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908902 001

LAKES OIL N.L.

A.C.N. 004 247 214

GANGELL NO. 1

WELL COMPLETION REPORT

PEP 157 - VICTORIA

by

D.A. SHORT & J.N. MULREADY

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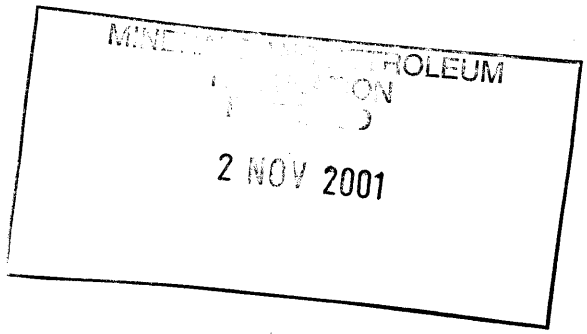

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Lakes Oil N.L.
A.C.N. 004 247 214
Level 11,
500 Collins Street
MELBOURNE 3000

March, 2001

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SEASPRAY
8321-3-1
908902_006Y

Trifon No. 1

Gangel No. 1

Boards Road
Prices Road
Carr Road
Creek
Drain
McNeilly Road
Seaspray
Hawkins Road
Carr Creek
Wallinda Park
"Curnamunya"
"Burong"
adbroke
BM
LAKE REEVE
Depth and extent varies greatly
PARK
GOLDEN BEACH 19 km
SCALE 1:25 000
METRES 0 500 1000 1500 2000 METRES
LAKES
THE ISLAND
Shoreline
High
Sand dunes
water
mean
5762
5761
5760
5759
5758
5756
18'
25'00"

Figure

1.0 SUMMARY

Gangell-1 was located in PEP 157 of the Gippsland Basin, approximately 26 kilometres south south-east of Sale. The closest wells were Burong-1 approximately 0.4 kilometres to the north and Gangell-1 approximately 1.3 kilometres to the north northwest.

The well was drilled to evaluate the hydrocarbon potential of an alluvial fan interpreted from seismic. Secondary targets were thin meander belt sands in the upper Strzelecki Formation which were gas productive in North Seaspray-1&3.

Gangell-1 spudded on January 3rd, 2001 and surface hole (445 mm./17.5") was drilled to 262m. Surface casing (340 mm./13-375") was set at 257.2m. and 311 mm. (12.25") hole was drilled to 1281m. DST#1 was run over the interval 660-691m. to test a gas show of 319 units from the top Latrobe Group. The test failed to flow gas and was inconclusive due to plugging during the flow period. Only mud was recovered in the pipe and sample chamber.

After logging, intermediate casing (244mm./ 9.625") was set in the top Strzelecki Formation at 1273.0m. and the well was then drilled (216mm. hole) to a total depth of 2350m. which was reached on 27th January 2001. One core (100% recovery) was cut and four drill stem tests were attempted (four successful) while drilling the Strzelecki Formation. The maximum gas flow recorded was 18mcfd from DST#3.

Wireline logs and a velocity survey were run at total depth and a further two drill stem test carried out over the Strzelecki Formation but they failed to flow gas to surface. The interval 671 to 684 metres at the top Latrobe Group / base of Gippsland Limestone was then perforated and tested with drill stem tetsts 8 (misrun) and 9 which recovered a small amount of cement contaminated formation water.

The well was then plugged with plugs (1) across the 244mm. casing shoe, (2) across the perforations and (3) at surface, and the rig was released on 1st February 2001.

2.0 WELL HISTORY

2.1 General Data

2.1.1	Well Name and Number	:	GANGELL No.1
2.1.2	Location	:	Latitude : 38°18'53.34"S Longitude : 147°11'48.49"E Easting : 517 204.74 Northing : 5 759 221.30 Seismic : VP 618 Line : GH 85-16
2.1.3	Elevations	:	G.L. : 35.0m. A.S.L. K.B. : 39.9m. A.S.L.
2.1.4	Petroleum Tenement	:	PEP 157
2.1.5	Name of Operator	:	LAKES OIL N.L. A.C.N. 004 247 214 11th Level, 500 Collins Street, MELBOURNE 3000
2.1.6	Other Participants	:	None
2.1.7	Date Drilling Commenced:		2300 hours 03rd January, 2001
2.1.8	Date Drilling Completed	:	0630 hours 27th January, 2001
2.1.9	Date Rig Released	:	0900 hours 01st February, 2001
2.1.10	Drilling Time to T.D.	:	28.4 days (8.9 days rotating)
2.1.11	Total Depth	:	Driller : 2350.0m. Logger : 2350.0m. (Extrapolated)
2.1.12	Status	:	Plugged and suspended for future evaluation.

AGD 66

see comp well log of

ALSO TRITON WCR

APPENDIX 6

2.2 Rig Data

2.2.1	Drilling Contractor	:	O.D.&E. Pty. Limited 8th Level, 9 Bligh Street, SYDNEY NSW 2000
2.2.2	Rig	:	Number 30 Make - Ideco Rated - 3,350m. / 11,000ft.
2.2.3	Draw Works	:	Type - Ideco Hydrair 725D Drive System - 4 Caterpillar 3412-PCTA Transmission - SCR Drill Line - 28mm/1-1/8" (Diesel- electric SCR Brown Boveri 600 volt - 3 phase 60 Htz)
2.2.4	Mast	:	Type - Draco -cantilever Height - 38.7 metres/127 ft Capacity - 227,678 kg/510,000 lbs
2.2.5	Substructure	:	Floor Height - 4.6 metres / 15.1 feet KB Height - 4.9 metres / 16.1 feet
2.2.6	Rotary Table	:	Type - Oilwell A 20.5"
2.2.7	Hook Block	:	Type - Crosby McKissock Capacity - 250 tonnes / 250 tons (2240lb)
2.2.8	Swivel	:	Type - Oilwell PC-300
2.2.9	Mud Pumps (2)	:	Type - Gardner-Denver PZ-8 Power - EMD Output - 800 hp
2.2.10	Mud System	:	Tanks - 800-bbl system
2.2.11	Shale Shaker	:	Type - DFE - SCR01 Linear Motion
2.2.12	Desander	:	Type - None

2.2.13	Desilter	:	Type - Harrisburg 12 cone.
2.2.14	Ram Type BOP	:	Type - Shaffer LWS Bore Size - 346mm / 13.625" Rating - 34,475 kpa/5000 psi
2.2.15	Annular Type BOP	:	Type - Hydril Bore Size - 346mm / 13.625" Rating - 21,000 kpa/3000 psi
2.2.16	Accumulator	:	Type - Wagner 130-160 3 BND
2.2.17	Choke Manifold	:	Size - 1 x 5000psi with McEvoy and 1x3" positive & 1 Swaco 3"superchoke
2.2.18	Drill Pipe	:	Size - 4.5" (2750 metres) Weight - 16.6 lb/ft Grade - G Connection - 4.0" IF Size - 4.5" (250 metres) Weight - 16.6 lb/ft Grade - E Connection - 4.0" IF
2.2.19	HW Drill Pipe	:	Size - 4.5" (15 joints) Weight - 45.0 lb/ft Connection - 4.0" IF
2.2.20	Drill Collars	:	Number/Size - 24 x 6 1/4" Connection - 4.0" IF

2.3 Drilling Data

2.3.1 The following is the daily operations summary for Gangell-1. It has been compiled from the tour sheets and daily drilling reports. Onsite drilling supervision for Lakes Oil N.L. was provided by B. Speechly.. Further details are given in the time/depth curve (Fig. 2) and the time analysis chart (Fig. 3).

The depths in the following summary are those reached at 2400 hours on each day with the operations given for the previous 24 hour period.

Date	Depth	Operation
03.01.01	22.0m.	Spud @ 23:00 hours. 03/01/01 - Drill ahead to 22m.
04.01.01	262.0m.	Drill to 40m. - Circulate & survey @ 28.2m. 0 deg. - Drill to 77m. - Circulate & survey @ 65m. 0.5 deg. - Drill to 134m. - Circulate & survey @ 122m. 0.75 deg. - Drill to 198m. - Circulate & survey @ 186m. 0.5 deg. - Drill to 262m. - Circulate & clean well -.Carbide lag indicates in gauge hole. - Survey @ 253m. 0.25 deg. - Wiper trip to the 8" drill collars. (Strap 252.95m., Tally 253.03m.) - Circulate & condition mud. - POOH. - Rig to run casing. - Run 22 joints of 13 3/8" 54.5#, J-55, BTC casing. - Head up. - Circulate casing.
05.01.01	262.0m.	Change lines to Halliburton - Pressure test to 2500psi. - Mix & pump 324 sacks. of 2.5% gel filler lead at 11.8 ppg & 126 sacks. of neat tail slurry at 15.6 ppg. Displace with water. Bump plug with 2000psi at 0203 hours. Hold pressure at 2000psi for 10 mins to test casing. – WOC - Slack off & head down. Remove landing joint. Weld in centralizer bars. Hand top up the annulus with 5 sacks class A. Cut collar. Install 13 5/8" X 9 5/8" WG-22, 3K, BTC bradenhead & torque up with the potato masher. - Nipple up the BOP.

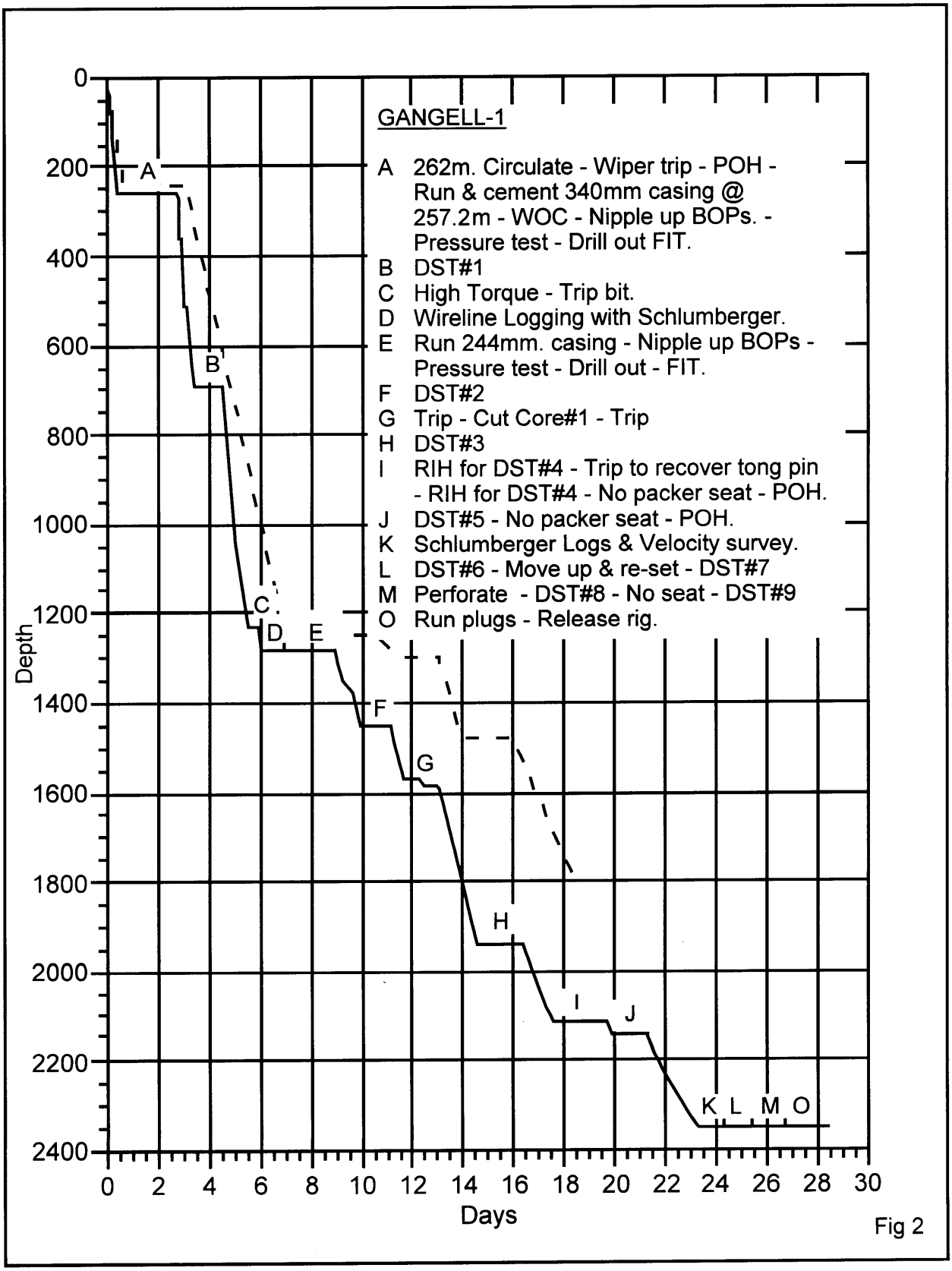
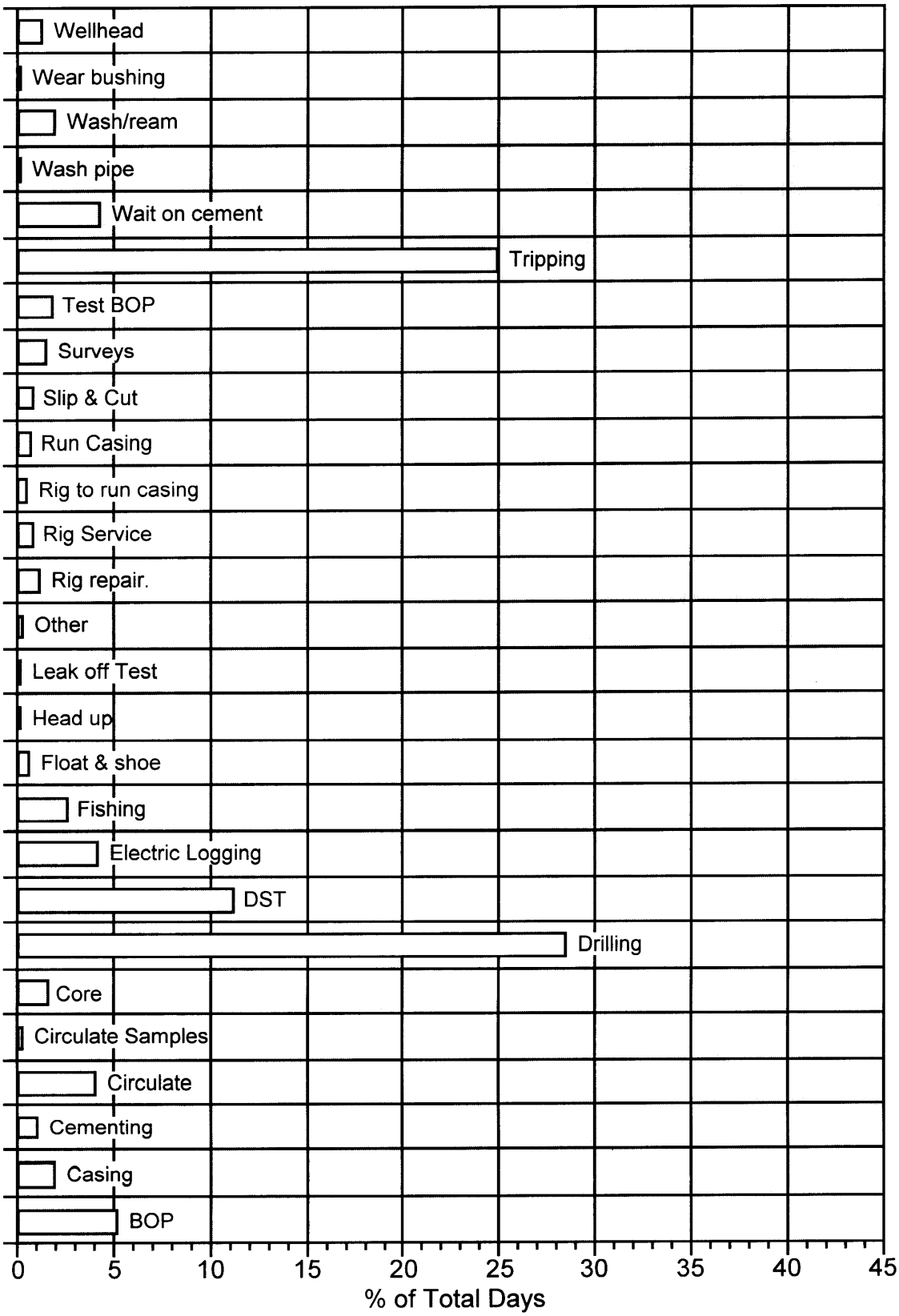

GANGELL-1
A 262m. Circulate - Wiper trip - POH - Run & cement 340mm casing @ 257.2m - WOC - Nipple up BOPs. - Pressure test - Drill out FIT.
B DST#1
C High Torque - Trip bit.
D Wireline Logging with Schlumberger.
E Run 244mm. casing - Nipple up BOPs - Pressure test - Drill out - FIT.
F DST#2
G Trip - Cut Core#1 - Trip
H DST#3
I RIH for DST#4 - Trip to recover tong pin - RIH for DST#4 - No packer seat - POH.
J DST#5 - No packer seat - POH.
K Schlumberger Logs & Velocity survey.
L DST#6 - Move up & re-set - DST#7
M Perforate - DST#8 - No seat - DST#9
O Run plugs - Release rig.
Depth
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
Days

Fig 2

06.01.01	504.0m.	Nipple up BOP. - Pressure test blind rams, hcr & choke manifold to 200psi for 5 mins & 2000psi for 10 mins. - Make up BHA # 2 & RIH. Tag cement top at 242.5m. - Pressure test pipe rams, Hydril, stab-in valve & inside BOP to 200psi for 5 mins & 2000psi for 10 mins. - Change out wash pipe. - Drill out float & shoe. - Drill to 270m. Circulate & change out mud system. Leak off test. 17.2 ppg. equivalent. - Drill ahead to 362m. - Circulate & survey @ 350m. M/R. - Drill to 371m. - Circulate & survey @ 359m. 0.25 deg.- Drill to 504m.
07.01.01	691.0m.	Drill to 513m. - Circulate & survey @ 501m. 0.75 deg. - Drill ahead to 691m. - Circulate samples.- Pump slug. Wiper trip to the 6 1/4" drill collars (hole tight 10k to 40k overpull). - Circulate & condition well. - POOH for DST#1 off bottom dual packer conventional 659m. - 691m. - Make up DST# 1 string. - RIH with DST# 1 string. - Head up. - Open valve 2124 hours. Initial moderate blow to zero at 30 minutes. No GTS. Close in for buildup 2224 hours.
08.01.01	1045.0m.	Shut in for buildup of DST# 1. - Unseat packers. Drop bar. Reverse circulate. Ports plugged (coal).Reverse lines. Pump string volume the long way. Pump slug. Head down. - POOH with DST# 1 string. - Break & lay out DST tools. Recover sample from sample chamber (gas cut mud). - Make up bit # 3 assembly & RIH. - Break circulation. Circulate cavings & cuttings from the annulus (unable to drill, annulus packing off). - Drill ahead to 760m. - Circulate & survey @ 748m. M/R. - Drill ahead to 779m. - Circulate & survey @ 767m. 1.0 deg. - Drill ahead to 1017m. - Circulate & survey @ 1005m. 0.5 deg. - Drill ahead to 1045m.



GANGELL-1 - Time Breakdown Chart

Figure 3

09.01.01	1281.0m.	Drill to 1234m. Excessive torque. - Circulate sample & build slug. - Pump slug & POOH. - Break out & lay out bit & stabilizer (lower 3" hard facing failed). Make up RR bit & RIH. - Slip 33' drill line. - RIH. - Pick up kelly. Break circulation. Wash 22m. to bottom. - Drill ahead to 1281m.
10.01.01	1281.0m.	Circulate & condition well. - Pump slug. Survey. M/R. - POOH to log. - Rig up Schlumberger. RIH. Work bridge at 1033m. POOH. Reconfigure string. RIH Work bridge at 1033m. POOH. - Make up bit slick assembly. RIH to 1024m. - Wash & ream 1024m. to 1043m. - RIH to 1138m. - Wash & ream 1138m. to 1157m. - RIH to 1214m. Wash & ream to 1281m. - Circulate & condition well. - POOH to log. - Rig up & run Schlumberger. HLLS. HLLD. GR. Sonic. Cal. SP. Rig down. - Pick up & lay out 3 x 8" drill collars.
11.01.01	1281.0m.	Rig to run casing. - Run 110 joints 9 5/8" K-55 36# BTC casing. - Rig up circulating swadge & wash 1267m. to 1273m. - Head up. Circulate casing. Dilute concentrated prehydrated gel + CFR-3 mix water. Take on board displacement water. - Test lines to 3000psi. Pump water spacer. Mix & pump 435 sacks of lead cement containing 3.2% prehydrated gel & 0.3 % CFR-3 at 11.8 ppg. Mix & pump 76 sacks neat tail cement at 15.6 ppg. Displace with 323 bbl water. Bump to 2200psi & hold for 10 minutes. Bleed back 3 bbl. (80% mud returns at 270 bbl into the displacement). - Set slip & seal assembly 115,000 # in tension. - Head down & clean equipment from floor. - Nipple down & lift BOP - Rough cut casing to 14". Remove cut off. Remove spacer spool & DSA.
12.01.01	1317.0m.	- 07:00. Final cut & dress casing. Install 13 5/8" x 9 5/8" casing spool. Nipple up BOP's & test spool primary & secondary seals to 2000psi. - Pressure test BOP's, choke manifold, stand pipe,

kelly cocks against the blind rams to 200psi for 5 mins & 2200psi. for 10 mins. - Install wear bushing. - Make up bit #5 pendulum assembly & RIH picking up drill collars. - Tag cement top at 1260m. Lay out 3 singles. - Pressure test annular, pipe rams, stab-in valve & inside BOP to 200psi for 5 mins & 2200psi for 10 mins. - Drill out float & shoe. - Drill to 1290m. - Circulate & Leak off test. - Drill from 1290m. to 1317m.

13.01.01 1452.0m. Drill ahead to 1319m. (torque) - Wash, ream & work tight hole 1309m. - 1319m. - Circulate & weight up mud to 8.7 ppg. - Drill ahead to 1339m. (developing torque, wash & ream each connection). - Circulate & weight up mud to 8.9 ppg. - Drill ahead to 1357m. (developing torque, wash & ream each connection). - Rig repair. Travelling blocks. - Drill to 1366m. (developing torque, wash & ream each connection). - Circulate & weight up mud to 9.1 ppg. - Survey @ 1366m. 0 deg. - Drill ahead to 1423m. - Rig service. - Drill ahead to 1452m. - Circulate & condition mud. - Pump slug & POOH for DST# 2 (Strzelecki 1378m. - 1452m.).

14.01.01 1452.0m. Slip 33' drill line. - Continue to POOH. Lay out stabilizer. - Make up DST# 2 string - Conventional off bottom dual packer - Strzelecki Fm. 1378m. to 1452m. - RIH with DST string. - Head up. - DST# 2. Open tool 1334 hours. Final flow RTSTM. Close in for build up at 1234 hours. - Unseat packers 1634 hours. Reverse circulate out rat hole mud recovery. Head down. - POOH with DST string. - Break & lay down DST string. - Make up bit #6 pendulum assembly & RIH (lay out 6 1/2" DC with galled box face).

15.01.01 1566.0m. Continue to RIH with bit #6 assembly. - Pick up the kelly & break circulation. Wash from 1440m. to 1452m. - Drill ahead to 1500m. - Rig service. - Drill ahead to 1566m. - Circulate well

clean. Pump heviweight slug. - POOH with the bit assembly. - Make up dual core barrel assembly. -RIH.

16.01.01 1590.0m. RIH with the dual core barrel assembly - Break circulation & wash from 1543m. - 1548m. - Rig repair. Change out washpipe. - Wash from 1548m. - 1566m. - Drop circulating bypass ball. - Core 1566m. - 1584m. - POOH with core assembly. - Break & lay out core. Break & lay out core barrels. - Rig service. - Make up bit #7 pendulum assembly & RIH. - Slip & cut drill line. - Continue to RIH. - Break circulation & wash 10m. to bottom. - Drill ahead to 1590m.

17.01.01 1821.0m. Flow check. BOP drill. Observe well. - Drill ahead to 1614m. - Circulate & survey @ 1602m. 1 deg. - Drill ahead to 1690m. - Rig service. - Drill ahead to 1813m. - Circulate & survey @ 1801m. 2.75 deg. - Drill ahead to 1821m.

18.01.01 1940.0m. Drill ahead to 1927m. - Rig service. - Drill ahead to 1940m. - Circulate 10 minutes. POOH to 1858m. Circulate hole clean. Pump slug. - Wiper trip to shoe - hole tight. - Wash 1916m. - 1940m. - Circulate 20 mins. POOH to 1858m. Circulate hole clean. Pump slug. - POOH for DST#3, dual off bottom conventional, Strzelecki Fm. 1885m. - 1940m.

19.01.01 1940.0m. Continue to POOH - Pick up & make up DST# 3 tools - RIH with DST# 3 string. - Slip 33' drill line. - Continue to RIH with DST# 3 assembly. Tag fill at 1933m. - Head up - DST# 3. Open tool at 0849 hours. Skid 7m. to bottom. GTS 1043 hours RTSTM 1/8" choke 52psi. Close in for buildup 1152 hours. Pull free 1600 hours. - Pull one stand off bottom. Drop bar. Reverse circulate out 1650m. water. Pump slug. Head down. - POOH with DST# 3 assembly. - Break & lay out DST tools.

20.01.01	2050.0m.	Continue to lay out DST tools. - Make up bit #7RR pendulum assembly & RIH to the heviwate cleaning cuttings from the BHA. - Pick up kelly. Flush the BHA of cuttings - Continue to RIH to shoe. Pick up kelly & clear jets. - Continue to RIH to 1886m. - Wash & ream 1886m. - 1940m. - Drill ahead to 1946m. - Rig service. - Drill ahead to 2022m. - Circulate & survey @ 2009m. 2.75 deg. - Drill ahead to 2050m.
21.01.01	2117.0m.	Drill to 2098m. - Rig service - Drill to 2117m. - Circulate & condition well. - Wiper trip to 1849m.(tight). - Wash 2095m. to 2117m. - Circulate well clean. - POOH for DST# 4 Strzelecki Fm. 2100m. to 2117m. conventional dual packer off bottom. - Make up DST# 4 string.
22.01.01	2117.0m.	Inspect flow line & cellar for tong pin. Break & lay out DST# 4 string (tongs not gripping). - Make up 8" Bowen full face circulating magnet & RIH to shoe (tongs not gripping). - Slip 33' drill line. - Continue to RIH. - Wash 2103m. to 2117m. - Work fish. Circulate bottoms up. - POOH with magnet assembly. - Recover fish. Break & lay out magnet assembly. - Make up DST# 4 string . - RIH with DST# 4 assembly. Tag fill at 2111m. - Head up. - Seat packers. Open valve. 2222 hours. Skid down to bottom. No packer seat. Annulus lost to drill pipe. Unseat packers. - Drop bar & reverse circulate. Head down.
23.01.01	2149.0m.	POOH flow checking the well. - Break & lay out DST string. - Make up Bit # 8 packed hole pendulum assembly. RIH picking up 3 x 6 1/2" drill collars & sevicing BHA. - Slip & cut 107' drill line. - RIH with bit assembly. - Wash 2096m. to 2117m. - Drill ahead to 2137m. - Circulate & survey @ 2125m. 2.25 deg. - Drill to 2149m. - Circulate sample. - Pull one stand. -

		Circulate well clean. Pump slug. - POOH for DST# 5 Strzelecki 2085m. - 2149m.
24.01.01	2149.0m.	Continue to POOH. - Pick up & make up DST# 5 tools. - RIH with DST string. Tag 10m. fill. - Head up. - DST# 5. Open tool. Chase 10m. to bottom. Failed packer seat. Reseat. Failed seat. Drop bar & fill string with mud. - Pump slug & POOH with DST# 5 string. - Break & lay out DST tools - Pick up stabilizers & #8RR bit for the packed hole pendulum assembly. - Rig repair .Lay out old rig tongs. Pick up & hang new rig tongs. Attempt to make up string with new tongs. Lay out. Pick up & hang old tongs. Adjust counter weights. - Make up the pendulum assembly & RIH.
25.01.01	2233.0m.	Continue to RIH with bit assembly. - Slip 33' drill line. - Continue to RIH. - Wash 2135m. to 2149m. Work junk sub. - Drill ahead to 2166m. - Rig service. - Drill ahead to 2233m.
26.01.01	2328.0m.	Drill ahead to 2290m. - Rig service. - Drill ahead to 2328m.
27.01.01	2350.0m.	Drill ahead to 2350m. - Circulate hole clean. Pump slug. - Wiper trip to 2088m. - Circulate hole clean with a 40 bbl. high vis flush. Pump slug. - Drop survey @. 2348m. 2 3/4 Deg. - Strap out of hole. Lay out stabilizers, junk sub, bit sub & bit. - Rig up Schlumberger. Run porosity, sonic & resistivity tools. Rig down.
28.01.01	2350.0m.	Rig down. - Make up DST# 6 inflate straddle string Strzelecki 2124m. - 2154m. - RIH with DST# 6 string. - Head up. Inflate. Open valve 1717 hours. Final flow 2psi through the bubble hose RTSTM. Close in for buildup - Deflate 2017 hours. Jar free with a 75,000 # overpull. Head down. - POOH to 1548m. for DST# 7 Strzelecki 1548m. - 1578m. - Head up. Inflate. No seat. Move up & reposition 1547m. - 1577m. Re-inflate. Open valve 2254 hours. Final flow

		2psi through the bubble hose RTSTM. Close in for buildup 2354 hours.
29.01.01	2350.0m.	Continue to close in DST#7 for buildup. Pull free at 0054 hours. - Drop bar. Reverse circulate. Ports plugged. Circulate long way. Pump slug. Head down. - POOH flow checking every 5 stands. - Break & lay out DST string. - Pick up & run one stand of drill pipe (shooting nipple). Rig up Schlumberger. Build perforating guns. RIH & perforate 678m. - 684m. POOH. Rig down Schlumberger. Rack back one stand of drill pipe. - Make up DST# 8 string Strzelecki inflate straddle 666m. - 696m. - RIH with DST# 8 string. - Head up & inflate DST# 8. No packer seat. Re-inflate. No packer seat. Head down. - POOH to check DST string. - Slip 33' of drill line. - Continue to POOH.
30.01.01	2350.0m.	Service DST tools. - RIH with DST# 9 string Strzelecki 666m. - 696m. - Head up & inflate DST# 9. Open valve 0443 hours. Initial poor blow. Final flow 0 / 2psi RTSTM. Close in 0647 hours. for buildup. Pull free 0900 hours. - Pull free. Head down. - POOH. 181m. mud in pipe. - Break & lay out test tools. - Retrieve wear bushing. - RIH to 1320m. Head up to set cement suspension plug. - Test lines. Mix & pump 210 sacks class A cement neat. Displace as a balanced plug. In place 1920 hours. Plug # 1. 1320m. - 1173m. - POOH to 1035m. - Pick up kelly. Circulate string clean. - POOH to 807m. Lay out excess tubulars.
31.01.01	2350.0m.	WOC. Lay out excess tubulars. - WOC. Lay out BHA. - WOC. RIH with drill pipe. Tag shoe cement plug at 1212m. with 10,000 #.- POOH to 1157m. Pick up the kelly & circulate string clear.- POOH to 702m. – Circulate - Mix & pump 150 sacks of class A neat cement. Displace as a balanced plug. In place 1021 hours. Plug # 2. 690m. to 590m. - WOC. POOH to 418m. - WOC. Circulate pipe clean. - WOC. Break kelly

& bushing. Lay out excess tubulars. RIH. Tag plug #2 at 581m. with 10,000 lbs. - POOH laying out remaining tubulars. - Flush BOP, choke manifols, degasser & kelly. Nipple down bell nipple.

01.02.01 2350.0m. Nipple down & lay out BOP. - Mix & place a surface 10 foot class A neat cement plug. Flush VR plug & 2-1/8" wing valve outlet on the 9 5/8" spool. - Install a cover plate on the 9-5/8" casing spool. Install well marker plate. - Rig Released at 09:00 hours on 1st. February 2001.

2.3.2 Hole Sizes and Depths :

17.50" / 445 mm. to 262.0m.
12.25" / 311 mm. to 1281.0m.
8.50" / 216 mm. to 2350.0m. - TD

2.3.3 Casing and Cementing :

<u>Surface</u>

Size -	13.375" / 340 mm.
Weight -	54.5lb/ft - 79.8kg/m.
Grade -	K-55
Shoe Setting Depth -	257.2m.
Quantity of Cement -	324 sacks + 2.5% gel lead / 126 sacks neat tail.

<u>Intermediate</u>

Size -	9.625" / 244 mm.
Weight -	36.0lb/ft - 52.7kg/m.
Grade -	K55
Shoe Setting Depth -	1273.0.0m.
Quantity of Cement -	435 sacks + 3.2% gel + 0.3% CFR3 lead / 76 sacks neat tail.

2.3.4 Deviation Surveys :

Depth (metres)	Deviation (degrees)	Depth (metres)	Deviation (degrees)	Depth (metres)	Deviation (degrees)
28	0.00	359	0.25	1602	1.00
65	0.50	501	0.75	1801	2.75
122	0.75	767	1.00	2009	2.75
186	0.50	1005	0.50	2125	2.25
253	0.25	1366	0.00	2348	2.75

2.3.5 Drilling Fluid :

(a) Spud - 262m. Type - Gel Spud Mud
Additives - Ausgel, Caustic, Soda Ash.

(b) 262 – 2350m. Type - KCl - Polymer
Additives - AMC Pac-LV, AMC Pac-R Ausben, Ausgel, Barite, Biocide, Defoamer, KCl, PHPA, Soda Ash, Sodium Sulphite, Xantemp.

2.3.6 Physical Mud Properties :

Date	Wt.	Vis.	WL	FC	pH	KCl	K+	Cl-
03/01	8.50	53			8.8			
04/01	9.05	47			8.5			
05/01	9.05				9.0			
06/01	8.90	52	12.4	1	9.0	22697	4.2	24500
07/01	9.60	54	11.8	1	8.8	21616	4.0	24000
08/01	9.75	54	9.4	1		22156	4.1	24500
09/01	9.75	47	9.5	1		19454	3.6	22000
10/01	9.70	46	10.5	1	9.0	19454	3.6	22000
11/01	9.70				9.0			
12/01	8.50	33	13.0	1	8.5	5404	1.0	9000
13/01	9.15	37	6.2	1	8.8	21616	4.0	22000
14/01	9.15	37	6.2	1	8.6	21616	4.0	22000
15/01	9.15	38	5.6	1	8.6	17833	2.0	18500
16/01	9.15	45	5.5	1	9.0	16752	3.1	17500
17/01	9.15	44	5.5	1	9.0	15131	2.8	16000
18/01	9.15	44	5.5	1	8.8	15131	2.8	16000
19/01	9.15	54	7.8		8.8	11889	2.2	13000
20/01	9.15	41	7.8	1	8.8	10268	1.9	11000
21/01	9.10	50	6.0	1	8.8	8106	1.5	9000
22/01	9.10	54	5.6	1	9.0	8106	1.5	9000
23/01	9.15	50	4.8	1	8.8	8106	1.5	9000
24/01	9.15	50	4.8	1	8.8	8106	1.5	9000
25/01	9.15	48	7.1	1	8.8	7566	1.4	9000
26/01	9.15	47	8.6	1	8.8	7566	1.4	9000
27/01	9.15	47	7.4	1	8.8	7566	1.4	9000
28/01	9.15	51	7.4	1	8.8	7566	1.4	9000
29/01	9.25	52	7.4			7566	1.4	9000
30/01	9.25	52	7.4			7566	1.4	9000
31/01	9.25	52	7.4			7566	1.4	9000
01/02	9.25							

Chemicals Used :

PRODUCT	UNIT (lb)	USED	WEIGHT (lb)
AMC Pac-LV	55	7	385
AMC Pac-R	55	44	2420
Ausben	50	66	3300
Ausgel	55	316	17380
Barite	55	2157	118635
Biocide	25	12	300
Caustic Soda	44	22	968
Defoamer	25	3	75
KCl	55	624	34320
PHPA	55	126	6930
Soda Ash	55	46	2530
Sodium Sulphite	55	62	3410
Xantemp	55	41	2255

2.3.7 Water Supply :

Water was obtained from a bore on site.

2.3.8 Perforations :

678 – 684m. - Base Lakes Entrance Fm. / Top Latrobe Group

2.3.9 Plugging and Cementing :

Plug 1. 1320 - 1173m	210 sacks "A" - tag @ 1212m.
Plug 2. 690.0 - 590.0m	150 sacks "A".
Surface.	

2.4 Logging and Testing

2.4.1 Wellsite Geologist :

D.A. Short

2.4.2 Mudlogging :

Mudlogging services were provided by Geoservices. Cuttings gas was monitored from surface casing shoe to total depth using a hot-wire gas detector and a gas chromatograph.

A mudlog recording lithology, penetration rate, mud gas and other data was prepared and is an enclosure to this report.

2.4.3 Ditch Cutting Samples :

Cuttings were collected at 10m. intervals from surface to 260m. and then at 3m. intervals to 2350.0m. (T.D). The cuttings samples and sets were:

Sample Type	No. Sets
Unwashed	1
Washed	2
Samplex Trays	1

2.4.4 Coring :

1 Interval 1566.5 – 1584.5m. Strzelecki Fm. Recovery 100%.

2.4.5 Sidewall Cores :

None

2.4.6 Testing :

DST No.:	1 Bottom Hole (311mm. hole.)
Formation :	Top Latrobe Group
Interval :	659.7-691.0m.(D) / 660.2-691.5m.(L)
Result:	Weak to moderate blow, dead after 35 mins – no gas to surface. Charts indicate plugging during flow period.
Recovery :	Could not reverse circulate due to plugging. Calculated (from fluid recorder) recovery of 210 metres of drilling mud (Sample chamber had 3 litres of 1.17 SG mud.)

DST No.:	2 Open Hole – Bottom hole
Formation :	Strzelecki Formation
Interval :	1377.9-1452.0(D) / 1378.4-1452.5(L)
Result:	Weak to moderate blow throughout - No gas to surface.
Recovery :	Tool plugged on reverse circulating – Pumped down drill pipe to clear – Reverse circulate – No water or gas cut mud observed - Calculated (from fluid recorder) recovery of 255m. of drilling mud. (Sample chamber had 3 litres of mud at 14 psi.)

DST No.:	3 Open Hole – Bottom hole
Formation :	Strzelecki Formation
Interval :	1885.0-1940.0m.(D) / 1885.5-1940.5m.(L)
Result:	Gas to surface after 105 minutes with 52psi on a 1/8" choke – Pressure declined slowly to 38psi at end of flow. (Q = 18mcfd)
Recovery :	Tool plugged while reverse circulating – Calculated (from fluid recorder) recovery of 1370m. of gas cut formation

water. (Sample chamber had 3 litres of gas cut formation water at 554 psi.)

DST No.:	4 Bottom Hole
Formation :	Strzelecki Formation
Interval :	2100.0-2117.0m.(D) / 2100.5-2117.5m.(L)
Result:	Misrun - could not seat packers

DST No.:	5 Open Hole – Inflate Straddle
Formation :	Strzelecki Formation
Interval :	2085.0-2149.0m.(D) / 2085.5-2149.5m.(L)
Result:	Misrun - could not seat packers

DST No.:	6 Open Hole – Inflate Straddle
Formation :	Strzelecki Formation
Interval :	2085.0-2149.0m.(D) / 2085.5-2149.5m.(L)
Result:	Open tool for 90 minute flow – weak air blow throughout – no fluid to surface. Shut-in for 92 minutes and move up hole for DST#7.
Recovery :	Tool plugged - Could not reverse circulate after DST#7 - Sample chamber contained drilling mud.

DST No.:	7 Open Hole – Inflate Straddle
Formation :	Strzelecki Formation
Interval :	1546.5-1576.5m.(D) / 1547.0-1577.0m.(L)
Result:	Open tool for 60 minute flow – weak air blow throughout – no fluid to surface. Shut-in for 120 minutes.
Recovery :	Tool plugged - Could not reverse circulate after DST#7 - Sample chamber contained drilling mud.

DST No.:	8 Cased Hole – Inflate Straddle of perforated interval 678-684m.
Formation :	Top Latrobe Group
Interval :	672.0-702.0m.(D) / 672.5-702.5m.(L)
Result:	Misrun – Packers would not inflate.

DST No.:	9 Cased Hole – Inflate Straddle of perforated interval 678-684m.
Formation :	Top Latrobe Group
Interval :	672.0-702.0m.(D) / 672.5-702.5m.(L)
Result:	Open tool for 134 minute initial flow – Very weak air blow – Dead after 10 minutes – No fluid to surface.
Recovery :	185 metres cement contaminated water. 3 litres cement contaminated water @ 2 psi in sample chamber. (1.4% KCl in test mud - 4.0% KCl in original mud - 0.0% in recovery.)

2.4.7 Wireline Logs :

Three suites of logs were run by Schlumberger

Suite / Depth	Logs
1 @ 1281m.	HDLL / RXOZ / BHCS / GR / SP / Cal
2 @ 2350m.	HDLL / RXOZ / BHCS / GR / RHOZ / TNPH / SP / Cal

2.4.8 Temperature Surveys :

None — Temperatures recorded from drill stem tests at Trifon-1 & Gangell-1 give a temperature gradient of 29.5°C / 1000m. The bottom hole temperature at 2350m. calculated as 94°C

2.4.9 Velocity Survey :

A velocity survey was conduceted at TD by Expertest.

3.0 GEOLOGY

3.1 Reasons for Drilling

Gangell-1 was drilled to evaluate the hydrocarbon potential of an alluvial fan interpreted from seismic within the Strzelecki Formation. This fan, unlike the fan interpreted in North Seaspray-2, was interpreted as having effective cross fault seal, being juxtaposed with generally low energy meander belt sediments of the Strzelecki Formation, as penetrated in the North Seaspray 1,2&3 wells. Secondary targets were thin meander belt sands in the upper Strzelecki Formation which were gas productive in North Seaspray-1&3.

Previous wells in the area included Trifon-1, North Seaspray-1, North Seaspray-2, North Seaspray-3,Carrs Creek-1 and Burong-1.

North Seaspray-1 was drilled in 1962 on an anticline closed on the Latrobe Group. A drill stem test within the top Latrobe Group was attempted but the packer did not seat. The lower Latrobe sand unit was not tested. Log interpretation suggests the Latrobe sands are fresh water flushed. Significant attention was paid to the upper Strzelecki Formation between 1104 and 1158m. culminating in the setting of casing and testing through perforations. Open hole DST#3 (1147.6-1156.7m. KB. flowed gas at an estimated 50-100mcfd for a

duration of 2 hours. The well was drilled to 1371.6m. KB. and plugged back to 1161.3m. KB. DST#5 attempted over the interval 1144.5-1161.3m. KB. but failed due to plugging with cement. The hole was then cased and perforated and further DSTs were run. Testing did not extend below 1150.3m. KB. and although gas flowed to surface the rate was less than in the original DST#3 in open hole.

