarbon gas, devoid of carbon dioxide. (Note: the CO_2 , N_2 and O_2 detected is attributed to air in the pipe at the start of the test).

The Main Flow was stopped due to the gradually declining rate of gas influx and, after a 157-minute Final Shut-In, the test was terminated and the tool pulled from the hole. Liquid recovery above the shut-in tool comprised 2.2bbls of mud with no indication of liquid hydrocarbons.

2.4.3.2 Wireline Formation Testing

Repeat Formation Tester (RFT) pressure readings were carried out at 27 points spanning the Waarre and Eumeralla Formations (Enclosure 7). Thirteen good tests were obtained, all within the Waarre Formation, and a plot of pressures recorded at these points (Figure 3) indicates a Gas/Water Contact around 1755.7mKB. Sample chambers were run on the RFT tool, but no samples were attempted.

2.4.4 Sample Analyses

Laboratory work on Core #1 comprised a core gamma log and colour white-light photography. All plugs cut from Core #1 were subjected to routine core analysis (porosity, permeability and grain density) and a subset of these were then selected for special core analysis (formation factor, resistivity index and trapped gas saturation).

In addition to the above, analysis of selected cuttings, sidewall core and core samples from Langley-1 comprised organic geochemistry, palynology and petrography. Table 3 lists the analyses performed on each sample (excluding work on the core plugs), details of which can be found in the appropriate Section/Appendix.

Core Analysis	see Section 2.4.2.1	and Appendix 5
Petrography	see Section 3.2	and Appendix 9
Geochemistry	see Section 3.4	and Appendix 10
Palynology	see Section 3.5	and Appendix 11

LANGLEY #1 RFT PRESSURES

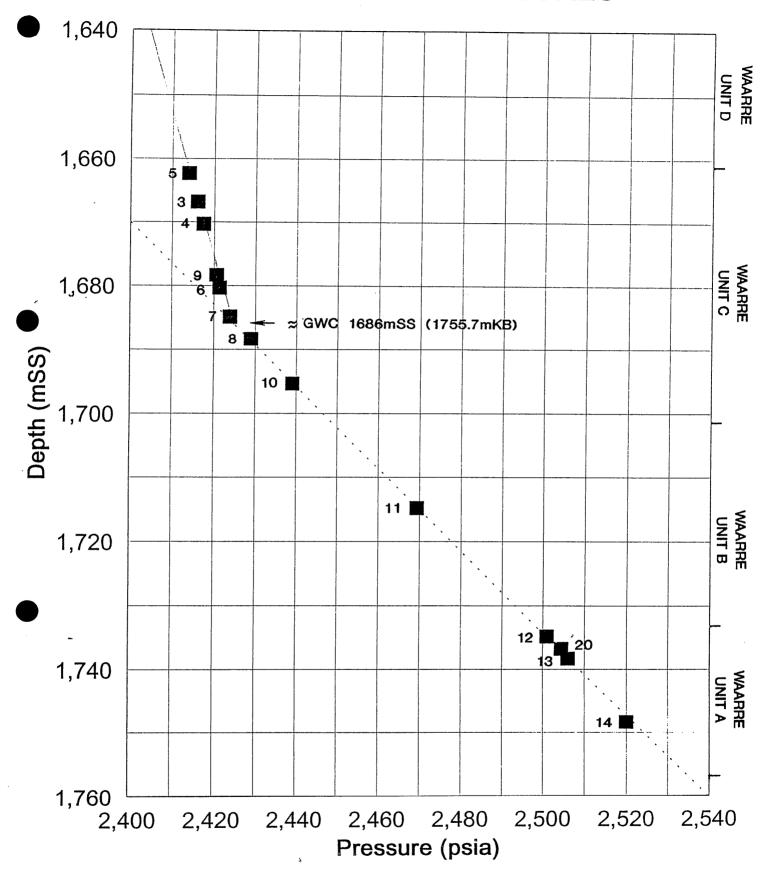


TABLE 3

SIDEWALL CORES AND CUTTINGS ANALYSES

		SWC					
Sample	Depth	Recovery	Palynology	Geochemistry	TOC	Rock-Eval	Petrography
~F	(mKB)	(mm)	, 5,	ľ			
SWC#59	895.0	40	✓				
SWC#58	916.0	50	✓				· · · · · · · · · · · · · · · · · · ·
SWC#56	1291.0	15	✓	/			
SWC#55	1325.0	45	√				
SWC#52	1516.0	35	✓				
SWC#51	1518.5	12		✓			
SWC#50	1522.0	25					✓
SWC#49	1541.0	30	✓				
SWC#48	1579.0	50	✓		ļ		
SWC#47	1634.0	30	· ·				
SWC#46	1677.0	35	✓ ✓		ļ		
SWC#45 SWC#44	1692.0 1701.0	50 47	V				
SWC#44	1701.0	40	→				
SWC#43	1712.3	35	√				
SWC#42 SWC#41	1728.0	40	· · ·				
SWC#40	1729.5	45					
SWC#39	1732.0	25	· · · · · · · · · · · · · · · · · · ·	7			
SWC#38	1733.5	35	✓		<u> </u>		
Core sample	1745.4	plug end					1
Core sample	1746.3	plug end					✓
Core sample	1748.6	plug end					✓
Core sample	1749.6	plug end					✓
Core sample	1750.2	-	✓				
Core sample	1754.15	plug end					/
Core sample	1758.8	-	✓				
SWC#37	1768.2	30	✓				
SWC#36	1770.0	30		/	ļ		
SWC#35	1772.0	30	✓		ļ		
SWC#34	1776.5 1778.5	30 40	<i>'</i>		 		
SWC#33 SWC#32	1778.3	30	→		-		
SWC#32	1783.0	25			 	<u> </u>	
SWC#30	1784.0	25					√
SWC#29	1789.0	25	✓				-
SWC#28	1795.0	30	√			· • · · · · · · · · · · · · · · · · · ·	
SWC#27	1798.0	30	✓				
SWC#26	1799.5	32	✓				
SWC#25	1802.0	25	✓				
SWC#24	1803.5	45		1			
SWC#23	1804.5	30					
SWC#22	1808.0	30					✓
SWC#21	1810.5	40			-	<u> </u>	
SWC#20	1814.5 1818.5	30 30			<u> </u>	<u> </u>	√
SWC#19 SWC#18	1818.5	35	-	 			¥
	1822.5	15	√		 		
SWC#17 SWC#16	1824.0	35	<u> </u>				
SWC#15	1825.5	20	· ·		1	✓	
SWC#14	1827.0	30	·		<u> </u>		
SWC#13	1836.5	40					√
SWC#12	1853.0	30					
SWC#11	1855.5	35	✓		✓		
SWC#10	1870.0	30					
SWC#8	1878.5	40					
SWC#6	1884.0	35		✓			✓
SWC#5	1924.5	40			✓		
Cuttings	1936			√			
Cuttings	1945			✓			
SWC#4 SWC#3	1957.0	30			ļ	1	
	1969.0	45	I	Į.	1	ł	1

Note: core analyses on plugs cut from Core #I not listed here - see Appendix 5

2.5 LOGGING AND SURVEYS

2.5.1 Mud Logging

A standard skid-mounted unit supplied by Baker Hughes-Inteq (BHI) and equipped for continuous recording of depth, penetration rate (ROP), mud gas, pump rate and mud volume data, as well as intermittent mud and cuttings gas (blender) analysis was operative from 110 metres until the well was plugged and abandoned. The lithological, gas and engineering data collated by the BHI crew is presented on the 1:500 scale Formation Evaluation Log (i.e. "Mud Log") in Enclosure 2. A tabulated listing of the gas data is provided in Appendix 8 and the ROP and gas data are also included on the 1:1000 scale Composite Log (Enclosure 1).

2.5.2 Wireline Logging

Wireline logging was performed by Schlumberger Seaco using a standard truck-mounted unit. Only one logging suite was conducted (at Total Depth) comprising six separate runs into the hole (with a wiper trip after the first three) between 0830 hours on June 3 and 1400 hours on June 5. These runs are listed in Table 4 in the sequence in which they were acquired.

From the array sonic tool run in Langley-1 a standard Bore Hole Compensated (BHC) sonic curve was produced at the time of logging (Enclosure 4). The full array sonic waveforms data (which includes Stoneley, Shear and Compressional curves) was subsequently processed at Schlumberger's Melbourne processing centre and the report and logs produced from this work are contained in Enclosure 11.

Similarly, the raw checkshot data (Enclosure 8) was submitted to the processing centre and a Well Seismic Processing Report was produced (Volume 4).

The raw dipmeter data (Enclosure 6) was also subsequently sent to Schlumberger's Melbourne processing centre and a Mean Square Dip plot was produced (Enclosure 10).

TABLE 4

WIRELINE LOGS RUN IN LANGLEY-1

Log	Interval (mKB)	Enclosure Number
Dual Laterolog - Micro-Spherically Focussed Log - Gamma Ray - Caliper (DLL-MSFL-GR-SP-Cals) ¹	2002.5 - 312 (GR T.D Surface)	3
Sonic - Gamma Ray - Spontaneous Potential - Caliper (AS ² /BHC-GR-Cals) ¹	2002.5 - 312 (GR T.D Surface)	4
Lithodensity Log - Compensated Neutron Log - Gamma Ray - Caliper (LDL-CNL-GR-Cali)	2006.0 - 1360	5
Checkshot Survey ³ (WST-A)	2005.0 - 350.0	8
Repeat Formation Tester (RFT - GR)	1920.0 - 1731.5	7
Dipmeter Log ⁴ (SHDT - GR)	2006.5 - 1432	6
Sidewall Core Sampler (CST)	1990.0 - 836.0	9

Notes:

- 1 Provided as separate logs but recorded on the same logging run.
- 2 BHC sonic was produced from data collected by array sonic tool. Processed array sonic data is provided in Enclosure 11.
- 3 Raw checkshot survey data was subsequently processed and presented in a Well Seismic Processing report which is provided in Volume 4.
- 4 Raw dipmeter data was subsequently processed to produce a Mean Square Dip plot, which is provided in Enclosure 10.

2.5.3 Bottom Hole Temperature

In order to obtain an estimate of true formation temperature, a Horner-type method using temperatures and times from the first three wireline log runs was adopted, with the following input data;

Time when drilling stopped (reached T.D.) 2100hrs on 2/6/94 Time when circulation ended 0230hrs on 3/6/94

 \Rightarrow :: Circulation Time $(t_c) = 5.5$ hours

Maximum temperatures recorded during the first three wireline logging runs were as follows:

Log	Depth	Temperature [T]	Time since end of circulation	log <u>tc+∆t</u>
	(mKB)	(°C)	$[\Delta t]$ (hours)	Δt
Resistivity / Sonic	2002.5	65.6	7.9	0.2295
Density / Neutron	2006.0	70.0	16.7	0.1236
Checkshots	2005.0	73.3	20.7	0.1023

Note: after these first three logging runs a wiper trip was run, so temperature data from the last three runs were not used in the true BHT estimate.

Running a linear regression on the temperature versus $\log(t_c + \Delta t)/\Delta t$ data to find the intercept (or, equivalently, by plotting these on linear axes and extrapolating a straight line back to the Temperature axis) yields an estimated stabilized bottom hole temperature of 77.9°C. Assuming a mean surface temperature of 18°C, this stabilized bottom hole temperature indicates a temperature gradient of about 3.0°C per 100 metres.

2.5.4 Deviation Surveys

Totco surveys were conducted frequently during the drilling of Langley-1 to monitor well bore deviation. Using this deviation data maximum horizontal and vertical distances from the initial location were obtained by summing the components of horizontal distance [$interval\ length \times sine(deviation\ angle)$] and vertical distance [$interval\ length \times cosine(deviation\ angle)$] for each interval (Table 5). The results of this are;

• at the depth of the primary target (1730 metres) the hole location was within a 34-metre radius of the surface location and the true vertical depth was less than half a metre short of the measured (drilled) depth.

TABLE 5

TOTCO Deviation Surveys in Langley-1

Depth	Interval	Deviation Angle	Horizontal Distance	Cumulative Horizontal	Vertical Distance	Cumulative Vertical
(m)	(m)	(°)	(m)	(m)	(m)	(m)
30	30	0.75	0.39	0.39	30.00	30.00
67	37	0.25	0.16	0.55	37.00	67.00
128	61	0.5	0.53	1.09	61.00	127.99
191	63	0.5	0.55	1.64	63.00	190.99
248	57	0.25	0.25	1.88	57.00	247.99
335	87	0.75	1.14	3.02	86.99	334.98
391	56	1	0.98	4.00	55.99	390.98
468	77	0.75	1.01	5.01	76.99	467.97
525	57	0.5	0.50	5.51	57.00	524.97
660	135	1	2.36	7.86	134.98	659.95
708	48	1	0.84	8.70	47.99	707.94
870	162	0.5	1.41	10.11	161.99	869.93
1004	134	1.5	3.51	13.62	133.95	1003.89
1033	29	2	1.01	14.63	28.98	1032.87
1062	29	1.75	0.89	15.52	28.99	1061.86
1091	29	1.5	0.76	16.28	28.99	1090.85
1129	38	1.5	0.99	17.27	37.99	1128.83
1158	29	0.5	0.25	17.53	29.00	1157.83
1196	38	1	0.66	18.19	37.99	1195.83
1228	32	1.5	0.84	19.03	31.99	1227.82
1244	16	1.25	0.35	19.38	16.00	1243.81
1273	29	1	0.51	19.88	29.00	1272.81
1305	32	1.75	0.98	20.86	31.99	1304.79
1331	26	1.75	0.79	21.65	25.99	1330.78
1360	29	1.75	0.89	22.54	28.99	1359.77
1390	30	1.25	0.65	23.19	29.99	1389.76
1524	134	2	4.68	27.87	133.92	1523.68
1610	86	1.5	2.25	30.12	85.97	1609.65
1706	96	1.75	2.93	33.05	95.96	1705.60
1808	102	0.75	1.34	34.39	101.99	1807.59
2000	192	1	3.35	37.74	191.97	1999.57
-	Accessed to the control of the contr	Total	37.74	Total	1999.57	

• the bottom hole location was within a 38-metre radius of the surface location and the true vertical total depth was about half a metre short of the measured (drilled) total depth.

2.5.5 Velocity Surveys

A Checkshot survey was carried out by Schlumberger Seaco during the wireline logging program. The field data for the checkshots is included as Enclosure 8 and a Well Seismic Processing Report (including a Drift Corrected Sonic Log, Seismic Calibration Log and Synthetic Seismograms) is included as Volume 4.

GEOLOGY

3. GEOLOGY

3.1 STRATIGRAPHY

The section penetrated in Langley-1 is interpreted to have formation tops as shown in Table 6 based on consideration of rate of penetration, cuttings descriptions, palynological analyses and wireline logs. A schematic comparison of the predicted and actual formation tops is shown in Figure 4.

No samples above 110 metres were collected or described. Based on the gamma ray curve the contact between the Port Campbell Limestone and the Gellibrand Marl is inferred to be at 109 metres.

Selection of formation tops from the Clifton Formation down to the Belfast Mudstone involved a relatively straightforward comparison of wireline logs with other wells in the Port Campbell region, with palynology providing supporting data where it is available.

The contact between the Tertiary Pebble Point Formation and the Cretaceous Paaratte Formation is consistently marked by a shaly interval, which is 19.8 metres thick in Langley-1. In previous wells the Cretaceous-Tertiary boundary has been placed at either the top or bottom of this shaly interval, apparently dependent on whether it was preferred to have a sandy top to the Paaratte Formation or a sandy base to the Pebble Point Formation.

Palynological data points through this interval are rare, but the few datings of sidewall cores which are available (e.g. Iona-1, Boggy Creek-1, Langley-1) suggest that this shale is partly Maastrichtian and partly Palaeocene in age. Therefore, in Langley-1 this shaly interval is (for the first time in the Otway Basin) proposed as a separate and distinct stratigraphic entity (see palynology report in Appendix 11), herein referred to informally as the "K-T Shale". Given its ubiquity in wells across much of the Otway Basin, it may eventually be formally recognised as a separate stratigraphic entity.

The cuttings and log character over the Nullawarre Greensand equivalent in Langley-1 do not differ markedly from sandy intervals in the overlying Skull Creek Mudstone, but it has been differentiated with the aid of palynology from sidewall cores.

TABLE 6

LANGLEY-1 FORMATION TOPS AND THICKNESSES

Stratigraphic Unit	Dej	Depth			
	(mKB)	(mSS)	(m)		
Heytesbury Group	5.7	+64.0	414.3		
Port Campbell Limestone	5.7	+64.0	103.3		
Gellibrand Marl	109.0	-39.3	301.0		
Clifton Formation	410.0	-340.3	10.8		
Nirranda Group	420.8	-351.1	134.2		
Narrawaturk Marl	420.8	-351.1	84.2		
Mepunga Formation	505.0	-435.3	50.0		
Wangerrip Group	555.0	-485.3	362.0		
Dilwyn Formation	555.0	-485.3	235.4		
Pember Mudstone	790.4	-720.7	51.6		
Pebble Point Formation	842.0	-772.3	55.2		
"K-T Shale"	897.2	-827.5	19.8		
Sherbrook Group	917.0	-847.3	909.0		
Paaratte Formation	917.0	-847.3	427.0		
Skull Creek Mudstone	1344.0	-1274.3	173.0		
Nullawarre Greensand (equiv.)	1517.0	-1447.3	38.8		
Belfast Mudstone	1555.8	-1486.1	160.0		
Waarre Formation	1715.8	-1646.1	110.2		
Unit D †	1715.8	-1646.1	14.6		
Unit C	1730.4	-1660.7	40.4		
Unit B	1770.8	-1701.1	31.7		
Unit A	1802.5	-1732.8	23.5		
Otway Group	1826.0	-1756.3	180.0+		
Eumeralla Formation	1826.0	-1756.3	180.0+		
Total Depth (Driller)	2006.0	-1936.3			
Total Depth (Logger)	2007.0	-1937.3			

[†] Also known as the Flaxman Formation

PE906684

This is an enclosure indicator page. The enclosure PE906684 is enclosed within the container PE900949 at this location in this document.

The enclosure PE906684 has the following characteristics:

ITEM_BARCODE = PE906684
CONTAINER_BARCODE = PE900949

NAME = Formation Tops Table

BASIN = OTWAY PERMIT = PPL1

TYPE = WELL

SUBTYPE = STRAT_COLUMN

DESCRIPTION = Formation Top Depth and Times for

Langley-1

REMARKS =

DATE_CREATED =

DATE_RECEIVED = 31/01/96

 $W_NO = W1099$

WELL_NAME = LANGLEY-1

CONTRACTOR =

CLIENT_OP_CO = GFE RESOURCES LTD

(Inserted by DNRE - Vic Govt Mines Dept)



LANGLEY-1 FORMATION TOP DEPTHS AND TIMES

Predicted

Actual

(mss)	Two-Way Time (milliseconds)	(mKB)			(mss)	Two-Way Ti (millisecond	ime (mKB) ds)	
			PORT CAMPBELL	LST	+64.0		5.7	-
			GELLIBRANI	MARI	-39.3	43	109.0	
-322		386	CLIFTON FM.		-340.3	368.9	410.0	24m LOW
		428	NARRAWATURK M.	ARL	-351.1	376.7	420.8	7.2m HIGH
-453	465	523	MEPUNGA FM.		-435.3	458.4	505.0	(6.6ms HIGH)
-501	499	571	DILWYN FM.		-485.3	504.6	555.0	16m HIGH <i>(5.6ms LOW)</i>
-733		803	PEMBER MDST.		-720.7	682.3	790.4	12.6m HIGH
-775	709	845	PEBBLE POINT F	M. SHALE"	-772.3 -827.5	720 755.5	842.0 897.2	3m HIGH (11ms LOW)
-861	760	931	PAARATTE FM.		-847.3	769.2	917.0	14m HIGH (9.2ms LOW)
1004			SKULL CREEK MD	ST.	-1274.3	1063.0		50m HIGH (19ms HIGH)
1324	1082	1394	SKULL OTILL					
1421	1132	1491	NULLAWARRE GNSD (eq		-1447.3	1174.2		26m LOW (42.2ms LOW)
1495	1183	1565	BELFAST MDST.		-1486.1	1198.5		9.2m HIGH (15.5ms LOW)
1651	1278	1721	WAARRE FM.	UNIT C UNIT B	1646.1 — -1660.7 -1701.1	1304.7 1312.8 1337.5		9.4m LOW (34.8ms LOW)
1739	1352	1809	EUMERALLA FM.	UNIT A	-1732.8 - 1756.3	1353.5 1366.1	1802.5	17m LOW 14.1ms LOW)

TOTAL DEPTH 2005mKB

DEPT. NAT. RES & ENV

TOTAL DEPTH 2007.0mKB (Logger)

The nomenclature used by GFE Resources for the sub-Belfast Mudstone Late Cretaceous section follows the Beach Petroleum scheme outlined by Buffin (1989)¹, in which the otherwise named Flaxman Formation and Waarre Sandstone are subdivided into the Waarre Formation Units A, B, C and D (with Unit D = Flaxman Formation). This subdivision is largely based on log character, as Buffin (1987)² "defined" with a "General Type Section" from an unidentified well and then exemplified in 26 wells from the Port Campbell region. The top of the Waarre Formation (i.e. top of Unit D) is taken to be where a sharp jump in the resistivity curve occurs. Beneath this marker Unit D can be of variable character (mostly shaly), Unit C comprises well developed orthoquartzites, Unit B is dominantly shaly/silty with occasional "medial" sands, and Unit A is dominated by lithic sandstones in a commonly upward fining sequence.

Application of this subdivision can be somewhat subjective and problematic, especially in wells where the Waarre Formation is not completely developed or preserved. Also, its utility in conjunction with biostratigraphic data remains unclear. That notwithstanding, the subdivision was successfully applied to a reasonably complete Waarre Formation section in the well preceding this one (Iona-2 in PPL2) and appears to be applicable in Langley-1 also.

The relatively detailed palynological sampling in Langley-1 has allowed a far more useful correlation between the lithostratigraphy and biostratigraphy in the lower Sherbrook Group section than has been undertaken in any other recent wells in this region, which is likely to make this well an important reference or correlation point for future wells.

3.2 LITHOLOGY

The following is a summary of the lithological units observed in Langley-1. More detailed descriptions are included in Appendix 4, as well as on the Mud Log (Enclosure 2). Additional lithological information can be found in the Sidewall Core Descriptions (Appendix 6) and the associated Petrography Report (Appendix 9).

¹ APEA Journal, 1989, p.299-311.

² A Depositional Model and Facies Analysis of the Waarre Formation, Port Campbell Embayment (Unpublished report, Beach Petroleum NL).

3.2.1 Heytesbury Group (Surface - 420.8 metres)

3.2.1.1 Port Campbell Limestone (Surface - 109.0 metres)

This unit could not be described in Langley-1 because no cuttings samples were collected above 110 metres. Based on the gamma ray log response the base of this formation is interpreted to be at 109 metres.

3.2.1.2 Gellibrand Marl (109.0 - 410.0 metres)

<u>Marl</u>: medium grey to medium brown grey to medium green grey, very soft, sticky, abundant fossil fragments including foraminifera, bivalves and gastropods, trace pyrite, slightly silty in part, occasionally common very fine quartz sand grains, occasional carbonaceous specks, non-fissile.

3.2.1.3 Clifton Formation (410.0 - 420.8 metres)

Marl: medium to dark brown, soft to firm, trace very fine sand in part, occasional sucrosic texture, common glauconite, trace pyrite, non-fissile, interbedded with and grading to

<u>Coquina</u>: white, buff, cream, becoming red brown with depth, oxidised shell, skeletal and fossil remains, abundant glauconite in part, trace pyrite, friable to moderately hard, non-fissile.

3.2.2 Nirranda Group (420.8 - 555.0 metres)

3.2.2.1 Narrawaturk Marl (420.8 - 505.0 metres)

Marl: medium to dark brown grey, occasionally medium to dark grey, trace glauconite, trace to common dispersed silt and quartz sand grains, very argillaceous in part grading to claystone, trace disseminated pyrite, common coquina, non-fissile, in part grading to **Siltstone**: medium brown grey, very argillaceous, moderately calcareous, often very finely arenaceous, trace white fossil specks, firm, non-fissile.

3.2.2.2 Mepunga Formation (505.0 - 555.0m)

Sandstone: light to medium dark brown; occasionally red brown grey, medium to coarse, occasionally very coarse, dominantly medium, poorly sorted, subangular to rounded, common iron oxide cement and staining, trace to common silt and argillaceous matrix, common glauconite, common pyrite, unconsolidated, poor visual porosity.

3.2.3 Wangerrip Group (555.0 - 897.2m)

3.2.3.1 Dilwyn Formation (555.0 - 790.4m)

Sandstone: light to medium brown grey, dominantly light grey, becomes dominantly very light grey with depth, medium to coarse grained, dominantly coarse, becomes fine to medium grained with depth, subangular to subrounded, poor to moderately sorted, weak silica cement, trace to occasionally abundant light brown silt matrix, trace altered feldspars, trace black coaly detritus, common pyrite, friable to unconsolidated, poor to fair visual porosity, interbedded with and in part grading to

<u>Siltstone</u>: light to dark brown grey, moderately argillaceous, common carbonaceous flecks, common glauconite in part, slightly calcareous, soft to firm, non to slightly subfissile.

3.2.3.2 Pember Mudstone (790.4 - 842.0m)

<u>Claystone</u>: medium to dark brown grey, medium to dark olive grey, very silty in part grading to siltstone, common black carbonaceous flakes, common dark green glauconite, common micromica, moderately dispersive, moderately sticky, soft, non-fissile with minor interbedded

<u>Sandstone</u>: very light grey, common very light brown staining, fine to coarse grained, dominantly fine, angular to subrounded, moderately sorted, weak silica cement, common light brown silt matrix, common glauconite, common pyrite, friable, poor visual porosity.

3.2.3.3 Pebble Point Formation (842.0 - 897.2m)

<u>Sandstone</u>: light brown grey, very light red brown, medium to coarse grained, subangular to rounded, poor to occasionally moderate sorting, weak silica cement, common weak iron oxide cement, trace argillaceous and silt matrix, common iron oxide staining on quartz grains, trace pyrite, occasional dark grey silty carbonaceous lithics, unconsolidated, poor to dominantly fair visual porosity, interbedded with minor

<u>Claystone</u>: medium to dark brown, medium to dark olive grey, moderately to very sticky, soft to firm, moderately to very dispersive, common black carbonaceous flecks, very silty often grading to siltstone, common dark green glauconite, common micromica, nonfissile.

3.2.4 "K-T Shale" (897.2 - 917.0m)

<u>Claystone</u>: medium to dark brown grey, medium to dark olive grey, very sticky, soft to firm, moderately dispersive, trace to common black carbonaceous flecks, very silty often grading to siltstone, common dispersed very fine quartz sand grains, common micromica, trace to common pyrite, non-fissile, with minor interlaminated

<u>Sandstone</u>: light brown grey, very light red brown, medium to coarse grained, subangular to rounded, poor to occasionally moderate sorting, weak silica cement, common weak iron oxide cement, trace argillaceous and silt matrix, common iron oxide staining on quartz grains, trace pyrite, occasional dark grey silty carbonaceous lithics, unconsolidated, poor visual porosity.

3.2.5 Sherbrook Group (917.0 - 1826.0m)

3.2.5.1 Paaratte Formation (917.0 - 1344.0m)

Sandstone: light grey to off white, clear to colourless quartz grains, very fine to very coarse, dominantly medium grained, subangular to subrounded, poor to moderately sorted, weak silica cement, nil to trace light brown grey argillaceous and silt matrix, trace nodular and disseminated pyrite, occasional dark grey carbonaceous lithics, abundant coal detritus in part, trace grey green lithics, trace orange

volcanic lithics in part, trace amber, unconsolidated to moderately hard, poor to good dominantly fair visual porosity, interbedded with **Claystone**: medium to dark olive grey, soft to occasionally firm, very silty grading to siltstone in part, common very fine sand grains in part, non to slightly calcareous, occasionally micromicaceous, common very fine to fine black coal flecks, very dispersive, non-fissile, and minor detrital

<u>Coal</u>: dark brown to dominantly black, firm to brittle, subconchoidal fracture, moderately silty, trace pyrite.

3.2.5.2 Skull Creek Mudstone (1344.0 - 1517.0m)

<u>Claystone</u>: medium to dark grey, occasionally medium brown grey, common carbonaceous lithics and laminae, common to abundant micromica, trace pyrite, moderately to occasionally very silty and grading to siltstone in part, very dispersive, sticky, firm, non-fissile, interbedded with thin

Sandstone: very light grey, off white, occasionally medium grey, very fine to fine gained, angular to subrounded, moderately to dominantly well sorted, moderate dolomite cement, trace to common carbonaceous lithics, trace micromica, trace pyrite, friable to hard, poor visual porosity.

3.2.5.3 Nullawarre Greensand (equiv.) (1517.0 - 1555.8m)

Sandstone: very light to medium grey, occasionally medium olive grey, very fine to fine grained becoming fine to very coarse with depth, dominantly fine grained, subangular to subrounded, poor to well sorted, common calcareous and dolomite cements at top otherwise weak silica cement, trace to common off white to light brown grey to medium grey argillaceous and silt matrix, common pyrite in part, trace glauconite, trace black carbonaceous flecks, friable to occasionally hard, very poor to fair visual porosity, with minor finely interbedded

<u>Claystone</u>: medium to dark olive grey, often very finely arenaceous, common very fine black carbonaceous flecks, trace dolomite, non calcareous, trace pyrite, trace glauconite, common micromica, soft to firm, slightly subfissile, with (especially at top)

<u>Dolomite</u>: medium brown, tan, moderately argillaceous, common very fine black to dark brown flecks, firm to dominantly hard.

3.2.5.4 Belfast Mudstone (1555.8 - 1715.8m)

<u>Claystone</u>: medium to dark grey, medium to dark olive grey, occasionally light to medium brown grey, moderately to very silty, very finely arenaceous in part, common to abundant glauconite in general increasing with depth, trace to common carbonaceous flecks, trace medium brown cryptocrystalline dolomite, trace to common pyrite, trace micromica, trace *Inoceramus*, soft to firm, slightly subfissile.

3.2.5.5 Waarre Formation (1715.8 - 1826.0m)

3.2.5.5.1 Unit D (1715.8 - 1730.4m)

<u>Claystone</u>: medium grey to medium brown, moderately silty, carbonaceous, abundant glauconite, rare to common pyrite, trace fossil fragments, soft, subfissile.

3.2.5.5.2 Unit C (1730.4 - 1770.8m)

Sandstone: very light grey, colourless to occasionally pale yellow quartz grains, fine to coarse, dominantly medium, angular to occasionally subrounded, moderate to strong silica cement in part, trace pyrite cement, no visible matrix, occasional carbonaceous staining and specks, common red brown amber, rare shell fragments, friable, fair to good inferred porosity, interbedded with minor

<u>Claystone</u>: medium grey to medium brown, moderately silty, carbonaceous, abundant glauconite, rare to common pyrite, trace fossil fragments, soft, subfissile, with minor detrital

<u>Coal</u>: black, often very argillaceous, subconchoidal to platy fracture, common pyrite inclusions, subvitreous to earthy texture, brittle.

3.2.5.5.3 Unit B (1770.8 - 1802.5m)

<u>Claystone</u>: light to medium olive grey, occasionally light brown grey, common to abundant carbonaceous lithics and laminae, often very silty and grading to siltstone in part, trace to common disseminated pyrite, moderately dispersive, moderately hard, subfissile, interbedded with thin

Sandstone: very light grey, clear quartz grains, fine to very coarse, subangular to occasionally subrounded, very poorly sorted, moderate to strong silica cement, common moderately strong to strong calcareous cement, occasional dolomite cement, occasional pyrite cement, trace off white to light grey argillaceous matrix, trace carbonaceous lithics, friable to hard, poor visual porosity, fair inferred porosity.

3.2.5.5.4 Unit A (1802.5 - 1826.0m)

<u>Sandstone</u>: off white, light brown, fine to dominantly medium, subangular to subrounded, dominantly subangular, quartzose, well sorted, weak calcareous cement, abundant argillaceous matrix, friable to moderately hard, no visual porosity, with minor interbedded

<u>Claystone</u>: light to medium olive grey, occasionally light brown grey, common to abundant carbonaceous lithics and laminae, often very silty and grading to siltstone in part, trace to common disseminated pyrite, moderately dispersive, moderately hard, subfissile.

3.2.6 Otway Group (1826.0 - 2007.0+m)

3.2.6.1 Eumeralla Formation (1826.0 - 2007.0+m)

Sandstone: light to medium green grey, off white to medium blue grey, very fine to medium, dominantly fine to medium, moderately sorted, subangular to subrounded, weak to occasionally moderate silica cement, common to abundant green grey argillaceous and silt

matrix, common green and orange red lithics, trace amber, common carbonaceous lithics, trace to common pyrite, trace micromica, friable, poor visual porosity, interbedded with

<u>Claystone</u>: very light green grey, very light blue green grey, slightly silty, rarely very finely arenaceous, occasional carbonaceous laminae, trace pyrite, trace micromica where silty, moderately dispersive, firm to moderately hard, slightly subfissile.

3.3 HYDROCARBON INDICATIONS

3.3.1 Mud Gas Readings

The mud gas detection equipment was operational from a hole depth of 110 metres until the cement plug at the casing shoe was tested. Gas levels detected during drilling are plotted on the Composite Log (Enclosure 1) and the Mud Log (Enclosure 2) as well as being tabulated in Appendix 8 and summarised as follows:

- Down to 500 metres no gas was detected.
- ➤ Over the interval 500 1344 metres (top Mepunga Formation to base Paaratte Formation) mud gas readings ranged;

Total Gas : Trace - 0.2 units C_1 : 1 - 30 ppm

 C_2 : BDL*

From 1344 metres down to 1555.8 metres (Skull Creek Mudstone and Nullawarre Greensand equivalent) mud gas readings ranged;

Total Gas : 0.1 - 5.5 units C_1 : 6 - 1037 ppm C_2 : BDL - 11 ppm

 C_3 : BDL

^{*} Note: BDL denotes Below Detection Limit.

3.3 HYDROCARBON INDICATIONS

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- > Over the interval 500 1344 metres (top Mepunga Formation to base Paaratte Formation) mud gas readings ranged;

Total Gas: Trace - 0.2 units

 C_1 : 1 - 30 ppm

C₂ : BDL*

From 1344 metres down to 1555.8 metres (Skull Creek Mudstone and Nullawarre Greensand equivalent) mud gas readings ranged;

Total Gas : 0.1 - 5.5 units

 C_1 : 6 - 1037 ppm

C₂ : BDL - 11 ppm

 C_3 : BDL

^{*} Note: BDL denotes Below Detection Limit.

From 1555.8 metres down to 1715.8 metres (Belfast Mudstone) mud gas readings ranged;

Total Gas : 1.0 - 3.9 units C_1 : 183 - 705 ppm C_2 : 6 - 24 ppm C_3 : BDL - 6 ppm C_4 : BDL

 C_4 : BDL

From 1715.8 metres down to 1730.4 metres corresponding to the Warre Formation Unit D gas readings remained low and ranged;

Total Gas : 1.3 - 1.6 units C_1 : 231 - 302 ppm C_2 : 8 - 12 ppm C_3 : 1 - 2 ppm C_4 : BDL

From 1730.4 metres down to 1771 metres (corresponding to the Waarre Formation Unit C) mud gas rose and throughout the interval remained in the range;

Total Gas : 3 - 20.5 units C_1 : 519 - 3477 ppm C_2 : 14 - 96 ppm C_3 : 1 - 44 ppm C_4 : 1 - 35 ppm C_5 : BDL

Across the interval 1771 - 1802 metres (corresponding to the Waarre Formation Unit B) gas readings ranged;

Total Gas : 1 - 5.5 units C_1 : 162 - 793 ppm C_2 : 7 - 125 ppm C_3 : 1 - 16 ppm C_4 : BDL - 1 ppm C_5 : BDL Through the interval 1802 - 1826.0 metres (corresponding to Waarre Formation Unit A) gas readings mostly ranged;

Total Gas : 2.8 - 8.3 units C_1 : 421 - 1464 ppm C_2 : 10 - 72 ppm C_3 : 4 - 22 ppm C_4 : BDL - 1 ppm C_5 : BDL

with a peak at 1802 metres of;

 $\begin{array}{cccc} \text{Total Gas} & : & 21 \text{ units} \\ \text{C_1} & : & 3111 \text{ ppm} \\ \text{C_2} & : & 262 \text{ ppm} \\ \text{C_3} & : & 104 \text{ ppm} \\ \text{C_4} & : & 38 \text{ ppm} \\ \text{C_5} & : & \text{BDL} \end{array}$

➤ Gas readings across the interval 1826 - 1890 metres (corresponding to the upper portion of the Eumeralla Formation) ranged;

Total Gas : 2 - 16.3 units C_1 : 366 - 2928 ppm C_2 : 12 - 101 ppm C_3 : BDL - 21 ppm C_4 : BDL - 20 ppm

Gas reading across the interval 1890 metres to 1907 metres (intra-Eumeralla Formation sandstones) rose sharply and ranged;

Total Gas : 7 - 87 units

 C_1 : 1345 - 14030 ppm C_2 : 32 - 513 ppm C_3 : 7 - 130 ppm

C₄ : 1 - 192 ppm

 C_5 : BDL

> Below 1907 metres until T.D. at 2006 metres (driller) mud gas readings ranged;

Total Gas : 1.3 - 15 units C_1 : 238 - 2623 ppm C_2 : 6 - 53 ppm

 C_3 : 2 - 53 ppm

C₄ : BDL - 20 ppm

 C_5 : BDL

with a peak at 1976.7 metres (corresponding to a tight sandstone unit) of;

Total Gas : 48 units C_1 : 6405 ppm C_2 : 240 ppm C_3 : 53 ppm C_4 : 52 ppm C_5 : BDL

3.3.2 Fluorescence

Cuttings samples and sidewall cores were routinely inspected for shows with the following results;

3.3.2.1 Cuttings

No oil fluorescence or oil staining was observed in any cuttings from Langley-1.

3.3.2.2 Core

No fluorescence was observed in Core #1 (1745 - 1764m).

3.3.2.3 Sidewall Cores

Small amounts of fluorescence were observed in 21 sidewall cores from Langley-1, mostly from the Waarre Formation. At least some of this fluorescence, especially in the sidewall cores above the

Waarre Formation, is suspected to be contamination. Descriptions of the observed fluorescence are included with the lithological descriptions of the sidewall cores in Appendix 6.

3.3.3 Drill Stem Test Gas Samples

Gas samples were collected and analysed for DST's 1 and 3, which tested the Waarre Formation Unit C and intra-Eumeralla Formation sandstones, respectively. Laboratory reports for these analyses are included in Appendix 7 and summarized in Table 2. The most significant difference between the gas produced from these two intervals is that the sample from the Waarre Formation Unit C is two thirds carbon dioxide while the intra-Eumeralla Formation sample contains little or no CO_2 (the small amount reported is thought to be part of the air "contamination" in the test string due to this being a low flow-rate test which was kept closed at surface).

The hydrocarbon components of the two sampled intervals have similar relative proportions, suggesting (among other things) that the hydrocarbon gas may have generated and migrated into the Waarre and Eumeralla Formation sands at around the same time and that CO₂ subsequently migrated into the Waarre Formation, but not into the Eumeralla Formation interval (posibly due to the lower permeability of the latter).

The DST-3 gas sample was also submitted for carbon isotope analysis of the light hydrocarbons and the results are provided in Appendix 7C.

3.4 GEOCHEMISTRY

3.4.1 Analyses

A total of 11 samples (9 sidewall cores and 2 cuttings) from Langley-1 were submitted for various geochemical analyses.

The two cuttings samples were submitted during drilling of the well for thermal extract GC analysis. Three sidewall cores were analysed for Total Organic Carbon (TOC) content to determine their suitability for Rock-Eval pyrolysis. The other six sidewall cores were selected from those which reported fluorescence and were submitted for extraction to identify and characterise their hydrocarbon content.

3.4.2 Results

Thermal extraction on the two cuttings samples (1936 and 1945 metres) yielded nothing. Of the three sidewall cores submitted for TOC only one (1825.5 metres) had enough to perform Rock-Eval pyrolysis. This sample produced reasonably good S1 and S2 results, the latter of which prompted Pyrolysis GC anlysis which indicated only very poor oil source potential.

Of the six extracted sidewall cores, the two deepest (1803.5 and 1884.0 metres) produced too small a yield to analyse adequately, so no further work was attempted on them. For the other four a saturates fraction was separated and analysed by gas chromatography. The resulting GC traces suggest that the samples from 1291.0 and 1518.5 metres (and possibly also 1732.0 metres) are probably diesel contamination, based on their lack of C_{22+} compounds. The sample at 1770.0 metres appears to be a very waxy terrestrial/coaly sample depleted in light ends.

3.5 PALYNOLOGY

Thirty-three sidewall cores and two core samples were submitted to Biostrata (Alan Partridge) for palynological analysis and the resulting report comprises Appendix 11. The samples ranged from 895.0 metres (basal Pebble Point Formation) down to 1989.0 metres (Eumeralla Formation) and were determined to span from the basal Paleocene to the Late Albian.

This number of samples is unprecedented in an exploration well in this region and has consequently provided a relatively closely sampled interval which will provide an important tie to future wells in the region, particularly over the Waarre Formation where additional subzones within the *P. infusorioides* Zone have been recognised.

The oldest zone penetrated in Langley-1 is the *P. pannosus* Zone, which conforms to the youngest age known from the Eumeralla Formation. As in the nearby Iona-2 development well (which preceded Langley-1), the *A. distocarinatus* zone (and thus the Cenomanian) is not present in Langley-1, its absence comprising part of the mid-Cretaceous unconformity between the Eumeralla and Waarre Formations. The base of

the Waarre Formation (and hence base of the Sherbrook Group) is clearly identified by the first indications of marine microplankton and all of the Sherbrook Group samples analysed are considered to be marine. Above 1516 metres sample density is insufficient to distinguish all the zones known to occur in this part of the sequence.

The distinctive shale unit spanning 897.2 - 917.0 metres appears to be a local equivalent of the Cretaceous/Tertiary boundary shale observed widely in the Gippsland Basin and supporting evidence for this correlation is provided by samples in Langley-1 and some earlier wells. Therefore, this unit is herein proposed as a separate entity (provisionally labelled the "K-T Shale") with the recognition that much more work needs to be done before it can become a formal stratigraphic entity. On wireline logs this unit is evident in many previous wells in this region, but (presumably due to a lack of appropriate sampling and dating) its chronostratigraphic significance has not been previously identified and it has been placed either at the top of the Paaratte Formation or the base of the Pebble Point Formation.

3.6 STRUCTURE

Within PPL1 two regional structural grains are evident in the interpretation of the Waarre 3D Seismic Survey. The dominant WNW-ESE trend of generally Late Cretaceous age (with occasional Tertiary reactivation) overprints a more subtle older ENE-WSW trend, probably no younger than mid-Cretaceous in age. Similar to other structures in the area, the Langley prospect is formed by the intersection of these two fault trends.

As shown on the pre-drill maps and seismic sections in Figures 5-8, the Langley structure at Waarre Formation level is an elongate (ENE-WSW) tilted (north-westerly dipping) fault block with crests at either end. The western crest, the site of Langley-1, is fault bounded to the southeast and southwest with no fault-independent closure. The eastern crest is down thrown relative to the northern bounding fault and, therefore, perceived as having a higher associated lateral seal risk.

Langley-1 constitutes the first test of the interpretation of 3D seismic data in this moderately to intensely structured area.

The drilling of Langley-1 has not necessitated any significant modification of the predrill interpretation. Most of the differences between the prognosed and actual

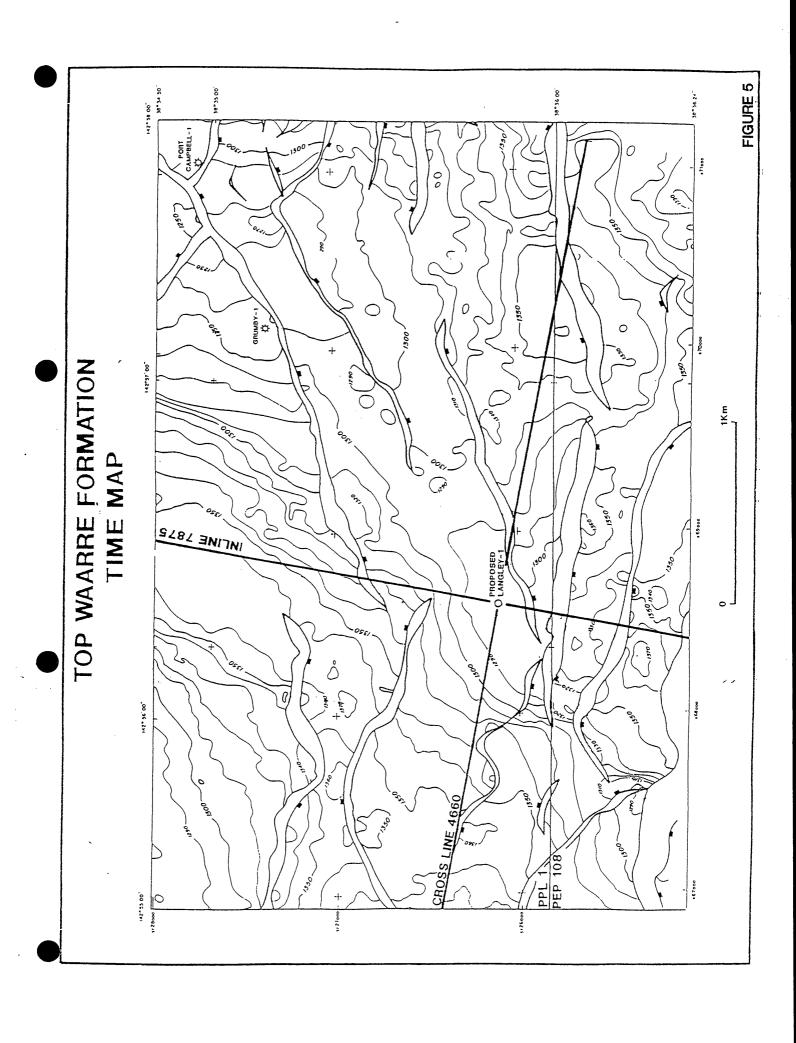


FIGURE 6 38°34 50" 38,36,00 142° 58 00 142057'00" ± E DEPTH MAP (metres subsea) INCINE 7875 .1700 PROPOSED O LANGLEY-1 0 *68000 .45 28 00 CROSS LINE 4660 4 de 6 14205500

TOP WAARRE FORMATION

PE906685

This is an enclosure indicator page. The enclosure PE906685 is enclosed within the container PE900949 at this location in this document.

The enclosure PE906685 has the following characteristics:

ITEM_BARCODE = PE906685
CONTAINER_BARCODE = PE900949

NAME = Seismic Section Inline 7875

BASIN = OTWAY
PERMIT = PPL1
TYPE = SEISMIC
SUBTYPE = SECTION

DESCRIPTION = Seismic Section Inline 7875, showing

Langley-1

REMARKS = DATE_CREATED =

DATE_RECEIVED = 31/01/96

 $W_NO = W1099$

WELL_NAME = LANGLEY-1

CONTRACTOR =

CLIENT_OP_CO = GFE RESOURCES LTD

(Inserted by DNRE - Vic Govt Mines Dept)

PE906686

This is an enclosure indicator page. The enclosure PE906686 is enclosed within the container PE900949 at this location in this document.

The enclosure PE906686 has the following characteristics:

ITEM_BARCODE = PE906686
CONTAINER_BARCODE = PE900949

NAME = Seismic Section Crossline 4660

BASIN = OTWAY PERMIT = PPL1

TYPE = SEISMIC

SUBTYPE = SECTION

DESCRIPTION = Seismic Section Crossline 4660, showing

Langley-1

REMARKS =

DATE_CREATED =

DATE_RECEIVED = 31/01/96

 $W_NO = W1099$

WELL_NAME = LANGLEY-1

CONTRACTOR =

CLIENT_OP_CO = GFE RESOURCES LTD

(Inserted by DNRE - Vic Govt Mines Dept)

formation tops (Figure 4) are within the resolution of the data, and many of the variations in depth are due to differences between the regional velocity model used for depth conversion and the actual velocities at Langley-1. The biggest differences between actual and prognosed horizons occur beneath the Paaratte Formation. Apart from the Skull Creek Mudstone top, which came in 19 milliseconds high, all of the sub-Paaratte horizons came in between 14 and 42 milliseconds low to prognosis, which equates to around half to one and a half cycles. With regard to the top of the Waarre Formation in particular this discrepancy appears difficult to improve on, since the top of the marked change in seismic character which had been taken to be the top of the Warre Formation Unit C occurs well up into the Belfast Mudstone (around 1675 mKB). This change may equate to sonic and density changes in the basal Belfast Mudstone (below 1685 metres) and/or the Waarre Formation Unit D top.

3.7 LOG ANALYSIS

Log analysis was undertaken on the Langley-1 wireline logs using Crocker Data Processing's PETROLOG software. The Waarre Formation was divided into five zones, one each for Units A, B and D and two for Unit C (above and below the gas/water contact). (A lack of sand in the zone spanning Unit D precludes it from the following discussion and summary). The Eumeralla Formation was only analysed as a single zone.

For each of the sand-bearing zones basic input parameters are given in Table 7 and a summary of the results is provided in Table 8. A listing of input parameters, environmental corrections and complex lithology results can be found in Appendix 12 and a 1:500 scale analysis log is provided as Enclosure 12.

The overall quality of the logs in the zones analysed is regarded as good to very good.

As shown in Table 8, Zones 2 - 6 all contained significant proportions of sand, with Units C and A having the highest net-to-gross and best reservoir properties (as expected). After running the wireline logs a cursory look at the neutron-density curves suggested that the only interval containing significant gas pay was the upper part of the Waarre Formation Unit C sand (Zone 2), over most of which DST-1 was conducted. This was confirmed by the log analysis, in which Zone 2 was estimated to comprise about 88% net sand with an average V_{clay} of around 10-11%, average effective porosity

around 18-19%, and average water saturation around 28-30%, yielding 18.7 metres of net pay.

The sands in the lower part of Unit C, as well as those in Units B and A, do all seem to contain gas, but in lower proportions (water saturations range 63-71%).

The Eumeralla Formation section analysed (Zone 6) also reports as being entirely water wet, with an average water saturation in the sands of around 87%. This result is somewhat contradicted by DST-3 (1883.07-1909.13mKB driller) which flowed very low-rate gas without co-producing water. While a more lengthy and detailed analysis of the logs over the Eumeralla Formation might ultimately be able to reconcile this difference, it is well recognized that this formation is notoriously difficult to analyse confidently with standard petrophysical logging tools, especially in tight sands.

Based on the log analysis results, a Gas/Water Contact (GWC) in Langley-1 would be inferred to occur close to (or within) the shale band at 1751.8-1752.3mKB (logger).

TABLE 7

LANGLEY-1
BASIC INPUT PARAMETERS FOR LOG ANALYSIS

ZONE#	2	3	4	5	6
FORMATION	Waarre C	Waarre C	Waarre B	Waarre A	Eumeralla
From (m)	1730.0	1752.9	1772.0	1798.9	1826.5
To (m)	1752.9	1772.0	1798.9	1826.5	1985.0
Interval (m)	22.9	19.0	27.0	27.6	158.5
Average Zone Temperature (°C)	64.1	64.6	65.1	65.7	67.8
Rw at Av. Zone Temp. (ohm.m)	0.225	0.224	0.223	0.221	0.442
Rw at 23.9 °C (ohm.m)	0.425	0.425	0.425	0.425	0.870
Salinity (Kppm)	14.0	14.0	14.0	14.0	6.5
Mud Filtrate Salinity (Kppm)	22.8	22.8	22.8	22.8	22.8
Assumed Matrix Density (g/cc)	2.65	2.65	2.65	2.65	2.67
GRclean (API units)	20	20	25	35	40
GRelay (API units)	115	115	115	115	126
Rclay (ohm.m)	8.0	8.0	9.0	9.0	14.9
Saturation Equation	Indonesian	Indonesian	Indonesian	Indonesian	Indonesian
Tortuosity (a)	1.0	1.0	1.0	1.0	0.62
Cementation Exponent (m)	1.7	1.7	1.7	1.7	2.15
Saturation Exponent (n)	2.0	2.0	2.0	2.0	2.0

TABLE 8

LANGLEY-1
LOG ANALYSIS RESULTS SUMMARY

ZONE#	2	3	4	5	6
FORMATION	Waarre C	Waarre C	Waarre B	Waarre A	Eumeralla
From (m)	1730.0	1752.9	1772.0	1798.9	1826.5
To (m)	1752.9	1772.0	1798.9	1826.5	1985.0
Interval (m)	22.9	19.0	27.0	27.6	158.5
Net Sand [†] (m)	20.1	16.2	6.7	21.3	38.1
Net/Gross (%)	87.8	85.3	24.8	77.2	24.0
Sand Average $\emptyset_{\text{eff.}}^{}\dagger}$ (%)	18.2	22.0	18.3	23.2	16.1
Sand Average S _w † (%)	29.8	71.3	65.1	63.3	86.8
Sand Average V _{clay} [†] (%)	10.8	5.7	14.5	14.1	27.5
For net pay:					
Average Ø eff. Cut off	0.05	0.05	0.05	0.05	0.05
S _w Cut off	0.50	0.50	0.50	0.50	0.50
V _{clay} Cut off	0.40	0.40	0.40	0.40	0.40
Net Pay (m)	18.7	0.6	1.1	0.2	0.0
Pay Average ∅ _{eff} (%)	18.7	17.1	19.3	19.1	n/a
Pay Average S _w (%)	27.5	45.5	39.0	49.8	n/a
Pay Average V _{clay} (%)	10.2	23.6	16.0	15.3	n/a

 $^{^{\}dagger}\text{Obtained using cut offs of S}_{\text{w}} = 100\%; \ \varnothing_{\text{eff.}} = 5\%; \ V_{\text{clay}} = 40\%$

CONCLUSION

4. CONCLUSIONS

4.1 OBJECTIVES VERSUS PERFORMANCE

The main objective in drilling Langley-1 was to evaluate the hydrocarbon potential of the structure mapped at the top Waarre Formation level and the section beneath it into the Eumeralla Formation. Since Langley-1 was the first well drilled on a prospect identified from the Waarre 3D Seismic Survey it was also the first test of the worth of 3D seismic data in this region.

The top Waarre Formation sandstone (Unit C) was evaluated by DST-1, wireline logs and RFTs, and shown to contain a trapped gas column of very similar extent the minimum predicted case (ie. prognosed minimum closing contour at 1680mSS, actual GWC appears to be around 1683mSS) indicating that the structure is probably filled to its spill point. In addition to this, DST-3 established the presence of a gas zone (which could not be identified on wireline logs or RFT data) within a tight Eumeralla Formation sandstone interval. Thus, Langley-1 can be said to have at least adequately fulfilled its intended purpose, and to be a "technical" success in terms of the ability of the 3D seismic to improve the delineation of prospects in this area.

However, Langley-1 was plugged and abandoned because the 23-metre gas column encountered at the top of the Waarre Formation Unit C was found to contain a mix of one-third dry hydrocarbon gas and two-thirds carbon dioxide (CO₂), making it uncommercial for exploitation of either commodity. Prior to drilling, the possibility of the reservoir containing CO₂ had been identified as the greatest risk associated with the Langley prospect due to the presence of CO₂ in variable proportions in nearby wells, most notably Grumby-1. Previous work had suggested that proximity to major northeast trending faults increased the likelihood for a structure to contain significant CO₂ and the result in Langley-1 appears to support this.

With regard to the Eumeralla Formation, obtaining a gas flow (albeit low-rate) without co-producing water was a positive (but also uncommercial) result for the Langley-1 well. Not being able to better define this gas column with RFTs or wireline logs leaves this result somewhat intangible, but may also indicate that the occurrence of low-rate gas sands in the Eumeralla Formation is more common than previously thought.

Assessment of performance in terms of time (and thus cost) is less favourable. As shown in Figure 2, Langley-1 took about ten days longer than the prognosed 18 days to drill, due to a variety of causes, including;

- drilling assembly differentially stuck in hole (just over three days lost)
- tight hole problems requiring wiper trips, BHA changes and reaming (total of about two and a half days lost)
- two extra (unanticipated) drill stem tests (DSTs 2 and 3) were conducted to evaluate shows in the intra-Eumeralla sandstone unit (two and a half days extra)
- longer time to prepare for and run wireline logs, partly due to running more logs than anticipated (about one and a half days extra)
- unexpected repairs to rig clutch and draw-works sub-frame (about half a day lost).

Another parameter which pertains to performance during drilling of the well is hole deviation. As outlined in Section 2.5.4, the horizontal component of hole deviation was kept within a 34-metre radius of the proposed location at the primary target (top Waarre Formation sandstone, 1730 metres) level, which equates to a maximum overall deviation of just over one degree.

With regard to the prognosis of geological and geophysical parameters the results obtained in Langley-1 were generally in line with expectations. Formation tops were mostly within 20 milliseconds two-way time of prognosis, with the two exceptions being the Nullawarre Greensand equivalent and Waarre Formation Unit C tops, which came in low by 42.2 and 34.8 milliseconds, respectively. In terms of depth, most horizons were within 20 metres of prognosis, except the Clifton Formation (24m low), the Skull Creek Mudstone (50m high) and the Nullawarre Greensand equivalent (26m low). Thus, the time-depth relationship observed in Langley-1 indicates that the actual velocity profile is broadly similar to the pre-drill regional velocity model used.

4.2 CONTRIBUTION TO GEOLOGICAL KNOWLEDGE AND HYDROCARBON PROSPECTIVITY

In addition to the basic information that drilling a petroleum exploration well adds to the geological knowledge and hydrocarbon prospectivity of an area (eg. depth to formation tops, cuttings samples, sidewall cores, wireline logs, etc.) the drilling of Langley-1 and analysis of the technical data from it has;

- confirmed the technical worth of using 3D seismic data in this moderately to intensely structured area to improve the delineation of structural features (the commercial worth has yet to be proven).
- provided (by virtue of relatively closely spaced sidewall cores) a higher density of biostratigraphic sample points over the lower Sherbrook Group (especially the Waarre Formation) and the upper part of the Eumeralla Formation than has been available in previous exploration wells in this area. This has enabled an unprecedented level of biostratigraphic resolution within this interval, which has resulted in some new subzones being recognized and provided further confirmation (c.f. Iona-2 WCR) of the absence of Cenomanian strata in this area. Thus, Langley-1 has provided a better understanding of the juxtaposition of the biostratigraphy with the lithostratigraphy and will be a very useful well for correlation work over this interval into the future.
- provided (again by biostratigraphic work on sidewall cores) sufficient biostratigraphic evidence to propose the establishment of a new entity in Otway Basin stratigraphy, provisionally labelled the "K-T Shale", which is equivalent to the Cretaceous/Tertiary boundary shale observed in the Gippsland Basin.
- confirmed the migration of hydrocarbons and carbon dioxide into sands of the Waarre Formation in the Langley structure. (The presence of such a high proportion of carbon dioxide in this structure might be construed as supporting the proposed relationship between the occurrence of that gas in structures which are proximal to north-east bounding faults).
- identified tight (but hydrocarbon gas-bearing) potential reservoir sandstones within the Eumeralla Formation. It is also of interest to note that this hydrocarbon gas is very similar to that encountered in the Waarre Formation, but has no carbon dioxide reservoired along with it. To what extent this difference may be controlled by factors such as timing of generation/migration and/or relative permeability remains unclear.

Additional items acquired in Langley-1 which provide a contribution to geological knowledge of the area include the core cut in the Waarre Formation Unit C, the routine and special core analysis done on plugs from this core, the dipmeter data and the array sonic data, all of which are relatively sparse in wells in this region.

APPENDIX 1

GFE RESOURCES LTD

APPENDIX 1

RIG SPECIFICATIONS

LANGLEY-1

INVENTORY - RIG #11

CARRIER Cooper LTO 750 Carrier with triple front and rear axles

54000lb front and 70000lb rear. All necessary highway equipment. Unit levelled with hydraulic jacks when

stationary.

SUBSTRUCTURE 17' floor height - 14' below table beams with plates in base.

DRAWWORKS Cooper 750 H.P. Drawworks.

42" x 12" main drum with Fawick 28VC 1000 clutch and 3000 metres $\frac{9}{16}$ " sandline. Driven by 2 each Cat D3406TA

Diesel Engines.

ROTARY TABLE National Rotary Table Model C-175.

DERRICK Cooper Derrick Model 118-365. Ground height 118'.

Maximum rated static hook load 350000 lbs with 10 lines.

Mast raised, lowered and telescoped hydraulically.

CROWN BLOCK Cooper Crown Block with 4 working sheaves. Fast line

sheave and dead line sheave. All grooved for $1-\frac{1}{8}$ " line.

Sandline sheave grooved for $\frac{9}{16}$ " line.

HOOK BLOCK National Hook Block Model 435 G-175. 175 ton capacity.

4-35" sheaves grooved for $1-\frac{1}{8}$ " line.

SWIVEL P-200 National.

KELLY SPINNER Foster Model K-77

SLUSH PUMPS No. 1:

National 8-P-80 Slush Pump. $6^{1}/_{4}$ " x $8^{1}/_{2}$ " Triplex single

acting driven by Cat. D398TA Diesel Engine.

No. 2:

National 7-P-50 Slush Pump driven by Cat D379TA Diesel

Engine.

PULSATION DAMPENER 1 each Hydril Pulsation Dampener type K20-3000.

MUD SYSTEM 2 x 300 bbl tanks incorporating 80 bbl pill tank and 40 bbl

trip tank.

SHAKERS Triton NNF Screening Machine (Linear Motion).

DEGASSER Drilco Atmosheric Degasser Standard Pit. 7¹/₂ H.P. 60 Hz

230v

DESANDER Demco Model 122. Two, 12" cone with Warman 6" x 4"

Centrifugal pump driven by 50 H.P. Electric Motor.

DESILTER Pioneer Economaster Model T12-E4. 12 x 4" cones with

Warman 6" x 4" Centrifugal pump, driven by a 50 H.P.

Electric Motor.

MUD MIXING PUMP Warman 6" x 4" Centrifugal pump driven by a 50 H.P.

Electric Motor.

MUD AGITATORS 4 only Brandt Mud Agitator Model MA 7.5.

B.O.P'S & 10" x 3000 P.S.I. Shaffer Double Gate B.O.P. with $2^3/8$ ",

ACCUMULATOR $2^{7}/_{8}$ ", $3^{1}/_{2}$ ", $4^{1}/_{2}$ ", $5^{1}/_{2}$ ", 7" and Blind.

10" x 3000 P.S.I. Hydril GK Annular B.O.P. Koomey B.O.P. Control Unit. Accumulator Unit Model 100-11S.

CHOKE MANIFOLD Cameron 5000 psi.

SPOOL 10" x 3000 x 10" x 3000 Flanged Drilling Spool with 3" x

3000 flanged choke and kill outlets.

INSTRUMENTATION Martin-Decker 6 pen Record-O-Graph

Martin-Decker Weight Indicator Type F.S.

Martin-Decker Weight indicator Type F.:
Martin-Decker Mud Pressure Gauge
Martin-Decker Rotary R.P.M. Indicator
Martin-Decker Stroke Indicator (2 off)
Martin-Decker Rota Torque Indicator
Martin-Decker Tong Torque Indicator
Martin-Decker Mud Flow Sensor
Martin-Decker Mud Flow Fill System

Martin-Decker Mud Volume Totaliser (M.V.T.)

AUTOMATIC DRILLER Satellite Automatic Driller Model SA100-50-1500.

WIRELINE STRIPPER Guiberson Oil Saver Type H-4.

SURVEY UNIT Totco 8 Deg Recorder.

MUD LAB Baroid Rig Laboratory Model 821.

KELLY $5^{1}/_{4}$ " HEX Kelly. $2^{13}/_{16}$ " I.D. x 40' long with $6^{5}/_{8}$ " API Reg.

L.H. Box up 4" I.F. Pin down.

UPPER KELLY VALVE Upper Kelly Cock. 10000 test 6⁵/₈" API Reg. L.H.

Connections.

LOWER KELLY VALVE Hydril Kelly Guard. $4^{1}/_{4}$ " - 10000 P.S.I. 4" I.F. Pin and Box.

KELLY DRIVE BUSHING Varco Type 4 KRS Kelly Drive Bushing.

DRILL PIPE 7000' Drill Pipe $4^{1}/_{2}$ " O.D. 16.60 lb. Grade E Range 2 with

4" I.F. x 18 degree taper tool joints.

DRILL COLLARS 20 each Drill Collars $6^{1}/_{4}$ " O.D. slick $2^{13}/_{16}$ " I.D. x 30' long

with $4^{1}/_{2}$ " XH pin and box connections.

FISHING TOOLS To suit pipe, collars and tubing.

SUBSTITUTES To suit drill string.

HANDLING TOOLS Farr Hydraulic Power Tongs, 13³/₈" Varco SSW-10

spinning wrench.

Manual tongs, elevators and slips to handle pipe, collars,

casing and tubing.

WELDING EQUIPMENT Lincoln Electric Welder Model 400AS.

AIR COMPRESSORS Sullair compressor Package Model 10-30.

AC GENERATOR 2 each Caterpillar 3408TA AC Generator model SR-4. 1800

rpm 60 hz 275 kw.

FUEL TANKS 2 each 10,000 litre - Skid Mounted.

WATER TANK 400 bbl tank with two Warman 3 x 2 pumps driven by 24 hp

electric motors.

PIPE RACKS 5 sets 30 feet in length.

CATWALKS 2 piece Catwalk drill pipe construction 42" height.

RADIO Codan Mobile Transceiver.

TRANSPORTATION International 530 Payloader.

Toyota 4 x 4 Pickup.

Toyota 4 x 4 Crew Vehicle.

RIG ACCOMMODATION 2 Skid Mounted Toolpusher/Company Man Units.

CAMP

1- Camp Generator House 31' long x 10' wide skid mounted complete with 2 -3304 T 80 Kw, 50 Hz, 200 - 400 volt generators, camp distribution panel. 6,794 litres fuel storage, 12,000 litres fresh water storage and 24,000 litres shower water storage.

1 Kitchen/Dining Room	40' x 10' x 10'
1 Recreation Room	40' x 10' x 10'
1 Ablution/Laundry	40' x 10' x 10'
3 12 Man Bunkhouses	40' x 10' x 10'
1 Cooler/Freezer	20' x 8' x 8'

APPENDIX 2

GFE RESOURCES LTD

APPENDIX 2

DRILLING FLUID RECAP

LANGLEY-1

GFE RESOURCES LTD DRILLING FLUID RECAP LANGLEY-1 OTWAY BASIN VICTORIA



Prepared by

M. Olejniczak, C. DaSilva

Date

June 1994

"All information, recommendations and suggestions herein concerning our products are based on tests and data believed to be reliable. However, it is the user's responsibility to determine the safety, toxicity and suitability for their own use of the products described herein."

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WELL SUMMARY

Operator : GFE Resources Ltd

Well Name : Langley-1

Average Angle & Direction : Vertical

Location : Onshore Otway Basin, Victoria

Contractor/Rig : Century, Rig 11

Start Date : 12 May 1994

RKB Elevation : 5.2 m

Total Depth : 2006 m MD

Date Reached T.D : 2 June 1994

Total Days Drilling : 22 Days

Rig Released : 8 June 1994

Total Days On Well : 28 Days

Hole Size Cost (A\$) Interval **Drilling Fluid Type** 658.00 12-1/4" Flocculated Native Clay 5 m - 340 m 340 m - 1400 m 8-1/2" 6,394.28 FW/AQUAGEL/CMC 23,621.05 1400 m - 2006 m 8-1/2" KCI/Polymer

Mud Materials Charged To Drilling TOTAL A\$ 30,673.33

Engineer On Location From : 12 May 94 to 7 June 94 (27 days)

Drilling Fluid Engineering : 27 Days @ \$ 530/Day 14,310.00

Total Cost Of Drilling Materials & Engineering A\$ 44,983.33

Mud Materials Not Charged To Drilling A\$ Nil

Casing Program : 9-5/8" @ 334.4 m

Drilling Supervisors : Ken Smith

Baroid Engineers : M. Olejniczak, C. DaSilva

INTRODUCTION-SUMMARY

Langley-1 was spudded on 12 May using Century rig 11.

The 12-1/4" hole was drilled through the surface limestone to 50 m with water only. 1% KCl was then added to inhibit dispersion through the Gellibrand Mari and reduce water consumption. The system was then maintained as a Flocculated Native Clay to the 340 m casing point. There were some problems with unexpected caving of the Gellibrand Mari and minor mud rings during the wiper trip at 340 m. The 9-5/8" casing was run and cemented to 334.4 m, but a surface top up cement job was required.

The same Flocculated Native Clay was used to drill out the casing shoe and continue in 8-1/2" hole through to the top of the Dilwyn Formation at 560 m. The mud system was then converted to an AQUAGEL/CMC to provide improved hole stability and reduced filtration control through the sands of the Dilwyn and Paaratte Formations.

From 1400 m the mud system was again converted to a 3%KCl/Polymer system to provide increased inhibition and improved log separation through the lower part of the Sherbrook Group and into the Eumeralla Formation to the TD of 2006 m.

There were some problems with increasing deviation and tight hole on trips while drilling through the Paaratte Formation. The major problem of the well also occurred in the lower part of the Paaratte Formation. The pipe was differentially stuck pipe at 1438 m, with 3 days lost before drilling resumed. This was a direct result of a draw-works clutch failure while drilling with intermittent high torque.

The well was then drilled to the 2006 m TD, reached on the 2nd June, without any more hole or mud problems. Three drill stem tests, one core and the wireline logs were successfully run. The final caliper log showed the 8-1/2" hole to be in very good gauge with only a few washouts.

The final cost of \$30,673.33 for materials used for drilling, (not including cementing and completion) was only 7.5% higher than programmed, despite the stuck pipe problem and the slower than expected drilling.

DISCUSSION BY INTERVAL

12 1/4" Hole

5 m - 340 m

(335 m Drilled - 2 Days)

Formations

Port Campbell Lst, Gellibrand Marl

DRILLING FLUID

Water to Flocculated Native Clay

As the surface limestone appeared to be quite competent and the Gellibrand Marl was expected very close to surface the hole was spudded in using water only.

The limestone was thicker than expected with the first thin bands of marl only occurring from about 50 m. Forty sacks of Potassium Chloride were immediately added to give a KCl content of close to 1%. This was done to inhibit the hydration of the Gellibrand Marl and reduce water dilution and dumping requirements.

Drilling continued steadily through the marl to the 340 m casing point. No more KCl was added with the KCl content allowed to gradually reduce by dilution to 0.3%. Lime was regularly added to maintain flocculation of the system and provide additional inhibition. Dilution with water was used to control viscosity and mud weight.

TYPICAL MUD PROPERTIES

Weight :
Viscosity :
Yield Point :

8.5 to 8.9 28 to 42 0 to 25 ppg seconds/qt lb/100 ft²

Yield Point API Filtrate Chlorides

No Control 4,500 to 2,000

ml mg/L

KCL Content

0.8 to 0.3

% by wt soln.

HOLE CONDITIONS

There were no hole problems during actual drilling of the section. A large amount of cuttings was returned at the shakers during drilling. The proportion of cavings appeared to increase with depth.

After circulating the hole clean for a half hour, the wiper trip at casing point was run without problems, but mud ring problems after circulation resumed blocked the flowline. The shaker had to be bypassed and returns dumped temporarily, with water dilution used to control the problem. A large amount of marl cavings up to 2-1/2" in size was returned at the shakers.

The 9-5/8" casing was run to 334.4 m, with the last joint requiring washing to bottom. While circulating the casing a large amount of cavings was again returned. The casing was cemented, using about 80% excess, but no cement returns were observed. The cement was later measured at 9 m below surface, and was topped up by hand.

SOLIDS CONTROL

The single Triton shaker was run with a combination of 80/50/50 mesh screens. The desander and desilter were run continuously. Almost no volume was dumped during drilling. However, a severe weight and viscosity increase after the wiper trip, at casing point, had to be controlled by temporarily dumping returns and diluting with water.

ে পাল্লেটা এইটালো এইটালিটার নির্ভাব তেওঁ স্থাবিজ্ঞান সাম্প্রী করিছে স্থাবিজ্ঞান ই ইটার জন্ম কর্মার জন্ম বিভাগ

CONCLUSIONS AND RECOMMENDATIONS

- The use of the KCl and Lime inhibited the marl sufficiently so that there was no need for dumping during drilling, with a controlled viscosity obtained. This would have been impossible with a fresh water mud.
- Concerns for minimising dumping to the small sump led to the viscosity of the system being run in the 40 to 42 second range. In retrospect this was too high. Mud ring problems on the wiper trip would have been reduced with a much lower 34 to 36 second viscosity.
- The large amount of cavings and lack of cement returns indicated the hole was significantly enlarged. This caving of the Gellibrand Marl is unusual and has not been observed on previous wells in the area. There was no significant difference in the drilling fluid or hydraulics. It may be the result of a localised geological variation.
- There is scope for extending inhibition of the Gellibrand Marl to reduce viscosity and potential mud ring problems and dilution requirements. This is becoming more important as there is more pressure to reduce sump clean-up costs. Below are several low cost options depending on the mud system to be used for the next hole section.
 - 1) Maintain a 1% KCl content through to casing point. The system could then be continued as a KCl/Polymer for the next section.
 - 2) Continue with increased Lime additions and control viscosity using a lignosulphonate such as QB II, ENVIROTHIN or POLYNOX. The system could then be continued as a Lime/Polymer for the next section.
 - "Clear Water" drill the section using a PHPA flocculant. Lime, CaCl₂ or KCl can be used as the required ionic component. This cannot be used if there is any potential for washing out the surface conductor. A significant amount of water can be recycled from the sump. As basically water is left in the pits this is compatible with continuing with any water based mud for the next section.

DISCUSSION BY INTERVAL

8 1/2" Hole

340 m - 1400 m

(1060 m Drilled - 6.5 Days)

Formations

Gellibrand Marl to Skull Creek Mudstone

DRILLING FLUID

Fresh Water AQUAGEL/CMC EHV

The 9-5/8" casing shoe was drilled out using old Lime-Flocculated mud from the previous section, diluted with water. The cement contamination was left untreated.

Drilling then continued through the Gellibrand Marl diluting with water. The dilution rate was controlled to minimise dumping to the small sump, and conserve volume for the higher dilution rates expected in the Dilwyn and Paaratte Formations. The high pH from the earlier cement contamination steadily reduced.

From the top of the Dilwyn Sandstone at 560 m, CMC-EHV was steadily added to a concentration of about 1ppb. Pre-hydrated AQUAGEL was added to maintain the mud viscosity above 40 seconds. This reduced the API filtrate of the mud to the 8.5-9.0 ml range.

There were noticeable downhole seepage losses of 2-3 bbl/hr while drilling through the sands of the Paaratte formation. The clay content, (MBT) of the mud was allowed to steadily decrease to 9 ppb towards the base of the Paaratte to minimise problems converting to a KCI/Polymer system. This began at 1400 m after drilling into the Skull Creek Mudstone.

TYPICAL MUD PROPERTIES

Weight : 8.8 to 9.0 ppg

Viscosity : 40 to 42 seconds/qt
Yield Point : 10 to 14 lb/100 ft²
API Filtrate : Reducing to 8.5 , ml

Chlorides : 1,000 to 1,500 mg/L

KCL Content : Nil % by wt soln.

MBT : 8 to 10 ppb

HOLE CONDITIONS

A 25 stand wiper trip was run at 832 m, without problems. On the next wiper trip at 1228 m, the pipe pulled tight from near bottom and was temporarily stuck at 1076 m. It was worked free through tight hole up to 1035 m over 1 hour and was then run back in with only 2 m of fill.

A full trip was run at 1257 m for a BHA change. There were no problems pulling out, but 2 hrs were required to ream back in from 1062-1075 m and 1177-1257 m. Another trip was run

assembly because of continuing problems with increasing hole deviation. It took 13-1/2 hrs to ream this assembly back to bottom from 947 m.

SOLIDS CONTROL

The single Triton shaker was run with a combination of 80/50/50 mesh screens. The desander and desilter were run continuously. The mud weight was easily controlled at 8.9-9.0 ppg without any dumping required, due to the low clay content of the formations.

CONCLUSIONS AND RECOMMENDATIONS

- There were no mud problems through this section with mud properties closely following the program.
- The caliper log at TD showed this section to be mostly close to gauge at 8 1/2" to 9". This indicates that the reduced hydraulics run were successful in reducing hole washout in the loose sand sections.
- The tight hole and reaming problems during tripping through the Paaratte formation would have been due to:
 - 1) Filter cake build up across the very permeable sandstone.
 - 2) Near gauge hole. (caliper log showed 8 3/4" for this section at TD.)
 - 3) Variations in the deviation which finally resulted in the stiff assembly being run.
- Suggestions to reduce the tight hole and reaming problems would include :
 - 1) Reduce the programmed API filtrate through the Paaratte Formation.
 - 2) Run more frequent short wiper trips to wipe the hole of filter cake buildup.
 - 3) Consider the addition of BARACARB, (ground to size Limestone), to the system to act as a pore throat plugging agent, reducing permeability.

DISCUSSION BY INTERVAL

8-1/2" Hole

1400 m to 2006 m

(606 m Drilled, 18.5 Days)

Formations

Skull Creek Mudstone to TD in Eumeralla.

DRILLING FLUID

KCVPolymer.

Conversion of the previous fresh water AQUAGEL/CMC mud to a KCl/Polymer began at 1400 m. This had barely begun when the rig clutch broke down at 1438 m and the pipe became differentially stuck. The completion of the conversion had to be delayed until after the pipe was freed.

The KCL content was then increased to 3 %, with PAC R and PAC L used for viscosity and filtration control. The system was simply maintained by added all chemicals as pre-mixed mud from the reserve pit. No more pre-hydrated AQUAGEL was used for the remainder of the well.

Through the Nullawaare and Belfast Formations the mud rheology increased due to the large amount of clay solids incorporated into the system. The viscosity rose to the 50-55 seconds range with yield points of 18-20 lb/100ft². The sandtrap was dumped regularly to control the mud weight and viscosity. The mud weight was allowed to increase to the required 9.3 ppg by the top of the Waare Formation target without any barite being added.

From the Waare Formation through to TD, the lower clay content of the formations resulted in a lower mud rheology being more easily maintained, with viscosities of 42-48 seconds and yield points of 15-20 lb/100 ft².

TYPICAL MUD PROPERTIES.

Weight : 9.0 to 9.3+ ppg

 Viscosity
 : 42 to 50
 seconds/qt

 Yield Point
 : 16 to 20
 lb/100 ft²

 API Filtrate
 : 7.0 to 8.0
 ml

Chlorides : 15,000 to 18,000 mg/L KCl Content : 3.0 % by wt soln.

MBT : 10 to 12 ppb

HOLE CONDITIONS.

At 1438 m while drilling with the new stiff assembly and intermittent high torque, the rig clutch broke down. The drill pipe, which was on bottom and could not be rotated or moved for several hours, became differentially stuck while the clutch was being repaired. The pipe was worked and the hole displaced to water twice, before it was freed using a 32 bbl EZ SPOT pill.

There were no major hole problems during drilling and tripping for the rest of the well. Trips were run at 1638 m, 1732 m, 1745 m, 1764 m, 1897 m, 1910 m, and the 2006 m TD with only minor tight hole experienced. Wireline logs were run at TD with no problems. Two drill stem tests were run during drilling at 1745 m and 1910 m, with no problems running in or pulling out. DST 1 successfully flowed gas, but DST 2 was a misrun. This interval was successfully straddle tested after wireline logging, (DST 3), with only a weak blow recorded.

The hole continued to take an average of 2-1/2 bbls of mud per hour during wireline logging.

There were still problems with the draw-works clutch slipping, particularly after reaching TD, which caused further delays.

SOLIDS CONTROL.

The shaker was run with 1x80 and 2x50 mesh screens. The desander and desilter were run continuously. All the solids control equipment worked well, with the mud weight kept to 9.3 ppg as programmed. There was no centrifuge available on this well, nor was one required.

CONCLUSIONS AND RECOMMENDATIONS.

- The primary cause of the stuck pipe at 1438 m was the clutch failure. The drill string was on bottom and could not be rotated or moved for several hours, becoming differentially stuck.
- Except for the stuck pipe incident, hole conditions were very good. The end of well caliper log showed the section to be a very uniform 9" gauge, except for the zone where the pipe had been stuck, which was up to 20". This would have resulted from the jarring, working of pipe and displacing to water done at that depth.
- The fact that the stuck pipe occurred as the mud system was beginning to be converted does not mean that this was a contributing factor. There had already been tight hole and one instance of temporarily stuck pipe with the fresh water/AQUAGEL/CMC used previously. In addition the continuing downhole losses of 2-1/2 bbl/hr measured while logging shows there was still potential for differential sticking with the KCl/Polymer system. For recommendations to reduce the potential for differential sticking, see the recommendations for the previous section.
- There were no major problems with the KCL/Polymer mud system. It is recommended the same mud system be used in future wells in this area through this section.

APPENDIX - A

FORMATION TOPS

Formation	Measured Depth (m)
Mepunga	1900年 - 1900年
Dilwyn Sandstone	560
Pember Mudstone	778
Pebble Point	836
Paaratte	917
Skull Creek Mudstone	1348
Nullawaare	1427
Belfast Mudstone	1545
Waarre	1716
Eumeralla	1826 ·
T.D.	2006

APPENDIX - B

8 1/2" HOLE CALIPER DATA (averaged)

Measured Depth (m)	Hole Size (ins)
340 - 400 400 - 440	9.0	or and the process of the first of the first of the second
	9.0	
450 - 475 475 - 510	8.5 - 16.0	(off scale)
	9.0	(on socie)
510 - 550	9.0	
550 - 600	10.5	
600 - 650	9.0	
650 - 700	9.0	
700 - 778		(off scale)
778 - 825	9.0	(OII Scale)
825 - 875		
875 - 917	9.0	
917 - 950	8.75	
950 - 1000	8.75	
1000 - 1050	8.75	
1050 - 1100	8.75	
1100 - 1150	8.75	
1150 - 1200	8.75	
1200 - 1250	8.75	
1250 - 1275	12.5	
1275 - 1300	9.0	
1300 - 1325	12.5	
1325 - 1350	8.75	(-ff pools)
1350 - 1375	8.5 - 20.0	•
1375 - 1425	8.5 - 20.0	(off scale)
1425 - 1525	9.0	,i
1525 - 1625	9.0	
1625 - 1725	9.0	
1725 - 1825	9.0	
1825 - 1870	9.0	
1870 - 1910	9.0	
1910 - 2006	9.0	

DAILY ACTIVITY SUMMARY



Baroid Australia Pty Ltd

COMPANY GFE Resources Ltd

WELL Langley-1

LOCATION Otway Basin, Victoria

CONT/RIG Century Rig 11

PAGE-1

1994 ACTIVITY

- 12 May Spud in with water at 13:30 hrs after pre-spud meeting. Drilled 12 1/4" hole through limestone and marl at 20 to 30 m/hr.
- 13 May Drilled to 340 m casing point at 05:00 hrs. Circulated hole clean for 1/2 hr. Ran wiper trip, then circulated hole clean for another hour. POH and ran 9 5/8" casding, washing last joint to bottom. Circulated casing for 1 hr. Cemented xcasing with 15.6 ppg neat slurrey. WOC.
- 14 May Wait on cement. Used 14 sxs cement to do top up on surface casing. Nippled up BOP and pressure tested. Began making up 8 1/2" BHA.
- 15 May RIH and tagged cement at 318 m. Drilled out cement and shoe with mud, then drilled 6m new hole to 346 m. Ran PIT test giving 22.6 ppg EMW. Continued drilling through marl. Had to clear flowline of mud ring at 395 m for 1 hour. Continued drilling taking regular surveys.
- Drilled to 832 m. Circulated out for 1/2 hr then ran 25 stand wiper trip to casing shoe. 16 - May Ran back in without problems and no fill. Continued drilling from 12:30 hrs. Reduced bit weight and taking more surveys as deviation increased.
- Drilled to 1228 m. Circulated out 1/2 hr, then POH for wiper trip. Pipe pulled tight from 17 - May near bottom. Temporarily stuck at 1076 m. Worked free, and worked pipe through tight hole to 1035 m over 1 hr. Continued POH to 823 m. Ran back in without problems. Had 2 m fill. Resumed drilling but survey line broke during survey at 1257 m. POH to recover line and survey barrel.
- Continued POH. Checked bit, changed BHA and slipped line. Ran back into hole. Had 18 - May to ream in from 1062 to 1075 m over 1/2 hr and from 1177 to 1257 m over 1 1/2 hrs. resumed drilling from 11:30 hrs.
- Drilled to 1363 m at 08:30 hrs. Circ out 1/2 hr, then POH for bit and BHA change. Had to 19 - May work tight hole from 1302 to 1158 m pulling out. Changed bit and added 2 stabilisers to BHA to stiffen BHA. RIH to 947 m. Had to ream in the rest of the way. Reached 1240 m.
- 20 May Reamed to bottom and continued drilling ahead. At 1438m incountered some torque. Pulled up and clutch went down. Could not move the pipe for several hours while repairing clutch. After fixing the clutch tried to pull pipe. The pipe was stuck, work pipe. Working pipe and activating jars.
- Worked stuck pipe. Displaced annulas with 258bbls of water and work pipe. Hold tension 21 - May and torque on pipe for one hour, then work pipe again. Reverse circulate with mud to water at shakers and work pipe. Continued to work pipe while waiting on Schlumberger, not circulating. Circulated and displaced water with active mud, dump water in sump. Running wireline free point indicator.
- 22 May Completed free point. Circulated hole clean, then displaced the hole to water. Work stuck pipe. Mix and pump 32 bbls EZ Spot around collars and HWDP, Work pipe straight away. Rig up and run another free point. Pipe came free while running free point. Circulated and displaced water and EZ Spot Diesel with mud. Circulated and conditioned mud.
- Pulled out of the hole and changed bit. Tight hole from 1361 to1226m on the way out. 23 - Mav Ran in the hole to 1238m washed to bottom.

DAILY ACTIVITY SUMMARY



Baroid Australia Pty Ltd COMPANY GFE Resources Ltd

WELL Langley-1

LOCATION Otway Basin, Victoria

CONT/RIG Century Rig 11

PAGE-2

1994 ACTIVITY

- 24 May Continue drilling 8.5" hole, survey at 1527m.
- 25 May Drilling ahead 8.5" hole to 1623m. Made 10 stand wiper trip OK. Continued drilling ahead , at 1628m circulated up a sample.
- 26 May Continued drilling ahead without any hole problems to 1729m, there was a drilling break at this point. Drilled to 1731m and circulated up a sample. Tried to drill 3m extra but only managed 1m, because the bit was torqueing up. POH.
- 27—May Ran in the hole to 1713m wash to bottom at 1732m. Circulated bottoms up prior to drilling to 1734m, circulated up sample. Drilled to 1745m Circulated up sample. It was decided to do a test at this depth, made a wpier trip to the shoe. Ran back to bottom and circulated hole clean prior to POH for DST # 1.
- 28 May Ran in the hole and perform DST # 1. Interval 1715m to 1745m, Recovered CO2 gas. Pulled out of the hole and laid out test tool. Made up core barrel and ran in the hole. Wash and ream last 15m to bottom.
- 29 May Core from 1745m to 1764m. POH with core barrel and lay out core. Ran in the hole with 8.5" bit, Drilling ahead.
- 30-May Continued drilling through Waare and Eumeralla formations at 2-3 m/hr.
- 31 May Drilled to 1897m, circulated up sample for Geologist as gas increased to 70 units. Then made a wiper trip (10 stands), tight from 1802 1742m. Drilled on to 1910m, circulated up sample for Geologist. (Gas 87units) Decided to test, POOH for DST # 2.
- 01 Jun Ran in the hole with test tool, and perform DST # 2. Interval 1875m to 1910m. Did not flow, pulled out of the hole. Ran back in with bit to 1890m, washed to bottom and circulated for thirty five minutes prior to drilling ahead 8.5" hole.
- 02—Jun Continued drilling ahead 8.5" hole to 2006m. (T.D.) circulated bottoms up prior to making a 42 stand wiper trip, no hole problems on trip. Circulated the hole clean, and POOH to log.
- 03—Jun Running wire line logs. Logging tool got to bottom without any problems.
- 04-Jun After WRT log, Ran in the hole for a wiper trip. Circulated the hole clean. Draw works clutch silpping, repair clutch and POOH to log. Continued logging.
- 05—Jun Completed logging and ran in the hole for a wiper trip. Circulated bottoms up at 2000m, could not get to bottom as had problems with the clutch slipping. POOH to the shoe and repair clutch.
- O6-Jun Ran in the hole, clutch slipping so POOH to the shoe. Work on clutch, then ran in the hole with 25 stands. Clutch slipping so POOH to the shoe again and repair clutch. Ran in the hole clutch OK. Wash last 20m to bottom, and circulated the hole clean prior to POOH to test. Made up test tools.
- 07-Jun Ran in the hole and performed DST # 3, interval 1882.9 1909.1m POOH with test tool.

 Layed out test tools and layed down BHA. Ran in the hole open ended to set four cement plugs.

BLANK

MATERIAL RECAP

Page 1.

COMPANY GFE Resources Ltd WELL Langley-1 LOCATION Otway Basin, Victoria

HOLE SIZE 12 1/4" CONTRACTOR/RIG Century Rig 11 MUD TYPE Flocculated Native Clay

INTERVAL TO (m)

340

DRILLING DAYS ROTATING HRS

2

COST/DAY

A\$329.00

FROM (m)

5

12.5

COST/m

A\$1.96

DRILLED (m) DATE

335 13-May-94

COST/bbl CONSUMPTION FACTOR (bbl/m)

A\$0.79 2.47

MATERIAL	UNIT	UNIT	QUAN	NTITY ACT		(lb/bbl) ACT	TOTAL CO ESTIMATE	STS ACTUAL
KCL,Tech(sx)	SIZE 25 kg	14.44	35	40	2.0	2.7	505.40	577.60
Lime	25 kg	8.04	10	10	0.6	0.7	80.40	80.40

VOLUMES			COST LESS BARITE : COST WITH BARITE :	A\$585.80 A\$585.80	A\$658.00 A\$658.00
Sea W.	bbl				
Drill W.	bbi	957.6	825		
other	bbl				
other	bbl				
Chemical	bbl	3.4	4		
Salvaged Mud	bbl				
TOTAL MUD USED	bbl	961	829		

COMMENTS

Spud in with water. KCl and Lime used to inhibit Gellibrand Marl and flocculate incorporated clays.

MATERIAL RECAP

Page 2.

COMPANY GFE Resources Ltd WELL Langley-1 LOCATION Otway Basin, Victoria

HOLE SIZE 8 1/2" CONTRACTOR/RIG Century Rig 11 MUD TYPE FW/AQUAGEL/CMC

INTERVAL TO (m) FROM (m)

1400 340

DRILLING DAYS ROTATING HRS

6.5 67

COST/DAY COST/m A\$983.74 A\$6.03

DRILLED (m)

1060

COST/bbl

A\$3.26

DATE

20-May-94

CONSUMPTION FACTOR (bbi/m)

1.85

MATERIAL	UNIT	UNIT	QU EST	ANTITY ACT	CONC	C (lb/bbl) ACT	TOTAL C ESTIMATE	OSTS ACTUAL
AQUAGEL,sx Caustic Soda CMC EHV Soda Ash	25 kg 25 kg 25 kg 25 kg 25 kg	14.33 32.43 106.61 16.15	336 13 32 4	126 10 40	7.0 0.3 0.7 0.1	3.5 0.3 1.1	4,814.88 421.59 3,411.52 64.60	1,805.58 324.30 4,264.40

A\$6,394.28 A\$8,712.59 **COST LESS BARITE:** A\$6,394.28 A\$8,712.59 **COST WITH BARITE: VOLUMES** bbl Sea W. 2307.5 1610 bbl bbl bbi

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Drill W. other other 25.5 13 Chemical bbl 336 bbl 300 Salvaged Mud 1959 2633 TOTAL MUD USED bbl

COMMENTS

Retained 336 bbl of old mud from 12 1/4" section. Prehydrated AQUAGEL and CMC-EHV used to maintain viscosity and tration through sands of Dilwyn and Paraatte Formations.

MATERIAL RECAP

Page 3.

COMPANY GFE Resources Ltd WELL Langley-1 LOCATION Otway Basin, Victoria HOLE SIZE 8 1/2"

CONTRACTOR/RIG Century Rig 11

MUD TYPE KCI/Polymer

INTERVAL TO (m) FROM (m) 2006 1400 DRILLING DAYS ROTATING HRS

18.5 140.5 COST/DAY COST/m COST/bbl A\$1,276.81 A\$38.98

DRILLED (m) 606
DATE 7-Jun-94

CONSUMPTION FACTOR (bbi/m)

A\$24.25 1.61

	UNIT	UNIT	OΠΔΙ	VTITY	CONC	(lb/bbl)	TOTAL COS	TS
MATERIAL	SIZE	COST	EST	ACT	EST	ACT	ESTIMATE	<u>ACTUAL</u>
BARACIDE	25 kg	549.92	1	1	0.0	0.1	549.92	549.92
BARACOR 129	25 kg	64.96	3	5	0.1	0.3	194.88	324.80
Barite,sx	50 kg	15.96	81	age of the spe	5.0			, and the
Caustic Soda	25 kg	32.43	14	18	0.4	1.0	454.02	583.74
CMC EHV	25 kg	106.61		9		0.5		959.49
EZ SPOT	208 It	761.18		2		0.9		1,522.36
KCL,Tech(sx)	25 kg	14.44	300	335	9.3	19.0	4,332.00	4,837.40
PAC-R	50 lb	170.74	36	46	1.0	2.4	6,146.64	7,854.04
PAC-H PAC-L	50 lb	170.74	36	40	1.0	2.1	6,146.64	6,829.60
da Ash	25 kg	16.15	5		0.2		80.75	
BARAFILM	25 lt	159.7		1		0.1		159.70

i

VOLUMES			COST LESS BARITE : COST WITH BARITE :	A\$17,904.85 A\$19,197.61	A\$23,621.05 A\$23,621.05
Sea W.	bbl				
Drill W.	bbl	1241.2	935		
other	bbl				
other	bbl				
Chemical	bbl	37.8	39		
Salvaged Mud	ldd	500			
TOTAL MUD USED	bbl	1779	974		

COMMENTS

500 bbl old mud converted to KCI/Polymer from 1400 m. KCI/Polymer maintained to TD.

x 25 L can BARAFILM used for drill pipe coating while pulling out sideways at end of well.