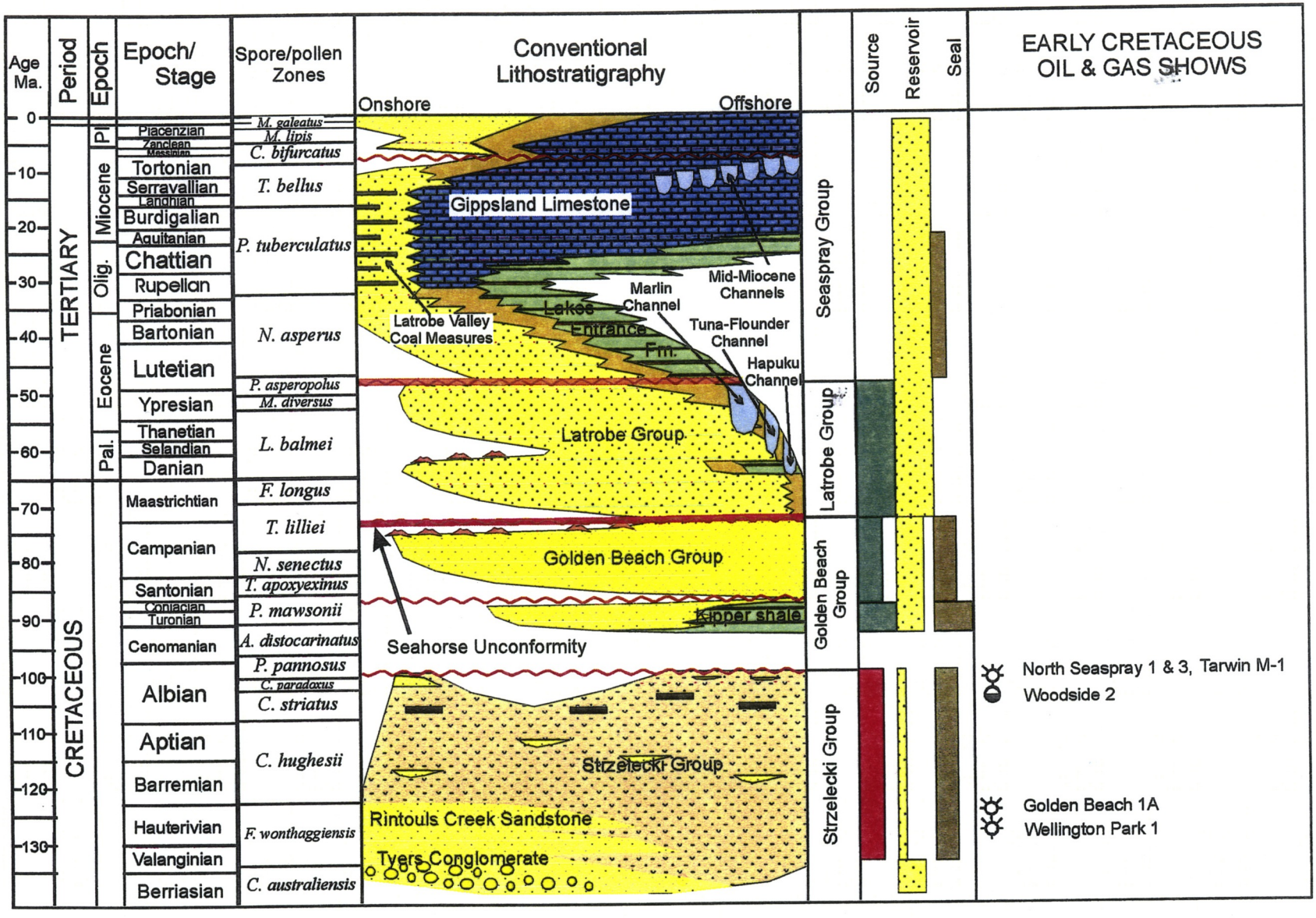
Carrs Creek-1 was drilled in 1963 following the encouraging gas flows in North Seaspray-1 some 5.3km. to the west. The well was located down-dip of the North Seaspray structure where it was hoped that the Strzelecki Formation sands would have better porosities and permeabilities. Subsequent mapping has shown that the Carrs Creek feature is separate to the North Seaspray structure. No significant shows were encountered in the well and the gas sand noted in North Seaspray-1 was not encountered. The Latrobe Group sands were fresh water flushed. A sandstone between 1388 – 1402m. KB. also contained fresh water suggesting possible communication with the overlying Latrobe Group. Waters were brackish in the remainder of the Strzelecki Formation sands.

The Burong structure is a northeast-southwest trending asymmetrical anticline, fault controlled to the north west. The fault was probably a down to the basin normal fault which has subsequently been inverted and reversed during the Late Miocene. The Burong-1 well was drilled in 1985 as a crestal test of the anticline. The main target was the Latrobe Group and although the sands had excellent porosities and permeabilities no oil shows were observed and minor methane was recorded from the top 60m. Wireline logs confirmed the sands to be water saturated and the gas shows to have been associated with Latrobe Group coals.

3.2 Stratigraphic Prognosis

The stratigraphic prognosis was made utilising the results of nearby wells and the available seismic coverage.

A comparison between prognosed and actual formation tops is given below.



LITHOSTRATIGRAPHY
GIPPSLAND BASIN

Figure 4

FORMATION	PROGNOSED	ACTUAL	DIFFERENCE
	MD (mKB)	MD (mKB)	MD (m)
Haunted Hill Gravels	4.9	4.9	0.0
Jemmy's Point Fm.	106.0	96.5	9.5
Tambo River Fm.	211.0	183.5	27.5
Gippsland Limestone	241.0	249.5	-8.5
Lakes Entrance Fm.	625.0	642.0	-17.0
Latrobe Group (Top Clastics)	670.0	683.0	-13.0
Latrobe Group (Top Coals)	795.0	820.0	-25.0
Strzelecki Group	1221.0	1251.0	-30.0
Total Depth	1800.0	2350.5	

3.3 Stratigraphy

The stratigraphic section encountered in Gangell-1 is graphically illustrated in Figure 4 and discussed below.

HAUNTED HILL GRAVELS

4.9 - 96.5 metres Thickness : 91.6 metres

4.9 - 96.5m SANDSTONE, clear to translucent white, very pale grey, fine to medium, occasionally coarse, sub-angular to sub-rounded, moderate sorted, loose quartz grains, minor red-brown, yellow-brown and grey chert grains, trace white and green mica flakes, good porosity.

JEMMY'S POINT FORMATION

96.5 - 183.5 metres Thickness : 87.0 metres

96.5 - 183.5m Interbedded LIMESTONE and MARL.

LIMESTONE, white, very pale pinkish white, fossil fragments, silty and argillaceous in part, grading to marl in part, minor glauconite, dark green to black silty nodules / concretions and as replacement in some fossil fragments.

MARL, pale grey, pale brownish grey, very fossiliferous, silty, occasionally sandy.

TAMBO RIVER FORMATION

183.5 - 249.5 metres Thickness : 66.0 metres

183.5 - 249.5m. Interbedded MARL and LIMESTONE.

MARL, white to pale grey, fossiliferous, argillaceous, silty / sandy, occasionally glauconitic.

LIMESTONE, white to pinkish white, fossil fragments in a calcite cement, occasionally argillaceous and silty.

GIPPSLAND LIMESTONE

249.5 - 642.0 metres Thickness : 392.5 metres

249.5.0 - 642.0m. LIMESTONE (at top) grading to predominantly MARL below 350 metres.

LIMESTONE, white to cream, pinkish white, occasionally grey, very fossiliferous and grades to coquina in part, argillaceous in part and grades to marl.

MARL, light to moderate grey, pale grey-brown, becoming pale greenish white to greenish grey below 550 metres, soft to firm, becoming more argillaceous with depth, abundant fossil fragments and calcite grains, trace glauconite.

LAKES ENTRANCE FORMATION

642.0 - 683.0 metres Thickness : 41.0 metres

642.0 - 677.0m. MARL, white to pale brown, pale greenish white, very calcareous, trace glauconite and glauconitic staining, soft. Abundant glauconite below 665 metres and below 675 metres there is 5-10% dark green glauconite nodules with 1-2% disseminated / nodular pyrite.

677.0 - 683.0m. Interbedded SANDSTONE and MARL.

SANDSTONE, clear to translucent white, very fine to medium, sub-angular to sub-rounded, some rounded, moderate sorted, loose quartz grains, trace disseminated pyrite, fair to good inferred porosity. Minor very fine, hard with a strong calcite cement, poor porosity.

MARL, white to pale brown, pale greenish white, soft, very calcareous, 5-10% glauconite and glauconitic staining, 1-2% disseminated / nodular pyrite.

LATROBE GROUP

683.0 - 1251.0 metres Thickness : 568.0 metres

683.0 - 696.0m. COAL, very dark brown to black, earthy to dull lustre, lignitic, brittle, friable, grades to dark brown carbonaceous shale in part.

696.0 - 707.0m. SANDSTONE, clear to translucent pale brown, fine to predominantly medium some coarse and occasionally very coarse, angular to sub-rounded, poor to moderate sorted, trace brown to dark brown dispersive argillaceous matrix, loose, very good porosity.

707.0 - 714.0m. COAL, very dark brown to black, earthy to dull lustre, lignitic, brittle, friable, grades to dark brown carbonaceous shale in part.

714.0 - 820.0m. SANDSTONE, clear to translucent pale brown, medium to very coarse predominantly coarse and very coarse, sub-angular to rounded, poor to moderate sorted quartz grains, trace grey to grey-black quartzite grains, trace brown to dark brown dispersive argillaceous matrix, loose, very good porosity.

820.0 - 1160.0m. SANDSTONE with interbedded SILTSTONE / CLAYSTONE and COAL.

SANDSTONE, clear to translucent brown, medium to very coarse, predominantly coarse to very coarse, angular to sub-rounded, poor to moderate sorted, loose, dispersive clay matrix, very good porosity.

SILTSTONE, predominantly above 1035 metres, white to light brown, soft, dispersive, very argillaceous, carbonaceous, grades to claystone in part.

CLAYSTONE, predominantly below 1035 metres, white to light brown, dispersive, soft, carbonaceous, silty in part.

COAL, very dark brown to black, earthy to dull lustre, lignitic, brittle, friable, grades to dark brown carbonaceous shale in part.

1160.0 - 1251.0m. SANDSTONE with minor CLAYSTONE.

SANDSTONE, clear to translucent, medium to very coarse, occasionally granular, angular to sub-angular, moderate sorted, loose, trace white clay matrix, very good porosity.

CLAYSTONE, white to light brown, soft, dispersive, carbonaceous, silty in part.

STRZELECKI FORMATION

1251.0 - 2350.5 metres Thickness : +1099.5 metres

1251.0 - 1281.0m. CLAYSTONE with minor SANDSTONE.

CLAYSTONE, white to pale green, grey-green, pale brown to grey-brown, soft to firm, occasionally silty, trace carbonaceous material.

SANDSTONE, clear to translucent, coarse to very coarse, sub-angular to sub-rounded, moderate sorted, loose quartz grains, trace pyrite nodules, good porosity. (Sandstone is similar to and probably is Latrobe – caved / eroded from the Latrobe Fm. Immediately above).

1281.0 - 1341.0m. SANDSTONE, clear to white, pale grey, grey-green, grey-black, fine to coarse, mostly medium, sub-rounded, moderate sorted loose quartz,

quartzite and volcano-lithic grains, feldspathic, minor calcite, dispersive white clay matrix, fair inferred porosity.

1341.0 - 1387.0m. SANDSTONE with interbedded CLAYSTONE.
SANDSTONE, white to light grey, grey-green, bluish grey, grey-black, fine to medium, occasional coarse, sub-angular to sub-rounded, moderate sorted, quartz, quartzite, feldspar and volcano-lithic grains, minor calcite, dispersive clay matrix, friable to loose, fair inferred porosity.
CLAYSTONE, pale blue-grey, pale brown soft, trace carbonaceous material.

1387.0 - 1444.0m. SANDSTONE with minor CLAYSTONE.
SANDSTONE, translucent white to translucent greenish white, grey-green, grey, grey-black, fine to medium, occasional coarse, sub-angular to sub-rounded, moderate sorted, loose quartz, feldspar and volcano-lithic grains, common calcite, trace mica flakes and rare pyrite, moderate to abundant dispersive clay matrix, fair inferred porosity.
CLAYSTONE, white to pale grey, pale grey-brown, soft, dispersive, trace micro-micaceous and carbonaceous material.

1444.0 - 1492.0m. Interbedded SANDSTONE and CLAYSTONE.
SANDSTONE, white to pale bluish grey, fine to medium, sub-angular, moderate sorted, quartz and volcano-lithic grains, moderate to abundant dispersive clay matrix, slightly calcareous, friable, fair inferred porosity.
CLAYSTONE, white to pale grey, pale brown, soft to firm, silty with carbonaceous specks in part, tuffaceous in part.

1492.0 - 1507.0m. SANDSTONE with minor CLAYSTONE.
SANDSTONE, white to pale bluish grey, fine to medium, sub-angular, moderate sorted, quartz and volcano-lithic grains, moderate to abundant dispersive clay matrix, slightly calcareous, friable, fair inferred porosity.
CLAYSTONE, white to pale grey, pale brown, soft to firm, silty with carbonaceous specks in part, tuffaceous in part.

1507.0 - 1546.0m. CLAYSTONE with interbedded SANDSTONE.

CLAYSTONE, pale brown, light to moderate grey, grey-green, moderate to dark brown, soft to firm, silty and carbonaceous in part, trace plant fragments.

SANDSTONE, light to moderate grey, grey-green, fine to medium, occasional coarse, sub-angular to sub-rounded, moderate sorted, quartz and volcano-lithic grains, moderate to abundant clay matrix, friable, poor to fair inferred porosity.

1546.0 - 1590.0m. SANDSTONE with minor CLAYSTONE.

SANDSTONE, light to moderate grey, grey-green, fine to medium, occasional coarse, sub-angular to sub-rounded, moderate sorted, quartz and volcano-lithic grains, moderate to abundant clay matrix, friable, fair inferred porosity.

CLAYSTONE, light to moderate greenish grey, grey-brown, soft to firm, silty and sandy in part, minor dark brown, very carbonaceous.

1590.0 - 1639.0m. SANDSTONE with minor CLAYSTONE.

SANDSTONE, grey to bluish grey, greenish grey, fine to medium, occasional coarse, sub-rounded, moderate sorted, friable to hard, quartzose, feldspathic, abundant volcano-lithics, minor carbonaceous specks and laminae, common calcite, trace mica flakes and pyrite, moderate to abundant clay matrix, poor to fair porosity.

CLAYSTONE, light to dark grey, grey-green, grey-brown, firm, occasionally carbonaceous.

1639.0 - 1854.0m. SANDSTONE with minor CLAYSTONE.

SANDSTONE, grey to bluish grey, greenish grey, very fine to medium, silty in part, occasional coarse, sub-rounded, poor to moderate sorted, friable to hard, quartzose, feldspathic, abundant volcano-lithics, minor carbonaceous specks and laminae, trace to abundant calcite, trace mica flakes and pyrite, moderate to abundant clay matrix, poor to fair porosity.

CLAYSTONE, light to dark grey, grey-green, grey-brown, light to dark brown, soft to firm, grades to siltstone in part, occasionally carbonaceous.

1854.0 - 1889.0m. Interbedded SANDSTONE and CLAYSTONE.

SANDSTONE, grey to bluish grey, greenish grey, very fine to medium, silty in part, occasional coarse, sub-rounded, poor to moderate sorted, friable to hard, quartzose, feldspathic, abundant volcano-lithics, minor carbonaceous specks and laminae, trace to abundant calcite, trace mica flakes and pyrite, moderate to abundant clay matrix, poor porosity.

CLAYSTONE, light to dark grey, grey-green, grey-brown, light to dark brown, soft to firm, grades to siltstone in part, occasionally carbonaceous.

1889.0 - 1906.0m. SANDSTONE with minor CLAYSTONE.

SANDSTONE, white to pinkish white, pale green to grey-green, fine to medium, occasionally coarse, sub-angular to sub-rounded, poor to moderate sorted, quartz, pinkish white feldspar and green and grey-black volcano-lithic grains, slightly to moderately calcareous, moderate to abundant clay matrix, friable, poor porosity.

CLAYSTONE, light to moderate brown, soft to firm, carbonaceous and silty in part; also some pale to moderate grey and grey-green.

1906.0 - 1947.0m. Interbedded SANDSTONE and CLAYSTONE.

SANDSTONE, white to pinkish white, pale green to grey-green, fine to medium, occasionally coarse, sub-angular to sub-rounded, poor to moderate sorted, quartz, pinkish white feldspar and green and grey-black volcano-lithic grains, slightly to moderate to strongly calcareous, abundant clay matrix, friable, poor porosity.

CLAYSTONE, light grey-brown, light grey, minor dark brown, soft to firm, minor shaly and carbonaceous.

1947.0 - 2067.0m. Interbedded SANDSTONE and CLAYSTONE.

SANDSTONE, white to grey-green, pale grey, very fine to fine. Occasionally medium, sub-angular to sub-rounded, moderate sorted,

volcano-lithic, feldspathic, abundant clay matrix, strongly calcareous, friable to moderately hard, poor porosity.

CLAYSTONE, moderate to dark grey, grey-brown, firm, grades to siltstone in part, minor very dark brown, very carbonaceous and grades to lignite / coal below 2020 metres.

2067.0 - 2104.0m. Interbedded SANDSTONE, SILTSTONE and CLAYSTONE.

SANDSTONE, white to grey-green, pale grey, very fine to fine. occasionally medium, silty in part, sub-angular to sub-rounded, moderate sorted, volcano-lithic, feldspathic, abundant clay matrix, moderate to strongly calcareous, friable to moderately hard, poor porosity.

SILTSTONE, moderate to dark grey, light to moderate bluish grey, grey-brown to brown, firm, carbonaceous specks and laminae, grades to very fine sandstone in part.

CLAYSTONE, moderate to dark grey, firm to hard, silty in part, minor dark brown to black, carbonaceous.

2104.0 - 2108.0m. SANDSTONE with minor SILTSTONE and CLAYSTONE.

SANDSTONE, white to pale bluish grey, very fine to fine, sub-rounded, poor to moderate sorted, volcano-lithic, feldspathic, common brown mica flakes, very calcareous, abundant clay matrix, friable to moderately hard, poor porosity.

SILTSTONE and CLAYSTONE as for 2080-2104m.

2108.0 - 2122.0m. Interbedded SILTSTONE and CLAYSTONE with minor SANDSTONE.

SILTSTONE, light to dark grey, bluish grey, sandy, firm, lithic and feldspathic, minor dark brown, very carbonaceous.

CLAYSTONE, moderate to dark grey, minor dark brown, silty.

SANDSTONE, white to pale bluish grey, very fine to fine, sub-rounded, poor to moderate sorted, volcano-lithic, feldspathic, common brown mica flakes, very calcareous, abundant clay matrix, friable to moderately hard, poor porosity.

2122.0 - 2138.0m. SANDSTONE with minor SILTSTONE and CLAYSTONE.

SANDSTONE, white to grey, occasional pale grey-green, very fine to fine, minor medium, sub-angular to sub-rounded, moderate sorted, volcano-lithic, feldspathic, common carbonaceous fragments, trace mica flakes, abundant clay matrix, slightly to strongly calcareous, friable, poor porosity.

SILTSTONE, moderate to dark grey, firm to hard, lithic and sandy in part, carbonaceous specks.

CLAYSTONE, moderate grey, occasionally light to dark brown, soft to moderately hard, silty in part, carbonaceous in part.

2138.0 - 2146.0m. SILTSTONE with minor CLAYSTONE and trace SANDSTONE, as for 2120 – 2137 metres.

2146.0 - 2253.0m. SANDSTONE with interbedded SILTSTONE and CLAYSTONE.

SANDSTONE, white, grey to grey-green, very fine to fine, occasionally medium and rare coarse, sub-angular to sub-rounded, poor to moderate sorted, grey-green to grey-black lithics, feldspathic, minor carbonaceous material, trace mica flakes, moderate to abundant clay matrix, moderate to strong calcareous, friable to moderately hard, poor porosity.

SILTSTONE, moderate to dark grey, grey-green, grey-brown, firm to hard, blocky, trace carbonaceous material, grades to claystone.

CLAYSTONE, moderate to dark grey to grey-brown, firm, silty in part, trace carbonaceous material.

2253.0 - 2335.0m. SANDSTONE with interbedded SILTSTONE and CLAYSTONE and trace COAL.

SANDSTONE, light to moderate grey, grey-green, very fine to fine, sub-angular to sub-rounded, poor to moderate sorted, lithic, feldspathic, trace mica flakes and carbonaceous material, abundant clay matrix, moderate calcareous, moderately hard, poor porosity.

SILTSTONE, light to dark grey, firm to hard, lithic and sandy in part, carbonaceous specks.

CLAYSTONE, moderate to dark grey to grey-brown, silty in part, moderately hard.
COAL, dark brown to black, lignitic.

2235.0 - 2350.0m. Interbedded SANDSTONE, SILTSTONE and CLAYSTONE.
SANDSTONE, light to moderate grey, grey-green, very fine to fine, sub-angular to sub-rounded, poor to moderate sorted, lithic, feldspathic, trace mica flakes and carbonaceous material, abundant clay matrix, moderate calcareous, moderately hard, poor porosity.
SILTSTONE, light to dark grey, firm to hard, lithic and sandy in part, carbonaceous specks.
CLAYSTONE, moderate to dark grey to grey-brown, silty in part, moderately hard.

TOTAL DEPTH

Driller: 2350.0 metres

Logger: 2350.5 metres (Extrapolated)

3.4 Hydrocarbon Shows

Latrobe Group : The only shows were from the coals at the top of the unit where a maximum of 319 units of gas (100% C1) was recorded.
DST#1 was run on penetration of the top coal and resulted in a weak to moderate blow, dead after 35 minutes. There was no gas to surface but the DST charts indicate plugging during flow period.
DST#9 was run over perforations (678-684m.) in 244mm. casing and resulted in a very weak air blow, dead after 10 minutes and no gas to surface.
A total of 185m. of cement contaminated water was recovered in the drill string and the sample chamber had 3 litres of cement contaminated water @ 2 psi.

Strzelecki Group : Moderate to very good gas shows (200 to 900 units) were recorded from a number of sands while drilling the Strzelecki Formation. Bottom hole and straddle tests on the best of the shows failed to flow gas (with the exception of DST#3) and indicated the sands to have poor reservoir quality.

DST#3 over the interval 1885.0-1940.0m. flowed gas to surface after 105 minutes with 52psi on a 1/8" choke. The pressure declined slowly to 38psi at end of flow and a calculated recovery of 1370m. of gas cut formation water was recovered from the drill pipe. (The sample chamber had 3 litres of gas cut formation water at 554 psi.)

The water flow / recovery in DST#3 is probably from fractures which can be identified from the sonic log. Similar water flows were recorded from DSTs of fractures in the Strzelecki Formation at Trifon-1.

4.0 DISCUSSION AND CONCLUSIONS

Gangell-1 intersected a normal onshore Gippsland Basin sedimentary section and formation tops were generally 10 to 30 metres lower than prognosed.

Gangell-1 achieved its objective of evaluating the upper Strzelecki Formation but the sands encountered were predominantly fine grained, lithic, very argillaceous and with poor to fair reservoir quality This appears to be confirmed by core data and wireline logs where although calculated porosities lie in the 12 – 18% range, when tested the sands lack permeability.

The sands of the Latrobe Group had very good porosity and permeability but were, as expected, water saturated. The top Latrobe had a maximum gas reading of 319 units but DST#9 run over perforations (678-684m.) in 244mm. casing and resulted in a very weak air blow, dead after 10 minutes and no gas to surface. A total of 185m. of cement contaminated water was recovered in the drill string and the sample chamber had 3 litres of cement contaminated water @ 2 psi.

5.0 COMPLETION

None – the well was plugged and suspended for possible re-entry.

Table 1 : GANGELL No.1 - STRATIGRAPHIC TABLE

Age	Formation	Depth KB (m)	Elevation (m)	Thickness (m)
TERTIARY- Pleistocene-Pliocene	Haunted Hill Gravels	4.9	35.0	91.6
TERTIARY- Pliocene	Jemmy's Point Fm.	96.5	-56.6	87.0
TERTIARY - Miocene	Tambo River Fm.	183.5	-143.6	66.0
TERTIARY - Miocene-Oligocene	Gippsland Limestone	249.5	-209.6	392.5
TERTIARY - Oligocene	Lakes Entrance Fm.	642.0	-602.1	41.0
TERTIARY – E Oligocene-Eocene	Latrobe Group	683.0	-643.1	568.0
	Latrobe Coals	820.0	-780.1	
EARLY CRETACEOUS	Strzelecki Fm.	1251.0	-1211.1	1099.5
	Total Depth	2350.5	-2310.6	

Table 1

APPENDIX 1

CUTTINGS DESCRIPTIONS

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
20	100	SANDSTONE, clear to translucent, occasionally yellow and red iron stained and minor dark grey, medium to very coarse, predominantly coarse to very coarse, angular to sub-rounded, poor to moderate sorted, weak silica cement, trace argillaceous matrix, common quartz overgrowths, loose, trace friable aggregates, very good porosity.	
30 (2.8)	100	SANDSTONE, a.a.	0.0 (0:0:0:0:0)
40 (1.4)	100	SANDSTONE, a.a.	0.0 (0:0:0:0:0)
50 (0.9)	100	SANDSTONE, a.a. – predominantly medium to coarse, very good porosity.	0.0 (0:0:0:0:0)
60 (0.9)	100	SANDSTONE, a.a. – predominantly yellow iron stained quartz, predominantly angular to sub-angular, trace carbonaceous specks.	0.2 (100:0:0:0:0)
70 (0.6)	100	SANDSTONE, a.a.	0.3 (100:0:0:0:0)
80 (0.4)	100	SANDSTONE, clear to translucent, common light to dark "smokey" grey, predominantly medium to coarse, common very coarse, angular to sub-angular, minor sub-rounded, poor to moderate sorted, weak silica cement, common quartz overgrowths and mica, trace nodular and disseminated pyrite, loose, very good inferred porosity.	0.3 (100:0:0:0:0)
90 (0.4)	100	SANDSTONE, clear to translucent, minor light to dark grey and green, trace yellow-red, fine to coarse, predominantly medium, angular to sub-angular, minor sub-rounded, weak silica cement, trace argillaceous matrix, common quartz overgrowths and mica, minor glauconite grains and carbonaceous material, predominantly loose and friable aggregates, fair inferred porosity.	0.2 (100:0:0:0:0)
100 (1.1)	100	SANDSTONE, a.a.	0.2 (100:0:0:0:0)
110 (1.1)	60 40	SANDSTONE, a.a. LIMESTONE, buff, translucent light grey, arenaceous to fossiliferous, abundant fossil fragments (sponge spicules, bryozoan, molluscs, forams), friable to brittle, sub-blocky.	0.2 (100:0:0:0:0)
120 (0.8)	20 80	SANDSTONE, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
130 (0.8)	100	LIMESTONE, buff to light grey-brown, fossiliferous, abundant sponge spicules and coral fragments, friable to firm, unconsolidated in part.	0.2 (100:0:0:0:0)
140 (0.8)	10 90	SANDSTONE, a.a. LIMESTONE, a.a.	0.3 (100:0:0:0:0)
150 (0.4)	100	LIMESTONE, a.a.	0.4 (100:0:0:0:0)
160 (0.4)	100	LIMESTONE, a.a.	0.5 (100:0:0:0:0)
170 (0.3)	100	LIMESTONE, white to buff, minor light grey-brown, fossiliferous, abundant coral fragments, friable and unconsolidated.	0.4 (100:0:0:0:0)
180 (0.3)	100	LIMESTONE, a.a.	0.4 (100:0:0:0:0)
190 (0.5)	100	LIMESTONE, a.a.	0.6 (100:0:0:0:0)
200 (0.4)	100	LIMESTONE, buff to light grey-brown, silty and argillaceous in part, common shell and coral fragments, friable to firm, unconsolidated in part.	0.2 (100:0:0:0:0)
210 (0.4)	100	LIMESTONE, a.a.	0.4 (100:0:0:0:0)
220 (0.4)	100	LIMESTONE, a.a.	0.5 (100:0:0:0:0)
230 (0.5)	100	LIMESTONE, a.a.	0.7 (100:0:0:0:0)
240 (1.5)	100	LIMESTONE, a.a.	0.7 (100:0:0:0:0)
250 (1.1)	100	LIMESTONE, light grey to buff, silty in part, abundant shell and coral fragments, friable to firm, loose in part.	0.8 (100:0:0:0:0)
260 (1.4)	100	LIMESTONE, a.a.	0.9 (100:0:0:0:0)
270 (1.4)	100	LIMESTONE, white to cream, pale pinkish white, fossil fragments, common greenish glauconite grains and staining.	0.1 (100:0:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
273 (1.4)	100	LIMESTONE, a.a.	0.1 (100:0:0:0:0)
276 (1.1)	100	LIMESTONE, a.a.	0.0 (0:0:0:0:0)
279 (1.0)	100	LIMESTONE, a.a.	0.0 (0:0:0:0:0)
282 (0.9)	100	LIMESTONE, white to cream, light grey, fossil fragments, trace glauconite and greenish lithics, silty and argillaceous in part.	0.0 (0:0:0:0:0)
285 (0.9)	100	LIMESTONE, a.a.	0.0 (0:0:0:0:0)
288 (1.0)	10 90	MARL, light to moderate grey to greenish grey, soft, fossiliferous, trace glauconitic staining. LIMESTONE, white to cream, pinkish white, occasionally grey, very fossiliferous and grades to coquina in part, argillaceous in part and grades to marl.	0.0 (0:0:0:0:0)
291 (0.9)	10 90	MARL, a.a. LIMESTONE, a.a.	0.0 (0:0:0:0:0)
294 (1.0)	10 90	MARL, a.a. LIMESTONE, a.a.	0.0 (0:0:0:0:0)
297 (0.9)	20 80	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
300 (0.7)	20 80	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
303 (0.9)	30 70	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
306 (0.7)	30 70	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
309 (0.8)	30 70	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
312 (0.8)	30 70	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
315 (0.8)	40 60	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
318 (0.5)	40 60	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
321 (0.6)	40 60	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
324 (0.8)	50 50	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
327 (0.7)	60 40	MARL, light to moderate grey, occasionally greenish grey, soft to firm, abundant very fine fossil fragments, trace glauconite. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
330 (0.7)	70 30	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
333 (0.5)	70 30	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
336 (0.5)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
339 (0.7)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
342 (0.8)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
345 (1.0)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
348 (1.0)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
351 (0.9)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
354 (0.4)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
357 (0.5)	70 30	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
360 (0.5)	70 30	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
363 (0.5)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
366 (0.5)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
369 (0.5)	80 20	MARL, white to light bluish grey, soft, sticky, fossiliferous, trace grey-green lithics. LIMESTONE, white to cream fossil fragments, occasionally grey and grades to marl.	0.2 (100:0:0:0:0)
372 (0.5)	80 20	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
375 (0.5)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
378 (0.5)	90 10	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
381 (0.5)	90 10	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
384 (0.5)	90 10	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
387 (0.5)	90 10	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
390 (0.4)	90 10	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
393 (0.3)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
396 (0.3)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
399 (0.3)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
402 (0.4)	80 20	MARL, a.a. – minor grey-brown. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
405 (0.4)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
408 (0.5)	80 20	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
411 (0.4)	80 20	MARL, white to cream, pale grey, occasional grey-brown, soft, very fossiliferous, minor green to greenish black glauconite and lithics. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
414 (0.4)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
417 (0.5)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
420 (0.5)	80 20	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
423 (0.4)	80 20	MARL, a.a. LIMESTONE, a.a.	0.1 (100:0:0:0:0)
426 (0.4)	80 20	MARL, a.a. LIMESTONE, a.a.	0.2 (100:0:0:0:0)
429 (0.5)	100	MARL, a.a.	0.1 (100:0:0:0:0)
432 (0.6)	100	MARL, a.a.	0.2 (100:0:0:0:0)
435 (0.6)	100	MARL, a.a.	0.2 (100:0:0:0:0)
438 (0.6)	100	MARL, a.a.	0.2 (100:0:0:0:0)
441 (0.7)	100	MARL, a.a.	0.2 (100:0:0:0:0)
444 (0.7)	100	MARL, a.a.	0.2 (100:0:0:0:0)
447 (0.6)	100	MARL, a.a.	0.2 (100:0:0:0:0)
450 (0.8)	100	MARL, a.a.	0.2 (92:8:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
453 (1.0)	100	MARL, white to pale pinkish brown, light grey to grey-brown, soft, very fossiliferous, grades to limestone in part.	0.3 (100:0:0:0:0)
456 (0.9)	100	MARL, a.a.	0.3 (93:7:0:0:0)
459 (0.8)	100	MARL, a.a.	0.2 (95:5:0:0:0)
462 (1.0)	100	MARL, a.a.	0.3 (100:0:0:0:0)
465 (1.1)	100	MARL, a.a.	0.3 (100:0:0:0:0)
468 (1.1)	100	MARL, a.a.	0.3 (100:0:0:0:0)
471 (1.8)	100	MARL, a.a.	0.3 (100:0:0:0:0)
474 (1.1)	100	MARL, a.a.	0.3 (100:0:0:0:0)
477 (1.3)	100	MARL, a.a.	0.3 (100:0:0:0:0)
480 (1.3)	100	MARL, a.a.	0.3 (100:0:0:0:0)
483 (1.3)	100	MARL, a.a. – silty in part.	0.3 (100:0:0:0:0)
486 (0.9)	100	MARL, a.a.	0.3 (100:0:0:0:0)
489 (1.1)	100	MARL, a.a.	0.3 (100:0:0:0:0)
492 (1.2)	100	MARL, white to very pale brown, grey-brown, soft to firm, fossiliferous, silty in part, trace glauconite.	0.3 (100:0:0:0:0)
495 (1.2)	100	MARL, a.a.	0.3 (100:0:0:0:0)
498 (1.2)	100	MARL, a.a.	0.3 (100:0:0:0:0)
501 (1.3)	100	MARL, a.a.	0.3 (100:0:0:0:0)
504 (1.7)	100	MARL, a.a.	0.3 (97:3:0:0:0)
507 (2.3)	100	MARL, a.a.	0.3 (100:0:0:0:0)
510 (1.5)	100	MARL, a.a.	0.3 (100:0:0:0:0)
513 (2.9)	100	MARL, a.a.	0.3 (100:0:0:0:0)
516 (4.1)	100	MARL, white to pale brown, grey-brown, soft to firm, occasionally hard, medium to coarse fossiliferous and calcite grains, silty and argillaceous, trace to minor glauconite, grades to limestone in part.	0.3 (100:0:0:0:0)
519 (4.3)	100	MARL, a.a.	0.3 (100:0:0:0:0)
522 (2.6)	100	MARL, a.a.	0.3 (100:0:0:0:0)
525 (2.5)	100	MARL, a.a.	0.3 (99:1:0:0:0)
528 (4.0)	100	MARL, a.a.	0.3 (99:1:0:0:0)
531 (2.2)	100	MARL, a.a.	0.3 (99:1:0:0:0)
534 (2.1)	100	MARL, a.a.	0.3 (93:7:0:0:0)
537 (1.4)	100	MARL, a.a.	0.4 (100:0:0:0:0)
540 (1.5)	100	MARL, a.a.	0.3 (100:0:0:0:0)
543 (2.0)	100	MARL, a.a.	0.6 (100:0:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
546 (2.3)	100	MARL, a.a.	0.6 (100:0:0:0:0)
549 (1.6)	100	MARL, a.a.	0.7 (100:0:0:0:0)
552 (2.5)	100	MARL, a.a.	1.4 (100:0:0:0:0)
555 (2.0)	100	MARL, a.a.	1.5 (100:0:0:0:0)
558 (1.4)	100	MARL, a.a.	1.9 (100:0:0:0:0)
561 (1.3)	100	MARL, a.a.	2.5 (100:0:0:0:0)
564 (1.3)	100	MARL, a.a.	2.0 (100:0:0:0:0)
567 (1.4)	100	MARL, a.a.	2.4 (100:0:0:0:0)
570 (1.3)	100	MARL, white to pale greenish grey, soft to firm, minor fossil fragments, calcareous, becoming more argillaceous, trace greenish glauconitic staining.	2.9 (100:0:0:0:0)
573 (1.5)	100	MARL, a.a.	3.0 (100:0:0:0:0)
576 (1.3)	100	MARL, a.a.	2.8 (100:0:0:0:0)
579 (1.2)	100	MARL, a.a.	3.2 (100:0:0:0:0)
582 (1.2)	100	MARL, a.a.	2.9 (100:0:0:0:0)
585 (1.4)	100	MARL, a.a.	3.9 (100:0:0:0:0)
588 (1.3)	100	MARL, a.a.	3.5 (100:0:0:0:0)
591 (1.4)	100	MARL, a.a.	3.8 (100:0:0:0:0)
594 (1.2)	100	MARL, a.a.	3.9 (100:0:0:0:0)
597 (1.1)	100	MARL, a.a.	3.6 (100:0:0:0:0)
600 (1.0)	100	MARL, a.a. – greenish glauconitic stain and trace glauconite nodules.	3.6 (100:0:0:0:0)
603 (1.0)	100	MARL, a.a.	4.9 (100:0:0:0:0)
606 (1.1)	100	MARL, a.a.	3.5 (100:0:0:0:0)
609 (1.2)	100	MARL, a.a. – white to greenish white, pale greenish grey.	4.6 (100:0:0:0:0)
612 (1.1)	100	MARL, a.a.	6.0 (100:0:0:0:0)
615 (1.1)	100	MARL, a.a.	7.0 (100:0:0:0:0)
618 (1.1)	100	MARL, a.a.	7.8 (100:0:0:0:0)
621 (1.1)	100	MARL, a.a.	6.8 (100:0:0:0:0)
624 (1.0)	100	MARL, a.a.	7.6 (100:0:0:0:0)
627 (0.9)	100	MARL, a.a.	8.2 (100:0:0:0:0)
630 (1.1)	100	MARL, a.a.	8.5 (100:0:0:0:0)
633 (0.9)	100	MARL, a.a.	9.5 (100:0:0:0:0)
636 (1.0)	100	MARL, white to pale brown, pale greenish white, very calcareous, trace glauconite and glauconitic staining, soft.	11.6 (100:0:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
639 (1.2)	100	MARL, a.a.	11.5 (100:0:0:0:0)
642 (1.0)	100	MARL, a.a.	12.9 (100:0:0:0:0)
645 (1.3)	100	MARL, a.a.	12.4 (100:0:0:0:0)
648 (1.6)	100	MARL, a.a.	11.4 (100:0:0:0:0)
651 (1.6)	100	MARL, a.a.	12.1 (100:0:0:0:0)
654 (1.5)	100	MARL, a.a.	14.0 (100:0:0:0:0)
657 (1.6)	100	MARL, a.a.	17.1 (100:0:0:0:0)
660 (1.3)	100	MARL, a.a.	23.9 (100:0:0:0:0)
663 (1.2)	100	MARL, a.a.	22.9 (100:0:0:0:0)
666 (1.4)	100	MARL, a.a.	20.2 (100:0:0:0:0)
669 (1.3)	100	MARL, a.a. – greenish white, abundant fine to medium glauconite nodules (2-5%).	17.5 (100:0:0:0:0)
672 (1.7)	100	MARL, a.a.	21.6 (100:0:0:0:0)
675 (1.3)	100	MARL, a.a. – 5% dark green glauconite nodules.	20.6 (100:0:0:0:0)
678 (1.9)	100	MARL, a.a. – 5-10% dark green glauconite nodules, 1-2% nodular / disseminated pyrite.	16.6 (100:0:0:0:0)
681 (5.0)	30 20 50	SANDSTONE, clear to translucent white, very fine to medium, sub-angular to sub-rounded, some rounded, moderate sorted, loose quartz grains, trace disseminated pyrite, fair to good inferred porosity. Minor very fine, hard with a strong calcite cement, poor porosity. MARL, a.a. – abundant glauconite, trace fossil fragments. COAL, very dark brown to black, earthy to dull lustre, lignitic, brittle, friable, grades to dark brown carbonaceous shale in part.	16.6 (100:0:0:0:0)
684 (1.2)	40 10 50	SANDSTONE, a.a. MARL, a.a. COAL, a.a.	65.2 (100:0:0:0:0)
687 (0.6)	40 10 50	SANDSTONE, a.a. MARL, a.a. COAL, a.a.	229.5 (100:0:0:0:0)
690 (0.5)	40 10 50	SANDSTONE, a.a. MARL, a.a. COAL, a.a.	240.7 (100:0:0:0:0)
693 (1.6)	20 40 40	SANDSTONE, a.a. MARL, a.a. COAL, a.a.	220.3 (100:0:0:0:0)
696 (2.6)	10 70 20	SANDSTONE, a.a. MARL, a.a. COAL, a.a.	173.3 (100:0:0:0:0)
699 (2.8)	100 Tr	SANDSTONE, clear to translucent, medium to very coarse, sub-angular to rounded, moderate sorted, loose quartz grains, trace brown argillaceous matrix adhering to some grains, trace white mica flakes, very good porosity. COAL, a.a.	127.3 (100:0:0:0:0)
702 (2.8)	90 10	SANDSTONE, a.a. COAL, a.a.	97.5 (100:0:0:0:0)
705 (1.9)	100 Tr	SANDSTONE, a.a. – sub-angular to sub-rounded, poor to moderate sorted. COAL, a.a.	110.5 (100:0:0:0:0)
708 (1.0)	100 Tr	SANDSTONE, a.a. – sub-angular to rounded, very good porosity. COAL, a.a.	94.1 (100:0:0:0:0)
711 (2.4)	80 20	SANDSTONE, a.a. COAL, a.a.	141.4 (100:0:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
714 (1.6)	100 Tr	SANDSTONE, clear to translucent pale brown, fine to predominantly medium some coarse and occasionally very coarse, angular to sub-rounded, poor to moderate sorted, trace brown to dark brown dispersive argillaceous matrix, loose, very good porosity. COAL, a.a.	122.9 (100:0:0:0:0)
717 (0.9)	100 Tr	SANDSTONE, a.a. COAL, a.a.	135.8 (100:0:0:0:0)
720 (0.4)	100 Tr	SANDSTONE, a.a. COAL, a.a.	118.9 (100:0:0:0:0)
723 (0.6)	100	SANDSTONE, a.a. – medium to very coarse, sub-angular to rounded, moderate sorted, very good porosity.	102.1 (100:0:0:0:0)
726 (1.5)	100	SANDSTONE, a.a.	76.5 (100:0:0:0:0)
729 (0.9)	100	SANDSTONE, a.a.	69.4 (100:0:0:0:0)
732 (0.4)	100	SANDSTONE, a.a. – trace grey to grey-black quartzite grains, very good porosity.	68.8 (100:0:0:0:0)
735 (0.4)	100	SANDSTONE, a.a.	59.2 (100:0:0:0:0)
738 (0.8)	100	SANDSTONE, a.a. – mostly coarse to very coarse.	58.3 (100:0:0:0:0)
741 (1.1)	100	SANDSTONE, a.a.	57.6 (100:0:0:0:0)
744 (1.2)	100	SANDSTONE, a.a. – medium to very coarse, sub-rounded to rounded, moderate sorted, very good porosity.	51.2 (100:0:0:0:0)
747 (1.0)	100	SANDSTONE, a.a.	48.1 (100:0:0:0:0)
750 (0.8)	100	SANDSTONE, a.a.	37.2 (100:0:0:0:0)
753 (0.5)	100	SANDSTONE, a.a.	40.0 (100:0:0:0:0)
756 (0.6)	100	SANDSTONE, a.a. – trace grey to grey-black quartzite grains.	43.7 (100:0:0:0:0)
759 (0.7)	100	SANDSTONE, a.a.	39.1 (100:0:0:0:0)
762 (0.6)	100	SANDSTONE, a.a. – predominantly coarse to very coarse.	21.1 (100:0:0:0:0)
765 (0.8)	100	SANDSTONE, a.a. – medium to very coarse.	15.9 (100:0:0:0:0)
768 (0.9)	100	SANDSTONE, a.a.	15.0 (100:0:0:0:0)
771 (0.9)	100	SANDSTONE, a.a.	15.2 (100:0:0:0:0)
774 (1.0)	100	SANDSTONE, a.a. – sub-angular to rounded, very good porosity.	11.9 (100:0:0:0:0)
777 (0.8)	100	SANDSTONE, a.a.	11.7 (100:0:0:0:0)
780 (0.5)	100	SANDSTONE, a.a.	11.9 (100:0:0:0:0)
783 (1.1)	100	SANDSTONE, a.a. – sub-rounded to rounded, very good porosity.	8.0 (100:0:0:0:0)
786 (1.0)	100	SANDSTONE, a.a.	9.8 (100:0:0:0:0)
789 (1.0)	100	SANDSTONE, a.a.	10.1 (100:0:0:0:0)
792 (0.9)	100	SANDSTONE, a.a. – predominantly sub-angular, medium to very coarse, very good porosity.	7.9 (100:0:0:0:0)
795 (1.0)	100	SANDSTONE, a.a.	7.1 (100:0:0:0:0)
798 (1.3)	100	SANDSTONE, a.a. – medium to very coarse, sub-angular to rounded, very good porosity.	8.2 (100:0:0:0:0)
801 (1.1)	100	SANDSTONE, a.a.	5.6 (100:0:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
804 (1.2)	100	SANDSTONE, a.a.	5.5 (100:0:0:0:0)
807 (1.1)	100	SANDSTONE, a.a. – predominantly coarse to very coarse.	5.6 (100:0:0:0:0)
810 (1.1)	100	SANDSTONE, a.a.	5.2 (100:0:0:0:0)
813 (0.9)	100	SANDSTONE, a.a.	5.1 (100:0:0:0:0)
816 (1.3)	100	SANDSTONE, a.a.	5.6 (100:0:0:0:0)
819 (1.1)	100	SANDSTONE, a.a.	5.5 (100:0:0:0:0)
822 (1.2)	90 10	SANDSTONE, a.a. SILTSTONE, dark brown, soft, dispersive, argillaceous, carbonaceous.	5.7 (100:0:0:0:0)
825 (1.1)	70 20 10	SANDSTONE a.a. SILTSTONE, .a.a. COAL, a.a.	6.7 (100:0:0:0:0)
828 (0.7)	60 20 20	SANDSTONE a.a. SILTSTONE, .a.a. COAL, a.a.	6.2 (100:0:0:0:0)
831 (0.9)	80 20	SANDSTONE white to translucent, medium to very coarse, mostly coarse to very coarse, sub-angular to rounded, poor to moderate sorted, loose quartz grains, very good porosity. COAL, very dark brown to black, earthy to dull lustre, lignitic, grades to carbonaceous shale / claystone in part.	6.3 (100:0:0:0:0)
834 (1.1)	80 20	SANDSTONE a.a. COAL, a.a.	6.5 (100:0:0:0:0)
837 (1.1)	70 30	SANDSTONE a.a. – trace mica flakes. COAL, a.a.	6.2 (100:0:0:0:0)
840 (0.9)	80 20	SANDSTONE a.a. COAL, a.a.	6.6 (100:0:0:0:0)
843 (0.8)	80 20	SANDSTONE a.a. COAL, a.a.	5.3 (100:0:0:0:0)
846 (0.7)	70 10 20	SANDSTONE a.a. SILTSTONE, dark brown, soft, dispersive, argillaceous, carbonaceous. COAL, a.a.	6.7 (100:0:0:0:0)
849 (0.7)	70 20 10	SANDSTONE a.a. SILTSTONE, .a.a. COAL, a.a.	7.2 (100:0:0:0:0)
852 (0.8)	70 30 Tr	SANDSTONE a.a. SILTSTONE, .a.a. COAL, a.a.	6.8 (100:0:0:0:0)
855 (1.3)	70 30 Tr	SANDSTONE a.a. SILTSTONE, .a.a. COAL, a.a.	5.0 (100:0:0:0:0)
858 (1.2)	60 20 20	SANDSTONE clear to translucent brown, fine to coarse, occasionally very coarse, sub-angular to rounded, poor to moderate sorted, brown dispersive argillaceous matrix, loose, good porosity. SILTSTONE, .moderate to dark brown, soft, very argillaceous, carbonaceous. COAL, a.a.	4.6 (100:0:0:0:0)
861 (1.1)	60 20 20	SANDSTONE a.a. SILTSTONE, .a.a. COAL, a.a.	4.9 (100:0:0:0:0)
864 (1.1)	60 20 20	SANDSTONE a.a. SILTSTONE, .a.a. COAL, a.a.	4.2 (100:0:0:0:0)
867 (1.1)	80 20 Tr	SANDSTONE a.a. SILTSTONE, .a.a. COAL, a.a.	4.1 (100:0:0:0:0)
870 (1.0)	80 20	SANDSTONE, a.a. SILTSTONE, a.a.	4.0 (100:0:0:0:0)
873 (1.3)	90 10	SANDSTONE, a.a. SILTSTONE, a.a.	3.4 (100:0:0:0:0)