Baroid Australia Pty Ltd COMPANY GFE Resources Ltd WELL Language 1

MATERIAL SUMMARY

WELL Langley-1

LOCATION Otway Basin, Victoria CONTRACTOR/RIG Century Rig 11

INTERVAL MUD TYPES SIZE m Flocculated Native Clay 12 1/4" FW/AQUAGEL/CMC 8 1/2" 1 KCI/Polymer 8 1/2"	335 1060 606	DAYS 2 6.5 18.5	HOURS 12.5 67 140.5	WELL FROM : TO :	DURATION 12-May-94 07-Jun-94
--	--------------------	--------------------------	------------------------------	------------------------	------------------------------------

}						COST/DAY	A\$1,136.05
						COST/m	A\$15.33
		TOTALS	2001	27	220	COST/bbl	A\$8.95
RECAP BY	M. Olejniczak, C			CO	NSUMPTION FA	CTOR (bbl/m)	1.71
MATERIAL	UNIT	UNIT		QUAN	TITY	TOTAL	COSTS
MAILIME	SIZE	COST	EST	IMATE	ACTUAL	ESTIMATE	ACTUAL
AQUAGEL,sx	25 kg	14.33		336	126	4,814.88	1,805.58
BARACIDE	25 kg	549.92		1	1	549.92	549.92
BARACOR 129	25 kg	64.96		3	5	194.88	324.80
Barite.sx	50 kg	15.96		81		1,292.76	
Caustic Soda	25 kg	32,43		27	28	875.61	908.04
CMC EHV	25 kg	106.61		32	49	3,411.52	5,223.89
EZ SPOT	208 lt	761.18			2		1,522.36
CL,Tech(sx)	25 kg	14.44		335	375	4,837.40	5,415.00
me	25 kg	8.04		10	10	80.40	80.40
PAC-R	50 lb	170.74		36	46	6,146.64	7,854.04
PAC-L	50 lb	170.74		36	40	6,146.64	6,829.60
Soda Ash	25 kg	16.15		9		145.35	
BARAFILM	25 lt	159.7			1		159.70

VOLUMES		-	S BARITE : H BARITE :	A\$27,203.24 A\$28,496.00	A\$30,673.33 A\$30,673.33
Sea W.	bbl				
Drill W.	bbl	4506.3	3370		
other	bbl				
other	bbl				
Chemical	bbl	66.7	56		
Salvaged Mud	bbl				
TOTAL MUD USED	bbl	<u>4573</u>	3426		

COMMENTS



COMPANY GFE Resources Ltd

WEEKLY INVENTORY

Page 1

8 8 20 500 400 ଥ YEAR 1994 ਨ Ba 18/05 Rec Used 우 8 8 **8 8 8** 888 Bal 17/05 Rec Used 0 0 888 320 306 8 8 **8** 8 ಜ Bal 16/05 Used Rec 8 8 4 ° 02 04 05 04 36 Bal 15/05 Bal Used Rec 8 8 8 8 8 14/05 Used Rec 8 9 9 9 0 Ba 13/05 Used Rec **8 8 8** 200 400 400 **4** Bal **4 4 8** 8 8 8 360 12/05 Used Rec WELL Langley-1 **8** 은 25 kg 25 kg 25 kg 25 kg S Kg 25 kg 25 kg 25 kg ස ස 20 20 208 It DATE Size MATERIAL **BARACOR 129** AQUAGEL, sx KCL,Tech(sx) Caustic Soda BARACIDE CMCEHV Soda Ash Barite, sx Barite,sx **EZ SPOT** PAC-R PAC-L E.B



COMPANY GFE Resources Ltd

Page 2

WEEKLY INVENTORY

WELL Langley-1

Ba 23 200 400 600 22 10 ଥ YEAR 1994 25/05 Used Rec ၀ က 2 ജ 306 202 80 80 80 8 5 S_C 20 Bal 24/05 Used Rec Bal ನ 20 40 80 2 3 306 88 8 23/05 Used Rec ស្ត 9 02 04 05 04 ଷ୍ଠ ८ अ अ 290 Bal 22/05 Used Rec 우 306 888 300 Bal 21/05 Used Rec 8888 8 8 8 29 8 Bal 20/05 Used Rec ន 320 8 400 ജ 4 4 8 Ва 19/05 Used Rec 25 kg 50 kg 25 kg 25 kg 25 kg 25 kg 25 kg 50 lb 50 10 208 11 DATE Size MATERIAL BARACOR 129 AQUAGEL, sx Caustic Soda KCL, Tech(sx) BARACIDE CMCEHV Soda Ash Barite, sx EZ SPOT Barite, sx PAC-R PAC-L Line



Baroid Australia Pty Ltd COMPANY GFE Resources Ltd

WEEKLY INVENTORY

Mathematical Control of Math	(David)	COMPANY GFE Resources Ltd	H.	Resour	ces Ltc	<u> </u>																	F age
Single S		WELL	Lang	ley-1								-										YEAR	1994
1	MATERIAL	DATE	100		L	\neg	i					T			Used		·	Used		Ba	Used	01/06 Rec	Ba
25 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	AQUAGEL, sx	25 kg			╟	(0)	11 1	$\ - \ $	(0)	لــــالـ		9				111	306		11 1	306	_		306
25 15 15 15 15 15 15 15 15 15 15 15 15 15	BARACIDE	25 kg				+			+			=								-			-
25 14 250	BARACOR 129	25 kg	_	_	-	က	-		е	_		<u>ල</u>			6		e			၈			က
25 kg 4 4 20 1 400 400 400 400 400 400 400 400 400	Barite,sx	50 kg				200			500		ત	8		ŏ			500			800			80
Signature Sign	Berite,sx	25 kg			-	호	-	-	0		4			<u>\$</u>			9			0 0			9
20 kg kg 4	Caustic Soda	25 kg			-	72	-		8	-			2	+			9			5			3
200 II	CMCEHV	25 kg	1	4			_																
25 Kg 40	EZ SPOT	208 It								-													-
25 Rg	KCL, Tech(sx)	25 kg	4	0		8	8		ន				0	4	0		4		8				120
25 kg	Lime	25 kg		_	-							_											
30 b 10 10 30 7 2 40 40 10 30 10 30 40 40 40 40 40 40	PAC-R	Q1 0C		မ		14			4				4				9						4
	PAC-L	9 20 20				10			유				9				5)						4
	Soda Ash	25 kg				80			20			8		ä	0		×			8			ଯ
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COMPANY GFE Resources Ltd

Page 4

WEEKLY INVENTORY

WELL Langley-1

YEAR 1994 200 400 00 ß 왕 8 8 89 90//0 Used Rec 306 8 9 ß 용 8 8 Ba 90/90 Used Rec Ba 306 200 400 00 유 4 8 8 02/06 Bal Used Rec 원 4 ଯ 306 200 400 400 2 8 04/06 Bal Used Rec 306 5 & 4 8 8 ଥ 90/60 Bal Used Rec 4 200 400 306 8 02/06 Used Rec 8 수 25 kg 50 kg 25 kg 50 lb 50 E 208 11 DATE Size MATERIAL BARACOR 129 EZ SPOT KCL, Tech(sx) Lime AQUAGEL, sx Caustic Soda BARACIDE BARAFILM CMCEHV Soda Ash Barite, sx Barite, sx PAC-R PAC-L



GFE Resources Ltd Langlev – 1 COMPANY



LOCATION Otway Basin, Victoria

CILIATION MATERIAL REC

DATES: FROM 12-May-94 TO 07-Jun-94

COMPANY		GFE Resor Langlev – 1	GFE Resources Ltd anglev 1							CONT/RIG	CONT/RIG (Jeway Da Jentury R	Century Rig 11		TO	TO 07-Jun-94
		ON SITE	DELIVERIE	DELIVERIES BY DT No.	<u>o</u> .				INTERV	INTERVAL USEAGE						
MATERIAL	UNIT	PRICE	_	DT 337077 DT 337186 DT 337092	DT 337092	GFE stock	TOTAL	VALUE	(1) (2)		(3)	TOTAL	VALUE	INVEN	VALUE (A\$)	COMMENTS
>9 130 VI 10 V	35 kg	14.33			5000		423	6061.59				126	1805.58		4384.98	
BABACIDE	25 kg	<u> </u>					-	549.92			-	-	549.92			
BARACOR 129	25 kg	64.96		8			80	519.68			5	5	324.8	က	194.88	Balance to Cobden
Barite.sx	50 kg	_		200			200	3192						200	3192	
Barite.sx	25 kg	<u>L</u>		400			400	3192						400	3192	
Caustic Soda	25 kg		40				40	1297.2		10	18	28	908.04	12	389.16	Balance to Mylor – 1
CMC EHV	25 kg	_		49			49	5223.89		40	O	49	5223.89			
EZ SPOT	208 lt	_				က	က	2283.54			7	2	1522.36		761.18	_
KCL.Tech(sx)	25 kg	<u> </u>	360		120		480	6931.2	40		335	375	5415	65	938.6	Balance to Cobden
Lime	25 kg			10			10	80.4	10			10	80.4			-
PAC-R	50 lb	-	40		40		80	13659.2			46	46	7854.04		5805.16	-
PAC-L	50 lb	170.74	40		40	-	80	13659.2			40	40	6829.6		6829.6	
Soda Ash	25 kg	16.15		20			20	323						20	323	
BARAFILM	25 lt			2			2	319.4			-	-	159.7	-	159.7	Balance to Mylor-1
													-			
						 										
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TOTALS A\$	_							27.282.22					300/3.33	10	20110.21	10

BARUII

Baroid Australia Pty Ltd

SOLIDS CONTROL and MUD VOLUME ANALYSIS

PAGE 1

COMPANY GFE Resources Ltd

WELL Langley-1
LOCATION Otway Basin, Victoria

1994 CONT/RIG Century Rig 11

	ONTROL	10 - May	13-May	14-May	15-May	16-Mav	17 May	18-May	19-May	20-May	ZI-IVIQY
SOLIDS CO		50,50'80	50,50,80	50,50,80	50,50,80	50,50,80	50,50,80	50,50,80	50,50,80	50x50x80	50x50x80
Shaker 1	Screens	10.5	7.5	30,50,00	21	21	17	15	16.5	17	18
	Hrs Screens	10.5	7.5								
Shaker 2	Hrs										
Ob alson O	Screens										
Shaker 3	Hrs]									
Shaker 4	Screens										
Snaker 4	Hrs										
Desander	U/F ppg	10.4	10.5	:	11.6	11.5	11.4	11.1	11.2	11.3	
Desarider	bbl/hr	3.5	3.5		4.5	2.5	4	3	1.5	1.3	
	Hrs	1	1		12	21	17	11	15	12	
	bbl	4	4		54	53	68	33	23	16	
Desilter 1.	U/F ppg	10.8	11.2		11,4	11.4	11.1	11	11	10.7	
Desiller 1.	bbi/hr	10	5		5	7	6	6	4	3	
	Hrs	6.5	5		20	21	17	15	12	12	
	bbl	65	25		100	147	102	90	48	36	
Desilter 2.	U/F ppg										
Desiliei 2.	bbl/hr				ļ					ļ	
)	Hrs										
,	bbl				l						
Centrifuge											
Centriuge	O/F ppg	:			į						
	U/F ppg										
	bbl/hr										
	Hrs					İ					
	bbl										
Centrifuge :											
Centrituge .	O/F ppg									}	
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	U/F ppg bbl/hr						l				
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	<u>Hrs</u> bbl										
VOLUMES		12-May	13-May	14-May	15-May	16 May	17-May	18-May	19-May	20-May	
Downhole \								288	206		040
DOM!!!!OIC	Valume	128	84	84	145	228	272		296		312
		128	84	84	145	74		74	34	14	
Initial Rese	rve	128	84	84	145						
	rve Act Mud	128	84	84	145				34		
Initial Rese	rve Act Mud Seawater	128	84	84	145						
Initial Rese	rve Act Mud Seawater Drill-Water	128	84	84		74	74	74	34		
Initial Rese	rve Act Mud Seawater Drill—Water other	128	84	84		74	74	74	34		
Initial Rese	Act Mud Seawater Drill-Water other	128	84	84	135	130	74	74	200		14
Initial Reset Added:	Act Mud Seawater Drill-Water other other Chemical	128	84	84	135	130	60	74 220 1 34	200 1 14	14	14
Initial Reser Added: Final Reser	Act Mud Seawater Drill-Water other other Chemical	128			135	130	60	74 220 1 34 350	200 1 14 374	14	14
Initial Reser Added: Final Reser	Act Mud Seawater Drill-Water other other Chemical	128	220	336	135 5 74	130 14 74	74 60 1 74	74 220 1 34	200 1 14	14	14
Initial Reser Added: Final Reser	Act Mud Seawater Drill-Water other other Chemical ve	128			135 5 74 336	130 4 74 450	74 60 1 74 450	74 220 1 34 350	200 1 14 374	14 14 374	14
Initial Reser Added: Final Reser	Act Mud Seawater Drill-Water other other Chemical ve Bes Mud Seawater		220		135 5 74 336	130 4 74 450	74 60 1 74 450	74 220 1 34 350	200 1 14 374	14	14
Initial Reser Added: Final Reser	Act Mud Seawater Drill-Water other other Chemical ve Bes Mud Seawater Drill-Water	425			135 5 74 336 66	130 4 74 450 134	74 60 1 74 450 61	74 220 1 34 350	200 1 14 374	14 14 374	14
Initial Reser Added: Final Reser	Act Mud Seawater Drill-Water other other Chemical ve Bes Mud Seawater Drill-Water		220		135 5 74 336 66	130 4 74 450 134	74 60 1 74 450 61	74 220 1 34 350	200 1 14 374	14 374 80	14
Initial Reser Added: Final Reser	Act Mud Seawater Drill-Water other other Chemical ve Bes Mud Seawater Drill-Water other	425	220		135 5 74 336 66	130 4 74 450 134	74 60 1 74 450 61	74 220 1 34 350	200 1 14 374 221	14 374 80	14
Initial Reser Added: Final Reser Initial Active Added:	Act Mud Seawater Drill—Water other Chemical ve Res Mud Seawater Drill—Water other other	425	220 400		135 5 74 336 66	130 4 74 450 134 250	74 60 1 74 450 61	74 220 1 34 350	200 1 14 374 221	14 374 80 3 52	14 14 389
Initial Reser Added: Final Reser	Act Mud Seawater Drill—Water other other Chemical ve Res Mud Seawater Drill—Water other other Chemical	425 4 69	220 400		135 5 74 336 66 435	130 4 74 450 134 250	74 60 1 74 450 61 120	74 220 1 34 350 261	200 1 14 374 221	14 374 80 3 52	14 14 389
Added: Final Reser Initial Active Added:	Act Mud Seawater Drill—Water other Chemical Ve B Res Mud Seawater Drill—Water other other Chemical Seawater Other	425	220 400		135 5 74 336 66 435	130 4 74 450 134 250	74 60 1 74 450 61 120	74 220 1 34 350 261 123 63 35	200 1 14 374 221 71 82 60	14 374 80 3 52	14 14 389 60 18
Final Reser Initial Active Added:	Act Mud Seawater Drill—Water other Chemical ve Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole	425 4 69 12	220 400 29 299	336	135 5 74 336 66 435 154 172	74 130 4 74 450 134 250	74 60 1 74 450 61 120	1 34 350 261 123 63 35 374	34 200 1 14 374 221 71 82 60 374	14 374 80 3 52	14 389 60 18 311
Final Reser Initial Active Added: Losses:	Act Mud Seawater Drill—Water other other Chemical Ve Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole	425 4 69 12	220 400 29 299 336	336	135 5 74 336 66 435 154 172 450	74 130 4 74 450 134 250 200 51 50 450	74 60 1 74 450 61 120 170 47 20 350	74 220 1 34 350 261 123 63 35	200 1 14 374 221 71 82 60	14 374 80 3 52	14 389 60 18 311
Final Reser Initial Active Added: Losses:	Act Mud Seawater Drill—Water other other Chemical Ve Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole	425 4 69 12	220 400 29 299	336	135 5 74 336 66 435 154 172 450	74 130 4 74 450 134 250 200 51 50 450	74 60 1 74 450 61 120 170 47 20 350	123 63 35 374 408	71 82 60 374 388	14 374 80 3 52 389 403	14 389 60 18 311 325
Final Reser Initial Active Added: Losses: Final Active Total Final DILUTION	Act Mud Seawater Drill—Water other other Chemical Ve Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole	425 4 69 12 220 220	220 400 29 299 336 336	336	135 5 74 336 66 435 154 172 450	74 130 4 74 450 134 250 200 51 50 450	74 60 1 74 450 61 120 170 47 20 350 424	123 63 35 374 408	71 82 60 374 388	14 374 80 3 52 389 403	14 389 60 18 311 325
Final Reser Initial Active Added: Losses: Final Active Total Final DILUTION Interval Type	Act Mud Seawater Drill—Water other other Chemical Ve Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole	425 4 69 12 220 220 Sect 1.	220 400 29 299 336 336	336 336 336	135 5 74 336 66 435 154 172 450 524	130 4 74 450 134 250 200 51 50 450 524	74 60 1 74 450 61 120 170 47 20 350 424	123 63 35 374 408	71 82 60 374 388 Sect 2.	14 374 80 3 52 389 403 Sect 2. 1438	14 389 60 18 311 325
Final Reser Initial Active Added: Losses: Final Active Total Final DILUTION Interval Typ Depth m	Act Mud Seawater Drill—Water other other Chemical Ve Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole Volume	425 4 69 12 220 220 Sect 1.	220 400 29 299 336 336 336	336 336 336	135 5 74 336 66 435 154 172 450 524 Sect 2. 690	130 4 74 450 134 250 200 51 50 450 524 Sect 2. 1062	74 60 1 74 450 61 120 170 47 20 350 424 Sect 2.	123 63 35 374 408 Sect 2.	71 82 60 374 388	14 374 80 3 52 389 403	14 389 60 18 311 325 Sect 2. 1438
Final Reser Initial Active Added: Losses: Final Active Total Final DILUTION Interval Typ Depth m Daily drilled	Act Mud Seawater Drill—Water other other Chemical Ve Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole Volume	425 4 69 12 220 220 Sect 1. 223 218	220 400 29 299 336 336 336 340 117	336 336 336	135 5 74 336 66 435 154 172 450 524 Sect 2. 690 350	130 4 74 450 134 250 200 51 50 450 524 Sect 2. 1062 372	74 60 1 74 450 61 120 170 47 20 350 424 Sect 2. 1257 195	123 63 35 374 408 Sect 2.	71 82 60 374 388 Sect 2.	14 374 80 3 52 389 403 Sect 2. 1438	14 389 60 18 311 325
Final Reser Initial Active Added: Losses: Final Active Total Final DILUTION Interval Typ Depth m Daily drilled Daily Dilutio	Act Mud Seawater Drill—Water other other Chemical Ve Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole Volume	425 4 69 12 220 220 Sect 1. 223 218 81	220 400 29 299 336 336 336 317 328	336 336 336	135 5 74 336 66 435 154 172 450 524 Sect 2. 690 350 326	74 130 4 74 450 134 250 200 51 50 450 524 Sect 2. 1062 372 301	74 60 1 74 450 61 120 170 47 20 350 424 Sect 2. 1257 195 237	123 63 35 374 408 Sect 2. 1321 64 221	71 82 60 374 388 Sect 2. 1363 42	14 374 80 3 52 389 403 Sect 2. 1438 75	14 389 60 18 311 325 Sect 2. 1438
Final Reser Initial Active Added: Losses: Final Active Total Final DILUTION Interval Typ Depth m Daily drilled Daily Dilutio Daily Cons	Act Mud Seawater Drill—Water other other Chemical Ve Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole Volume Chemical Column bol Down bol Down bol	425 4 69 12 220 220 Sect 1. 223 218 81 429	220 400 29 299 336 336 336 Sect 1. 340 117 328 400	336 336 336	135 5 74 336 66 435 154 172 450 524 Sect 2. 690 350 326 575	74 130 4 74 450 134 250 200 51 50 450 524 Sect 2. 1062 372 301 384	74 60 1 74 450 61 120 170 47 20 350 424 Sect 2. 1257 195 237 181	123 63 35 374 408 Sect 2. 1321 64 221 221	71 82 60 374 388 Sect 2. 1363 42 213 201	14 374 80 3 52 389 403 Sect 2. 1438 75 52	14 389 60 18 311 325 Sect 2. 1438
Final Reser Initial Active Added: Final Reser Initial Active Added: Losses: Final Active Total Final DILUTION Interval Typ Depth m Daily drilled Daily Dilutio Daily Cons Interval Dri	Act Mud Seawater Drill—Water other other Chemical Ve Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole Volume Oe d m on bbl umption bbl	425 4 69 12 220 220 Sect 1. 223 218 81 429 218	220 400 29 299 336 336 336 Sect 1. 340 117 328 400 335	336 336 336 340	135 5 74 336 66 435 154 172 450 524 Sect 2. 690 350 326 575 350	74 130 4 74 450 134 250 200 51 50 450 524 Sect 2. 1062 372 301 384 722	74 60 1 74 450 61 120 170 47 20 350 424 Sect 2. 1257 195 237 181 917	74 220 1 34 350 261 123 63 35 374 408 Sect 2. 1321 64 221 221 981	71 82 60 374 388 Sect 2. 1363 42 213 201 1023	14 374 80 3 52 389 403 Sect 2. 1438 75 52 83	144 389 60 18 311 325 Sect 2. 1438 78
Final Reser Initial Active Added: Final Reser Initial Active Added: Losses: Final Active Total Final DILUTION Interval Typ Depth m Daily drilled Daily Cons Interval Dri Interval Dri Interval Dri	Act Mud Seawater Drill—Water other other Chemical Ve Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole Volume In the control of the control Lost/Dumped DownHole In the control of the contro	425 4 69 12 220 220 Sect 1. 223 218 81 429 218 81	220 400 29 299 336 336 336 317 328 400 335 409	336 336 336 340	135 5 74 336 66 435 154 172 450 524 Sect 2. 690 350 326 575 350 326	74 130 4 74 450 134 250 250 250 450 450 524 Sect 2. 1062 372 301 384 722 627	74 60 1 74 450 61 120 170 47 20 350 424 Sect 2. 1257 195 237 181 917 864	123 63 350 261 123 63 35 374 408 Sect 2. 1321 64 221 221 981 1085	71 82 60 374 388 Sect 2. 1363 42 213 201 1023 1298	14 374 80 3 52 389 403 Sect 2. 1438 75 52 83 1098 1350	144 389 60 18 311 325 Sect 2. 1438 78 1098 1428
Final Reser Initial Active Added: Final Reser Initial Active Added: Losses: Final Active Total Final DILUTION Interval Typ Depth m Daily drilled Daily Cons Interval Dri Interval Dri Interval Dri Interval Dilutterval Dri Rate bbl/r	Act Mud Seawater Drill—Water other other Chemical Ve Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole Volume In the control of the control Lost/Dumped DownHole In the control of the contro	425 4 69 12 220 220 Sect 1. 223 218 81 429 218	220 400 29 299 336 336 336 Sect 1. 340 117 328 400 335	336 336 336 340	135 5 74 336 66 435 154 172 450 524 Sect 2. 690 350 326 575 350	74 130 4 74 450 134 250 200 51 50 450 524 Sect 2. 1062 372 301 384 722 627 0.87	74 60 1 74 450 61 120 170 47 20 350 424 Sect 2. 1257 195 237 181 917 864 0.94	123 63 350 261 123 63 35 374 408 Sect 2. 1321 64 221 221 981 1085 1.11	71 82 60 374 388 Sect 2. 1363 42 213 201 1023	14 374 80 3 52 389 403 Sect 2. 1438 75 52 83 1098 1350 1.23	144 389 60 18 311 325 Sect 2. 1438 78 1098 1428 1.3

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WELL

Langley-1 LOCATION Otway Basin, Victoria SOLIDS CONTROL and MUD **VOLUME ANALYSIS**

PAGE 2

COLUDE CO	CONT/RIG	Century R	23-May	24-May	25-May	26-Mav	27-May	28-May	29-May	30-May	31 – Ma
SOLIDS CO Shaker 1	Screens	50x50x80	50x50x80	50x50x80	50x50x80	50x50x80	50x50x80	50x50x80	50x50x80	50x50x80	50x50x8
maker	Hrs	6	8	24	24	15	12	2	. 9	24	1
Shaker 2	Screens									:	
J. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	Hrs										
Shaker 3	Screens										
	Hrs										
Shaker 4	Screens										
	Hrs			44.0	11.1	11	10.7	10.7	10.9	11	10
Desander	U/F ppg			11.3	1.25	1.25	1.2	1.25	1.2	1.2	1.
	bbl/hr			1	1.25	1.23	12	2	9	24	1
	Hrs			22	28	19	14	3	11	29	2
	<u>bbl</u>			22 10.7	10.5	10.3	10.1	10	10.1	10.3	-
Desilter 1.	U/F ppg				10.3	2	2	1.75	1.5	1.5	1
	bbl/hr			12	22	15	12	2	9	24	-
	Hrs			24	44	30	24	4	14	36	- 2
- "	bbl										
Desilter 2.	U/F ppg									1	
	bbl/hr										
	Hrs bbl										
O 1if 1	Feed ppg										
Centrifuge 1						•					
	O/F ppg U/F ppg	ļ									
	bbl/hr		,								
	Hrs										
	bbl										
Centrifuge 2											
Jenii liuge 2	O/F ppg		1								
	U/F ppg						-				
	bbl/hr										
	Hrs		ļ								
	bbl										
VOLUMES		22-May	23-May	24-May	25-May	26-May	27 - May	28-May	29-May		
Downhole Vo		312	312		364	379	382	382	389		39
Initial Reserv		14	14	14	14	14	14	14	14	14	
Added:	Act Mud										
Added:	Act Mud Seawater										
Added:	Seawater										
Added:											
Added:	Seawater Drill-Water										
Added:	Seawater Drill-Water other other					غ			·		
	Seawater Drill—Water other other Chemical	14	14	14	14	14	14	14	14	14	
Final Reserv	Seawater Drill—Water other other Chemical	14 311	14 308		14 419		14 437	14 419	14 389		
Final Reserv Initial Active	Seawater Drill—Water other other Chemical					14					
Added: Final Reserv Initial Active Added:	Seawater Drill – Water other other Chemical e			308	419	14 371	437		389	419	4
Final Reserv Initial Active	Seawater Drill—Water other other Chemical e Res Mud					14					4
Final Reserv Initial Active	Seawater Drill—Water other other Chemical e Res Mud Seawater			308	419	14 371	437		389	419	4
Final Reserv Initial Active	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water		308	308 205	419 75	14 371 126	437		389 90	419 83	4
Final Reserv Initial Active	Seawater Drill-Water other other Chemical e Res Mud Seawater Drill-Water other		308	308 205 9	419 75	14 371 126	40	419	90 2	419 83	4
Final Reserv Initial Active Added:	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other	311	308	308 205 9 46	75 4 72	14 371 126	437 40 3 38	419	90 2 25	419 83 1 65	4
Final Reserv Initial Active Added: Losses:	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other other Chemical	311	308	308 205 9 46	75 4 72	14 371 126	40	419	90 2	419 83	4
Final Reserv Initial Active Added: Losses:	Seawater Drill—Water other Other Chemical e Res Mud Seawater Drill—Water other other Chemical Solids Control	311 4 7	308 5	308 205 9 46 30	419 75 4 72 30	14 371 126 4 49	497 40 3 38 20	7 23	90 2 25 30	419 83 1 65 25	4
Final Reserv Initial Active Added: Losses:	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole	311 4 7 308	308 5 5 308	308 205 9 46 30 419	419 75 4 72 30 371	14 371 126 4 49	437 40 3 38 20 419	7 23 389	389 90 2 25 30 419	419 83 1 65 25 419	3
Final Reserv Initial Active Added: Losses:	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole	311 4 7	308 5 5 308	308 205 9 46 30 419	419 75 4 72 30 371	14 371 126 4 49	497 40 3 38 20	7 23	90 2 25 30	419 83 1 65 25 419	3
Final Reserv Initial Active Added: Losses: S Final Active Total Final V	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole	311 4 7 308 322	308 5 5 308 322	308 205 9 46 30 419 433	419 75 4 72 30 371 385	14 371 126 4 49 437 451	437 40 3 38 20 419 433	7 23 389 403	389 90 2 25 30 419 433	419 83 1 65 25 419 433	33
Final Reserv Initial Active Added: Losses: S Final Active Total Final V DILUTION	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole	311 4 7 308 322 Sect 2.	308 5 308 322 Sect 2.	308 205 9 46 30 419 433	419 75 4 72 30 371 385	14 371 126 4 49 437 451	40 3 38 20 419 433	7 23 389 403 Sect 2.	389 90 2 25 30 419 433 Sect 2.	419 83 1 65 25 419 433	33 3
Final Reserv Initial Active Added: Losses: S Final Active Total Final V DILUTION DICTION	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole	311 4 7 308 322	308 5 5 308 322	308 205 9 46 30 419 433 Sect 2.	419 75 4 72 30 371 385 Sect 2. 1666	14 371 126 4 49 437 451 Sect 2.	40 3 38 20 419 433 Sect 2.	7 23 389 403	389 90 2 25 30 419 433 Sect 2.	419 83 1 65 25 419 433 Sect 2. 1853	33 3 Sect 2
Final Reserv Initial Active Added: Losses: S Final Active Total Final V DILUTION Distribution	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole Colume	311 4 7 308 322 Sect 2. 1438	308 5 308 322 Sect 2. 1438	308 205 9 46 30 419 433 Sect 2. 1557 119	419 75 4 72 30 371 385 Sect 2. 1666 109	14 371 126 4 49 437 451 Sect 2. 1732 66	40 3 38 20 419 433 Sect 2. 1745 13	7 23 389 403 Sect 2. 1745	389 90 2 25 30 419 433 Sect 2. 1779 34	419 83 1 65 25 419 433 Sect 2. 1853 74	33 3 Sect 2
Final Reserv Initial Active Added: Losses: S Final Active Total Final V DILUTION Interval Type Depth m Daily drilled Daily Dilution	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole olume m bbl	311 4 7 308 322 Sect 2. 1438	308 5 308 322 Sect 2. 1438 5	308 205 9 46 30 419 433 Sect 2. 1557 119 76	419 75 4 72 30 371 385 Sect 2. 1666 109 102	14 371 126 4 49 437 451 Sect 2. 1732 66 49	40 3 38 20 419 433 Sect 2. 1745 13 58	7 23 389 403 Sect 2.	389 90 2 25 30 419 433 Sect 2. 1779 34 55	419 83 1 65 25 419 433 Sect 2. 1853 74 90	33 33 Sect 2
Final Reserv nitial Active Added: Losses: Final Active Total Final V DILUTION Interval Type Depth m Daily drilled Daily Dilution Daily Consu	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other Chemical Solids Control Lost/Dumped DownHole folume m bbl mption bbl	311 4 7 308 322 Sect 2. 1438 7 4	308 5 308 322 Sect 2. 1438 5	308 205 9 46 30 419 433 Sect 2. 1557 119 76 214	419 75 4 72 30 371 385 Sect 2. 1666 109 102 79	14 371 126 4 49 437 451 Sect 2. 1732 66 49 130	40 3 38 20 419 433 Sect 2. 1745 13 58 43	7 23 389 403 Sect 2. 1745 30	389 90 2 25 30 419 433 Sect 2. 1779 34 55 92	419 83 1 65 25 419 433 Sect 2. 1853 74 90 84	33 3 3 Sect 2 19
Final Reservential Active Added: Losses: Final Active Total Final V DILUTION Interval Type Depth m Daily drilled Daily Dilution Daily Consuler Interval Drilled Interval Drilled Daily Consuler Interval Drilled D	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other Chemical Solids Control Lost/Dumped DownHole olume m bbl mption bbl ed m	311 4 7 308 322 Sect 2. 1438 7 4 1098	308 5 308 322 Sect 2. 1438 5 5 1098	308 205 9 46 30 419 433 Sect 2. 1557 119 76 214 1217	371 385 Sect 2. 1666 109 102 79 1326	14 371 126 4 49 437 451 Sect 2. 1732 66 49 130 1392	437 40 3 38 20 419 433 Sect 2. 1745 13 58 43 1405	7 23 389 403 Sect 2. 1745 30 1405	389 90 2 25 30 419 433 Sect 2. 1779 34 55 92 1439	419 83 1 65 25 419 433 Sect 2. 1853 74 90 84 1513	33 33 Sect 2 19
Final Reserv Initial Active Added: Losses: Final Active Total Final V DILUTION Interval Type Depth m Daily drilled Daily Dilution Daily Consu Interval Drille	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other Chemical Solids Control Lost/Dumped DownHole olume m bbl mption bbl ed m	311 4 7 308 322 Sect 2. 1438 7 4 1098 1435	308 5 308 322 Sect 2. 1438 5 5 1098 1440	308 205 9 46 30 419 433 Sect 2. 1557 119 76 214 1217 1516	371 385 Sect 2. 1666 109 102 79 1326 1618	14 371 126 4 49 437 451 Sect 2. 1732 66 49 130 1392 1667	437 40 3 38 20 419 433 Sect 2. 1745 13 58 43 1405 1725	7 23 389 403 Sect 2. 1745 30 1405 1755	389 90 2 25 30 419 433 Sect 2. 1779 34 55 92 1439 1810	419 83 1 65 25 419 433 Sect 2. 1853 74 90 84 1513 1900	33 33 Sect 2 19
Final Reserv Initial Active Added: Losses:	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole olume m h bbl mption bbl ed m ion bbl	311 4 7 308 322 Sect 2. 1438 7 4 1098 1435 1.31	308 5 308 322 Sect 2. 1438 5 5 1098 1440 1.31	308 205 9 46 30 419 433 Sect 2. 1557 119 76 214 1217 1516 1.25	371 385 Sect 2. 1666 109 102 79 1326 1618 1.22	14 371 126 4 49 437 451 Sect 2. 1732 66 49 130 1392 1667 1.2	497 40 3 38 20 419 433 Sect 2. 1745 13 58 43 1405 1725 1.23	7 23 389 403 Sect 2. 1745 30 1405 1755 1.25	389 90 2 25 30 419 433 Sect 2. 1779 34 55 92 1439 1810 1.26	419 83 1 65 25 419 433 Sect 2. 1853 74 90 84 1513 1900 1.26	33 33 Sect 2 19:
Final Reserv Initial Active Added: Losses: Final Active Total Final V DILUTION Interval Type Depth m Daily drilled Daily Dilution Daily Consu Interval Drille Interval Dilutinerval Dilut	Seawater Drill—Water other other Chemical e Res Mud Seawater Drill—Water other other Chemical Solids Control Lost/Dumped DownHole olume m h bbl mption bbl ed m ion bbl	311 4 7 308 322 Sect 2. 1438 7 4 1098 1435	308 5 308 322 Sect 2. 1438 5 5 1098 1440	308 205 9 46 30 419 433 Sect 2. 1557 119 76 214 1217 1516 1.25 1868	371 385 Sect 2. 1666 109 102 79 1326 1618 1.22 1947	14 371 126 4 49 437 451 Sect 2. 1732 66 49 130 1392 1667	437 40 3 38 20 419 433 Sect 2. 1745 13 58 43 1405 1725	7 23 389 403 Sect 2. 1745 30 1405 1755	389 90 2 25 30 419 433 Sect 2. 1779 34 55 92 1439 1810	419 83 1 65 25 419 433 Sect 2. 1853 74 90 84 1513 1900 1.26 2296	33 33 Sect 2 19 15 19 1. 23

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SOLIDS CONTROL and MUD **VOLUME ANALYSIS**

COMPANY PAGE 3 WELL Langley-1 Otway Basin, Victoria LOCATION 1994 Century Rig 11 CONT/RIG **TOTALS** 05-Jun 06-Jun 07-Jun 04-Jun 03-Jun 01-Jun SOLIDS CONTROL 50x50x80 | 50x50x80 | 50x50x80 | 50x50x80 | 50x50x80 50x50x80 50x50x80 Shaker 1 Screens 319.5 3 1.5 24 1.5 2 Hrs Screens Shaker 2 Hrs Screens Shaker 3 Hrs Screens Shaker 4 Hrs 10.5 10.5 10.5 10.7 10.9 U/F ppg 10.7 Desander 1.2 1.2 1 1.2 1.2 1.2 bbl/hr 246.5 3 1 24 1.5 2 Hrs 442 1 1 4 29 2 2 bbl 10 10 10 10.3 10.1 10 Desilter 1. U/F ppg 1.25 1.5 1.5 1.5 1.5 1.5 bbl/hr 255 1 1.5 3 2 24 Hrs 865 1 5 2 3 36 2 bbl U/F ppg Desilter 2. bbl/hr Hrs bbl Feed ppg Centrifuge 1 O/F ppg U/F ppg bbl/hr Hrs bbl Centrifuge 2 Feed ppg O/F ppg U/F ppg bbl/hr Hrs bbl 07-Jun 05-Jun 06-Jun 04-Jun VOLUMES bbl Jun Jun 03-Jun 416 416 416 416 416 416 Downhole Volume 396 14 14 14 14 14 14 14 Initial Reserve Act Mud Added: Seawater 745 Drill-Water other other £ 12 Chemical 14 14 14 14 14 14 14 Final Reserve 405 370 368 339 419 385 371 Initial Active 743 Res Mud Added: Seawater 2625 70 3 135 Drill-Water 40 other other 45 Chemical 4 1307 2 4 9 3 65 Losses: Solids Control 5 1054 3 5 20 20 10 Lost/Dumped 311 10 65 30 23 DownHole 325 339 405 370 368 385 419 Final Active 384 382 353 339 433 419 Total Final Volume 399 DILUTION Sect 2. Interval Type 2006 2006 2006 1915 2006 2006 2006 Depth m 2001 91 Daily drilled m 5 2672 35 73 32 14 85 14 Daily Dilution bbl 25 3427 3 139 71 40 Daily Consumption bbl 1666 1666 1666 1666 1666 1666 nterval Drilled m 1575 2249 2263 2144 2217 2109 Interval Dilution bbl 2010 2095 1.33 1.35 1.36 1.27 1.29 1.26 1.28 Rate bbl/m

2524

1.52

2524

1.52

2385

1.51

Interval Consumption bbl

Rate bbl/m

2524

1.52

2595

1.56

2598

1.56

2598

1.56



COMPANY GFE Resources Ltd

WATER BASE MUD PROPERTIES

Pede 1

10.3 0.46/1 7.5 8 -4. 0.5 ଞ 6. 9 œ œ <u>0</u> 8 24:00 5 1438 80 æ 46 & စ္လ 8 2 YEAR 1994 Z 23/05 0.51/1 0.2 60 4.4 0.1 4.0 8 8 2.7 5.7 04:35 9 24 0 1438 15 7. 8.5 ജ 3 22/05 0.45 2.6 0.2 5 4. ئ 8 8 0.49 5 7 8 0 17:30 80 8 8 1438 5 3 Z 21/05 0.8 0.52/0 0.54/0 0.51/0 0.47/0 0.50/0 0.50/1 89 5.7 8 **ග** අ 20 ଚ ജ 34 24 12:15 21:30 (C) 0.5 0.05 4 0 4 8 2 8 8 8 0 8.5 64 8 5 တ (၁ 27 ස 24 7 9 0.5 0.05 'n 8.5 8 ဖ 0.7 24:00 12:00 24:00 1363 8 5 ജ S 8 = 7 8 3 0.05 0.05 9 <u>ب</u> മ മ <u>გ</u> 8 8.5 6 1383 2 80 (2) ಜ ജ 各 19/05 ଞ ₹ 2.7 0.05 95.3 8 **4** တ ထ္က 80.55 0 8 2 တ బ Ξ ଯ 1321 0.05 0.5 2,7 **\$ 4** თ თ 9 11:30 23 위 1257 80 앋 ജ ຊ ю О ജ 18/05 0.45/1 0.45/1 0.5 0.05 윙 **4** 2 ႘ 6.8 ტ დ 24:00 1257 80 ജ 0 4 26 9 0.05 15:00 0 മ හි 2,7 1219 ი დ 0. 80 හ ල တ္ 23 ജ **4** 92 5.6 0.21/1 0.26/4 0.49/0 0.49/0 96.5 0.5 0.03 ន ရ ω 4 6 8.5 ន 12:40 | 24:00 | 12:00 | 24:00 1062 89 99 4 8 8 ଞ 2.7 0 0.05 95.3 0.07 수 4.6 얻 80 2 ឧ ೪ თ 4 ജ 16/05 833 8 ପ୍ଷ 2.6 9.03 0.12 <u>რ</u> 96.5 **4** 80 (3) 9. 4. 0.7 8 8.8 ဗ္ဟ ର ଯ ន 8 24 ଞ S 9 2.7 10.5 0.15 0.17 9 8 80 5 3.8 S 7 8 හ ල 各 4 ജ <u>क</u> 14/05 0.03 റ്റ 0.4 8 9 12.2 940 ജ ଞ Ξ 24:00 05:00 20:00 S N LOO 0.03 8 R 0.3 0.05 0.07 23 8 <u>တ</u> 3.8 တ္တ <u>.</u> 940 12.2 4 F 13/05 **4** ස 일 1.5 2.6 18 S 902 96.5 ن 4.5 14 223 12.2 8.8 수 4 8 28 <u>რ</u> 0 ပ္ WELL Langley-1 16:00 83 89 g Z % Wt Soln mg/Lx103 mg/Lx103 32nd ins N or OUT ml/30min ml/30min 1b/100 ft² Ib/100 H² lb/100 ft² lb/100 ft² 15/100 ft² lb/100 ft² Ib/100 ft² 32nd ins 1b/100 ft² Ib/100 ft² Ib/100 ft2 <u>ار</u> % ام % meter ام % sec/at 0.84% Vol mg/L ၁၁/၆ a d d Ē Έ Ε hrs ĥ. g, <u>2</u> ပွ Methylene Blue cap Time Sample Taken HPHT Filter Cake Sample Location Funnel Viscosity Total Hardness Plastic Viscosity API Filter Cake ASG of Solids K+ Ion Conc Flowline Temp Alk. Filtrate Pl HPHT Filtrate Alk. Mud Pm Gel - 10 min Gel - 10 sec Gel - 30 min HPHT Temp 0il Content API Filtrate Yield Point Chlorides 200 rpm Calcium Hole Size 300 rpm 100 rpm AK. M 600 rpm 6 70 70 Water ء ج Weight Solids Sand



COMPANY GFE Resources Ltd

Page 2

WATER BASE MUD PROPERTIES

0.3 0.2 17.5 හු 0.54/1 17.2 5.5 ឧ 2.8 ន 0.1 9 75 75 11:89 2006 8.5 9.3 8 **金** 8 ₹5 \ ω 은 စ္ YEAR 1994 Z 04/06 0 0 0 0 0 0 0 0 0 0 0 0 17.5 0.53/1 17.2 29 5.5 ន ន R 2006 16 7.5 9 19:00 80. 9 **备 备** 90/60 2.9 0.35 17.7 17.2 53 <u>რ</u> 0 ജ ន 0.51/1 0.55/1 0.56/ 80 7.5 93 8 유 ξ 24:00 12:45 02:30 1965 2006 4 8 റ്റ 8 17.5 17.2 0.25 တ လ 0.0 8.3 S ဗ္ဗ മ ନ 02/06 9.35 8 ଷ 8 <u>_</u> 37 4 ij 0.5 0.45 16.5 93.5 0.3 65 60 <u>1</u>9 വ മ 1915 တ 80 1 5 9 ស ପ୍ଷ 2 7.1 01/06 0.35 16.5 ಬ 2.8 0.55/0 0.54/1 6 9.2 10:45 23:45 11:15 17:10 9 80 <u>ග</u> \$ 8 ജ 5 4 17.2 0.3 0.03 93.5 S <u>ო</u> 0 20 හ က 8.5 7.2 9 စ္ 34/05 1853 1897 **&** 4 ജ 쓴 4 0.53/1 93.5 0.35 0.25 0.4 17.2 Ŋ 8 ន 80 C3 <u>ග</u> വ 44 42 ည္လ 4 Z 0.52/1 0.3 93.5 0.5 0.4 0.00 17.2 <u>გ</u> ន 8.5 တ മ œ 48 1821 **4** 8 4 ଖ 0.54/1 93.5 17.8 <u>ල</u> 0.2 4.0 വ ရှ 23:25 3. <u>က</u> 1779 9.35 8 **4** ജ 29/05 18.5 0.52/1 17.2 0.3 0.5 0.35 റ 93.5 ន <u>4</u> 24:00 1745 <u>დ</u> 18 **4 \$** 28/02 0.35 0.25 മ 6.8 ജ 3.5 0.48/1 0.46/1 0.54/1 0.54/1 0.51/1 0.54/1 93 13 8 1745 80 왕 **쇼** & 8 ୍ଷ 0 08:30 18:00 **4** 17.2 0.3 93 1745 4. 94 9 გ გ മ 80 6.5 7 8 0 9.58 ଷ 4 ន Ж ភ 17.2 4 3.2 9 0.3 8 8 4. 3 12:15 | 24:00 || 13:00 | 22:35 || 09:30 | 15:35 | 1732 0 9.3 8 g 17.2 80 თ თ 0.4 о. Э 8 8 1719 9.25 4. 10. 8 0 26/05 ଜ ₹ 4 **4** 7 ö o Ci 17.8 9.3 0.3 0.4 10.5 8 8.5 9.2 6.4 8 9 8 S စ္ <u>е</u> 1666 8 33 **4** ដ ਨ Z 17.8 0.13 0.3 4.0 0 10.0 8 <u>တ</u> 4. G 8 1623 80 8 9.25 ß (L) <u>რ</u> 25/05 \$ ജ ଷ 8 బ్ ജ Z 0.49/1 0.49/1 0.25 20.5 0.13 0.12 18.4 9 10 တ 4.0 3 8 ტ (7) 0 ജ <u>e</u> 257 (C) 4 Langley-1 Z 18.4 0.45 0.12 8 G 2.2 8.93 8 დ დ 4 505 മ 8 42 ജ 8 ຊ 20.1 24/05 WELL mg/Lx103 % Wt Soln mg/Lx103 32nd ins N or OUT ml/30min 1b/100 ft² lb/100 ft² ml/30min 1b/100 ft² lb/100 ft² Ib/100 ft2 32nd ins Ib/100 ft² Ib/100 ft² 15/100 ft² 1b/100 ft² Ib/100 ft² sec/at م الا <u>ه</u> % ۵ % meter 0.84% Vol 틷 mg/L qdd Ε Ξ Ē Time Sample Taken hrs J. 2 ပွ ٤ Methylene Blue cap HPHT Filter Cake Sample Location Total Hardness Funnel Viscosity Plestic Viscosity ASG of Solids Flowline Temp API Filter Cake K+ Ion Conc Alk. Filtrate PI Gel - 10 min HPHT Filtrate Alk. Mud Pm Gel - 10 sec Gel - 30 min HPHT Temp Oil Content API Filtrate Yield Point Chlorides Hole Size 200 rpm Calcium 100 rpm 600 rpm 300 rpm AK. M Weight Solids Water 6 rpm Sand 309



Hole Size

Depth

600 rpm

Weight

100 rpm 200 rpm 300 rpm

6 rpm

aron Brom

Baroid Australia Pty Ltd

COMPANY GFE Resources Ltd

Page 3

WATER BASE MUD PROPERTIES

YEAR 1994 0.3 0.2 ន 15 ន 5 2 5.7 8.55 2006 93 ନ୍ଧ 20 R R 19:00 \$ 90//0 2.8 0.54/1 9.0 5 0.3 ର ର 0.5 0.1 8.7 5.7 18:35 2006 80 <u>ග</u> 8 8 8 4 90/90 0.55 2.8 0.56/1 14.9 0.25 ន ន 20:15 5.7 0.1 ල ල 14 2006 18 80 4 2 2 4 WELL Langley-1 90/20 % Wt Soln mg/Lx103 mg/Lx103 1b/100 ft² 1b/100 ft² 1b/100 ft² ml/30min ml/30min 1b/100 ft² lb/100 H² 32nd ins N OUT 1b/100 ft² 32nd ins 1b/100 ft² 1b/100 ft² lb/100 ft² Ib/100 H² % Vol % Vol % \ 0.84% Vd meter mg/L mg/L ၁၁/၆ sec/at qdd bad E 망 Έ E Time Sample Taken hrs Ľ. ပွ Ε Methylene Blue cap HPHT Filter Cake Sample Location Total Hardness Funnel Viscosity Plastic Viscosity API Filter Cake ASG of Solids Flowline Temp Alk. Filtrate Pf K+ Ion Conc Gel - 10 min HPHT Filtrate Gel - 30 min Alk. Mud Pm Gel - 10 sec HPHT Temp Oil Content API Filtrate Yield Point Calcium

Chlorides

ء ۾ ج

Alk. Mf

Water

Sand

핍

Solids



Baroid Australia Pty Ltd

COMPANY GFE Resources Ltd
WELL Langley-1
LOCATION Otway Basin, Victoria
CONT/RIG Century Rig 11

	LOCATION Otway Basin, Victoria	DATES:	FROM 12-May-94
	CONT/RIG Century Rig 11		TO 07-Jun-94
	WITH WITH BUILD TOWN AND SOLVE THE S		WIN WIN

	IARKS						「#1·		ſ#2.			
	CONDITION & REMARKS	9					T1/B1/IN Trip for DST # 1.		T2/B2/IN Trip for DST	3 T.D.	Circulate / Wiper Trip	
	O LIII ON	T2/B2/G 1/16	T1/B1/G1/16	T2/B7/G1/16	T1/B1/IN	T2/B2/IN	31/IN Tri	20 % Core.	32/IN Tri	T2/B4/1 1/16 T.D.	ulate / M	-
		42 T2/I		<u>. </u>	<u>. </u>	<u> </u>	50 T1/I	49 20	46 T2/	<u> </u>	48 Circ	
	MOD VIS Sec											
	MT WIT			∞			9.3	9.3			6.0	
		10.6	5.47	7.33	5.67	5.82	5.82	6.46	6.93	6.93	6.93	
	PRES	575	750	1025	900	006	850	625	1100	1100	1125	
		0.75	<u>.</u> r	7.	1.75	1.5	1.5	5.	0.75	_	_	
		120	110	120	110	9	6	06	100	100	100	
11111	7 (000) X (000) Ib	15-20	20	10	15	15	20	13	25	20		
Š	PRIG His	12.5	59.5	79	93.5	150.5	153	155	199	220		
ļ		27.2	19.5	5.4	5.2	5.2	5.2	9.5	3.3	4.6		
	26 h	12.5	47	19.5	14.5	24	2.5	2	44	2		
		340	917	106	75	294	13	19	146	96		
		0	1257	1363	1438	1732	1745	1764	1910	2006	5006	
				1257	1363	1438	1732	1745	1764	1910	5006	
	<u> </u>											
	о Ш.(: '		13	43	d 3	(13	K13	ВП	x13			
		3x20	1x11 2x13	1x11 2x13	1x11 2x13	1x11 2x13	1x11 2x13	CORE BIT	1x11 2x13	3x13	3x13	
			17							ETD-517	ETD-517	
		S33SF	ETD-417	EDT-417	S82F	S82F	S82F	CD502	S82F	Ė	Ė	
	WAKE	SEC	VAREL	VAREL	SEC	SEC	SEC	D.B.	SEC	VAREL	VAREL	
	BIT SZE ins	īυ										
	NO.	RR# 1		RR# 2	က	4	2	9	RR # 5	RR# 7	RR # 7	
		Œ		Œ					<u>ac</u>	Œ	Œ	



COMPANY GFE Resources Ltd
WELL Langley-1
LOCATION Otway Basin, Victoria
CONT/RIG Century Rig 11

DIRECTIONAL SURVEYS

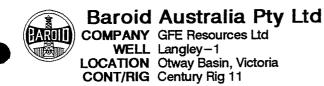
PAGE-1

MD m	TVD m	INCL°	DIR °	DISP m	
248		0.25			
335		0.75			
391		1			
468		0.75			
515		0.5			
660		1			
708		1			
870		0.5			
1004		1.5			
1033		2			
1091		1.5			
1158		0.5			
1196		1			
1228		1.5			
1244		1.25			
1276		1			
1305		1.75			
1331		1.75			
1363		1.75			
1527	1527	2			
1610	1610	1.5			
1808	1808	0.75			
2000	2000	1			

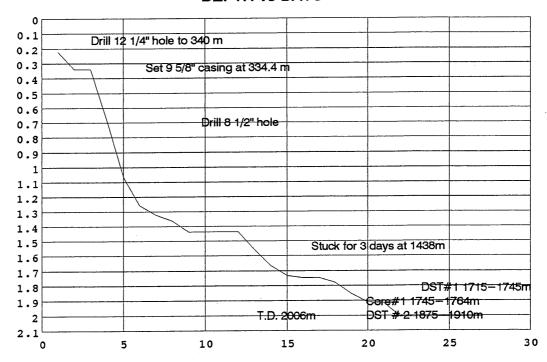
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GRAPH - 1 Metres Drilled 25 Consumption Rate = Mud Made INTERVAL CUMULATIVE DILUTION AND CONSUMPTION RATES 20 KOL / POLYMER - CONSUMPTION 8.5" Hole 15 DAYS ON WELL Dilution Rate = Initial Active - Final Active + Additions - Transfers - DILUTION 10 AQUAGEL/CMC Metres Drilled 8 1/2" hole Flocculated Native Glay **Baroid Australia Pty Ltd** 12 1/4" hole LOCATION Otway Basin, Victoria COMPANY GFE Resources Ltd CONT/RIG Century Rig 11 WELL Langley-1 0 0

30

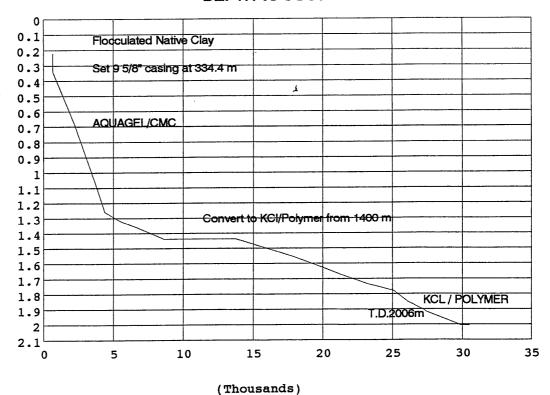


DEPTH vs DAYS



Days on Well

DEPTH vs COST



Cost - A\$

Depth m (Thousands)

Depth m (Thousands)

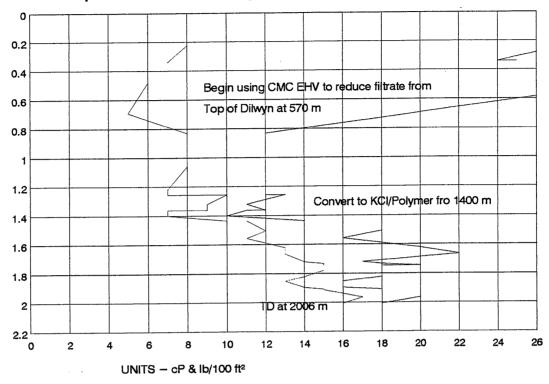


Depth-m (Thousands)

Baroid Australia Pty Ltd COMPANY GFE Resources Ltd

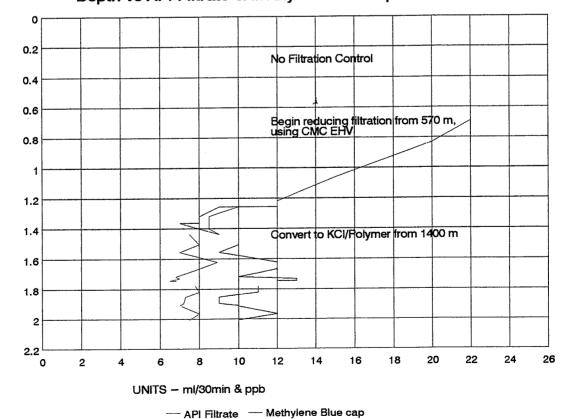
WELL Langley-1

Depth vs Plastic Viscosity & Yield Point



--- Plastic Viscosity --- Yield Point

Depth vs API Filtrate & Methylene Blue cap



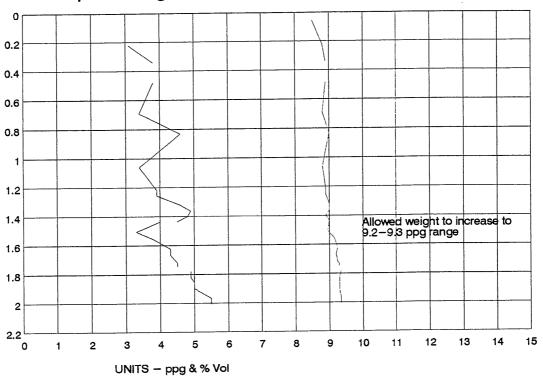
Depth-m (Thousands)



Depth-m (Thousands)

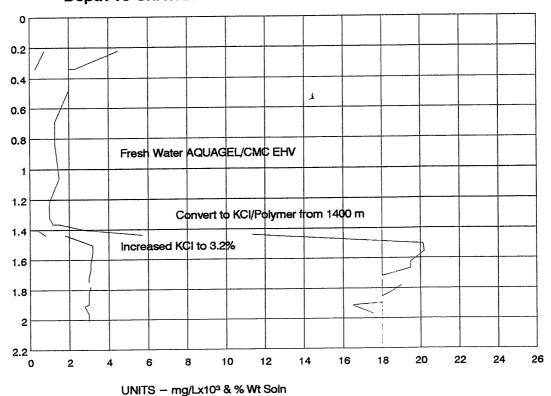
Baroid Australia Pty Ltd COMPANY GFE Resources Ltd WELL Langley-1

Depth vs Weight & Solids



- Weight - Solids

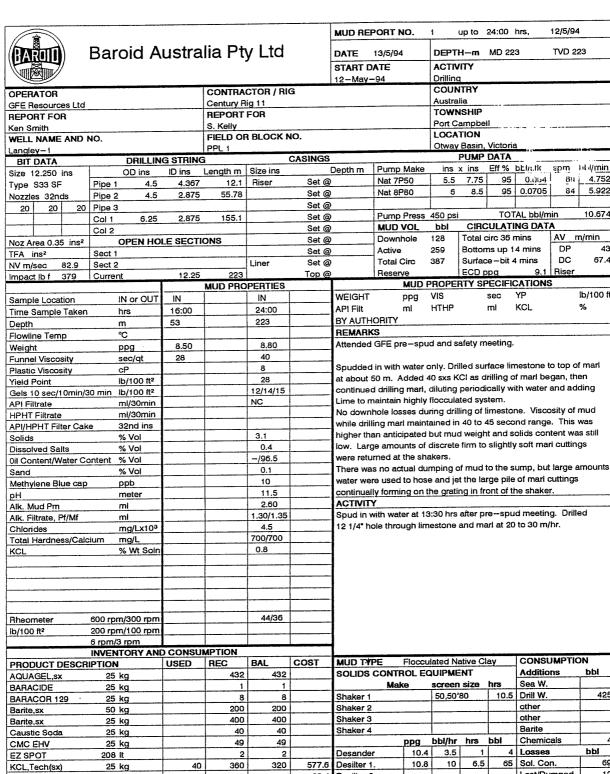
Depth vs Chlorides & KCL



- Chlorides - KCL

Depth-m (Thousands)

BLANK



bl-l/min

4.752

5.922

10.674

43

67.4

lb/100 ft3

bbl

bbl

425

69

m/min

MOL, IECHION		ng .									
Lime		kq	10	10		80.4	Desilter 2.			Lost/Dumped	12
PAC-R	50			40	40		Centrifuge 1			Down Hole	
PAC-L	50			40	40		Centrifuge 2			Newhole	104
Soda Ash		kg		20	20					NET GAIN	348
OOUU ASII		.vg					Solids Control	Effic.	%	Oscharged	81
BARC	ID Engineer		OFFICE		WAREHOL	ISE	D/	AILY COST	CUMI	JLATIVE COST	
M. Ole	ejniczak		Melbourne		Adelaide		A\$	658.00	A\$	6წ8.00	
	787103		03-6213311		08-47743						
THE RECOMM	MENDATIONS MA	ADE HER	EON SHALL NOT	BE CONS	TRUED AS	AUTHORIZI	NG THE INFRINGE	MENT OF ANY VAL	JID PATENT, A	ND ARE MADE	1

WITHOUT ASSUMPTION OF ANY LIABILITY BY BAROID DRILLING FLUIDS, INC OR IT'S AGENTS, AND ARE STATEMENTS OF OPINION ONLY.

TIME BREAKDOWN RESERVE PITS SURVEY DATA **SOLIDS ANALYSIS** hrs 10.5 DIR ° DISP m Low Grav. Solids % Vol 2.9 Drilling MD m TVD m INCL® bbl TYPE NO ppb 26.4 ow Grav. Solids Circulating Pill High Grav. Solids % Vol 0.2 Reaming In High Grav. Solids ppb 2.9 Reaming out ASG of Solids g/cc 2.70 Tripping Cuttings Volume bbl 104.0 Interval Dilution bbl/m 0.4 Interval Consumption bbl/m 2.0 AVE ROP m/hr 20.76

4							MUD REP	ORT NO	. 2	ι	up to 2	4:00 h	rs, 13/5/94	4
BAROID	Bar	oid A	ustral	ia Pty	y Ltd		START DA			DEPTH ACTIV WOC		MD 340	TVD 3	40
22521702				CONTRA	CTOR / RIG	3	12-Way-	94		COUN	TRY			
OPERATOR GFE Resources Ltd	d		1	Century R	•					Austral				
REPORT FOR				REPORT	FOR				1	TOWN				
Ken Smith				S. Kelly						LOCA	ampbell			
WELL NAME AND	NO.		1		R BLOCK N	Ю.					Basin, \	/ictoria	-	
Langley-1				PPL 1		CASINGS			تلـــــــــــــــــــــــــــــــــــــ		PUMP [
BIT DATA			G STRING	_ength m	Size ins		Depth m	Pump M	ake			Eff % b	bi/stk spm	bbl/min
Size 12.250 ins	Pipe 1	OD ins 4,5	ID ins 1 4,367	_engarm	Riser	Set @		Nat 7P5		5.5	7.75	95	0.054	
Type S33 SF Nozzles 32nds	Pipe 2		2.875		9 5/8"	Set @	334.43	Nat 8P8	0	6	8.5	95	0.0705	
	0 Pipe 3					Set @		<u> </u>		20	1	TOT	AL bbl/min	L
	Col 1	6.25	2.875			Set @		Pump P		oo psi bbl			IG DATA	
	Col 2					Set @		Downho		4	Total ci			m/min
Noz Area 0.92 ins		OPEN HO	LE SECTION	ONS		Set @ Set @		Active		36	Bottom			
TFA ins²	Sect				Liner	Set @		Total Ci		20	Surface	-	- mins DC	
NV m/sec Impact lb f	Sect :		12.25	5.6	1	Top @		Reserve			ECD p		8.9 Riser	
mipact in I	Curre			MUD PRO	PERTIES			N					ATIONS	II- (400 °
Sample Location		IN or OUT	OUT		IN		WEIGHT			/IS			(P (CL	lb/100 ft ²
Time Sample Take	en	hrs	05:00		20:00		API Filt	m	il F	HTHP	r	ni i	CL	76
Depth		m	340		340		BY AUTH							
Flowline Temp		℃	0.00		8.90		Maintaine	d mud d	uring la	ast sec	tion of h	ole by	water dilution	only, to
Weight		ppg sec/qt	8.90 40		42		allow acti	ive volum	e to inc	crease	. After v	viper tri	p had large an	nount of
Funnel Viscosity Plastic Viscosity		cP	7		7		cavings r	eturned to	surfa	ce. (up	to 2.5"	in size)	These tempo	rarily
Yield Point		lb/100 ft ²	24		25		blocked t	he flowlir	e, but	it was	quickly	cleared	by bypassing	the
Gels 10 sec/10mir	n/30 min	lb/100 ft ²	10/11/11		10/11/11		shaker po	ossum be	ily, an	d dum	ping tili i	ine wor	st had past. cavings was a	nain
API Filtrate		ml/30min	NC		NC		While circ	culating ti	ie casi	ng a is	re was i	ount of	lem with the flo	owline.
HPHT Filtrate		ml/30min					returned	SI IIIE SIII	ent wa	s num	ned, but	t no cer	nent returns w	ere
API/HPHT Filter C	ake	32nd ins	3.8		3.8		observed	at the sh	akers.	High	pH of re	turning	mud suggeste	ed the
Solids Dissolved Salts		% Vol	0.2		0.2		cement v	vas close	(late	meas	ured at	31' belo	ow surface)	
Oil Content/Water	Content		-/96.0		-/96.0		Hole obv	iously sig	nifican	itly ove	er guage).		
Sand	<u></u>	% Vol	0.1		0.2									
Methylene Blue c	ар	ppb	10		10		-							
рН		meter	9.0	ļ	8.8 0.40		ACTIVIT	Y						
Alk. Mud Pm		ml ml	0.50 0.05/0.07		0.05/0.07		Drilled to	340 m ca	asing p	oint at	05:00 h	rs. Cir	culated hole cl	ean
Alk. Filtrate, Pf/Mf Chlorides		mg/Lx10 ³	2.3	ļ	2.0		for 1/2 hr	r. Ran wij	er trip	, then	circulate	ed hole	clean for anoth	her hour.
Total Hardness/C	alcium	mg/L	200/200		200/200		POH and	1 ran 9 5/8	3" casc	ling, w	ashing I	ast join	t to bottom. Ci	irculated
KCL		% Wt Soln	0.3		0.3		casing fo	or 1 hr. C	ement	ed xca	sing with	ի 15.6 բ	pg neat slurre	y. woc.
					-		4							
					 		-							
							1							
Rheometer	600 rr	m/300 rpm	38/31		39/32		1							
lb/100 ft²		om/100 rpm]							
10/10011	6 rpm	/3 rpm					4							
	INVE	NTORY AN				T = = ==		mr (1	ete d N	lative Cl	av.	CONSUMPT	ION
PRODUCT DESC	CRIPTIO	N	USED	REC	BAL.	COST	MUD TY	CONTR				ay	Additions	bbl
				 	+		100000	Make			n size	hrs	Sea W.	
1			 	 			Shaker 1	!		50,50	,80	7.5	Drill W.	400
							Shaker 2						other	-
							Shaker 3					<u> </u>	other	
				1	I	ļ	Shaker 4			bbl/hr	hrs	<u> </u>	Barite	+
									ppg	. II 11/EII		nnı	Chemicals	
						 	Decarate					bbl 4	Chemicals Losses	bbl
							Desande	er	10.5	3.5	1	4 25	Losses	
							Desilter	er 1.			1	4	Losses	29
								er 1. 2.	10.5	3.5	1	4	Losses Sol. Con. Lost/Dumped Down Hole	299
							Desilter :	er 1. 2. ge 1	10.5	3.5	1	4	Losses Sol. Con. Lost/Dumped Down Hole Newhole	299 1 299 56
							Desilter Desilter Centrifuç Centrifuç	er 1. 2. ge 1 ge 2	10.5	3.5	1	25	Losses Sol. Con. Lost/Dumped Down Hole Newhole NET GAIN	299 1 299 56
BAROID E			OFFICE		WAREHO		Desilter Desilter Centrifuç Centrifuç	er 1. 2. ge 1 ge 2	10.5	3.5	1	4 25 %	Losses Sol. Con. Lost/Dumped Down Hole Newhole	299 1 299 56 72

Tel. 059-787103 03-6213311 08-477433

THE RECOMMENDATIONS MADE HEREON SHALL NOT BE CONSTRUED AS AUTHORIZING THE INFRINGEMENT OF ANY VALID PATENT, AND ARE MADE WITHOUT ASSUMPTION OF ANY LIABILITY BY BAROID DRILLING FLUIDS, INC OR IT'S AGENTS, AND ARE STATEMENTS OF OPINION ONLY.

Adelaide

Meibourne

M. Olejniczak

DECE	RVE PITS			SURVE	EY DATA			SOLIDS AN	ALYSIS	3	TIME BREAK	DOWN	hrs
NO	TYPE	bbl	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	3.6	Drilling		5
NO	Pill	551	248	1.00.11	0.25			Low Grav. Solids	ppb	32.8	Circulating		2.5
ļ	FIII		335		0.75			High Grav. Solids	% Vol	0.2	Reaming In		
								High Grav. Solids	ppb	2.9	Reaming out		
			 					ASG of Solids	g/cc	2.70	Tripping		7.5
			 					Cuttings Volume	bbi	56.0	Other		13.5
ļ	 		 					Interval Dilution	bbl/m	1.2			
	 		 		 			Interval Consumption	bbl/m	2.5			
			 								AVE ROP	m/hr	23.4

A\$ 0.00

A\$ 658.00

up to 24:00 hrs, MUD REPORT NO. Baroid Australia Pty Ltd DEPTH-m MD 340 DATE 15/5/94 START DATE ACTIVITY Making up BHA 12-May-94 COUNTRY CONTRACTOR / RIG **OPERATOR** Australia Century Rig 11 GFE Resources Ltd TOWNSHIP REPORT FOR REPORT FOR Port Campbell S. Kelly Ken Smith LOCATION FIELD OR BLOCK NO. WELL NAME AND NO. Otway Basin, Victoria Langley-PUMP DATA CASINGS DRILLING STRING BIT DATA Eff % bbl/stk ins x ins Length m Size ins Pump Make Depth m Size 8.500 ins QD ins ID ins 95 0.054 5.5 7.75 Set @ Nat 7P50 340 Riser Type ETD 417 4.367 Pipe 1 45 95 0.0705 6 8.5 Set @ 334.43 Nat 8P80 9 5/8" Pipe 2 4.5 2.875 Nozzles 32nds Set @ 13 Pipe 3 13 11 TOTAL bbl/min Set @ Pump Press - psi 6.25 2.875 Col 1 CIRCULATING DATA MUD VOL bbl Set @ Col 2 Total circ - mins Downhole 83 **OPEN HOLE SECTIONS** Set @ Noz Area 0.35 ins² Bottoms up - mins Active 336 Set @ Sect 1 TFA ins2 Surface-bit - mins Total Circ 419 Set @ Liner Sect 2 NV m/sec Reserve ECD ppg 56 Top @ Current Impact lb f MUD PROPERTY SPECIFICATIONS MUD PROPERTIES ΥP WEIGHT sec ppg IN or OUT Sample Location mi KCL API Filt mi Time Sample Taken hrs BY AUTHORITY m Depth REMARKS Flowline Temp °C 2x13, 1x11 nozzles selected for 8 1/2" bit to give following hydraulics, Weight ppg at 300 gpm. (maximum anticipated pump rate) Funnel Viscosity sec/qt Nozzle Velocity - 272 ft/sec сР Plastic Viscosity Impact - 379 lb lb/100 ft² Yield Point AV (collars) - 221 ft/min Gels 10 sec/10min/30 min lb/100 ft² AV (drill pipe) - 141 ft/min ml/30min API Filtrate Relatively low nozzle velocity should reduce hole wshout in loose ml/30min **HPHT Filtrate** sands, while annular velocities will easily clean hole. 32nd ins API/HPHT Filter Cake % Vol Solids % Vol Dissolved Salts 0il Content/Water Content % Vol % Vol Sand Methylene Blue cap ppb рΗ meter ACTIVITY Alk. Mud Pm ml Wait on cement. Used 14 sxs cement to do top up on surface casing. Alk. Filtrate, Pf/Mf ml Nippled up BOP and pressure tested. Began making up 8 1/2" BHA. mg/Lx103 Chlorides Total Hardness/Calcium mq/L % Wt Soln Rheometer 600 rpm/300 rpm 200 rpm/100 rpm lb/100 ft2 6 rpm/3 rpm INVENTORY AND CONSUMPTION CONSUMPTION Flocculated Native Clay COST MUD TYPE BAL PRODUCT DESCRIPTION USED REC Additions SOLIDS CONTROL EQUIPMENT creen size Make Sea W Shaker 1 50,50,80 Drill W. other Shaker 2 other Shaker 3 Barite Shaker 4 bbl/hr hrs bbl Chemicals PP9 Losses Desander

14/5/94

spm

ΑV m/min

DC

Riser

TVD 340

bbl/min

lb/100 ft²

bb

bbl

Sol. Con.

Lost/Dumped

Down Hole

%

NET GAIN Discharged Solids Control Effic DAILY COST CUMULATIVE COST WAREHOUSE OFFICE **BAROID Engineer** A\$ 658.00 A\$ 0.00 Adelaide M. Olejniczak Melbourne 08-477433 03-6213311 059-787103 THE RECOMMENDATIONS MADE HEREON SHALL NOT BE CONSTRUED AS AUTHORIZING THE INFRINGEMENT OF ANY VALID PATENT, AND ARE MADE WITHOUT ASSUMPTION OF ANY LIABILITY BY BAROID DRILLING FLUIDS, INC OR IT'S AGENTS, AND ARE STATEMENTS OF OPINION ONLY.

Desilter 1.

Desilter 2.

Centrifuge 1 Centrifuge 2

pres	RVE PITS			SURVE	Y DATA			SOLIDS AN	IALYSIS	TIME BREAKDOWN	hrs
NO	TYPE	bbl	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	Drilling	
NO	Pill	וטט	IND III	100111	1102			Low Grav. Solids	ppb	Circulating	
ļ	Pill		 		 			High Grav. Solids	% Vol	Reaming In	
 			ļ	ļ				High Grav. Solids	ppb	Reaming out	
			·		 		·	ASG of Solids	g/cc	Tripping	
			<u> </u>		 		 	Cuttings Volume	bbl	Other	24
				 			 	Interval Dilution	bbl/m		
	-		 	 			 	Interval Consumption	bbi/m		
	 		 	 	 					AVE ROP m/hr	

						MUD REF	ORT NO.	4	up to	24:00	hrs, 15/5/	94
BAROID	Baroid A	ustra	lia Pt	y Ltd	_	START D			TH-m	MD 69	O TVD	690
OPERATOR			CONTRA	CTOR / RIC	l	12-May-	94		JNTRY			
GFE Resources Ltd			Century R	-					tralia			
REPORT FOR			REPORT	FOR				1	NNSHIP Campbe	41		
Ken Smith			S. Kelly	BLOCK N	10				CATION			
WELL NAME AND I Langley-1	NO.		PPL 1	1 BLOOK I				Otw	ay Basin	Victoria	1	
BIT DATA	DRILLIN	G STRING			CASINGS					DATA		t- b-16
Size 8.500 ins	OD ins	ID ins	Length m			Depth m	Pump Ma		s x ins .5 7.75		bbl/stk spm 0.054	bbl/m
Type ETD 417	Pipe 1 4.5	4.367	480.5	Riser 9 5/8*	Set @ Set @	334.43	Nat 7P50 Nat 8P80	- 3	6 8.5			1 7.1:
Nozzles 32nds 11 13 13	Pipe 2 4.5 Pipe 3	2.875	55.26	9 5/6	Set @	004.40	Tract St. St.					
11 13 13	Coi 1 6.25	2.875	154.22		Set @		Pump Pre				AL bbl/min	7.1
	Col 2				Set @		MUD VOI			circ 84 I	NG DATA	m/min
Noz Area 0.35 ins²		LE SECTION	ONS		Set @ Set @		Downhole Active	450	ı	ms up 1	}	
TFA ins ² NV m/sec 82.9	Sect 1 Sect 2			Liner	Set @		Total Circ		1	ce – bit s	1	67
NV m/sec 82.9 Impact lb f 370	Current	8.5	355.6		Top @	- 1	Reserve					F
			MUD PRO						PERTY S		YP	lb/100
Sample Location	IN or OUT			IN		WEIGHT API Filt	ppg ml	VIS HTH	P		KCL	%
Time Sample Taken		12:40 481		24:00 690		BY AUTH		, , , , ,				
Depth Flowline Temp		401				REMARK	S			-		
Weight	ppg	8.90		8.80		Unable to	dilute hea	vily thro	ıgh Gellik	rand M	arl due to sma . Into Dilwyn :	II sump. sande fr
Funnel Viscosity	sec/qt	40		36 5		Mari mak	ıng mud ca n m. Bedin	iusing m nina to i	ua ring p educe filt	rate whi	ile maintaining	viscosit
Plastic Viscosity Yield Point	cP lb/100 ft ²	6 32		20			tional AQU				·	
Gels 10 sec/10min/3		15/17/20		18/24/30		l						
API Filtrate	ml/30min	NC		22.0		l						
HPHT Filtrate	ml/30min	<u> </u>										
API/HPHT Filter Cak	e 32nd ins % Vol	3.8		3.4								
Solids Dissolved Salts	% Vol	0.2		0.1		į						
0il Content/Water C	ontent % Vol	<i>−/</i> 96.0		-/96.5								
Sand	% Vol	0,1	 	10								
Methylene Blue cap pH	ppb meter	10.5		9.5								
Alk. Mud Pm	ml	1.60		0.70		ACTIVIT	Υ					
Alk. Filtrate, Pf/Mf	ml	0.15/0.17		0.10/0.12		RIH and	tagged cen	nent at 3	18 m. Dr	illed out	cement and s PIT test givin	:noe Will a 22 fi n
Chlorides	mg/Lx10 ³	2.0		1.3		FMW C	n annea on ontinued di	illina thr	ough ma	n. Had	to clear flowlin	e of
Total Hardness/Cald KCL	ium mg/L % Wt Soir		 	40/40		mud ring	at 395 m fo	or 1 hou	. Contin	ued drill	ing taking reg	ular surv
ASG of Solids	g/cc	2.7		2.6								
n&K		0.21/10.2	4	0.26/4.94		1						
				 		ł						
		 				1						
Rheometer	600 rpm/300 rpm	44/38		30/25]						
lb/100 ft ²	200 rpm/100 rpm	<u> </u>	ļ			1						
	6 rpm/3 rpm INVENTORY AN	D CONSU	MPTION	1		1						
PRODUCT DESCR		USED	REC	BAL	COST	MUD TY			SEL/CMC		CONSUMP	
AQUAGEL,sx	25 kg	68		364	974.44	SOLIDS	CONTROL				Additions	bbl
Caustic Soda	25 kg	2		38	64.86	Shaker 1	Make		en size 50,80	hrs 21	Sea W. Drill W.	
CMC EHV	25 kg	5		44	233.05	Shaker 1		130	-0,00		other	
		 	 	1		Shaker 3					other	
						Shaker 4			·	h-1	Barite	
						Desande	PP		hr hrs	bbl 54	Chemicals Losses	bbl
		-			-	Desilter 1		1.4	5 20		Sol. Con.	
						Desilter 2					Lost/Dumpe	d ·
						Centrifuc					Down Hole	
			ļ		 	Centrifug	je 2				Newhole NET GAIN	+-
		 	1		 	Solids Co	ontrol Effic.			%	Discharged	
BAROID Eng	ineer	OFFICE		WAREHOL	JSE	1	DAILY			CUMI	JLATIVE COS	
STATUTE CITY							A\$ 15	572.35	ξ.	A\$	2230.35	
	l l	44-11										
M. Olejniczak Tel. 059-787103		Melbourn 03-62133		Adelaide 08-4774	00		WΦ 15	71 2.0	•	ΖΨ	2200.00	

TIME BREAKDOWN SOLIDS ANALYSIS hrs RESERVE PITS SURVEY DATA Low Grav. Solids 18 DIR ° DISP m % Vol 3.4 Drilling TVD m INCL° NO TYPE bbl MD m ppb 30.9 Circulating 2.5 Low Grav. Solids 391 74 Pill Reaming In % Vol 0.2 High Grav. Solids 0.75 468 ppb 2.9 Reaming out 0.5 High Grav. Solids 515 2.5 1 Tripping ASG of Solids g/cc 2.60 660 **Cuttings Volume** Other bbl 80.0 Interval Dilution bbl/m 0.9 Interval Consumption bbl/m 1.6 AVE ROP m/hr 19.44

						MUD REP	ORT NO). E	5 1	up to	24:00	nrs, 1	16/5/94	
BAROID	Baroid A	ustra	lia Pt	y Ltd		START D			DEPTI ACTIV	TY	MD 100	52	TVD 10	62
OPERATOR			CONTRA	CTOR / RIG	G	12-May-	94		COUN					
GFE Resources Ltd			Century R	ig 11					Austra					
REPORT FOR			REPORT	FOR				1	TOWN	ISHIP ampbel	H			
Ken Smith			S. Kelly	BLOCK N	10				LOCA			-		
WELL NAME AND N Langley-1	IO.		PPL 1	I BLOOK I	···						Victoria	1		
BIT DATA	DRILLIN	G STRING		(CASINGS					PUMP				
Size 8.500 ins	OD ins		Length m	Size ins		Depth m	Pump M Nat 7P5		ins : 5.5	7.75	Eff %	0.054	spm	bbl/min
Type ETD 417	Pipe 1 4.5	4.367 2.875	841.4	Riser 9 5/8"	Set @ Set @			-	5.5	8.5	95	0.0705	101	7.121
Nozzles 32nds 11 13 13	Pipe 2 4.5 Pipe 3	2.015	33.20	9 3/0	Set @									
-11 10 10	Cal 1 6.25	2.875	165.29		Set @		Pump P					AL bbl/m		7.121
	Col 2				Set @		Downho		<u>bbl</u> 228		circ 95 r	NG DATA	AV π	n/min
Noz Area 0.35 ins²		LE SECTION	ONS		Set @ Set @		Active		450		ns up 2		DP	43
TFA ins² NV m/sec 82.9	Sect 1			Liner			Total Ci		678	į.	e-bit 8		DC	67.3
Impact lb f 370	Current	8.5	727.6		Top @		Reserve		74	ECD p		8.86	Riser	
			MUD PRO									YP		lb/100 ft
Sample Location	IN or OUT	IN		IN		WEIGHT API Filt	•		VIS HTHP	42-47		KCL		111/100 IC %
Time Sample Taken	hrs	12:00 832		24:00 1062		BY AUTH					••••			
Depth Flowline Temp	 ©	002		1002		REMARK	S							
Weight	ppg	9.00		8.80		Continue						e-hydrat	ted AQI	JAGEL
Funnel Viscosity	sec/qt	44		42		and CMC No proble						a hole et	ahla	
Plastic Viscosity	cP	8		12		No proble	ems with	sanos	OH SHE	ikeis, ii	luicatii	g noie su	abie.	
Yield Point Gels 10 sec/10min/3	lb/100 ft²	12 12/20/30		12/20/30		İ								
API Filtrate	ml/30min	20.0		15.0		1								
HPHT Filtrate	ml/30min					l								
API/HPHT Filter Cake		4/-		3/-	 	ł								
Solids	% Vol % Vol	4.6 0.1		0.1	 	l								
Dissolved Salts Oil Content/Water Co		-/95.3		-/96.5		1								
Sand	% Vol	0.1		0.1]								
Methylene Blue cap	ppb	10		10	<u> </u>	ł								
pH Alk, Mud Pm	meter mi	9.0 0.50	 	9.0		ACTIVITY	7							
Alk. Filtrate, Pf/Mf	ml	0.05/0.07		0.05/0.10		Drilled to	832 m.	Circula	ated ou	t for 1/2	hr the	n ran 25 s	stand w	iper
Chlorides	mg/Lx10³	1.3		1.5		trip to cas	sing shoe	. Ran	back i	n witho	ut prob	lems and	I no fill.	ina mor
Total Hardness/Calc		40/40		50/50		Continue					aucea c	nt weight	and tar	ang mor
KCL	% Wt Soln	2.7		2.6		Suiveys	is deviati		, euscu.	•				
ASG of Solids n & K	g/cc	0.49/0.94		0.49/0.94]								
						1								
		 		ļ	ļ	1								
Rheometer	600 rpm/300 rpm	28/20		28/20	 	i								
	200 rpm/100 rpm					1								
	6 rpm/3 rpm		l	<u> </u>	<u> </u>	ł								
	INVENTORY AN			BAL	COST	MUD TY	DE P	W/AO	UAGEL	/CMC		CONSL	JMPTIC	N
PRODUCT DESCRI	25 kg	USED 58	REC	306	831.14	SOLIDS						Additio		bbl
AQUAGEL,sx Caustic Soda	25 kg	3		35	97.29	l	Make		screen	size		Sea W.		
CMC EHV	25 kg	5		39	533.05				50,50,	,80	21	Drill W.		380
				ļ	 	Shaker 2 Shaker 3					₩	other		-
L			 			Shaker 4						Barite		
									bbl/hr		bbl	Chemic		4
		T				Desande		11.5			53	Sol. Col		bbl
					I .	Desilter 1	. 1	11.4	7	21	147	I SOL LIO	11.	200
				ļ										51
						Desilter 2						Lost/Du Down H	mped	
							e 1					Lost/Du Down H Newhol	imped lole e	51 50 86
						Desilter 2 Centrifug	e 1 e 2				%	Lost/Du Down H	mped lole e AIN	50

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Adelaide

M. Olejniczak

Melbourne

DESE	RVE PITS			SURVE	EY DATA			SOLIDS AN	IALYSIS	·	TIME BREAK	DOWN	hrs
NO	TYPE	bbl	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	3.4	Drilling		20.5
	Pre-Gel	74	708	110	1			Low Grav. Solids	ppb	30.9	Circulating		0.5
	Pre-Gei		870		0.5		·	High Grav. Solids	% Vol	0.3	Reaming In		
			1004		1.5		-	High Grav. Solids	dqq	4.4	Reaming out		
			1033		2			ASG of Solids	g/cc	2.60	Tripping		3
			1000	 				Cuttings Volume	bbl	86.0	Other		
					 			Interval Dilution	bbl/m	0.9			
			1				·	Interval Consumption	bbl/m	1.3			
			 		 		 	l			AVE ROP	m/hr	18.15

A\$ 3691.83

A\$ 1461.48

						MUD REF	ORT N	o. 6	5 L	ip to 2	24:00 h	nrs, 17/5/94	
	Baroid A	uetra	lia Pt	v I td		DATE	18/5/94		DEPTH	i-m	MD 125	7 TVD 12	257
BAROLL	Daiola A	uoua		y		START D			ACTIV				
						12-May-	-94		Drilling COUN				
OPERATOR				CTOR / RIC	3				Austral				
GFE Resources Ltd			Century R REPORT						TOWN				
REPORT FOR Ken Smith			S. Kelly						Port Ca				
WELL NAME AND	NO.			BLOCK N	Ю.				LOCAT		·		
angley-1			PPL 1		O A OUN CO				Otway	PUMP !			
BIT DATA		G STRING ID ins	Length m		CASINGS	Depth m	Pump I	Make			Eff % t	obl/stk spm	bbl/min
Size 8.500 ins	OD ins Pipe 1 4.5	4.367	1036.4	Riser	Set @		Nat 7P		5.5	7.75	95	0.054 136	7.344
Type ETD 417 Nozzies 32nds	Pipe 2 4.5	2.875		9 5/8"	Set @	334.43	Nat 8P	30	6	8.5	95	0.0705	
11 13 13					Set @				1000		TOT	AL bbl/min	7,344
	Col 1 6.25	2.875	165.29		Set @		MUD V		1000 ps bbl			NG DATA	7.544
	Col 2	E OFOTH	ONE		Set @ Set @		Downh		272		irc 85 m		n/min
Noz Area 0.35 ins² TFA ins²	OPEN HO	LE SEUTT	UNU		Set @		Active		350	Botton	ıs up 28		44.3
NV m/sec 85.5	Sect 2	er i meren i s		Liner	Set @		Total C		-,, ,,2-24		e-bit 9		69.4
Impact lb f 398	Current	8.5	922.6		Top @		Reserv			ECD p		8.96 Riser	
			MUD PRO	PERTIES		WEIGHT				40 – 45 :			lb/100 fi
Sample Location	IN or OUT	IN 10:00	 	1N 24:00		WEIGHT API Filt		-1-0	vio . HTHP			KCL 15 20	%
Time Sample Taken	hrs m	12:00		1257		BY AUTH			Mud Pr				
Depth Flowline Temp	°C	1219		1207		REMARK	S						
Weight	ppg	8.90		8.90		Allowing	bentonit	e conte	ent and	mud vo	olume to	o reduce, with a	im of
Funnel Viscosity	sec/qt	40		40		beginnin	g conver	sion to	KCI/Po	lymer f	rom 140	υυ m.	
Plastic Viscosity	сР	7		7									
Yield Point	lb/100 ft ² 30 min lb/100 ft ²	12 13/23/30		12/22/30									
Gels 10 sec/10min/3 API Filtrate	ml/30min	12.0	<u> </u>	12.0		1							
HPHT Filtrate	ml/30min												
API/HPHT Filter Cak		_2/		2/-	<u> </u>	1							
Solids	% Vol	3.9	 	3.9 0.1		1							
Dissolved Salts Oil Content/Water Co	% Vol	0.1 -/96.0	 	-/96.0		1							
Sand	% Vol	0.1		0.1									
Methylene Blue cap		10		10									
рН	meter	9.0	ļ	9.0		ACTIVIT	~						
Alk. Mud Pm	ml	0.50 0.05/0.10	-	0.50		Drilled to	1228 m	. Circu	lated o	ut 1/2 h	r, then	POH for wiper t	rip.
Alk, Filtrate, Pf/Mf Chlorides	mi mg/Lx10 ³	1.0	 	1.0		Pipe pull	ed tiaht 1	from ne	ear botte	om. Te	mporar	rily stuck at 107	6 m.
Total Hardness/Cald		50/50		40/40		Worked 1	ree, and	worke	d pipe t	hrough	tight h	ole to 1035 m o	ver 1 hr
KCL	% Wt Soln					Continue	d POH t	o 823 r	n. Ran	back ir	n withou	ut problems. Ha	1d 2 m 11
ASG of Solids	g/cc	2.7		0.45/1.15		Resumed POH to r						survey at 1257	
n&K		0.45/1.15	<u>'</u>	0.45/1.15		1	ecover 11	no uno	ourroy				
]							
						4							
Rheometer	600 rpm/300 rpm		<u> </u>	26/19		-1							
lb/100 ft²	200 rpm/100 rpm	 	 			1							
	6 rpm/3 rpm INVENTORY AN	D CONSU	MPTION			L							
PRODUCT DESCR		USED	REC	BAL	COST	MUD TY			UAGEL			CONSUMPTI	
Caustic Soda	25 kg	2		33	64.86	-1				ENT size	hre	Additions Sea W.	bbl
CMC EHV	25 kg	6	4	33	639.66	Shaker 1	Mak		50.50		nrs 17		18
		-	 		 	Shaker 2			155,55	- -		other	
				 		Shaker 3						other	
						Shaker 4					<u></u>	Barite	+
						<u> </u>		PPG	bbl/hr		bbl	Chemicals	bbl
		 	ļ			Desande		11.4	6	17	102		17
		ļ	 		-	Desilter Desilter		11.1	0	 ''	1.02	Lost/Dumped	4
		 	+	 	 	Centrifu						Down Hole	2
						Centrifug					<u></u>	Newhole	4
		T									%	NET LOSS Discharged	21
						Calido C							

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WAREHOUSE

Adelaide

OFFICE

Melbourne

BAROID Engineer

M. Olejniczak

DECE	RVE PITS			SURVE	Y DATA			SOLIDS AN	IALYSIS	·	TIME BREAK	DOWN	hrs
	TYPE	bbl	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	3.7	Drilling		16
NO			1091	140	1.5		1	Low Grav. Solids	ppb	33.7	Circulating		1
6	Pre-Gel	74	1158		0.5		 	High Grav. Solids	% Vol	0.2	Reaming In		
			1196		1			High Grav. Solids	ppb	2.9	Reaming out		1
			1228		1.5			ASG of Solids	g/cc	2.70	Tripping		6
	 		1244		1.25			Cuttings Volume	bbl	45.0	Other		
								Interval Dilution	bbl/m	0.9	<u> </u>		
			 					Interval Consumption	· bbl/m	1.2	<u></u>		
			 				1.				AVE ROP	m/hr	12.19

Solids Control Effic.

DAILY COST

A\$ 704.52

NET LOSS % Discharged
CUMULATIVE COST

A\$ 4396.35



Solids

Sand

рΗ

Dissolved Salts

Alk. Mud Pm

Chlorides

Alk. Filtrate, Pf/Mf

Methylene Blue cap

0il Content/Water Content

Baroid Australia Pty Ltd

% Vol

% Vol

% Vol

% Vol

ppb

ml

mi

meter

mg/Lx10³

3.9

0.1

-/96.0

0.1

9.0

0.50

0.05/0.10

1.0

9

 MUD REPORT NO.
 7
 up to 24:00 hrs,
 18/5/94

 DATE 19/5/94
 DEPTH—m MD 1321
 TVD 1321

 START DATE 12-May-94
 ACTIVITY Drilling

COUNTRY CONTRACTOR / RIG Australia Century Rig 11 GFE Resources Ltd TOWNSHIP REPORT FOR REPORT FOR Port Campbell S. Kelly Ken Smith FIELD OR BLOCK NO. LOCATION WELL NAME AND NO. Otway Basin, Victoria PPI 1 Langley-1

CUT	DATA				DRILLING	STRING	9		CASINGS				PUMP	DATA			
					OD ins	ID ins	Length m	Size ins	De	epth m	Pump Make	ins	x ins	Eff %	bbl/stk	spm	bbl/min
Size 8			- 1						Set @	<u> </u>	Nat 7P50	5.5	7.75	95	0.054	136	7.344
Type	ETD 4	17	ļ	Pipe 1	4.5	4.367	1111.4	Riser				_	8.5		0.0705		
Nozzle	as 32n	ıds		Pipe 2	4.5	2.875	55.28	9 5/8"	Set @	334.43	Nat 8P80	6	0.5	95	0.0703		
11	13	_	13	Pipe 3					Set @			<u> </u>			L	<u> </u>	<u> </u>
	13	+	-,5	Col 1	6.25	2.875	154.33	1	Set @		Pump Press	1000 p	si	TO	TAL bbl/m	nin	7.344
	 	╁		Col 2	0.23	2.073	104.00		Set @		MUD VOL	bbl	CIRC	CULAT	ING DAT	Α	
	1							 	Set @		Downhole	288	Total	circ 90	mins	AV	m/min
Noz A	rea 0.3	35 ii	าร2		OPEN HO	E SECT	IONS						1			DP	44.3
TFA	ins2			Sect 1				1	Set @		Active	374	1		29 mins		
		85	_	Sect 2				Liner	Set @		Total Circ	662	Surfa	ce−bit	10 mins	DC	. 69.4
Impac		40	_	Curren		8.5	986.6	4	Top @ =	,	Reserve	34	ECD	opg 🕞	9,05	Riser	gir Sana Syri

MUD PROPERTY SPECIFICATIONS MUD PROPERTIES 10-15 lb/100 ft2 WEIGHT <9.2 IN ppg IN or OUT Sample Location HTHP KCL API Filt <12 ml 24:00 11:30 Time Sample Taken hrs BY AUTHORITY Mud Program 1257 1321 Depth m REMARKS Flowline Temp °C Continued maintaining viscosity and filtration control using CMC-EHV 9.00 Weight ppg 8.90 additions only. Keeping mud MBT (clay content) low to prepare 38 Funnel Viscosity sec/qt 41 for conversion to KCI/Polymer. 9 Plastic Viscosity сΡ 10 11 lb/100 ft² 13 Yield Point Gels 10 sec/10min/30 min lb/100 ft2 2/23/30 10/19/29 10.0 8.5 ml/30min API Filtrate HPHT Filtrate ml/30min 2/-2/-API/HPHT Filter Cake 32nd ins

ACTIVITY

Continued POH. Checked bit, changed BHA and slipped line. Ran back into hole. Had to ream in from 1062 to 1075 m over 1/2 hr and from 1177 to 1257 m over 1 1/2 hrs. resumed drilling from 11:30 hrs.