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Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
876 (0.7)	100 Tr	SANDSTONE, a.a. SILTSTONE, a.a.	3.8 (100:0:0:0:0)
879 (0.6)	100 Tr	SANDSTONE, a.a. SILTSTONE, a.a.	2.9 (100:0:0:0:0)
882 (0.6)	90 10	SANDSTONE, a.a. SILTSTONE, a.a.	3.3 (100:0:0:0:0)
885 (0.7)	90 10	SANDSTONE, a.a. SILTSTONE, a.a.	3.3 (100:0:0:0:0)
888 (0.7)	100 Tr	SANDSTONE, a.a. – medium to very coarse, loose, good porosity. COAL, a.a.	3.1 (100:0:0:0:0)
891 (0.7)	100 Tr	SANDSTONE, a.a. COAL, a.a.	2.9 (100:0:0:0:0)
894 (1.0)	90 10	SANDSTONE, a.a. COAL, a.a.	2.3 (100:0:0:0:0)
897 (0.9)	100	SANDSTONE, a.a. – predominantly coarse to very coarse, sub-angular.	3.0 (100:0:0:0:0)
900 (0.8)	100	SANDSTONE, a.a.	2.3 (100:0:0:0:0)
903 (0.7)	100	SANDSTONE, a.a.	2.7 (100:0:0:0:0)
906 (0.7)	100	SANDSTONE, a.a.	2.5 (100:0:0:0:0)
909 (0.7)	100 Tr	SANDSTONE, a.a. – sub-angular to sub-rounded, very good porosity. SILTSTONE, a.a.	2.4 (100:0:0:0:0)
912 (1.2)	100 Tr	SANDSTONE, a.a. SILTSTONE, a.a.	1.7 (100:0:0:0:0)
915 (0.9)	100	SANDSTONE, a.a.	2.4 (100:0:0:0:0)
918 (0.6)	100	SANDSTONE, a.a.	2.3 (100:0:0:0:0)
921 (0.7)	100	SANDSTONE, a.a.	1.8 (100:0:0:0:0)
924 (0.8)	90 10	SANDSTONE, a.a. – predominantly very coarse, sub-angular, very good porosity. COAL, a.a.	2.2 (100:0:0:0:0)
927 (0.9)	90 10	SANDSTONE, a.a. COAL, a.a.	2.8 (100:0:0:0:0)
930 (0.8)	100 Tr	SANDSTONE, a.a. COAL, a.a.	2.5 (100:0:0:0:0)
933 (0.7)	100 Tr	SANDSTONE, a.a. – sub-angular to sub-rounded. COAL, a.a.	2.4 (100:0:0:0:0)
936 (1.1)	90 10	SANDSTONE, a.a. COAL, a.a.	2.3 (100:0:0:0:0)
939 (0.9)	90 10	SANDSTONE, a.a. COAL, a.a.	2.5 (100:0:0:0:0)
942 (1.5)	90 10	SANDSTONE, a.a. COAL, a.a.	2.6 (100:0:0:0:0)
945 (1.4)	60 10 30	SANDSTONE, a.a. SILTSTONE, moderate to dark brown, very argillaceous, soft, dispersive, carbonaceous, grades to claystone in part. COAL, a.a.	2.5 (100:0:0:0:0)
948 (1.1)	60 10 30	SANDSTONE, a.a. SILTSTONE, a.a. COAL, a.a.	2.4 (100:0:0:0:0)
951 (1.5)	70 10 20	SANDSTONE, a.a. SILTSTONE, a.a. COAL, a.a.	2.2 (100:0:0:0:0)
954 (1.7)	90 10	SANDSTONE, clear to translucent brown, medium to very coarse, sub-angular, poor to moderate sorted, loose, dispersive clay matrix, very good porosity. COAL, a.a.	5.9 (100:0:0:0:0)
957 (1.9)	90 10	SANDSTONE, a.a. COAL, a.a.	4.4 (100:0:0:0:0)

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Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
960 (0.8)	100 Tr	SANDSTONE, a.a. – predominantly very coarse, sub-angular to sub-rounded, very good porosity. COAL, a.a.	3.0 (100:0:0:0:0)
963 (0.4)	100 Tr	SANDSTONE, a.a. COAL, a.a.	4.1 (100:0:0:0:0)
966 (0.9)	80 10 10	SANDSTONE, a.a. – medium to very coarse. SILTSTONE, a.a. COAL, a.a.	3.6 (100:0:0:0:0)
969 (1.1)	80 10 10	SANDSTONE, a.a. SILTSTONE, a.a. COAL, a.a.	2.8 (100:0:0:0:0)
972 (0.9)	70 20 10	SANDSTONE, a.a. SILTSTONE, a.a. COAL, a.a.	4.3 (100:0:0:0:0)
975 (1.2)	80 20	SANDSTONE, a.a. COAL, a.a.	4.1 (100:0:0:0:0)
978 (1.4)	80 20	SANDSTONE, a.a. COAL, a.a.	3.7 (100:0:0:0:0)
981 (1.7)	70 30	SANDSTONE, a.a. COAL, a.a.	5.0 (100:0:0:0:0)
984 (1.4)	70 30	SANDSTONE, a.a. – fine to coarse. COAL, a.a.	3.4 (100:0:0:0:0)
987 (2.3)	80 20	SANDSTONE, a.a. COAL, a.a.	2.5 (100:0:0:0:0)
990 (1.8)	80 20	SANDSTONE, a.a. COAL, a.a.	2.4 (100:0:0:0:0)
993 (0.7)	80 20	SANDSTONE, a.a. – medium to very coarse, sub-angular to angular. COAL, a.a.	2.8 (100:0:0:0:0)
996 (0.7)	80 20	SANDSTONE, a.a. COAL, a.a.	2.6 (100:0:0:0:0)
999 (1.0)	80 20	SANDSTONE, a.a. COAL, a.a.	2.6 (100:0:0:0:0)
1002 (1.8)	80 20	SANDSTONE, a.a. – predominantly coarse to very coarse, sub-angular, good porosity. COAL, a.a.	2.6 (100:0:0:0:0)
1005 (2.1)	70 10 20	SANDSTONE, a.a. SILTSTONE, white to light brown, soft, dispersive, very argillaceous, carbonaceous, grades to claystone in part. COAL, a.a.	2.7 (100:0:0:0:0)
1008 (1.6)	80 10 10	SANDSTONE, a.a. SILTSTONE, a.a. COAL, a.a.	2.8 (100:0:0:0:0)
1011 (2.1)	80 10 10	SANDSTONE, a.a. SILTSTONE, a.a. COAL, a.a.	2.2 (100:0:0:0:0)
1014 (1.4)	90 10	SANDSTONE, a.a. – mostly very coarse, sub-angular, very good porosity. COAL, a.a.	2.0 (100:0:0:0:0)
1017 (2.1)	90 10	SANDSTONE, a.a. COAL, a.a.	2.4 (100:0:0:0:0)
1020 (2.3)	70 10 20	SANDSTONE, a.a. – medium to very coarse, sub-angular, very good porosity. SILTSTONE, a.a. COAL, a.a.	2.0 (100:0:0:0:0)
1023 (1.2)	70 10 20	SANDSTONE, a.a. SILTSTONE, a.a. COAL, a.a.	1.6 (100:0:0:0:0)
1026 (1.2)	70 10 20	SANDSTONE, a.a. SILTSTONE, a.a. COAL, a.a.	1.4 (100:0:0:0:0)
1029 (1.8)	70 10 20	SANDSTONE, a.a. – mostly coarse to very coarse, sub-angular. SILTSTONE, a.a. COAL, a.a.	1.3 (100:0:0:0:0)

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Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1032 (1.8)	80 Tr 20	SANDSTONE, a.a. SILTSTONE, a.a. COAL, a.a.	1.1 (100:0:0:0:0)
1035 (2.1)	100 Tr Tr	SANDSTONE, a.a. SILTSTONE, a.a. COAL, a.a.	1.0 (100:0:0:0:0)
1038 (1.0)	100 Tr Tr	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	1.8 (100:0:0:0:0)
1041 (1.2)	90 10	SANDSTONE, a.a. CLAYSTONE, white, soft, dispersive, amorphous.	2.1 (100:0:0:0:0)
1044 (1.1)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	1.8 (100:0:0:0:0)
1047 (2.6)	90 10	SANDSTONE, a.a. – predominantly very coarse, sub-angular, very good porosity. CLAYSTONE, a.a.	1.4 (100:0:0:0:0)
1050 (3.0)	80 20	SANDSTONE, a.a. – coarse to very coarse. CLAYSTONE, a.a. – occasional pale brown, silty, carbonaceous.	1.7 (100:0:0:0:0)
1053 (1.0)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	1.6 (100:0:0:0:0)
1056 (0.8)	70 10 20	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	1.4 (100:0:0:0:0)
1059 (1.1)	70 10 20	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	1.1 (100:0:0:0:0)
1062 (2.4)	80 10 10	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	1.4 (100:0:0:0:0)
1065 (2.1)	70 20 10	SANDSTONE, a.a. – medium to very coarse, good porosity. CLAYSTONE, a.a. COAL, a.a.	1.2 (100:0:0:0:0)
1068 (1.2)	70 20 10	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	1.6 (100:0:0:0:0)
1071 (1.2)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	1.6 (100:0:0:0:0)
1074 (1.2)	100 Tr	SANDSTONE, a.a. – coarse to granular, sub-angular to sub-rounded. CLAYSTONE, a.a.	1.2 (100:0:0:0:0)
1077 (1.2)	100	SANDSTONE, clear to translucent white, medium to very coarse, angular to sub-angular, moderate sorted, loose quartz grains, very good porosity.	1.4 (100:0:0:0:0)
1080 (1.2)	100	SANDSTONE, a.a.	1.4 (100:0:0:0:0)
1083 (1.2)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	1.2 (100:0:0:0:0)
1086 (1.5)	70 20 10	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	1.2 (100:0:0:0:0)
1089 (1.8)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	1.3 (100:0:0:0:0)
1092 (1.2)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	1.1 (100:0:0:0:0)
1095 (2.9)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	1.1 (100:0:0:0:0)
1098 (1.3)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	1.2 (100:0:0:0:0)
1101 (1.2)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	1.0 (100:0:0:0:0)
1104 (2.3)	70 20 10	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	0.8 (100:0:0:0:0)

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Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1107 (3.9)	60 30 10	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	0.7 (100:0:0:0:0)
1110 (3.1)	80 20 Tr	SANDSTONE, a.a. – sub-angular to sub-rounded. CLAYSTONE, a.a. COAL, a.a.	1.0 (100:0:0:0:0)
1113 (4.0)	90 10	SANDSTONE, a.a. – predominantly very coarse. CLAYSTONE, a.a.	0.5 (100:0:0:0:0)
1116 (3.3)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	0.8 (100:0:0:0:0)
1119 (1.6)	70 20 10	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	0.8 (100:0:0:0:0)
1122 (1.6)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	0.8 (100:0:0:0:0)
1125 (2.0)	80 10 10	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	0.7 (100:0:0:0:0)
1128 (1.1)	80 10 10	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	0.6 (99:1:0:0:0)
1131 (2.0)	60 30 10	SANDSTONE, a.a. CLAYSTONE, white to light brown, soft, dispersive, carbonaceous, silty in part. COAL, a.a.	0.7 (99:1:0:0:0)
1134 (3.3)	50 40 10	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	0.8 (99:1:0:0:0)
1137 (2.7)	70 20 10	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, a.a.	1.0 (98:2:0:0:0)
1140 (4.4)	60 30 10	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, .a.a	0.8 (99:1:0:0:0)
1143 (4.6)	70 30 Tr	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, .a.a	1.8 (98:2:0:0:0)
1146 (2.9)	70 30 Tr	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, .a.a	4.6 (94:6:0:0:0)
1149 (2.1)	60 40	SANDSTONE, a.a. CLAYSTONE, a.a.	5.2 (91:9:0:0:0)
1152 (3.5)	70 30 Tr	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, .a.a	4.0 (91:9:0:0:0)
1155 (5.3)	80 20 Tr	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, .a.a	2.3 (93:7:0:0:0)
1158 (2.8)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	1.2 (94:6:0:0:0)
1161 (1.5)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	1.3 (97:3:0:0:0)
1164 (1.0)	90 10 Tr	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, .a.a	1.1 (99:1:0:0:0)
1167 (1.7)	90 10 Tr	SANDSTONE, a.a. CLAYSTONE, a.a. COAL, .a.a	1.7 (97:3:0:0:0)
1170 (1.6)	80 20	SANDSTONE, clear to translucent, medium to very coarse, angular to sub-angular, moderate sorted, loose, trace white clay matrix, very good porosity. CLAYSTONE, a.a.	2.1 (99:1:0:0:0)
1173 (1.1)	90 10	SANDSTONE, a.a. – rare pyrite cemented aggregates. CLAYSTONE, a.a.	2.2 (100:0:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1176 (2.0)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	2.1 (99:1:0:0:0)
1179 (2.1)	100	SANDSTONE, a.a.	2.0 (100:0:0:0:0)
1182 (1.9)	100	SANDSTONE, a.a.	2.3 (99:1:0:0:0)
1185 (1.8)	100	SANDSTONE, a.a. – medium to very coarse, granular in part, sub-rounded, very good porosity.	2.9 (94:6:0:0:0)
1188 (1.5)	100	SANDSTONE, a.a.	2.7 (97:3:0:0:0)
1191 (1.6)	100 Tr	SANDSTONE, a.a. – predominantly coarse to very coarse, sub-angular to sub-rounded, trace pyrite and pyrite cemented aggregates. CLAYSTONE, a.a.	2.6 (94:6:0:0:0)
1194 (3.1)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	2.2 (96:4:0:0:0)
1197 (2.8)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	2.1 (98:2:0:0:0)
1200 (1.6)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	2.5 (99:1:0:0:0)
1203 (2.4)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	2.3 (100:0:0:0:0)
1206 (8.0)	70 30	SANDSTONE, a.a. CLAYSTONE, a.a.	1.5 (97:3:0:0:0)
1209 (5.4)	90 10	SANDSTONE, a.a. – very fine to medium, minor coarse to very coarse, sub-angular, poor to moderate sorted, loose, good porosity. CLAYSTONE, a.a.	2.1 (99:1:0:0:0)
1212 (3.0)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	2.2 (100:0:0:0:0)
1215 (2.4)	90 10	SANDSTONE, a.a. – mostly medium to very coarse, sub-angular. CLAYSTONE, a.a.	2.6 (98:2:0:0:0)
1218 (8.0)	80 20	SANDSTONE, a.a. – sub-angular to sub-rounded, good porosity. CLAYSTONE, a.a.	1.9 (98:2:0:0:0)
1221 (7.9)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	2.2 (98:2:0:0:0)
1224 (2.7)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	1.8 (99:1:0:0:0)
1227 (4.7)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	1.9 (100:0:0:0:0)
1230 (5.5)	100	SANDSTONE, a.a.	1.8 (99:1:0:0:0)
1233 (7.1)	100	SANDSTONE, a.a – trace quartz crystal faces on some grains..	1.8 (99:1:0:0:0)
1236 (4.4)	100	SANDSTONE, a.a.	3.5 (100:0:0:0:0)
1239 (1.3)	100	SANDSTONE, a.a.	6.9 (100:0:0:0:0)
1242 (1.2)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	8.4 (100:0:0:0:0)
1245 (1.8)	100 Tr	SANDSTONE, a.a. – medium to very coarse, sub-angular to sub-rounded, good porosity. CLAYSTONE, a.a.	6.9 (100:0:0:0:0)
1248 (2.7)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	5.8 (100:0:0:0:0)
1251 (3.4)	80 20 Tr	SANDSTONE, a.a. CLAYSTONE, white, soft, amorphous, dispersive; also minor green to grey-green. COAL, very dark brown to black, lignitic.	5.0 (100:0:0:0:0)
1254 (12.9)	70 30	SANDSTONE, a.a. – clear to translucent, fine to very coarse. CLAYSTONE, a.a.	8.6 (100:0:0:0:0)
1257 (4.4)	70 30	SANDSTONE, clear to translucent, coarse to very coarse, sub-angular to sub-rounded, moderate sorted, loose quartz grains, trace pyrite nodules, good porosity. CLAYSTONE, white to pale grey-brown, soft, silty, dispersive; also light to moderate green, soft to firm.	17.5 (100:0:0:0:0)

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Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1260 (4.3)	60 40	SANDSTONE, a.a. CLAYSTONE, a.a.	42.6 (100:0:0:0:0)
1263 (2.3)	50 50	SANDSTONE, a.a. CLAYSTONE, a.a.	57.6 (100:0:0:0:0)
1266 (4.9)	40 60	SANDSTONE, a.a. CLAYSTONE, a.a.	25.2 (99:1:0:0:0)
1269 (4.5)	40 60	SANDSTONE, a.a. CLAYSTONE, white to pale green, grey-green, pale brown to grey-brown, soft to firm, occasionally silty, trace carbonaceous material.	37.5 (99:1:0:0:0)
1272 (2.6)	20 70	SANDSTONE, a.a. CLAYSTONE, a.a.	68.9 (100:0:0:0:0)
1275 (5.5)	20 80	SANDSTONE, a.a. CLAYSTONE, a.a.	42.4 (100:0:0:0:0)
1278 (6.9)	20 80	SANDSTONE, a.a. CLAYSTONE, a.a.	33.1 (99:1:0:0:0)
1281 (6.7)	20 80	SANDSTONE, a.a. CLAYSTONE, a.a.	42.8 (100:0:0:0:0)
1284 (7.1)	70 30	SANDSTONE, white, light to moderate grey, grey-green, bluish grey, fine to medium, sub-angular to sub-rounded, moderate sorted, loose quartz and volcano-lithic grains, common white calcite grains, trace mica and pyrite, fair inferred porosity. CLAYSTONE, a.a.	30.2 (99:1:0:0:0)
1287 (6.0)	100	SANDSTONE, a.a.	34.5 (99:1:0:0:0)
1290 (5.7)	100	SANDSTONE, a.a.	34.5 (99:1:0:0:0)
1293 (4.1)	100	SANDSTONE, a.a.	36.3 (99:1:0:0:0)
1296 (6.5)	100	SANDSTONE, clear to translucent, light to moderate grey to greenish grey, bluish grey, grey-black, fine to medium, occasionally coarse, sub-rounded, moderate sorted, loose quartz, feldspar and volcano-lithic grains, minor calcite, trace mica flakes, trace dispersive clay matrix, fair inferred porosity.	37.0 (99:1:0:0:0)
1299 (6.6)	100	SANDSTONE, a.a.	73.3 (99:1:0:0:0)
1302 (4.8)	100	SANDSTONE, a.a. – moderate dispersive clay matrix, fair inferred porosity.	29.0 (99:1:0:0:0)
1305 (3.0)	100	SANDSTONE, a.a.	35.3 (99:1:0:0:0)
1308 (3.4)	100	SANDSTONE, a.a.	88.2 (100:0:0:0:0)
1311 (3.1)	100	SANDSTONE, a.a. – moderate dispersive clay matrix, fair inferred porosity.	59.0 (100:0:0:0:0)
1314 (2.9)	100	SANDSTONE, a.a.	58.8 (99:1:0:0:0)
1317 (2.5)	100	SANDSTONE, a.a.	63.5 (99:1:0:0:0)
1320 (3.9)	100	SANDSTONE, clear to white, pale grey, grey-green, grey-black, fine to coarse, mostly medium, sub-rounded, moderate sorted loose quartz, quartzite and volcano-lithic grains, feldspathic, minor calcite, dispersive white clay matrix, fair inferred porosity.	60.2 (100:0:0:0:0)
1323 (8.1)	100	SANDSTONE, a.a.	40.5 (100:0:0:0:0)
1326 (7.5)	100	SANDSTONE, a.a.	48.7 (100:0:0:0:0)
1329 (5.8)	100	SANDSTONE, a.a.	71.0 (100:0:0:0:0)
1332 (5.7)	100	SANDSTONE, a.a.	84.3 (100:0:0:0:0)
1335 (4.9)	100	SANDSTONE, a.a.	98.5 (100:0:0:0:0)
1338 (5.0)	100	SANDSTONE, a.a.	104.0 (100:0:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1341 (5.0)	70 30	SANDSTONE, a.a. CLAYSTONE, light to moderate grey, soft to firm, silty in part.	84.2 (100:0:0:0:0)
1344 (4.6)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	105.7 (100:0:0:0:0)
1347 (4.8)	100	SANDSTONE, a.a. – moderate dispersive clay matrix, fair inferred porosity.	80.5 (100:0:0:0:0)
1350 (5.6)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	69.0 (100:0:0:0:0)
1353 (4.9)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	126.8 (100:0:0:0:0)
1356 (6.5)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	147.8 (100:0:0:0:0)
1359 (5.2)	100	SANDSTONE, translucent, pale grey to moderate grey, grey-green, grey-black, fine to medium, occasional coarse, sub-angular to sub-rounded, moderate sorted, predominantly loose quartz, quartzite, feldspar and volcano-lithic grains, moderate to abundant dispersive clay matrix, trace mica, common calcite grains, fair inferred porosity.	77.7 (100:0:0:0:0)
1362 (4.4)	100	SANDSTONE, a.a.	176.5 (99:1:0:0:0)
1365 (6.8)	60 40	SANDSTONE, a.a. CLAYSTONE, pale blue-grey, pale brown, soft.	147.7 (99:1:0:0:0)
1368 (6.2)	70 30	SANDSTONE, a.a. CLAYSTONE, a.a.	85.0 (100:0:0:0:0)
1371 (5.8)	70 30	SANDSTONE, a.a. CLAYSTONE, a.a.	91.8 (99:1:0:0:0)
1374 (6.2)	80 20	SANDSTONE, white to light grey, grey-green, green, bluish grey, grey-black, fine to medium and occasional coarse, sub-angular to sub-rounded, moderate sorted quartz, quartzite, feldspar and volcano-lithic grains, minor calcite, dispersive clay matrix, friable to loose, fair inferred porosity. CLAYSTONE, a.a.	84.7 (99:1:0:0:0)
1377 (4.9)	70 30	SANDSTONE, a.a. CLAYSTONE, a.a.	133.0 (99:1:0:0:0)
1380 (6.5)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	149.2 (99:1:0:0:0)
1383 (8.0)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	224.2 (98:2:0:0:0)
1386 (4.9)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	176.0 (98:2:0:0:0)
1389 (4.0)	70 30	SANDSTONE, a.a. CLAYSTONE, white to pale grey, pale brown, soft, dispersive, trace carbonaceous material.	200.5 (99:1:0:0:0)
1392 (3.4)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	292.0 (99:1:0:0:0)
1395 (6.9)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	295.2 (99:1:0:0:0)
1398 (4.0)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	290.0 (99:1:0:0:0)
1401 (5.8)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	288.7 (99:1:0:0:0)
1404 (10.4)	90 10	SANDSTONE, white, light to moderate grey to grey-green, bluish grey, grey-black, fine to medium, some coarse, sub-angular, poor to moderate sorted, friable to loose quartz, feldspar and volcano-lithic grains, trace mica, moderate to abundant argillaceous matrix, common calcite grains, fair inferred porosity. CLAYSTONE, a.a.	236.2 (99:1:0:0:0)
1407 (5.7)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	246.2 (99:1:0:0:0)
1410 (6.4)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	308.2 (99:1:0:0:0)
1413 (5.9)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	259.3 (99:1:0:0:0)
1416 (3.8)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	271.0 (99:1:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1419 (2.9)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	417.5 (99:1:0:0:0)
1422 (4.3)	90 10	SANDSTONE, white to greenish white, greenish grey, grey, grey-black, fine to medium, occasionally coarse, sub-angular to sub-rounded, moderate sorted, loose quartz, feldspar and volcano-lithic grains, common calcite, trace mica flakes, moderate to abundant dispersive clay matrix, fair inferred porosity. CLAYSTONE, a.a.	302.3 (99:1:0:0:0)
1425 (3.3)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	207.5 (99:1:0:0:0)
1428 (3.5)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	314.8 (99:1:0:0:0)
1431 (6.0)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	228.2 (99:1:0:0:0)
1434 (4.2)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	194.3 (99:1:0:0:0)
1437 (4.5)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	196.8 (99:1:0:0:0)
1440 (5.5)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	351.3 (99:1:0:0:0)
1443 (5.3)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	400.0 (99:1:0:0:0)
1446 (6.1)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	199.3 (99:1:0:0:0)
1449 (6.1)	50 50	SANDSTONE, a.a. CLAYSTONE, white to pale grey, pale grey-brown, soft, dispersive, trace micro-micaceous and carbonaceous material.	131.5 (99:1:0:0:0)
1452 (6.6)	70 30	SANDSTONE, a.a. CLAYSTONE, a.a. – silty in part.	85.8 (99:1:0:0:0)
1455 (7.1)	40 60	SANDSTONE, a.a. CLAYSTONE, pale grey, pale brown, soft to firm, silty and carbonaceous in part, tuffaceous in part.	79.5 (99:1:0:0:0)
1458 (3.9)	40 60	SANDSTONE, a.a. CLAYSTONE, a.a.	98.8 (99:1:0:0:0)
1461 (4.6)	40 60	SANDSTONE, a.a. CLAYSTONE, a.a.	180.0 (99:1:0:0:0)
1464 (5.5)	70 30	SANDSTONE, a.a. CLAYSTONE, a.a.	85.2 (99:1:0:0:0)
1467 (3.7)	70 30	SANDSTONE, white to pale bluish grey, fine to medium, sub-rounded, moderate sorted quartz and volcano-lithic grains, moderate to abundant dispersive clay matrix, slightly calcareous, friable, fair inferred porosity. CLAYSTONE, a.a.	98.8 (100:0:0:0:0)
1470 (4.1)	40 60	SANDSTONE, a.a. CLAYSTONE, a.a.	100.3 (100:0:0:0:0)
1473 (4.0)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	114.3 (100:0:0:0:0)
1476 (4.8)	80 20	SANDSTONE, a.a. – minor red to red-brown volcano-lithic grains. CLAYSTONE, a.a.	98.0 (100:0:0:0:0)
1479 (5.0)	80 20	SANDSTONE, white to pale grey, bluish grey to greenish grey, grey-black, fine to medium, occasionally coarse, sub-rounded, moderate sorted, friable to loose quartz, feldspar and greenish grey to grey-black with minor red to red-brown volcano-lithic grains, minor calcite, dispersive clay matrix, fair inferred porosity. CLAYSTONE, a.a.	95.2 (100:0:0:0:0)
1482 (6.1)	100	SANDSTONE, a.a.	76.2 (100:0:0:0:0)
1485 (4.5)	80 20	SANDSTONE, a.a. CLAYSTONE, light to moderate grey, grey-brown, soft to firm, silty with carbonaceous specks in part.	112.0 (99:1:0:0:0)
1488 (4.7)	60 40	SANDSTONE, a.a. CLAYSTONE, a.a. – also pale greenish grey, soft, dispersive.	72.7 (100:0:0:0:0)
1491 (4.8)	60 40	SANDSTONE, a.a. – friable aggregates with an argillaceous matrix, poor to fair inferred porosity. CLAYSTONE, a.a. – grades to siltstone in part.	104.0 (100:0:0:0:0)

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Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1494 (5.1)	60 40	SANDSTONE, a.a. CLAYSTONE, a.a.	99.2 (100:0:0:0:0)
1497 (5.6)	90 10	SANDSTONE, white to pale bluish grey, moderate grey to grey-black, fine to medium, occasionally coarse, sub-angular to sub-rounded, moderate sorted quartz and volcano-lithic grains, trace mica flakes, dispersive clay matrix, friable, fair inferred porosity. CLAYSTONE, a.a.	83.5 (100:0:0:0:0)
1500 (4.0)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	70.5 (100:0:0:0:0)
1503 (4.3)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	53.8 (100:0:0:0:0)
1506 (3.4)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	81.8 (100:0:0:0:0)
1509 (5.7)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	62.7 (100:0:0:0:0)
1512 (5.0)	50 50	SANDSTONE, a.a. CLAYSTONE, white to pale brown, pale grey, soft, silty in part.	42.5 (100:0:0:0:0)
1515 (6.4)	30 70	SANDSTONE, a.a. CLAYSTONE, a.a.	43.0 (99:1:0:0:0)
1518 (6.4)	20 80	SANDSTONE, a.a. CLAYSTONE, a.a. – silty with carbonaceous specks.	53.5 (99:1:0:0:0)
1521 (4.9)	30 70	SANDSTONE, a.a. CLAYSTONE, pale brown, light to moderate grey, grey-green, moderate to dark brown, soft to firm, silty and carbonaceous in part, trace plant fragments.	57.7 (99:1:0:0:0)
1524 (5.8)	40 60	SANDSTONE, a.a. CLAYSTONE, a.a.	54.5 (99:1:0:0:0)
1527 (6.7)	50 50	SANDSTONE, a.a. CLAYSTONE, a.a.	33.3 (99:1:0:0:0)
1530 (4.8)	60 40	SANDSTONE, a.a. CLAYSTONE, a.a.	60.5 (99:1:0:0:0)
1533 (5.0)	60 40	SANDSTONE, light to moderate grey, grey-green, fine to medium, occasionally coarse, sub-angular to sub-rounded, moderate sorted quartz and volcano-lithic grains, moderate to abundant clay matrix, friable, poor to fair inferred porosity. CLAYSTONE, a.a.	62.0 (99:1:0:0:0)
1536 (6.5)	50 50	SANDSTONE, a.a. CLAYSTONE, a.a.	38.7 (99:1:0:0:0)
1539 (7.0)	30 70	SANDSTONE, a.a. CLAYSTONE, a.a.	79.2 (99:1:0:0:0)
1542 (6.3)	20 80	SANDSTONE, a.a. CLAYSTONE, white to pale brown, soft, dispersive, minor dark brown, carbonaceous and silty.	37.8 (99:1:0:0:0)
1545 (7.8)	20 80	SANDSTONE, a.a. CLAYSTONE, light to moderate greenish grey, grey, grey-brown, soft to firm, silty and sandy in part; minor dark brown, very carbonaceous.	29.0 (99:1:0:0:0)
1548 (6.8)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	39.2 (99:1:0:0:0)
1551 (3.7)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	59.7 (100:0:0:0:0)
1554 (3.9)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	40.5 (100:0:0:0:0)
1557 (4.0)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	38.8 (100:0:0:0:0)
1560 (3.6)	70 30	SANDSTONE, a.a. CLAYSTONE, a.a.	78.5 (100:0:0:0:0)
1563 (4.4)	70 30	SANDSTONE, a.a. CLAYSTONE, a.a.	53.7 (99:1:0:0:0)

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Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1566 (6.2)	70 30	SANDSTONE, grey to bluish grey, greenish grey, fine to medium, occasional coarse, sub-rounded, moderate sorted, friable to hard, quartzose, feldspathic, abundant volcano-lithics, minor carbonaceous specks and laminae, common calcite, trace mica flakes and pyrite, moderate to abundant clay matrix, poor to fair porosity. CLAYSTONE, light to dark grey, grey-green, grey-brown, firm, occasionally carbonaceous.	33.0 (100:0:0:0:0)
1569 (9.2)		CORE #1 1566.5 – 1584.5m. Recovered 100%	20.3 (100:0:0:0:0)
1572 (15.6)		CORE #1 1566.5 – 1584.5m. Recovered 100%	20.0 (100:0:0:0:0)
1575 (14.5)		CORE #1 1566.5 – 1584.5m. Recovered 100%	28.0 (100:0:0:0:0)
1578 (13.3)		CORE #1 1566.5 – 1584.5m. Recovered 100%	32.3 (99:1:0:0:0)
1581 (17.1)		CORE #1 1566.5 – 1584.5m. Recovered 100%	19.5 (100:0:0:0:0)
1584 (15.3)		CORE #1 1566.5 – 1584.5m. Recovered 100%	17.8 (100:0:0:0:0)
1587 (8.3)	100	SANDSTONE, a.a. – trace mica flakes and pyrite.	21.2 (100:0:0:0:0)
1590 (5.1)	100	SANDSTONE, a.a.	51.3 (100:0:0:0:0)
1593 (4.6)	80 20	SANDSTONE, white, green, grey-green, fine to medium, sub-angular to sub-rounded, moderate sorted quartz and volcano-lithic grains, dispersive clay matrix, common calcite, rare pyrite and mica flakes, poor to fair inferred porosity. CLAYSTONE, a.a.	46.2 (100:0:0:0:0)
1596 (4.0)	60 40	SANDSTONE, a.a. – very fine to medium, very argillaceous. CLAYSTONE, grey-brown, green to grey-green, pale brown, firm, silty and sandy in part.	59.8 (100:0:0:0:0)
1599 (5.0)	50 50	SANDSTONE, a.a. – trace carbonaceous material. CLAYSTONE, a.a.	51.5 (100:0:0:0:0)
1602 (5.4)	50 50	SANDSTONE, a.a. CLAYSTONE, a.a.	78.8 (100:0:0:0:0)
1605 (6.1)	50 50	SANDSTONE, a.a. CLAYSTONE, a.a.	64.3 (100:0:0:0:0)
1608 (4.2)	40 60	SANDSTONE, a.a. – very fine to fine, occasionally medium. CLAYSTONE, a.a.	70.3 (100:0:0:0:0)
1611 (4.1)	50 60	SANDSTONE, a.a. CLAYSTONE, a.a.	98.2 (100:0:0:0:0)
1614 (6.4)	70 30	SANDSTONE, a.a. – very fine to medium, trace carbonaceous material, moderate to abundant clay matrix, poor porosity. CLAYSTONE, a.a.	75.5 (100:0:0:0:0)
1617 (4.9)	40 60	SANDSTONE, a.a. CLAYSTONE, a.a. – silty and sandy in part.	71.3 (100:0:0:0:0)
1620 (4.9)	50 50	SANDSTONE, a.a. CLAYSTONE, a.a.	75.3 (100:0:0:0:0)
1623 (5.2)	70 30	SANDSTONE, a.a. CLAYSTONE, a.a.	81.7 (100:0:0:0:0)
1626 (4.1)	50 50	SANDSTONE, a.a. CLAYSTONE, a.a.	86.3 (99:1:0:0:0)
1629 (5.7)	30 70	SANDSTONE, a.a. CLAYSTONE, white to pale grey, pale brown, grey-brown, dispersive, silty and sandy in part, minor dark brown, shaly, carbonaceous and grades to coal.	42.5 (99:1:0:0:0)
1632 (6.8)	20 80	SANDSTONE, a.a. CLAYSTONE, a.a.	37.0 (100:0:0:0:0)
1635 (5.0)	20 60 20	SANDSTONE, a.a. CLAYSTONE, white to pale grey, soft, dispersive; also moderate to dark grey to grey-green, grey-brown, firm, silty, carbonaceous and tuffaceous in part. TUFF, white to pale grey-brown, silty in part.	75.2 (100:0:0:0:0)

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Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1638 (5.4)	20 80	SANDSTONE, a.a. CLAYSTONE, a.a.	69.0 (100:0:0:0:0)
1641 (2.5)	80 20	SANDSTONE, white, grey-green, moderate to dark grey, fine to medium, sub-rounded, moderate sorted, volcano-lithic, trace carbonaceous material, slightly calcareous, moderate to abundant clay matrix, friable, poor porosity. CLAYSTONE, a.a.	113.8 (100:0:0:0:0)
1644 (2.1)	80 20 Tr	SANDSTONE, a.a. CLAYSTONE, a.a. TUFF, a.a.	111.0 (100:0:0:0:0)
1647 (3.4)	90 10	SANDSTONE, a.a. – volcano-lithic, feldspathic. CLAYSTONE, a.a.	94.5 (100:0:0:0:0)
1650 (3.7)	100 Tr	SANDSTONE, a.a. – occasionally coarse, poor to fair porosity. CLAYSTONE, a.a.	77.8 (100:0:0:0:0)
1653 (4.6)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	73.0 (100:0:0:0:0)
1656 (2.7)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	110.2 (100:0:0:0:0)
1659 (2.8)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	114.0 (100:0:0:0:0)
1662 (3.3)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	85.0 (100:0:0:0:0)
1665 (3.5)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	105.0 (100:0:0:0:0)
1668 (3.6)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	83.5 (100:0:0:0:0)
1671 (4.1)	100 Tr	SANDSTONE, a.a. CLAYSTONE, a.a.	68.2 (100:0:0:0:0)
1674 (3.6)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	75.8 (100:0:0:0:0)
1677 (3.6)	80 20	SANDSTONE, a.a. CLAYSTONE, pale to moderate brown, pale to moderate grey, soft to firm, silty and sandy in part.	136.5 (99:1:0:0:0)
1680 (4.4)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	70.7 (100:0:0:0:0)
1683 (4.7)	40 60	SANDSTONE, a.a. CLAYSTONE, a.a.	52.0 (100:0:0:0:0)
1686 (3.9)	40 60	SANDSTONE, a.a. CLAYSTONE, a.a.	55.3 (100:0:0:0:0)
1689 (5.3)	30 70	SANDSTONE, a.a. CLAYSTONE, a.a.	48.8 (100:0:0:0:0)
1692 (4.2)	50 50	SANDSTONE, a.a. CLAYSTONE, a.a.	82.0 (100:0:0:0:0)
1695 (3.6)	50 50	SANDSTONE, white to green, very fine to medium, sub-rounded, moderate sorted, volcano-lithic, feldspathic, very argillaceous, trace carbonaceous material, calcareous in part, very poor porosity. CLAYSTONE, a.a.	89.0 (100:0:0:0:0)
1698 (3.4)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	116.2 (100:0:0:0:0)
1701 (4.2)	80 20	SANDSTONE, a.a. CLAYSTONE, a.a.	77.3 (100:0:0:0:0)
1704 (4.3)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	62.5 (100:0:0:0:0)
1707 (4.1)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	59.5 (100:0:0:0:0)
1710 (3.6)	90 10	SANDSTONE, a.a. – green, feldspathic and volcano-lithic, very argillaceous, poor porosity. CLAYSTONE, a.a.	63.3 (100:0:0:0:0)
1713 (4.2)	90 10	SANDSTONE, a.a. – white to light green, grey-green, poor porosity. CLAYSTONE, a.a.	60.3 (100:0:0:0:0)
1716 (4.5)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	73.2 (100:0:0:0:0)
1719 (4.5)	90 10	SANDSTONE, a.a. CLAYSTONE, a.a.	63.0 (100:0:0:0:0)

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Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1722	100	SANDSTONE, a.a.	68.7
(4.6)	Tr	CLAYSTONE, a.a.	(100:0:0:0:0)
1725	90	SANDSTONE, a.a.	62.8
(4.6)	10	CLAYSTONE, a.a.	(100:0:0:0:0)
1728	90	SANDSTONE, a.a. – abundant calcite grains.	66.0
(5.1)	10	CLAYSTONE, a.a.	(100:0:0:0:0)
1731	90	SANDSTONE, a.a.	55.0
(4.7)	10	CLAYSTONE, a.a.	(100:0:0:0:0)
1734	50	SANDSTONE, a.a. – slightly calcareous.	72.7
(4.1)	50	CLAYSTONE, moderate grey-green, grey-brown, soft to firm, carbonaceous and silty in part.	(100:0:0:0:0)
1737	20	SANDSTONE, a.a.	71.8
(5.3)	80	CLAYSTONE, a.a.	(100:0:0:0:0)
1740	30	SANDSTONE, a.a.	70.8
(4.8)	70	CLAYSTONE, a.a. – grades to siltstone.	(100:0:0:0:0)
1743	80	SANDSTONE, a.a.	77.5
(3.6)	20	CLAYSTONE, a.a.	(100:0:0:0:0)
1746	80	SANDSTONE, a.a.	64.2
(4.1)	20	CLAYSTONE, a.a.	(100:0:0:0:0)
1749	90	SANDSTONE, a.a.	49.8
(5.6)	10	CLAYSTONE, a.a.	(100:0:0:0:0)
1752	100	SANDSTONE, white to green, grey-green to grey-black, fine to medium,	43.8
(5.5)		sub-rounded, moderate sorted, volcano-lithic, feldspathic, abundant clay matrix, friable to moderately hard, poor porosity.	(100:0:0:0:0)
	Tr	CLAYSTONE, a.a.	
1755	100	SANDSTONE, a.a.	81.7
(4.9)	Tr	CLAYSTONE, a.a.	(100:0:0:0:0)
1758	90	SANDSTONE, a.a.	67.5
(4.7)	10	CLAYSTONE, a.a.	(100:0:0:0:0)
1761	90	SANDSTONE, a.a. – common pinkish feldspar, abundant clay matrix,	44.3
(5.2)		poor porosity.	(100:0:0:0:0)
	10	CLAYSTONE, a.a.	
1764	100	SANDSTONE, a.a. – sub-angular to sub-rounded, poor porosity.	40.0
(5.9)	Tr	CLAYSTONE, a.a.	(100:0:0:0:0)
1767	100	SANDSTONE, a.a.	48.7
(5.2)	Tr	CLAYSTONE, a.a.	(100:0:0:0:0)
1770	100	SANDSTONE, a.a.	39.7
(5.7)	Tr	CLAYSTONE, a.a.	(100:0:0:0:0)
1773	90	SANDSTONE, a.a. – fine to medium, common pinkish feldspar and	53.2
(6.1)		calcite, abundant dispersive clay matrix, poor porosity.	(100:0:0:0:0)
	10	CLAYSTONE, a.a.	
1776	100	SANDSTONE, a.a. – moderate to abundant calcite .	71.3
(4.7)	Tr	CLAYSTONE, a.a.	(99:1:0:0:0)
1779	70	SANDSTONE, a.a.	55.8
(4.5)	30	CLAYSTONE, a.a.	(100:0:0:0:0)
1782	20	SANDSTONE, a.a.	59.7
(5.1)	80	CLAYSTONE, a.a.	(99:1:0:0:0)
1785	30	SANDSTONE, a.a.	58.7
(6.2)	70	CLAYSTONE, a.a.	(99:1:0:0:0)
1788	30	SANDSTONE, a.a.	99.5
(3.8)	70	CLAYSTONE, a.a.	(100:0:0:0:0)
1791	30	SANDSTONE, a.a.	73.7
(5.3)	70	CLAYSTONE, a.a.	(99:1:0:0:0)
1794	60	SANDSTONE, a.a.	83.7
(4.7)	40	CLAYSTONE, a.a.	(100:0:0:0:0)
1797	70	SANDSTONE, a.a. – very fine to medium, poor porosity.	69.7
(5.5)	30	CLAYSTONE, a.a.	(99:1:0:0:0)
1800	80	SANDSTONE, a.a. - trace carbonaceous material, very poor porosity.	60.5
(6.4)	20	CLAYSTONE, a.a.	(99:1:0:0:0)
1803	80	SANDSTONE, a.a.	57.5
(6.5)	20	CLAYSTONE, a.a.	(99:1:0:0:0)

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Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1806 (5.7)	80	SANDSTONE, white, green, grey-green, very fine to medium, sub-angular to sub-rounded, moderate sorted quartz, pinkish feldspar and green, grey and grey-green volcano-lithic grains, common calcite grains, abundant argillaceous matrix, minor carbonaceous material, poor porosity.	70.5 (99:1:0:0:0)
	20	CLAYSTONE, a.a.	
1809 (6.5)	80	SANDSTONE, grey to grey-brown, grey-green, very fine to fine, sub-angular to sub-rounded, moderate sorted, volcano-lithic, feldspathic, trace carbonaceous material, abundant clay matrix, silty, very poor porosity.	49.3 (99:1:0:0:0)
	20	CLAYSTONE, a.a.	
1812 (7.8)	80	SANDSTONE, a.a. – mostly grey-green to green.	35.0 (99:1:0:0:0)
	20	CLAYSTONE, a.a.	
1815 (8.4)	90	SANDSTONE, a.a.	39.8 (99:1:0:0:0)
	10	CLAYSTONE, a.a.	
1818 (6.8)	100	SANDSTONE, a.a. – very fine to medium, poor to moderate sorted, very argillaceous, poor porosity.	50.7 (99:1:0:0:0)
1821 (7.5)	80	SANDSTONE, a.a. – grades to siltstone in part.	43.8 (99:1:0:0:0)
	20	CLAYSTONE, pale grey, grey-green, brown, soft, silty.	
1824 (7.2)	90	SANDSTONE, a.a.	46.5 (99:1:0:0:0)
	10	CLAYSTONE, a.a.	
1827 (6.6)	80	SANDSTONE, a.a.	49.3 (100:0:0:0:0)
	20	CLAYSTONE, a.a.	
1830 (5.0)	80	SANDSTONE, a.a.	65.2 (100:0:0:0:0)
	20	CLAYSTONE, a.a.	
1833 (5.1)	90	SANDSTONE, a.a. – very argillaceous.	57.8 (100:0:0:0:0)
	10	CLAYSTONE, a.a.	
1836 (5.4)	90	SANDSTONE, a.a.	133.0 (99:1:0:0:0)
	10	CLAYSTONE, a.a.	
1839 (6.0)	90	SANDSTONE, a.a. – very argillaceous.	50.3 (99:1:0:0:0)
	10	CLAYSTONE, a.a.	
1842 (6.7)	90	SANDSTONE, a.a. – very calcareous.	39.0 (100:0:0:0:0)
	10	CLAYSTONE, a.a.	
1845 (6.0)	20	SANDSTONE, a.a.	39.5 (100:0:0:0:0)
	80	CLAYSTONE, a.a.	
1848 (6.0)	90	SANDSTONE, a.a.	50.0 (100:0:0:0:0)
	10	CLAYSTONE, a.a.	
1851 (5.4)	90	SANDSTONE, a.a. – moderately calcareous.	71.7 (100:0:0:0:0)
	10	CLAYSTONE, a.a.	
1854 (5.0)	20	SANDSTONE, a.a.	68.2 (99:1:0:0:0)
	80	CLAYSTONE, a.a.	
1857 (6.1)	40	SANDSTONE, a.a.	56.2 (99:1:0:0:0)
	60	CLAYSTONE, light to moderate brown, soft to firm, carbonaceous and silty in part; also some pale to moderate grey and grey-green.	
1860 (6.5)	30	SANDSTONE, a.a.	57.7 (99:1:0:0:0)
	70	CLAYSTONE, a.a. – pale brown to pale grey-brown.	
1863 (5.4)	30	SANDSTONE, a.a.	64.0 (99:1:0:0:0)
	70	CLAYSTONE, a.a.	
1866 (5.3)	30	SANDSTONE, a.a. – moderate to very calcareous.	87.0 (99:1:0:0:0)
	70	CLAYSTONE, a.a.	
1869 (6.4)	30	SANDSTONE, a.a. – very calcareous.	35.5 (99:1:0:0:0)
	70	CLAYSTONE, pale grey to grey-brown, soft to firm, occasionally silty.	
1872 (4.6)	20	SANDSTONE, a.a.	69.7 (99:1:0:0:0)
	80	CLAYSTONE, a.a.	
1875 (5.4)	20	SANDSTONE, a.a.	49.2 (99:1:0:0:0)
	80	CLAYSTONE, a.a.	
1878 (4.8)	20	SANDSTONE, a.a.	54.0 (99:1:0:0:0)
	80	CLAYSTONE, a.a.	
1881 (6.2)	20	SANDSTONE, a.a.	58.5 (99:1:0:0:0)
	80	CLAYSTONE, a.a.	
1884 (5.6)	20	SANDSTONE, a.a. – moderately calcareous.	42.0 (99:1:0:0:0)
	80	CLAYSTONE, a.a.	
1887 (6.1)	30	SANDSTONE, a.a.	62.7 (99:1:0:0:0)
	70	CLAYSTONE, a.a.	