4.6

0.1

-/95.3

0.1

8

9.0

0.50

0.05/0.10

1.0

PRODUCT DESC	DIDTION	USED	REC	BAL	COST	MUD TYPE	FW/AC	UAGEL	/CMC		CONSUMPTIC	ON
	25 kg	2022	1	31	64.86	SOLIDS CONT	ROL EC	UIPME	NT		Additions	bbl
Caustic Soda		10		23	1066.1	4		screen		hrs	Sea W.	
CMC EHV	25 kg				1000.1	Shaker 1		50,50,		15	Drill W.	220
				-		Shaker 2		1			other	
			 			Shaker 3					other	
						Shaker 4					Barite	
			 				ppg	bbl/hr	hrs	bbl	Chemicals	1
				-		Desander	11.1	3	11	33	Losses	bbl
			 	-		Desilter 1.	11	6	15	90	Sol. Con.	123
			 			Desilter 2.					Lost/Dumped	63
			 			Centrifuge 1					Down Hole	35
						Centrifuge 2					Newhole	15
			 								NET GAIN	
		 				Solids Control E	Effic.			%	Discharged	186

 BAROID Engineer
 OFFICE
 WAREHOUSE
 DAILY COST
 CUMULATIVE COST

 M. Olejniczak
 Melbourne
 Adelaide
 A\$ 1130.96
 A\$ 5527.31

 Tel. 059-787103
 03-6213311
 08-477433
 08-477433

THE RECOMMENDATIONS MADE HEREON SHALL NOT BE CONSTRUED AS AUTHORIZING THE INFRINGEMENT OF ANY VALID PATENT, AND ARE MADE WITHOUT ASSUMPTION OF ANY LIABILITY BY BAROID DRILLING FLUIDS, INC OR IT'S AGENTS, AND ARE STATEMENTS OF OPINION ONLY.

arer	RVE PITS			SURV	EY DATA			SOLIDS AN	IALYSIS	3	TIME BREAK	DOWN	hrs
NO	TYPE	bbl	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	4.3	Drilling		12.5
	Pre-Mix	34	1276	1,40,111	1			Low Grav. Solids	ppb	39.1	Circulating		0.5
	FIG-IVIX		1305		1.75		1	High Grav. Solids	% Vol	0.3	Reaming In		2
			1000					High Grav. Solids	ppb	4.4	Reaming out		
			l		 			ASG of Solids	g/cc	2.70	Tripping		9
			·[Cuttings Volume	bbl	15.0	Other		
					 		 	Interval Dilution	bbl/m	1.1			
			 				 	Interval Consumption	bbl/m	1.4			
			·	 	 		 				AVE ROP	m/hr	5.12

4						MUD REPO	ORT NO.	. 8	L	up to	24:00 l	nrs, 19/5/	94	
	Baroid A	uetra	lia Pt	bt I v		DATE 2	0/5/94		DEPTH	1m	MD 136	63 TVD	1363	
(HAKUIU)	Dai Olu A	usua	na i i	y Lia		START DA			ACTIV					
						12-May-9		- 1	Reamir					
COUNTOR			CONTRA	CTOR / RIC	3	12 11.01			COUN					
OPERATOR GFE Resources Ltd			Century R	•					Austral	lia				
REPORT FOR			REPORT					- 1	TOWN					
Ken Smith			S. Kelly					_	Port Ca		ll			
WELL NAME AND	NO.			BLOCK N	IO.			- 1	LOCAT		Victoria			
Langley-1			PPL 1		CASINGS					PUMP				
BIT DATA		G STRING		Size ins		Depth m	Pump Ma	ake		x ins	Eff %	bbl/stk spm	bbl/	min
Size 8.500 ins	OD ins	ID ins 4,367	Length m 1010.1	Riser	Set @		Nat 7P50		5.5	7.75	95	0.054 10)5	5.67
Type Sec S82F Nozzles 32nds	Pipe 1 4.5 Pipe 2 4.5	2.875		9 5/8"	Set @				6	8.5	95	0.0705		
11 13 13	1.15.5.5	2.0.0			Set @									
-11 10 19	Col 1 6.25	2.875	174.6		Set @		Pump Pr					AL bbl/min		5.67
	Col 2				Set @		MUD VC		bbl			NG DATA	m/mi	in
Noz Area 0.35 ins²	OPEN HO	LE SECTION	ONS		Set @		Downhol	-	296		circ 118			34.2
TFA ins ²	Sect 1				Set @		Active Total Circ		374		ns up 3 :e-bit 1			53.6
NV m/sec 66.0	Sect 2	4 + 27+ + + 4	. 2000 00 00	Liner			Reserve		14	ECD r		9.04 Rise	· Hangana Grap	10105
Impact lb f 240	Current	8.5	1028.6 MUD PRC	DEDTIES	Top @							CATIONS		
0	IN or OUT	IN	MUDFAC	IN		WEIGHT <				40-45			15 lb/1	00 f
Sample Location		12:00		24:00			<15 mi	-	HTHP		mi	KCL	%	
Time Sample Taker	m nrs	1363		1363		BY AUTHO			Mud Pr	ogram				
Depth Flowline Temp	<u></u>	. 300		37		REMARKS	3							
Weight	ppg	9.00		9.00		Slow drillin	ıg as wei	ght o	n bit re	duced	attempi	ng to control	deviati	on.
Funnel Viscosity	sec/qt	40		38		BHA chanç	ge made	to stil	ffen ass	sembly	and sto	op deviation v	vorsen	ıng.
Plastic Viscosity	сР	9		7					e to stiff	fer, lon	ger BH/	A going into v	ery clo	se
Yield Point	lb/100 ft ²	12		11		to guage 8	1/2" hole	∋. • •	winnin.	- but a	ico ann	ear to have ha	ad see	nan
Gels 10 sec/10min/		9/20/30	<u> </u>	7/17/26		Mud losses losses into							1 0 000	Pug
API Filtrate	ml/30min	8.5		8.5		Continued	using Cl	MG-E	EHV on	ilv for r	nud ma	intainence.		
HPHT Filtrate	ml/30min	2/		2/-		00/11/1000	aog			.,				
API/HPHT Filter Cal Solids	(e 32nd ins % Vol	4.9		4.9										
Dissolved Salts	% Vol	0.1		0.1		1								
Oil Content/Water C		-/95.0		-/95.0		1								
Sand	% Vol	0.1		0.1		l								
Methylene Blue cap	ppb	8		7										
рН	meter	9.0		8.8		A O T D UTDY								
Alk. Mud Pm	mi	0.50		0.50		ACTIVITY	262 m a	08.3	0 hre	Circ o	ıt 1/2 hr	, then POH fo	r bit ar	nd
Alk, Filtrate, Pf/Mf	ml	0.05/0.10		0.05/0.10		BHA chan	ne Had	to wo	ork tiahl	t hole f	rom 130	02 to 1158 m	pulling	i out
Chlorides	mg/Lx10 ³ cium mg/L	1.2 50/50		60/60		Changed I	bit and a	dded	2 stabil	lisers to	BHA t	o stiffen BHA.	RIH t	0
Total Hardness/Cal	% Wt Soln			100/00		947 m. Ha	d to real	n in t	he rest	of the	way. R	eached 1240	m.	
ASG of Solids	g/cc	2.6		2.6		1								
n&K		0.51/0.87		0.47/0.96										
						1								
						ł								
				05/40		ł								
Rheometer	600 rpm/300 rpm	30/21		25/18		1								
lb/100 ft ²	200 rpm/100 rpm 6 rpm/3 rpm	 				1								
	INVENTORY AN	CONSU	MPTION											
PRODUCT DESCR		USED	REC	BAL	COST	MUD TYP			UAGEL			CONSUMP		
Caustic Soda	25 kg	1		30	32.43	SOLIDS C						Additions	<u>b</u> i	bl
CMC EHV	25 kg	11		12	1172.71	l	Make		screen		hrs 16.5	Sea W. Drill W.	+	201
			 	ļ	ļ	Shaker 1			50,50,	,ou	10.5	other		
		ļ			 	Shaker 2 Shaker 3					1	other	_	
		 		 		Shaker 4					1	Barite		
		 		 		3,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	DI	pg	bbl/hr	hrs	bbl	Chemicals		
			<u> </u>	1		Desander		11.2	1.5		23	Losses	bl	ы
		 				Desilter 1.		11	4	12	48			7
						Desilter 2.						Lost/Dumpe	d	8
						Centrifuge					 	Down Hole		6
						Centrifuge	2		L	<u></u>		Newhole		11
		1		-							0/	NET LOSS		15
			1		i	Solids Cor	ntrol Effic	; <u>. </u>			%	Discharged		13
				1	100		D4#3		>T		CHIM	HATIVE COS	: 1	
BAROID En	gineer	OFFICE		WAREHOL	JSE		DAILY	COS	ST			LATIVE COS	5 T	
		OFFICE Melbourne	· · · · · · · · · · · · · · · · · · ·	WAREHOU	JSE			205			сими А\$	6732.45	5 F	
BAROID En. M. Olejniczal Tel. 059-787103 THE RECOMMENDA	•	Melbourne	111	Adelaide	33		A\$ 1	205	.14		A\$	6732.45		

TIME BREAKDOWN hrs SOLIDS ANALYSIS SURVEY DATA RESERVE PITS INCL° 8.5 DISP m Low Grav. Solids % Vol 4.9 Drilling DIR ° MD m TVD m NO TYPE bbl 0.5 Low Grav. Solids ppb 44.6 Circulating 1.75 6 Pre-Mix 1331 7.5 High Grav. Solids % Vol Reaming in 1363 1.75 High Grav. Solids ppb Reaming out 7.5 ASG of Solids g/cc 2.60 Tripping bbl 10.0 Other Cuttings Volume Interval Dilution bbl/m 1.3 Interval Consumption bbl/m 1.5 AVE ROP m/hr 4.94

WITHOUT ASSUMPTION OF ANY LIABILITY BY BAROID DRILLING FLUIDS, INC OR IT'S AGENTS, AND ARE STATEMENTS OF OPINION ONLY.

*						MUD REP	ORT N	O. 9) u	ip to 2	4:00 h	nrs, 2	0/5/94	
BAROID	Baroid A	ustra	lia Pt	y Ltd			1/5/94		DEPTH		MD 143	88	TVD 14	38
						START DA		I	ACTIVE Stuck F					
OPERATOR			CONTRA	CTOR / RIC				- 1	COUN					
GFE Resources Ltd			Century R						Austral TOWN					
REPORT FOR			REPORT	FOR					Port Ca		ł			
Ken Smith			S. Kelly	BLOCK N	0				LOCA			-		
WELL NAME AND I Langlev-1	NO.		PPL 1	DECOR						Basin, '				
BIT DATA	DRILLIN	G STRING		(CASINGS					PUMP				In I Complete
Size 8.500 ins	OD ins	ID ins I	Length m				Pump i		ins >	7.75	Eff % 1	0.054	110	obl/mi 5.9
Type Sec S82F	Pipe 1 4.5	4.367	1208.1	Riser	Set @		Nat 7P		<u> </u>	8.5			-110	
Nozzies 32nds	Pipe 2 4.5	2.875	55.28	9 5/8"	Set @ Set @	334.43	IVAL OI	00		0.0				
11 13 13	Pipe 3 Col 1 6.25	2.875	174.6		Set @		Pump	Press (525 psi		TOT	AL bbi/mi	n	5.9
	Col 2	2,013	114.0		Set @		MUD \	/OL	bbl			NG DATA		
Noz Area 0.35 ins²	OPEN HO	LE SECTIO	ONS		Set @		Downh		312		irc 118			n/min
TFA ins²	Sect 1				Set @		Active		389		ns up 3	- 1	DP DC	35 56
NV m/sec 69.1	Sect 2			Liner	Set @		Total C	4-4-5	701		e-bit 1	9.06		
Impact lb f 264	Current	8.5	1103.6 MUD PRC	DEDTIES	Top @	<u> </u>						ATIONS	. (100)	
0	IN or OUT	IN	MUD PRO	IN		WEIGHT				40-46			0-151	b/100
Sample Location Time Sample Taken		12:15		21:30		API Filt			HTHP	1	ml l	KCL 3	3 9	%
Depth	m	1401		1438		BY AUTHO	DRITY							
Flowline Temp	°C	38		38		REMARK								
Weight	ppg	8.90		9.00		Started to	switch	over to	KCL / F	olyme	rsyster	n. 	to activ	o tan
Funnel Viscosity	sec/qt	38		45		Mixing bat	ches o	Pre-	viix in pi	III tank i	ana tne	n adding	to activ	/e (aii
Plastic Viscosity	сР	7		10										
Yield Point	lb/100 ft ²	10		9/20/30										
Gels 10 sec/10min/S	30 min 1b/100 π² ml/30min	8/18/27 8.5		9.0		l								
API Filtrate HPHT Filtrate	mi/30min	0.5		3.0		1								
API/HPHT Filter Cal		2/-		2/-		1								
Solids	% Vol	4.8		4.5		1								
Dissolved Salts	% Vol	0.2		0.5		l								
0il Content/Water C		<u>-/95.0</u>		-/95.0 0.1		ł								
Sand	% Vol	0.1 8		9		İ								
Methylene Blue cap pH	ppb meter	8.6		8.8										
Alk. Mud Pm	mi	0.50		0.45		ACTIVITY								
Alk. Filtrate, Pf/Mf	mi	0.05/0.10		0.10/0.20		Reamed t	o botto	m and	continu	ed drilli	ng ahe	ad.		
Chlorides	mg/Lx10 ³	2.8		5.7		At 1438m Could not	incoun	tered s	ome tor	que. P	une wh	ile rensirii	on clut	it aan ch
Total Hardness/Cal		80/80		80/80		After fixing	move	ine pipe	e for sev	ıll nine	The oil	ne vepani ne was sti	uck. wo	ork pi
KCL	% Wt Soln	0.4 2.4		0.8		Working p								
ASG of Solids n & K	g/cc	0.50/0.75	 	0.50/1.06		1		-	•					
K+ Ion Conc	mg/Lx10³	2.3		4.6]								
7(1 1011 99119														
					ļ	i								
Rheometer	600 rpm/300 rpm	24/17	-	34/24	ļ	1								
lb/100 ft ²	200 rpm/100 rpm	 		 										
	6 rpm/3 rpm INVENTORY ANI	CONSU	MPTION	<u> </u>		 _								
PRODUCT DESCR		USED	REC	BAL	COST	MUD TYP			OLYM			CONSU		
Caustic Soda	25 kg	1		29	32.43	SOLIDS					h	Addition Sea W.	15	bbl
CMC EHV	25 kg	5	<u> </u>	7	533.05	Shaker 1	Mak	(e	50x50		nrs 17			l
KCL,Tech(sx)	25 kg	20	 	300	288.8 341.48				JUAGO			other		
PAC-R PAC-L	50 lb 50 lb	4		36	682.96							other		
FAU-L	30 10	 				Shaker 4						Barite		
								ppg	bbl/hr		bbl	Chemica	als	F
						Desander		11.3		12	16	Losses Sol. Cor		bbl
		-	<u> </u>			Desilter 1		10.7	3	12	36	Lost/Du		
					 	Desilter 2 Centrifuge		 		 		Down H		- -
			 		 	Centrifug		 		—		Newhole		
		t												
		 	 			Centinug						NET GA		
						Solids Co	ntrol El				%	NET GA Dischar	NN ged	
BAROID Eng	jineer	OFFICE		WAREHOL	JSE		ntrol El	fic. LY CO	ST			NET GA	NN ged	

SOLIDS ANALYSIS TIME BREAKDOWN SURVEY DATA RESERVE PITS Drilling % Vol 4.5 12 DISP m Low Grav. Solids MD m TVD m INCL° DIR ° bbl NO TYPE 40.9 Circulating Low Grav. Solids ppb 6 Pre-Mix 6 % Vol Reaming In High Grav. Solids Reaming out High Grav. Solids ppb g/cc 2.60 Tripping ASG of Solids 6 17.0 Other Cuttings Volume bbl Interval Dilution bbl/m 1.2 Interval Consumption bbl/m 1.5 m/hr 6.25

AVE ROP

Tel. 059-787103 03-6213311 08-477433

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)	Ва
OPER	ATOR		
	esourc		
	RT FO	R	
Ken S	mith NAME	AND	10
Langle		AND I	10.
BIT	DATA		
	3.500 ir	ns	
	Sec S8		Pip
1	s 32nd		Pip
11	13	13	Pip
			Col
			Col
	rea 0.35	ins ²	
TFA	ins²		Sec
	sec	288 A. C.	Sec
Impac	t lb f		Cu
	le Loca		
	Sample	Taken	
Depth			
	ne Tem	p	
Weigh		_:A	
	Visco		
Yield	C Viscos	sity	
Gole	0 sec/1	Omin/3	30 m
API Fi		Citinge	
	Filtrate		
	PHT Fil		e
Solids			
	lved Sa	its	
	ntent/W		onte
Sand			
Methy	/lene Bl	ue cap	

aroid Australia Pty Ltd

up to 24:00 hrs, 21/5/94 MUD REPORT NO. TVD 1438 DEPTH-m MD 1438 DATE 22/5/94 ACTIVITY START DATE

bbl

Stuck - Running Free point 12-May-94 COUNTRY CONTRACTOR / RIG Australia Century Rig 11 TOWNSHIP REPORT FOR Port Campbell J.Hoffman LOCATION FIELD OR BLOCK NO. Otway Basin, Victoria

Langi	ey-1						I F F L I						PUMP	DATA			
BIT	DATA				DRILLING	G STRING	3		CASINGS				PUMP				
						ID ins	Length m	Size ins		epth m	Pump Make	ins	x ins	Eff %	bbl/stk	spm	bbl/min
Size	8.500 i	ns			OD ins						Nat 7P50	5.5	7.75	95	0.0525	1	
Type	Sec St	32F	:	Pipe 1	4.5	4.367	1207.8	Riser	Set @			3.3					
1 ,,				Pipe 2	4.5	2.875	55.28	9 5/8"	Set @	334.43	Nat 8P80	6	8.5	95	0.0705		
Nozz	les 32n	as				2.010		3 3/3								1	
11	13	-	13	Pipe 3					Set @			٠		TO	TAL bbl/m	nin.	
		Т		Col 1	6.25	2.875	174.96		Set @		Pump Press	- ps					
	+	+-							Set @		MUD VOL	bbl	CIRC	CULAT	ING DAT	A	
				Col 2							Dawahala	312	Total	circ -	mins	AV	m/min
Noz A	Area 0.3	5 i	ns2		OPEN HOI	LE SECT	IONS		Set @		4					1	
				Sect 1				Ì	Set @		Active	311	Bottor	ms up	- mins	DP	
								Linns	Set @		Total Circ	623	Surfac	ce-bit	- mins	- DC	4.3
NV m	n/sec 🦠		14.5	Sect 2	1.14	5: 12		Liner			The second contract of			a street was been been been	Commence of the Commence of th	Dica	er en en en en en en en en en en en en en
Imna	ct lh f			Currer	nt	8.5	1103.6		Top @		Reserve		ECD	ppq	9	Lusei	
TFA	/sec					5, 12		Liner	Set @ Set @ Set @ Top @	er i springerjansky s	Downhole Active Total Circ Reserve	312 311 623		ms up	mins - mins - mins 9	DP DC	

MUD PROPERTY SPECIFICATIONS MUD PROPERTIES 10-18 lb/100 ft² WEIGHT <9.3 ppg VIS 40-50 sec IN or OUT IN KCL 3 HTHP ml API Filt 6-8 ml 17:30 hrs BY AUTHORITY Mud Program 1438 m REMARKS 37 ç Lost 78bbls of mud while displacing annulus to water, and then back 9.00 ppg 45 to mud again. sec/qt 10 15 lb/100 ft² in lb/100 ft² 7/17/25 9.0 ml/30min ml/30min 2/-32nd ins 4.5 % Vol 0.5 % Vol -/95.0 nt % Vol 0.1 % Vol 9 ppb 8.8 рН meter ACTIVITY 0.45 Alk. Mud Pm mi Worked stuck pipe. 0.10/0.20 Alk. Filtrate, Pf/Mf mi Displaced annulas with 258bbls of water and work pipe. 5.5 mg/Lx103 Chlorides Hold tension and torque on pipe for one hour, then work pipe again. 80/80 Total Hardness/Calcium mg/L Reverse circulate with mud to water at shakers and work pipe. 0.7 % Wt Soln KCL Continued to work pipe while waiting on Schlumberger, not circulating. 2.6 ASG of Solids Circulated and displaced water with active mud, dump water in sump. 0.49/1.18 n&K Running wireline free point indicator. K+ Ion Conc mg/Lx10³

6 rpm/3 rpm INVENTORY AND CONSUMPTION CONSUMPTION KCL / POLYMER USED REC COST MUD TYPE BAL PRODUCT DESCRIPTION SOLIDS CONTROL EQUIPMENT **Additions** 50 lb 32 682.96 Sea W. screen size Make Drill W. 18 50x50x80 Shaker 1 other Shaker 2 other Shaker 3

Barite Shaker 4 Chemicals bbl/hr hrs ppg Losses bbl Desander Sol. Con. Desilter 1. Lost/Dumped 60 Desilter 2. Down Hole 18 Centrifuge 1 Newhole Centrifuge 2 **NET LOSS** 78 60 Discharged Solids Control Effic CUMULATIVE COST DAILY COST WAREHOUSE

BAROID Engineer A\$ 682.96 9294.13 Adelaide Melbourne C. Da Silva 08-477433 03-6213311

35/25

600 rpm/300 rpm

200 rpm/100 rpm

Rheometer lb/100 ft²

PAC-L

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DESE	RVE PITS			SURVE	EY DATA			SOLIDS AN	IALYSIS		TIME BREAKD	OWN	hrs
NO	TYPE	bbl	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	4.5	Drilling		
	Pre-Mix	- 551	1 111	1::5:::				Low Grav. Solids	ppb	40.9	Circulating		4
	Pre-Mix		·				1	High Grav. Solids	% Vol		Reaming In		
			 		 		†	High Grav. Solids	ppb		Reaming out		
			 				 	ASG of Solids	g/cc	2.60	Tripping		
			-		 		 	Cuttings Volume	bbl		Other		20
			 	-	 			Interval Dilution	bbl/m	1.3			
			 		 	<u> </u>	1	Interval Consumption	bbl/m	1.5			
			-				 				AVE ROP	m/hr	

						<u>م.</u>								
	•					MUD REP	ORT NO.	. 1	1 u	ip to 2	24:00 h	nrs, 22/5	5/94	
BAROLD	Baroid A	ustra	lia Pty	y Ltd	L	DATE START DA	23/5/94		DEPTH		MD 143	38 TV	D 143	38
						12-May-			CIRC &	CONE	MUD			
OPERATOR			CONTRA	CTOR / RIG	à			1	COUN					
GFE Resources Ltd			Century R						Austral TOWN					
REPORT FOR			REPORT J.Hoffman					1	Port Ca					
Ken Smith WELL NAME AND	NO.			BLOCK N	О.				LOCAT			-		
Langley-1			PPL 1		2401100					Basin, PUMP	Victoria DATA			
BIT DATA	OD ins	S STRING	i Length m	Size ins	CASINGS	Depth m	Pump Ma	ake	ins x		Eff %	obl/stk spi	n b	bl/min
Size 8.500 ins Type Sec S82F	Pipe 1 4.5	4.367	1207.8	Riser	Set @		Nat 7P50		5.5	7.75	95		30	6.825
Nozzles 32nds	Pipe 2 4.5	2.875	55.28	9 5/8"	Set @	334.43	Nat 8P80		6	8.5	95	0.0705		
11 13 13	Pipe 3		.7400		Set @ Set @		Pump Pr	200	1300 ps	l	TOT	AL bbl/min		6.825
	Col 1 6.25	2.875	174.96		Set @		MUD VO		bbi			NG DATA		
Noz Area 0.35 ins²	OPEN HOL	E SECTION	ONS		Set @		Downhol	-	312		irc 91 n		<u>' m/</u>	
TFA ins²	Sect 1				Set @		Active		308 520		ns up 3. e-bit 1	1	P C	41.2
NV m/sec. 79.4	Sect 2	0.5	1103.6	Liner	Set @ Top @	read the second	Total Circ Reserve		20	ECD p	e-bit i	9.07 Ri		
Impact lb f 348	Current	8,5	MUD PRO	PERTIES	100 @			JD P				ATIONS		
Sample Location	IN or OUT			IN		WEIGHT		-		40 – 50				o/100 ft ,
Time Sample Taken	hrs			04:35		API Filt			HTHP		mi	KCL	3 %	6
Depth	m °C			1438		BY AUTH		JU C1	ogram					
Flowline Temp Weight	ppg			9.00		712.00	<u> </u>							
Funnel Viscosity	sec/qt			46										
Plastic Viscosity	cP			11										
Yield Point	lb/100 ft ² 30 min lb/100 ft ²			15 6/16/24										
Gels 10 sec/10min/S API Filtrate	ml/30min			7.1										
HPHT Filtrate	ml/30min													
API/HPHT Filter Cak				4.4										
Solids Dissolved Salts	% Vol % Vol			0.6										
0il Content/Water Co				-/95.0										
Sand	% Vol			0.1 8		1								
Methylene Blue cap pH	ppb meter			8.5		İ								
Alk. Mud Pm	ml			0.40		ACTIVITY								
Alk. Filtrate, Pf/Mf	mi			0.10/0.20			d free poi				ho holo	to water		
Chlorides	mg/Lx10 ³		ļ	60/60		Circulate	d hole clea	an, tn Iix an	en aisp d pump	32 bb	is EZ Si	pot around	ollar	s and
Total Hardness/Cald	cium mg/L % Wt Solni			1.0			ork pipe :							
ASG of Solids	g/cc			2.7			d run and							
n & K			ļ	0.51/1.08 5.7		Pipe cam	e free whi	le rur	nning fr d water	ee poir and F2	it. Z Spot í	Diesel with n	nud.	
K+ Ion Conc	mg/Lx10³		 	5.7			d and con				,			
						1								
Rheometer	600 rpm/300 rpm			37/26										
lb/100 ft²	200 rpm/100 rpm		-	ļ		1								
	6 rpm/3 rpm INVENTORY AND	CONSU	MPTION	<u> </u>										
PRODUCT DESCR		USED	REC	BAL	COST	MUD TY			POLYM			CONSUM	PTIO	
EZ SPOT	208 lt	2			1522.36	SOLIDS	CONTRO	LEG			hrs	Additions Sea W.		bbl
KCL,Tech(sx)	25 kg	10		290	144.4 170.74	Shaker 1	Make		50x50			Drill W.		
PAC-R	50 lb	1		31	170.74	Shaker 2						other		
						Shaker 3					 	other Barite		
			-	 		Shaker 4		pg	bbl/hr	hrs	bbl	Chemicals		
			 	 		Desande						Losses		bbl
						Desilter 1					<u> </u>	Sol. Con.		
						Desilter 2				-	 	Lost/Dump		
			 			Centrifug Centrifug			-		+	Newhole		
		ļ	-	1		Johnnag						NET LOS		
		 	1	1	T	Calida Ca	ntrol Effic				%	Discharge	rd l	

% Discharged
CUMULATIVE COST

A\$ 11302.37

Tel. 03-6213367 (Fax) 03-6213311 08-477433

THE RECOMMENDATIONS MADE HEREON SHALL NOT BE CONSTRUED AS AUTHORIZING THE INFRINGEMENT OF ANY VALID PATENT, AND ARE MADE WITHOUT ASSUMPTION OF ANY LIABILITY BY BAROID DRILLING FLUIDS, INC OR IT'S AGENTS, AND ARE STATEMENTS OF OPINION ONLY.

WAREHOUSE

Adelaide

Meibourne

BAROID Engineer

C. Da Silva

DESE	RVE PITS			SURVE	Y DATA			SOLIDS AN	ALYSIS	<u> </u>	TIME BREAKE	DOWN	hrs
NO	TYPE	bbl	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	4.1	Drilling		
	Pre-Mix	UDI	IND III	110111				Low Grav. Solids	ppb	37.3	Circulating		4
6	Pre-Mix							High Grav. Solids	% Vol	0.3	Reaming In		
			ļ					High Grav. Solids	ppb	4.4	Reaming out		
 			 					ASG of Solids	g/cc	2.70	Tripping		
								Cuttings Volume	bbl		Other		20
<u> </u>			ļ	-				Interval Dilution	bbl/m	1.3			
			I				 	Interval Consumption	bbl/m	1.5			
			{								AVE ROP	m/hr	

Solids Control Effic.

DAILY COST

A\$ 2008.24

							MUD REP	ORT N	0. 1	12 L	up to	24:00	hrs,	23/5/94	
	Rarc	nid Δι	ustral	ia Ptv	/ Ltd		DATE	24/5/94		DEPTH	1-m	MD 14	38	TVD 14	138
TARLET	Darc	лаж	401141	٠. ٠.	,		START D			ACTIV					
				CONTRA	CTOR / RIG		12-May-	94		RIH WE		O DOLL	om.		
PERATOR				Century R						Austral	ia				
FE Resources Lt	1			REPORT						TOWN					
en Smith				J.Hoffman						Port Ca		<u> </u>			
VELL NAME AND	NO.		1		BLOCK N	0.				LOCAT Otway		Victoria	- a		
angley-1				PPL 1		ASINGS					PUMP		<u> </u>		
BIT DATA			G STRING	_ength m	Size ins		Depth m	Pump	Make				bbl/stk	spm	bbl/m
ize 8,500 ins		OD ins 4.5	ID ins 1 4,367	1207.8		Set @	, op., , , , ,	Nat 7P		5.5	7.75	95	0.0525	125	6.5
ype Sec S82F lozzies 32nds	Pipe 1 Pipe 2	4.5	2.875			Set @	334.43	Nat 8P	80	6	8.5	95	0.0705		
	3 Pipe 3	7.0				Set @							L	L	L
11 13	Col 1	6.25	2.875	174.96		Set @		Pump	Press 8	325 psi			TAL bbl/m		6.5
	Col 2					Set @		MUD \		bbl			ING DAT		- Innin
loz Area 0.35 ins		PEN HOI	E SECTIO	ONS		Set @		Downh		312		irc 94		AV n	n/min 39
FA ins²	Sect 1					Set @		Active		308			35 mins 12 mins	DC	Je
V m/sec 76.4	Sect 2	4-			Liner	Set @	uppirminoriti v	Total C	of the section with	620	ECD o	e-Dir	9.08		- جستينا ق
mpact lb f 322	Current		8,5	1103.6	DEDTIES	Top @							CATIONS		
				MUD PRO			WEIGHT				40-50		YP	10-18	lb/100
Sample Location		V or OUT			1N 24:00	,	API Filt		rra	HTHP		mi	KCL		%
ime Sample Tak		irs .			1438		BY AUTH								
Depth	nr °r	n C			38		REMARK								
Flowline Temp					9.00										
Veight unnel Viscosity		ec/at			46										
Plastic Viscosity		P			11										
rield Point		o/100 ft²			18										
Gels 10 sec/10mi					6/15/24										
API Filtrate		nl/30min			7.5										
HPHT Filtrate		nl/30min													
API/HPHT Filter C		2nd ins			2/-										
Solids		6 Vol			4.0										
Dissolved Salts		6 Vol			1.0 -/95.0										
oil Content/Water		6 Vol			0.1										
Sand		pb			10		l								
Methylene Blue c oH		neter			8.8										
Alk. Mud Pm		ni			0.40		ACTIVIT								
Alk, Filtrate, Pf/Mi	n	ni			0.10/0.20		Pulled or	it of the	hole ar	nd chan	iged bit	i . 	_		
Chlorides	n	ng/Lx10 ³			11.3		Tight hol	e from 1	361 to	1226m	on the v	way ou ottom	π.		
Total Hardness/C		ng/L			60/60		Ran in th	e noie (12301	II Wasii	eu io b	Ottorn.			
KCL		% Wt Soln			1.8		l								
ASG of Solids	9	g/cc	ļ		0.46/1.65										
n & K		ng/Lx10 ³			10.3		1								
K+ Ion Conc		ng/LX10°			10.0										
							1								
Rheometer	600 rpm	n/300 rpm			40/29		1								
lb/100 ft ²	200 rpm	n/100 rpm													
	6 rpm/3	rpm					ļ								
		FORY AND	CONSU		T=	0007	VIII TO	DE	KCL /	POLYM	ER		CONS	UMPTI	ON
PRODUCT DES			USED	REC	BAL	32,43	MUD TY SOLIDS						Additio		bbl
Caustic Soda	25 F		50		28	722	JULIUS	Mal			ı size	hrs	Sea W.		
KCL,Tech(sx)	25 F		10		21	1707.4	Shaker 1			50x50			Drill W.		
PAC-L	50 1	<u>. </u>	10		 	1. 2	Shaker 2						other		_
			1	1	1		Shaker 3						other		4
			 	1			Shaker 4					<u></u>	Barite		
			 						ppg	bbl/hr	hrs	bbl	Chemi		
							Desande				ļ	-	Losses		bbl
							Desilter :		 	 	 	+	Sol. Co		+-
					-		Desilter 2		+			+	Lost/D		+
			ļ	ļ	 	ļ	Centrifug			+	+	+	Newho		+
				ļ	-		Centrifug	le 5	1		٠	1	NET G		\vdash
			ļ			 	Solids C	ontrol E	ffic			%	Discha		1
			OFFICE		WAREHOL	ISE	Journal C		LY CO	ST			ULATIVE		
BAROID	ngineer		OFFICE		WAHEHUL	,oc	1								
	. 1	ı	Melbourn	е .	Adelaide		1	A\$	2461	1.83		A\$	1376	4.20	
C. Da Silve	ez /5 a.u)	i	03-6313	311	08-4774	33_	<u></u>								
C. Da Silva	ATIONS MA	DE HERFC	N SHALL N	OT BE CON	ISTRUED AS	AUTHORIZI	NG THE IN	FRINGE	MENT O	F ANY V	ALID PA	TENT,	AND ARE	MADE	
Tel. 03-62133				ואו וואח חו	S EL LIIDS INC	OR IT'S A	GENTS, AN	D ARE S	TATEM	ENTS OF	F OPINIO	INO NC	LY.		
Tel. 03-62133	TION OF A	VY LIABILIT	A RA RWHO		4 . 20.00,	<u> </u>									
Tel. 03-62133	PTION OF A	NY LIABILIT	Y BY BAHO	ID DITIELING	21 20.00,										
Tel. 03-62133 THE RECOMMENI WITHOUT ASSUM	PTION OF A	NY LIABILIT		EY DATA				SOLI	DS AN	ALYSIS	3	TIME	BREAK	OOWN	h
Tel. 03-62133 THE RECOMMENT WITHOUT ASSUM RESERVE PITS	PTION OF A	MD m			DIR °	DISP m	Low Gra	SOLI v. Solid	DS AN	ALYSIS % Vol	3.7	TIME	BREAKI ng	OWN	h
Tel. 03-62133 THE RECOMMENT WITHOUT ASSUM RESERVE PITS	PTION OF A		SURV	EY DATA				SOLI v. Solid v. Solid	DS AN	ALYSIS	3.7 33.7	Drilli Circi	BREAK	OOWN	h

general control of the control of th

Tripping

AVE ROP

m/hr

Other

13 3

% Vol 0.3 ppb 4.4

g/cc 2.70

bbl/m 1.3

bbl

High Grav. Solids

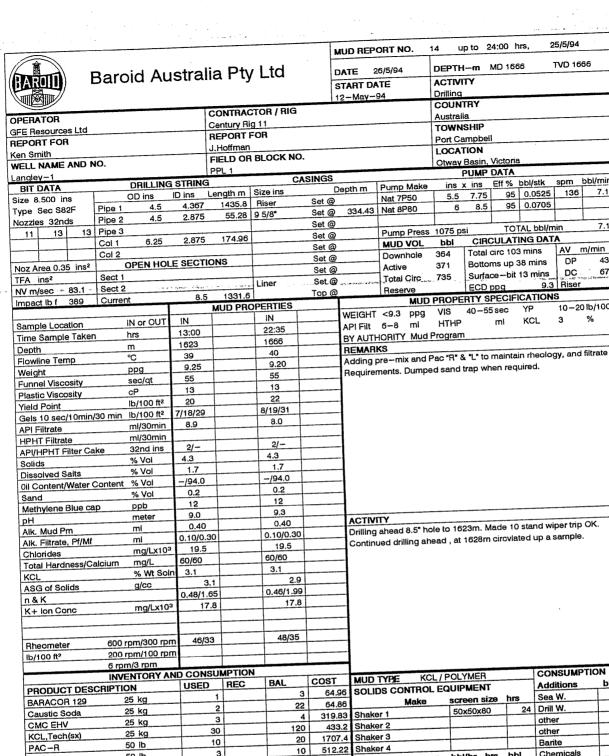
ASG of Solids

Cuttings Volume Interval Dilution

Interval Consumption bbl/m 1.5

RAROID							. [MUD REP	ORT N	o.	13 (up to	24:00 h	nrs, 24/5/94	<u> </u>
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	F	3aroi	A b	ustra	lia Pt	y Ltd			25/5/94			H-m	MD 155	57 TVD 15	557
								START DA		ļ	ACTIV Drilling				
OPERATOR						CTOR / RIC	3				COUN				
GFE Resources	Ltd				Century R REPORT						Austra TOWN				
REPORT FOR Ken Smith					J.Hoffmar		,					ampbel	!		
WELL NAME A	ND N	0.				BLOCK N	Ю.				LOCA Obvav	TION Basin,	Victoria	-	
Langley-1 BIT DATA		DE	III I IN	G STRING	PPL 1		CASINGS					PUMP			
Size 8,500 ins		OD			Length m	Size ins		Depth m	Pump N				Eff %		bbl/min 7.193
Type Sec S82F	-	Pipe 1	4.5 4.5	4.367 2.875	1326.8	Riser 9 5/8*	Set @ Set @		Nat 7P5		5.5 6	7.75 8.5	95 95		7.193
Nozzles 32nds		Pipe 2 Pipe 3	4.5	2.015	33.20	9 3/0	Set @								
		Col 1	6.25	2.875	174.96		Set @		Pump F		1000 ps bbl			AL bbl/min NG DATA	7.193
N== A=== 0.05		Col 2	N HO	LE SECTION	ONS		Set @ Set @		Downh		339		irc 105		n/min
Noz Area 0.35 TFA ins²	11152	Sect 1	NITO	LL GLOTT	J.10		Set @		Active		419		ns up 3	1	43.4
	3.7	Sect 2		^		Liner	Set @		Total C Reserve	irc	758		e-bit 1		68
Impact lb f 39	93	Current		8.5	1222.6 MUD PRO	PERTIES	TOD @							ATIONS	
Sample Locatio	n	IN or	OUT	IN		IN		WEIGHT		. •		40 – 55			ib/100 ft %
Time Sample To	aken	hrs		12:15		24:00 1557		API Filt BY AUTH			HTHP ogram	i	mi i	KCL 3	70
Depth Flowline Temp		m_ ℃		1505 39		39		REMARK	S						
Weight		ppg		8.95		9.15		Increase I							
Funnel Viscosit		sec/	<u>qt</u>	48 12		11		Added BA	nre-mi)	t∈ 129 kes and	tor corr d also f	OSION C	and PA	C "L" for rheolo	gy and
Plastic Viscosity Yield Point	У	Ib/10	00 ft²	18		16		filtration c							••
Gels 10 sec/10r	min/30	min lb/10	00 ft²	5/14/23		5/13/22		Build mud	d volume	in tan	ks.		14950	n and Belfast @	1465m
API Filtrate	·		Omin_	8.0		7.0		Tentative	tormatio	n tops	, Nullav	vaare @	y 14350	i ariu beliasi w	1403111.
HPHT Filtrate API/HPHT Filter	r Cake		Omin I ins	2/-		2/-									
Solids		% Vo	ol	3.3		3.8									
Dissolved Salts Oil Content/Wat		% Vo		1.7 -/95.0		1.7 -/94.5									
Sand	ter Co	% V		0.2		0.2									
Methylene Blue	есар	ppb		10		9									
pH Alk, Mud Pm		mete mi	er	9.0 0.45		9.3		ACTIVITY	7						
Alk. Filtrate, Pf/	Mf	ml		0.12/0.25		0.12/0.25		Continue	drilling 8	3.5" ho	le, surv	ey at 15	527m.		
Chlorides			Lx10 ³	20.2		20.2									
Total Hardness KCL	/Calci		t Soin	60/60 3,2		60/60 3.2		l							
ASG of Solids		g/cc		2.6		3		l							
n&K				0.49/1.41 18.4		0.49/1.27 18.4		1							
K+ Ion Conc		mg/i	Lx10 ³	10.4		10.4		1							
				40/00		20/07		•							
Rheometer lb/100 ft ²		300 rpm/30 200 rpm/10		42/30		38/27									
157190 1		rpm/3 rpn	n					l							
PRODUCT DE		NVENTOR	YAN	D CONSUI	REC	BAL	COST	MUD TY	DE H	KCL / F	OLYM	ER		CONSUMPTIO	ON
PHCHIRIT		25 kg		4	NEO	4	259.84	SOLIDS		OL EG	UIPME	NT		Additions	bbl
		25 kg		4		24	129.72	<u> </u>	Make	3	50x50		hrs	Sea W. Drill W.	205
BARACOR 129 Caustic Soda		25 kg 50 lb		90		150 30	1299.6 1195.18	Shaker 1 Shaker 2			SUXSU	XOU	24	other	200
BARACOR 129 Caustic Soda KCL,Tech(sx)		30 10		8		13	1365.92	Shaker 3						other	
BARACOR 129 Caustic Soda KCL,Tech(sx) PAC-R		50 lb						Shaker 4			L	- h-n	bbl	Barite Chemicals	9
BARACOR 129 Caustic Soda KCL,Tech(sx)				+		1		<u> </u>		11.3	bbi/hr	22	22		bbl
BARACOR 129 Caustic Soda KCL,Tech(sx) PAC-R								Desandei	[I						1 40
BARACOR 129 Caustic Soda KCL,Tech(sx) PAC-R								Desander Desilter 1		10.7	2	12	24	Sol. Con.	
BARACOR 129 Caustic Soda KCL,Tech(sx) PAC-R								Desilter 1 Desilter 2			2	12	24	Sol. Con. Lost/Dumped	
BARACOR 129 Caustic Soda KCL,Tech(sx) PAC-R								Desilter 1	e 1		2	12	24	Sol. Con.	30
BARACOR 129 Caustic Soda KCL,Tech(sx) PAC-R								Desilter 1 Desilter 2 Centrifug Centrifug	e 1 e 2	10.7	2	12		Sol. Con. Lost/Dumped Down Hole Newhole NET GAIN	27 138
BARACOR 129 Caustic Soda KCL,Tech(sx) PAC -R PAC -L		50 lb				WARTIO	let.	Desilter 1 Desilter 2 Centrifug	e 1 e 2 entrol Eff	10.7			%	Sol. Con. Lost/Dumped Down Hole Newhole NET GAIN Discharged	27 138
BARACOR 129 Caustic Soda KCL,Tech(sx) PAC-R) Engi	50 lb		OFFICE		WAREHOU	JSE	Desilter 1 Desilter 2 Centrifug Centrifug	e 1 e 2 entrol Eff	10.7 ic.	ST		% CUMU	Sol. Con. Lost/Dumped Down Hole Newhole NET GAIN Discharged LATIVE COST	27 138
BARACOR 129 Caustic Soda KCL,Tech(sx) PAC -R PAC -L BAROID C. Da Sil	iva	50 lb		Melbourne		Adelaide		Desilter 1 Desilter 2 Centrifug Centrifug	e 1 e 2 entrol Eff	10.7	ST		% CU M U	Sol. Con. Lost/Dumped Down Hole Newhole NET GAIN Discharged	27 138 76
BARACOR 129 Caustic Soda KCL,Tech(sx) PAC -R PAC -L	Iva 3367 (neer	HEREO	Melbourne 03-62133	11 OT BE CON	Adelaide 08-47743	33 AUTHORIZII	Desilter 1 Desilter 2 Centrifug Centrifug Solids Co	e 1 e 2 entrol Eff DAIL A\$	10.7 ic. Y CO:	ST 0.26	ALID PAT	% CUMU A\$	Sol. Con. Lost/Dumped Down Hole Newhole NET GAIN Discharged LATIVE COST 18014.46	27 138

TIME BREAKDOWN SOLIDS ANALYSIS SURVEY DATA RESERVE PITS % Vol 2.9 20 Drilling DIR ° DISP m Low Grav. Solids NO TYPE bbl MD m TVD m INCL° Low Grav. Solids ppb 26.4 Circulating 1527 6 Pre-Mix 1527 2 High Grav. Solids % Vol 0.9 Reaming In High Grav. Solids ppb 13.2 Reaming out ASG of Solids g/cc 3.00 Tripping Cuttings Volume Interval Dilution bbl 27.0 Other bbl/m 1.3 Interval Consumption bbl/m 1.5 AVE ROP m/hr 5.95



25/5/94 up to 24:00 hrs, TVD 1666 DEPTH-m MD 1666 ACTIVITY COUNTRY Australia TOWNSHIP Port Campbell LOCATION

ins x ins Eff % bbl/stk 136 95 0.0525 5.5 7.75 95 0.0705 8,5 7.14 TOTAL bbl/min Pump Press 1075 psi CIRCULATING DATA m/min Total circ 103 mins ΑV 43.1 Bottoms up 38 mins DC 67.5 Surface-bit 13 mins Rise ECD ppg MUD PROPERTY SPECIFICATIONS 10-20 lb/100 ft2 YP 40-55 sec % KCL 3 ml

bbl/min

spm

Drilling ahead 8.5" hole to 1623m. Made 10 stand wiper trip OK. Continued drilling ahead , at 1628m circvlated up a sample.

CONSUMPTION KCL / POLYMER bbl SOLIDS CONTROL EQUIPMENT Additions Sea W. screen size 75 Drill W. 24 50x50x80 other other Barite 10 3 Chemicals 50 lb bbl/hr hrs bbl ppg PAC-L Losses bbl 28 22 11.1 1.25 Desander 72 44 Sol. Con. 10.5 2 22 Desilter 1 Lost/Dumped 30 Desilter 2 Down Hole Centrifuge 1 25 Newhole Centrifuge 2 23 **NET LOSS** 102 Discharged Solids Control Effic CUMULATIVE COST DAILY COST

WAREHOUSE OFFICE **BAROID Engineer** 21116.93 3102.47 C. Da Silva

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WITHO	UT ASSUMPTION OF A	VI LIADILII					SOLIDS AN	AL YSIS		TIME BREAKDOY	VN	hrs
_	RVE PITS	MD m	SURVE TVD m	Y DATA INCL°	DIR °		Low Grav. Solids	% Vol	3.5	Drilling Circulating		21 1
NO 6	TYPE bbl Pre-Mix	1610	1610	1.5			Low Grav. Solids High Grav. Solids	ppb % Vol	8.0	Reaming In		
							High Grav. Solids ASG of Solids		11.8 2.90	Reaming out Tripping	_	
							Cuttings Volume Interval Dilution	bbi bbi/m	25.0 1.2	Other		1
							Interval Consumption			AVE ROP m	/hr	5.19
						L				TAVE NO.		