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Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1890 (4.7)	70	SANDSTONE, white to pinkish white, pale green to grey-green, fine to medium, occasionally coarse, sub-angular to sub-rounded, poor to moderate sorted, quartz, pinkish white feldspar and green and grey-black volcano-lithic grains, slightly to moderately calcareous, moderate to abundant clay matrix, friable, poor porosity.	243.3 (99:1:0:0:0)
	30	CLAYSTONE, a.a.	
1893 (4.3)	90	SANDSTONE, a.a. – trace carbonaceous material.	197.8 (99:1:0:0:0)
	10	CLAYSTONE, a.a.	
1896 (4.2)	90	SANDSTONE, a.a.	206.5 (99:1:0:0:0)
	10	CLAYSTONE, a.a.	
1899 (5.0)	70	SANDSTONE, a.a.	178.2 (99:1:0:0:0)
	30	CLAYSTONE, a.a.	
1902 (3.8)	70	SANDSTONE, a.a. – very calcareous.	208.8 (99:1:0:0:0)
	30	CLAYSTONE, a.a.	
1905 (4.1)	70	SANDSTONE, a.a. – slightly to moderately calcareous.	113.3 (100:0:0:0:0)
	30	CLAYSTONE, a.a.	
1908 (7.1)	70	SANDSTONE, a.a. – very argillaceous, poor porosity.	74.0 (99:1:0:0:0)
	30	CLAYSTONE, a.a.	
1911 (5.8)	70	SANDSTONE, a.a. – very calcareous and argillaceous.	86.0 (99:1:0:0:0)
	30	CLAYSTONE, a.a.	
1914 (5.7)	70	SANDSTONE, a.a.	96.7 (99:1:0:0:0)
	30	CLAYSTONE, a.a.	
1917 (6.2)	40	SANDSTONE, a.a.	84.3 (99:1:0:0:0)
	60	CLAYSTONE, light grey-brown, light grey, minor dark brown, soft to firm, minor shaly and carbonaceous.	
1920 (7.3)	20	SANDSTONE, a.a.	74.7 (99:1:0:0:0)
	80	CLAYSTONE, a.a.	
1923 (7.4)	Tr	SANDSTONE, a.a.	50.3 (99:1:0:0:0)
	100	CLAYSTONE, a.a.	
1926 (7.4)	10	SANDSTONE, a.a.	49.8 (99:1:0:0:0)
	90	CLAYSTONE, a.a.	
1929 (5.2)	20	SANDSTONE, a.a.	109.7 (99:1:0:0:0)
	80	CLAYSTONE, light to dark grey, some pale grey to grey-brown, soft to firm, carbonaceous in part.	
1932 (4.8)	30	SANDSTONE, a.a.	92.2 (99:1:0:0:0)
	70	CLAYSTONE, a.a.	
1935 (5.3)	50	SANDSTONE, a.a.	65.7 (100:0:0:0:0)
	50	CLAYSTONE, a.a.	
1938 (5.5)	80	SANDSTONE, a.a.	67.0 (100:0:0:0:0)
	20	CLAYSTONE, a.a.	
1941 (7.7)	80	SANDSTONE, a.a.	91.0 (99:1:0:0:0)
	20	CLAYSTONE, a.a.	
1944 (12.3)	60	SANDSTONE, white, grey, grey-green, very fine to fine, sub-angular to sub-rounded, poor to moderate sorted, volcano-lithic, feldspathic, abundant clay matrix, trace calcareous, friable to moderately hard, poor porosity.	131.2 (99:1:0:0:0)
	40	CLAYSTONE, moderate to dark grey, firm, silty and carbonaceous in part.	
1947 (7.5)	60	SANDSTONE, a.a.	136.7 (99:1:0:0:0)
	40	CLAYSTONE, a.a.	
1950 (5.3)	80	SANDSTONE, a.a.	87.5 (100:0:0:0:0)
	20	CLAYSTONE, a.a.	
1953 (5.6)	80	SANDSTONE, a.a. – moderately calcareous.	67.5 (100:0:0:0:0)
	20	CLAYSTONE, a.a.	
1956 (5.9)	80	SANDSTONE, a.a. – fine to medium, poor to fair porosity.	57.8 (100:0:0:0:0)
	20	CLAYSTONE, a.a.	
1959 (7.5)	90	SANDSTONE, a.a. – moderately calcareous, trace carbonaceous material.	46.8 (99:1:0:0:0)
	10	CLAYSTONE, a.a.	
1962 (6.6)	90	SANDSTONE, a.a. – very argillaceous.	41.5 (99:1:0:0:0)
	10	CLAYSTONE, a.a.	
1965 (6.3)	90	SANDSTONE, a.a. – very calcareous.	51.3 (99:1:0:0:0)
	10	CLAYSTONE, a.a.	

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Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
1968 (6.9)	90	SANDSTONE, a.a. – white to grey, moderate to dark grey-green, grey-black, fine to medium, sub-angular to sub-rounded, poor to moderate sorted, volcano-lithic, feldspathic, abundant argillaceous matrix, moderately calcareous, friable, poor to fair porosity.	38.0 (99:1:0:0:0)
	10	CLAYSTONE, a.a.	
1971 (5.9)	80	SANDSTONE, a.a. – trace carbonaceous material.	92.8 (99:1:0:0:0)
	20	CLAYSTONE, moderate to dark grey, firm, silty in part, trace carbonaceous specks.	
1974 (6.1)	70	SANDSTONE, a.a. – strongly calcareous.	66.3 (100:0:0:0:0)
	30	CLAYSTONE, a.a.	
1977 (7.2)	90	SANDSTONE, a.a.	100.5 (99:1:0:0:0)
	10	CLAYSTONE, a.a.	
1980 (6.1)	80	SANDSTONE, a.a. – moderately calcareous.	67.7 (100:0:0:0:0)
	20	CLAYSTONE, a.a.	
1983 (6.7)	80	SANDSTONE, a.a.	62.3 (100:0:0:0:0)
	20	CLAYSTONE, a.a.	
1986 (8.1)	30	SANDSTONE, a.a.	57.5 (99:1:0:0:0)
	70	CLAYSTONE, light to moderate grey, grey-brown, brown, soft to occasionally z.	
1989 (7.8)	20	SANDSTONE, a.a.	53.2 (99:1:0:0:0)
	80	CLAYSTONE, a.a.	
1992 (5.9)	70	SANDSTONE, a.a. – very fine to medium, very calcareous, poor porosity.	74.2 (100:0:0:0:0)
	30	CLAYSTONE, a.a.	
1995 (7.6)	60	SANDSTONE, a.a. – moderately calcareous, very argillaceous.	84.7 (99:1:0:0:0)
	40	CLAYSTONE, a.a.	
1998 (8.3)	10	SANDSTONE, a.a.	65.2 (99:1:0:0:0)
	90	CLAYSTONE, a.a.	
2001 (7.0)	10	SANDSTONE, a.a.	47.2 (99:1:0:0:0)
	90	CLAYSTONE, a.a.	
2004 (7.7)	10	SANDSTONE, a.a.	67.5 (99:1:0:0:0)
	90	CLAYSTONE, a.a. – silty in part.	
2007 (8.8)	30	SANDSTONE, white to pale grey, very fine to fine, sub-angular to sub-rounded, moderate sorted, lithic, silty, minor carbonaceous material, very argillaceous, calcareous in part, poor porosity.	52.2 (99:1:0:0:0)
	70	CLAYSTONE, a.a.	
2010 (6.2)	70	SANDSTONE, a.a. – very fine to medium, very argillaceous, calcareous in part, poor porosity.	63.2 (100:0:0:0:0)
	30	CLAYSTONE, a.a.	
2013 (6.3)	70	SANDSTONE, a.a.	65.0 (100:0:0:0:0)
	30	CLAYSTONE, a.a.	
2016 (7.1)	70	SANDSTONE, a.a.	51.2 (100:0:0:0:0)
	30	CLAYSTONE, a.a.	
2019 (7.4)	70	SANDSTONE, a.a.	50.3 (100:0:0:0:0)
	30	CLAYSTONE, a.a.	
2022 (8.1)	80	SANDSTONE, a.a. – very fine to fine, very calcareous, poor porosity.	47.8 (100:0:0:0:0)
	20	CLAYSTONE, a.a.	
2025 (7.2)	60	SANDSTONE, a.a.	52.5 (100:0:0:0:0)
	40	CLAYSTONE, a.a.	
2028 (7.0)	70	SANDSTONE, a.a. – very fine to fine, very calcareous, very argillaceous, trace carbonaceous material, very poor porosity.	74.3 (100:0:0:0:0)
	30	CLAYSTONE, a.a.	
2031 (6.8)	70	SANDSTONE, a.a.	59.2 (100:0:0:0:0)
	30	CLAYSTONE, moderate to dark grey, grey-brown, firm, minor dark grey-brown to brown-black, very carbonaceous.	
2034 (6.9)	70	SANDSTONE, a.a.	71.3 (100:0:0:0:0)
	30	CLAYSTONE, a.a.	
2037 (8.2)	50	SANDSTONE, a.a.	82.0 (99:1:0:0:0)
	50	CLAYSTONE, a.a. – grades to siltstone in part.	
2040 (8.4)	20	SANDSTONE, a.a. – slightly calcareous.	39.2 (99:1:0:0:0)
	80	CLAYSTONE, a.a.	
2043 (6.6)	20	SANDSTONE, a.a.	67.0 (99:1:0:0:0)
	80	CLAYSTONE, a.a.	

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
2046 (9.6)	Tr 100	SANDSTONE, a.a. CLAYSTONE, moderate to dark grey, grey-brown, firm, grades to siltstone in part, minor carbonaceous specks.	63.3 (99:1:0:0:0)
2049 (7.2)	Tr 100	SANDSTONE, a.a. CLAYSTONE, a.a. – minor very dark brown, very carbonaceous and grades to lignite / coal.	120.5 (99:1:0:0:0)
2052 (8.0)	Tr 100	SANDSTONE, a.a. CLAYSTONE, a.a.	127.3 (99:1:0:0:0)
2055 (9.7)	10 90	SANDSTONE, a.a. CLAYSTONE, a.a.	64.5 (99:1:0:0:0)
2058 (8.1)	70 30	SANDSTONE, white to grey-green, pale grey, very fine to fine. Occasionally medium, sub-angular to sub-rounded, moderate sorted, volcano-lithic, feldspathic, abundant clay matrix, strongly calcareous, friable to moderately hard, poor porosity. CLAYSTONE, a.a.	74.7 (99:1:0:0:0)
2061 (11.3)	60 40	SANDSTONE, a.a. CLAYSTONE, a.a.	46.0 (99:1:0:0:0)
2064 (10.2)	70 30	SANDSTONE, a.a. CLAYSTONE, a.a.	51.0 (99:1:0:0:0)
2067 (10.1)	70 30	SANDSTONE, a.a. CLAYSTONE, a.a.	106.7 (99:1:0:0:0)
2070 (11.3)	30 70	SANDSTONE, a.a. – very fine to fine, moderately calcareous, silty, poor porosity. CLAYSTONE, mostly moderate to dark grey, firm to hard, silty in part; minor dark brown, to black, carbonaceous.	69.0 (99:1:0:0:0)
2073 (11.9)	30 70	SANDSTONE, a.a. CLAYSTONE, a.a.	97.5 (99:1:0:0:0)
2076 (11.2)	20 50 30	SANDSTONE, a.a. SILTSTONE, moderate to dark grey, light to moderate bluish grey, grey-brown to brown, firm, carbonaceous specks and laminae, grades to very fine sandstone in part. CLAYSTONE, a.a.	45.8 (99:1:0:0:0)
2079 (11.4)	20 50 30	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	174.3 (99:1:0:0:0)
2082 (12.2)	20 40 40	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	36.7 (99:1:0:0:0)
2085 (11.3)	10 50 40	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	38.8 (99:1:0:0:0)
2088 (11.2)	20 40 40	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	69.5 (99:1:0:0:0)
2091 (9.8)	20 50 30	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	69.2 (99:1:0:0:0)
2094 (10.3)	30 70	SILTSTONE, a.a. CLAYSTONE, a.a.	43.0 (99:1:0:0:0)
2097 (8.9)	10 40 50	SANDSTONE, a.a. – very calcareous, poor porosity. SILTSTONE, light to dark grey, grey-brown, firm to hard, argillaceous, carbonaceous. CLAYSTONE, a.a.	88.3 (99:1:0:0:0)
2100 (10.0)	10 40 50	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	69.5 (99:1:0:0:0)
2103 (9.1)	10 40 50	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	60.2 (99:1:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
2106 (6.9)	30	SANDSTONE, white to pale bluish grey, very fine to fine, sub-rounded, poor to moderate sorted, volcano-lithic, feldspathic, common brown mica flakes, very calcareous, abundant clay matrix, friable to moderately hard, poor porosity.	379.3 (99:1:0:0:0)
	30	SILTSTONE, a.a.	
	40	CLAYSTONE, a.a.	
2109 (9.1)	40	SANDSTONE, a.a.	135.2 (99:1:0:0:0)
	20	SILTSTONE, a.a. – very argillaceous and grades to claystone.	
	40	CLAYSTONE, moderate to dark grey, minor moderate to dark brown, firm, occasionally silty.	
2112 (10.4)	20	SANDSTONE, a.a.	56.7 (99:1:0:0:0)
	30	SILTSTONE, a.a.	
	50	CLAYSTONE, a.a.	
2115 (10.3)	10	SANDSTONE, a.a.	52.8 (99:1:0:0:0)
	30	SILTSTONE, a.a.	
	60	CLAYSTONE, a.a.	
2118 (9.1)	10	SANDSTONE, a.a. – grades to siltstone, very poor porosity.	43.8 (99:1:0:0:0)
	50	SILTSTONE, light to dark grey, bluish grey, sandy, firm, lithic and feldspathic, minor dark brown, very carbonaceous.	
	40	CLAYSTONE, moderate to dark grey, minor dark brown, silty.	
2121 (7.5)	10	SANDSTONE, a.a. – grades to siltstone, very poor porosity.	98.2 (99:1:0:0:0)
	50	SILTSTONE, light to dark grey, bluish grey, sandy, firm, lithic and feldspathic, minor dark brown, very carbonaceous.	
	40	CLAYSTONE, moderate to dark grey, minor dark brown, silty.	
2124 (6.1)	60	SANDSTONE, white to grey, very fine to fine, occasionally medium, sub-angular to sub-rounded, moderate sorted, volcano-lithic, feldspathic, common carbonaceous fragments, trace mica flakes, abundant clay matrix, slightly calcareous, friable, poor porosity.	228.0 (99:1:0:0:0)
	20	SILTSTONE, a.a.	
	20	CLAYSTONE, a.a.	
2127 (6.0)	60	SANDSTONE, a.a. – very argillaceous.	157.7 (99:1:0:0:0)
	20	SILTSTONE, a.a.	
	20	CLAYSTONE, a.a.	
2130 (7.1)	60	SANDSTONE, a.a. – very fine to medium, very argillaceous, strong calcareous, friable to moderately hard, poor porosity.	105.5 (99:1:0:0:0)
	30	SILTSTONE, moderate to dark grey, firm to hard, lithic and sandy in part, carbonaceous specks.	
	10	CLAYSTONE, a.a.	
2133 (5.5)	80	SANDSTONE, a.a. – very calcareous.	167.5 (99:1:0:0:0)
	10	SILTSTONE, a.a. – trace coal / carbonaceous fragments.	
	10	CLAYSTONE, a.a.	
2136 (5.8)	80	SANDSTONE, a.a. – very calcareous.	369.3 (99:1:0:0:0)
	10	SILTSTONE, a.a. – trace coal / carbonaceous fragments.	
	10	CLAYSTONE, a.a.	
	Tr	COAL, black, dull to sub-vitreous lustre.	
2139 (7.9)	70	SANDSTONE, white to pale grey, pale grey-green, sub-angular to sub-rounded, moderate sorted, lithic, feldspathic, minor carbonaceous material, abundant clay matrix, slightly calcareous, poor porosity.	391.7 (99:1:0:0:0)
	10	SILTSTONE, a.a.	
	20	CLAYSTONE, moderate grey, occasionally light to dark brown, soft to moderately hard, silty in part, carbonaceous in part.	
2142 (10.5)	20	SANDSTONE, a.a. – very fine to fine.	45.7 (99:1:0:0:0)
	60	SILTSTONE, a.a.	
	20	CLAYSTONE, a.a.	
2145 (8.3)	60	SANDSTONE, a.a.	112.7 (100:0:0:0:0)
	30	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2148 (7.0)	80	SANDSTONE, a.a.	160.7 (99:1:0:0:0)
	10	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
2151 (12.1)	80	SANDSTONE, white to light grey, very fine to fine, sub-angular to sub-rounded, moderate sorted, lithic, feldspathic, minor mica flakes and carbonaceous material, clay matrix, silica cement in part, friable to hard, poor porosity.	84.2 (100:0:0:0:0)
	10	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2154 (12.1)	80	SANDSTONE, a.a.	58.2 (100:0:0:0:0)
	10	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2157 (16.3)	80	SANDSTONE, a.a. – moderate to strong calcareous.	36.2 (99:1:0:0:0)
	10	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2160 (10.9)	80	SANDSTONE, a.a.	38.8 (99:1:0:0:0)
	10	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2163 (10.1)	80	SANDSTONE, a.a. – very fine to occasionally medium, abundant lithics, feldspathic, moderate to abundant clay matrix, calcareous, poor porosity.	38.5 (99:1:0:0:0)
	10	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2166 (13.3)	70	SANDSTONE, a.a.	42.8 (99:1:0:0:0)
	10	SILTSTONE, a.a.	
	20	CLAYSTONE, a.a.	
2169 (10.5)	50	SANDSTONE, a.a.	26.0 (99:1:0:0:0)
	30	SILTSTONE, moderate to dark grey, firm to hard, blocky, very argillaceous and grades to claystone in part.	
	20	CLAYSTONE, a.a.	
2172 (11.4)	80	SANDSTONE, white to grey, grey-green, very fine to medium, sub-angular to sub-rounded, moderate sorted, abundant grey-green to grey-black lithic grains, feldspathic, trace mica flakes, abundant clay matrix, moderate to strong calcareous, friable to moderately hard, poor porosity.	24.8 (99:1:0:0:0)
	10	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2175 (12.4)	80	SANDSTONE, a.a.	19.5 (99:1:0:0:0)
	10	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2178 (12.4)	70	SANDSTONE, a.a.	24.5 (99:1:0:0:0)
	10	SILTSTONE, a.a.	
	20	CLAYSTONE, moderate to dark grey, grey-green, dark brown, firm, silty.	
2181 (10.0)	80	SANDSTONE, a.a. – strong calcareous.	25.8 (99:1:0:0:0)
	10	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2184 (12.0)	60	SANDSTONE, a.a.	22.0 (99:1:0:0:0)
	20	SILTSTONE, a.a.	
	20	CLAYSTONE, a.a.	
2187 (12.5)	20	SANDSTONE, a.a.	26.5 (99:1:0:0:0)
	60	SILTSTONE, moderate to dark grey, grey-green, grey-brown, firm to hard, blocky, trace carbonaceous material, grades to claystone.	
	20	CLAYSTONE, a.a.	
2190 (12.3)	20	SANDSTONE, a.a.	29.3 (99:1:0:0:0)
	60	SILTSTONE, a.a.	
	20	CLAYSTONE, a.a.	
2193 (11.5)	20	SANDSTONE, a.a.	40.7 (99:1:0:0:0)
	60	SILTSTONE, a.a.	
	20	CLAYSTONE, a.a.	
2196 (11.8)	10	SANDSTONE, a.a.	56.7 (99:1:0:0:0)
	30	SILTSTONE, a.a.	
	60	CLAYSTONE, a.a.	
	Tr	COAL, very dark brown to black, lignitic.	
2199 (10.1)	30	SANDSTONE, grey to grey-green, very fine to fine, sub-angular to sub-rounded, poor to moderate sorted, lithic, feldspathic, calcareous, argillaceous, friable to moderately hard, poor porosity.	43.3 (99:1:0:0:0)
	40	SILTSTONE, a.a.	
	30	CLAYSTONE, a.a.	
	Tr	COAL, a.a.	

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
2202 (11.5)	60 20 20	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	25.5 (99:1:0:0:0)
2205 (10.4)	70 20 10	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	33.2 (99:1:0:0:0)
2208 (8.7)	80 10 10	SANDSTONE, a.a. – very argillaceous, calcareous, poor porosity. SILTSTONE, a.a. – grades to claystone. CLAYSTONE, moderate to dark grey, grey-green, dark brown, firm, silty and carbonaceous in part.	28.8 (99:1:0:0:0)
2211 (12.8)	70 10 20	SANDSTONE, a.a. very fine to medium, occasionally coarse, very calcareous, poor porosity. SILTSTONE, a.a. CLAYSTONE, a.a.	32.3 (99:1:0:0:0)
2214 (12.5)	50 20 30	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	28.0 (99:1:0:0:0)
2217 (12.7)	20 30 50	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	38.0 (99:1:0:0:0)
2220 (11.7)	20 60 20	SANDSTONE, a.a. SILTSTONE, moderate to dark grey, firm, blocky, grades to claystone in part. CLAYSTONE, moderate to dark grey to grey-brown, firm, carbonaceous in part.	25.7 (99:1:0:0:0)
2223 (13.3)	60 10 30	SANDSTONE, a.a. – moderate to strong calcareous, poor porosity. SILTSTONE, a.a. CLAYSTONE, a.a.	24.2 (99:1:0:0:0)
2226 (12.0)	60 10 30	SANDSTONE, a.a. – grey to grey-green, trace carbonaceous material, poor porosity. SILTSTONE, a.a. CLAYSTONE, a.a.	25.8 (99:1:0:0:0)
2229 (13.4)	60 10 30	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	23.2 (99:1:0:0:0)
2232 (13.5)	80 10 10	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	20.7 (99:1:0:0:0)
2235 (14.1)	70 10 20	SANDSTONE, a.a. – very fine to fine, very argillaceous, poor porosity. SILTSTONE, a.a. CLAYSTONE, a.a.	16.2 (99:1:0:0:0)
2238 (12.5)	70 10 20	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	24.0 (100:0:0:0:0)
2241 (11.8)	80 10 10	SANDSTONE, a.a. – very argillaceous, very calcareous. SILTSTONE, a.a. CLAYSTONE, a.a.	22.3 (100:0:0:0:0)
2244 (13.5)	70 10 20	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	28.3 (99:1:0:0:0)
2247 (12.6)	80 10 10	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	26.0 (100:0:0:0:0)
2250 (11.0)	90 Tr 10	SANDSTONE, a.a. – trace carbonaceous material and mica flakes. SILTSTONE, a.a. CLAYSTONE, a.a.	24.7 (100:0:0:0:0)
2253 (11.8)	80 10 10	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	31.0 (99:1:0:0:0)
2256 (12.9)	60 30 10	SANDSTONE, a.a. – slightly calcareous. SILTSTONE, a.a. CLAYSTONE, a.a.	24.2 (99:1:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
2259 (12.4)	30 50 20	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	48.0 (99:1:0:0:0)
2262 (12.8)	10 70 20	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	30.5 (99:1:0:0:0)
2265 (18.5)	10 40 50	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	19.7 (99:1:0:0:0)
2268 (13.8)	10 40 50	SANDSTONE, a.a. SILTSTONE, grey to grey-green, firm to hard, sub-fissile to blocky, trace carbonaceous material, grades to claystone. CLAYSTONE, moderate to dark grey to grey-green, firm to hard, silty in part.	36.7 (99:1:0:0:0)
2271 (12.8)	10 30 60	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	32.7 (99:1:0:0:0)
2274 (13.2)	30 70 Tr	SILTSTONE, a.a. CLAYSTONE, a.a. COAL, dark grey to black, lignitic.	103.2 (99:1:0:0:0)
2277 (12.4)	30 70	SILTSTONE, a.a. CLAYSTONE, a.a.	47.7 (100:0:0:0:0)
2280 (10.5)	20 40 40	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	70.3 (100:0:0:0:0)
2283 (13.9)	50 10 40	SANDSTONE, white, light grey, very fine to fine, sub-angular to sub-rounded, moderate sorted, lithic, feldspathic, trace carbonaceous material, moderate to abundant clay matrix, slightly calcareous, friable to moderately hard, poor porosity. SILTSTONE, a.a. CLAYSTONE, a.a.	39.7 (99:1:0:0:0)
2286 (12.7)	60 10 30	SANDSTONE, a.a. – moderately calcareous. SILTSTONE, a.a. CLAYSTONE, a.a.	36.7 (100:0:0:0:0)
2289 (13.9)	70 10 20	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	49.8 (100:0:0:0:0)
2292 (13.5)	70 10 20	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	32.8 (99:1:0:0:0)
2295 (13.3)	80 10 10	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	36.0 (99:1:0:0:0)
2298 (12.2)	70 10 20	SANDSTONE, a.a. SILTSTONE, a.a. CLAYSTONE, a.a.	33.0 (99:1:0:0:0)
2301 (12.3)	90 10 Tr	SANDSTONE, light to moderate grey, grey-green, very fine to fine, sub-angular to sub-rounded, poor to moderate sorted, lithic, feldspathic, trace mica flakes and carbonaceous material, abundant clay matrix, moderate calcareous, moderately hard, poor porosity. SILTSTONE, a.a. CLAYSTONE, a.a.	36.0 (99:1:0:0:0)
2304 (13.0)	90 10	SANDSTONE, a.a. SILTSTONE, a.a.	23.0 (99:1:0:0:0)
2307 (13.8)	90 10	SANDSTONE, a.a. SILTSTONE, a.a.	27.5 (99:1:0:0:0)
2310 (13.0)	100 Tr	SANDSTONE, a.a. SILTSTONE, a.a.	27.8 (99:1:0:0:0)
2313 (14.1)	90 10	SANDSTONE, a.a. SILTSTONE, a.a.	22.3 (99:1:0:0:0)
2316 (13.6)	100 Tr	SANDSTONE, a.a. SILTSTONE, a.a.	23.7 (99:1:0:0:0)

LAKES OIL N.L. GANGELL-1

Depth	Percent	Lithological Description	Gas (units) (Breakdown %)
2319 (14.7)	100	SANDSTONE, a.a. – very fine to medium, sub-angular to sub-rounded, poor to moderate sorted, abundant clay matrix, poor porosity.	20.5 (99:1:0:0:0)
	Tr	SILTSTONE, a.a.	
2322 (15.7)	100	SANDSTONE, a.a.	14.8 (99:1:0:0:0)
	Tr	SILTSTONE, a.a.	
2325 (13.5)	80	SANDSTONE, a.a.	26.3 (99:1:0:0:0)
	10	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2328 (14.5)	60	SANDSTONE, a.a.	15.5 (99:1:0:0:0)
	10	SILTSTONE, light to dark grey, firm to hard, sandy, lithic, carbonaceous specks.	
	30	CLAYSTONE, moderate to dark grey to grey-brown, silty in part, moderately hard.	
2331 (15.7)	70	SANDSTONE, a.a.	17.7 (99:1:0:0:0)
	20	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2334 (17.6)	70	SANDSTONE, a.a. – moderate to strong calcareous, argillaceous, poor porosity.	19.8 (99:1:0:0:0)
	20	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2337 (18.4)	80	SANDSTONE, a.a.	13.0 (99:1:0:0:0)
	10	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2340 (16.6)	70	SANDSTONE, a.a.	11.2 (99:1:0:0:0)
	20	SILTSTONE, a.a.	
	10	CLAYSTONE, a.a.	
2343 (14.9)	30	SANDSTONE, a.a. – very fine, silty, poor porosity.	15.3 (99:1:0:0:0)
	50	SILTSTONE, a.a.	
	20	CLAYSTONE, a.a.	
2346 (14.7)	10	SANDSTONE, a.a.	20.3 (99:1:0:0:0)
	50	SILTSTONE, a.a.	
	40	CLAYSTONE, a.a.	
2349 (14.2)	20	SANDSTONE, a.a.	25.0 (99:1:0:0:0)
	40	SILTSTONE, a.a.	
	40	CLAYSTONE, a.a.	
		TD 2350 metres - 06.30 hours 27 January 2001	

APPENDIX 2

CORE DESCRIPTIONS

LAKES OIL N.L. GANGELL-1 CORE DESCRIPTION

Core No : One	Interval : 1566.50 – 1584.50m	Recovered : 18.0 metres / 100%
Date : 16-01-2001	Geologist : Doug Short	Formation / Age : Strzelecki / Cretaceous
G.L. : 35.0m.	Latitude : 38°18'54"S	Permit : PEP 157 - Victoria
K.B. : 40.0m.	Longitude : 147°11'49"E	

DEPTH K.B. (m)	LITHOLOGY	DESCRIPTION	HYDROCARBON INDICATIONS			
			P	F	G	
1566.50 – 1575.68	SANDSTONE	Medium to dark grey to greenish grey, fine to occasional medium, sub-rounded, moderate sorted quartz, white feldspar and grey, green and occasional red-brown volcano-lithic grains, trace brown mica, abundant clay matrix, minor carbonaceous laminae, (1566.85-67.15 / 1567.8 / 1568.00-68.10 / 1572.96-73.12 / 1573.35–73.50 / 1573.95-74.15) and rare shale clasts (1572.40), moderately hard to hard, poor porosity. Slickenslide @1568.90 metres.				Slight gas bleeding. mostly from bedding planes or when core is fractured while being recovered.
1575.68 – 1576.25	SANDSTONE	As for 1566.5 – 1575.68 metres, moderate to abundant carbonaceous laminae.				As above
1576.25 – 1577.70	SANDSTONE	As for 1566.5 – 1575.68 metres, fine to medium , minor carbonaceous material, shale clasts @ 1577.52m., minor cross bedding, poor porosity.				As above
1577.70 – 1577.78	SANDSTONE	As for 1566.5 – 1575.68 metres, but with abundant elongate / tabular (1 x 5 cm.) shale clasts.				As above
1577.78 – 1578.02	SANDSTONE	As for 1566.5 – 1575.68 metres, but with abundant tabular coal fragments (up to 0.5 x 4 cm.)				
1578.02 – 1580.00	SANDSTONE	As for 1566.5 – 1575.68 metres, minor crossbeds.				As above
1580.00 – 1582.10	SANDSTONE	As for 1566.5 – 1575.68 metres, fine, calcareous in part (calcareous vein @ 1580.80 metres) and minor crossbeds, tight to very poor porosity.				
1582.10 – 1584.50	SANDSTONE	As for 1566.5 – 1575.68 metres, minor crossbeds. From field examination the core has a high percentage of clay matrix, very poor to poor porosity and probably nil to extremely poor permeability. Overall dip is 10° – 12°				As above

APPENDIX 3

WIRELINE LOG ANALYSIS

GANGELL-1

LOG ANALYSIS

D.A. Short
February 2001

LAKES OIL N.L. - GANGELL-1 Log Analysis

A basic log analysis has been performed on Trifon-1 over the top Latrobe Group and selected intervals in the Strzelecki Formation.

Two Schlumberger logging runs were made :

Run / Depth	Logs
1 @ 1281m.	DLL / MSFL / BCS / GR / SP / Cal
2 @ 2350m.	DLL / MSFL / BCS / RHOZ / TNPH / GR / SP / Cal

Nine drill stem tests were conducted and the results are summarized in figures 1a – 1d.

Temperatures recorded from drill stem tests at Trifon-1 & Gangell-1 give a temperature gradient of 29.5°C / 1000m. – figure 2.
The bottom hole temperature at 2350m. calculated as 89°C

True formation resistivity (Rt) is calculated from the DLL / MSFL combination or if no MSFL the DLL is assumed to approximate Rt.

Formation water resistivity was taken from:

1 Latrobe Group 12.5Ωm @ 42°C Hingle Plot of sand 795-805m.
2 Strzelecki Group 0.29Ωm @ 25°C Water sample from DST#3.

Filtrate resistivity calculated at 0.16Ωm at 41°C. (Figures 3a & 3b.)

Porosity was calculated from the Sonic log and adjusted for Vclay.

Clay content (Vclay) was calculated from the Gamma Ray log

Water saturation was then calculated using the Indonesia Equation and the results presented both as a table and graphically at a scale of 1 to 500.

The following tables and graphical plots – figures 4a – 4d - summarize the calculated Porosity / Vclay / Water Saturation for the Latrobe and Strzelecki sands investigated.

Latrobe Group

Interval (metres)	Porosity	V clay	Water Saturation
677.7 - 678.2	21.8	29.9	100.0
680.0 - 680.3	17.0	23.3	100.0
697.1 - 706.8	37.1	8.2	100.0
714.6 - 764.3	36.3	10.2	97.5
765.2 - 787.6	34.4	14.2	95.2
788.2 - 811.5	34.7	14.0	91.2
812.4 - 819.9	34.4	13.9	92.0
825.3 - 826.5	27.5	31.0	96.7
844.1 - 846.9	20.4	48.5	78.2

Strzelecki Group

1500.1 - 1501.0	17.7	21.9	73.3
1501.6 - 1507.7	17.8	27.0	78.0
1511.4 - 1512.7	13.4	52.2	99.6
1522.8 - 1524.0	14.4	37.3	97.2
1524.6 - 1525.8	13.6	34.7	97.8
1527.5 - 1533.3	16.7	36.5	90.3
1543.7 - 1562.0	16.7	29.4	75.6
1563.2 - 1582.1	16.1	28.1	72.1
1582.7 - 1590.3	16.2	28.6	70.7
1597.2 - 1598.7	13.0	49.5	99.1
1599.6 - 1600.2	12.1	51.9	100.0
1604.0 - 1605.7	12.1	53.8	99.2
1609.0 - 1610.3	12.9	52.6	100.0
1611.3 - 1612.7	12.6	52.2	100.0
1617.4 - 1618.2	11.6	55.1	100.0
1619.4 - 1621.1	14.5	31.9	84.1
1622.9 - 1624.3	13.3	49.6	94.1
1624.9 - 1627.0	13.2	49.6	96.1
1631.1 - 1634.6	15.9	41.2	94.8
1640.1 - 1677.6	14.5	28.9	67.5
1693.3 - 1699.3	15.4	34.1	74.8
1700.5 - 1705.2	14.8	26.3	56.8
1705.8 - 1716.5	16.0	18.0	58.4
1718.9 - 1724.7	15.0	21.3	64.4
1742.4 - 1777.4	13.7	20.0	66.4
1778.2 - 1779.4	13.5	44.0	84.5
1786.6 - 1788.9	11.4	49.7	87.0
1792.7 - 1794.1	14.2	33.4	76.3
1794.8 - 1804.9	14.0	10.7	67.4
1805.8 - 1840.7	13.4	15.3	64.9

1841.5 - 1853.8	13.6	20.3	68.7
1862.8 - 1866.3	13.9	28.5	66.1
1870.4 - 1872.2	15.3	51.0	90.0
1877.9 - 1878.8	14.1	54.4	75.3
1882.0 - 1884.4	13.7	44.0	77.8
1885.7 - 1897.5	16.6	34.9	65.8
1898.1 - 1907.3	22.2	16.3	62.6
1908.2 - 1909.0	11.7	38.3	72.9
1910.2 - 1912.9	13.7	32.3	79.6
1913.5 - 1916.9	13.6	36.2	70.1
1927.3 - 1940.8	12.2	40.7	82.5
1948.1 - 1978.9	13.7	21.3	69.7
1979.5 - 1985.2	14.6	17.8	54.7
1992.2 - 1993.5	12.0	38.9	67.3
2009.1 - 2011.4	13.4	28.2	67.5
2012.6 - 2028.0	12.0	30.1	70.2
2028.6 - 2035.8	11.5	34.5	69.9
2042.9 - 2044.0	14.6	48.0	93.5
2053.1 - 2053.9	11.0	36.9	81.3
2054.7 - 2064.7	12.4	27.4	76.1
2105.6 - 2106.8	13.8	35.0	74.4
2124.8 - 2125.8	11.2	35.4	77.2
2127.5 - 2135.9	13.8	20.7	68.5
2136.7 - 2137.9	12.3	36.9	63.8
2146.6 - 2148.8	12.4	29.1	72.9
2149.8 - 2150.7	12.9	21.9	55.2
2151.6 - 2153.6	11.6	33.1	77.5
2154.6 - 2163.5	11.6	21.1	71.3
2168.7 - 2171.2	12.2	23.0	73.7
2172.0 - 2175.2	12.1	18.4	76.3
2176.3 - 2176.7	10.7	16.7	77.1
2177.6 - 2179.0	11.7	17.2	75.0
2179.8 - 2180.8	12.1	21.0	66.3
2197.9 - 2200.8	12.5	14.9	74.5
2201.6 - 2208.6	12.3	13.5	67.5
2224.0 - 2226.0	10.7	15.5	59.9
2227.9 - 2228.6	11.7	7.5	60.2
2237.7 - 2239.2	10.5	12.7	61.0
2240.3 - 2242.4	11.0	10.8	60.8
2243.6 - 2244.1	10.6	16.3	59.8
2245.3 - 2246.7	10.7	8.6	60.1

Conclusions

The sands of the Latrobe Group had very good porosity and permeability but were, as expected, water saturated. A cased hole drill stem test, through perforations, over thin sands in the basal Lakes Entrance Formation and the very top Latrobe Coal suggested the zone to have poor reservoir quality and to be water saturated.

The coal was produced in large "chunks" while drilling and showed what appeared to be an extensive fracture system. While this could be a reservoir for "coal seam gas" it could also provided a conduit to the underlying water filled Latrobe sands. If this were the case then any attempts to produce gas from the coal(s) would quite likely be frustrated by very high and probably sustained water production.

Drill stem test one attempted to test the top Latrobe coal on penetration but the tool plugged and the results were inconclusive. Consideration should be given to running a water cushion with any future testing programme.

The Strzelecki Formation sands encountered were predominantly fine grained, lithic, very argillaceous and with poor to fair reservoir quality This appears to be confirmed by core data and wireline logs where although calculated porosities often lie in the 12 – 18% range, when tested the sands lack permeability. The water flow / recovery in DST#3 is probably from fractures which can be identified from the sonic log. Similar water flows were recorded from DSTs of fractures in the Strzelecki Formation at Trifon-1.

DST#3 over the interval 1885.0-1940.0m. flowed gas to surface after 105 minutes with 52psi on a 1/8" choke. The pressure declined slowly to 38psi at end of flow and a calculated recovery of 1370m. of gas cut formation water was recovered from the drill pipe. (The sample chamber had 3 litres of gas cut formation water at 554 psi.)

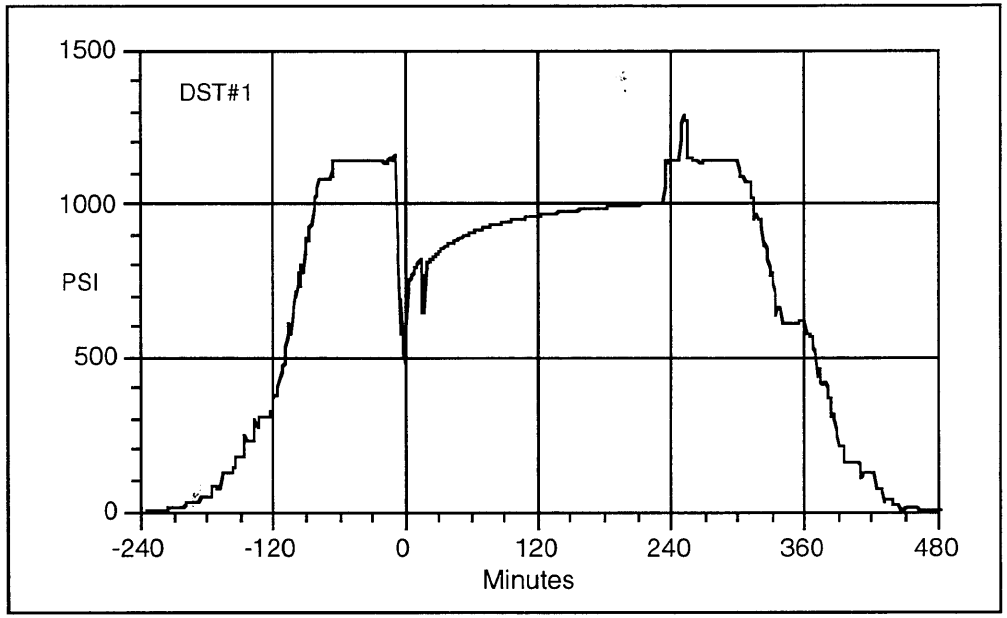
Doug Short
February 2001

GANGELL-1 Drill Stem Tests 1 & 2.

DST#1	Top Latrobe Group	EMP	DATA
Depth (driller)	659.7-691.0	(Inside)	(m/psi/°C)
Depth (logger)	660.2-691.5	Depth	655
Type test (open hole)	Bottom hole - 12.25"	IHH	1136
Date	7 January 2001	1st Flow 1	478
First flow open	60	1st Flow 2	?
First flow shut-in	181	1st Shut-in	1002
Second flow open		2nd Flow 1	
Second flow shut-in		2nd Flow 2	
SG Mud/Make-up/Rec	1.15/1.00/1.17	2nd Shut-in	
Res. Mf/Make-up/Rec - 25°C	- / - / -	FHH	1142
Cl- Mf/Make-up/Rec	24000/ - / -	Temp (°C)	37

REMARKS : Result: Weak to moderate blow, dead after 35 mins – no gas to surface. Charts indicate plugging during flow period.

Recovery : Could not reverse circulate due to plugging. Calculated (from fluid recorder) recovery of 210 metres of drilling mud. (Sample chamber contained 3 litres of 1.17 SG mud.)