4						MUD REP	ORT N	ο.	15	up to	24:00	nrs,	26/5/9	4
PARTIT	Baroid A	ustra	lia Pt	v Ltd		DATE	27/5/94		DEPT	H-m	MD 17	32	TVD 1	732
			•	,		START D	ATE		ACTIV	ITY				
						12-May-	94		Trippir					
OPERATOR				CTOR / RIC	G				COUN					
GFE Resources Ltd			Century R						Austra TOWN					
REPORT FOR			REPORT J.Hoffman							ampbei	1			
Ken Smith WELL NAME AND	NO			BLOCK N	10.	· · · · · · · · · · · · · · · · · · ·			LOCA	TION		-		
Langlev-1			PPL 1							Basin,		<u> </u>		
BIT DATA	DRILLIN	IG STRING			CASINGS					PUMP		h hi /otle		bbl/min
Size 8.500 ins	OD ins		Length m		Set @	Depth m	Pump I Nat 7Ps		5.5	x ins 7.75	95	bbi/stk 0.0525	spm 111	5.828
Type Sec S82F	Pipe 1 4.5 Pipe 2 4.5	4.367 2.875	1501.8 55.28	Riser	Set @	334.43			6	8.5	95			
Nozzles 32nds 11 13 13	 	2.070	00.20	3 0,0	Set @									<u> </u>
-11 19 19	Col 1 6.25	2.875	174.96		Set @		Pump f					AL bbl/m		5.828
	Col 2				Set @		MUD V		bbl			NG DAT	·	m/min
Noz Area 0.35 ins²	 	LE SECTI	ONS		Set @		Downh Active		379 437		airc 140 ns up 4		DP	35.2
TFA ins²	Sect 1			Liner	Set @ Set @		Total C		816		,	7 mins	- DC	55.1
NV m/sec 67.8 Impact lb f 262	Sect 2 Current	8.5	1397.6	Liliei	Top @		Reserv		mathinin myle	ECD p	pg	9.37	Riser	ngir , parke giran isa sas
impact in 1 202	Carrent	l U.S	MUD PRO	PERTIES				MUD P	ROPE	RTY SF	ECIFIC	CATIONS		
Sample Location	IN or OUT	IN		IN		WEIGHT	<9.3 p			40-55		ΥP		1b/100 ft
Time Sample Taken	hrs	09:30		15:35		API Filt			HTHP		ml	KCL	3	%
Depth	m	1719		1732		BY AUTH		Mud Pr	rogram					
Flowline Temp	°C	40		9.30		REMARK Continue		nre-m	ix and	PAC for	mud n	naintaine	nce.	
Weight Funnel Viscosity	ppg sec/qt	9.25 50		51		Continue	adding	PI	iin airia	, , , , , , , , ,				
Plastic Viscosity	cP	14		15										
Yield Point	lb/100 ft ²	17		18										
Gels 10 sec/10min/s		5/15/24		6/17/26										
API Filtrate	ml/30min	6.8		7.0										
HPHT Filtrate	ml/30min (e 32nd ins	2/-		2/-										
API/HPHT Filter Cal Solids	% Vol	4.5	 	4.5										
Dissolved Salts	% Voi	1.5		1.5		1								
0il Content/Water C	ontent % Vol	-/94.0		-/94.0		l								
Sand	% Vol	0.2		0.2		l								
Methylene Blue cap		9.3	1	9.5										
pH Alk. Mud Pm	meter ml	0.40		0.40		ACTIVITY	1							
Alk. Filtrate, Pf/Mf	mi	0.10/0.30		0.10/0.30		Continue								
Chlorides	mg/Lx10 ³	18.0		18.0		was a dril	ling brea	ak at th	nis poin	t. Drille	d to 173	31m and	circula	ted
Total Hardness/Cal		60/60		60/60		up a sam the bit wa				xtra but	only m	anaged	ım, be	cause
KCL	% Wt Solr	3.0		3.0		the bit wa	is torque	ang up	J. POH.					
ASG of Solids n & K	g/cc	0.54/1.07		0.54/1.14	 									
K+ Ion Conc	mg/Lx10 ³	17.2		17.2		l								
						l								
					<u> </u>									
Rheometer lb/100 ft ²	600 rpm/300 rpm 200 rpm/100 rpm			48/33	 									
ID/100 IL	6 rpm/3 rpm		ļ											
	INVENTORY AN	D CONSU	MPTION											
PRODUCT DESCR		USED	REC	BAL	COST	MUD TY			OLYM			CONSI		ON bbl
Caustic Soda	25 kg	1	ļ	21	32.43	SOLIDS				ENT size	hre	Addition Sea W.	uis	100
CMC EHV	25 kg	40		80	426.44 577.6	Shaker 1	Mak	d	50x50		15			126
KCL,Tech(sx) PAC -R	25 kg 50 lb	6		14		Shaker 2						other		
1 40-11	00 ID	T				Shaker 3						other		
					ļ	Shaker 4					<u> </u>	Barite	-10	
			<u> </u>		ļ	n			bbl/hr 1.25	hrs 15	bbl 19	Chemic		bbl 4
		 	 			Desander Desilter 1		11.3	1.25		30			49
		 	 	 		Desilter 2		, , , ,				Lost/Du		
		1	 			Centrifug						Down H		
				1	1	1			1	i	1	I Administration of		15
						Centrifug	8 2			Ь	ا	Newho		
											·	NET G	AIN	81
BAROID Eng		OFFICE		WAREHOL	ISE	Solids Co	ntrol Eff	ic.	ST		% CUMU		AIN rged	81 49

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BESE	RVE PITS			SURVE	EY DATA			SOLIDS AN	IALYSIS	3	TIME BREAKDO	WN	hrs
NO	TYPE	bbi	MD m	TVD m	INCL°	DIR°	DISP m	Low Grav. Solids	% Vol	2.8	Drilling		13
110	1112		1					Low Grav. Solids	ppb	25.5	Circulating		2
	 		1					High Grav. Solids	% Vol	1.7	Reaming In		
	+		1					High Grav. Solids	ppb	25.0	Reaming out		
			1	-				ASG of Solids	g/cc	3.20	Tripping		9
	 		 	-				Cuttings Volume	bbl	15.0	Other		
-			1					Interval Dilution	bbl/m	1.2			
-	 		1					Interval Consumption	bbl/m	1.5			
	<u> </u>		1								AVE ROP n	n/hr	5.08

						r e			. 1				
	· · · · · · · · · · · · · · · · · · ·					MUD REF	PORT NO.	16	upto 2	24:00 h	nrs,	27/5/94	
(PAPITI)	Baroid A	ustra	lia Pt	v Ltd		DATE	28/5/94	DEPTI	i-m	MD 174	15	TVD 17	'45
7111			•	,		START D	ATE	ACTIV	ITY				
						12-May-	94	Trippin					
OPERATOR			CONTRA	CTOR / RIC	3			COUN					ĺ
GFE Resources Ltd			Century R	ig 11				Austra					
REPORT FOR			REPORT					TOWN	ishir ampbel	ı			
Ken Smith			J.Hoffmar					LOCA		<u> </u>			
WELL NAME AND I	NO.			BLOCK N	Ю.				Basin.	Victoria			
Langley-1	DDII I IN	G STRING	PPL 1		CASINGS				PUMP				
Size 8,500 ins	OD ins		Léngth m			Depth m	Pump Make	ins	x ins	Eff %	obl/stk	spm	bbl/min
Type S82F	Pipe 1 4.5	4,367	1514.8		Set @		Nat 7P50	5.5	7.75	95	0.0525	111	5.828
Nozzles 32nds	Pipe 2 4.5	2.875		9 5/8"	Set @	334.43	Nat 8P80	6	8.5	95	0.0705		
	Pipe 3				Set @			ـــــل				Ļ	
	Col 1 6.25	2.875	174.96		Set @		Pump Press				AL bbi/m		5.828
	Col 2				Set @		MUD VOL	bbl			NG DAT	AV n	o/min
Noz Area 0.32 ins²	OPEN HO	LE SECTION	ONS		Set @		Downhole	382 419		irc 137 1s up 49		DP II	35.2
TFA ins ²	Sect 1				Set @		Active Total Circ	801		e-bit 1		DC	55.1
NV m/sec 75.7	Sect 2	<u> </u>		Liner		ma., 54 mg - 120	Reserve	001	ECD p	Carte Spice	9.37		
Impact lb f 293	Current	8.5	1410.6 MUD PRC	DEDTIFE	Top @			PROPE			ATIONS		
		IN	MUD PHO	IN		WEIGHT			40 – 55				lb/100 ft ²
Sample Location	IN or OUT	08:30		18:00		API Filt		HTHP		ml i	KCL	3	%
Time Sample Taken	hrs m	1745		1745		BY AUTH	ORITY Mud F	rogram					
Depth Flowline Temp	°C	40		40		REMARK							
Weight	ppg	9.28		9.30		Remove	near bit stabal	izer and	put on	a new b	oit.		ļ
Funnel Viscosity	sec/qt	51		50		KCL used	i for slugs.						Ì
Plastic Viscosity	сР	15		15									
Yield Point	lb/100 ft ²	20		18									
Gels 10 sec/10min/3		6/17/26		5/13/20									
API Filtrate	ml/30min	6.5		6.8		l							
HPHT Filtrate	ml/30min			2/-									
API/HPHT Filter Cak	e 32nd ins % Vol	2/- 4.5		4.5		1							
Solids Dissolved Salts	% Vol	1.5		1.5		l							
Oil Content/Water Co		-/94.0		-/94.0									
Sand	% Vol	0.2		0.2									
Methylene Blue cap		13		12		1							
pH	meter	9.0		9.0			· · · · · · · · · · · · · · · · · · ·						
Alk. Mud Pm	ml	0.35		0.35	ļ	ACTIVIT	Y e hole to 1713		to bott	om et 1	732m C	irculate	d hottoms
Alk. Filtrate, Pf/Mf	ml	0.10/0.30	 	0.10/0.25		Han in th	e hole to 1713 o drilling to 17	m wasn 734m ci	culated	un san	nole Dri	lled to 1	745m
Chlorides	mg/Lx103	18.0	ļ	18.0		Circulate	d up sample.	t was d	ecided	to do a	test at th	is dept	h, made
Total Hardness/Cald		50/50 3.0		3.0		a woier to	ip to the shoe	. Ran be	ck to b	ottom a	nd circui	lated ho	ole clean
KCL ASG of Solids	% Wt Soln	3.0		3.0			OH for DST #						
n & K	g/cc	0.51/1.45		0.54/1.14		l' '''							
K+ Ion Conc	mg/Lx10 ³	17.2		17.2		1							
KT IOH OOHO						1							
	600	FOIDE		48/33		1							
Rheometer	600 rpm/300 rpm 200 rpm/100 rpm	50/35	 	40/00		1							
lb/100 ft²	6 rpm/3 rpm	 	 			1							
	INVENTORY AN	CONSU	MPTION			L							
PRODUCT DESCR		USED	REC	BAL	COST	MUD TY		POLYM			CONS		
Caustic Soda	25 kg	1		20	32.43	SOLIDS	CONTROL E				Additio	ns	<u>bbl</u>
KCL,Tech(sx)	25 kg	30		50	433.2	 	Make			hrs	Sea W.		40
		ļ	ļ	ļ	L	Shaker 1		50x50	x80	12	Drill W.		40
			ļ			Shaker 2 Shaker 3		+			other		
			 	 		Shaker 4		+			Barite		

bbl

14 Losses

24 Sol. Con.

bbl/hr hrs bbl

12

12

1.2

10.7

10.1

Chemicals

Lost/Dumped

Down Hole

Newhole

38

20

3

15 58

				NET LOSS
			Solids Control Effic.	% Discharged
BAROID Engineer	OFFICE	WAREHOUSE	DAILY COST	CUMULATIVE COST
C. Da Silva	Melbourne	Adelaide	A\$ 465.63	A\$ 23643.47
Tel. 03-6213367 (Fax)	03-6213311	08-477433	IZANG THE INTERINGEMENT OF ANY VAL	ID DATENT AND ADE MADE

Shaker 4

Desander

Desilter 1.

Desilter 2.

Centrifuge 1

Centrifuge 2

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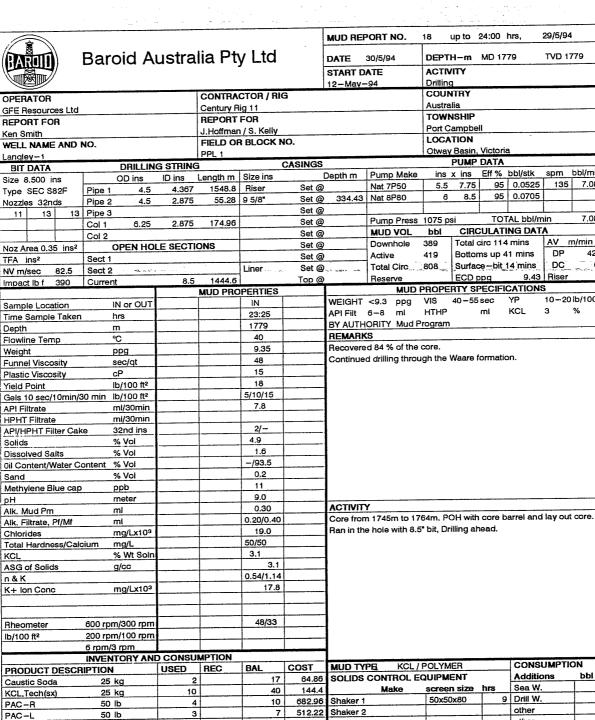
DEG	ERVE PITS			SURV	EY DATA			SOLIDS AN	IALYSIS	·	TIME BREAK	DOWN_	hrs
NO	TYPE	bbl	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	2.8	Drilling		2
NO	I I I F E	UDI	IVID III	1,45			1	Low Grav. Solids	ppb	25.5	Circulating		5
			1	-				High Grav. Solids	% Vol	1.7	Reaming In		
	 		1					High Grav. Solids	ppb	25.0	Reaming out		
	 		1					ASG of Solids	g/cc	3.20	Tripping		16
			·	1				Cuttings Volume	bbl	3.0	Other		1
	 		 				T	Interval Dilution	bbl/m	1.2			
			1					Interval Consumption	bbi/m	1.5			
			 		 						AVE ROP	m/hr	6.5

DPERATOR FEE Resources Ltd REPORT FOR Ken Smith MELL NAME AND N anglev-1 BIT DATA	Baroid Au	ıstra	lia Pty	y Ltd	L		9/5/94		EPTH	−m N	ID 1745	TVD	1745	5
OPERATOR FE Resources Ltd REPORT FOR Ken Smith WELL NAME AND N angley—1			-	•										
GFE Resources Ltd REPORT FOR Ken Smith WELL NAME AND N angley—1						START DA		1.	CTIVIT					
GFE Resources Ltd REPORT FOR Ken Smith WELL NAME AND N angley—1			CONTRA	CTOR / RIG		12-May-	94		COUNT					
REPORT FOR Ken Smith WELL NAME AND No. 1 Langley — 1			Century R						ustralia					
Ken Smith WELL NAME AND I angley-1			REPORT					1.	OWNS					
angley-1			J.Hoffmar						ort Car					
	NO.		FIELD OF	BLOCK N	U .			1 -		Basin, V	ictoria			
	DRILLING	STRING		C	ASINGS					UMP D			- 1-1-	-Umin
Size 8.500 ins	OD ins		Length m	Size ins		Depth m	Pump Ma		ins x 5.5	ins E				ol/min 6.458
Type CD502	Pipe 1 4.5	4.367	1514.8		Set @ Set @	334.43	Nat 7P50 Nat 8P80		6	8.5		0.0705		
Nozzles 32nds	Pipe 2 4.5	2.875	55.28	9 5/8"	Set @	304.40	1100 01 05							
CORE BIT	Pipe 3 Col 1 6.25	2.875	174.96		Set @		Pump Pr					L bbl/min		6.458
	Col 2				Set @		MUD VC		bbl	CIRCU Total cir		G DATA	m/i	min
Noz Area ins²	OPEN HOL	E SECTI	ONS		Set @		Downho Active	-	}	Bottom:				39
TFA ins²	Sect 1			Liner	Set @ Set @		Total Cir		71	Surface	-bit 15	i mins · D		- 61
NV m/sec	Sect 2 Current	8.5	1410.6	1	Top @	e i, in our Publications.	Reserve		- ~	ECD pp	g	9.38 Ris	er	Agent wine
Impact lb f	Onitelit	5.5		PERTIES								ATIONS	20 14	/100 P
Sample Location	IN or OUT			IN		WEIGHT			'IS 4 ITHP	-55 s n		'P 10- (CL 3	ما 20· %	/100 ft
Time Sample Taken	hrs			24:00		API Filt BY AUTH				11	111 1	OL O	,-	_
Depth	m			1745		REMARK		<u>uu 110</u>						
Flowline Temp				9.30		Approx. 5	mmcfd of	gas.						
Weight Funnel Viscosity	ppg sec/qt			49										
Plastic Viscosity	сР			14		l								
Yield Point	lb/100 ft²			18		l								
Gels 10 sec/10min/3				5/12/19 7.0										
API Filtrate HPHT Filtrate	mi/30min mi/30min		 	1										
API/HPHT Filter Cal				2/										
Solids	% Vol			4.9		į								
Dissolved Salts	% Vol		 	1.6		ł								
0il Content/Water C				-/93.5 0.2		1								
Sand Methylene Blue cap	% Vol			12		1								
pH	meter			9.0										
Alk. Mud Pm	ml			0.30		ACTIVIT	Y - belo on	d porfe	orm DS	T#11	ntervai	1715m to 1	745m	1.
Alk. Filtrate, Pf/Mf	ml			0.20/0.35		Recovere	d CO2 at	as. Pul	led out	of the i	nole an	d laid out te	st toc	oi.
Chlorides	mg/Lx10 ³ cium mg/L		 	50/50		Made up	core barr	ei and	ran in	the hole	e. Wash	and ream I	ast 1	5m to
Total Hardness/Cal KCL	% Wt Soin			3.0		bottom.								
ASG of Solids	g/cc			3		1								
n & K				0.52/1.25										
K+ Ion Conc	mg/Lx10 ³			17.2	<u> </u>	1								
				 		1								
Rheometer	600 rpm/300 rpm			46/32										
lb/100 ft ²	200 rpm/100 rpm					-								
	6 rpm/3 rpm	CONCL	IMPTION		<u> </u>	1								
PRODUCT DESCI	INVENTORY AND	USED	REC	BAL	COST	MUD TY			OLYM			CONSUM	PTIO	
Caustic Soda	25 kg		1	19	32.43	SOLIDS	CONTR		UIPME	NT		Additions	— r	bbl
Oddollo oo aa						 	Make		50x50	size	nrs 2	Sea W. Drill W.		
			 		 	Shaker 1 Shaker 2			SUXSU	A00		other		
		 		+	-	Shaker 3						other		
						Shaker 4					<u> </u>	Barite		
									bbl/hr		bbl	Chemicals Losses		bbl
				<u> </u>	-	Desande		10.7 10	1.25	2	4		П	UUI
						Desilter :		10	1.,,3	<u> </u>	<u> </u>	Lost/Dump	ed	2
					 	Centrifug						Down Hole		
			+			Centrifu				L	L	Newhole	_	
1						1					%	NET LOS		31
		1	1	1	1	Solids C	ontrol Eff	ur.			/0			
		OFFICE		WAREHO	LICE	- Condo C		Y CO	ST			LATIVE CO		

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				et IDV	Y DATA_			SOLIDS AN	ALYSIS		TIME BREAKD	OWN	hrs
_	RVE PITS		Lup	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	3.7	Drilling		
NO	TYPE	bbl	MD m	IVD m	INCL		10101	Low Grav. Solids	ppb	33.7	Circulating		1
								High Grav. Solids	% Vol	1.2	Reaming In		1
			<u> </u>					High Grav. Solids	daa	17.6	Reaming out		
ļ			 				 	ASG of Solids	g/cc	3.00	Tripping		15
							<u> </u>	Cuttings Volume	bbl		Testing		4
					 			Interval Dilution	bbl/m	1.3	Other		3
			 		 	-	 	Interval Consumption	bbl/m	1.5			
			 		 	 		1			AVE ROP	m/hr	
1	Į.		1			<u> </u>		I					



TVD 1779

spm bbl/min

AV m/min

10-20 lb/100 ft2

%

DP

DC

7.088

42.8

67

ł.	INVENTORYAN	AD COMPOS	ML LIOIA									
PRODUCT DESC	RIPTION	USED	REC	BAL	COST	MUD TYPE	KCL/F	POLYME	ER		CONSUMPTIO	
Caustic Soda	25 kg	2		17	64.86	SOLIDS CONT	ROL EC	UIPME	NT		Additions	bbl
	25 kg	10		40	144.4	Ma	ake	screen	size	hrs	Sea W.	
KCL,Tech(sx)		4		10	682.96	Shaker 1		50x50	ĸ80	9	Drill W.	90
PAC-R	50 lb	3		7	512.22						other	
PAC-L	50 lb	 	 	 		Shaker 3					other	
		 	 	 		Shaker 4					Barite	
				·			ppg	bbl/hr	hrs	bbl	Chemicals	2
				 		Desander	10.9	1.2	9	11	Losses	bbl
				 		Desilter 1.	10.1	1.5	9	14	Sol. Con.	25
						Desilter 2.					Lost/Dumped	30
						Centrifuge 1					Down Hole	
		-		1		Centrifuge 2					Newhole	8
		-									NET GAIN	37
				····		Solids Control	Effic.			%	Discharged	55
DAGOID F-	-cinose	OFFICE		WAREHOL	ISE	D/	ILY CO	ST		CUMU	LATIVE COST	

BAROID Engineer A\$ 25080.34 A\$ 1404.44 Adelaide Melhourne 08-477433 03-6213311 03-6213367 (Fax) THE RECOMMENDATIONS MADE HEREON SHALL NOT BE CONSTRUED AS AUTHORIZING THE INFRINGEMENT OF ANY VALID PATENT, AND ARE MADE

WAREHOUSE

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OFFICE

DAILY COST

AVE ROP

m/hr

SOLIDS ANALYSIS TIME BREAKDOWN hrs SURVEY DATA RESERVE PITS 10 Low Grav. Solids % Vol 3.4 Drilling DIR ° DISP m MD m TVD m INCL° NO TYPE bbl 30.9 Circulating Low Grav. Solids ppb Reaming In % Vol 1.5 High Grav. Solids 22.0 Reaming out High Grav. Solids daa 3.10 Tripping ASG of Solids g/cc Cuttings Volume bbl 8.0 Testing Interval Dilution bbl/m 1.3 Other Interval Consumption bbl/m 1.5

			· .	٠	<u> </u>						: 			11 . T
						MUD REP	ORT N	0. 1	19 L	ip to 2	24:00 h	ırs, 🤅	30/5/94	
RAROID	Baroid A	ustral	ia Pt	y Ltd		DATE	31/5/94		DEPTH	i-m	MD 185	3	TVD 18	53
			•	•		START D			ACTIV					
			CONTRA	CTOR / RIG		12-May-	94		Drilling COUN					
OPERATOR GFE Resources Ltd		ŀ	Century R	•					Austral					
REPORT FOR			REPORT					1	TOWN Port Ca		,			
Ken Smith			S. Kelly	R BLOCK N	Ο.				LOCAT		·	-		
WELL NAME AND I	NO.		PPL 1	, DECOUNT							Victoria			
BIT DATA		3 STRING			CASINGS)- mth m	Pump I	Maka	ins >	UMP	Eff %	obl/stk	spm i	obl/min
Size 8.500 ins	OD ins Pipe 1 4.5	ID ins 1	_ength m 1622.8		Set @	Depth m	Nat 7P		5.5	7.75		0.0525	132	6.93
Type SEC S82F Nozzies 32nds	Pipe 1 4.5 Pipe 2 4.5	2.875		9 5/8"	Set @	334.43	Nat 8P	во	6	8.5	95	0.0705		
	Pipe 3				Set @		Pump f	Proce :	1100 ps		TOT	AL bbl/m	in	6.93
	Col 1 6.25	2.875	174.96		Set @ Set @		MUD V		bbl			NG DAT		
Noz Area 0.35 ins²	Col 2 OPEN HOL	E SECTION	ONS		Set @		Downh		383		irc 116		AV m	
TFA ins²	Sect 1				Set @		Active Total C		419 802		ns up 40 e-bit 1		DP DC	41.8 65.5
NV m/sec 80.6	Sect 2	8.5	1518.6	Liner	Set @ Top @		Reserv		002	ECD p	pg	9.37	Riser	de l'éco
Impact lb f 371	Current			PERTIES					ROPE	RTY SP	ECIFIC	ATIONS		
Sample Location	IN or OUT	iN		IN		WEIGHT				4055				lb/100 ft² %
Time Sample Taken		10:45		23:45 1853		API Filt BY AUTH			HTHP ogram		ml !			.·
Depth Flowline Temp	m ℃	1821 40		41		REMARK	S							
Weight	ppg	9.30		9.30		Top of Eu	ımeralla	format	ion at 1	820m (tentativ	e).	rillad int	o the
Funnel Viscosity	sec/qt	48		13		Mud visco	osity and a formati	d Hneol ion, as	it conta	ins less	minnea) mudst	one and	claysto	ne.
Plastic Viscosity Yield Point	cP lb/100 ft²	14		16		Lameran	2101111							
Gels 10 sec/10min/s		4/9/13		4/8/11										
API Filtrate	ml/30min	8.0		7.3										
HPHT Filtrate API/HPHT Filter Cal	ml/30min (e 32nd ins	2/-		2/-										
Solids	% Vol	4.9		5.0										
Dissolved Salts	% Vol	1.6		1.5										
0il Content/Water C	ontent % Vol % Vol	-/93.5 0.2		-/93.5 0.2										
Sand Methylene Blue cap		11		9										
pH	meter	9.0		9.0		ACTIVIT	·							
Alk. Mud Pm Alk. Filtrate, Pf/Mf	ml ml	0.30 0.20/0.40		0.35		Continue	d drilling	throug	gh Waa	re and	Eumera	alla forma	ations a	i
Chlorides	mg/Lx10³	18.5		18.0		2-3 m/h	r.							
Total Hardness/Cale		50/50		50/50 3.0										
KCL ASG of Solids	% Wt Soln	3.0		3.0										
n & K		0.52/1.25		0.53/1.06		l								
K+ Ion Conc	mg/Lx10 ³	17.2		17.2		l								
				 										
Rheometer	600 rpm/300 rpm	46/32		42/29										
lb/100 ft²	200 rpm/100 rpm			 										
	6 rpm/3 rpm INVENTORY ANI	CONSU	MPTION											
PRODUCT DESCR		USED	REC	BAL	COST	MUD TY			POLYM			CONSI		DN bbl
Caustic Soda	25 kg	4	ļ	16	32.43 682.96	SOLIDS	Mak			i size	hrs	Sea W.	1110	
PAC-R PAC-L	50 lb	2		5	341.48	1			50x50	x80	24	Drill W.		83
						Shaker 2					ļ	other		
				-		Shaker 3 Shaker 4			 			Barite		
								ppg	bbi/hr		bbi	Chemic		1
						Desande		11		24				bbl 65
			<u> </u>	 		Desilter :		10.3	1.5	24	30	Lost/Du		25
		-				Centrifug						Down I	lole	-
						Centrifug	je 2	L	1	<u></u>	<u></u>	Newho		17
				 		Solids C	ontrol Ef	fic.			%	Discha		90
BAROID En	gineer	OFFICE		WAREHOL	JSE			LY CO	ST		CUMU	LATIVE	COST	
				1		I	۸¢					26137	7 04	

A\$ 26137.21

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Adelaide

Melbourne

C. Da Silva

DECE	RVE PITS			SURVE	Y DATA			SOLIDS AN	IALYSIS	·	TIME BREAK	DOWN	hrs
NO	TYPE	bbl	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	3.8	Drilling		23
NO	IIFE	DDI	1808	1808	0.75			Low Grav. Solids	ppb	34.6	Circulating		
-	 		1	1333				High Grav. Solids	% Vol	1.2	Reaming In		
-	 		 					High Grav. Solids	ppb	17.6	Reaming out		
								ASG of Solids	g/cc	3.00	Tripping		
-							·	Cuttings Volume	bbl	17.0	Testing		
-	 		 				1	Interval Dilution	bbl/m	1.3	Other		1
-	 		 					Interval Consumption	bbl/m	1.5			
 											AVE ROP	m/hr	3.22

A\$ 1056.87

								MUD REF	OPTA	10 (20	up to 2	24.00	nre :	31/5/94	
		Dor	oid·∧	uctro	lia Dt	, I +d						H-m		<u>-</u>	TVD 19	
BAROLL)	Dan	old A	uslia	וומדני	y Ltd		DATE START D	1/6/94 ATE		ACTIV		WID 19	-	140 13	
	/							12-May-				g Out f	or DST	# 2.		
OPERATOR					CONTRA	CTOR / RIC	3				COUN					
GFE Resour					Century R						Austra TOWN					
REPORT FO	OR				REPORT	FOR				1		ampbeli				
Ken Smith	C AND	NO.			S. Kelly	BLOCK N	10.				LOCA			-		
WELL NAMI	E AND	NO.			PPL 1	DEGGI						Basin,		1		
BIT DATA			DRILLIN	G STRING		(CASINGS					PUMP		h h 1/ 1/2		bbl/min
Size 8.500			OD ins		Length m	Size ins		Depth m	Pump Nat 7P		5.5	x ins 7.75	95	0.0525	132	6.93
Type SEC S		Pipe 1	4.5	3.826 2.875	1679.8 55.28	Riser	Set @ Set @	334.43			6	8.5		0.0705		
Nozzles 32r		Pipe 2 Pipe 3	4.5	2.875	35.20	9 3/0	Set @		1,10							
11 13	13	Col 1	6.25	2.875	174.96		Set @			Press				AL bbi/m		6.93
		Col 2					Set @		MUD		bbl			NG DATA	AV n	/min
Noz Area 0.3	35 ins²		OPEN HO	LE SECTION	ONS		Set @		Down! Active		395 371	Total c			DP II	41.8
TFA ins ²		Sect 1				Liner	Set @ Set @		Total (766	1.		2 mins	DC	65.5
NV m/sec Impact lb f	80.6 371	Sect 2 Currer		8.5	1575.6				Resen					9.38	Riser	٠
impact in i	3/1	Culler			MUD PRO	PERTIES				MUD P	ROPE	RTY SP		CATIONS		
Sample Loc	ation		IN or OUT	IN		IN		WEIGHT				40 – 55				lb/100 ft²
Time Sampl			hrs	11:15		17:10		API Filt	_		HTHP		mi	KCL	3	%
Depth			m	1897		1910		BY AUTH REMARK		Mua Pr	ogram					
Flowline Ter	np		℃	41 9.30		9,30		Mud prop	erties s	taving v	erv ste	ady, PA	C and	Caustic u	sed fo	mud
Weight Funnel Visc	oeitu.		ppg sec/qt	45		46		maintaina		,		•				
Plastic Visco			cP	14		15										
Yield Point			lb/100 ft ²	16		18										
Gels 10 sec	/10min/3		lb/100 ft ²	4/9/12		5/9/14										
API Filtrate			mi/30min	7.2		7.0										
HPHT Filtrat			ml/30min 32nd ins	2/-		2/-										
Solids	iller Car		% Vol	5.0		5.1										
Dissolved S	alts		% Vol	1.5		1.4		1								
0il Content/	Water C		% Vol	-/93.5		-/93.5		l								
Sand			% Vol	0.2		0.1										
Methylene E	Blue cap		ppb meter	9.3		9.2		l								
pH Alk. Mud Pn	n		mi	0.30		0.35		ACTIVIT	Y							
Alk. Filtrate,			ml	0.20/0.35		0.25/0.35		Drilled to	1897m	, circula	ted up	sample	for Ge	ologist as	gas in	creased
Chlorides			mg/Lx10 ³	18.0		16.5		to 70 unit Drilled or	s. Then	made a	wiper	trip (10	stands	i), tight tre	om 180 + (Gee	2-17421 87units)
Total Hardn	ess/Cald		mg/L	50/50		50/50		Drilled or					pie ioi	Geologia	i. (Gas	o r armo,
KCL ASG of Soli			% Wt Soln g/cc	3.0		2.8		Decided	10 1001,							
n & K	us		9/00	0.55/0.97		0.54/1.14		1								
K+ Ion Con	c		mg/Lx10 ³	17.2		16.1										
			1000	44/00	ļ	49/22		ł								
Rheometer lb/100 ft ²			n/300 rpm n/100 rpm	44/30		48/33_	 	1								
10/100 11-		6 rpm/3														
			TORY AN			,				140: :-				CONC	MOTI	NA.
PRODUCT				USED	REC	BAL	COST	MUD TY		KCL/F			,	CONSL)N bbl
Caustic Soc	da	25		1	 	15	32.43	อบเมช	CONII Mal			:NI 1 size	hrs	Sea W.		
EZ SPOT	v)	208	ka ka	 	80	120	 	Shaker 1		· -	50x50		18			48
KCL,Tech(s	^/	50		2			341.48							other		<u></u>
PAC-L		50		5			853.7							other		
						ļ	<u> </u>	Shaker 4			bbi/hr	h	bbl	Barite	ais	1
					 	 		Desande		ppg 10.5	1.2		22			bbl
					 	 	-	Desilter 1		10.5	1.5		27	 		49
				 			<u> </u>	Desilter 2						Lost/Du	mped	36
								Centrifug				<u> </u>	ļ	Down H		
				ļ			ļ	Centrifug	e 2		<u> </u>		L	NET LC		13 36
					-	ļ	 	Solids Co	ontrol E	ffic			%	Discha		85
BAD	OID Eng	rinos-		OFFICE	<u> </u>	WAREHOL	JSE	SUITUS CO		LY CO	ST			LATIVE		
	Silva	J.11661		Melbourne	•	Adelaide			A\$	1227	'.61		A\$	27364	.82	

m/hr

AVE ROP

TIME BREAKDOWN SOLIDS ANALYSIS SURVEY DATA RESERVE PITS 10 DIR ° DISP m Low Grav. Solids % Vol 4.1 Drilling NO TYPE bbl MD m TVD m INCL° 2 Low Grav. Solids ppb 37.3 Circulating High Grav. Solids % Vol 1.0 Reaming In 14.7 Reaming out High Grav. Solids ppb Tripping 8 2.90 ASG of Solids g/cc Cuttings Volume Testing bbl 13.0 4 Interval Dilution Other bbl/m 1.3

Interval Consumption

bbl/m 1.5

08-477433

WITHOUT ASSUMPTION OF ANY LIABILITY BY BAROID DRILLING FLUIDS, INC OR IT'S AGENTS. AND ARE STATEMENTS OF OPINION ONLY.

THE RECOMMENDATIONS MADE HEREON SHALL NOT BE CONSTRUED AS AUTHORIZING THE INFRINGEMENT OF ANY VALID PATENT, AND ARE MADE

03-6213311

03-6213367 (Fax)

			<u> </u>		Т		OFT				24.00 '		1/6/94	
BARUII	Baroid A	ustra	lia Pty	/ Ltd		START D	2/6/94 ATE		DEPTH ACTIVI	i-m	24:00 I		TVD 19	15
OPERATOR			CONTRAC	CTOR / RIG	<u> </u>	12-May-	94		COUN					
OPERATOR GFE Resources Ltd			Century R	-					Austral					
REPORT FOR			REPORT	FOR					TOWN					
Ken Smith			S. Kelly	OL OCK N					Port Ca		<u> </u>	-		
WELL NAME AND	NO.		PPL 1	BLOCK N	O.				Otway		Victoria			
Langley-1 BIT DATA	DRILLING	S STRING		(CASINGS					PUMP				- 1- 1 (i
Size 8.500 ins	OD ins		Length m			Depth m	Pump N Nat 7P5		ins x 5.5	7.75	Eff % 95	0.0525	spm 1	bl/min 6.93
Type ETD-517	Pipe 1 4.5	3.826	1684.8 55.28		Set @ Set @	334,43			5.5	8.5	95	0.0705		
Nozzles 32nds	Pipe 2 4.5 Pipe 3	2.875	33.20	9 3/0	Set @									
11 13 10	Col 1 6.25	2.875	174.96		Set @		Pump F					AL bbl/m		6.93
	Col 2				Set @		MUD V		<u>bbi</u> 396		irc 113	NG DAT	AV m	/min
Noz Area 0.35 ins²	OPEN HOL	E SECTI	ONS		Set @ Set @		Downh Active		385		nsup 4		DP	41.8
TFA ins²	Sect 1			Liner	Set @		Total C		781		•	2 mins	DC	65.5
NV m/sec 80.6 Impact lb f 371	Sect 2 Current	8.5	1580.6	LINIO	Top @		Reserv			ECD p		9,39		
impact is 1 or 1	Joanone		MUD PRO	PERTIES								CATIONS	10-20	Ib/400 f
Sample Location	IN or OUT			IN		WEIGHT		- 1- 3	VIS (HTHP	40 – 55		YP KCL		16/100 I %
Time Sample Taken				24:00		BY AUTH						NOL.	•	,-
Depth	 ©			1915 41		REMARK		<u> </u>	3,					
Flowline Temp Weight	ppg			9.30		No gas to								
Funnel Viscosity	sec/qt			48		Packer fa	iled to se	eat, mi	srun.					
Plastic Viscosity	сР			15										
Yield Point	lb/100 ft ²			20										
Gels 10 sec/10min/s	30 min lb/100 ft² ml/30min			7/12/17 7.1		l								
API Filtrate HPHT Filtrate	ml/30min		 	,		1								
API/HPHT Filter Cal				2/-		1								
Solids	% Vol			5.1		ł								
Dissolved Salts	% Vol ontent % Vol			1.4 -/93.5		1								
0il Content/Water C Sand	% Vol			0.1		1								
Methylene Blue cap				10]								
рН	meter		-	9.0		ACTIVIT								
Alk. Mud Pm	ml		 	0.30		Ran in th		ith test	tool, ar	nd perf	orm DS	T # 2.		
Alk. Filtrate, Pf/Mf Chlorides	ml mg/Lx10 ³		1	16.5		interval 1	875m to	1910n	n. Did n	ot flow	, pulled	out of th	ne hole.	
Total Hardness/Cal				50/50		Ran back	c in with	bit to 1	890m, \	washed	to bot	tom and	circulate	ed for
KCL	% Wt Soin			2.8		thirty five	minutes	prior	o drillin	g anea	.c.8 D	iole.		
ASG of Solids	g/cc	ļ	1	2.9 0.51/1.45		1								
n & K K+ Ion Conc	mg/Lx10 ³		 	16.1		1								
TET IST COME						1								
				ļ <u>.</u>	ļ	1								
Rheometer	600 rpm/300 rpm	!	 	50/35		1								
lb/100 ft ²	200 rpm/100 rpm 6 rpm/3 rpm	 		 		1								
	INVENTORY AND	CONSU	MPTION											222
PRODUCT DESCR		USED	REC	BAL	COST	MUD TY SOLIDS			POLYMI			Additio	UMPTIC	bbi Idd
			-	ļ		SOLIDS	CONTH Mak		SCLEGU		hrs	Sea W		T
		 				Shaker 1			50x50		2			4
		 				Shaker 2						other		
						Shaker 3			 		 	other		
				ļ	<u> </u>	Shaker 4			bbl/hr	h	bbl	Barite	cals	
						Desande		10.7						bbl
		 	-	 	 	Desilter		10.7	1	2		Sol. Co	on.	
						Desilter 2	2.						umped	2
				ļ		Centrifug		ļ			 	Down		
		1	1	1	1	Centrifug	je 2	<u> </u>		L		NET G		+

spm bbl/min 132 6.93

10-20 lb/100 ft²

bbl 5

NET GAIN

40

20

15

6.93

41.8

			Solids Control Effic.	% Discharged
BAROID Engineer	OFFICE	WAREHOUSE	DAILY COST	CUMULATIVE COST
C. Da Silva	Melbourne	Adelaide	A\$ 0.00	A\$ 27364.82

Tel. 03 - 6213367 (Fax) 03 - 6213311 08 - 477433

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DESE	RVE PITS			SURVE	EY DATA			SOLIDS AN	ALYSIS		TIME BREAKDOWN	hrs
NO	TYPE	bbi	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	4.1	Drilling	1
NO	I I I FE	501	IVID III	1.40				Low Grav. Solids	ppb	37.3	Circulating	1
 	ļ		 -				1	High Grav. Solids	% Vol	1.0	Reaming In	
				 			T	High Grav. Solids	ppb	14.7	Reaming out	
							T	ASG of Solids	g/cc	2.90	Tripping	16
	 		 					Cuttings Volume	bbl	1.0	Testing	3
	 		 	 				Interval Dilution	bbl/m	1.3	Other	3
	ļ				 			Interval Consumption	bbl/m	1.5		
			1	 	 		 				AVE ROP m/hr	5

					7	MUD RE	PORT NO.	22 up to 24:0	:00 hrs, 2/6/94	
	Baroid A	uetra	ılia Pt	v I td	. !		3/6/94	DEPTH-m MD		2006
GARUIT.	שמוטום דיי	uous	na i	y	!	START DA	DATE	ACTIVITY		
			CONTRA	ACTOR / RIG	<u></u>	12-May-	·94	POOH to log, T.D	<u>).</u>	
OPERATOR GFE Resources Ltd			Century R					Australia		
REPORT FOR			REPORT S. Kelly	FOR				TOWNSHIP Port Campbell		
Ken Smith WELL NAME AND	NO.		FIELD OF	R BLOCK N	NO.			LOCATION		
Langley-1		IG STRING	PPL 1		CASINGS	<u></u>		Otway Basin, Vict PUMP DA	ATA	
Size 8.500 ins	OD ins	ID ins	Length m	Size ins		Depth m	Pump Make		f % bbi/stk spm 95 0.0525 132	bbl/min 6.93
Type ETD-517 Nozzles 32nds	Pipe 1 4.5 Pipe 2 4.5			9 5/8"	Set @ Set @		Nat 7P50 Nat 8P80		95 0.0705	<u> </u>
	Pipe 3				Set @		Pump Press	- 1100 nsi	TOTAL bbl/min	6.93
	Col 1 6.25	2.875	174.96		Set @ Set @	9	MUD VOL	bbl CIRCUL	LATING DATA	
Noz Area 0.39 ins²	OPEN HOL	LE SECTI	IONS		Set @	9	Downhole Active		up 47 mins DP	m/min 41.8
TFA ins² NV m/sec 73.0	Sect 1			Liner	Set @		Total Circ	835 Surface -	-bit 13 mins DC	65.5
Impact lb f 337	Current	8.5			Top @	 '	Reserve	ECD ppg PROPERTY SPEC		
Sample Location	IN or OUT		MUDERO	IN			<9.3 ppg	VIS 40-55 sec	c YP 10-20	0 lb/100 ft²
Time Sample Taken	hrs	12:45	<u></u>	02:30 2006			6-8 ml HORITY Mud F	HTHP mi Program	KCL 3	%
Depth Flowline Temp	.c m	1965 41		41		REMARK	KS		12 12 12 12 12 12 12 12 12 12 12 12 12 1	1 1-500
Weight	ppg	9.35		9.35 48	<u> </u>	Nearing T	/.D. at 2006m	, viscosity and rheo and dumped sand	ology began to raise. trap as needed, usin	. Adding
Funnel Viscosity Plastic Viscosity	sec/qt cP	51 17	+	16		maintain f		in dumpos	14p w 1 ,	9
Yield Point	lb/100 ft ²	20		18		4				į
Gels 10 sec/10min/3 API Filtrate	30 min lb/100 ft² ml/30min	7/12/18 8.0	+	6/10/15 7.5		1				}
HPHT Filtrate	ml/30min					4				1
API/HPHT Filter Cak Solids	(e 32nd ins % Vol	2/- 5.5	+	2/- 5.5		_1				
Dissolved Salts	% Vol	1.5		1.5		4				J
0il Content/Water Co Sand	ontent % Vol % Vol	-/93.0 0.2	+	-/93.0 0.2		1				1
Methylene Blue cap	ppb	12		10		-1				ļ
pH Alk. Mud Pm	meter mi	9.0 0.30	-	9.3 0.35		ACTIVITY	Υ			
Alk. Filtrate, Pf/Mf	ml	0.25/0.50	5	0.25/0.50	4	Continue	ed drilling ahea	ad 8.5" hole to 200f	6m. (T.D.) circulated no hole problems on	j bottoms
Chlorides Total Hardness/Calc	mg/Lx10 ³ cium mg/L	17.5 50/50	+	17.7 50/50		Circulate	a making a مر d the hole cle	an, and POOH to ic	og.	uip.
KCL	% Wt Soln	3.0		3.0		-				1
ASG of Solids	g/cc	2.9 0.55/1.20		2.9 0.56/1.03		_1				ļ
K+ Ion Conc	mg/Lx10³			17.2		-1				1
		-				1				}
Rheometer	600 rpm/300 rpm			50/34		4				1
lb/100 ft²	200 rpm/100 rpm 6 rpm/3 rpm					1				1
TROPUST DESCR	INVENTORY AND	USED	REC	BAL	COST	MUD TYP	PE KCL	/ POLYMER	CONSUMPTIO	ON
PRODUCT DESCR BARACIDE	25 kg	1	1		549.92	SOLIDS	CONTROL E	EQUIPMENT	Additions	bbl
Caustic Soda	25 kg 25 kg	40		13			Make 1	screen size hrs 50x50x80	rs Sea W. 24 Drill W.	135
KCL,Tech(sx) PAC-R	50 lb	8		36		Shaker 2	2		other other	
					 	Shaker 3 Shaker 4			Barite	
			1	1			ppg		bl Chemicals 29 Losses	bbl
				-	 	Desander Desilter 1			36 Sol. Con.	65
						Desilter 2	2.		Lost/Dumped Down Hole	20
		-	+	+		Centrifuge Centrifuge		+	Newhole	21
								%	NET GAIN 6 Discharged	54 85
BAROID Eng	iner	OFFICE		WAREHOL	USE	Solids Co	DAILY CO		UMULATIVE COST	
		Melbourne		Adelaide		1		58.30 A	\$ 29923.12	1
C. Da Silva Tel. 03-6213367	(Eav)	03_62133	1311	08-47743	433		•			!
THE RECOMMENDAT	TONS MADE HEREOL	ON SHALL N	NOT BE CONS	ISTRUED AS	AUTHORIZI	NG THE INF	RINGEMENT	OF ANY VALID PATEN	IT, AND ARE MADE	,
WITHOUT ASSUMPTION	ON OF ANY LIABILITY	Y BY BARO	ID DRILLING	i FLUIDS, INC	C OR IT'S A	JENTS, ANL) ARE STATEM	MENTS OF OFINION	JNLY.	
RESERVE PITS			VEY DATA		1		SOLIDS AN		IME BREAKDOWN	hrs 22
NO TYPE	bbl MD m	TVD m	INCL°	DIR °	DISP m	Low Grav			Orilling Circulating	1
1 1						_ {			Reaming In	Τ,
				ļ		High Grav				 ,
					=	High Grav	av. Solids	ppb 14.7 Re	Reaming out Fripping	

AVE ROP

m/hr 4.14

// B 7/		. , .			المعال	mar i	7.1	PORT NO.			up to 2		a read		
BAROID	Baro	id A	ustral	lia Pty	/ Lta	ļ		4/6/94			H-m	MD 200	06 T	VD 200	
							START D		- 1	ACTIV Loggir					
PERATOR				CONTRAC	CTOR / RIC	3	12-11/44	37		COUN					
GFE Resources Lt	.d			Century R	-					Austra					
REPORT FOR				REPORT					1		NSHIP	1			
Ken Smith				S. Kelly	DI 001/ N						ampbel TION				
WELL NAME AND) NO.				BLOCK N	Ю.			1		Basin,	Victoria	١		
angley-1		DILL IN	G STRING	PPL 1		CASINGS					PUMP				
BIT DATA Size ins		D ins		Length m			Depth m	Pump Ma	ake	ins	x ins			pm bi	ol/mir
Туре	Pipe 1	4.5	3.826	1775.8	Riser	Set @		Nat 7P50		5.5	7.75		0.0525		
Nozzles 32nds	Pipe 2	4.5	2.875	55.28	9 5/8"	Set @	334.43	Nat 8P80)	6	8.5	95	0.0705		
	Pipe 3					Set @		Pump Pr	088	- nsi		TOT	AL bbl/min		
	Col 1	6.25	2.875	174.96		Set @ Set @		MUD VO		bbl			NG DATA		
N A ing2	Col 2	EN HOI	LE SECTION	ONS		Set @		Downhol		116		irc -		V m/	nin
Noz Area ins² TFA ins²	Sect 1	LIVITO	LL OLO III			Set @		Active	4	105	1	•		DP	
NV m/sec	Sect 2				Liner	Set @		Total Circ	3 6	321	1			DC	
Impact lb f	Current		8.5	1671.6		Top @		Reserve		2005	ECD p		9.3 F	liser	
				MUD PRO			WEIGHT				40 – 55		YP 10	0-20 lb	/100
Sample Location		or OUT			IN		API Filt	<9.3 pp 6-8 ml	•	/IS HTHP			KCL 3		
Time Sample Take		3			19:00 2006			ORITY MI							
Depth Flowline Temp	.c m				2000		REMARK								
Flowline Temp Weight	pp				9.30			depth 2007	7m.						
Funnel Viscosity		c/qt			48										
Plastic Viscosity	Point lb/100 ft ²				15										
Yield Point	10 sec/10min/30 min lb/100 ft ²				19										
	10 sec/10min/30 min lb/100 ft² iltrate ml/30min				6/11/16		l								
API Filtrate					7.5		l								
HPHT Filtrate API/HPHT Filter C		/30min nd ins			2/-		l								
Solids		Vol			5.5		l								
Dissolved Salts		Vol			1,5		1								
0il Content/Water		Vol			-/93.0										
Sand		Vol			0.1		ł								
Methylene Blue co					9.0		Ì								
pH	me	eter			0.30		ACTIVIT	Y							
Alk, Mud Pm Alk, Filtrate, Pf/Mf					0.20/0.50		Running	wire line lo	gs. L	oggin	g tool go	ot to bo	ttom witho	ut any	
Chlorides		g/Lx10 ³			17.5		problems	s.							
Total Hardness/C		g/L			50/50										
KCL		Wt Soln			3.0		l								
ASG of Solids	<u>g/</u>	cc			2.8 0.53/1.25		l								
n & K K+ Ion Conc		g/Lx103			17.2		1								
K+ IOII COIIC		9/2210					1								
Rheometer	600 rpm/3				49/34		ł								
lb/100 ft ²	200 rpm/						ł								
	6 rpm/3 r		CONSU	MOTION			ł								
PRODUCT DESC		JHT ANL	USED	REC	BAL	COST	MUD TY	PE K	CL/P	OLYM	ER		CONSU	APTION	
LUODOO! DESC	Jan HON		2222					CONTRO			ENT		Addition	s	ьы
								Make	i			hrs	Sea W.		
							Shaker 1			50x50	08xC	1.5	Drill W.		
				ļ			Shaker 2 Shaker 3						other		
							Shaker 4						Barite		_
							Chance 4		pg	bbl/hi	hrs	bbl	Chemica	ls	
			 			 	Desande		10.7	1.2		2	Losses		bbl
							Desilter 1		10,1	1.5	1.5	2	Sol. Con.		
							Desilter 2						Lost/Dum		
							Centrifug			ļ		-	Down Ho	ie	
							Centrifug	je 2		L	<u> </u>	L	Newhole NET LOS	38	
			ļ			l	Solida C	ontrol Effic				%	Discharg		
					 					-					
DARROLL	ngincer		OFFICE		WAREHOL	JSE		DAILY	COS	š i		CUMU	LATIVE C		
BAROID E	ngineer		OFFICE		WAREHOL	JSE		DAILY		51				12	
C. Da Silva	67 (Eav)		Melbourne	111	Adelaide	33		DAILY A\$ 0	.00			A\$	29923.		
C. Da Silva	67 (Fax)	E HEREO	Melbourne	OT BE CON	Adelaide 08-4774	33 AUTHORIZI	NG THE INI	A\$ 0	.00 NT OF	ANYV	'ALID PA' F OPINIC	A\$	29923. ND ARE MA		
C. Da Silva Tel. 03-621336 THE RECOMMEND WITHOUT ASSUMF	67 (Fax)	E HEREO	Melbourne 03-62133 N SHALL NO Y BY BAROI	311 OT BE CON: D DRILLING	Adelaide 08-4774	33 AUTHORIZI	NG THE INI	A\$ 0	.00 NT OF TEME	ANY V	F OPINIC	A\$ FENT, A	29923. ND ARE MA	DE	hrs
C. Da Silva Tel. 03-621336 THE RECOMMEND WITHOUT ASSUMF RESERVE PITS	67 (Fax) DATIONS MADE	E HEREO ' LIABILIT	Melbourne 03-62133 N SHALL NO Y BY BAROI SURVI	DT BE CON: D DRILLING	Adelaide 08-4774	33 AUTHORIZI	NG THE INI	DAILY A\$ 0 FRINGEMER D ARE STA	.00 NT OF TEME	ANY V	F OPINIC	A\$ FENT, A	29923. ND ARE MA (. BREAKDO	DE	hr
C. Da Silva Tel. 03-621336 THE RECOMMEND WITHOUT ASSUMF RESERVE PITS	67 (Fax) DATIONS MADE	E HEREO ' LIABILIT MD m	Melbourne 03 – 62133 N SHALL NO Y BY BAROI SURVI	DT BE CON: D DRILLING EY DATA INCL°	Adelaide 08 – 4774: STRUED AS FLUIDS, INC	33 AUTHORIZI C OR IT'S A	NG THE INI GENTS, AN	DAILY A\$ 0 FRINGEMEI D ARE STA SOLIDS V. Solids	.00 NT OF TEME	ANY V NTS O	F OPINIC	A\$ FENT, A ON ONLY	29923. ND ARE MA Y. BREAKDO	DE	
C. Da Silva Tel. 03-621336 THE RECOMMEND WITHOUT ASSUMF RESERVE PITS	67 (Fax) DATIONS MADE	E HEREO ' LIABILIT	Melbourne 03-62133 N SHALL NO Y BY BAROI SURVI	DT BE CON: D DRILLING EY DATA INCL°	Adelaide 08 – 4774: STRUED AS FLUIDS, INC	33 AUTHORIZI C OR IT'S A	NG THE INI GENTS, AN Low Gra Low Gra High Gra	A\$ 0 FRINGEMEN D ARE STA SOLIDS V. Solids V. Solids AV. Solids	.00 NT OF TEME	ANY V NTS O LYSIS % Vol ppb % Vol	4.8 43.7 0.7	A\$ FENT, A ON ONLY TIME Drillin Circul Ream	29923. ND ARE MA BREAKDO g ating ing In	DE	
C. Da Silva Tel. 03-621336 THE RECOMMEND WITHOUT ASSUMF RESERVE PITS	67 (Fax) DATIONS MADE	E HEREO ' LIABILIT MD m	Melbourne 03 – 62133 N SHALL NO Y BY BAROI SURVI	DT BE CON: D DRILLING EY DATA INCL°	Adelaide 08 – 4774: STRUED AS FLUIDS, INC	33 AUTHORIZI C OR IT'S A	NG THE INI GENTS, AN Low Gra Low Gra High Gra High Gra	A\$ 0 FRINGEME! D ARE STA SOLIDS V. Solids V. Solids IV. Solids IV. Solids IV. Solids IV. Solids	.00 NT OF TEME	ANY V NTS O LYSIS % Vol ppb % Vol ppb	4.8 43.7 0.7 10.3	TIME Drillin Circul Ream	29923. ND ARE MA (. BREAKDO g lating ling in ling out	DE	
C. Da Silva Tel. 03-621336 THE RECOMMEND WITHOUT ASSUMF RESERVE PITS	67 (Fax) DATIONS MADE	E HEREO ' LIABILIT MD m	Melbourne 03 – 62133 N SHALL NO Y BY BAROI SURVI	DT BE CON: D DRILLING EY DATA INCL°	Adelaide 08 – 4774: STRUED AS FLUIDS, INC	33 AUTHORIZI C OR IT'S A	Low Gra Low Gra Low Gra High Gra High Gra ASG of S	DAILY A\$ 0 FRINGEMEN D ARE STA SOLIDS V. Solids V. Solids AV. Solids Solids Solids	.00 NT OF TEME	ANY V NTS O LYSIS % Vol ppb % Vol ppb g/cc	4.8 43.7 0.7	TIME Drillin Circul Ream Ream Trippi	29923. ND ARE MA (DE	
C. Da Silva Tel. 03-621336 THE RECOMMEND WITHOUT ASSUMF RESERVE PITS	67 (Fax) DATIONS MADE	E HEREO ' LIABILIT MD m	Melbourne 03 – 62133 N SHALL NO Y BY BAROI SURVI	DT BE CON: D DRILLING EY DATA INCL°	Adelaide 08 – 4774: STRUED AS FLUIDS, INC	33 AUTHORIZI C OR IT'S A	NG THE INIGENTS, AN Low Gra Low Gra High Gre High Gre ASG of S Cuttings	DAILY A\$ 0 FRINGEMER D ARE STA SOLIDS V. Solids V. Solids AV. Solids AV. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids	.00 NT OF TEME	ANY V NTS O LYSIS % Vol ppb % Vol ppb g/cc bbl	4.8 43.7 0.7 10.3 2.80	TIME Drillin Circul Ream Ream Trippi Testir	29923. ND ARE MA Y. BREAKDO g lating ing In ing out ng	DE	hrs
C. Da Silva Tel. 03-621336 THE RECOMMEND WITHOUT ASSUMF RESERVE PITS	67 (Fax) DATIONS MADE	E HEREO ' LIABILIT MD m	Melbourne 03 – 62133 N SHALL NO Y BY BAROI SURVI	DT BE CON: D DRILLING EY DATA INCL°	Adelaide 08 – 4774: STRUED AS FLUIDS, INC	33 AUTHORIZI C OR IT'S A	Low Gra Low Gra Low Gra High Gra High Gra ASG of S Cuttings Interval I	DAILY A\$ 0 FRINGEMER D ARE STA SOLIDS V. Solids V. Solids AV. Solids AV. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids V. Solids	.00 NT OF TEME	ANY V NTS O LYSIS % Vol ppb % Vol ppb g/cc	4.8 43.7 0.7 10.3 2.80	TIME Drillin Circul Ream Ream Trippi	29923. ND ARE MA Y. BREAKDO g ating ing in ing out ng ing	DE	