DST#2	Strzelecki Group	EMP	DATA
Depth (driller)	1377.9-1452.0(D)	(Inside)	(m/psi/°C)
Depth (logger)	1378.4-1452.5(L)	Depth	1374
Type test (open hole)	Bottom hole	IHH	2191
Date	14 January 2001	1st Flow 1	174
First flow open	120	1st Flow 2	413
First flow shut-in	240	1st Shut-in	1877
Second flow open		2nd Flow 1	
Second flow shut-in		2nd Flow 2	
SG Mud/Make-up/Rec	1.10/1.00/ -	2nd Shut-in	
Res. Mf/Make-up/Rec - 25°C	- / - / -	FHH	2192
Cl- Mf/Make-up/Rec	22000/ - / -	Temp (°C)	59

REMARKS : Result: Weak to moderate blow throughout - No gas to surface.

Recovery : Tool plugged on reverse circulating – Pumped down drill pipe to clear – Reverse circulate – No water or gas cut mud observed - Calculated (from fluid recorder) recovery of 255 metres of drilling mud. (Sample chamber contained 3 litres of mud at 14 psi.)

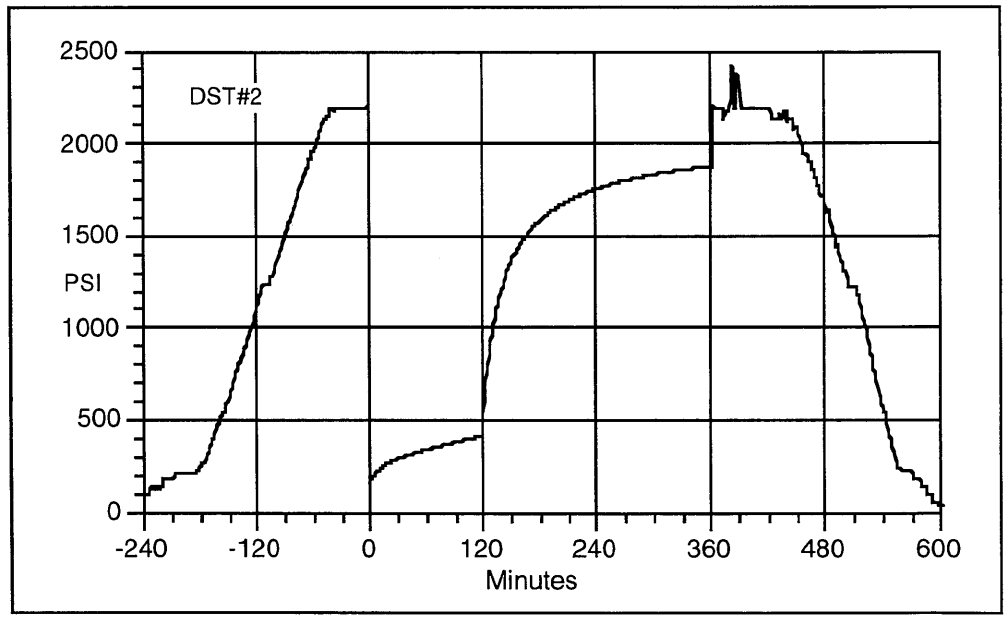


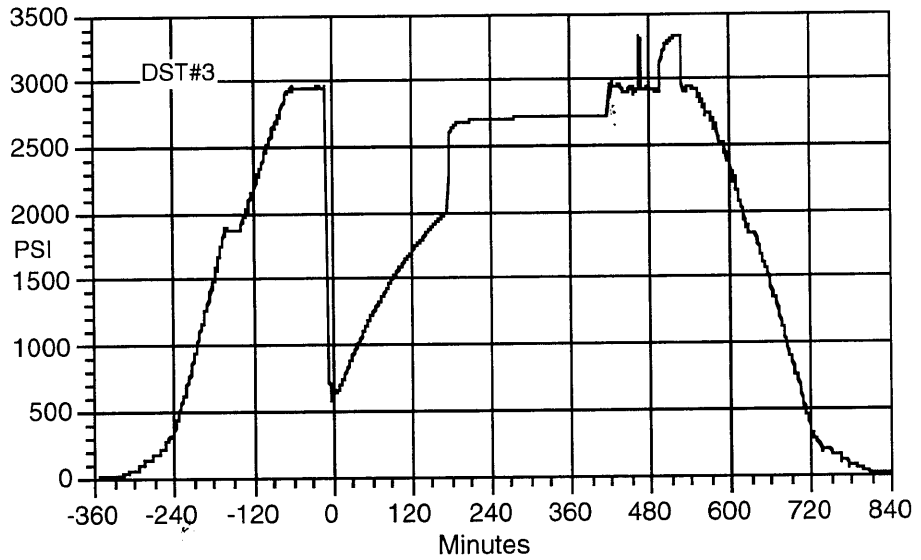
Figure 1a

GANGELL-1 Drill Stem Tests 3,4 & 5.

DST#3	Strzelecki Group	EMP	DATA
Depth (driller)	1885.0-1940.0	(Inside)	(m/psi/°C)
Depth (logger)	1885.5-1940.5	Depth	1881
Type test (open hole)	Bottom hole	IHH	2943
Date	19 January 2001	1st Flow 1	583
First flow open	180	1st Flow 2	2015
First flow shut-in	240	1st Shut-in	2718
Second flow open		2nd Flow 1	
Second flow shut-in		2nd Flow 2	
SG Mud/Make-up/Rec	1.10/1.00/1.00	2nd Shut-in	
Res. Mf/Make-up/Rec - 25°C	- / - /0.3	FHH	2953
Cl- Mf/Make-up/Rec	13000/ - /14500	Temp (°C)	78

REMARKS : Result: Gas to surface after 105 minutes with 52psi on a 1/8" choke – Pressure declined slowly to 38psi at end of flow. (Q = 18mcfd)

Recovery : Tool plugged while reverse circulating – Calculated (from fluid recorder) recovery of 1370m. of gas cut formation water. (Sample chamber had 3 litres of gas cut formation water at 554 psi.)



DST#4	Strzelecki Group	EMP	DATA
Depth (driller)	2100.0-2117.0	(Inside)	(m/psi/°C)
Depth (logger)	2100.5-2117.5	Depth	
Type test (open hole)	Bottom Hole	IHH	
Date	22 January 2001	1st Flow 1	
		1st Flow 2	
DST#5	Strzelecki Group	1st Shut-in	
Depth (driller)	2085.0-2149.0	2nd Flow 1	
Depth (logger)	2085.5-2149.5	2nd Flow 2	
Type test (open hole)	Bottom Hole	2nd Shut-in	
Date	24 January 2001	FHH	
		Temp (°C)	

REMARKS : DST#4 and DST#5 were both misruns - could not seat packers

DST#4 and DST#5 were both misruns - could not seat packers

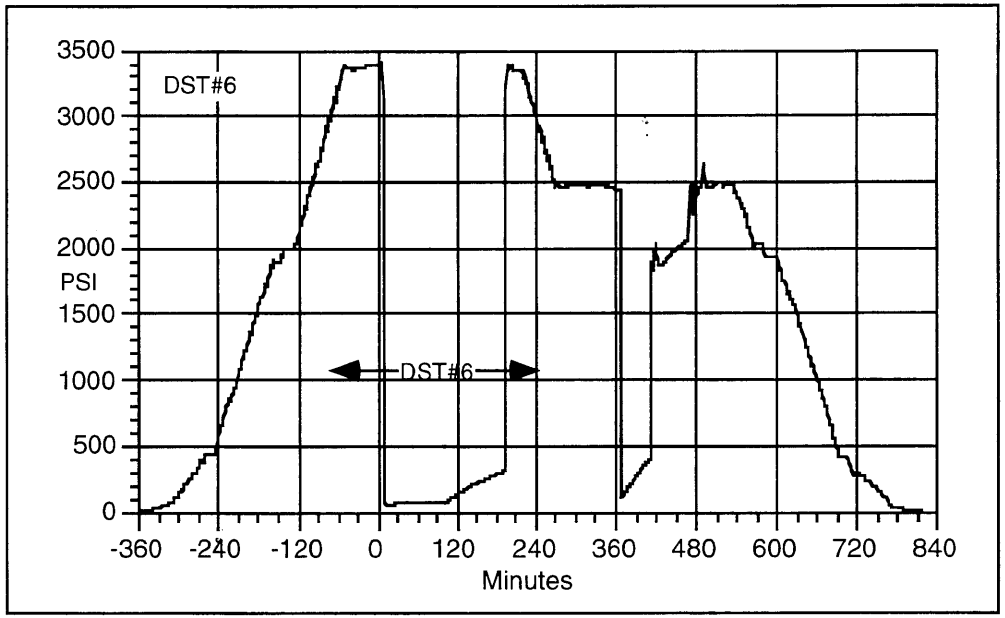
Figure 1b

GANGELL-1 Drill Stem Tests 6 & 7.

DST#6	Strzelecki Group	EMP	DATA
Depth (driller)	2124.0-2154.0	(Inside)	(m/psi/°C)
Depth (logger)	2124.5-2154.5	Depth	2114
Type test (open hole)	Inflate straddle	IHH	3391
Date	28 January 2001	1st Flow 1	57
First flow open	90	1st Flow 2	68
First flow shut-in	92	1st Shut-in	310
Second flow open		2nd Flow 1	
Second flow shut-in		2nd Flow 2	
SG Mud/Make-up/Rec	1.10/1.00/ -	2nd Shut-in	
Res. Mf/Make-up/Rec - 25°C	- / - / -	FHH	
Cl- Mf/Make-up/Rec	9000/ - / -	Temp (°C)	78

REMARKS : Result: Open tool for 90 minute flow – weak air blow throughout – no fluid to surface. Shut-in for 92 minutes and move up hole for DST#7.

Recovery : Tool plugged - Could not reverse circulate after DST#7 - Sample chamber contained drilling mud.



DST#7	Strzelecki Group	EMP	DATA
Depth (driller)	1546.5-1576.5	(Inside)	(m/psi/°C)
Depth (logger)	1547.0-1577.0	Depth	1538
Type test (open hole)	Inflate straddle	IHH	2059
Date	28 January 2001	1st Flow 1	108
First flow open	60	1st Flow 2	399
First flow shut-in	120	1st Shut-in	2059
Second flow open		2nd Flow 1	
Second flow shut-in		2nd Flow 2	
SG Mud/Make-up/Rec	1.10/1.00/ -	2nd Shut-in	
Res. Mf/Make-up/Rec - 25°C	- / - / -	FHH	2498
Cl- Mf/Make-up/Rec	9000/ - / -	Temp (°C)	64

REMARKS : Result: Open tool for 60 minute flow – weak air blow throughout – no fluid to surface. Shut-in for 120 minutes.

Recovery : Tool plugged - Could not reverse circulate after DST#7 - Sample chamber contained drilling mud.

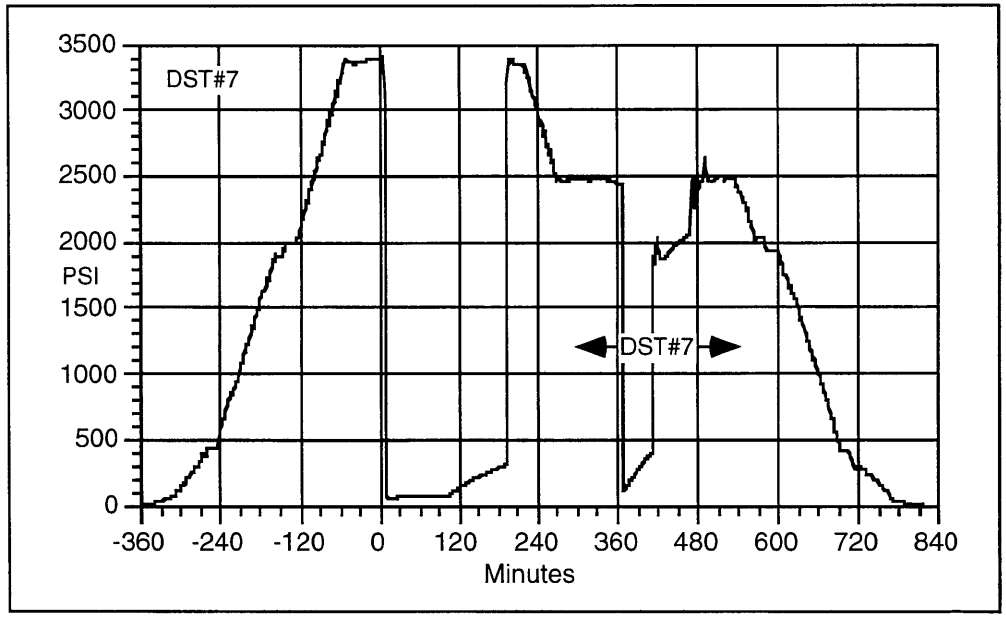


Figure 1c

GANGELL-1 Drill Stem Tests 8 & 9.

DST#8	Top Latrobe Group
Depth (driller)	672.0-702.0
Depth (logger)	672.5-702.5
Type test (cased hole)	Inflate straddle
Date	29 January 2001
First flow open	
First flow shut-in	
Second flow open	
Second flow shut-in	
SG Mud/Make-up/Rec	1.11/1.00/ -
Res. Mf/Make-up/Rec - 25°C	- / - / -
Cl- Mf/Make-up/Rec	9000/ - / -

EMP (Inside)	DATA (m/psi/°C)
Depth	
IHH	
1st Flow 1	
1st Flow 2	
1st Shut-in	
2nd Flow 1	
2nd Flow 2	
2nd Shut-in	
FHH	
Temp (°C)	

REMARKS : Result: Misrun - Could not seat packer - failed to inflate.

Recovery :

Misrun - Could not seat packer - failed to inflate.

DST#9	Top Latrobe Group
Depth (driller)	672.0-702.0(D)
Depth (logger)	672.5-702.5(L)
Type test (cased hole perforations)	Inflate straddle
Date	30 January 2001
First flow open	134
First flow shut-in	123
Second flow open	
Second flow shut-in	
SG Mud/Make-up/Rec	1.11/1.00/ -
Res. Mf/Make-up/Rec - 25°C	- / - / -
Cl- Mf/Make-up/Rec	9000/ - /7500
Note: When drilled Cl- was 24000ppm	

EMP (Inside)	DATA (m/psi/°C)
Depth	662
IHH	1078
1st Flow 1	55
1st Flow 2	311
1st Shut-in	818
2nd Flow 1	
2nd Flow 2	
2nd Shut-in	
FHH	1068
Temp (°C)	42

REMARKS : Result: Open tool for 134 minute initial flow – Very weak air blow – Dead after 10 minutes – No fluid to surface.

Recovery : 185 metres cement contaminated water.
3 litres cement contaminated water @ 2 psi in sample chamber.
(1.4% KCl in test mud - 4.0% KCl in original mud - 0.0% in recovery.)

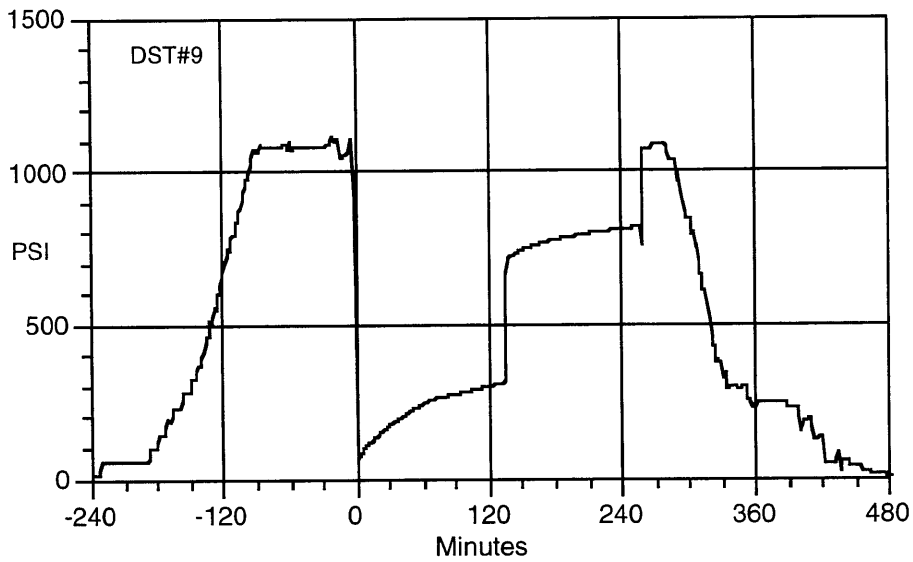


Figure 1d

LAKES OIL N.L. DST Temperature v Depth Plot for Trifon-1 & Gangel-1.

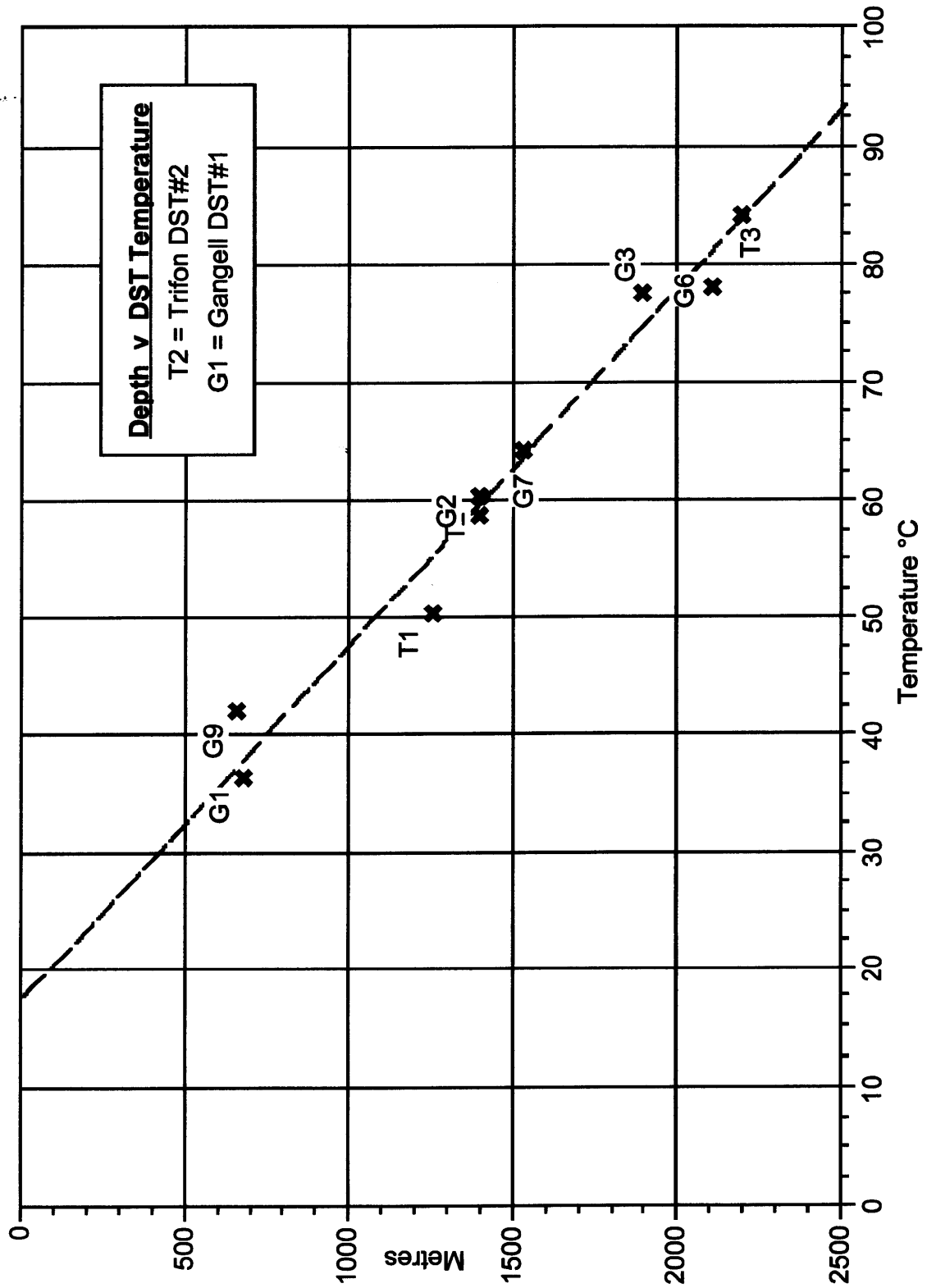


Figure 2

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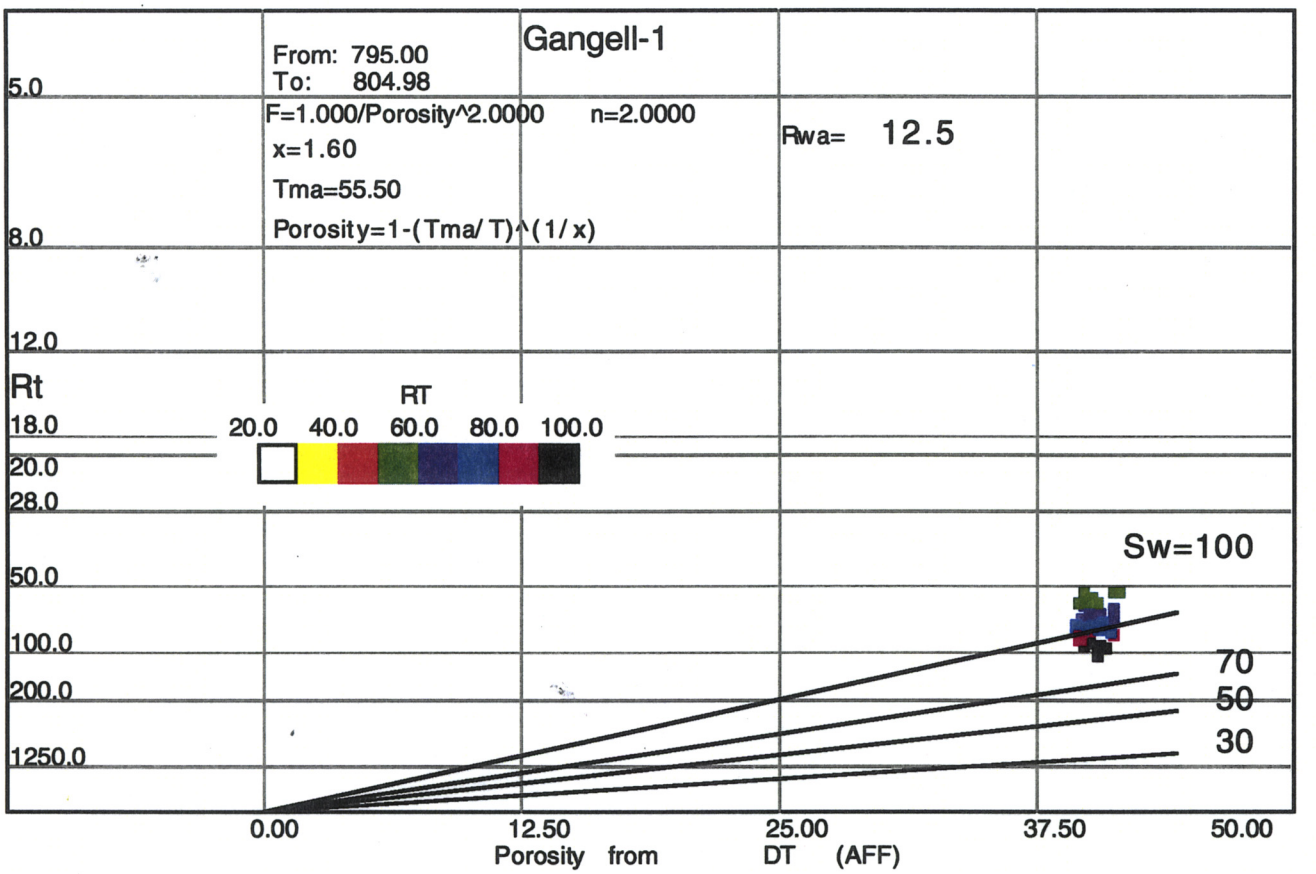
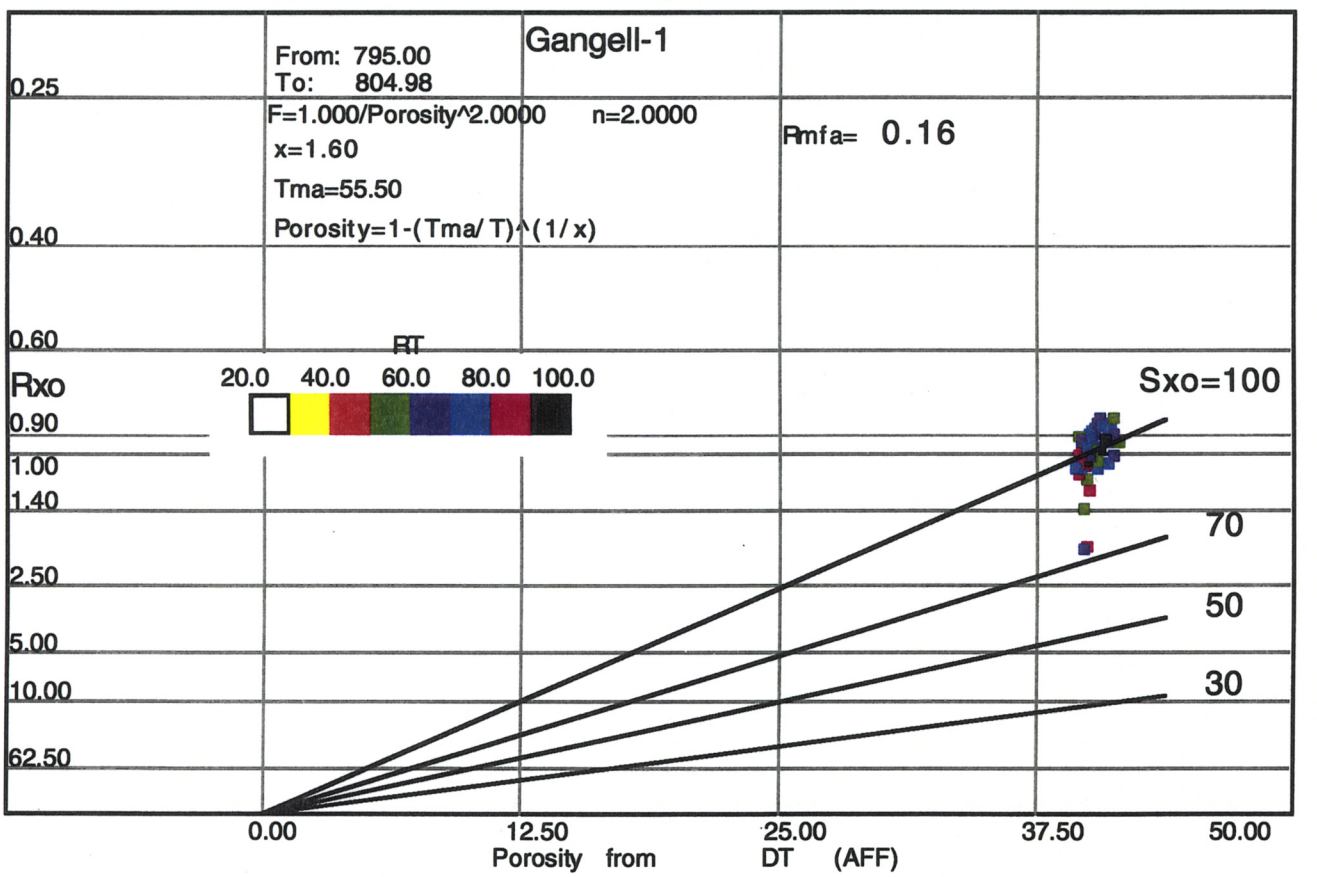
Hingle Plot - Apparent water resistivity - figure 3a



Hingle Plot - Apparent water resistivity - figure 3b



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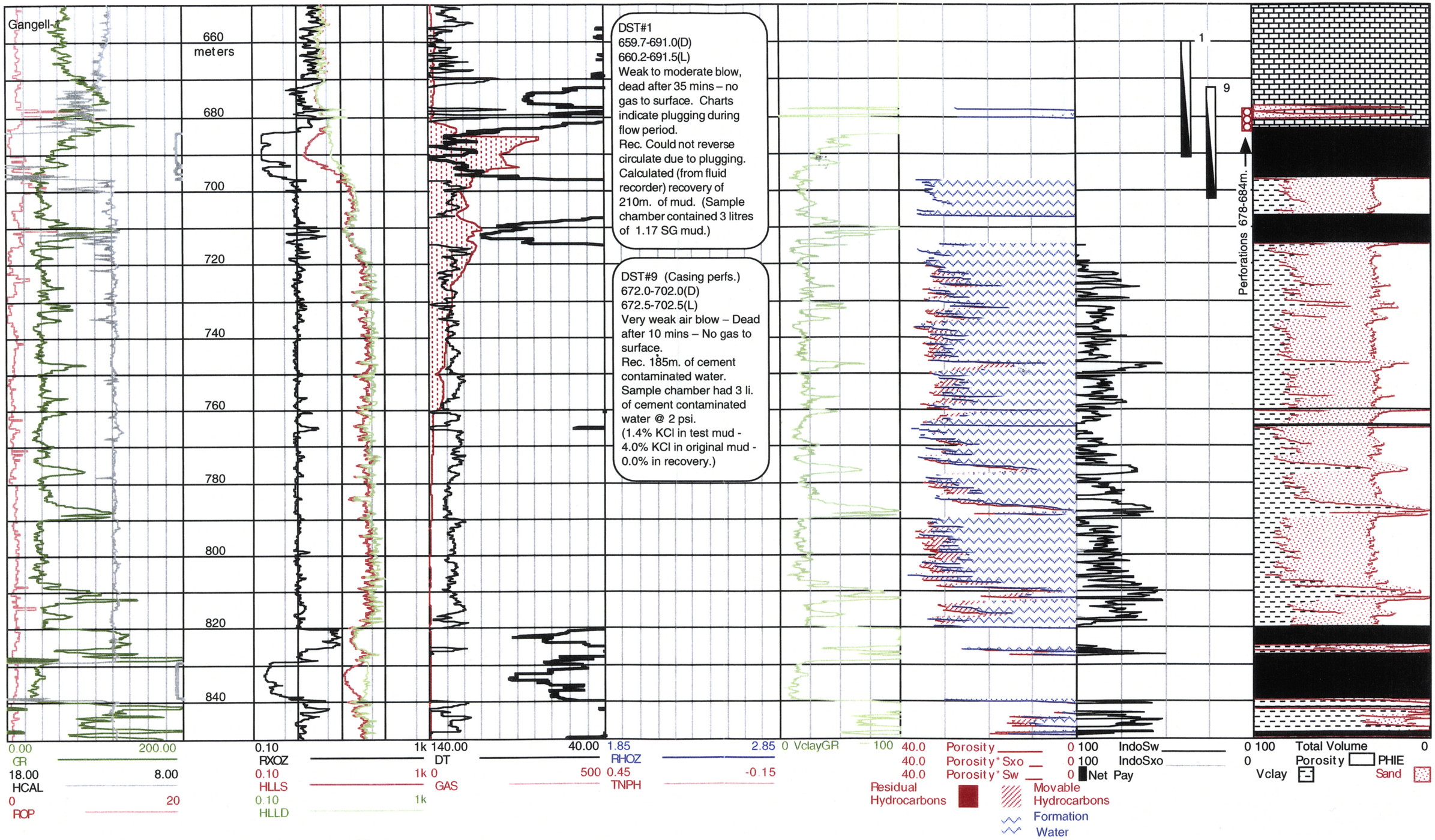
LAKES OIL N.L. GANGELL-1 - Top LATROBE FORMATION EVALUATION



Evaluation using Indonesian Water Saturation Model

(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*SwInd^(n/2)
b=1-(Vclay/2)

Parameters Used.

Surface temperature = 77°F BHT (logs) = 180°F RHOF = 1.00
Measured Rmf = 0.172 at 180°F. Bit Size = 12.25
GRclean = 20 GRclay = 120 VclayGR = 0.5*VclayGR/(1.5-VclayGR)
Shaly Sand model for lithology. RTclay = 20 Rwa = 12.5
PHIE cutoff sets Sw & Sxo to 100% below 0.0 % porosity.
Coal is detected if RHOZ<1.65 & RHOZ<>0 or if TNPH > 55.0 or if DT > 240.0.

TD logger = 2350 meters. Rt from RT curve.
Bit Size = 8.500 from 1251 to 2350
RHOG = 2.65 for Density porosity.
Rmfa = 0.16 a = 1.0 : m = 2.0 : n = 2.0
Sw & Sxo set to 100% above 100% Vclay.
Sonic porosity AFF model. Ø = 1-(Tma/T)^(1/x)

Vclay is Vclay from GR
PHIE = (1-Vclay)*PHIT.
Sxo is limited to: Sxo>=Sw.

x = 1.60 Tma = 55.5 ms/ft

Figure 4a

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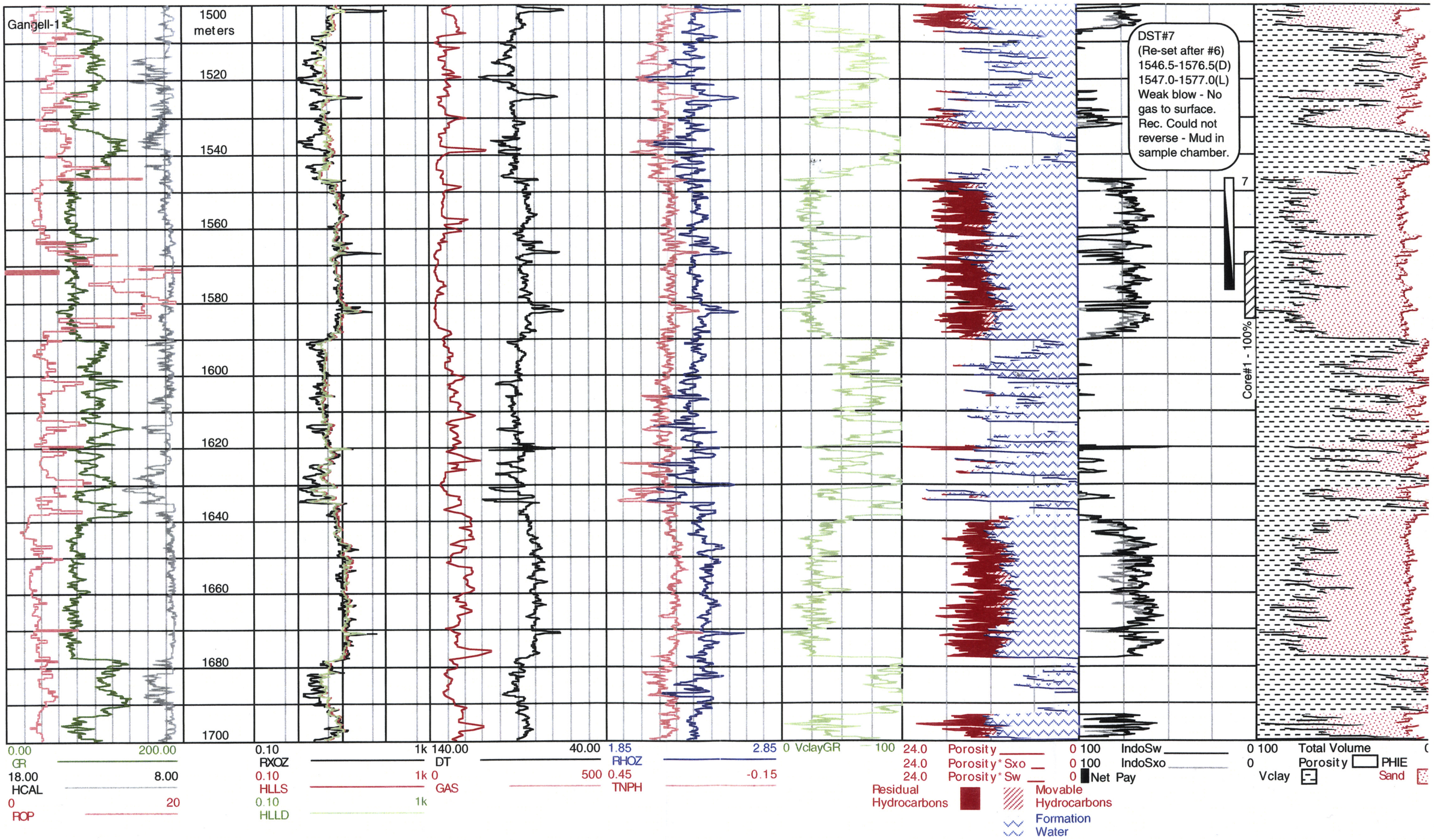
LAKES OIL N.L. GANGELL-1 - STRZELECKI FORMATION EVALUATION - 1500-1700m.



Evaluation using Indonesian Water Saturation Model

(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*SwInd^(n/2)

b=1-(Vclay/2)

Parameters Used.

Surface temperature = 77°F BHT (logs) = 180°F
Measured Rmf = 0.172 at 180°F.
GRclean = 60 GRclay = 120 VclayGR = 0.5*VclayGR/(1.5-VclayGR)
Shaly Sand model for lithology. RTclay = 20 Rwa = 12.5
PHIE cutoff sets Sw & Sxo to 100% below 0.0 % porosity.
Coal is detected if RHOZ<1.65 & RHOZ<>0 or if TNPH > 55.0 or if DT > 240.0.

RHOF = 1.00
Bit Size = 12.25

TD logger = 2350 meters. Rt from RT curve.
Bit Size = 8.500 from 1251 to 2350
RHOG = 2.65 for Density porosity.
Rmfa = 0.16 a = 1.0 : m = 2.0 : n = 2.0
Sw & Sxo set to 100% above 100% Vclay.
Sonic porosity AFF model. Ø = 1-(Tma/T)^(1/x)

Vclay is Vclay from GR
PHIE = (1-Vclay)*PHIT.
Sxo is limited to: Sxo>=Sw.

x = 1.60 Tma = 55.5 ms/ft

Figure 4b

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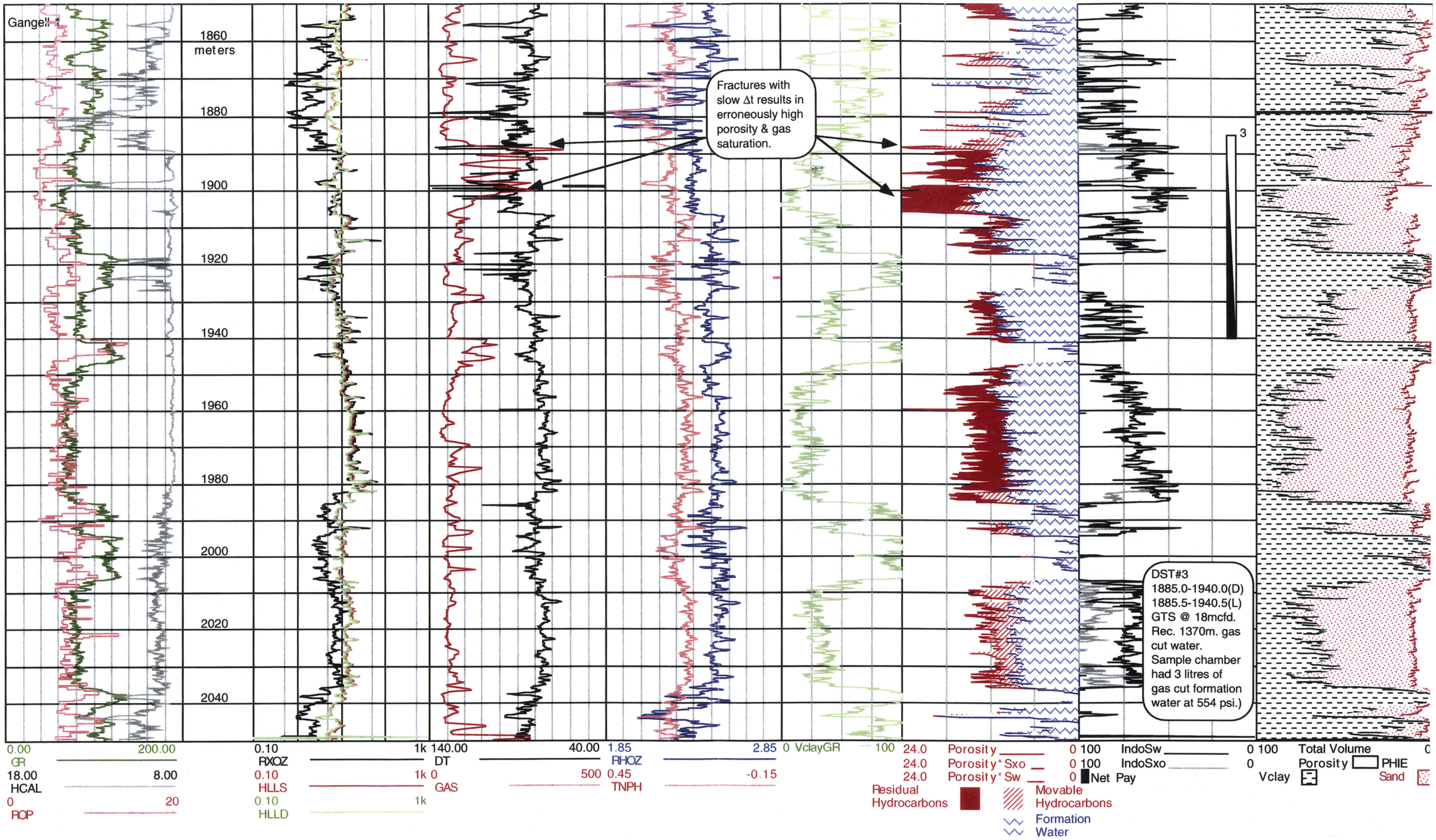
LAKES OIL N.L. GANGELL-1 - STRZELECKI FORMATION EVALUATION - 1850-2050m.



Evaluation using Indonesian Water Saturation Model

(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*SwInd^(n/2)

b=1-(Vclay/2)

Parameters Used.

Surface temperature = 77°F BHT (logs) = 180°F RHOF = 1.00

Measured Rmf = 0.172 at 180°F. Bit Size = 12.25

GRclean = 60 GRclay = 120 VclayGR = 0.5*VclayGR/(1.5-VclayGR)

Shaly Sand model for lithology. RTclay = 20 Rwa = 0.15

PHIE cutoff sets Sw & Sxo to 100% below 0.0 % porosity.

Coal is detected if RHOZ<1.65 & RHOZ<>0 or if TNPH > 55.0 or if DT > 240.0.

TD logger = 2350 meters. Rt from RT curve.

Bit Size = 8.500 from 1251 to 2350

RHOG = 2.65 for Density porosity.

Rmfa = 0.16 a = 1.0 : m = 2.0 : n = 2.0

Sw & Sxo set to 100% above 100% Vclay.

Sonic porosity AFF model. Ø = 1-(Tma/T)^(1/x)

Vclay is Vclay from GR

PHIE = (1-Vclay)*PHIT.

Sxo is limited to: Sxo>=Sw.

x = 1.60 Tma = 55.5 ms/ft

Figure 4c

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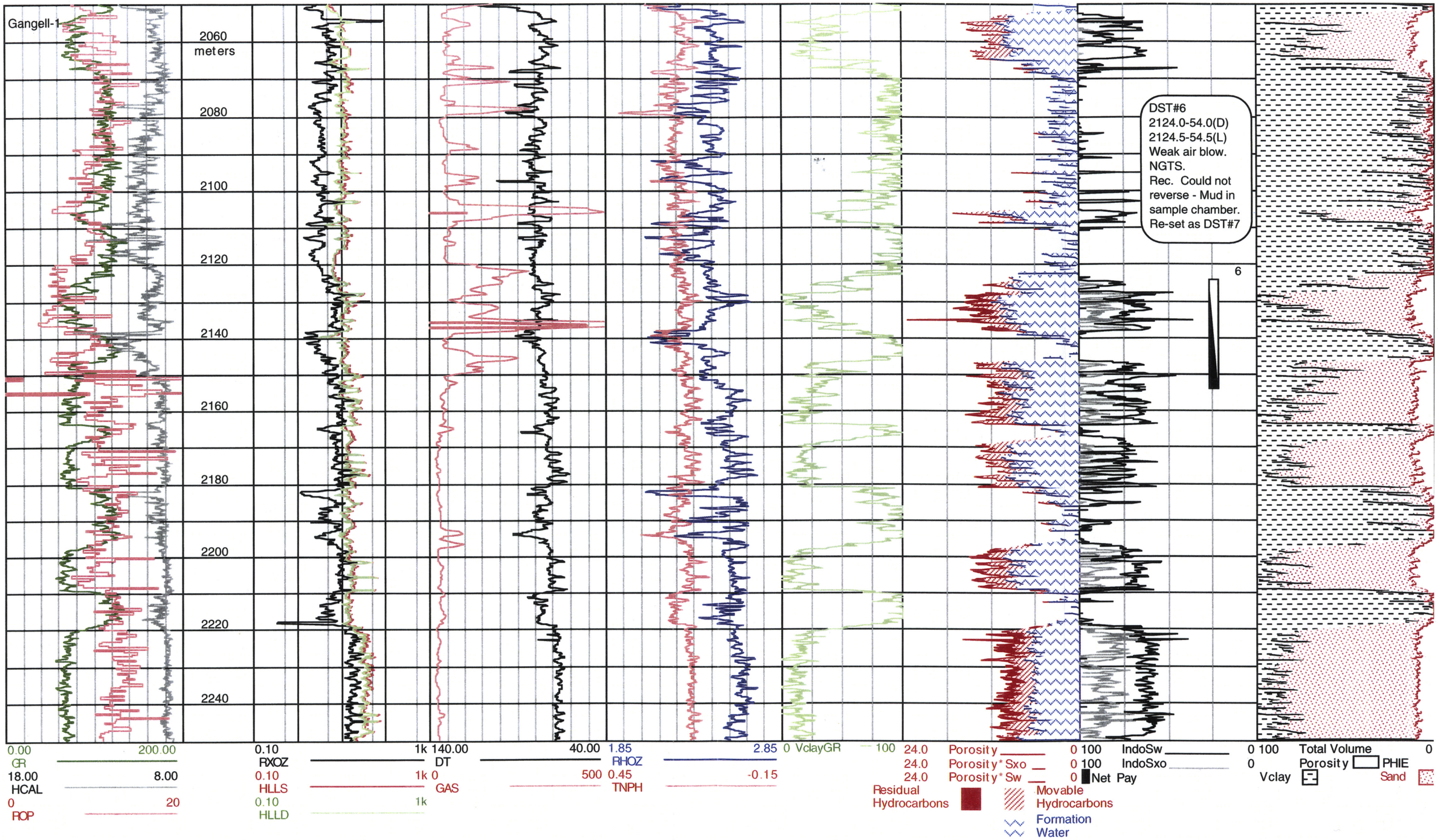
LAKES OIL N.L. GANGELL-1 - STRZELECKI FORMATION EVALUATION - 2050-2250m.



Evaluation using Indonesian Water Saturation Model

(1/RT)^0.5=[(Vclay^b)/(Rclay^0.5)+(PHIE^(m/2))/(a*Rw)^0.5]*SwInd^(n/2)
b=1-(Vclay/2)

Parameters Used.

Surface temperature = 77°F BHT (logs) = 180°F RHOF = 1.00
Measured Rmf = 0.172 at 180°F. Bit Size = 12.25
GRclean = 60 GRclay = 120 VclayGR = 0.5*VclayGR/(1.5-VclayGR)
Shaly Sand model for lithology. RTclay = 20 Rwa = 0.15
PHIE cutoff sets Sw & Sxo to 100% below 0.0 % porosity.
Coal is detected if RHOZ<1.65 & RHOZ<>0 or if TNPH > 55.0 or if DT > 240.0.

TD logger = 2350 meters. Rt from RT curve.
Bit Size = 8.500 from 1251 to 2350
RHOG = 2.65 for Density porosity.
Rmfa = 0.16 a = 1.0 : m = 2.0 : n = 2.0
Sw & Sxo set to 100% above 100% Vclay.
Sonic porosity AFF model. Ø = 1-(Tma/T)^(1/x)

Vclay is Vclay from GR
PHIE = (1-Vclay)*PHIT.
Sxo is limited to: Sxo>=Sw.

x = 1.60 Tma = 55.5 ms/ft

Figure 4d

APPENDIX 4

BIT RECORD

GANGELL-1 BIT RECORD

Bit	Run	Size	Make	Type	IADC	Serial	Nozzles	Motor	S/Sub	Depth	Metres	Hours	ROP	SUM	Bit Grading								WOB	RPM	Pump Press
No.	No.	(mm)			Code	No.	(32nd)	(Y/N)	(S/No)	Out			(m/h)	Hrs	I	O	D	L	B	G	O	R			(psi)/(gpm)
1RR	1	445	Varel	L117	1-1-7	134516	20-20-20	N	-	262	262	8.0	32.8	8.0	3	3	SS	A	3	1	ER	CTD	5-25	70-140	1100/741
2	1	311	Varel	L114	1-1-4	142777	20-18-0	N	-	691	428	13.0	32.9	21.0	3	3	SS	A	4	1	ER	DST	25-30	150-160	1500/627
3	1	311	Varel	L117	1-1-7	148979	18-18-0	N	-	1234	543	23.5	23.1	44.5	4	6	SS	A	E	4	ER	TQ	20-30	145-160	1750/627
4RR	1	311	Varel	L114	1-1-4	142700	18-18-0	N	-	1281	47	3.5	13.4	48.0	6	3	SS	G	E	2	ER	CP	20-30	145-160	1700/610
5	1	216	Varel	L127	1-2-7	126101	12-12-0	N	-	1452	223	18.0	12.3	66.0	4	4	SS	A	2	1	ER	DST	20-24	120-130	1750/314
6	1	216	Varel	L114	1-1-4	105443	12-12-0	N	-	1566	114	12.0	9.5	78.0	3	4	BT	I	2	1	SS	CP	20-28	115-130	1900/314
7	1	216	Varel	ETD417EPS	4-1-7	148483	12-12-0	N	-	1940	374	36.0	10.4	114.0	2	2	BT	M	E	0	ER	DST	20-30	90-110	1950/314
7RR	1	216	Varel	ETD417EPS	4-1-7	148483	12-12-0	N	-	2117	117	27.5	6.5	141.5	3	5	BT	GM	E	0	SD	DST	20-30	80-115	1950/314
8	1	216	Varel	ETD437P	4-3-7	137466	12-12-0	N	-	2149	32	4.0	8.0	145.5	2	2	BT	NM	E	0	LT	DST	20-35	70- 90	2000305
8RR	1	216	Varel	ETD437P	4-3-7	137466	12-12-0	N	-	2350	201	47.5	4.3	193.0	4	3	BT	NM	E	0	LT	TD	20-35	50- 70	2000/305

APPENDIX 5

DRILLING FLUID SUMMARY

by

RMN DRILLING FLUIDS PTY. LTD.

RMN
Drilling Fluids

DRILLING FLUID SUMMARY

FOR : LAKES OIL NL

WELL : GANGELL # 1

GIPPSLAND BASIN

PEP 137

VICTORIA

Prepared by : Neil Kyberd
Andre Skujins

Date : February 2001

908902 097

RMN Drilling Fluids

CONTENTS

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Operator	:	**Lakes Oil NL**
Well	:	**Gangell # 1**
Rig	:	**ODE # 30**
Spud	:	**3rd January 2001**

RMN Drilling Fluids

1. SUMMARY OF OPERATIONS

Gangell # 1 was spudded on the 3rd January 2001 utilising ODE # 30 and reached a total depth of 2350 m on the 27th January 2001.

The rig water supply was from a water well drilled on site. The water had the following properties :

Chlorides	:	700 mg/l
Hardness	:	120 mg/l
Pf/Mf	:	0/0.1

HOLE SIZE	:	**17½" SURFACE HOLE**
MUD TYPE	:	**GEL SPUD MUD**
INTERVAL	:	**0 - 262 m**
CASING	:	**13-3/8" @ 261 m**

Prior to spudding, all mud tanks were filled with approximately 500 bbls water and had 19 ppb Ausgel (double yielding bentonite) added plus two drums of caustic added to them, to achieve a yield point in excess of 20 lb/100 ft² (funnel viscosity of around 50 sec/qt). The linear motion shale shakers were dressed with S84 screens.

For the initial stages of spud, while the large diameter collars were drilled past the conductor barrel, the pump rate remained low. It was then increased to approximately 740 gpm. The desilter was used almost from the outset, as the predominant formation type was sand. Despite the amount of sand drilled, blinding of the shakers was not a problem and downhole losses were insignificant. Consequently, lcm was not added while drilling.

While drilling ahead, mud volume was maintained with pre-hydrated Ausgel additions. The yield point was maintained around 20 lb/100 ft² throughout the interval and the mud weight slowly increased to a maximum level of 9.1 ppg.

Drilling continued to a casing point of 262 m where the hole was circulated clean prior to running a wiper trip. As downhole losses were negligible, Enerseal fine was not added prior to pulling out to run casing as a protection against cement losses when cementing. (Additionally, the cement slurry was to be built using pre-hydrated bentonite, lowering the cement hydrostatic and lowering the likelihood of loosing cement to the formation.) The pipe was then pulled from the hole.

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13-3/8" surface casing was then run in the hole. After circulating the hole clean, the casing was cemented and cement was displaced with water. Returns were good for most of the job, but as the cement column rose near the surface, returns tapered off somewhat although good cement did return to surface. A small top up job was eventually required. All mud tanks were then dumped and cleaned.

HOLE SIZE	:	**12¼" Intermediate Hole**
MUD TYPE	:	**KCl PHPA Polymer**
INTERVAL	:	**262 m - 1281 m**
CASING	:	**9-5/8" @ 1273 m**

All tanks were filled with water that was sourced from the back part of the sump, as considerable fluid rich in KCl and PHPA had been trucked over to this well from the previous well, Trifon # 1. The pill tank was isolated as it was intended to be used to drill out cement. Into the remainder of the tanks, the following was added :

Biocide	:	1 drum
Xantemp	:	6 sacks (0.5 ppb)
Praestol PHPA	:	3 sacks (0.25 ppb)
KCl (ag grade)	:	144 sacks (for 5%)
Caustic Soda	:	1 drum

Based on the previous well, no AMC Pac-R was added for this interval, as it was expected that PHPA alone would control the fluid loss adequately.

The KCl concentration was going to be run at lower levels on this well, so usage was lowered. Sodium Sulphite for corrosion control was added just prior to drilling ahead. The S84 screens were kept on the shale shakers in case problems were experienced with the fresh mud.

After BOPs had been installed and tested, a 12¼" bit was run in the hole. The cement, float and shoe were drilled out with water circulated through the pill tank. Open hole was drilled where a leak off test was conducted, indicating a formation break down pressure equivalent to a mud weight of 18.7 ppg. Drilling then continued and the hole was displaced to the premixed KCl PHPA fluid and all cement contaminated water was dumped.

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The Drilling Fluid's properties were then improved. Initially, the yield point was built up with Xantemp SD and the PHPA concentration was increased. Inhibition appeared very good judging by the nature of the cuttings at the shakers.

Once the yield point approached 20 lb/100 ft², barite additions commenced with the view to increasing the mud weight to 9.6 ppg prior to the Latrobe coals. Fortunately, the rig's two separate mud mixing hoppers allowed barite to be added direct to the suction tank through one, while building fresh premixes in the other. These premixes consisted primarily of Xantemp for the building and maintenance of the yield point (20 - 30 lb/100 ft²) and PHPA and KCl for inhibition. Due to the rapid drilling of the larger 12¼" hole size, considerable amounts of volume had to be built on a continuous basis.

As the Xantemp and PHPA concentration were built up, the 6RPM reading increased to around 10 - 12, a very good level for hole cleaning and barite suspension. The mud weight reached the required level of 9.6 ppg by 600 m.

As the first coal was intersected, no obvious losses occurred as on the previous well and drilling continued uneventfully. Large coal chunks did appear at the shakers, but were not the same size as seen previously.

Drilling continued to 691 m where the hole was circulated clean and a wiper trip to the shoe was conducted. The hole was tight all the way, with 10 - 40 k over pull. When back on bottom, the hole was again circulated clean and the pipe was pulled. The hole was in good condition.

Test tools were made up and run in the hole. DST # 1 was conducted without problems. After pulling free, the pipe was reverse circulated and the tools were pulled from the hole and laid out.

A bit was run in the hole and prior to drilling ahead, the hole had to be cleaned of coal cavings which were causing considerable torque. Once the cavings had been cleared, drilling proceeded uneventfully.

The mud weight was maintained at 9.6 ppg with selective use of the desilter and rheological properties were maintained with Xantemp and PHPA. KCl was added as required to keep the concentration around 3.5 - 4%.

As drilling continued through to the casing point of 1281 m, the yield point was kept at 25 - 30 lb/100 ft² and the mud weight was around 9.7 - 9.75 ppg. At 1234 m, the hole was circulated clean and the bit was tripped. Hole conditions were fair and the hole was washed and reamed from 1016 m to bottom.

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Drilling continued through to the casing point of 1281 m, where the hole was circulated clean. As the bit had just been tripped, no wiper trip was made and the pipe was pulled for logs.

Electric logs were run in the hole but were unable to pass 1032 m. A wiper trip was made, washing and reaming 1024 m - 1043 m, 1138 m - 1157 m and 1214 m -1281 m. The hole was circulated clean and while circulating, Xantemp was added directly to the suction tank to maintain the yield point at around 28 - 30 lb/100 ft², as it appeared to be dropping somewhat. The pipe was pulled and electric logs were run, this time successfully.

It was decided to run 9-5/8" casing straight into the hole. While this was happening, the premix tank was isolated and Ausben (Wyoming API bentonite) mix water was pre-hydrated for the cement job.

When the casing was on bottom, the hole was circulated clean and the cement job was conducted. As the hole was in such good gauge, cement (albeit cut with some mud) returned to surface. While waiting on cement and nippling up BOPs, all tanks were dumped and cleaned.

HOLE SIZE	:	**8½"**
MUD TYPE	:	**KCl PHPA Polymer**
INTERVAL	:	**1281 m - 2350 m (TD)**
CASING	:	**P&A**

All tanks were filled with water that was again sourced from the back part of the sump (approximately 600 bbls.) The sump still had good levels of KCl and PHPA in it. The pill tank was also isolated as it was intended to be used to drill out cement. Into the remainder of the tanks, the following was added :

Biocide	:	1 drum
AMC Pac-R	:	2 sacks (0.5 ppb)
Praestol PHPA	:	6 sacks (0.35 ppb)
Caustic Soda	:	1 drum

KCl was added later to bring the concentration up to 2%. The predominantly S84 screens were kept on the shale shakers for the time being. It was intended on this hole to keep the mud weight at no more than 8.8 pg and the PHPA concentration at a minimum of 1.5 ppb. Initially, though, the PHPA concentration was lower, as no depletion had occurred to the polymer. The high PHPA concentration was in

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an effort to prevent the dispersion and gross hole wash outs seen on the previous well.

An 8½" bit was run in the hole and the cement, float and shoe were drilled out with water via the pill tank. Once into open hole, a leak off test was conducted at 1290 m indicating a formation breakdown pressure equivalent to a mud weight of 16.9 ppg. At the same time, the premixed mud was lined up to the hole and as drilling continued, the hole was displaced to mud and the cement contaminated water was dumped.

A new premix was rapidly built while drilling ahead, as it was expected that a DST would be conducted fairly soon after drilling out. PHPA was added to increase its concentration and AMC Pac-R was added to both lower the fluid loss and increase the yield point. It was not deemed as necessary to use Xanthan Gum to improve the yield point as the carrying capacity provided by Regular Pac was deemed adequate in this section of hole.

Mud properties were fairly simple at this stage, with the yield point at around 10 lb/100 ft² and the fluid loss at approximately 10 - 12 cc's. The KCl concentration was just over 1.5%.

However, as drilling continued to 1319 m, continued tight hole on connections led to new hole having to be reamed back two or three times to make a connection. Consequently, the mud weight was increased to 8.7 ppg. KCl had to be used because the carrying capacity of the mud was not enough initially to suspend barite. AMC Pac-R and then Xantemp (once the AMC Pac-R had lowered the fluid loss to below 7 cc's) were also added directly to the system to improve the yield point.

Once the yield point was over 12 lb/100 ft², only barite was used for further weight increases. The 8.7 ppg mud weight aided in improving hole conditions at 1319 m, but further tight hole at 1357 m led to a further weight increase to 8.9 ppg. Again, this aided the hole conditions at this point.

Then, once again, the hole was tight at 1366 m and again the mud weight was increased, this time to 9.1 ppg. Hole conditions remained good from there on.

All the previous weighting up was made with a shortened system (i.e. the intermediate tank - 250 bbls - was isolated). After the weight was at 9.1 ppg, this tank was re-introduced and the system's weight was maintained with barite at 9.1 ppg.

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Drilling continued to 1452 m where the hole was circulated clean and the pipe pulled. Test tools were made up and run in the hole. DST # 2 was conducted without problems and after the tools were pulled free, the pipe was reverse circulated. The test tools were then pulled from the hole.

A bit was made up and run back in and the hole was washed and reamed from 1440 m to bottom. Drilling continued, with mud properties being maintained with PHPA for yield point (10 - 12 lb/100 ft²) and fluid loss (5 - 6 cc's). At 1566 m, the hole was circulated clean and the pipe was pulled.

A core barrel was made up and run in the hole, washing and reaming 25 m to bottom. Core # 1 was then cut to 1584 m. The core barrel was pulled from the hole and the 100% recovered core was laid out.

A bit was again made up and run back in the hole, washing 9 m to bottom. Drilling continued with the mud properties still being maintained primarily with PHPA. The PHPA concentration was constantly increasing, and by this stage had reached 2.0 ppb. Caustic soda was also being added when required to keep the pH at around 8.5, Sodium Sulphite was added to maintain a sulphite residual of around 120 mg/l for corrosion control, and Biocide was added occasionally to premixes as the sump water appeared "off".

Drilling continued through to 1940 m where the hole was briefly circulated before pulling 3 stands and circulating bottoms up. A wiper trip was conducted to the shoe, with the hole being tight initially. On running back in, the hole was washed and reamed from 1916 m to bottom. Again the hole was circulated briefly prior to pulling back 3 stands and circulating bottoms up.

The pipe was pulled and test tools were run in for DST # 3. After successfully conducting the test, the pipe was reverse circulated and pulled from the hole. A bit was run back in, washing and reaming from 1886 m to bottom.

As drilling continued, AMC Pac-LV (as the yield point was already high to start with) and AMC Pac-R were introduced to the system to lower and control the fluid loss, as it was showing and increasing trend as the bottom hole temperature was increasing.

The desilter was now being run intermittently to keep the mud weight at around 9.1 - 9.15 ppg. Drilling continued to 2117 m where a wiper trip was conducted back to 1910 m. The hole was tight most of the way (up to 60 k over pull) and on running back in the hole was washed and reamed 22 m to bottom. After circulating the hole clean, the pipe was pulled and test tools made up. However, as they were being run in the hole, a tong pin was dropped down the hole.

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A magnet was made up and run in to 2103 m, where the hole was tight. It was worked to bottom and the fish was picked up, pulled from the hole and retrieved. On the way out of the hole, the hole was tight at 2056 m and from 1971 m to 1961 m.

Test tools were again made up and run in the hole. DST # 4 was attempted but the packer was lost. The tools were pulled from the hole and laid down. A bit was run back in, washing 21 m to bottom and drilling continued.

At 2149 m the hole was briefly circulated and 1 stand was pulled and the hole circulated clean. The bit was pulled and test tools were made up. These were run in the hole and DST # 5 was attempted. Again, the packer failed (fill on bottom) and the tools were pulled.

A bit was run back in the hole, washing and reaming 2135 m to bottom. As drilling continued, Xantemp was re-introduced as the yield point was dropping. Once the yield point was increased, AMC Pac-R was added as by that stage, the fluid loss started showing an increasing trend due to the increasing bottom hole temperature. Continual AMC Pac-R treatment stabilised the fluid loss at around 7 - 8 cc's. The desilter was used selectively to maintain the mud weight at 9.1 ppg.

Drilling continued through to Total Depth of 2350 m, where the hole was circulated clean prior to running a 5 stand wiper trip. Fill of 1 m was found when back on bottom. A high viscosity pill was then circulated through the hole and the pipe was pulled to run electric logs.

Electric logs were run successfully. Test tools were then made up and run in the hole. DST # 6 was conducted, and straight after, DST # 7 (after having to reset the packers). After reverse circulating, these were then pulled from the hole.

A perforating gun was then run in the hole and perforated the intermediate casing at 684 m. Test tools were then made up and run in the hole. DST # 8 was unsuccessful as the packers failed, so after pulling them from the hole and servicing them, they were run back in and DST # 9 was conducted. After pulling free and pulling them from the hole, pipe was run in open ended and the well was plugged and abandoned.

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Rig	:	ODE # 30
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RMN Drilling Fluids

2. OBSERVATIONS, RECOMMENDATIONS AND WELL ANALYSIS

Gangell # 1 was drilled to a total depth of 2350 m for a mud cost of $82,659.70 or $35.17 per metre. No major problems were experienced although 2 Drill Stem Tests were aborted due to fill on bottom.

17½" Surface Hole

This section of hole was drilled to 262 m for a mud cost of $3,888.00 or $14.82 per metre. No problems were experienced and possible downhole losses did not occur. Lost circulation material was not added prior to running and cementing of casing, as the cement slurry was lightened by the addition of pre-hydrated bentonite.

12¼" Intermediate Hole

This section of hole was drilled to 1281 m for a mud cost of $38,801.80 or $38.08 per metre. Electric logs could not pass 1032 m on their first attempt, but after a wiper trip washed and reamed this section, no further problems occurred. Given the hole size and the type of formations drilled in this section, it would be unreasonable to economically run a mud system that would *guarantee* logs getting to bottom on the first run. Occasionally, problems will be encountered, so in this respect, a modification to the mud program would not be recommended.

Costs were lowered considerably on this section (25% reduction compared to Trifon, despite a longer interval) due to :

- Modification of the mud program somewhat - slightly less KCl was run as its inhibitive properties were not thought to be as important.
- Sump water containing both PHPA and KCl had been carted from the previous well, Trifon # 1, to this location and was used as the sole basis of all mud mixed, thereby lowering the amount of KCl and polymers (both PHPA and Xanthan Gum) required.
- No LCM being required, although overall downhole losses and overall volume mixed were quite similar to Trifon.

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The mud weight was increased to around 9.6 ppg with barite as drilling progressed through to the Latrobe Group at about 660 m, which contains a lot of coal. Due to the rapid drilling of the prior formation and due to the fact that it was a 12¼" hole, which requires considerable new volume, the mud weight increase started immediately the mud had enough carrying capacity. However, once the mud did have sufficient carrying capacity, the yield point was built more slowly, thereby reducing costs more by using less Xantemp (Xanthan Gum).

It was interesting to note that although there was considerable coal cavings, they were not as large nor as plentiful as on the previous well.

8½" Production Hole

This section of hole was drilled with a KCl PHPA Polymer Drilling Fluid to a total depth of 2350 m for a mud cost of $39,969.90 or $37.39 per metre. Problems encountered were tight hole on connections in the top section of hole and problems with fill causing 2 aborted DST's'. The first of these was directly after pulling the magnet from the hole - tight hole was experienced on the way out and had to be worked, so this may have been the cause of the fill. However, thought should be given to pumping very high viscosity pills prior to testing in this formation in future.

The mud program was changed significantly for this section of hole, as compared to Trifon # 1. This was mainly due to the poor hole gauge experienced there. Consequently, it was decided to :

- Significantly increase the PHPA concentration to a minimum of 1.5 ppb. It actually was increased to a maximum of 2.65 ppb at one stage. This was expected to prevent the major dispersion of the formation. This appeared to be successful as hole gauge was improved and significantly less dispersion into the mud system was noted.
- Lower KCl levels, as the formations were dispersive, not reactive.
- Maintain mud weight at or below 8.8 ppg.

The last objective, keeping the mud weight at or below 8.8 ppg, had to be abandoned soon after drilling ahead because significant tight hole was experienced on connections. This tight hole was only alleviated by increasing the mud weight in increments to 9.1 ppg. Initially, KCl had to be used, as the mud did not have the carrying capacity for barite. Once the yield point had been increased sufficiently, barite was used.

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Despite the change in program which was designed to improve hole conditions, which normally could be expected to add to the mud cost, the mud costs were in fact lower than the previous well on a per metre basis. Also, the increase in mud weight contributed significantly to costs.

Overall, the large increase in PHPA concentration led to more easily attainable yield point properties, which considerably lowered the Xantemp required. Also, since there was less dispersion, far less dumping and dilution was required than on the previous well. This is especially highlighted in the dilution rates for this section : On this well 1.5 bbls per metre of new fluid was required as compared to 2.6 bbls per metre on Trifon.

A further reason for the lowered costs was due to the sump water, from Trifon, which was solids free and contained appreciable KCl (was tested in the early stages of the well and contained nearly 1.5% KCl) and PHPA levels.

Recommendations for Future Wells

In the light of the experience gained on *both* wells, the following should at least be considered for future wells in the area.

It appears that most formations drilled in this area are not overly reactive. KCl levels of no more that 2 - 3% should be more than adequate. In any event, KCl does not prevent dispersion, which was a major problem in the Strzelecki Group on Trifon. PHPA is an excellent inhibiting agent, and also helps prevent dispersion. Additionally, it aids in the maintenance of both Fluid Loss and Yield Point parameters.

The use of Salt (NaCl) should be considered for mud weight increases. More accurate costings would have to be done at the time, but salt costs are not that much different to barite costs. Using salt would have the following advantages :

- In the 12¼" section, the mud weight could be increased earlier (even when mixing the fresh mud) without having to wait for the yield point to be increased sufficiently to carry barite. Note that the yield point can not be increased to its desired level of around 14 - 20 lb/100ft² prior to drill out, as the amount of polymer required along with the PHPA in the system, would lead to significant problems with the shale shakers handling the flow.

  Consequently, if the mud weight were to be built more easily and earlier, Xantemp additions (an expensive product) would be tailored around good

Operator	:	**Lakes Oil NL**
Well	:	**Gangell # 1**
Rig	:	**ODE # 30**
Spud	:	**3rd January 2001**

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mud properties for the drilling of the massive coal sections. Costs would be significantly lowered in this way.

Building the mud weight earlier in the section with salt should not impact significantly on ROP in the top section of hole.

- Using Salt for mud weight increases in the 8½" section would lead to a less damaging fluid than if barite were used. If formation damage is concern, which it should be, a lower solids fluid should lead to less damage occurring.

3. INTERVAL COSTS

Product			17-1/2" Surface Hole			12-1/4" Intermediate Hole			8-1/2" Production Hole			Total Well Consumption		
	Interval :		0 - 262 m			262 m - 1281 m			1281 m - 2350 m			0 - 2350 m (TD)		
	Cost	Unit Size	Used	Cost	%Cost	Used	Cost	%Cost	Used	Cost	%Cost	Used	Cost	%Cost
Aus Pac-LV	$161.00	25 kg							7	$1,127.00	2.8%	7	$1,127.00	1.4%
Aus Pac-R	$161.00	25 kg							44	$7,084.00	17.7%	44	$7,084.00	8.6%
Ausgel	$12.00	25 kg	316	$3,792.00	97.5%							316	$3,792.00	4.6%
Barite	$7.50	25 kg				1047	$7,852.50	20.2%	1110	$8,325.00	20.8%	2157	$16,177.50	19.6%
Biocide	$140.00	25 kg				6	$840.00	2.2%	6	$840.00	2.1%	12	$1,680.00	2.0%
Caustic Soda	$32.00	20 kg	3	$96.00	2.5%	5	$160.00	0.4%	14	$448.00	1.1%	22	$704.00	0.9%
Defoamer	$125.00	25 kg				2	$250.00	0.6%	1	$125.00	0.3%	3	$375.00	0.5%
KCl Ag	$17.55	25 kg				396	$6,949.80	17.9%	228	$4,001.40	10.0%	624	$10,951.20	13.2%
PHPA	$120.00	25 kg				27	$3,240.00	8.4%	99	$11,880.00	29.7%	126	$15,120.00	18.3%
Soda Ash	$27.50	25 kg				25	$687.50	1.8%	21	$577.50	1.4%	46	$1,265.00	1.5%
Sodium Sulphite	$39.50	25 kg				16	$632.00	1.6%	46	$1,817.00	4.5%	62	$2,449.00	3.0%
Xantemp SD	$535.00	25 kg				34	$18,190.00	46.9%	7	$3,745.00	9.4%	41	$21,935.00	26.5%
Totals :				**$3,888.00**	**100.0%**		**$38,801.80**	**100.0%**		**$39,969.90**	**100.0%**		**$82,659.70**	**100.0%**
Cost per Metre :				**$14.84**			**$38.08**			**$37.39**			**$35.17**	

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4. MATERIALS RECONCILIATION

Previous Well : Trifon # 1
Well : Gangell # 1
Transferred to : Stores

PRODUCT	UNIT	TOTAL RECEIVED	TOTAL USED	TRANSFER BALANCE
AMC Pac-LV	25 kg	40	7	33
AMC Pac-R	25 kg	97	44	53
Ausben	25 kg	84	66	18
Ausgel	25 kg	410	316	94
Barite	25 kg	2357	2157	200
Biocide	20 kg	22	12	10
Caustic Soda	20 kg	29	22	7
Citric Acid	25 kg	27		27
Defoamer	25 lt	19	3	16
Enerseal Fine	25 kg	94		94
KCl	25 kg	624	624	
Kwikseal Fine	18.2 kg	31		31
Kwikseal Medium	18.2 kg	90		90
Lime	20 kg	50		50
PHPA (Praestol)	25 kg	200	126	74
Rod Free	200 lt	2		2
Soda Ash	25 kg	49	46	3
Sodium Sulphite	25 kg	83	62	21
Xantemp	25 kg	60	41	19

5. FLUID PROPERTIES SUMMARY

Date	Mud Type	Temp.	Depth	Weight	Vis	PV	YP	Gels 10 sec	Gels 10 min	Filtrate API	Filtrate Cake	Solids Solids	Solids Water	Solids Oil	Solids Sand	Solids MBT	pH	Pm	Pf	Mf	Cl-	Ca++	SO3=	K+	KCl	PHPA
3-Jan-01	Gel Spud Mud		20	8.50	53							1.2	98.8													
4-Jan-01	Gel Spud Mud		262	9.10	49	9	23	15	25	17	2	5.4	94.6		Tr		9.0		0.08	0.25	750	140				
	Gel Spud Mud		262	9.05	47							5.1	94.9													
6-Jan-01	KCl PHPA Polymer	29	371	8.75	46	8	12	3	4	15	1	1.2	98.8		Tr	<2.5	9.0		0.08	0.75	29,000	360	180	28,100.8	5.2	0.40
	KCl PHPA Polymer	32	520	8.90	52	14	23	8	10	12	1	2.5	97.5		Tr	4.0	8.8		0.05	0.65	24,500	280	140	22,696.8	4.2	0.70
7-Jan-01	KCl PHPA Polymer	35	691	9.60	54	17	29	10	12	12	1	7.6	92.4		Tr	5.0	8.5		0.05	0.60	24,000	320	120	21,616	4.0	0.55
8-Jan-01	KCl PHPA Polymer	36	710	9.70	49	18	28	12	14	10.5	1	8.5	91.5		1/2	6.0	8.5		0.05	0.60	20,000	460	80	16,212	3.0	0.55
	KCl PHPA Polymer	39	1030	9.75	54	14	30	11	14	9.4	1	8.6	91.4		1/4	6.0	9.0		0.10	0.85	24,500	260	140	22,156	4.1	0.70
9-Jan-01	KCl PHPA Polymer	40	1234	9.60	46	14	28	9	13	9.5	1	7.5	92.5		1/2	6.0	9.0		0.10	1.20	24,500	200	120	21,616	4.0	0.75
	KCl PHPA Polymer	47	1255	9.75	47	13	29	7	12	9.5	1	8.8	91.2		1/2	6.0	9.0		0.10	1.35	22,000	260	120	19,454	3.6	0.80
10-Jan-01	KCl PHPA Polymer	47	1281	9.75	45	13	26	7	11	10.2	1	8.8	91.2		1/2	6.0	8.8		0.08	1.35	22,000	280	120	19,454	3.6	0.80
	KCl PHPA Polymer	46	1281	9.70	46	13	27	8	12	10.5	1	8.4	91.6		1/2		8.8		0.08	1.45	22,000	280	120	19,454	3.6	0.80
11-Jan-01	KCl PHPA Polymer		1281	9.75	48							10.0	90.0													
12-Jan-01	KCl PHPA Polymer		1317	8.50	33	7	6	1	2	13.0	1	0.6	99.4		Tr		9.5		0.12	1.25	9,000	260	120	5,404	1.0	1.25
13-Jan-01	KCl PHPA Polymer	30	1360	8.80	38	12	16	2	4	7.5	1	1.4	98.6		Tr		9.5		0.15	1.05	31,000	180	120	30,262	5.6	1.45
	KCl PHPA Polymer	35	1452	9.15	37	11	12	1	2	6.2	1	4.5	95.5		1/4	4.0	9.0		0.80	0.90	22,000	420	100	21,616	4.0	1.45
14-Jan-01	KCl PHPA Polymer		1452	9.15	36							5.8	94.2													
15-Jan-01	KCl PHPA Polymer	37	1498	9.20	37	11	10	1	2	5.8	1	5.0	95.0		Tr	5.0	8.8		0.08	0.78	19,500	420	140	18,914	3.5	1.95
	KCl PHPA Polymer	39	1566	9.15	38	11	11	1	2	5.6	1	4.7	95.3		Tr	5.0	8.5		0.05	0.70	18,500	340	120	17,833	3.3	1.95
16-Jan-01	KCl PHPA Polymer	38	1570	9.15	43	12	11	1	2	5.8	1	4.7	95.3		Tr		8.5		0.05	0.65	18,000	260	120	17,833	3.3	1.95
	KCl PHPA Polymer	40	1584	9.15	45	13	12	1	2	5.5	1	4.7	95.3		Tr	5.0	8.8		0.08	0.70	17,500	180	140	16,752	3.1	2.00
17-Jan-01	KCl PHPA Polymer	41	1695	9.15	43	13	14	1	2	5.2	1	4.8	95.2		Tr	5.0	9.0		0.10	0.70	17,000	180	120	16,212	3.0	2.25
	KCl PHPA Polymer	43	1816	9.15	44	13	16	1	2	5.5	1	4.8	95.2		Tr	5.0	8.6		0.05	0.65	16,000	240	120	15,131	2.8	2.25
18-Jan-01	KCl PHPA Polymer	46	1929	9.15	58	15	20	2	5	7.5	1	5.0	95.0		Tr	4.5	9.0		0.10	0.90	13,000	100	140	11,889	2.2	2.35
	KCl PHPA Polymer	47	1940	9.15	54	15	19	2	4	7.8	1	5.0	95.0		Tr		9.0		0.10	0.95	13,000	100	120	11,889	2.2	2.35
20-Jan-01	KCl PHPA Polymer	45		9.10	39	12	13	2	4	9.4	1	4.8	95.2		Tr	4.0	8.5		0.05	0.70	11,000	280	120	10,268	1.9	2.35
	KCl PHPA Polymer	48		9.15	41	14	13	2	5	7.8	1	5.1	94.9		Tr	5.0	9.0		0.08	0.75	11,000	260	140	10,268	1.9	2.35
21-Jan-01	KCl PHPA Polymer	50	2085	9.15	54	20	20	2	4	5.8	1	5.2	94.8		Tr		9.0		0.08	0.75	9,500	180	140	8,646	1.6	2.60
	KCl PHPA Polymer	51	2114	9.10	50	20	21	2	4	6.0	1	4.9	95.1		Tr	5.0	8.8		0.05	0.75	9,000	120	120	8,106	1.5	2.60
22-Jan-01	KCl PHPA Polymer	49	2117	9.05	54	21	21	2	3	5.6	1	4.5	95.5		Tr		8.8		0.05	0.75	9,000	120	120	8,106	1.5	2.60
23-Jan-01	KCl PHPA Polymer	48	2131	9.15	57	20	19	2	3	4.5	1	5.2	94.8		Tr		8.5		0.05	0.65	9,000	160	100	8,106	1.5	2.60
	KCl PHPA Polymer	53	2149	9.15	50	20	16	1	3	4.8	1	5.2	94.8		Tr	5.0	8.8		0.08	0.70	9,000	120	120	8,106	1.5	2.60
25-Jan-01	KCl PHPA Polymer	51	2177	9.10	45	17	18	2	5	7.0	1	4.9	95.1		1/4	5.0	8.5		0.05	0.65	8,500	140	140	7,566	1.4	2.63
	KCl PHPA Polymer	52	2215	9.15	48	19	21	2	6	7.1	1	5.2	94.8		1/4	5.5	9.0		0.10	1.00	9,000	120	120	7,566	1.4	2.63
26-Jan-01	KCl PHPA Polymer	54	2283	9.10	47	19	20	2	6	8.4	1	4.3	95.7		1/4	5.5	9.0		0.10	1.00	9,000	160	120	7,566	1.4	2.60
	KCl PHPA Polymer	55	2330	9.15	47	19	19	2	5	8.6	1	4.3	95.7		1/4	5.5	8.8		0.05	1.00	9,000	120	100	7,566	1.4	2.50
	KCl PHPA Polymer		2350	9.15	47	19	18	2	5	7.4	1	4.0	96.0		Tr	5.5	8.8		0.05	1.00	9,000	180	140	7,566	1.4	2.50
28-Jan-01	KCl PHPA Polymer		2350	9.25	51	19	18	2	5	7.4	1	4.5	95.5		Tr	5.0	8.8		0.05	1.00	9,000	180	120	7,566	1.4	2.50
29-Jan-01	KCl PHPA Polymer		2350	9.25	52	19	18	2	5	7.4	1	4.5	95.5		Tr	5.0	8.8		0.05	1.00	9,000	180	100	7,566	1.4	2.50

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6. Mud Volume Analysis

Date	Hole Size	Interval From	Interval To	Mud Type	Fluid Built & Received: Fresh Premix	Sump Premix	Direct Recirc	Water	Other	Fluid Disposed: De-sander	De-silter	Down-hole	Dumped	Other	Summary: Initial	Received	Disposed	Final
3-Jan-01	17-1/2"	0 m	22 m	Spud Mud	600										0	600	0	600
4-Jan-01	17-1/2"	22 m	262 m	Spud Mud	100			450			193	31	180		600	550	404	746
Sub Total					**700**	**0**	**0**	**450**	**0**	**0**	**193**	**31**	**180**	**0**		**1150**	**404**	
5-Jan-01	12-1/4"	262 m	262 m	KCl PHPA		600									112	600	0	712
6-Jan-01	12-1/4"	262 m	504 m	KCl PHPA		200					13	40	45	60	712	200	158	754
7-Jan-01	12-1/4"	504 m	691 m	KCl PHPA		420					0	164	40	60	754	420	264	910
8-Jan-01	12-1/4"	691 m	1045 m	KCl PHPA		400					100	132	25	40	910	400	297	1014
9-Jan-01	12-1/4"	1045 m	1281 m	KCl PHPA		350						166	25	50	1014	350	241	1122
10-Jan-01	12-1/4"	1281 m	1281 m	KCl PHPA								50			1122	0	50	1072
11-Jan-01	12-1/4"	1281 m	1281 m	KCl PHPA								15			1072	0	15	1057
Sub Total					**0**	**1970**	**0**	**0**	**0**	**0**	**113**	**567**	**135**	**210**		**1970**	**1025**	
12-Jan-01	8-1/2"	1281 m	1317 m	KCl PHPA		750									0	750	0	750
13-Jan-01	8-1/2"	1317 m	1452 m	KCl PHPA		120		45				48	30	40	750	165	118	797
14-Jan-01	8-1/2"	1452 m	1452 m	KCl PHPA								60			797	0	60	737
15-Jan-01	8-1/2"	1452 m	1566 m	KCl PHPA		240					55	81	80		737	240	216	761
16-Jan-01	8-1/2"	1566 m	1590 m	KCl PHPA		150					15	10	100		761	150	125	786
17-Jan-01	8-1/2"	1590 m	1821 m	KCl PHPA		260					46	21	74	20	786	260	161	885
18-Jan-01	8-1/2"	1821 m	1940 m	KCl PHPA		200					43	22	80	20	885	200	165	921
19-Jan-01	8-1/2"	1940 m	1940 m	KCl PHPA		100						15	35		921	100	50	971
20-Jan-01	8-1/2"	1940 m	2050 m	KCl PHPA		140					39	28	70		971	140	137	974
21-Jan-01	8-1/2"	2050 m	2117 m	KCl PHPA		120					18	28	40		974	120	86	1008
22-Jan-01	8-1/2"	2117 m	2117 m	KCl PHPA								25			1008	0	25	983
23-Jan-01	8-1/2"	2117 m	2149 m	KCl PHPA		40					11	20	40		983	40	71	953
24-Jan-01	8-1/2"	2149 m	2149 m	KCl PHPA								20	20		953	0	40	913
25-Jan-01	8-1/2"	2149 m	2233 m	KCl PHPA		100					9	34	20		913	100	62	951
26-Jan-01	8-1/2"	2233 m	2328 m	KCl PHPA		80					7	3			951	80	10	1021
27-Jan-01	8-1/2"	2328 m	2350 m	KCl PHPA		20					11	14			1021	20	25	1015
28-Jan-01	8-1/2"	2350 m	2350 m	KCl PHPA								20			1015	0	20	995
29-Jan-01	8-1/2"	2350 m	2350 m	KCl PHPA								440			995	0	440	555
30-Jan-01	8-1/2"	2350 m	2350 m	KCl PHPA								248			555	0	248	307
Sub Total					**0**	**2320**	**0**	**45**	**0**	**0**	**252**	**1136**	**589**	**80**		**2365**	**2058**	
Well Total					**700**	**4290**	**0**	**495**	**0**	**0**	**558**	**1734**	**904**	**290**		**5485**	**3486**	

Dilution Factors			
	Interval Length	Dilution Vol	Dilution Factor
17-1/2" Surface Hole	262 m	550 bbls	2.1 bbls/m
12-1/4" Intermediate Hole	1019 m	1370 bbls	1.3 bbls/m
8-1/2" Hole	1069 m	1615 bbls	1.5 bbls/m

R M N Drilling Fluids

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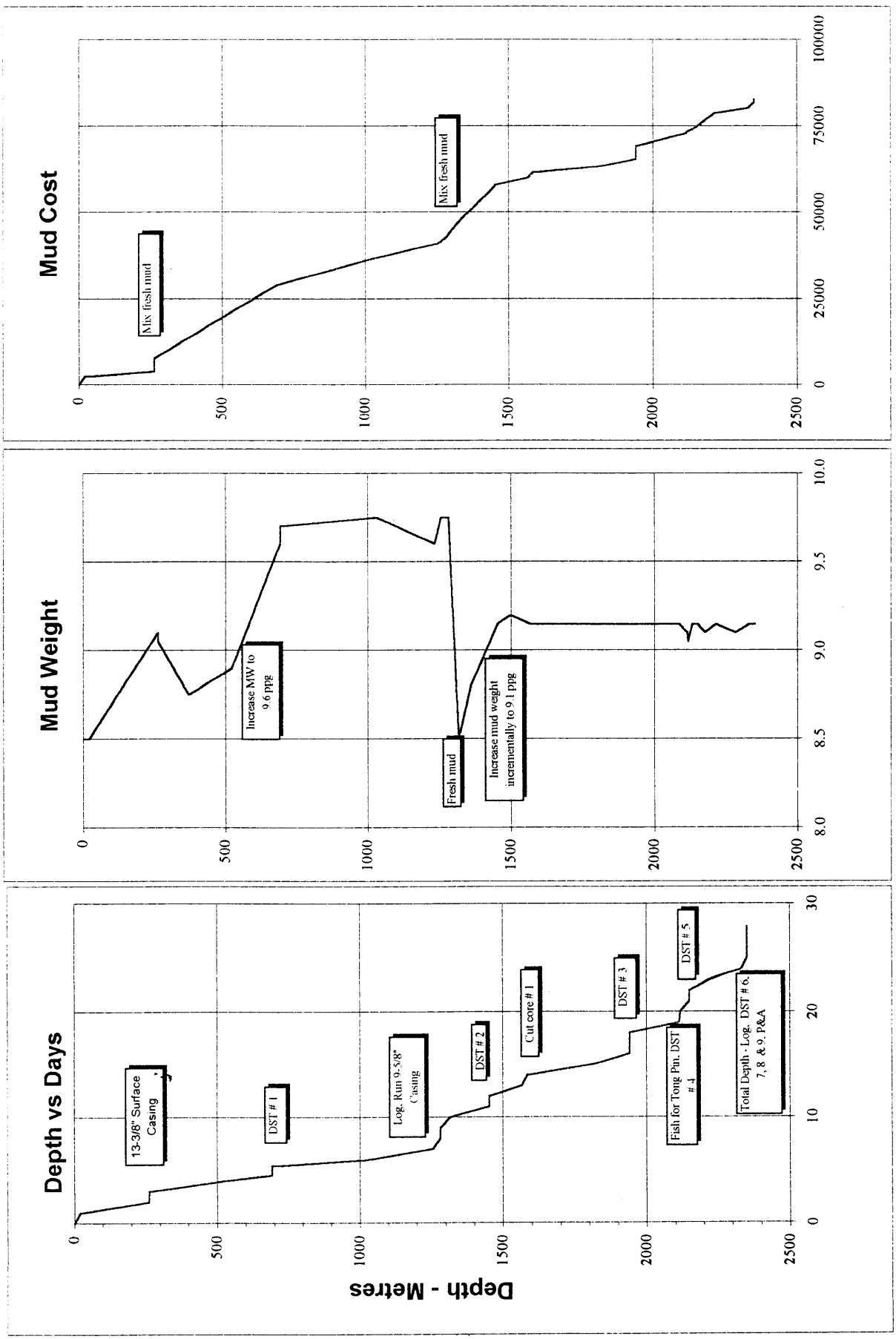
7. Graphs