			<u> </u>		Ĺ	MUD REF	ORT NO	D. 2	4 u	pto 2	4:00 h	rs, 4	1/6/94	
RAROII	Baroid A	ustra	lia Pt	y Ltd		DATE	5/6/94		DEPTH	-m	MD 200	6	TVD 200	06
To the same					ſ	START D	ATE	1	ACTIVI					
						12-May-	-94		Loggin					
OPERATOR				CTOR / RIG	ì			- 1	COUN Australi					
GFE Resources Li	td		Century R						TOWN					
REPORT FOR			REPORT	FOR				- 1	Port Ca					
Ken Smith			S. Kelly	BLOCK N					LOCAT					
WELL NAME AN	D NO.		PPL 1	1 BLOCK IN	0.			- 1	Otway		/ictoria			
Langley-1	DRILLIM	3 STRING		(CASINGS				F	UMP [ATA			
BIT DATA Size ins	OD ins		Length m			Depth m	Pump N	/lake	ins x	ins	Eff % b		spm b	bl/min
Size ins Type	Pipe 1 4.5	3.826	1775.8		Set @		Nat 7P5	0	5.5	7.75		0.0525		
Nozzles 32nds	Pipe 2 4.5	2.875		9 5/8"	Set @	334.43	Nat 8P8	30	6	8.5	95	0.0705		
1022.05 02.105	Pipe 3				Set @						TOT	1		
	Col 1 6.25	2.875	174.96		Set @		Pump F		– psi	CIRCI		AL bbl/m		
	Col 2				Set @		MUD V		bbl	Total ci		MG DATA	AV m	/min
Noz Area ins²	OPEN HOL	E SECTION	ONS	<u> </u>	Set @		Downh			Bottom			DP	·····
TFA ins²	Sect 1			l	Set @		Active Total C		786	Surface	•		DC -	
NV m/sec	Sect 2			Liner	Set @		Reserve			ECD p	na	9.3		
Impact lb f	Current	8.5	1671.6		Top @							ATIONS		
			MUD PRO			WEIGHT				40-55				b/100 ft ²
Sample Location	IN or OUT			IN		API Filt			HTHP				3 9	%
Time Sample Tak				11:00 2006		BY AUTH						-		
Depth				2000		REMARK	S							
Flowline Temp				9.30		Lost a tot	al of 33 i	obls of	mud to	the hol	e while	logging	so far.	
Weight	ppg sec/qt		-	48										
Funnel Viscosity Plastic Viscosity	cP			15										
Yield Point	lb/100 ft ²			18										
	in/30 min lb/100 ft²			6/10/16		l								
API Filtrate	ml/30min			7.5		1								
HPHT Filtrate	ml/30min					1								
API/HPHT Filter C	Cake 32nd ins			2/-										
Solids	% Val			5.5										
Dissolved Salts	% Vol			1.5		ļ								
0il Content/Water				-/93.0		i								
Sand	% Vol		<u> </u>	0.1		i								
Methylene Blue c				9.0										
pH	meter mi			0.30		ACTIVIT	Y							
Alk. Mud Pm Alk. Filtrate, Pf/Mi			 	0.20/0.50		After WR	Tlog, R	an in th	e hole i	for a wi	per trip	. Circulat	ted the f	nole
Chlorides	mg/Lx10 ³			17.5		clean. Dr	aw work	s clutcl	n silppir	ng, repa	air cluto	h and Po	OOH to	log.
Total Hardness/C				50/50		Continue	d loggin	g.						
KCL KCL	% Wt Soln			3.0		1								
ASG of Solids	g/cc			2.8		1								
n & K	<u> </u>			0.54/1.14		1								
K+ Ion Conc	mg/Lx10 ³			17.2		1								
						1								
				ļ		4								
Rheometer	600 rpm/300 rpm			48/33		ł								
lb/100 ft ²	200 rpm/100 rpm				<u> </u>	ł								
	6 rpm/3 rpm INVENTORY ANI	CONC	MOTION	<u> </u>		i								
		USED	REC	BAL	COST	MUD TY	PE	KCL/F	OLYM	R		CONS	JMPTIC	N
PRODUCT DES		USED 1		12	32.43			OL EC	UIPME	NT		Additio	ns	bbl
Caustic Soda	25 kg	 	 		1	1	Mak		screen		hrs	Sea W.		
		-	 	 		Shaker 1			50x50	x80	3	Drill W.		
		 	 			Shaker 2						other		ļ
						Shaker 3	3				ļ	other		ļ
						Shaker 4	1		L		<u> </u>	Barite		ļ
- -						<u> </u>			bbl/hr		bbl	Chemic		bbl
						Desande		10.5		3	5			9
					ļ	Desilter		10	1.5	3	 		umped	3
				1	1	Deciltor	^				1	I I OSTU "	HUDAU	, 3

			Shaker 1		50x50x	(80	3	Drill W.	
			Shaker 2					other	
			Shaker 3					other	
			Shaker 4					Barite	
				ppg	bbl/hr	hrs	bbl	Chemicals	
			Desander	10.5	1.2	3	4	Losses	bbl
			Desilter 1.	10		3	5	Sol. Con.	9
			Desilter 2.					Lost/Dumped	3
			Centrifuge 1					Down Hole	23
		- 	Centrifuge 2					Newhole	
			- Centinage L					NET LOSS	35
			Solids Control	Effic.			%	Discharged	12
BAROID Engineer	OFFICE	WAREHOUSE		AILY CO	ST		CUML	ILATIVE COST	
C. Da Silva	Melbourne	Adelaide	A\$	32.4	3		A\$	29955.55	

Tel. 03 –6213367 (Fax) 03 –6213311 08 –477433

THE RECOMMENDATIONS MADE HEREON SHALL NOT BE CONSTRUED AS AUTHORIZING THE INFRINGEMENT OF ANY VALID PATENT, AND ARE MADE WITHOUT ASSUMPTION OF ANY LIABILITY BY BAROID DRILLING FLUIDS, INC OR IT'S AGENTS, AND ARE STATEMENTS OF OPINION ONLY.

DECE	RVE PITS			SURVE	Y DATA			SOLIDS AN	IALYSIS		TIME BREAKDOWN	hrs
_	TYPE	bbl	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	4.8	Drilling	<u> </u>
NO	TYPE	וטטו	IVID III	1,40				Low Grav. Solids	ppb	43.7	Circulating	3
<u></u>	ļ <u>.</u>		l				†	High Grav. Solids	% Vol	0.7	Reaming In	
			 					High Grav. Solids	ppb	10.3	Reaming out	
<u> </u>			 	+			1	ASG of Solids	g/cc	2.80	Tripping	8
			 					Cuttings Volume	bbl		Testing	
	ļ		 	 			 	Interval Dilution	bbl/m	1.3	Logging	11
			 				+	Interval Consumption	bbl/m		Other	2
<u></u>	ļ		 				+	andra Condination			AVE ROP m/hr	

(A)		· · · · · · · · ·				MUD REP	ORT NO).	25·	up to	24:00	hrs,	5/6/94	
DADAIII	Baroid A	ustra	lia Pt	v Ltd		DATE	6/6/94		DEPT	H-m	MD 20	006	TVD 20	006
	barola 7	مان دا		,		START D			ACTIV					
				oran (st		12-May-	94		Wiper	Trip/Pu	ıll to sh	ioe.		
PERATOR FE Resources Ltd			CONTRA Century R	CTOR / RIG	Gi				Austra					
EPORT FOR			REPORT						TOW					1
en Smith			S. Kelly	R BLOCK N	<u> </u>				LOCA	ampbe TION	<u> </u>	-		
/ELL NAME AND I anglev-1	NO.		PPL 1	1 BLOCK I					Otway	Basin,	_			
BIT DATA		G STRING			CASINGS		Pump M	laka		PUMP x ins		bbl/stk	spm	bbl/min
ize 8.500 ins ype ETD-517	OD ins Pipe 1 4.5	ID ins 3.826	Length m 1775.8		Set @	Depth m	Nat 7P5		5.5					6.93
ozzles 32nds	Pipe 2 4.5	2.875		9 5/8"	Set @	334.43	Nat 8P8	0	6	8.5	95	0.0705		
13 13 13	Pipe 3		17100		Set @ Set @		Pump P	7099	1150 p	si	TO	TAL bbl/m	nin	6,93
	Col 1 6.25 Col 2	2.875	174.96		Set @		MUD V		bbl	CIRC	CULAT	ING DAT	A	
loz Area 0.39 ins²	OPEN HO	LE SECTION	ONS		Set @		Downho		416 368	1		3 mins 47 mins	AV n	n/min 41.8
FA ins²	Sect 1 Sect 2			Liner	Set @ Set @		Active Total Ci		784			13 mins	DC	,
IV m/sec 73.0 npact lb f 336	Current	8.5	1671.6		Top @		Reserve			ECD			Riser	
			MUD PRO	PERTIES	I	WEIGHT			PROPE VIS	40-55		YP		lb/100 ft²
ample Location ime Sample Taken	IN or OUT			IN 20:15		API Filt	6-8 m	ni i	HTHP		mi			%
epth	m			2006		BY AUTH		lud P	rogram					
Towline Temp Veight	ppg			9.30	 	REMARK Mud Loss	es to the	hole	today v	while lo	gging	were 65 b	bls.	
unnel Viscosity	sec/qt			48		Mixed up								
lastic Viscosity	сР			16 18		•								
ield Point Sels 10 sec/10min/3	lb/100 ft ² 0 min_lb/100 ft ²			6/9/14										
PI Filtrate	ml/30min			8.0										
IPHT Filtrate	mi/30min e 32nd ins			2/-										
Solids	% Vol			5.7		1								
Dissolved Salts	% Vol			1.3	 	1								
il Content/Water Co and	ontent % Vol % Vol			0.1										
fethylene Blue cap				10										
oH Nk, Mud Pm	meter mi			9.0		ACTIVIT								
lk. Filtrate, Pf/Mf	ml			0.25/0.55		Complete	d loggin	g and	ran in	the hol	e for a	wiper trip. jet to botte	om as	
Chlorides otal Hardness/Calc	mg/Lx10 ³ ium mg/L			15.0 50/50		had prob	lems with	the c	clutch s	lipping	. POOF	to the sh	noe and	l repair
CCL	% Wt Soln			2.6		clutch.								
SG of Solids	g/cc			2.8 0.56/1.03										
+ Ion Conc	mg/Lx10 ³			14.9										1
				 	<u> </u>									
Rheometer	600 rpm/300 rpm			50/34]								l
o/100 ft²	200 rpm/100 rpm			ļ	ļ									
	6 rpm/3 rpm INVENTORY AND	CONSU	MPTION	1										
RODUCT DESCR	IPTION	USED	REC	BAL	COST	MUD TY			POLYM			CONSI		DN bbi
(CL,Tech(sx) PAC-R	25 kg 50 lb	15		65 34	216.6 341.48		CONTHO Make			LNI nsize	hrs	Sea W.		
70-H						Shaker 1			50x50			2 Drill W.		70
				 	 	Shaker 2 Shaker 3			 		+	other other		
	A					Shaker 4						Barite		
				ļ <u>-</u>		Descri		10.5	bbl/hr		bbl	Chemic		bbl 1
			 	 	 	Desander Desilter 1		10.5				Sol. Co	n.	3
				ļ		Desilter 2					-	Lost/Du		5 65
			<u> </u>	 	-	Centrifug Centrifug			 	+-	+	Down I Newho		05
												NET L	oss	2
		OFF:CF		MADELICI	ISE	Solids Co	ontrol Effi DAIL		ST		% CUM	Discha ULATIVE		8
BAROID Eng		OFFICE		WAREHOL	795	1						30513		
C. Da Silva	1	Melbourne		Adelaide	00	I	A\$ 5	558.	UO		A\$	30313	J.UJ	
Tel. 03-6213367 THE RECOMMENDAT	ONS MADE HEREO	03-62133 N SHALL N	OT BE CON	08-4774 STRUED AS	AUTHORIZI	NG THE INF	RINGEME	NT O	F ANY V	ALID PA	TENT,	AND ARE N	MADE	
	ON OF ANY LIABILIT													1

5.5

15

2

m/hr

% Vol 0.7

ppb 10.3

g/cc 2.80

bbl/m 1.3

bbl

Reaming In

Reaming out

Tripping

Testing

Logging

Other AVE ROP

High Grav. Solids High Grav. Solids

ASG of Solids Cuttings Volume

Interval Dilution

Interval Consumption bbl/m 1.6

						MUD REP	ORT N	0. 2	26 1	up to 2	24:00 h	nrs, 6,	/6/94	
PARTITI	Baroid A	ustra	lia Pt	v Ltd		DATE	7/6/94		DEPTI	H-m	MD 500	06 1	VD 20	06
			.,	,		START D	ATE		ACTIV	TY				
						12-May-	94		Trippir	ng out, l	Make u	o test took	s	
OPERATOR			CONTRA	CTOR / RIC	G				COUN					
GFE Resources Ltd			Century R	ig 11					Austra					
REPORT FOR			REPORT	FOR					TOWN	ampbel				
Ken Smith			S. Kelly	- DI OOK N	10				LOCA		<u>'</u>			
WELL NAME AND	NO.		PPL 1	R BLOCK N	10.					Basin,	Victoria			
Langley-1	DOULIN	G STRING			CASINGS					PUMP	DATA			
Size 8.500 ins	OD ins		Length m			Depth m	Pump	Make	ins		Eff %			obl/min
Type ETD-517	Pipe 1 4.5	3.826	1775.8	Riser	Set @		Nat 7P		5.5	7.75	95	0.0525	117	6.143
Nozzles 32nds	Pipe 2 4.5	2.875	55.28	9 5/8"	Set @		Nat 8P	80	6	8.5	95	0.0705		
13 13 13	Pipe 3				Set @		Pump	Bross (nno nei		TOT	AL bbl/mii		6.143
	Col 1 6.25	2.875	174.96		Set @		MUD \		bbl bbl			NG DATA		<u> </u>
	Col 2	C CCCTU	ONG		Set @		Downh		416		irc 123			/min
Noz Area 0.39 ins²	OPEN HO	LE OEU III	J.10		Set @		Active		339	Botton	ns up 5	3 mins	DP	37.1
TFA ins² NV m/sec 64.7	Sect 2			Liner	Set @		Total C	Circ	755	1	e-bit 1		DC	58.1
Impact lb f 264	Current	8.5	1671.6		Top @		Reserv			ECD p		9.37	Hiser	
			MUD PRO							40-55		YP 1	0-201	b/100 ft
Sample Location	IN or OUT			IN		WEIGHT			VIS HTHP			KCL 3		%
Time Sample Taken				18:35		BY AUTH	-							
Depth	<u>m</u>			41		REMARK		W.GGTT	9,					
Flowline Temp Weight	°C ppg			9.30										
Funnel Viscosity	sec/at			48		1								
Plastic Viscosity	cP			15]								
Yield Point	lb/100 ft ²			18										
Gels 10 sec/10min/3	0 min lb/100 ft ²			6/9/13		l								
API Filtrate	ml/30min			8.0		ł								
HPHT Filtrate	ml/30min			2/		ł								
API/HPHT Filter Cak	e 32nd ins % Vol			5.7		1								
Solids Dissolved Salts	% Vol			1.3										
Oil Content/Water Co				-/93.0										
Sand	% Vol			0.1		1								
Methylene Blue cap	ppb			11										
pH	meter			8.7 0.30		ACTIVITY								
Alk. Mud Pm	ml ml		ļ	0.20/0.60		Ran in the	hole, c	lutch s	lipping	so PO)H to th	ne shoe. W	Vork or	clutch,
Alk. Filtrate, Pf/Mf Chlorides	mg/Lx10 ³			15.0		then ran i	n the ho	ie with	25 star	nds. Clu	ıtch slip	ping so P	OOH	o the
Total Hardness/Calc				50/50		shoe aga	in and r	epair cl	utch. R	łan in th	e hole	clutch OK	. Wash	last
KCL	% Wt Soln			2.6		4			ulated i	the hole	clean	prior to PC	OOH to	test .
ASG of Solids	g/cc		ļ	2.8		Made up	test too	is.						
n&K		<u> </u>		0.54/1.14		1								
K+ Ion Conc	mg/Lx10³		 	14.9		1								
						1								
Rheometer	600 rpm/300 rpm			48/33] .								
lb/100 ft²	200 rpm/100 rpm					1								
	6 rpm/3 rpm			l		4								
	INVENTORY AN			154	COST	MUD TY	oe.	KCL/F	MY IO	ER		CONSU	MPTIC	N
PRODUCT DESCR	IPTION	USED	REC	BAL	COST	SOLIDS						Addition		bbl
			 	 		1	Mak			n size	hrs	Sea W.		
						Shaker 1			50x50	08x	1.5	Drill W.		3
						Shaker 2			<u> </u>			other		
				ļ		Shaker 3			ļ			other		 -
			<u> </u>		ļ	Shaker 4			L	- b	bbl	Barite Chemica	ale	
		<u> </u>	ļ		 	Desande		ppg 10.5	bbl/hr		DDI 1	1.		bbl
		 	 	+	 	Desilter 1		10.5				Sol. Con)	2
ļ			 	+		Desilter 2			<u></u>			Lost/Dur		
				1		Centrifug						Down He		30
						Centrifug					L	Newhole		
						<u> </u>					%	NET LO Dischar		29
							antrol Ef							

C. Da Silva	Melbourne	Adelaide	A\$	0.00	A\$ 30513.63
Tel. 03-6213367 (Fax)	03-6213311	08-477433	<u> </u>		
THE RECOMMENDATIONS MA	DE HEREON SHALL NOT BE CON	STRUED AS AUTHORIZI	NG THE INFRINGE	MENT OF AN	Y VALID PATENT, AND ARE MADE
WITHOUT ASSUMPTION OF A	NY LIABILITY BY BAROID DRILLING	FLUIDS, INC OR IT'S AC	SENTS, AND ARE	STATEMENTS	S OF OPINION ONLY.

WAREHOUSE

OFFICE

BAROID Engineer

Solids Control Effic.

DAILY COST

29 2

% Discharged
CUMULATIVE COST

DESC	RVE PITS			SURVE	EY DATA			SOLIDS AN	ALYSIS	TIME BREAKDOWN	hrs
NO	TYPE	bbl	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol 5.0	Drilling	
NO_	1115		IND III	1,40	 ,==			Low Grav. Solids	ppb 45.5	Circulating	1.5
	 		 				1	High Grav. Solids	% Vol 0.7	Reaming In	
			 					High Grav. Solids	ppb 10.3	Reaming out	
	-		 	+	 		 	ASG of Solids	g/cc 2.80	Tripping	17
			 	 	 			Cuttings Volume	bbl	Testing	
	 		1		 		 	Interval Dilution	bbl/m 1.4	Logging	
	 		 		 			Interval Consumption	bbl/m 1.6	Other	5.5
					ļ					AVE ROP m/hr	



KCL **ASG of Solids**

n&K

K+ Ion Conc

Rheometer

lb/100 ft²

Baroid Australia Pty Ltd

% Wt Soln

mg/Lx103

g/cc

600 rpm/300 rpm

200 rpm/100 rpm

7/6/94 up to 24:00 hrs, MUD REPORT NO. 27 DEPTH-m MD 2006 TVD 2006 8/6/94 DATE ACTIVITY START DATE Run in hole to P.& A 12-May-94

10-20 lb/100 ft2

3 %

COUNTRY CONTRACTOR / RIG OPERATOR Australia Century Rig 11 **GFE Resources Ltd** TOWNSHIP REPORT FOR REPORT FOR Port Campbell S. Kelly Ken Smith LOCATION FIELD OR BLOCK NO. WELL NAME AND NO. Otway Basin, Victoria

	alev-1				I PPL I										
			DRILLIN	C CTDING			CASINGS				PUMP	DATA			
	DATA					Size ins		epth m	Pump Make	ins	x ins	Eff %	bbl/stk	spm	bbl/min
Size	ins		OD ins	ID ins	Length m			, ран на	Nat 7P50	5.5	7.75	95	0.0525		T
Type		Pipe 1	4.5	3.826	1775.8	Riser	Set @								
1	les 32nds	Pipe 2	4.5	2.875	55.28	9 5/8"	Set @	334.43	Nat 8P80	6	8.5	95	0.0705		
14022	T OZITOS	Pipe 3					Set @								
					174.00		Set @		Pump Press	- psi		TOT	TAL bbi/m	in	
i		Col 1	6.25	2.875	174.96						CIDO	MIL AT	NG DAT	Δ	
		Col 2					Set @		MUD VOL	_bbl_	CIHC	JULAI	ING DA		
NI	Area ins ²		OPEN HO	E SECT	IONS		Set @		Downhole	416	Total	circ —	mins	AV	m/min
_			OF EN TIO	LL OLO.	.0		Set @		Active	325	Bottor	ns up	- mins	DP	
TFA	ins ²	Sect 1							4 '				- mins	DC	
NV m	n/sec	Sect 2				Liner	Set @		Total Circ	741					
	1,000	Curron		8.5	1671.6	1	Top @		Reserve		ECD I	pgc	9.3	Riser	

Impact lb f MUD PROPERTY SPECIFICATIONS MUD PROPERTIES ΥP WEIGHT <9.3 ppg IN IN or OUT Sample Location HTHP KCL API Filt 6-8 19:00 Time Sample Taken hrs BY AUTHORITY Mud Programe 2006 Depth m REMARKS Flowline Temp °C Flowed weakly +-10,000cfd of gas. 9.30 ppg Weight Lost 10 bbls mud to hole. Also lost 4 bbls on trips. 48 sec/qt Funnel Viscosity Mud engineer left location after cement plugs were set. 15 сΡ Plastic Viscosity lb/100 ft² 20 Yield Point 6/10/15 Gels 10 sec/10min/30 min lb/100 ft2 8.0 ml/30min API Filtrate 2 x 25 Lt cans of BARAFILM recieved at start of well added onto ml/30min **HPHT Filtrate** stock for today. One of these used at end of well to coat pipe while 32nd ins 2/-API/HPHT Filter Cake pulling out sideways. 5.7 % Vol Solids 1.3 % Vol Dissolved Salts -/93.0 0il Content/Water Content % Vol % Vol 0.1 Sand 12 Methylene Blue cap ppb 8.6 meter рΗ ACTIVITY 0.30 Alk. Mud Pm mi 0.20/0.50 Alk. Filtrate, Pf/Mf mi 15.0 mg/Lx103 Chlorides 50/50 Total Hardness/Calcium ma/L

2.6

0.51/1.45

50/35

14.9

Ran in the hole and performed DST # 3, interval 1882.9 -1909.1m POOH with test tool. Layed out test tools and layed down BHA. Ran in the hole open ended to set four cement plugs.

6 rpm/3 rpm INVENTORY AND CONSUMPTION CONSUMPTION KCL / POLYMER REC BAL COST MUD TYPE USED PRODUCT DESCRIPTION SOLIDS CONTROL EQUIPMENT Additions bbl 159.7 BARAFILM 25 lt Sea W. Make screen size Drill W. Shaker 1 50x50x80 other Shaker 2 other Shaker 3 Barite Shaker 4 ppg bbl/hr hrs Chemicals Losses bbl Desander Sol. Con. Desilter 1. Lost/Dumped Desilter 2. 10 Down Hole Centrifuge 1 Newhole Centrifuge 2 14 **NET LOSS** Discharged Solids Control Effic. DAILY COST **CUMULATIVE COST** WAREHOUSE

OFFICE **BAROID Engineer** A\$ 30673.33 159.70 A\$ Adelaide Melbourne C. Da Silva 08-477433 03-6213367 (Fax) 03-6213311

THE RECOMMENDATIONS MADE HEREON SHALL NOT BE CONSTRUED AS AUTHORIZING THE INFRINGEMENT OF ANY VALID PATENT, AND ARE MADE WITHOUT ASSUMPTION OF ANY LIABILITY BY BAROID DRILLING FLUIDS, INC OR IT'S AGENTS, AND ARE STATEMENTS OF OPINION ONLY

DECE	RVE PITS			SURVE	Y DATA			SOLIDS AN	ALYSIS	3	TIME BREAKDO	WN	hrs
NO	TYPE	bbl	MD m	TVD m	INCL°	DIR °	DISP m	Low Grav. Solids	% Vol	5.0	Drilling		
NO	ITPE		IVID III	140				Low Grav. Solids	ppb	45.5	Circulating		
-			 				T	High Grav. Solids	% Vol	0.7	Reaming In		
			l					High Grav. Solids	ppb	10.3	Reaming out		
			ļ					ASG of Solids	g/cc	2.80	Tripping		12
			 					Cuttings Volume	bbl		Testing		6
			 				1	Interval Dilution	bbl/m	1.4	Logging		
	ļ		ļ				bbl/m	1.6	Other		6		
	 		 	 			<u> </u>	<u> </u>			AVE ROP r	n/hr	

APPENDIX 3

GFE RESOURCES LTD

APPENDIX 3

DRILLING OPERATIONS SUMMARY

LANGLEY-1

DRILLING OPERATIONS SUMMARY

LANGLEY-1

Permit: PPL 1 Spud Date: 12/05/94 Rig: Century Rig 11

GFE Rep: K. Smith Geologist: Val Akbari

	TIME	HOURS		OPERATIONS Page: 1 of 10
	12/05	/0/		
				Duill Det Hele and Mayre Hele
	0800 - 1000	2	_	Drill Rat Hole and Mouse Hole.
	1000 - 1130	1½	-	Rig up to spud.
	1130 - 1300	11/2	-	Pre-spud and safety meeting with all personnel by GFE's Engineer and
				Geologist and Century's Tool Pusher and Safety Officer.
	1300 - 1330	1/2	-	Jet cellar and clear floor prior to spud.
	1330 - 1500	11/2	-	Drill 12 ¹ / ₄ " hole from 0m to 43m.
	1500 - 1530	1/2	-	Circulate and survey at 30m.
	1530 - 1700	11/2	-	Drill 12 ¹ / ₄ " hole from 43m to 80m.
	1700 - 1730	1/2	-	Circulate and survey at 67m.
	1730 - 2000	21/2	-	Drill 12 ¹ / ₄ " hole from 80m to 141m.
	2000 - 2030	1/2	-	Circulate and survey at 128m.
	2030 - 2230	2	_	Drill 121/4" hole from 141m to 204m.
	2230 - 2330	1	-	Circulate and survey at 191m.
	2330 - 2400	1/2	_	Drill 12 ¹ / ₄ " hole from 204m to 223m.
	13/05	/94		
	0000 - 0130	11/2	-	Drill 12 ¹ / ₄ " hole from 223m to 261m.
	0130 - 0200	1/2	-	Circulate and survey at 248m.
	0200 - 0500	3	_	Drill 121/4" hole from 261m to 340m.
	0500 - 0530	1/2	-	Circulate bottoms up.
	0530 - 0730	2	-	Wiper trip.
	0730 - 0900	11/2	-	Run in hole.
	0900 - 0930	1/2	-	Break circulation and clean to bottom - 5m of fill.
	0930 - 1030	1	-	Circulate hole clean prior to running casing.
	1030 - 1300	$2\frac{1}{2}$	-	Pull out of hole.
	1300 - 1400	1	-	Lay out stabiliser, 2 x 8" DC's and recover survey.
	1400 - 1530	1½	-	Rig up to run and run 9 ⁵ / ₈ " casing - blew seal in hydraulic motor of power tongs after running first three joints.
	1530 - 1600	1/2	-	Lay out power tongs, clean floor and rig up rotary tongs.
	1600 - 2030	$4\frac{1}{2}$	_	Continue running casing with chain tongs and rotary tongs.
	2030 - 2130	1	-	Head up circulating swage and clean to bottom (8m of fill) and circulate prior to cementing.
	2130 - 2200	1/2	-	Remove swage, head up Dowell, land casing and chain down.
D	2200 - 2330	11/2	-	Pressure test lines, pump pre-flush. Mix cement and displace same - nil cement returns.
	2330 - 2400	1/2	-	Wait on cement.

ИE													
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_	44405			
	14 / 05			
- 1	0000 - 0530	5½	-	Continue wait on cement.
	0530 - 0730	2	-	Lay out cement head, landing joint and conductor pipe - tag top of cement at 31' (9.4m) below bottom of cellar.
	0730 - 0830	1	-	Make up casing bowl and spacer spool.
	0830 - 1030	2	-	Top up annulus with cement by hand, rig up 1" line and blow annulus out with air compressor to get cement to fall - used 14 sacks cement.
	1030 - 1700	$6\frac{1}{2}$	-	Nipple up BOP's and install choke and flare-line.
	1700 - 1730	1/2	-	Function test BOP - HCR valve stem leaking.
- 1	1730 - 1930	2	-	Repair HCR valve.
	1930 - 2200	21/2	-	Pressure test flare-line to 1,000psi, blind rams to 300psi and 1,500psi and pipe rams to 2,500psi, all choke valves, HCR valve, manual choke line valve and 2 kill-line valves to 2,500psi and Hydril to 1,500psi.
1	2200 - 2230	1/2	-	Break and lay out cup tester.
	2230 - 2400	11/2	-	Make up 8½" BHA and run in hole.
	15/05	/ 94		
	0000 - 0130	11/2	_	Continue run in hole. Pick up jars.
	0130 - 0230	1	-	Tag cement at 318m. Break circulation and pressure test upper and lower
				kelly cocks to 1,500psi with rig pump.
	0230 - 0330	1	-	Drill out plug, float collar cement and float shoe.
	0330 - 0400	1/2	-	Drill 8½" hole from 340m to 346m.
	0400 - 0430	1/2	-	Circulate hole clean and condition mud.
	0430 - 0530	1	-	Run Formation Integrity Test with Dowell - 22.6ppg EMW.
ı	0530 - 0700	11/2	-	Drill 8½" hole from 346m to 395m.
	0700 - 0800	1	-	Clean plugged flow-line and work mud ring out of hole.
	0800 - 0830	1/2	-	Continue drilling 8½" hole from 395m to 404m.
	0830 - 0900	1/2	-	Circulate and survey at 391m.
	0900 - 1200	3	-	Drill 8½" hole from 404m to 481m.
- 1	1200 - 1230	1/2	-	Centre crown of derrick over centre of rotary table.
1	1230 - 1300	1/2	-	Circulate and survey at 468m.
- 1	1300 - 1400	1	-	Drill 8½" hole from 481m to 515m.
	1400 - 1430	1/2	-	Circulate and clean mud ring from flow line.
- 1	1430 - 1500	1/2	-	Drill 8½" hole from 515m to 538m.
- 1	1500 - 1530	1/ ₂	-	Circulate and survey at 525m.
	1530 - 2100	5½	-	Drill 8½" hole from 538m to 673m.
- 1	2100 - 2130	1/2	-	Circulate and survey at 660m.
	2130 - 2230	1	-	Repair kelly spinner - engaging kelly while rotating.
	2230 - 2400 <i>16/05</i> /	1½	-	Drill 8½" hole from 673m to 690m.
	10/ 03 / 0000 - 0130	1½	_	Drill 8½" hole from 690m to 721m.
	0130 - 0200	1/2	_	Circulate and survey at 708m.
	0200 - 0900	72	_	Drill 8½" hole from 721m to 832m.
1	0900 - 0930	1/2	-	Flow check and circulate geological sample at 832m.
- 1	0930 - 0930	1½	-	Twenty-five stand wiper trip back to shoe.
- 1	1100 - 1130	1/2	_	Slip 40' of drill line.
	1130 - 1230	72 1	-	Run back in hole - no fill.
	1230 - 1230 1230 - 1430	2	-	Un-plug jet and drill 8½" hole from 832m to 883m.
	1430 - 1430 1430 - 1500	1/2	-	
	1700 - 1000	72	-	Circulate and survey at 870m.

•				
	1500 - 2030	5½	-	Drill 8½" hole from 883m to 1017m.
	2030 - 2100	1/2	_	Circulate and survey at 1004m.
	2100 - 2130	1/2	-	Drill 8½" hole from 1017m to 1046m.
١	2130 - 2200	1/2	_	Circulate and survey at 1033m.
	2200 - 2330	11/2	-	Drill 8½" hole from 1046m to 1075m.
	2330 - 2400	1/2	-	Circulate and survey at 1062m.
	17/05/			•
	0000 - 0200	2	_	Drill 8½" hole from 1075m to 1104m.
	0200 - 0230	1/2	_	Circulate and survey at 1091m.
	0230 - 0500	$2\frac{1}{2}$	_	Drill 8½" hole from 1104m to 1142m.
	0500 - 0530	1/2	_	Circulate and survey at 1129m.
	0530 - 0800	2½	_	Drill 8½" hole from 1142m to 1171m.
	0800 - 0830	1/2	_	Circulate and survey at 1158m.
	0830 - 1030	2	_	Drill 8½" hole from 1171m to 1199m.
	1030 - 1100	1/2	-	Circulate and survey at 1196m.
	1100 - 1300	2	_	Drill 8½" hole from 1199m to 1228m.
	1300 - 1330	1/2	-	Circulate and survey at 1228m.
	1330 - 1630	3	-	Twenty stand wiper trip back to 823m. Work tight hole at 1076m to
				1035m. Pipe stuck at 1076m for 20 minutes. 2m of fill.
	1630 - 2030	4	-	Drill 8½" hole from 1228m to 1257m.
	2030 - 2100	1/2	-	Circulate and survey at 1244m. Sand line parted while pulling survey
				barrel out of hole.
	2100 - 2230	11/2	_	Pull out of hole to recover survey barrel to 870m.
	2230 - 2300	1/2	-	Recover survey barrel.
	2300 - 2400	1	-	Continue to pull out of hole to inspect bit.
	18/05/	/ 94		
	0000 - 0130	11/2	_	Continue to pull out of hole.
	0130 - 0300	11/2	-	Run in hole to casing shoe. Change string stabiliser (1/8" under gauge)
				and working single.
	0300 - 0700	4	-	Slip and cut drill line to remove damaged section of line and repair sand
				line.
	0700 - 0800	1	-	Continue to run in hole.
	0800 - 0830	1/2	-	Circulate - unable to RIH due to storm and sleet.
	0830 - 0900	1/2	-	Continue to RIH to 1062m.
	0900 - 0930	1/2	-	Ream from 1062m to 1075m.
	0930 - 1000	1/2	-	Continue to RIH to 1177m.
	1000 - 1130	11/2	-	Ream from 1177m to 1257m.
	1130 - 1700	$5\frac{1}{2}$	-	Drill 8½" hole from 1257m to 1276m.
	1700 - 1730	1/2	-	Circulate and survey at 1276m.
	1730 - 2030	3	-	Drill 8½" hole from 1276m to 1305m.
	2030 - 2100	1/2	-	Circulate and survey at 1305m.
	2100 - 2400	3	-	Drill 8½" hole from 1305m to 1318m.
	19/05/	/94		
	0000 - 0200	2	-	Drill 8½" hole from 1318m to 1334m.
	0200 - 0230	1/2	-	Circulate and survey at 1331m.
	0230 - 0830	6	-	Drill 8½" hole from 1334m to 1363m.
	0830 - 0900	1/2	-	Circulate and survey at 1360m.
	· · · · · · · · · · · · · · · · · · ·			

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TIME

	TIME	HOURS	•	Perations Page: 4 of 10.
		1100118		Page: 4 of 10
	0900 - 1330	41/2	-	- 322 out of note to buffer up BITA - work tight hole from 1302m to
	1330 - 1430	1		1158m.
	1430 - 1430	1 2	-	Pick up DC, stabilisers and junk sub and make up new BHA with Bit #3.
	1630 - 2400	∠ 7½	-	Run in hole to 949m.
	1030 - 2400	1/2	-	Ream tight hole from 949m to 1240m, running stands or singles where possible.
	20/05/	/ 94		possible.
	0000 - 0400	4	_	Ream tight hole from 1240m to 1363m - work junk sub.
	0400 - 1030	6½	_	Drill $8\frac{1}{2}$ " hole from 1363m to 1394m.
i	1030 - 1100	1/2	_	Circulate and survey at 1390m.
	1100 - 1900	8	-	Drill 8½" hole from 1394m to 1438m - stuck in hole. Drill string locked
				up in hole, stalling motors. Unable to hoist after restarting motors - clutch slipping.
	1900 - 2130	$2\frac{1}{2}$	-	Check and degrease oily drum clutch and re-fit.
	2130 - 2400	$2\frac{1}{2}$	-	Try to hoist off bottom, pipe stuck, work jars to 35,000lbs over string
				weight, pull to 240,000lbs (115,000lbs over string weight) and try to
	21 / 27 /			rotate to get pipe free.
	21/05/			
	0000 - 1030	10½	-	Continue to jar and pull on pipe and try to rotate.
	1030 - 1200	1½	-	Displace annulas to water.
	1200 - 1330	1½	-	Jar and pull on pipe.
	1330 - 1530	2	-	Close Hydril and reverse, circulate slowly to displace hole to water completely.
	1530 - 1600	1/2	-	Continue to pull on pipe and jar intermittently.
	1600 - 1700	1	-	Visual check of drilling line, anchors, derrick supports and all lines, sheaves and safety pins in mast.
	1700 - 1930	21/2	-	Continue to pull on pipe and jar intermittently.
	1930 - 2030	1	-	Change out drive chain in draw-works.
	2030 - 2200	11/2	-	Displace hole to mud before running Free-Point Tool.
	2200 - 2400	2	-	Try to remove access bull plug in top of swivel goose neck - too tight -
				remove kelly hose etc. and goose neck.
	22/05/			
	0000 - 0800	8	-	Rig up Schlumberger and run Free-Point Tool to try to establish where
				drill string is stuck. Schlumberger's tests suggest that the string is stuck
	0000 0000	17		at the jars at 1262.97m - jars continues to function.
1	0800 - 0830 0830 - 1200	$\frac{1}{2}$ $3\frac{1}{2}$	-	Test jars for operation check.
		372	-	Re-install wash pipe, goose neck and kelly hose while evaluating Free-Point logs. Pressure test to 500psi.
	1200 - 1300	1	-	Circulate hole - complete circulation plus 30% - cavings from bottom of hole.
:	1300 - 1330	1/2	-	Work pipe to 250,000lbs.
	1330 - 1530	2	-	Displace hole to water.
	1530 - 1600	1/2	-	Work jars up to 160,000lbs and down 25,000lbs.
	1600 - 1900	3	-	Mix 'Ezy-Spot' and diesel fuel and spot across bottom of hole to
				1,200mKB with Dowell (circulated with water slowly while mixing, as
				pressure indicated hole could be packing-off).

1900 -	1930	1/2	_	Work jars up and down, hold torque on pipe.
1930 -		1	-	Remove access bull plug in goose neck and rig up Schlumberger.
2030 -		3	_	Run Free-Point tool with Schlumberger, string pulled free while applying
				tension for locating Free-Point - rig down Schlumberger.
2330 -	2400	1/2	_	Layout single of drill pipe and replace access plug.
1	23 / 05 /			
				TT1 1.4. 1. 1.14
0000 -		1	-	Unplug jets in bit.
0100 -		1	-	Displace hole to drilling mud.
0200 -		3	-	Circulate and condition mud.
0500 -	1330	81/2	-	Pull out of hole servicing all tool joint connections and lay out jars - work tight hole from 1361m to 1226m.
1330 -	. 1430	1	_	Make up cup tester and test pipe rams, choke and HCR to 2,500psi and
1330	1 150	•		500psi and Hydril to 1,000psi and 500psi.
1430 -	1700	$2\frac{1}{2}$	-	Make up new bit and BHA and run in hole to casing shoe.
1700 -	1930	21/2	-	Slip and cut 100' of drilling line.
1930 -	2130	2	-	Run in hole to 1207m. Lay out 20 singles for reaming. Service last 10
				connections, not serviced while pulling in tight hole.
2130 -	2400	21/2	_	Break circulation and ream and wash from 1207m to 1390m.
	24/05/	94		
0000 -	0200	2	-	Ream from 1390m to 1438m.
0200 -	1900	17	_	Drill 8½" hole from 1438m to 1537m.
1900 -	1930	1/2	_	Circulate and survey at 1524m.
1930 -	2400	41/2	-	Drill 8½" hole from 1537m to 1556m.
	25 / 05 /	94		
0000 -	1000	10	_	Drill 8½" hole from 1556m to 1614m.
1	1030	1/2	_	Circulate and survey at 1610m.
1030 -	1300	$2\frac{1}{2}$	-	Drill 8½" hole from 1614m to 1623m.
1300 -	1400	1	-	Ten stand wiper trip from 1623m to 1419m - work tight hole 1476m to
				1467m - 1 meter of fill.
1400 -	1530	11/2	-	Drill 8½" hole from 1623m to 1628m.
1530 -	1630	1	-	Circulate geological sample at 1628m.
1630 -	2400	$7\frac{1}{2}$	-	Drill 8½" hole from 1628m to 1675m.
	26/05/	94		
0000 -	1300	13	-	Drill 8½" hole from 1675m to 1731m.
				Lowered circulation rate from 300gpm to 250gpm at 1711m.
1300 -		1	-	Circulate geological sample at 1731m.
1400 -	1500	1	-	Drill 8½" hole from 1731m to 1732m. Drill string torqueing up - unable
				to put weight on bit.
1500 -	· 1900	4	-	Pull out of hole to check bit and stabilisers - high winds and driving rain -
				work tight hole at 1352m to 1243m - 35,000lb over-pull.
1900 -		1/2	-	Slip 20' of drilling line.
	- 2200	$2\frac{1}{2}$	-	Continue to pull out of hole.
	- 2400	2	-	Lay out stabilisers, make up new bit and stabilisers at 60'. Run in hole.
1	27/05/	94		
0000 -		3	-	Continue run in hole.
0300 -	- 0330	1/2	-	Precautionary ream from 1713m to 1732m - 2m of fill.

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TIME

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0330 - 0430	1		Circulate hole clean prior to drilling ahead.
0430 - 0500	1/2	_	Drill 8½" hole from 1732m to 1734m.
0500 - 0600	1	_	Circulate geological sample at 1734m.
0600 - 0700	1	_	Drill 8½" hole from 1734m to 1745m.
0700 - 0900	2	_	Circulate geological sample at 1745m.
0900 - 1200	3	_	Wiper trip to casing side - work tight hole at 1435m to 1430m.
1200 - 1230	1/2	_	Slip 20' of drilling line.
1230 - 1530	3	-	Continue to run in hole.
1530 - 1600	1/2	-	Tag bottom, break circulation, circulate for 10 minutes and pull back 2
			stands.
1600 - 1830	21/2	-	Circulate at 1706m, working pipe.
1830 - 1900	1/2	-	Pump weight pill and drop survey.
1900 - 2330	$4\frac{1}{2}$	_	Pull out of hole to pick up test tools - strap out.
2330 - 2400	1/2	-	Lay out bit stabiliser and recover survey.
28/05/	94		
0000 - 0100	1	_	Make up test tools.
0100 - 0600	5	_	Run in hole with test tool.
0600 - 0700	1	-	Head up surface equipment and work pipe until daylight.
0700 - 1030	31/2	_	Connect chicksans, set packers and run DST #1 at 1715.22m to 1745m.
1030 - 1500	41/2	_	Pull out of hole with test tool.
1500 - 1600	1	-	Lay out test tools.
1600 - 1700	1	-	Service and make up 60' core barrel.
1700 - 1830	11/2	_	Run in hole with core barrel.
1830 - 1900	1/2	-	Slip 20' of drilling line.
1900 - 2200	3	-	Run in hole with core barrel.
2200 - 2400	2	-	Ream to bottom 17m and circulate gas-cut mud.
29/05/	94		
0000 - 0200	2	-	Tag bottom. Drop ball and cut Core #1 at 1745m to 1764m.
0200 - 0700	5	-	Lay out 2 pup joints and pull out of hole with core barrel.
0700 - 0800	1	-	Recover Core #1.
0800 - 0930	11/2	-	Break and service core barrel and lay out.
0930 - 1030	1	-	Make up bit #5RR and run 1 stand of drill collars. Pick up cup tester and
			pressure test pipe rams to 2,500psi and 800psi against HCR valve and
			Hydril to 1,000psi.
1030 - 1100	1/2	-	Service Rig.
1100 - 1530	$4\frac{1}{2}$	-	Run in hole to 1726m.
1530 - 1630	1	-	Break circulation. Wash and ream down to top of unrecovered core at
			1761m.
1630 - 1700	1/2	-	Drill up 3 metres of unrecovered core.
1700 - 2130	4½	-	Drill 8½" hole from 1764m to 1776m.
2130 - 2200	1/2	-	Work bit to check for balling up - low penetration.
2200 - 2400	2	-	Drill 8½" hole from 1776m to 1780m.
30/05/			
0000 - 0800	8	-	Drill 8½" hole from 1780m to 1802m.
0800 - 0830	1/2	-	Circulate for survey at 1802m - abort survey due to broken strand in sand-
			line.
0830 - 1030	2	-	Drill 8½" hole from 1802m to 1821m.
1030 - 1100	1/2	-	Circulate and survey at 1808m.