8. Bit & Hydraulics Record

Operator :	Lakes Oil	Well :	Gangell # 1	Contractor :	ODE # 30	Supervisors : Brent Speechley																			
Spud Date :	3-Jan-01	TD Date :	27-Jan-01	Surface Csg :	13-3/8" @ 257 m	Intermediate Csg :	9-5/8" @ 1273 m											Production Csg :	P & A						
																Annular Flow Properties									
Bit #	Size	Make	Type	Jets				Depth Out	Depth Drilled	Hours	Cumm Hours	WOB	RPM	GPM	Mud Wt	n	q_{300}	Drill Pipe	Q CRIT dp	Flow	Drill Collars	Q CRIT dc	Flow	Jet Vel	HHPb /sq"	Impact Force
1rr	17.5"	Varel	L117	20	20	20		262	262	8	8	25	140	741	9.1	0.46	37	4.5	2077	Laminar	8	1932	Laminar	258	235	900
2	12.25"	Varel	L114	20	18			691	429	13	21	30	160	627	9.6	0.46	37	4.5	1063	Laminar	6.5	965	Laminar	361	412	1127
3	12.25"	Varel	L117	18	18			1234	543	23.5	44.5	30	160	627	9.75	0.4	44	4.5	1269	Laminar	6.5	1136	Laminar	404	523	1279
4rr	12.25"	Varel	L114	18	18			1281	47	3.5	48	30	160	610	9.75	0.39	42	4.5	1248	Laminar	6.5	1114	Laminar	393	481	1210
5	8.5"	Varel	L127	12	12			1452	171	18	66	24	130	314	9.15	0.56	23	4.5	353	Laminar	6.5	267	Turbulent	455	312	677
6	8.5"	Varel	L114	12	12			1566	114	12	78	28	130	314	9.15	0.58	22	4.5	335	Laminar	6.5	256	Turbulent	455	312	677
7	8.5"	Varel	ETD417EP	12	12			1940	374	36	114	30	110	314	9.15	0.53	34	4.5	477	Laminar	6.5	353	Laminar	455	312	677
7rr	8.5"	Varel	ETD417EP	12	12			2177	237	27.5	141.5	30	115	314	9.1	0.57	41	4.5	525	Laminar	6.5	400	Laminar	455	310	673
8	8.5"	Varel	ETD437P	12	12			2350	173	45	186.5	30	115	314	9.15	0.56	40	4.5	519	Laminar	6.5	392	Laminar	455	312	677

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9.1 Hole Gauge Evaluation

Hole Gauge by Formation Interpreted from Caliper Log Data

12-1/4" Intermediate Hole

Loggers Depth	1261 m	Calc OH Vol	480 bbl
Bit Size	12.25"	Actual OH Vol	481 bbl
CSG Size	13-3/8"	Volume Excess	0 bbl
CSG ID	12.715"	Excess %	0%
CSG Shoe	257 m	Average Hole Diam	12.26"
OH Depth	1004 m	CSG Volume	132.5 bbls
		Total Volume	613 bbls

FORMATION	FROM (m)	TO (m)	INTERVAL	CUB m	AVG DIAM inches
Gippsland Limestone	257 m	642	385 m	28.3 cub m	12.05"
Lakes Entrance	642	683	41 m	3.5 cub m	12.98"
Latrobe Gp (Top Clastics)	683	820	137 m	11.0 cub m	12.59"
Latrobe Gp (Top Coals)	820	1251	431 m	33.6 cub m	12.41"

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9.2 Hole Gauge Evaluation

Hole Gauge by Formation Interpreted from Caliper Log Data

8-1/2" Main Hole

Loggers Depth	2350 m	Calc OH Vol	248 bbl
Bit Size	8 1/2"	Actual OH Vol	319 bbl
CSG Size	9 5/8"	Volume Excess	71 bbl
CSG ID	8.921"	Excess %	29%
CSG Shoe	1273 m	Average Hole Diam	9.6"
OH Depth	1077 m	CSG Volume	323 bbls
		Total Volume	642 bbls

FORMATION	FROM (m)	TO (m)	INTERVAL	CUB m	MAX OH DIAM inches	AVG DIAM inches
Strzelecki Group	1273 m	1400 m	127 m	10.2 cub m	23.0"	12.6"
1400m-1500m	1400 m	1500 m	100 m	4.9 cub m	15.0"	9.8"
1500m - 1850m	1500 m	1850 m	350 m	13.8 cub m	11.2"	8.8"
1850m - 1900	1850 m	1900 m	50 m	2.6 cub m	15.0"	10.1"
1900m - 2000m	1900 m	2000 m	100 m	3.9 cub m	12.0"	8.8"
2000m - 2200m	2000 m	2200 m	200 m	9.5 cub m	14.0"	9.7"
2200m - 2350m	2200 m	2350 m	150 m	5.8 cub m	10.0"	8.7"

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	1	Date :	3-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	0 to 22		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	John Greydanus
WELL NAME AND No	Gangell # 1	FIELD: PEP 137	LOCATION: Gippsland Basin / STATE: Victoria

DRILLING ASSEMBLY		JET SIZE			CASING		MUD VOLUME (BBL)		CIRCULATION DATA				
PIT SIZE	TYPE	20	20	20	SURFACE	ft	HOLE	PITS	PUMP SIZE		CIRCULATION PRESS (PSI)	400	psi
17.50	Varel				SET @	M	18	582	6 X 8	Inches			
DRILL PIPE SIZE	TYPE	Length		Mtrs	INT.	ft	TOTAL CIRCULATING VOL.		PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	3	min
SIZE 4.5	16.6 #				SET @	M	600		GD PZ8	97.0			
DRILL PIPE SIZE	TYPE	Length		Mtrs	PROD. or LNR Set @	ft M	IN STORAGE		BBL/STK	STK / MIN	TOTAL CIRC. TIME (min)	147	min
									0.0700	60			
DRILL COLLAR SIZE (")		Length			MUD TYPE				BBL/MIN	GAL / MIN	ANN VEL. (ft/min) DP	15	
6.25	8	22		Mtrs	Gel Spud Mud				4.07	171	DCs	17	

MUD PROPERTIES			
SAMPLE FROM			FL
TIME SAMPLE TAKEN			23.30
DEPTH (ft) - (m)	Metres		20
FLOWLINE TEMPERATURE	°C / °F		
WEIGHT	ppg / SG		8.50 1.020
FUNNEL VISCOSITY (sec/qt) API @	°C		53
PLASTIC VISCOSITY cP @	°C		
YIELD POINT (lb/100ft²)			
GEL STRENGTHS (lb/100ft²) 10 sec/10 min			
FILTRATE API (cc's/30 min)			
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)			
SOLIDS CONTENT (% by Volume)			1.2
LIQUID CONTENT (% by Volume) OIL/WATER			98.8
SAND CONTENT (% by Vol.)			
METHYLENE BLUE CAPACITY (ppb equiv.)			
pH			
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)			
CHLORIDE (mg/L)			
TOTAL HARDNESS AS CALCIUM (mg/L)			
SULPHITE (mg/L)			
K+ (mg/L)			
KCl (% by Wt.)			
PHPA ppb			

MUD PROPERTY SPECIFICATIONS			
Mud Weight Min		API Filtrate	HPHT Filtrate
Plastic Vis		Yield Point > 20	pH
KCl		PHPA	Sulphites

OBSERVATIONS

All mud tanks were filled with water and added 19 ppb Ausgel.
As drilling progresses, water and fresh gel additions will be made to maintain volume and yield point.
If significant down hole losses are encountered, lcm will be added.

OPERATIONS SUMMARY

Spud Gangell # 1 at 23.00 hours
Drill 17-1/2" hole to midnight depth of 22 m.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
Premix (drill water)	600	Desander		INITIAL VOLUME	
Premix (recirc from sump)		Desilter			
Drill Water		Downhole	0	+ FLUID RECEIVED	600
Direct Recirc Sump		Dumped		-FLUID LOST	0
Other (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	600	TOTAL LOST	0	FINAL VOLUME	600

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 84	1
Degasser	PB		Desilter	12		Shaker #2	3 x 84	1

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

Product	Price	Start	Received	Used	Close	Cost
gel	$ 12.00	410		200	210	$ 2,400.00
Caustic Soda	$ 32.00	13		2	11	$ 64.00

SOLIDS ANALYSIS	PPB	%
High Grav solids		
Total LGS		
Bentonite		
Drilled Solids	1.2	
Salt		
n @ 23.30 Hrs		
K @ 23.30 Hrs		

BIT HYD. PRESS.DATA	
Jet Velocity	59
Impact force	45
HHP	3
HSI	0.0
Bit Press Loss	27
CSG Seat Frac Press	
Equiv. Mud Wt.	
ECD	
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$2,464.00	$2,464.00

FIELD ENGINEER Andre Skujins CITY Adelaide Office TELEPHONE 08 8338 7266

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	2	Date :	4-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	22 to 262		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	John Greydanus
WELL NAME AND No	Gangell # 1	FIELD	PEP 137
LOCATION	Gippsland Basin	STATE	Victoria

DRILLING ASSEMBLY

BIT SIZE	17.50	TYPE	Varel	
DRILL PIPE SIZE	4.5	TYPE	16.6 #	Length 66 Mtrs
DRILL PIPE SIZE	4.5	TYPE	HW	Length 46 Mtrs
DRILL COLLAR SIZE (")	6.25		8	Length 122 28 Mtrs

JET SIZE

20	20	20

CASING

SURFACE SET @	ft	M
INT. SET @	ft	M
PROD. or LNR Set @	ft	M

MUD TYPE: Gel Spud Mud

MUD VOLUME (BBL)

HOLE	PITS
236	510

TOTAL CIRCULATING VOL. 746

IN STORAGE

CIRCULATION DATA

PUMP SIZE	6 X 8 Inches	CIRCULATION PRESS (PSI)	1100 psi
PUMP MODEL	GD PZ8	ASSUMED EFF	97.0
BOTTOMS UP (min)	12 min		
BBL/STK	0.0700	STK / MIN	260
TOTAL CIRC. TIME (min)	42 min		
BBL/MIN	17.65	GAL / MIN	741
ANN VEL. (ft/min)	DP 64 / DCs 68 75		

MUD PROPERTIES

SAMPLE FROM		FL	FL	
TIME SAMPLE TAKEN		13.00	23.30	
DEPTH (ft) - (m)	Metres	262	262	
FLOWLINE TEMPERATURE	°C / °F			
WEIGHT	ppg / SG	9.10 1.092	9.05 1.086	
FUNNEL VISCOSITY (sec/qt) API @	°C	49	47	
PLASTIC VISCOSITY cP @	°C	9		
YIELD POINT (lb/100ft²)		23		
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		15 25		
FILTRATE API (cc's/30 min)		17		
HPHT FILTRATE (cc's/30 min) @	°F			
CAKE THICKNESS API : HPHT (32nd in)		2		
SOLIDS CONTENT (% by Volume)		5.4	5.1	
LIQUID CONTENT (% by Volume) OIL/WATER		94.6	94.9	
SAND CONTENT (% by Vol)		Tr		
METHYLENE BLUE CAPACITY (ppb equiv.)				
pH		9.0		
ALKALINITY MUD (Pm)				
ALKALINITY FILTRATE (Pf / Mf)		0.08 0.25		
CHLORIDE (mg/L)		750		
TOTAL HARDNESS AS CALCIUM (mg/L)		140		
SULPHITE (mg/L)				
K+ (mg/L)				
KCl (% by Wt.)				
PHPA ppb				

MUD PROPERTY SPECIFICATIONS

Mud Weight	Min	API Filtrate	HPHT Filtrate
Plastic Vis		Yield Point > 20	pH
KCl		PHPA	Sulphites

OBSERVATIONS

Maintained volume with water additions and viscosity with Ausgel.
Dumped sand trap regularly.
After cement job, will dump and clean tanks, fill same with sump water and mix fresh KCl PHPA mud.

Make up water : Pf/Mf : 0/.1
Chlorides : 700 mg/l
Hardness : 120 mg/l

OPERATIONS SUMMARY

Drill 17-1/2" hole to 262 m.
Circulate hole clean.
Wiper trip to 8" collars.
RIH.
Circulate hole clean.
POH.
Rig up and run 13-3/8" casing.
Circulate.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
Premix (drill water)	100	Desander		INITIAL VOLUME	600
Premix (recirc from sump)		Desilter	193		
Drill Water	450	Downhole	31	+ FLUID RECEIVED	550
Direct Recirc Sump		Dumped	180	-FLUID LOST	404
Other (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	550	TOTAL LOST	404	FINAL VOLUME	746

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 84	12
Degasser	PB		Desilter	12	9	Shaker #2	3 x 84	12

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter	9.0	11.6	15.00

Product	Price	Start	Received	Used	Close	Cost
Bentgel	$ 12.00	210		116	94	$ 1,392.00
Caustic Soda	$ 32.00	11		1	10	$ 32.00
Cement	$ 15.00	0	42	26	16	$ 390.00
Caustic		6	16		22	
Foamer		3	16		19	
Driwikseal Med		40	30		70	
PHPA		0	100		100	
Soda Ash		1	42		43	
Sodium Sulphite		43	40		83	
Quintemp		30	30		60	

Note : Ausben used for cement job and not so not included on daily Mud Costs.

SOLIDS ANALYSIS

	PPB	%
High Grav solids		
Total LGS		
Bentonite		
Drilled Solids	5.1	
Salt		
n @ 23.30 Hrs		
K @ 23.30 Hrs		

BIT HYD. PRESS.DATA

Jet Velocity	258
Impact force	896
HHP	234
HSI	1.0
Bit Press Loss	541
CSG Seat Frac Press	
Equiv. Mud Wt.	
ECD	
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$1,424.00	$3,888.00

MUD ENGINEER Andre Skujins CITY Adelaide Office TELEPHONE 08 8338 7266

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	3	Date :	5-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	262 to 262		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	John Greydanus
WELL NAME AND No	Gangell # 1	FIELD	PEP 137
LOCATION	Gippsland Basin	STATE	Victoria

DRILLING ASSEMBLY		JET SIZE			CASING		MUD VOLUME (BBL)	
BIT SIZE	TYPE				13 3/8 SURFACE	856 ft	HOLE	PITS
					SET @	260.9 M	114	600
DRILL COLLAR SIZE	TYPE	Length			INT.	ft	TOTAL CIRCULATING VOL.	
4.5	16.6 #			Mtrs	SET @	M	714	
DRILL PIPE SIZE	TYPE	Length			PROD. or	ft	IN STORAGE	
4.5	HW		46	Mtrs	LNR Set @	M		
DRILL COLLAR SIZE (")		Length			MUD TYPE			
6.25	8	122	28	Mtrs	Gel Spud Mud			

CIRCULATION DATA		
PUMP SIZE		CIRCULATION PRESS (PSI) psi
6 X 8 Inches		
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min) min
GD PZ8	97.0	
BBL/STK	STK / MIN	TOTAL CIRC. TIME (min) min
0.0700		
BBL/MIN	GAL / MIN	ANN VEL. DP (ft/min) DCs

MUD PROPERTIES		
SAMPLE FROM		
TIME SAMPLE TAKEN		
DEPTH (ft) - (m)	Metres	
FLOWLINE TEMPERATURE	°C / °F	
WEIGHT	ppg / SG	
FUNNEL VISCOSITY (sec/qt) API @	°C	
PLASTIC VISCOSITY cP @	°C	
YIELD POINT (lb/100ft²)		
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		
FILTRATE API (cc's/30 min)		
HPHT FILTRATE (cc's/30 min) @	°F	
CAKE THICKNESS API : HPHT (32nd in)		
SOLIDS CONTENT (% by Volume)		
LIQUID CONTENT (% by Volume) OIL/WATER		
SAND CONTENT (% by Vol.)		
METHYLENE BLUE CAPACITY (ppb equiv.)		
pH		
ALKALINITY MUD (Pm)		
ALKALINITY FILTRATE (Pf / Mf)		
CHLORIDE (mg/L)		
TOTAL HARDNESS AS CALCIUM (mg/L)		
SULPHITE (mg/L)		
K+ (mg/L)		
KCl (% by Wt.)		
PHPA ppb		

MUD PROPERTY SPECIFICATIONS					
Mud Weight	8.6 - 9.6	API Filtrate	< 12	HPHT Filtrate	
Plastic Vis	Min	Yield Point	> 20	pH	8.0 - 9.0
KCl	5%	PHPA	0.50 ppb	Sulphites	80 - 120

OBSERVATIONS

All tanks dumped and cleaned.

Trip tank to be isolated to drill cement.

Remaining tanks filled with sump water and fresh mud mixed comprising :

6 sacks Xantemp

3 sacks PHPA

KCL Caustic and Sodium Sulphite to be added later.

OPERATIONS SUMMARY

Circulate.

Cement casing.

WOC.

Nipple up BOP's.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
Premix (drill water)		Desander		INITIAL VOLUME	746
Recirc from sump)	600	Desilter			
Drill Water		Downhole	0	+ FLUID RECEIVED	600
Direct Recirc Sump		Dumped	746	-FLUID LOST	746
Diesel (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	600	TOTAL LOST	746	FINAL VOLUME	600

Product	Price	Start	Received	Used	Close	Cost
Biocide	$ 140.00	22		1	21	$ 140.00
PHPA (Praestol)	$ 120.00	100		3	97	$ 360.00
Xantemp	$ 535.00	60		6	54	$ 3,210.00

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 84	2
Degasser	PB		Desilter	12		Shaker #2	3 x 84	2

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

SOLIDS ANALYSIS	PPB	%
High Grav solids		
Total LGS		
Bentonite		
Drilled Solids		
Salt		
n @ Hrs		
K @ Hrs		

BIT HYD. PRESS.DATA
Jet Velocity
Impact force
HHP
HSI
Bit Press Loss
CSG Seat Frac Press
Equiv. Mud Wt.
ECD
Max Pressure @ Shoe :

DAILY COST	CUMULATIVE COST
$3,710.00	$7,598.00

MUD ENGINEER	Andre Skujins	CITY	Adelaide Office	TELEPHONE	08 8338 7266

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	4	Date :	6-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	262 to 504		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	John Greydanus
WELL NAME AND No	Gangell # 1	FIELD	PEP 137
LOCATION	Gippsland Basin	STATE	Victoria

DRILLING ASSEMBLY		JET SIZE		
SIZE	TYPE	18	20	
12.25	Varel 114			
DRILL PIPE SIZE 4.5	TYPE 16.6 #	Length 306 Mtrs		
DRILL PIPE SIZE 4.5	TYPE HW	Length 46 Mtrs		
DRILL COLLAR SIZE (") 6.25	8	Length 122	30 Mtrs	

CASING			
13 3/8 SURFACE	843	ft	
SET @	256.9	M	
INT.		ft	
SET @		M	
PROD. or LNR Set @		ft	
		M	
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
224	530
TOTAL CIRCULATING VOL.	
754	
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE 6 X 8 Inches		CIRCULATION PRESS (PSI)	1100 psi
PUMP MODEL GD PZ8	ASSUMED EFF 97.0	BOTTOMS UP (min)	14 min
BBL/STK 0.0700	STK / MIN 204	TOTAL CIRC. TIME (min)	54 min
BBL/MIN 13.85	GAL / MIN 582	ANN VEL. (ft/min) DP	110
		DCs	128 166

MUD PROPERTIES

		Pit	Pit
SAMPLE FROM		Pit	Pit
TIME SAMPLE TAKEN		20.00	01.00
DEPTH (ft) - (m)	Metres	371	520
FLOWLINE TEMPERATURE	°C / °F	29	32
WEIGHT	ppg / SG	8.75 1.050	8.90 1.068
FUNNEL VISCOSITY (sec/qt) API @	°C	46	52
PLASTIC VISCOSITY cP @	°C	8	14
YIELD POINT (lb/100ft²)		12	23
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		3 4	8 10
FILTRATE API (cc's/30 min)		14.5	12.4
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)		1	1
SOLIDS CONTENT (% by Volume)		1.4	2.7
LIQUID CONTENT (% by Volume) OIL/WATER		98.6	97.3
SAND CONTENT (% by Vol.)		Tr	Tr
METHYLENE BLUE CAPACITY (ppb equiv.)		<2.5	4.0
pH		9.0	8.8
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)		0.08 0.75	0.05 0.65
CHLORIDE (mg/L)		29,000	24,500
TOTAL HARDNESS AS CALCIUM (mg/L)		360	280
SULPHITE (mg/L)		180	140
K+ (mg/L)		28,101	22,697
KCl (% by Wt.)		5.2	4.2
PHPA ppb		0.40	0.70

MUD PROPERTY SPECIFICATIONS

Mud Weight	8.6 - 9.6	API Filtrate	< 12	HPHT Filtrate	
Plastic Vis	Min	Yield Point	> 20	pH	8.0 - 9.0
KCl	5%	PHPA	0.50 ppb	Sulphites	80 - 120

OBSERVATIONS

Maintaining volume with premixed fluid (sump water) containing Xantemp for yield point, PHPA for inhibition and fluid loss, abd KCl to maintain approximate 4 - 5% KCl. Increasing mud weight to 9.6 ppg by 660 m with barite.

Sump Fluid Analysis : pH : 6.8, Pf / Mf : 0/0.65
Chorides : 8500 mg/l, KCl : 1%
Hardness : 600 mg/l
Rheology: 600:51, 300:37, 200:31, 100:24, 60:20, 30:16, 6:10, 3:7.5

OPERATIONS SUMMARY

Nipple up BOPs.
Pressure Test.
Make up bit and BHA and RIH.
Tag cement.
Pressure Test.
Drill out cement, float and shoe.
Drill open hole and conduct FIT.
Drill ahead.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
Premix (drill water)		Desander		INITIAL VOLUME	712
Recirc from sump)	200	Desilter	13		
Drill Water		Downhole	40	+ FLUID RECEIVED	200
Direct Recirc Sump		Dumped	45	-FLUID LOST	158
Other (eg Diesel)		Shakers	60	+ FLUID IN STORAGE	
TOTAL RECEIVED	200	TOTAL LOST	158	FINAL VOLUME	754

Product	Price	Start	Received	Used	Close	Cost
Barite	$ 7.50	1397		257	1140	$ 1,927.50
Biocide	$ 140.00	21		2	19	$ 280.00
Caustic Soda	$ 32.00	10		2	8	$ 64.00
KCl	$ 17.55	624		144	480	$ 2,527.20
PHPA (Praestol)	$ 120.00	97	50	7	140	$ 840.00
Soda Ash	$ 27.50	43		7	36	$ 192.50
Sodium Sulphite	$ 39.50	83		4	79	$ 158.00
Xantemp	$ 535.00	54		13	41	$ 6,955.00
Wikseal Fine		3	28		31	
Wikseal Medium		70	20		90	

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 84	7
Degasser	PB		Desilter	12	3	Shaker #2	3 x 84	7

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter	8.7	10.2	3.00

SOLIDS ANALYSIS

	PPB	%
High Grav solids	19.0	1.3
Total LGS	6.2	
Bentonite	4.0	
Drilled Solids	2.2	
Salt	14.0	4.9
n @ 01.00 Hrs	0.46	
K @ 01.00 Hrs	2.07	

BIT HYD. PRESS.DATA

Jet Velocity	335
Impact force	899
HHP	305
HSI	2.6
Bit Press Loss	899
CSG Seat Frac Press	754
Equiv. Mud Wt.	17.2
ECD	9.00
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$12,944.20	$20,542.20

MUD ENGINEER	Andre Skujins	CITY	Adelaide Office	TELEPHONE	08 8338 7266

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	5	Date :	7-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	504 to 691		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	John Greydanus
WELL NAME AND No	Gangell # 1	FIELD	PEP 137
LOCATION	Gippsland Basin	STATE	Victoria

DRILLING ASSEMBLY			JET SIZE		
SIZE	TYPE		18	20	
12.25	Varel 114				
LL PIPE	TYPE	Length			
SIZE 4.5	16.6 #	493 Mtrs			
DRILL PIPE	TYPE	Length			
SIZE 4.5	HW	46 Mtrs			
LL COLLAR SIZE (")		Length			
6.25	8	122 30 Mtrs			

CASING		
13 3/8 SURFACE	843	ft
SET @	256.9	M
INT.		ft
SET @		M
PROD. or		ft
LNR Set @		M
MUD TYPE	KCl PHPA Polymer	

MUD VOLUME (BBL)	
HOLE	PITS
310	600
TOTAL CIRCULATING VOL.	
910	
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE		CIRCULATION PRESS (PSI)	1500 psi
6 X 8	Inches		
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	19 min
GD PZ8	97.0		
BBL/STK	STK / MIN	TOTAL CIRC. TIME (min)	61 min
0.0700	220		
BBL/MIN	GAL / MIN	ANN VEL. DP	118
14.94	627	(ft/min) DCs	138 179

MUD PROPERTIES		
SAMPLE FROM		Pit
TIME SAMPLE TAKEN		09.30
DEPTH (ft) - (m)	Metres	691
FLOWLINE TEMPERATURE	°C °F	35
WEIGHT	ppg SG	9.60 1.152
FUNNEL VISCOSITY (sec/qt) API @	°C	54
PLASTIC VISCOSITY cP @	°C	17
YIELD POINT (lb/100ft²)		29
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		10 12
FILTRATE API (cc's/30 min)		11.8
HPHT FILTRATE (cc's/30 min) @	°F	
CAKE THICKNESS API : HPHT (32nd in)		1
SOLIDS CONTENT (% by Volume)		7.6
LIQUID CONTENT (% by Volume) OIL/WATER		92.4
SAND CONTENT (% by Vol.)		Tr
METHYLENE BLUE CAPACITY (ppb equiv.)		5.0
pH		8.5
ALKALINITY MUD (Pm)		
ALKALINITY FILTRATE (Pf / Mf)		0.05 0.60
CHLORIDE (mg/L)		24,000
TOTAL HARDNESS AS CALCIUM (mg/L)		320
SULPHITE (mg/L)		120
K+ (mg/L)		21,616
KCl (% by Wt.)		4.0
PHPA ppb		0.55

MUD PROPERTY SPECIFICATIONS					
Mud Weight	8.6 - 9.6	API Filtrate	< 12	HPHT Filtrate	
Plastic Vis	Min	Yield Point	> 20	pH	8.0 - 9.0
KCl	5%	PHPA	0.50 ppb	Sulphites	80 - 120

OBSERVATIONS

Maintaining mud weight at 9.6 ppg with barite.

Maintaining yield point at approximately 20 - 25 lb/100 ft² with Xantemp to both suspend barite but more importantly, clean the hole of the large coal chunks that are now appearing.

Volume losses did occur when the coal was penetrated but were controlable. LCM may be added when drilling recommences if losses continue - mud cost per barrel is fairly high so lcm may be economically viable.

OPERATIONS SUMMARY

Drill to 691 m.

Circulate sample.

POH wiper trip to shoe. Hole tight all the way - 10 - 40 k over pull.

RIH. Circulate hole clean.

POH (Hole good).

Make up test tools and RIH.

Conduct DST # 1.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	754
ecirc from sump)	420	Desilter			
ill water		Downhole	164	+ FLUID RECEIVED	420
ct Recirc Sump		Dumped	40	-FLUID LOST	264
er (eg Diesel)		Shakers	60	+ FLUID IN STORAGE	
TOTAL RECEIVED	420	TOTAL LOST	264	FINAL VOLUME	910

Product	Price	Start	Received	Used	Close	Cost
ite	$ 7.50	1140		557	583	$ 4,177.50
cide	$ 140.00	19		2	17	$ 280.00
stic Soda	$ 32.00	8		1	7	$ 32.00
amer	$ 125.00	19		2	17	$ 250.00
	$ 17.55	480		72	408	$ 1,263.60
PA (Praestol)	$ 120.00	140		1	139	$ 120.00
a Ash	$ 27.50	36		4	32	$ 110.00
ium Sulphite	$ 39.50	79		2	77	$ 79.00
temp	$ 535.00	41		4	37	$ 2,140.00

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 84	12
Degasser	PB		Desilter	12		Shaker #2	3 x 84	12

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

SOLIDS ANALYSIS	PPB	%Vol
High Grav solids	44.0	3.0
Total LGS	18.0	1.9
Bentonite	5.0	0.5
Drilled Solids	13.0	1.4
Salt	14.0	1.4
n @ 09.30 Hrs	0.45	
K @ 09.30 Hrs	2.72	

BIT HYD. PRESS.DATA	
Jet Velocity	362
Impact force	1128
HHP	413
HSI	3.5
Bit Press Loss	1128
CSG Seat Frac Press	754
Equiv. Mud Wt.	17.2
ECD	9.80
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$8,452.10	$28,994.30

N ENGINEER	Andre Skujins	CITY	Adelaide Office	TELEPHONE	08 8338 7266

908902 122

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	6	Date :	8-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	691 to 1045		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	John Greydanus
WELL NAME AND No	Gangell # 1	FIELD	PEP 137
LOCATION	Gippsland Basin	STATE	Victoria

DRILLING ASSEMBLY

		JET SIZE		
SIZE 12.25	TYPE Varel L114	18	18	
DRILL PIPE SIZE 4.5	TYPE 16.6 #	Length 847 Mtrs		
DRILL PIPE SIZE 4.5	TYPE HW	Length 46 Mtrs		
DRILL COLLAR SIZE (") 6.25	8	Length 122	30 Mtrs	

CASING

13 3/8 SURFACE SET @	843 ft	256.9 M	
INT. SET @	ft	M	
PROD. or LNR Set @	ft	M	
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)

HOLE	PITS
473	540
TOTAL CIRCULATING VOL. 1013	
IN STORAGE	

CIRCULATION DATA

PUMP SIZE 6 X 8 inches		CIRCULATION PRESS (PSI)	1750 psi
PUMP MODEL GD PZ8	ASSUMED EFF 97.0	BOTTOMS UP (min)	29 min
BBL/STK 0.0700	STK / MIN 220	TOTAL CIRC. TIME (min)	68 min
BBL/MIN 14.94	GAL / MIN 627	ANN VEL. (ft/min) DP	118
		DCs	138 179

MUD PROPERTIES

	Pit	Pit
SAMPLE FROM		
TIME SAMPLE TAKEN	12.00	23.30
DEPTH (ft) - (m) Metres	710	1,030
FLOWLINE TEMPERATURE ^{0}C / ^{0}F	36	39
WEIGHT ppg / SG	9.70 1.164	9.75 1.170
FUNNEL VISCOSITY (sec/qt) API @ ^{0}C	49	54
PLASTIC VISCOSITY cP @ ^{0}C	18	14
YIELD POINT (lb/100ft^2)	28	30
GEL STRENGTHS (lb/100ft^2) 10 sec/10 min	12 14	11 14
FILTRATE API (cc's/30 min)	10.5	9.4
HPHT FILTRATE (cc's/30 min) @ ^{0}F		
CAKE THICKNESS API : HPHT (32nd in)	1	1
SOLIDS CONTENT (% by Volume)	6.3	6.4
LIQUID CONTENT (% by Volume) OIL/WATER	93.7	93.6
SAND CONTENT (% by Vol.)	0.50	0.25
METHYLENE BLUE CAPACITY (ppb equiv.)	6.0	6.0
pH	8.5	9.0
ALKALINITY MUD (Pm)		
ALKALINITY FILTRATE (Pf / Mf)	0.05 0.60	0.10 0.85
CHLORIDE (mg/L)	20,000	24,500
TOTAL HARDNESS AS CALCIUM (mg/L)	460	260
SULPHITE (mg/L)	80	140
K+ (mg/L)	16,212	22,156
KCl (% by Wt.)	3.0	4.1
PHPA ppb	0.55	0.70

MUD PROPERTY SPECIFICATIONS

Mud Weight	8.6 - 9.6	API Filtrate	< 12	HPHT Filtrate	
Plastic Vis	Min	Yield Point	> 20	pH	8.0 - 9.0
KCl	5%	PHPA	0.50 ppb	Sulphites	80 - 120

OBSERVATIONS

Maintaining mud weight with barite if required.

Running desilter to keep sand content in check.

Rheology: 600:58, 300:44, 200:38, 100:29, 60:25, 30:20, 6:13, 3:10.5

OPERATIONS SUMMARY

Conduct DST # 1.

Pull free and reverse circulate.

POH and lay down test tools.

Make up new bit and RIH.

Break circulation and clean hole of cavings.

Drill ahead.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	910
(recirc from sump)	400	Desilter	100		
Drill water		Downhole	132	+ FLUID RECEIVED	400
ect Recirc Sump		Dumped	25	-FLUID LOST	297
er (eg Diesel)		Shakers	40	+ FLUID IN STORAGE	
TOTAL RECEIVED	400	TOTAL LOST	297	FINAL VOLUME	1,013

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 84	16
Degasser	PB		Desilter	12	7	Shaker #2	2x84/110	16

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander			
Desilter	9.7	12.2 - 15.6	Variable

Product	Price	Start	Received	Used	Close	Cost
lite	$ 7.50	583	960	65	1478	$ 487.50
Biocide	$ 140.00	17		1	16	$ 140.00
Caustic Soda	$ 32.00	7		1	6	$ 32.00
Lime	$ 17.55	408		144	264	$ 2,527.20
PHPA (Praestol)	$ 120.00	139		10	129	$ 1,200.00
Soda Ash	$ 27.50	38		10	28	$ 275.00
Sodium Sulphite	$ 39.50	77		8	69	$ 316.00
Xantemp	$ 535.00	37		5	32	$ 2,675.00

Inventroy correction to Soda Ash - 48 sacks, not 42, delivered 4th January.

SOLIDS ANALYSIS

	PPB	%
High Grav solids	25.0	1.7
Total LGS	44.0	4.6
Bentonite	6.0	0.6
Drilled Solids	38.0	4.0
Salt	15.0	1.5
pH @ 23.30 Hrs	0.40	
MBT @ 23.30 Hrs	3.67	

BIT HYD. PRESS.DATA

Jet Velocity	404
Impact force	1280
HHP	524
HSI	4.4
Bit Press Loss	1430
CSG Seat Frac Press	754
Equiv. Mud Wt.	17.2
ECD	9.90
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$7,652.70	$36,647.00

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	7	Date :	9-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	1045 to 1281		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	John Greydanus
WELL NAME AND No	Gangell # 1	FIELD / LOCATION / STATE	PEP 137 / Gippsland Basin / Victoria

DRILLING ASSEMBLY

SIZE	TYPE	JET SIZE		
12.25	Varel L114	18	18	
LL PIPE	TYPE	Length		
SIZE 4.5	16.6 #	1083 Mtrs		
DRILL PIPE	TYPE	Length		
SIZE 4.5	HW	46 Mtrs		
LL COLLAR SIZE (")		Length		
6.25	8	122	30 Mtrs	

CASING

13 3/8 SURFACE SET @	843 ft / 256.9 M	
INT. SET @	ft / M	
PROD. or LNR Set @	ft / M	
MUD TYPE	KCl PHPA Polymer	

MUD VOLUME (BBL)

HOLE	PITS
582	540
TOTAL CIRCULATING VOL.	1122
IN STORAGE	

CIRCULATION DATA

PUMP SIZE		CIRCULATION PRESS (PSI)	1700 psi
6 X 8 Inches			
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	37 min
GD PZ8	97.0		
BBL/STK	STK / MIN	TOTAL CIRC. TIME (min)	77 min
0.0700	214		
BBL/MIN	GAL / MIN	ANN VEL. (ft/min) DP	115
14.53	610	DCs	135 174

MUD PROPERTIES

SAMPLE FROM		Pit	Pit
TIME SAMPLE TAKEN		12.30	22.30
DEPTH (ft) - (m)	Metres	1,234	1,255
FLOWLINE TEMPERATURE	°C / °F	40	47
WEIGHT	ppg SG	9.65 1.152	9.75 1.170
FUNNEL VISCOSITY (sec/qt) API @	°C	46	47
PLASTIC VISCOSITY cP @	°C	14	13
YIELD POINT (lb/100ft²)		28	29
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		9 13	7 12
FILTRATE API (cc's/30 min)		9.5	9.5
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)		1	1
SOLIDS CONTENT (% by Volume)		6.0	7.2
LIQUID CONTENT (% by Volume) OIL/WATER		94.0	92.8
SAND CONTENT (% by Vol.)		0.50	0.50
METHYLENE BLUE CAPACITY (ppb equiv.)		6.0	6.0
pH		9.0	9.0
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)		0.10 1.20	0.10 1.35
CHLORIDE (mg/L)		24,500	22,000
TOTAL HARDNESS AS CALCIUM (mg/L)		200	260
SULPHITE (mg/L)		120	120
K+ (mg/L)		21,616	19,454
KCl (% by Wt.)		4.0	3.6
PHPA ppb		0.75	0.80

MUD PROPERTY SPECIFICATIONS

Mud Weight	8.6 - 9.6	API Filtrate	< 12	HPHT Filtrate	
Plastic Vis	Min	Yield Point	> 20	pH	8.0 - 9.0
KCl	5%	PHPA	0.50 ppb	Sulphites	80 - 120

OBSERVATIONS

Maintained properties with Xantemp and PHPA.

OPERATIONS SUMMARY

Drill to 1234 m. Circulate bottoms up.
Trip bit.
RIH with RR bit.
Wash and Ream 1016 m - 1234 m.
Drill to casing point of 1281 m.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	1013
(recirc from sump)	350	Desilter			
Drill Water		Downhole	166	+ FLUID RECEIVED	350
ect Recirc Sump		Dumped	25	-FLUID LOST	241
ier (eg Diesel)		Shakers	50	+ FLUID IN STORAGE	
TOTAL RECEIVED	350	TOTAL LOST	241	FINAL VOLUME	1,122

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 84	17
Degasser	PB		Desilter	12		Shaker #2	3 x 110	17

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

Product	Price	Start	Received	Used	Close	Cost
ite	$ 7.50	1478		92	1386	$ 690.00
Caustic Soda	$ 32.00	6		1	5	$ 32.00
KCl	$ 17.55	264		36	228	$ 631.80
PA (Praestol)	$ 120.00	129		6	123	$ 720.00
Soda Ash	$ 27.50	28		4	24	$ 110.00
Sodium Sulphite	$ 39.50	69		2	67	$ 79.00
Temp	$ 535.00	32		4	28	$ 2,140.00

SOLIDS ANALYSIS

	PPB	%
High Grav solids	22.0	1.50
Total LGS	54.0	5.70
Bentonite	6.0	0.60
Drilled Solids	48.0	5.10
Salt	13.0	1.3
n @ 22.30 Hrs	0.39	
K @ 22.30 Hrs	3.72	

BIT HYD. PRESS.DATA

Jet Velocity	393
Impact force	1211
HHP	482
HSI	4.1
Bit Press Loss	1353
CSG Seat Frac Press	754
Equiv. Mud Wt.	17.2
ECD	9.90
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$4,402.80	$41,049.80

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	8	Date :	10-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	1281 to 1281		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	John Greydanus
WELL NAME AND No	Gangell # 1	FIELD: PEP 137	LOCATION: Gippsland Basin / STATE: Victoria

DRILLING ASSEMBLY		JET SIZE		
SIZE	TYPE	18	18	
12.25	Varel L114			
LL PIPE	TYPE	Length		
IZE 4.5	16.6 #	1083	Mtrs	
RILL PIPE	TYPE	Length		
IZE 4.5	HW	46	Mtrs	
LL COLLAR SIZE (")		Length		
6.25	8	122	30	Mtrs

CASING			
13 3/8 SURFACE SET @	843	ft	
	256.9	M	
INT. SET @		ft	
		M	
PROD. or LNR Set @		ft	
		M	
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
582	490
TOTAL CIRCULATING VOL.	
1072	
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE		CIRCULATION PRESS (PSI)	1700 psi
6 X 8	Inches		
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	37 min
GD PZ8	97.0		
BBL/STK	STK MIN	TOTAL CIRC. TIME (min)	74 min
0.0700	214		
BBL/MIN	GAL MIN	ANN VEL. DP	115
14.53	610	(ft/min) DCs	135 174

MUD PROPERTIES				
SAMPLE FROM		Pit	Pit	
TIME SAMPLE TAKEN		00.45	15.00	
DEPTH (ft) - (m)	Metres	1,281	1,281	
FLOWLINE TEMPERATURE	°C / °F	47	46	
WEIGHT	ppg / SG	9.75 1.170	9.70 1.164	
FUNNEL VISCOSITY (sec/qt) API @	°C	45	46	
PLASTIC VISCOSITY cP @	°C	13	13	
YIELD POINT (lb/100ft²)		26	27	
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		7 11	8 12	
FILTRATE API (cc's/30 min)		10.2	10.5	
HPHT FILTRATE (cc's/30 min) @	°F			
CAKE THICKNESS API : HPHT (32nd in)		1	1	
SOLIDS CONTENT (% by Volume)		8.8	8.4	
LIQUID CONTENT (% by Volume) OIL/WATER		91.2	91.6	
SAND CONTENT (% by Vol.)		0.50	0.50	
METHYLENE BLUE CAPACITY (ppb equiv.)		6.0		
pH		8.8	8.8	
ALKALINITY MUD (Pm)				
ALKALINITY FILTRATE (Pf / Mf)		0.08 1.35	0.08 1.45	
CHLORIDE (mg/L)		22,000	22,000	
TOTAL HARDNESS AS CALCIUM (mg/L)		280	280	
SULPHITE (mg/L)		120	120	
K+ (mg/L)		19,454	19,454	
KCl (% by Wt.)		3.6	3.6	
PHPA ppb		0.80	0.80	

MUD PROPERTY SPECIFICATIONS					
Mud Weight	8.6 - 9.6	API Filtrate	< 12	HPHT Filtrate	
Plastic Vis	Min	Yield Point	> 20	pH	8.0 - 9.0
KCl	5%	PHPA	0.50 ppb	Sulphites	80 - 120

OBSERVATIONS

Improved yield point with Xantemp on wiper trip.

After midnight, commenced mixing gel mix water for cement job.

OPERATIONS SUMMARY

Circulate hole clean.
POH to log.
Run logs - hit bridge at 1032 m.
RIH wiper trip.
Wash and ream 1024 - 1043, 1138 - 1157 & 1214 - 1281 m.
Circulate hole clean.
Pump pill and POH.
Log (successfully).
Laqy down 8" collars.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED	
...ix (drill water)	
(recirc from sump)	
Drill Water	
...ct Recirc Sump	
...er (eg Diesel)	
TOTAL RECEIVED	

FLUID DISPOSED	
Desander	
Desilter	
Downhole	50
Dumped	
Shakers	
TOTAL LOST	50

SUMMARY	
INITIAL VOLUME	1122
+ FLUID RECEIVED	
-FLUID LOST	50
+ FLUID IN STORAGE	
FINAL VOLUME	1,072

Product	Price	Start	Received	Used	Close	Cost
...ite	$ 7.50	1386		76	1310	$ 570.00
Xantemp	$ 535.00	28		2	26	$ 1,070.00
...rben		16	42		58	

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 84	3
Degasser	PB		Desilter	12		Shaker #2	2x84/110	1

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

SOLIDS ANALYSIS	PPB	%
High Grav solids	26.0	1.8
Total LGS	50.0	5.5
Bentonite	6.0	0.6
Drilled Solids	44.0	4.9
Salt	13.0	1.3
n @ 15.00 Hrs	0.41	
K @ 15.00 Hrs	3.19	

BIT HYD. PRESS.DATA	
Jet Velocity	393
Impact force	1205
HHP	479
HSI	4.1
Bit Press Loss	1346
CSG Seat Frac Press	754
Equiv. Mud Wt.	17.2
ECD	9.90
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$1,640.00	$42,689.80

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	9	Date :	11-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	1281 to 1281		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE	
REPORT FOR	Brent Speechley	REPORT FOR	John Greydanus	
WELL NAME AND No	Gangell # 1	FIELD	LOCATION	STATE
		PEP 137	Gippsland Basin	Victoria

DRILLING ASSEMBLY		JET SIZE	CASING	MUD VOLUME (BBL)	CIRCULATION DATA
SIZE 12.25	TYPE		13 3/8 SURFACE 843 ft	HOLE 582 / PITS 475	PUMP SIZE 6 X 8 Inches
DRILL PIPE SIZE 4.5	TYPE 16.6 #	Length 1083 Mtrs	INT. ft / SET @ M	TOTAL CIRCULATING VOL. 1057	PUMP MODEL GD PZ8 / ASSUMED EFF 97.0
DRILL PIPE SIZE 4.5	TYPE HW	Length 46 Mtrs	PROD. or LNR Set @ ft / M	IN STORAGE	BBL/STK 0.0700 / STK / MIN
DRILL COLLAR SIZE (") 6.25	8	Length 122 30 Mtrs	MUD TYPE KCl PHPA Polymer		BBL/MIN / GAL / MIN

CIRCULATION DATA: CIRCULATION PRESS (PSI) psi; BOTTOMS UP (min) min; TOTAL CIRC. TIME (min) min; ANN VEL. (ft/min) DP DCs

MUD PROPERTIES		Pit	Pit
SAMPLE FROM			
TIME SAMPLE TAKEN			15.00
DEPTH (ft) - (m)	Metres		1,281
FLOWLINE TEMPERATURE	°C °F		
WEIGHT	ppg SG		9.75 1.170
FUNNEL VISCOSITY (sec/qt) API @	°C		48
PLASTIC VISCOSITY cP @	°C		
YIELD POINT (lb/100ft²)			
GEL STRENGTHS (lb/100ft²) 10 sec/10 min			
FILTRATE API (cc's/30 min)			
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)			
SOLIDS CONTENT (% by Volume)			8.8
LIQUID CONTENT (% by Volume) OIL/WATER			91.2
SAND CONTENT (% by Vol.)			
METHYLENE BLUE CAPACITY (ppb equiv.)			
pH			
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)			
CHLORIDE (mg/L)			
TOTAL HARDNESS AS CALCIUM (mg/L)			
SULPHITE (mg/L)			
K+ (mg/L)			
KCl (% by Wt.)			
PHPA ppb			

MUD PROPERTY SPECIFICATIONS					
Mud Weight	8.6 - 9.6	API Filtrate	< 12	HPHT Filtrate	
Plastic Vis	Min	Yield Point	> 20	pH	8.0 - 9.0
KCl	5%	PHPA	0.50 ppb	Sulphites	80 - 120

OBSERVATIONS

Dump and clean all tanks.
Isolate pill tank for drilling out of cement.
Fill other tanks with water from back of sump.
Add : 1 drum biocide.
2 sacks AMC Pac-R.
6 sacks PHPA.
1 drum Caustic Soda.
Will add KCl (for 1.5 - 2.0%) and Sodium Sulphite prior to drill out.