Page: 6 of 10

TIME

	TIME	HOURS	OF	PERATIONS Page: 7 of 10
ı	1100 - 1200	1		Drill 8½" hole from 1821m to 1824m.
	1200 - 1200	12	-	Drill 8½" hole from 1824m to 1852m.
			-	Driii 872 noie from 1824m to 1832m.
	31/05/			
	0000 - 0930	91/2	-	Drill 8½" hole from 1852m to 1888m.
	0930 - 1000	1/2	-	Service rig.
	1000 - 1100	1	-	Drill 8½" hole from 1888m to 1897m.
	1100 - 1230	1½	-	Circulate geological sample at 1897m - circulate for 10 minutes, pull back to 1869m and continue circulating.
	1230 - 1430	2	-	Wiper trip back to 1700m. Work tight hole at 1802m to 1736m. RIH to 1770m, pick up kelly and clean out to 1780m. Continue to RIH - 1 metre of fill.
	1430 - 1600	11/2	-	Drill 8½" hole from 1897m to 1910m.
	1600 - 1800	2	-	Circulate for 10 minutes, pull back to 1869m and continue circulating.
	1800 - 2130	31/2	-	Pull out of hole for DST #2 - strap pipe.
	2130 - 2230	1	-	Slip 20' and cut 92' of drilling line.
	2230 - 2400	11/2	-	Continue to pull out of hole.
	01/06/	94		
	0000 - 0030	1/2	-	Continue to pull out of hole.
	0030 - 0130	1	-	Make up test tools.
	0130 - 0230	1	-	Run in hole with test tool.
	0230 - 0300	1/2	-	Service rig and adjust brakes.
	0300 - 0730	4½	-	Continue to run in hole with test tool and work tools through tight hole from 1791 to 1824m.
	0730- 0930	2	-	Run DST #2 at 1874.97m to 1910m - test aborted after packer seat failure on final flow opening.
			Str	ap result: Driller's depth: 1910m. Strap depth: 1910.61m.
				Strap depuir. 1910.01iii.
	0930 - 1500	5½	-	Pull out of hole - work through tight hole at 1849m to 1773m. Slight swabbing, recover 10bbls of mud.
	1500 - 1630	11/2	-	Break and lay out test tools.
	1630 - 1700	1/2	-	Restart draw-works motor.
	1700 - 1900	2	-	Make up 8½" BHA and run in hole.
	1900 - 1930	1/2	-	Slip 15' of drilling line.
	1930 - 2330	4	-	Run in hole to 1888m. Break circulation and precautionary ream to 1910m.
	2330 - 2400	1/2	-	Circulate and condition mud.
	02/06/	94		
	0000 - 0030	1/2	-	Continue to circulate gas out.
	0030 - 1200	$11\frac{1}{2}$	-	Drill 8½" hole from 1910m to 1964m.
-	1200 - 2100	9	-	Drill 8½" hole from 1964 to 2006m (T.D.).
į	2100 - 2200	1	-	Circulate bottoms up.
	2200 - 2400	2	-	Pull out of hole. Wiper trip back to 1186m - 10-15,000lbs over pull from 1869m to 1773m.

TIME HOURS OPERATIONS Page	e: 8 of 10

	03/06/	94		
	0000 - 0130	11/2	-	Run in hole. Wiper trip - work tight hole from 1751m to 1761m - 1 metre of fill.
١	0130 - 0300	1½	-	Circulate hole clean.
۱	0300 - 0400	1	_	Survey at 2000m - apply preservative to sand line.
١	0400 - 0430	1/2	_	Pull out of hole to log - strap out of hole.
١	0430 - 0500	1/2	_	Pick up kelly and work tight hole from 1761m to 1751m.
١	0500 - 0800	3	-	Continue to pull out of hole to log - strap pipe.
١	0800 - 0830	1/2	_	Pull out of hole. Break bit and stabiliser.
	0830 - 1200	31/2	_	Rig up Schlumberger. Run #1 - Resistivity/Sonic.
	1200 - 2400	12	_	Continue Run #1. Run #2 Neutron/Density. Run #3 Check Shot Survey.
	04/06/			
				Continue Dun #2 Charle Shot Survey
	0000 - 0300	3	-	Continue Run #3 Check Shot Survey.
	0300 - 0400	1	-	Make up 8½" BHA and run in hole.
l	0400 - 0430	½ 3	-	Slip 27' drilling line. Continue to run in hole.
	0430 - 0730	_	-	
	0730 - 0900	11/2	-	Break circulation and circulate hole.
			Но	le took 27.5bbls of mud while logging.
ĺ			Dri	iller's Depth: 2006m.
İ				ap Depth: 2005.87m.
				gger's Depth: 2007m.
			,	68
	0900 - 1030	1½	_	Work on slipping drum clutch.
	1030 - 1500	4½	-	
	1500 - 2400	9	-	Rig up Schlumberger. Run #4 RFT.
			Но	le used 65bbls of mud while logging.
	05/06/	94		
ĺ	0000 - 1330	13½	_	Continue logging with Schlumberger. Run #4 RFT. Run #5 Dipmeter.
				Run #6 Sidewall Cores.
	1330 - 1400	1/ ₂	-	Rig down Schlumberger.
	1400 - 1900	5	-	Make up 8½" BHA and run in hole to 1993m. Filled pipe at 955m when no mud returns being displaced. Break circulation and wash to 2000m. Check operation of drum clutch - started to slip at 147,000lbs indicator weight.
	1900 - 2000	1	_	Circulate bottoms up - 60 units gas - work pipe.
	2000 - 2330	3½	_	Pull out of hole to casing shoe - hit tight spot at 596m.
	2330 - 2400	1/2	_	Repair draw-works.
	06/06/			•
	0000 - 0130	1½		Change over drum clutch and Hydromatic clutch.
			-	· · · · · · · · · · · · · · · · · · ·
	0130 - 0400	2½	-	Run in hole. Clutch started to slip at 130,000lbs indicator weight while running in hole.
	0400 - 0600	2	-	Pull back to casing shoe.
	0600 - 0800	2	-	Remove drum clutch and re-face with new facing that arrived overnight in Melbourne.
,				mentality.

TI																e:		

_				
				nlumberger lost 4 sidewall core bullets in hole.
1			Ho	le took 41bbls while logging and 21bbls while repairing.
1				
	0800 - 0900	1	-	Change out clutch pads for new ones at shoe.
	0900 - 1100	2	-	Run in hole 25 stands and pull back to shoe - cracks in 2 members of
1				draw-works sub-frame.
	1100 - 1400	3	-	Shut well in, install stabbing valve and well gussets to reinforce draw-
				works sub-frame.
	1400 - 1730	3½	-	Run in hole to 1993m. Break circulation and clean to bottom - 3m of fill. Picked up kelly and filled pipe and hole at 1138m when mud stopped displacing from hole.
	1730 - 1830	1	-	Circulate bottoms up - work pipe - clutch okay.
1	1830 - 2300	41/2	-	Pull out of hole for DST #3.
	2300 - 2400	1	-	Make up DST tools.
	07/06/	/ 94		
1	0000 - 0200	2	_	Make up test tools.
	0200 - 0700	5	_	Run in hole with test tool - strap pipe - differential of 0.29m less than tally
	0200 0700	J		sheet.
	0700 - 0800	1	_	Head up surface equipment and pressure test chicksans to 100psi air
	0700 0000	•		pressure and change out 3 leaky ones.
1	0800 - 1400	6	_	Inflate packers and run DST #3 at 1883.07 to 1909.13m.
	1400 - 1900	5	_	Pull out of hole with test tool.
1	1900 - 2100	2	_	Break and lay out test tools - recover 2.2 barrels of mud.
1	2100 - 2400	3	_	Run in hole with BHA and lay out same.
1		_		
			Но	le took further 35bbls during repairs from 24hrs to 0800.
				T #3 interval 1883.07m to 1909.13m.
١	08/06/	/ 94		
	0000 - 0100	_		Continue lay out 6¼" D/C.
1	0100 - 0400	1 3	-	Run in hole with open ended drill pipe and pick up 12 singles.
1	0400 - 0530	1½	-	Circulate bottoms up at 1880m.
	0530 - 0700	$1\frac{1}{2}$	_	Head up Dowell pressure test lines and run cement plug #1 at 1880m to
7	0330 - 0700	172	_	1820m with 84 sacks Class 'A'.
	0700 - 0730	1/2	_	Pull back to 1760m.
-	0730 - 0830	1	_	Run cement plug #2 at 1760m to 1700m with 87 sacks Class 'A'.
-	0830 - 0900	1/2	_	Pull back 4 stands through cement.
	0900 - 0930	1/2	_	Circulate to clear pipe of any cement.
	0930 - 1300	3½	_	Lay out 78 joints of drill pipe.
	1300 - 1330	1/2	-	Run plug #3 at 940m to 880m with 8 sacks Class 'A'.
	1330 - 1400	1/2	-	Pull 9 stands and circulate to clear pipe of any cement.
-	1400 - 1700	3	-	Lay out 80 singles of drill pipe.
	1700 - 1730	1/2	_	Run in hole 19 stands and run plug #4 at 366m to 306m with 84 sacks
and the same				Class 'A'.
	1730 - 1830	1	-	Pull back 5 stands circulate to clear pipe of cement.
	1830 - 1900	1/2	_	Pull back 14 stands.
	1900 - 2300	4	-	Wait on cement - clean shaker tank and remove pipe spinner.
	2300 - 2400	1	-	Run in hole - tag plug #4 at 309m.

TIME	HOURS	OPERATIONS Page: 10 of 10
09/06	/94	
0000 - 0130	11/2	- Lay out drill pipe.
0130 - 0600	41/2	- Nipple down BOP, choke and flare line.
0600 - 0700	1	- Remove casing bowl and clean suction tank.
0700 - 0730	1/2	- Run surface plug with approximately 30 sacks Class 'A'.
0730 - 0800	1/2	- Lay out kelly and swivel.
0800 - 0830	1/2	- Release Rig.

Release Rig at 0830 hours, 9 JUNE 1994.

APPENDIX 4

APPENDIX 4

LITHOLOGICAL DESCRIPTIONS

4A. CUTTINGS DESCRIPTIONS
4B. GEOLOGICAL DESCRIPTIONS
FROM DAILY REPORTS

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APPENDIX 4A

CUTTINGS DESCRIPTIONS

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MARL: blue grey, soft, very fossiliferous with abundant coral and shell fragments.	MARL: as for 340-370m.	LIMESTONE: off white to tan, mostly fossil fragments.	MARL: dark grey to blue grey, often brown, calcareous, trace glauconite, trace pyrite.	LIMESTONE: mainly fossil fragments, common glauconite.	MARL: as for 395-405m.	LIMESTONE: as for 395-405m.	<b>MARL:</b> as for 395-405m.	LIMESTONE: as for 395-405m.	<b>MARL:</b> dark grey to blue grey, dominantly dark brown, calcareous, fossiliferous, soft, rare to common glauconite.	LIMESTONE: as for 395-405m.	MARL: as for 430-450m.	LIMESTONE: as for 395-405m.	MARL: as for 430-450m.	MARL: as for 430-450m.	SANDSTONE: medium to dark brown, very fine to medium, dominantly fine, subangular to subrounded, dominantly subrounded quartz, common fossil fragments, rare glauconite, common argillaceous matrix, soft, poor visual porosity.	SANDSTONE: medium to dark brown, very fine to coarse, dominantly medium, subrounded to rounded, dominantly subrounded quartz, poor to moderately sorted, common argillaceous matrix, poor visual porosity.
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100	SANDSTONE: off white to translucent, very fine to very coarse, dominantly coarse, subrounded to rounded, dominantly rounded, poor to moderately sorted, rare pyrite, unconsolidated, good intergranular porosity.	0.1	8-9	ij	ïŻ	ij	Ξ. Z	Z
80	SANDSTONE: as for 560-590m.	ΞΪΖ	IIZ	Nil	IIN	Ϊ́Ν	Nii	IIN
20	CLAYSTONE: dark brown, silty, carbonaceous, soft, massive.							
90	SANDSTONE: as for 560-590m.	Ξ̈́Z	ij	Nii	I!N	IIN	Nii	ΝΞΙ
10	CLAYSTONE: as for 590-600m.							
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100	SANDSTONE: as for 560-590m.	Nii	Nii	I!N	Nil	Niil	Nil	Nil
70	SANDSTONE: as for 560-590m.							
30	CLAYSTONE: medium to dark brown, silty, carbonaceous, weakly calcareous, rare of an conite soft							
80	SANDSTONE: as for 560-590m.							
20	CLAYSTONE: as for 740-745m.							
100	SANDSTONE: as for 560-590m.							
80	SANDSTONE: off white, light brown, very fine to medium, occasionally coarse, dominantly medium, subangular to subrounded, dominantly subrounded quartz, poor to moderately sorted, trace glauconite, trace pyrite, common fossil fragments, abundant argillaceous matrix, poor visual porosity, soft.	Nii	Nii	iż	īZ	Z	ī.	<del>Z</del>
20	CLAYSTONE: dark brown, silty, calcareous, carbonaceous, trace to rare glauconite, soft.							

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780-785	30	SANDSTONE: off white, light brown, very fine to medium, occasionally coarse, dominantly medium, subangular to subrounded, dominantly subrounded quartz, poor to moderately sorted, trace glauconite, trace pyrite, common fossil fragments, abundant argillaceous matrix, poor visual porosity, soft.  CLAYSTONE: dark brown, silty, calcareous, carbonaceous, trace to rare	IIZ	III	Ξ̈̈́Z	ij	īž	Ξ̈̈́Z	ij
		glauconite, soft.							
785-790	09	SANDSTONE: as for 780-785m.	ΞΞ	Nii	Ë	Ξ̈́Z	ΙΪΧ	NiiN	Nii
	40	CLAYSTONE: as for 780-785m.							
790-805	80	CLAYSTONE: as for 780-785m.	Nii	I!N	IIN	IIN	IIN	II.N	Ξ̈̈́Z
	20	SANDSTONE: as for 780-785m.							
805-830	100	CLAYSTONE: as for 780-785m.	Nii	I!N	IIN	IIN	Nil	Nii	ΙΪΖ
830-835	09	CLAYSTONE: as for 780-785m.	Nii	Nil	Nii	Nii	Ē	Nii	ΞΞ
	40	SANDSTONE: brown to translucent, very fine to granular, dominantly coarse, subangular to subrounded, dominantly subrounded quartz, common glauconite, common pyrite, trace iron oxide staining, abundant argillaceous matrix, nil visual porosity, soft.							
835-840		very poor sample (drilling following the wiper trip to check the hole condition).	ZiZ	N.	ijZ	īž	Ē	IIZ	ĪZ
840-880	100	SANDSTONE: brown, iron oxide staining, fine to medium, dominantly medium, subangular to subrounded, dominantly subrounded quartz, moderately sorted, trace argillaceous matrix, dominantly unconsolidated, good intergranular porosity.	Ii Z	Nii	IIN	Nii	Nii	I!N	Nii
880-895	100	SANDSTONE: as for 840-880m.	Ϊ̈́Ζ	IIZ	Ē	Ē	Ē	ΞΞ	III
895-900	6	SANDSTONE: as for 840-880m.	Ϊ́Ν	IIZ	Ξ̈̈́Z	ΞΞ	ĪŽ	ΞΞ	ΞZ
	10	SILTSTONE: medium grey brown, argillaceous, common glauconite, rare pyrite, rare calcite, massive, moderately firm.							

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900-905	50	SILTSTONE: medium grey brown, argillaceous, common glauconite, rare pyrite, rare calcite, massive, moderately firm.  SANDSTONE: as for 840-880m.	II Z	Ē	Ī	Ē	ĪŽ	Ī	Ξ
905-914	06 01	SILTSTONE: as for 900-905m. SANDSTONE: brown, iron oxide staining, fine subangular to subrounded, dominantly subrounded	IIN	ij	II Z	ī	ii.	IIZ IIZ	Z
914-1045	100	SANDSTONE: off white to translucent, very fine to granular, dominantly very coarse to granular, subangular to subrounded, dominantly subrounded quartz, poorly sorted, trace to common pyrite, trace to rare brown lithics, unconsolidated, very good intergranular porosity.	0.5	30	Z	II.	ij	Nii	īZ
1045-1050	80		IIZ	N:I	Nii	III	IIZ	ΞΞ	ij
1050-1060	90	SANDSTONE: as for 914-1045m. CLAYSTONE: as for 1045-1050m.	Nii	II.X	Nii	ΞZ	II.X	Nii	Ξ̈̈́Z
1060-1080	100	SANDSTONE: off white to translucent, very fine to granular, dominantly very coarse to granular, subangular to subrounded, dominantly subrounded quartz, poorly sorted, trace to common pyrite, trace coal, trace to rare brown lithics, unconsolidated, very good intergranular porosity.	ij	IIN	Nii	III	II.X	Nii	ij
1080-1100	90	SANDSTONE: as for 914-1045m. CLAYSTONE: as for 1045-1050m.							
1100-1130	100	SANDSTONE: as for 1060-1080m.	II.N	IÏN	Nii	Nii	Nil	Nil	Nii
1130-1140	80 20	SANDSTONE: as for 1060-1080m. CLAYSTONE: as for 1045-1050m.							
1140-1150	06	SANDSTONE: as for 914-1045m.	Nii	ΪΝ	IÏN	ΙΝ̈́	ΞΞ	ΞZ	ΙΪΧ
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CLAYSTONE: as for 1045-1050m.	SANDSTONE: off white to translucent, very fine to granular, dominantly very coarse to granular, subangular to subrounded, dominantly subrounded quartz, poorly sorted, trace to common pyrite, trace to rare brown lithics, unconsolidated, very good intergranular porosity.	SANDSTONE: as for 1150-1165m.	SANDSTONE: as for 1150-1165m.	SILTSTONE: medium to dark grey, very argillaceous, carbonaceous, moderately firm, massive.	SILTSTONE: as for 1170-1180m.	SANDSTONE: as for 1150-1165m.	SANDSTONE: off white to translucent, very fine to granular, dominantly very coarse to granular, subangular to subrounded, dominantly subrounded quartz, poorly sorted, trace to common pyrite, trace to rare brown lithics, unconsolidated, very good intergranular porosity.	SILTSTONE: medium to dark grey, very argillaceous, carbonaceous, moderately firm, massive.	COAL: dark brown to black, firm.	SILTSTONE: as for 1185-1190m.	SANDSTONE: as for 1185-1190m.	COAL: dark brown to black, firm.
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SANDSTONE: off white to translucent, very fine to granular, dominantly very coarse to granular, subangular to subrounded, dominantly subrounded quartz, poorly sorted, trace to common pyrite, trace to rare brown lithics, unconsolidated, very good intergranular porosity. SILTSTONE: as for 1185-1190m. COAL: dark brown to black, firm.	SANDSTONE: as for 1185-1190m. SILTSTONE: as for 1185-1190m.	SANDSTONE: colourless to translucent, very fine to coarse, dominantly coarse, subangular to subrounded, dominantly subangular quartz, poor to moderately sorted, weak calcareous cement, dominantly unconsolidated, good intergranular porosity.	SANDSTONE: as for 1220-1230m. CAVING: poor quality sample after wiper trip and drilling with reduced weight on bit (5,000lbs).	SILTSTONE: dark grey, argillaceous, often sandy grading into very fine sandstone, moderately firm, massive. SANDSTONE: as for 1230-1250m.	SANDSTONE: off white, translucent, very fine, often grading into siltstone, subangular to subrounded, dominantly subangular quartz, well sorted, strong dolomite cement, common pyrite, nil visual porosity, hard; at times medium to coarse, dominantly coarse, unconsolidated. SILTSTONE: as for 1250-1275m.	SANDSTONE: as for 1275-1285m. SILTSTONE: as for 1250-1275m.
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SANDSTONE: as for 1275-1285m, but with trace golden amber; first amber at 1325m.	COAL and Carbonaceous Material: common pyrite.	SANDSTONE: as for 1275-1285m.	SILTSTONE: as for 1250-1275m, but grading to silty claystone.	SANDSTONE: as for 1275-1285m.	CLAYSTONE: dark grey, argillaceous, silty, often sandy grading into very fine sandstone, moderately firm, massive.	SANDSTONE: as for 1275-1285m.	CLAYSTONE: dark grey, brown grey, very silty grading into siltstone, argillaceous, carbonaceous, very soft, dispersive.	CLAYSTONE: as for 1375-1385m.	SANDSTONE: as for 1275-1285m.	CLAYSTONE: dark grey, brown grey, very silty grading into siltstone, argillaceous, carbonaceous, very soft, dispersive.	CLAYSTONE: as for 1400-1405m.	CLAYSTONE: as for 1400-1405m.	CLAYSTONE: as for 1400-1405m.	SANDSTONE: off white, translucent, very fine, often grading into siltstone, subangular to subrounded, dominantly subangular quartz, well sorted, strong dolomite cement, nil visual porosity, hard; at times medium to coarse, dominantly
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1445-1455	50	SANDSTONE: off white, brown, very fine, subangular to subrounded, dominantly subangular quartz, well sorted, common dolomite cement, nil visual porosity, hard.	0.3		Ī	Z	Ī	ij	Ī
	50	CLAYSTONE: dark grey, silty, carbonaceous, common pyrite, soft.							
1455-1460	80	CLAYSTONE: as for 1445-1455m.	1.2		IIN	ij	Ξ	ΞZ	N:N
	20	SANDSTONE: as for 1445-1455m.							
1460-1475	06	CLAYSTONE: as for 1445-1455m, but soft to moderately firm.	1.2		Nil	Ξ̈̈́Z	Ξ̈̈́Z	N:I	Nii
	10	SANDSTONE: as for 1445-1455m.							
1475-1515	100	CLAYSTONE: medium to dark grey, brown, weakly calcareous, carbonaceous, rare glauconite, subfissile, soft to moderately firm.	5.5	1037	6	Niil	Nii	Nii	II.
1515-1520	80	CLAYSTONE: as for 1475-1515m.	3.0	009	5	I!N	IIX	Nii	Nii
	20	SANDSTONE: colourless, translucent, fine to medium, dominantly medium, subangular to subrounded, dominantly subrounded quartz, poor to moderately sorted, rare lithics, unconsolidated, good intergranular porosity.							J
1520-1525	6	CLAYSTONE: as for 1475-1515m.	1.3	237	4	Nii	ΞZ	ΞΞ	ΞZ
	10	SANDSTONE: as for 1515-1520m.							
1525-1540	100	CLAYSTONE: as for 1475-1515m.	2.5	475	5	Nii	Nii	Nii	Nii
1540-1595	100	CLAYSTONE: as for 1475-1515m.	3.7	705	18	Nil	Nii	Nil	Nii
1595-1600	100	CLAYSTONE: medium grey, brown, silty, carbonaceous, rare pyrite, rare glauconite, slightly calcareous, subfissile, soft.	3.2	587	22	IIN	īZ	Nii	Z
1600-1610	100	CLAYSTONE: as for 1595-1600m, but with common glauconite increasing with depth.	3.2	595	22	Nii	Nii	II.	ii.
1610-1615	001	CLAYSTONE: as for 1595-1600m, but with abundant glauconite and dark green glauconite nodules.	3.3	604	24	Nil	N:I	II.	ii N
1615-1630	100	100 CLAYSTONE: as for 1595-1600m, but with trace to rare glauconite.	2.4	439	12	iii	ij	Ϊ́Ζ	II.Z

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1655-1675 100 C		0.1	341	 ∞	Nil	ΞÏΖ	Nil	IIN
100	100 CLAYSTONE: as for 1595-1600m, but with trace glauconite.	1.8	338	19	ij	Nil	Nii	ij
	CLAYSTONE: medium grey, brown, silty, carbonaceous, rare pyrite, slightly calcareous, common glauconite increasing with depth, subfissile, soft.	2.3	384	22	4	II.	īZ	EZ.
)	(First C ₃ at 1690 1 unit).							
1700-1715 100 C	CLAYSTONE: as for 1675-1700m, but with abundant glauconite.	2.3	384	22	4	Nii	Nii	Nii
1715-1720 100 C	CLAYSTONE: as for 1675-1700m, but with trace to common glauconite.							
Trace	SAND: colourless, translucent, medium to coarse, unconsolidated.							
1720-1729 100 C	CLAYSTONE: medium grey, brown, silty, carbonaceous, abundant glauconite, abundant medium to coarse glauconite nodules, rare to common pyrite, trace fossil fragments, subfissile, soft.	1.6	302	12		I.N	N.I.	Nii
1729-1732 70 C	CLAYSTONE: as for 1720-1729m.	19	3233	98	13	17	IIN	N.I.
30	SANDSTONE: colourless, translucent, fine to coarse, dominantly medium, subangular to subrounded, dominantly subangular quartz, poorly sorted, unconsolidated, weak argillaceous matrix.	At 1729.5						
1732-1733 90	CLAYSTONE: as for 1720-1729m.	1:1	207	4	0	0	Ϊ́χ	ΞZ
01	SANDSTONE: as for 1729-1732m.							
1733-1734 80 (CLAYSTONE: as for 1720-1729m.							
20	SANDSTONE: as for 1729-1732m.							
1734-1735 70	CLAYSTONE: as for 1720-1729m.	8.5	1495	35	3	ΞZ	Ξ̈̈̈̈	II.N
30 8	SANDSTONE: as for 1729-1732m.							

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CLAYSTONE: medium grey, brown, silty, carbonaceous, abundant glauconite, abundant medium to coarse glauconite nodules, rare to common pyrite, trace fossil fragments, subfissile, soft. SANDSTONE: colourless, translucent, fine to coarse, dominantly medium, subangular to subrounded, dominantly subangular quartz, poorly sorted, unconsolidated, weak argillaceous matrix.	CLAYSTONE: as for 1735-1737m. SANDSTONE: as for 1735-1737m, but with trace to rare golden brown amber with bright yellow fluorescence.	CLAYSTONE: as for 1735-1737m. SANDSTONE: as for 1735-1737m, but with 5% amber.	CLAYSTONE: as for 1735-1737m. SANDSTONE: as for 1735-1737m, but with 10-15% amber.	CORE NO. 1: cut 19m recovered: 15.94m recovery: 83.9%	SANDSTONE: colourless to translucent, very fine to coarse, dominantly coarse, subangular to subrounded, dominantly subangular quartz, poor to moderately sorted, weak argillaceous matrix, dominantly unconsolidated, good visual intergranular porosity, dominantly friable. SHALE: dark grey to black, carbonaceous, micromica, subfissile, moderately hard.	SANDSTONE: as for 1764-1770m. SHALE: as for 1764-1770m.
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SANDSTONE: off white to translucent, very fine to very coarse, dominantly medium, subangular to subrounded, dominantly subrounded quartz, poorly sorted, common pyrite, rare brown lithics, common silt matrix, dominantly unconsolidated, good intergranular porosity. SHALE: dark grey to black, carbonaceous, micromica, fissile, hard.	SHALE: as for 1775-1780m. SANDSTONE: as for 1775-1780m.	SANDSTONE: as for 1775-1780m. SHALE: as for 1775-1780m.	SHALE: light to medium grey, silty, carbonaceous, micromica, dominantly soft, grading into CLAYSTONE: hard in part, subfissile, rare to common pyrite. SANDSTONE: off white to translucent, very fine to very coarse, dominantly medium, subangular to subrounded, dominantly subrounded quartz, poorly sorted, common pyrite, rare brown lithics, common silt matrix, dominantly unconsolidated, good intergranular porosity.	CLAYSTONE: as for 1790-1795m. SANDSTONE: as for 1790-1795m.	SANDSTONE: off white, light brown, fine to medium, dominantly medium, subangular to subrounded, dominantly subangular quartz, well sorted, abundant argillaceous matrix, weakly calcareous, nil visual porosity, moderately firm. CLAYSTONE: hard in part, rare to common pyrite, subfissile.	60 SANDSTONE: as for 1800-1805m. 40 CLAYSTONE: as for 1800-1805m.
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1775-1780	1780-1785	1785-1790	1790-1795	1795-1800	1800-1805	1805-1810

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1810-1815	70	SANDSTONE: as for 1800-1805m.							
	30	CLAYSTONE: as for 1800-1805m.	8.3	1464	72	18	Nii	Ϊ́̈́̈́	I.N
1815-1820	70	CLAYSTONE: as for 1800-1805m.	6.4	1067	27	8	Niil	Ξ̈̈́Z	ΙΪΝ
	30	SANDSTONE: as for 1800-1805m.							
1820-1825	09	CLAYSTONE: blue green, silty, sandy, abundant green lithics, very soft.	1.7	275	10	4	Nii	Ϊ̈́Z	ΞΞ
	30	SANDSTONE: off white, light brown, fine to medium, dominantly medium,							
		subangular to subrounded, dominantly subangular quartz, well sorted, abundant argillaceous matrix, weakly calcareous, nil visual porosity, moderately firm.	· · · · · · · · · · · · · · · · · · ·						
	10	COAL: dark brown to black, firm.							
1825-1835	100	CLAYSTONE: as for 1820-1825m.	3.1	549	15	4	II.N	ΞÏΖ	ΞZ
1835-1840	09	CLAYSTONE: as for 1820-1825m.							
	40	SANDSTONE: colourless to translucent, fine to medium, dominantly medium, subangular to subrounded, dominantly subrounded quartz, moderately sorted, trace to common green and brown lithics, common white argillaceous matrix, poor visual porosity.							
1840-1845	80	CLAYSTONE: as for 1820-1825m.	1.8	326	6	Nii	Nii	liN	III
	20	SANDSTONE: as for 1835-1840m.							
1845-1850	70	CLAYSTONE: as for 1820-1825m.	2.4	445	10	I!N	Nii	Ϊ́Ν	ΙΝ̈́
	30	SANDSTONE: as for 1835-1840m.							

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1850-1875	100	100 CLAYSTONE: light grey, blue grey, very silty grading into siltstone, carbonaceous, common lithics, soft. NOTE: 1859-1860 T.G: 14 Units CI: 2379, C2: 101, C3: 21, C4:10 1800-1801 T.G: 21 Units CI: 3111, C2: 262, C3: 104, C4:38	1.5-3	6222	24	N	īZ	:Z	N.I.
1875-1880	80 20	CLAYSTONE: light blue grey, very silty grading into siltstone, carbonaceous, common multicoloured lithics, subfissile, soft to moderately firm. SANDSTONE: light to medium green grey, translucent, very fine to coarse, dominantly medium, subangular to subrounded, dominantly subrounded quartz, common brown and green lithics, abundant argillaceous matrix, rare calcite, soft, poor porosity.	\$	961	25	_	Nii	Nii	Nii.
1880-1885	90 10	CLAYSTONE: as for 1875-1880m. SANDSTONE: as for 1875-1880m.	5.2	926	24	Э	-	ij	ΞZ
1885-1895	60 40	SANDSTONE: as for 1875-1880m. CLAYSTONE: as for 1875-1880m.	78	13664	480	68	191	Nil	ΞZ
1895-1897	70 30	SANDSTONE: as for 1875-1880m. CLAYSTONE: as for 1875-1880m.	7	1345	32	7		Nil	Nii
. 1897-1898	60 40	SANDSTONE: as for 1875-1880m. CLAYSTONE: as for 1875-1880m.	13.5	2287	105	31	20	Nil	Nii
1898-1899	60 40	SANDSTONE: as for 1875-1880m. CLAYSTONE: as for 1875-1880m.	10.2	1677	68	24	17	Nil	Nii
1899-1900	80	SANDSTONE: as for 1875-1880m. CLAYSTONE: as for 1875-1880m.	15	2531	94	20	20	Nii	Zii

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1900-1901 60 SANDSTONE : as for 1875-1880m.	

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	40	CLAYSTONE: as for 1875-1880m.							
1901-1902	70	SANDSTONE: as for 1875-1880m.	87	14030	432	130	192	Nii	ΙΞ
	30	CLAYSTONE: as for 1875-1880m.							
1902-1903	80	SANDSTONE: as for 1875-1880m.	15.5	2607	46	35	45	N:	ΙΪΧ
	20	CLAYSTONE: as for 1875-1880m.							
1903-1904	09	SANDSTONE: as for 1875-1880m.	42	7167	275	57	80	ïZ	Ξ̈́Z
	40	CLAYSTONE: as for 1875-1880m.							
1904-1905	80	SANDSTONE: as for 1875-1880m.	54	2096	302	74	92	Ξ̈́Z	IIZ
	20	CLAYSTONE: as for 1875-1880m.							
1905-1906	80	CLAYSTONE: as for 1875-1880m.	38	6458	213	35	47	ïZ	IIZ
	70	SANDSTONE: as for 1875-1880m.							
1906-1907	80	SANDSTONE: as for 1875-1880m.	14	2379	101	29	76	ΞZ	ĪŽ
	70	CLAYSTONE: as for 1875-1880m.							
1907-1908	70	SANDSTONE: as for 1875-1880m.	9.2	1647	34	19	3	Z	ij
	30	CLAYSTONE: as for 1875-1880m.							
1908-1909	8	SANDSTONE: as for 1875-1880m.	11.5	1982	11	21	5	ΞZ	Ē
	20	CLAYSTONE: as for 1875-1880m.							
1909-1910	06	SANDSTONE: as for 1875-1880m.	9.5	1616	72	21	12	Ī	ΪΝ
	10	CLAYSTONE: as for 1875-1880m.							

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1910-1915	80	SANDSTONE: light green grey, very fine to very coarse, dominantly coarse, subangular to subrounded, dominantly subrounded quartz, moderately sorted, common brown and green lithics, rare biotite, common pyrite, strong silica cement, very weakly calcareous, nil visual porosity, hard. CLAYSTONE: dark grey, very silty, carbonaceous, subfissile, moderately firm.	11.2	1770	113	52	16	Nil	Ξ̈
1915-1940	06								
	10	CLAYSTONE: as for 1910-1915m.				-			
	•••••	NOTE: INTERVAL TOTAL GAS							
		1910-1916 9-11 units							
		1916-1922 5-10 units					-		
		1922-1935 1.5-5 units							
1940-1945	100	SANDSTONE: as for 1910-1915m.	5.3	885	24	Э	Ξ	II Z	IIZ
	Trace	CLAYSTONE: light to medium brown, carbonaceous, massive, soft.							
1945-1950	80	SANDSTONE: as for 1910-1915m.	4.8	854	42	7		II.Z	ij
	70	CLAYSTONE: as for 1940-1945m.							
1950-1955	70	SANDSTONE: as for 1910-1915m.	3.7	640	27	9	Ī	IIZ I	Ν̈́Ξ
	30	CLAYSTONE: as for 1940-1945m.							
1955-1960	80	CLAYSTONE: as for 1940-1945m.	4.9	863	34	∞	Ī	IIZ	Ξ̈́
	70	SANDSTONE: as for 1910-1915m.							
1960-1965	09	CLAYSTONE: as for 1940-1945m.	6.0	1067	38	7	ij	ij	Ë
	40	SANDSTONE: as for 1910-1915m.							

65 12 12 Nil Nil	
2379	
14.1	
1965-1975 80 SANDSTONE : as for 1910-1915m.	-

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	20	20 CLAYSTONE: as for 1940-1945m.							
1975-1985	09	SILTSTONE: lig	4	671	34	12	1	Niil	Nii
	40	SANDSTONE: light green grey, very fine to coarse, dominantly medium, subangular to subrounded, subrounded quartz, poor to moderately sorted, common							
	•••••	multicoloured lithics, abundant argillaceous and silty matrix, trace to rare pyrite,							
		dominantly unconsolidated, soft.							
1985-1995	70	SANDSTONE: as for 1975-1985m.	6.0	1067	34	8	īZ	Ϊ́Ξ	N:I
	30	SILT							
1995-2006 TD	80	80 SANDSTONE: as for 1975-1985m.	2.2	366	15	14	-	ΞZ	IIN
	20	SILTSTONE: as for 1975-1985m.	At 2006						

APPENDIX 4B

GEOLOGICAL DESCRIPTIONS

FROM DAILY REPORTS

LANGLEY-1

DAILY REPORT GEOLOGICAL SUMMARY

LANGLEY-1

	: 12/05/94
Geologist: Val Akbari Permit: PPL1 Spud Date	
Geologist: Val Akbari Permit: PPL1 Spud Date	

Interval (m)	ROP (Av.) (m/hr)	Lithological and Fluorescence Description
110-340	40-120 (Av.55)	Marl: medium grey to medium green grey, dominantly very calcareous, occasionally slightly calcareous, abundant fossils and shell fragments, trace very fine to fine light grey sand grains and aggregates in part, trace pyrite nodules in part, very sticky, very soft, massive, becoming more argillaceous with depth.
340-370	60-100	Marl: blue grey to grey, very soft, very fossiliferous.
370-395		Marl: as for 340-370m, but interbedded with thin beds of
		Limestone: mainly fossil fragments.
395-450	10-100 (Av.50)	Marl: dark blue grey, often brown, calcareous, trace glauconite, trace pyrite, interbedded with thin beds of
		Limestone: mainly fossil fragments, common glauconite.
450-510	40-60 (Av.50)	Marl: dominantly dark brown, some dark blue grey, calcareous, fossiliferous, rare to common glauconite, soft.
510-560	60-130 (Av.95)	Sandstone: medium to dark brown, very fine to medium, dominantly medium, often calcareous, subrounded to rounded, dominantly subrounded quartz, poor to moderately sorted, common argillaceous matrix, poor porosity.
560-775	15-200 (Av.90)	Sandstone: off white to translucent, very fine to very coarse, dominantly coarse, subrounded to rounded, dominantly rounded quartz, poor to moderately sorted, unconsolidated, good intergranular porosity, interbedded with thin beds of
		Claystone: dark brown, silty, carbonaceous.
775-805	14-30 (Av.20)	Sandstone: off white to light brown, very fine to medium, occasionally coarse, dominantly medium, subangular to subrounded, dominantly subrounded quartz, poor to moderately sorted, trace glauconite, trace pyrite, common fossil fragments, abundant argillaceous matrix, poor visual porosity, soft, interbedded with
		Claystone: dark brown, silty, calcareous, carbonaceous, rare to trace glauconite, soft.
805-840	20-40	Interbedded Sandstone and Claystone as for 775-805m.
840-900	20-40	Sandstone: brown, iron oxide staining, fine to medium, dominantly medium, subangular to subrounded, dominantly subrounded quartz, moderately sorted, trace argillaceous matrix, good intergranular porosity.
900-914	20-40	Siltstone: medium brown grey, argillaceous, common glauconite, rare pyrite, weakly calcareous, massive, moderately firm.
914-1045	40-120	Sandstone: off white to translucent, very fine to granular, dominantly coarse, subangular to subrounded, dominantly subrounded quartz, poorly sorted, common to trace pyrite, rare to trace brown lithics, unconsolidated, very good intergranular porosity.

(m)	(m/hr)	
1045-1165	20-30	Sandstone: as for 914-1045m, but with trace Coal, interbedded with thin beds of Claystone: medium grey, silty, carbonaceous, soft.
1165-1185		Sandstone: off white to translucent, very fine to very coarse, dominantly coarse, subangular to subrounded, dominantly subrounded quartz, poorly sorted, common pyrite, rare lithics, unconsolidated, interbedded with minor
		Siltstone: medium to dark grey, very argillaceous, carbonaceous, firm.
1185-1220	••••••	Interbedded Sandstone and Siltstone with minor Coal as for 1045-1165m.
1220-1230	•••••	Sandstone: colourless, very fine to coarse, dominantly coarse, subangular to subrounded, dominantly subangular quartz, weak calcareous cement, dominantly unconsolidated.
1230-1250		Sandstone: as for 1220-1230m, but poor quality sample after wiper trip and drillin with reduced weight on bit (5,000lbs).
1250-1275	2-27 (Av.9)	Interbedded Sandstone and Siltstone: as for 1165-1185m.
1275-1300	2-30 (Av.15)	Sandstone: off white to translucent, mostly very fine, often grading into siltstone, subangular to subrounded, dominantly subangular quartz, well sorted, abundant dolomite cement, nil visual porosity, with minor
		sandstone, dominantly medium to coarse, unconsolidated and interbedded with dark grey, argillaceous siltstone.
1300-1355	4-23 (Av. 10)	Sandstone: as for 1275-1300m, with minor Coal and trace golden amber material (first at 1325m).
1355-1375	5-20 (Av. 10)	Sandstone: off white to translucent, very fine, subangular to subrounded, dominantly subangular quartz, well sorted, strong dolomite cement, common pyrite rare golden brown amber, nil visual porosity, hard, interbedded with
	• • • • • • • • • • • • • • • • • • •	Siltstone: dark grey, carbonaceous, argillaceous, often grading to silty Claystone.
1375-1400	2-10	Claystone: dark grey, brown, very silty, grading into argillaceous
	(Av.7)	Siltstone: carbonaceous, rare pyrite, soft, sticky, very dispersive, interbedded with thin beds of Sandstone: as for 1355-1375m, but fine grained, dolomite cement.
1400-1435	2-10 (Av.8)	Claystone: as for 1375-1400m.
1435-1460	8-15 (Av.7)	Sandstone: off white, light brown, very fine, subangular to subrounded, dominant subangular quartz, well sorted, common dolomite cement, nil visual porosity, hard interbedded with
		Claystone: dark grey, silty, carbonaceous, common pyrite, soft.
1460-1475	6-9 (Av.7)	Claystone: dark grey, silty, carbonaceous, rare pyrite, subfissile, soft to moderate firm.
1475-1515	6-8 (Av.7)	Claystone: medium to dark grey, brown, weakly calcareous, carbonaceous, rare glauconite, subfissile, soft to moderately firm.
1515-1525	6-8	Claystone: as for 1475-1515m, interbedded with
	(Av.7)	Sandstone: colourless, translucent, fine to medium, dominantly medium, subangular to subrounded, dominantly subrounded quartz, moderately sorted, rare lithics, unconsolidated, good intergranular porosity.

ROP (Av.) Lithological and Fluorescence Description

Interval

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Interval ROP (Av.) Lithological and Fluorescence Descript	ion !
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1525-1595	6-8 (Av.7)	Claystone: as for 1475-1515m.
1595-1600	7	<u>Claystone:</u> medium grey to brown, silty, carbonaceous, slightly calcareous, rare pyrite, rare glauconite, subfissile, soft.
1600-1615	7-8	Claystone: as for 1595-1600m, but glauconite increasing with depth.
1615-1630	5-10 (Av.7)	Claystone: as for 1595-1600m, but with trace to rare glauconite.
1630-1710	5-10 (Av.7)	Claystone: as for 1595-1600m, but with common glauconite, increasing with depth over the intervals 1630-1655m, 1675-1700m.
1710-1715	5-6	<u>Claystone:</u> as for 1595-1600m, but with abundant glauconite, increasing with depth.
1715-1720	2-5	Claystone: as for 1595-1600m, but with trace to common glauconite, common pyrite.
1720-1729	2-30	Claystone: as for 1595-1600m, but with abundant glauconite, abundant medium to coarse glauconite nodules, rare to common pyrite, trace fossil fragments.
1729-1732	2-5	Claystone: as for 1720-1729m, with up to 30%
		Sandstone: colourless to translucent, fine to coarse, dominantly medium, subangular to subrounded, dominantly subangular quartz, poorly sorted, unconsolidated, trace argillaceous matrix.
1732-1745	6-17	Interbedded Sandstone and Claystone: as for 1729-1732m, but with rare to trace golden brown amber with bright yellow fluorescence, increasing with depth to a maximum 15% at 1742-1744m.
1745-1750	2-12 (Av.9)	Sandstone: light to medium grey, very fine to fine, dominantly fine, subangular to subrounded, dominantly subangular quartz, moderately sorted, carbonaceous, rare multicoloured lithics, abundant argillaceous matrix, nil visual porosity, interlaminated with carbonaceous material,
		sandstone becoming coarse to very coarse, dominantly very coarse, subangular to subrounded, dominantly subrounded, weak calcareous cement, good visual porosity from 1745.4m.
1750-1751.5	30-38 (Av.34)	Shale: dark grey to black, highly carbonaceous, finely laminated, micromica, hard.
1751.5-1758	10-60 (Av.34)	Sandstone: off white to light brown, very fine to fine, dominantly fine, subangular to subrounded, dominantly subangular quartz, moderately sorted, carbonaceous, abundant argillaceous matrix, nil visual porosity, becoming coarse below 1751.6m, granular below 1757.4m and very fine Siltstone below 1757.90m.
1758-1758.6	60	Shale: dark grey to black, highly carbonaceous, micromica, fissile, very hard.
1758.6- 1760	20-60 (Av.44)	Sandstone: colourless, very fine to medium, dominantly fine, subangular to subrounded, dominantly subangular quartz, moderately sorted, abundant argillaceous matrix, becoming coarse to very coarse from 1759.1m.
1760-1775	2-11 (Av.5)	Sandstone: colourless to translucent, very fine to medium, occasionally coarse, dominantly medium, subangular to subrounded, dominantly subrounded quartz, poor to moderately sorted, trace argillaceous matrix, dominantly unconsolidated, good intergranular porosity, interbedded with thin beds of
		Shale: dark grey to black, carbonaceous, micromica, subfissile, moderately hard.

Interval (m)	ROP (Av.) (m/hr)	Lithological and Fluorescence Description
1775-1790	2.5-10 (Av.6)	Sandstone: colourless to translucent, very fine to very coarse, dominantly medium, subangular to subrounded, dominantly subrounded quartz, poorly sorted, common pyrite, rare brown lithics, common silt matrix, occasionally unconsolidated, interbedded with
		Shale: as for 1760-1775m.
1790-1795	1.3-4.3 (Av.3)	<u>Claystone:</u> light to medium grey, silty, carbonaceous, micromica, rare to common pyrite, dominantly soft, often subfissile, firm.
1795-1820	5-20	Sandstone: off white to light brown, fine to medium, dominantly medium, subangular to subrounded, dominantly subangular quartz, well sorted, abundant argillaceous matrix, weak calcareous cement, nil visual porosity, moderately firm, interbedded with thin beds of
		Claystone: as for 1790-1795m.
1820-1835	2-10	Claystone: light blue green, sandy, silty, abundant green lithics, very soft, sticky.
1835-1850	3-4	Sandstone: colourless to translucent, fine to medium, dominantly medium, subangular to subrounded, dominantly subangular quartz, moderately sorted, trace to common green and brown lithics, common white argillaceous matrix, poor porosity, interbedded with
		Claystone: as for 1820-1835m.
1850-1875	3-4	Claystone: light grey to blue grey, very silty, grading into
		Siltstone: carbonaceous, common lithics, soft.
1875-1885	2-8	Claystone: light blue grey, very silty grading into
	(Av.6)	Siltstone: carbonaceous, common multicoloured lithics, subfissile, soft to moderately firm.
1885-1910	6-20 (Av.10)	Sandstone: light to medium grey green, translucent, very fine to coarse, dominantly medium, subangular to subrounded, dominantly subrounded quartz, poorly sorted, common brown and green lithics, abundant argillaceous matrix, weakly calcareous, poor porosity, soft, interbedded with thin beds of
		Claystone: as for 1875-1885m.
1910-1915	7-11	Sandstone: light grey green, very fine to very coarse, dominantly coarse, subangular to subrounded, dominantly subrounded quartz, common green to brown lithics, common pyrite, rare biotite, strong silica cement, very weakly calcareous, nil visual porosity, hard, with minor
		Claystone: dark grey, very silty, carbonaceous, subfissile, moderately firm.
1915-1940	8	Sandstone: as for 1910-1915m.
1940-1955	4-11	Sandstone: as for 1910-1915m, but with minor
	(Av.6)	Claystone: medium brown, carbonaceous, massive, soft.
1955-1975	3-17	Claystone: as for 1940-1955m, but interbedded with
	(Av.7)	Sandstone: as for 1910-1915m.
1975-1995	3-13	Siltstone: light grey brown, very argillaceous, grading into silty
	(Av.7)	Claystone: subfissile, soft, interbedded with minor Sandstone.

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1775 2000	Sandstone: light grey green, very fine to coarse, dominantly medium, subangular to subrounded, dominantly subrounded quartz, poor to moderately sorted, common multicoloured lithics, abundant argillaceous and silt matrix, trace to rare pyrite, trace to common carbonaceous material, rare biotite, poor visual porosity, dominantly unconsolidated, interbedded with minor
	Siltstone: as for 1975-1995m.
	unconsolidated, interbedded with minor Siltstone: as for 1975-1995m. Total Depth: 2006m (driller) reached at 2100hrs on 2 June, 1994.