OPERATIONS SUMMARY

Rig up to and run 9-5/8" casing.
Circulate to bottom and circulate hole clean.
Cement casing.
WOC.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	1072
recirc from sump)		Desilter			
Drill Water		Downhole	15	+ FLUID RECEIVED	
ect Recirc Sump		Dumped		-FLUID LOST	15
ier (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED		TOTAL LOST	15	FINAL VOLUME	1,057

Product	Price	Start	Received	Used	Close	Cost
iben	$ -	58		40	18	

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 84	5
Degasser	PB		Desilter	12		Shaker #2	2x84/110	

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

SOLIDS ANALYSIS	PPB	%
High Grav solids	26.0	1.8
Total LGS	50.0	5.5
Bentonite	6.0	0.6
Drilled Solids	44.0	4.9
Salt	13.0	1.3
n @ 15.00 Hrs		
K @ 15.00 Hrs		

BIT HYD. PRESS.DATA	
Jet Velocity	
Impact force	
HHP	
HSI	
Bit Press Loss	
CSG Seat Frac Press	754
Equiv. Mud Wt.	17.2
ECD	
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
	$42,689.80

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908902 126

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	10	Date :	12-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	1281 to 1317		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor
WELL NAME AND No	Gangell # 1	FIELD	PEP 137
LOCATION	Gippsland Basin	STATE	Victoria

DRILLING ASSEMBLY		JET SIZE		
SIZE	TYPE	12	12	
8.50	Varel 127			
DRILL PIPE SIZE 4.5	TYPE 16.6 #	Length 1093 Mtrs		
DRILL PIPE SIZE 4.5	TYPE HW	Length 46 Mtrs		
DRILL COLLAR SIZE (") 6.25		Length 178 Mtrs		

CASING			
13 3/8 SURFACE SET @	843	ft	
	256.9	M	
9 5/8 INT. SET @	4177	ft	
	1273	M	
PROD. or LNR Set @		ft	
		M	
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
305	450
TOTAL CIRCULATING VOL.	755
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE		CIRCULATION PRESS (PSI)	1750 psi
6 X 8 Inches			
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	36 min
GD PZ8	97.0		
BBL/STK	STK / MIN	TOTAL CIRC. TIME (min)	101 min
0.0700	110		
BBL/MIN	GAL / MIN	ANN VEL. (ft/min) DP	59
7.47	314	DCs	69

MUD PROPERTIES

SAMPLE FROM	Pit	Pit	
TIME SAMPLE TAKEN		24.00	
DEPTH (ft) - (m)	Metres	1,317	
FLOWLINE TEMPERATURE	°C °F		
WEIGHT	ppg / SG	8.50	1.020
FUNNEL VISCOSITY (sec/qt) API @	°C	33	
PLASTIC VISCOSITY cP @	°C	7	
YIELD POINT (lb/100ft²)		6	
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		1	2
FILTRATE API (cc's/30 min)		13.0	
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)		1	
SOLIDS CONTENT (% by Volume)		0.9	
LIQUID CONTENT (% by Volume) OIL/WATER			99.1
SAND CONTENT (% by Vol.)		Tr	
METHYLENE BLUE CAPACITY (ppb equiv.)			
pH		9.5	
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)		0.12	1.25
CHLORIDE (mg/L)		9,000	
TOTAL HARDNESS AS CALCIUM (mg/L)		260	
SULPHITE (mg/L)		120	
K+ (mg/L)		5,404	
KCl (% by Wt.)		1.0	
PHPA ppb		1.25	

MUD PROPERTY SPECIFICATIONS

Mud Weight	8.4 - 8.8	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Increasing PHPA concentration towards 1.5 ppb.
Reducing fluid loss to approximately 8 cc's and increasing yield point over 12 lb/100 ft² with AMC Pac-R. Also will be using some Xantemp to increase the yield point.
Maintaining mud weight at no more that 8.8 ppg.

OPERATIONS SUMMARY

Nipple up BOP's.
Pressure Test.
Make up Bit and BHA and RIH.
Drill out cement. float and shoe and drill to 1290 m.
Conduct LOT.
Drill ahead to midnight depth of 1317 m.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	510
(recirc from sump)	240	Desilter			
Drill Water		Downhole		+ FLUID RECEIVED	240
ect Recirc Sump		Dumped		-FLUID LOST	
er (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	240	TOTAL LOST		FINAL VOLUME	750

Product	Price	Start	Received	Used	Close	Cost
C Pac-R	$ 161.00	97		4	93	$ 644.00
Biocide	$ 140.00	16		1	15	$ 140.00
stic Soda	$ 32.00	21		1	20	$ 32.00
	$ 17.55	228		48	180	$ 842.40
PA (Praestol)	$ 120.00	123		17	106	$ 2,040.00
Sodium Sulphite	$ 39.50	67		8	59	$ 316.00

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 110	6
Degasser	PB		Desilter	12		Shaker #2	2x84/110	6

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

SOLIDS ANALYSIS

	PPB	%
High Grav solids		
Total LGS	8.2	0.90
Bentonite		
Drilled Solids	8.2	0.90
Salt	5.0	0.5
n @ 24.00 Hrs	0.62	
K @ 24.00 Hrs	0.27	

BIT HYD. PRESS.DATA

Jet Velocity	454
Impact force	628
HHP	289
HSI	2.4
Bit Press Loss	1578
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	8.70
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$4,014.40	$46,704.20

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	11	Date :	13-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	1317 to 1452		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE	
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor	
WELL NAME AND No	Gangell # 1	FIELD	LOCATION	STATE
		PEP 137	Gippsland Basin	Victoria

DRILLING ASSEMBLY			JET SIZE		
SIZE	TYPE		12	12	
8.50	Varel 127				
LL PIPE	TYPE	Length			
SIZE 4.5	16.6 #	1228	Mtrs		
RILL PIPE	TYPE	Length			
E 4.5	HW	46	Mtrs		
LL COLLAR SIZE (")		Length			
6.25		178	Mtrs		

CASING			
13 3/8	SURFACE	843	ft
	SET @	256.9	M
9 5/8	INT.	4177	ft
	SET @	1273	M
	PROD. or		ft
	LNR Set @		M
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
367	430
TOTAL CIRCULATING VOL.	
797	
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE		CIRCULATION PRESS (PSI)	1700 psi
6 X 8	Inches		
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	44 min
GD PZ8	97.0		
BBL/STK	STK / MIN	TOTAL CIRC. TIME (min)	107 min
0.0700	110		
BBL/MIN	GAL / MIN	ANN VEL. DP	59
7.47	314	(ft/min) DCs	69

MUD PROPERTIES

SAMPLE FROM		Pit	Pit	
TIME SAMPLE TAKEN		08.00	23.30	
DEPTH (ft) - (m)	Metres	1,360	1,452	
FLOWLINE TEMPERATURE	°C / °F	30	35	
WEIGHT	ppg / SG	8.80 1.056	9.15 1.098	
FUNNEL VISCOSITY (sec/qt) API @	°C	38	37	
PLASTIC VISCOSITY cP @	°C	12	11	
YIELD POINT (lb/100ft²)		16	12	
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		2 4	1 2	
FILTRATE API (cc's/30 min)		7.5	6.2	
HPHT FILTRATE (cc's/30 min) @	°F			
CAKE THICKNESS API : HPHT (32nd in)		1	1	
SOLIDS CONTENT (% by Volume)		1.7	3.1	
LIQUID CONTENT (% by Volume) OIL/WATER		98.3	96.9	
SAND CONTENT (% by Vol.)		Tr	0.25	
METHYLENE BLUE CAPACITY (ppb equiv.)			4.0	
pH		9.5	9.0	
ALKALINITY MUD (Pm)				
ALKALINITY FILTRATE (Pf / Mf)		0.15 1.05	0.80 0.90	
CHLORIDE (mg/L)		31,000	22,000	
TOTAL HARDNESS AS CALCIUM (mg/L)		180	420	
SULPHITE (mg/L)		120	100	
K+ (mg/L)		30,262	21,616	
KCl (% by Wt.)		5.6	4.0	
PHPA ppb		1.45	1.45	

MUD PROPERTY SPECIFICATIONS

Mud Weight	8.4 - 8.8	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Problems with reaming fresh hole led to mud weight being incrementally increased from 8.5 to 9.1 ppg. Initially KCl was used as mud did not have carrying capacity for barite. As weight was being increased, first AMC Pac-R was added to increase yield point and lower fluid loss, then when fluid loss was within specifications, Xantemp was added to further increase yield point. From there, only barite was added to increase mud weight. All this was done with a shortened system (240 bbl intermediate tank was isolated). Later in day this tank was reintroduced which required further barite additions to maintain mud weight at 9.1 ppg.
High PHPA concentration appears to have limited severe dispersion seen on previous well. This also probably led to very good hole gauge, exacerbating tight hole problems.

OPERATIONS SUMMARY

Drill to 1319 m. Wash and ream tight connection 1309 - 1319 m. Increase mud weight to 8.7 ppg.
Drill to 1357 m. Wash and ream connection and increase mud weight to 8.9 ppg.
Drill to 1366 m. Tight connection and increase mud weight to 9.1 ppg.
Drill ahead to 1452 m. Circulate bottoms up and condition mud.
Pump pill and POH to test.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	755
recirc from sump)	120	Desilter			
Drill Water	40	Downhole	48	- FLUID RECEIVED	160
ect Recirc Sump		Dumped	30	-FLUID LOST	118
er (eg Diesel)		Shakers	40	+ FLUID IN STORAGE	
TOTAL RECEIVED	160	TOTAL LOST	118	FINAL VOLUME	797

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 110	24
Degasser	PB		Desilter	12		Shaker #2	2x84/110	24

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

Product	Price	Start	Received	Used	Close	Cost
C Pac-R	$ 161.00	93		7	86	$ 1,127.00
Barite	$ 7.50	1310		446	864	$ 3,345.00
Foamer	$ 125.00	17		1	16	$ 125.00
I	$ 17.55	180		180		$ 3,159.00
nPA (Praestol)	$ 120.00	106		7	99	$ 840.00
odium Sulphite	$ 39.50	59		4	55	$ 158.00
Xtemp	$ 535.00	26		4	22	$ 2,140.00

SOLIDS ANALYSIS

	PPB	%
High Grav solids	28.2	1.9
Total LGS	11.6	1.2
Bentonite	4.0	0.4
Drilled Solids	7.6	0.8
Salt	15.0	1.3
n @ 23.30 Hrs	0.56	
K @ 23.30 Hrs	0.68	

BIT HYD. PRESS.DATA

Jet Velocity	454
Impact force	676
HHP	311
HSI	2.6
Bit Press Loss	1699
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	9.35
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$10,894.00	$57,598.20

IN ENGINEER	Andre Skujins	CITY	Adelaide Office	TELEPHONE	08 8338 7266

908902 128

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	12	Date :	14-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	1452 to 1452		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE	
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor	
WELL NAME AND No	Gangell # 1	FIELD	LOCATION	STATE
		PEP 137	Gippsland Basin	Victoria

DRILLING ASSEMBLY		JET SIZE		
SIZE	TYPE	12	12	
8.50	Varel 127			
DRILL PIPE SIZE 4.5	TYPE 16.6 #	Length 1228 Mtrs		
DRILL PIPE SIZE 4.5	TYPE HW	Length 46 Mtrs		
DRILL COLLAR SIZE (") 6.25		Length 178 Mtrs		

CASING			
13 3/8 SURFACE SET @	843 ft	256.9 M	
9 5/8 INT. SET @	4177 ft	1273 M	
PROD. or LNR Set @	ft	M	
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
367	370
TOTAL CIRCULATING VOL.	737
IN STORAGE	

CIRCULATION DATA		
PUMP SIZE 6 X 8 Inches		CIRCULATION PRESS (PSI) psi
PUMP MODEL GD PZ8	ASSUMED EFF 97.0	BOTTOMS UP (min) min
BBL/STK 0.0700	STK / MIN	TOTAL CIRC. TIME (min) min
BBL / MIN	GAL / MIN	ANN VEL. (ft/min) DP DCs

MUD PROPERTIES

		Pit	Pit
SAMPLE FROM			
TIME SAMPLE TAKEN			17.30
DEPTH (ft) - (m)	Metres		1,452
FLOWLINE TEMPERATURE	°C °F		
WEIGHT	ppg SG		9.15 1.098
FUNNEL VISCOSITY (sec/qt) API @	°C		36
PLASTIC VISCOSITY cP @	°C		
YIELD POINT (lb/100ft²)			
GEL STRENGTHS (lb/100ft²) 10 sec/10 min			
FILTRATE API (cc's/30 min)			
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)			
SOLIDS CONTENT (% by Volume)			3.1
LIQUID CONTENT (% by Volume) OIL/WATER			96.9
SAND CONTENT (% by Vol.)			
METHYLENE BLUE CAPACITY (ppb equiv.)			
pH			
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)			
CHLORIDE (mg/L)			
TOTAL HARDNESS AS CALCIUM (mg/L)			
SULPHITE (mg/L)			
K+ (mg/L)			
KCl (% by Wt.)			
PHPA ppb			

MUD PROPERTY SPECIFICATIONS

Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

When back drilling, will maintain 9.1 ppg mud weight.

Barite aded for heavy weight pill but not pumped.

OPERATIONS SUMMARY

POH.

Make up test tools.

RIH and conduct DST # 2.

Pull free and reverse circulate.

POH.

Lay down test tools.

Make up Bit and BHA and RIH.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
Premix (drill water)		Desander		INITIAL VOLUME	797
Premix (recirc from sump)		Desilter			
Drill Water		Downhole	60	+ FLUID RECEIVED	
Direct Recirc Sump		Dumped		-FLUID LOST	60
Other (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED		TOTAL LOST	60	FINAL VOLUME	737

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 110	
Degasser	PB		Desilter	12		Shaker #2	2x84/110	

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

Product	Price	Start	Received	Used	Close	Cost
Barite	$ 7.50	864		25	839	$ 187.50

SOLIDS ANALYSIS

	PPB	%
High Grav solids	28.2	1.9
Total LGS	11.6	1.2
Bentonite	4.0	0.4
Drilled Solids	7.6	0.8
Salt	15.0	1.3
n @ 17.30 Hrs		
K @ 17.30 Hrs		

BIT HYD. PRESS.DATA

Jet Velocity	
Impact force	
HHP	
HSI	
Bit Press Loss	
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$187.50	$57,785.70

MUD ENGINEER	Andre Skujins	CITY	Adelaide Office	TELEPHONE	08 8338 7266

908902 129

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	13	Date :	15-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	1452 to 1566		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE	
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor	
WELL NAME AND No	Gangell # 1	FIELD	LOCATION	STATE
		PEP 137	Gippsland Basin	Victoria

DRILLING ASSEMBLY

SIZE	TYPE	JET SIZE	
8.50	Varel 127	12 / 12	
DRILL PIPE SIZE 4.5	TYPE 16.6 #	Length 1342 Mtrs	
DRILL PIPE SIZE 4.5	TYPE HW	Length 46 Mtrs	
DRILL COLLAR SIZE (") 6.25		Length 178 Mtrs	

CASING

13 3/8	SURFACE	843	ft
	SET @	256.9	M
9 5/8	INT.	4177	ft
	SET @	1273	M
	PROD. or LNR Set @		ft / M
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)

HOLE	PITS
347	370
TOTAL CIRCULATING VOL. 717	
IN STORAGE	

CIRCULATION DATA

PUMP SIZE 6 X 8 Inches		CIRCULATION PRESS (PSI)	1900 psi
PUMP MODEL GD PZ8	ASSUMED EFF 97.0	BOTTOMS UP (min)	41 min
BBL/STK 0.0700	STK / MIN 110	TOTAL CIRC. TIME (min)	96 min
BBL/MIN 7.47	GAL / MIN 314	ANN VEL. (ft/min) DP	148
		DCs	232

MUD PROPERTIES

	Pit	Pit
SAMPLE FROM		
TIME SAMPLE TAKEN	11.30	16.00
DEPTH (ft) - (m) Metres	1,498	1,566
FLOWLINE TEMPERATURE °C / °F	37	39
WEIGHT ppg / SG	9.20 1.104	9.15 1.098
FUNNEL VISCOSITY (sec/qt) API @ °C	37	38
PLASTIC VISCOSITY cP @ °C	11	11
YIELD POINT (lb/100ft²)	10	11
GEL STRENGTHS (lb/100ft²) 10 sec/10 min	1 2	1 2
FILTRATE API (cc's/30 min)	5.8	5.6
HPHT FILTRATE (cc's/30 min) @ °F		
CAKE THICKNESS API : HPHT (32nd in)	1	1
SOLIDS CONTENT (% by Volume)	3.8	3.5
LIQUID CONTENT (% by Volume) OIL/WATER	96.2	96.5
SAND CONTENT (% by Vol.)	Tr	Tr
METHYLENE BLUE CAPACITY (ppb equiv.)	5.0	5.0
pH	8.8	8.5
ALKALINITY MUD (Pm)		
ALKALINITY FILTRATE (Pf / Mf)	0.08 0.78	0.05 0.70
CHLORIDE (mg/L)	19,500	18,500
TOTAL HARDNESS AS CALCIUM (mg/L)	420	340
SULPHITE (mg/L)	140	120
K+ (mg/L)	18,914	17,833
KCl (% by Wt.)	3.5	3.3
PHPA ppb	1.95	1.95

MUD PROPERTY SPECIFICATIONS

Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Maintaining yield point and fluid loss just with the addition of PHPA presently.
Lowering and then maintaining mud weight at 9.1 ppg.

OPERATIONS SUMMARY

RIH to 144. Wash and ream to bottom.
Drill ahead to 1566 m.
Circulate bottoms up and POH.
Make up core barell and RIH.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	693
(recirc from sump)	240	Desilter	55		
Drill Water		Downhole	81	+ FLUID RECEIVED	240
ect Recirc Sump		Dumped	80	-FLUID LOST	216
er (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	240	TOTAL LOST	216	FINAL VOLUME	717

Product	Price	Start	Received	Used	Close	Cost
ite	$ 7.50	839		26	813	$ 195.00
PHPA (Praestol)	$ 120.00	99		14	85	$ 1,680.00
Soda Ash	$ 27.50	24		4	20	$ 110.00
ium Sulphite	$ 39.50	55		6	49	$ 237.00

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 110	14
Degasser	PB		Desilter	12	12	Shaker #2	2x84/110	14

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter	9.2	11.8	3.20

SOLIDS ANALYSIS

	PPB	%
High Grav solids	23.5	1.60
Total LGS	17.6	1.90
Bentonite	5.0	0.50
Drilled Solids	12.6	1.40
Salt	13.0	1.1
n @ 16.00 Hrs	0.58	
K @ 16.00 Hrs	0.57	

BIT HYD. PRESS.DATA

Jet Velocity	454
Impact force	676
HHP	311
HSI	5.5
Bit Press Loss	1699
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	9.35
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$2,222.00	$60,007.70

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908902 130

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	14	Date :	16-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	1566 to 1590		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor
WELL NAME AND No	Gangell # 1	FIELD	PEP 137
LOCATION	Gippsland Basin	STATE	Victoria

DRILLING ASSEMBLY		JET SIZE		
SIZE	TYPE	12	12	
8.50	Varel ETD417			
LL PIPE	TYPE	Length		
SIZE 4.5	16.6 #	1366	Mtrs	
)RILL PIPE	TYPE	Length		
E 4.5	HW	46	Mtrs	
LL COLLAR SIZE (")		Length		
6.25		178	Mtrs	

CASING			
13 3/8	SURFACE SET @	843	ft
		256.9	M
9 5/8	INT. SET @	4177	ft
		1273	M
	PROD. or LNR Set @		ft
			M
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
352	390
TOTAL CIRCULATING VOL.	
742	
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE		CIRCULATION PRESS (PSI)	1900 psi
6 X 8	Inches		
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	41 min
GD PZ8	97.0		
BBL/STK	STK / MIN	TOTAL CIRC. TIME (min)	99 min
0.0700	110		
BBL/MIN	GAL / MIN	ANN VEL. DP	148
7.47	314	(ft/min) DCs	232

MUD PROPERTIES				
SAMPLE FROM		Pit	Pit	
TIME SAMPLE TAKEN		07.00	11.30	
DEPTH (ft) - (m)	Metres	1,570	1,584	
FLOWLINE TEMPERATURE	^{0}C / ^{0}F	38	40	
WEIGHT	ppg / SG	9.15 1.098	9.15 1.098	
FUNNEL VISCOSITY (sec/qt) API @	^{0}C	43	45	
PLASTIC VISCOSITY cP @	^{0}C	12	13	
YIELD POINT (lb/100ft^2)		11	12	
GEL STRENGTHS (lb/100ft^2) 10 sec/10 min		1 2	1 2	
FILTRATE API (cc's/30 min)		5.8	5.5	
HPHT FILTRATE (cc's/30 min) @	^{0}F			
CAKE THICKNESS API : HPHT (32nd in)		1	1	
SOLIDS CONTENT (% by Volume)		3.7	3.7	
LIQUID CONTENT (% by Volume) OIL/WATER		96.3	96.3	
SAND CONTENT (% by Vol.)		Tr	Tr	
METHYLENE BLUE CAPACITY (ppb equiv.)			5.0	
pH		8.5	8.8	
ALKALINITY MUD (Pm)				
ALKALINITY FILTRATE (Pf / Mf)		0.05 0.65	0.08 0.70	
CHLORIDE (mg/L)		18,000	17,500	
TOTAL HARDNESS AS CALCIUM (mg/L)		260	180	
SULPHITE (mg/L)		120	140	
K+ (mg/L)		17,833	16,752	
KCl (% by Wt.)		3.3	3.1	
PHPA ppb		1.95	2.00	

MUD PROPERTY SPECIFICATIONS					
Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Maintaining yield point and fluid loss just with the addition of PHPA presently.
Lowering and then maintaining mud weight at 9.1 ppg.
Still using sump water for premixes.
Adding occasional biocide to protect mud system. No problems have been noted.

OPERATIONS SUMMARY

RIH with Core Barrel.
Wash and ream 1543 - 1568 m.
Cut core # 1 to 1584 m.
Pump pill and POH.
Recover core and lay down core barrel.
Make up bit and BHA and RIH.
Wash 1573 - 1584 m
Drill ahead.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	717
(recirc from sump)	150	Desilter	15		
Drill Water		Downhole	10	+ FLUID RECEIVED	150
ect Recirc Sump		Dumped	100	-FLUID LOST	125
er (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	150	TOTAL LOST	125	FINAL VOLUME	742

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	8
Degasser	PB		Desilter	12	4	Shaker #2	3 x 175	8

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander			
Desilter	9.2	11.1	1.20

Product	Price	Start	Received	Used	Close	Cost
ite	$ 7.50	813		25	788	$ 187.50
Biocide	$ 140.00	15		1	14	$ 140.00
C--istic Soda	$ 32.00	20		1	19	$ 32.00
PA (Praestol)	$ 120.00	85		7	78	$ 840.00
Soda Ash	$ 27.50	20		4	16	$ 110.00
Sodium Sulphite	$ 39.50	49		4	45	$ 158.00

SOLIDS ANALYSIS

	PPB	%
High Grav solids	21.0	1.40
Total LGS	21.2	2.20
Bentonite	5.0	0.50
Drilled Solids	16.2	1.70
Salt	12.0	1.1
n @ 11.30 Hrs	0.60	
K @ 11.30 Hrs	0.58	

BIT HYD. PRESS.DATA

Jet Velocity	454
Impact force	676
HHP	311
HSI	5.5
Bit Press Loss	1699
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	9.40
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$1,467.50	$61,475.20

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	15	Date :	17-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	1590 to 1821		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor
WELL NAME AND No	Gangell # 1	FIELD: PEP 137	LOCATION: Gippsland Basin / STATE: Victoria

DRILLING ASSEMBLY		JET SIZE			CASING			MUD VOLUME (BBL)		CIRCULATION DATA			
SIZE	TYPE	12	12		13 3/8 SURFACE	843	ft	HOLE	PITS	PUMP SIZE		CIRCULATION PRESS (PSI)	1950 psi
8.50	Varel ETD417				SET @	256.9	M	401	440	6 X 8 Inches			
LL PIPE SIZE 4.5	TYPE 16.6 #	Length 1597 Mtrs			9 5/8 INT. SET @	4177 1273	ft M	TOTAL CIRCULATING VOL. 841		PUMP MODEL GD PZ8	ASSUMED EFF 97.0	BOTTOMS UP (min)	47 min
RILL PIPE TYPE 4.5	HW	Length 46 Mtrs			PROD. or LNR Set @		ft M	IN STORAGE		BBL/STK 0.0700	STK / MIN 110	TOTAL CIRC. TIME (min)	113 min
LL COLLAR SIZE (") 6.25		Length 178 Mtrs			MUD TYPE KCl PHPA Polymer					BBL/MIN 7.47	GAL / MIN 314	ANN VEL. DP 148 (ft/min) DCs 232	

MUD PROPERTIES			
SAMPLE FROM		Pit	Pit
TIME SAMPLE TAKEN		11.00	23.30
DEPTH (ft) - (m)	Metres	1,695	1,816
FLOWLINE TEMPERATURE	°C / °F	41	43
WEIGHT	ppg SG	9.15 1.098	9.15 1.098
FUNNEL VISCOSITY (sec/qt) API @	°C	43	44
PLASTIC VISCOSITY cP @	°C	13	13
ELD POINT (lb/100ft²)		14	16
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		1 2	1 2
FILTRATE API (cc's/30 min)		5.2	5.5
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)		1	1
SOLIDS CONTENT (% by Volume)		4.1	4.1
LIQUID CONTENT (% by Volume) OIL/WATER		95.9	95.9
SAND CONTENT (% by Vol.)		Tr	Tr
METHYLENE BLUE CAPACITY (ppb equiv.)		5.0	5.0
pH		9.0	8.6
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)		0.10 0.70	0.05 0.65
CHLORIDE (mg/L)		17,000	16,000
TOTAL HARDNESS AS CALCIUM (mg/L)		180	240
SULPHITE (mg/L)		120	120
K+ (mg/L)		16,212	15,131
KCl (% by Wt.)		3.0	2.8
PHPA ppb		2.25	2.25

MUD PROPERTY SPECIFICATIONS					
Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Maintaining yield point and fluid loss just with the addition of PHPA presently.
High PHPA concentration appearing to keep control on solids dispersion.
Mud weight being controlled relatively easily.

OPERATIONS SUMMARY

BOP drill - pump through choke.
Drill ahead.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	742
(recirc from sump)	260	Desilter	46		
rill Water		Downhole	21	+ FLUID RECEIVED	260
ect Recirc Sump		Dumped	74	-FLUID LOST	161
er (eg Diesel)		Shakers	20	+ FLUID IN STORAGE	
TOTAL RECEIVED	260	TOTAL LOST	161	FINAL VOLUME	841

Product	Price	Start	Received	Used	Close	Cost
stic Soda	$ 32.00	19		3	16	$ 96.00
HPA (Praestol)	$ 120.00	78	50	13	115	$ 1,560.00
da Ash	$ 27.50	16		1	15	$ 27.50
ium Sulphite	$ 39.50	45		2	43	$ 79.00

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	24
Degasser	PB		Desilter	12	20	Shaker #2	3 x 175	24

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter	9.2	11.4	1.60

SOLIDS ANALYSIS	PPB	%
High Grav solids	15.3	1.00
Total LGS	28.9	3.00
Bentonite	5.0	0.50
Drilled Solids	23.9	2.50
Salt	11.0	1.0
n @ 23.30 Hrs	0.53	
K @ 23.30 Hrs	1.04	

BIT HYD. PRESS.DATA	
Jet Velocity	454
Impact force	676
HHP	311
HSI	5.5
Bit Press Loss	1699
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	9.40
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$1,762.50	$63,237.70

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	16	Date :	18-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	1821 to 1940		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor
WELL NAME AND No	Gangell # 1	FIELD: PEP 137	LOCATION: Gippsland Basin / STATE: Victoria

DRILLING ASSEMBLY			JET SIZE		
SIZE	TYPE		12	12	
8.50	Varel ETD417				
DRILL PIPE	TYPE	Length			
SIZE 4.5	16.6 #	1716 Mtrs			
DRILL PIPE	TYPE	Length			
SIZE 4.5	HW	46 Mtrs			
DRILL COLLAR SIZE (")		Length			
6.25		178 Mtrs			

CASING			
13 3/8	SURFACE	843	ft
	SET @	256.9	M
9 5/8	INT.	4177	ft
	SET @	1273	M
	PROD. or LNR Set @		ft / M
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
427	450
TOTAL CIRCULATING VOL.	
877	
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE		CIRCULATION PRESS (PSI)	1950 psi
6 X 8 Inches			
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	50 min
GD PZ8	97.0		
BBL/STK	STK / MIN	TOTAL CIRC. TIME (min)	117 min
0.0700	110		
BBL/MIN	GAL / MIN	ANN VEL. (ft/min) DP	148
7.47	314	DCs	232

MUD PROPERTIES

		Pit	Pit
SAMPLE FROM			
TIME SAMPLE TAKEN		12.00	18.15
DEPTH (ft) - (m)	Metres	1,929	1,940
FLOWLINE TEMPERATURE	°C / °F	46	47
WEIGHT	ppg / SG	9.15 1.098	9.15 1.098
FUNNEL VISCOSITY (sec/qt) API @	°C	58	54
PLASTIC VISCOSITY cP @	°C	15	15
YIELD POINT (lb/100ft²)		20	19
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		2 5	2 4
FILTRATE API (cc's/30 min)		7.5	7.8
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)		1	1
SOLIDS CONTENT (% by Volume)		5.0	5.0
LIQUID CONTENT (% by Volume) OIL/WATER		95.0	95.0
SAND CONTENT (% by Vol.)		Tr	Tr
METHYLENE BLUE CAPACITY (ppb equiv.)		4.5	
pH		9.0	9.0
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)		0.10 0.90	0.10 0.95
CHLORIDE (mg/L)		13,000	13,000
TOTAL HARDNESS AS CALCIUM (mg/L)		100	100
SULPHITE (mg/L)		140	120
K+ (mg/L)		11,889	11,889
KCl (% by Wt.)		2.2	2.2
PHPA ppb		2.35	2.35

MUD PROPERTY SPECIFICATIONS

Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

As depth and bottom hole temperature is increasing, will require more control over the increasing fluid loss by re-introducing Pac.

OPERATIONS SUMMARY

Drill to 1940 m. Circulate 10 minutes and POH 3 stands.
Circulate bottoms up.
POH to shoe - Hole tight.
RIH. Wash and Ream 1916 m - 1940 m.
Circulate 20 minutes and POH 3 stands.
Circulate bottoms up.
POH.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	841
(recirc from sump)	200	Desilter	43		
Drill Water		Downhole	22	+ FLUID RECEIVED	200
ect Recirc Sump		Dumped	80	-FLUID LOST	165
er (eg Diesel)		Shakers	20	+ FLUID IN STORAGE	
TOTAL RECEIVED	200	TOTAL LOST	165	FINAL VOLUME	877

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	15
Degasser	PB		Desilter	12	15	Shaker #2	3 x 175	15

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter	9.2	11.2	2.00

Product	Price	Start	Received	Used	Close	Cost
ite	$ 7.50	788		60	728	$ 450.00
Biocide	$ 140.00	14		1	13	$ 140.00
Caustic Soda	$ 32.00	16		1	15	$ 32.00
PA (Praestol)	$ 120.00	115		10	105	$ 1,200.00
oda Ash	$ 27.50	15		3	12	$ 82.50
Sodium Sulphite	$ 39.50	43		4	39	$ 158.00

SOLIDS ANALYSIS

	PPB	%
High Grav solids	15.5	1.10
Total LGS	30.0	3.20
Bentonite	4.5	0.50
Drilled Solids	25.5	2.70
Salt	9.0	0.8
n @ 18.15 Hrs	0.53	
K @ 18.15 Hrs	1.27	

BIT HYD. PRESS.DATA

Jet Velocity	454
Impact force	676
HHP	311
HSI	5.5
Bit Press Loss	1699
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	9.50
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$2,062.50	$65,300.20

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	17	Date :	19-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	1940 to 1940		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE	
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor	
WELL NAME AND No	Gangell # 1	FIELD	LOCATION	STATE
		PEP 137	Gippsland Basin	Victoria

DRILLING ASSEMBLY			JET SIZE		
SIZE	TYPE		12	12	
8.50	Varel ETD417				
LL PIPE	TYPE	Length			
SIZE 4.5	16.6 #	1716 Mtrs			
RILL PIPE	TYPE	Length			
E 4.5	HW	46 Mtrs			
LL COLLAR SIZE (")		Length			
6.25		178 Mtrs			

CASING			
13 3/8	SURFACE SET @	843 ft 256.9 M	
9 5/8	INT. SET @	4177 ft 1273 M	
	PROD. or LNR Set @	ft M	
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
427	500
TOTAL CIRCULATING VOL.	
927	
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE		CIRCULATION PRESS (PSI)	psi
6 X 8	Inches		
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	min
GD PZ8	97.0		
BBL/STK	STK / MIN	TOTAL CIRC. TIME (min)	min
0.0700			
BBL/MIN	GAL / MIN	ANN VEL. DP (ft/min) DCs	

MUD PROPERTIES

	Pit	Pit
SAMPLE FROM		
TIME SAMPLE TAKEN		
DEPTH (ft) - (m) Metres		
FLOWLINE TEMPERATURE °C / °F		
WEIGHT ppg / SG		
FUNNEL VISCOSITY (sec/qt) API @ °C		
PLASTIC VISCOSITY cP @ °C		
ELD POINT (lb/100ft²)		
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		
FILTRATE API (cc's/30 min)		
HPHT FILTRATE (cc's/30 min) @ °F		
CAKE THICKNESS API : HPHT (32nd in)		
SOLIDS CONTENT (% by Volume)		
LIQUID CONTENT (% by Volume) OIL/WATER		
SAND CONTENT (% by Vol.)		
METHYLENE BLUE CAPACITY (ppb equiv.)		
pH		
ALKALINITY MUD (Pm)		
ALKALINITY FILTRATE (Pf / Mf)		
CHLORIDE (mg/L)		
TOTAL HARDNESS AS CALCIUM (mg/L)		
SULPHITE (mg/L)		
K+ (mg/L)		
KCl (% by Wt.)		
PHPA ppb		

MUD PROPERTY SPECIFICATIONS

Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Will reduce fluid loss with AMC Pac-LV while yield point is still high.
Added 100 bbls premix prior to and while reverse circulating - a little volume lost down hole but mainly to ensure good surface volume.
Also dumped and cleaned out sand trap.

OPERATIONS SUMMARY

POH.
Make up test tools and RIH.
Conduct DST # 3.
Pull free and reverse circulate.
POH and lay down test tools.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	877
(recirc from sump)	100	Desilter			
Drill Water		Downhole	15	+ FLUID RECEIVED	100
ect Recirc Sump		Dumped	35	-FLUID LOST	50
ier (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	100	TOTAL LOST	50	FINAL VOLUME	927

Product	Price	Start	Received	Used	Close	Cost
ite	$ 7.50	728		35	693	$ 262.50
HPA (Praestol)	$ 120.00	105		4	101	$ 480.00

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	1
Degasser	PB		Desilter	12		Shaker #2	3 x 175	

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

SOLIDS ANALYSIS

	PPB	%
High Grav solids		
Total LGS		
Bentonite		
Drilled Solids		
Salt		
n @ Hrs		
K @ Hrs		

BIT HYD. PRESS.DATA

Jet Velocity	
Impact force	
HHP	
HSI	
Bit Press Loss	
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$742.50	$66,042.70

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	18	Date :	20-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	1940 to 2050		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor
WELL NAME AND No	Gangell # 1	FIELD	PEP 137
LOCATION	Gippsland Basin	STATE	Victoria

DRILLING ASSEMBLY		JET SIZE		
SIZE	TYPE	12	12	
8.50	Varel ETD417			
DRILL PIPE SIZE 4.5	TYPE 16.6 #	Length 1826 Mtrs		
DRILL PIPE SIZE 4.5	TYPE HW	Length 46 Mtrs		
DRILL COLLAR SIZE (") 6.25		Length 178 Mtrs		

CASING			
13 3/8	SURFACE SET @	843 ft / 256.9 M	
9 5/8	INT. SET @	4177 ft / 1273 M	
	PROD. or LNR Set @	ft / M	
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
450	480
TOTAL CIRCULATING VOL.	930
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE 6 X 8 Inches		CIRCULATION PRESS (PSI)	1950 psi
PUMP MODEL GD PZ8	ASSUMED EFF 97.0	BOTTOMS UP (min)	53 min
BBL/STK 0.0700	STK / MIN 110	TOTAL CIRC. TIME (min)	125 min
BBL/MIN 7.47	GAL / MIN 314	ANN VEL. (ft/min) DP 148 / DCs 232	

MUD PROPERTIES

		Pit	Pit
SAMPLE FROM			
TIME SAMPLE TAKEN		11.30	24.00
DEPTH (ft) - (m)	Metres	1970	2050
FLOWLINE TEMPERATURE	°C °F	45	48
WEIGHT	ppg SG	9.10 1.092	9.15 1.098
FUNNEL VISCOSITY (sec/qt) API @	°C	39	41
PLASTIC VISCOSITY cP @	°C	12	14
YIELD POINT (lb/100ft²)		13	13
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		2 4	2 5
FILTRATE API (cc's/30 min)		9.4	7.8
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)		1	1
SOLIDS CONTENT (% by Volume)		4.2	4.4
LIQUID CONTENT (% by Volume) OIL/WATER		95.8	95.6
SAND CONTENT (% by Vol.)		Tr	Tr
METHYLENE BLUE CAPACITY (ppb equiv.)		4.0	5.0
pH		8.5	9.0
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)		0.05 0.70	0.08 0.75
CHLORIDE (mg/L)		11,000	11,000
TOTAL HARDNESS AS CALCIUM (mg/L)		280	260
SULPHITE (mg/L)		120	140
K+ (mg/L)		10,268	10,268
KCl (% by Wt.)		1.9	1.9
PHPA ppb		2.35	2.35

MUD PROPERTY SPECIFICATIONS

Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Increasing bottom hole temperature leading to increased fluid loss, which now has to be controlled with Pac. Initially, AMC Pac-LV was added as yield point was high, but as yield point dropped, AMC Pac-R was used.

OPERATIONS SUMMARY

Lay down test tools.
Make up bit and BHA and RIH.
Wash and ream 1886 m to bottom.
Drill ahead.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
Premix (drill water)		Desander		INITIAL VOLUME	927
(recirc from sump)	140	Desilter	39		
Drill Water		Downhole	28	+ FLUID RECEIVED	140
Direct Recirc Sump		Dumped	70	-FLUID LOST	137
Other (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	140	TOTAL LOST	137	FINAL VOLUME	930

Product	Price	Start	Received	Used	Close	Cost
KC Pac-LV	$ 161.00	40		3	37	$ 483.00
AMC Pac-R	$ 161.00	86		10	76	$ 1,610.00
Caustic Soda	$ 32.00	15		2	13	$ 64.00
PHPA (Praestol)	$ 120.00	101		7	94	$ 840.00
Soda Ash	$ 27.50	12		3	9	$ 82.50

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	19
Degasser	PB		Desilter	12	18	Shaker #2	3 x 175	19

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander			
Desilter	9.2	12.5	1.50

SOLIDS ANALYSIS

	PPB	%
High Grav solids	13.8	0.90
Total LGS	33.0	3.50
Bentonite	5.0	3.00
Drilled Solids	28.0	0.50
Salt	10.0	0.7
n @ 24.00 Hrs	0.60	
K @ 24.00 Hrs	0.63	

BIT HYD. PRESS.DATA

Jet Velocity	454
Impact force	676
HHP	311
HSI	5.5
Bit Press Loss	1699
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	9.40
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$3,079.50	$69,122.20

MUD ENGINEER	Andre Skujins	CITY	Adelaide Office	TELEPHONE	08 8338 7266

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RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	19	Date :	21-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	2050 to 2117		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE	
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor	
WELL NAME AND No	Gangell # 1	FIELD	LOCATION	STATE
		PEP 137	Gippsland Basin	Victoria

DRILLING ASSEMBLY		JET SIZE		
SIZE	TYPE	12	12	
8.50	Varel ETD417			
DRILL PIPE	TYPE	Length		
SIZE 4.5	16.6 #	1893 Mtrs		
DRILL PIPE	TYPE	Length		
SIZE 4.5	HW	46 Mtrs		
DRILL COLLAR SIZE (")		Length		
6.25		178 Mtrs		

CASING			
13 3/8 SURFACE SET @	843	ft	
	256.9	M	
9 5/8 INT. SET @	4177	ft	
	1273	M	
PROD. or LNR Set @		ft	
		M	
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
464	500
TOTAL CIRCULATING VOL.	
964	
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE		CIRCULATION PRESS (PSI)	1900 psi
6 X 8	Inches		
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	55 min
GD PZ8	97.0		
BBL/STK	STK / MIN	TOTAL CIRC. TIME (min)	129 min
0.0700	110		
BBL/MIN	GAL / MIN	ANN VEL. DP	148
7.47	314	(ft/min) DCs	232

MUD PROPERTIES

SAMPLE FROM		Pit	Pit	
TIME SAMPLE TAKEN		07.30	12.00	
DEPTH (ft) - (m)	Metres	2,085	2,114	
FLOWLINE TEMPERATURE	°C °F	50	51	
WEIGHT	ppg SG	9.15 1.098	9.10 1.092	
FUNNEL VISCOSITY (sec/qt) API @	°C	54	50	
PLASTIC VISCOSITY cP @	°C	20	20	
YIELD POINT (lb/100ft²)		20	21	
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		2 4	2 4	
FILTRATE API (cc's/30 min)		5.8	6.0	
HPHT FILTRATE (cc's/30 min) @	°F			
CAKE THICKNESS API : HPHT (32nd in)		1	1	
SOLIDS CONTENT (% by Volume)		4.3	4.1	
LIQUID CONTENT (% by Volume) OIL/WATER		95.7	95.9	
SAND CONTENT (% by Vol.)		Tr	Tr	
METHYLENE BLUE CAPACITY (ppb equiv.)			5.0	
pH		9.0	8.8	
ALKALINITY MUD (Pm)				
ALKALINITY FILTRATE (Pf / Mf)		0.08 0.75	0.05 0.75	
CHLORIDE (mg/L)		9,500	9,000	
TOTAL HARDNESS AS CALCIUM (mg/L)		180	120	
SULPHITE (mg/L)		140	120	
K+ (mg/L)		8,646	8,106	
KCl (% by Wt.)		1.6	1.5	
PHPA ppb		2.60	2.60	

MUD PROPERTY SPECIFICATIONS

Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Lowered fluid loss with AMC Pac-R, which also increased yield point.
Turned desilter off when mud weight looked like dropping below 9.1 ppg.

OPERATIONS SUMMARY

Drill ahead to 2117 m.
Circulate hole clean. Pump pill.
Wiper trip to 1910 m. Hole tight 1971 - 1910 m. (60 k Over pull.)
RIH. Wash and ream 22 m to bottom.
Circulate hole clean. Pump pill and POH.
Make up test tools.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	930
(recirc from sump)	120	Desilter	18		
Drill Water		Downhole	28	+ FLUID RECEIVED	120
ect Recirc Sump		Dumped	40	-FLUID LOST	86
er (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	120	TOTAL LOST	86	FINAL VOLUME	964

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	15
Degasser	PB		Desilter	12	9	Shaker #2	3 x 175	15

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter	9.1	11.8	1.40

Product	Price	Start	Received	Used	Close	Cost
LC Pac-R	$ 161.00	76		11	65	$ 1,771.00
Barite	$ 7.50	693		93	600	$ 697.50
PHPA (Praestol)	$ 120.00	94		8	86	$ 960.00
Soda Ash	$ 27.50	9		4	5	$ 110.00
Sodium Sulphite	$ 39.50	39		6	33	$ 237.00

SOLIDS ANALYSIS

	PPB	%
High Grav solids	17.0	1.20
Total LGS	27.0	2.90
Bentonite	5.0	0.50
Drilled Solids	22.0	2.40
Salt	8.0	0.5
n @ 12.00 Hrs	0.57	
K @ 12.00 Hrs	1.15	

BIT HYD. PRESS.DATA

Jet Velocity	454
Impact force	672
HHP	309
HSI	5.4
Bit Press Loss	1690
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	9.45
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$3,775.50	$72,897.70

MUD ENGINEER	Andre Skujins	CITY	Adelaide Office	TELEPHONE	08 8338 7266

908902 136

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	20	Date :	22-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	2117 to 2117		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE	
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor	
WELL NAME AND No	Gangell # 1	FIELD	LOCATION	STATE
		PEP 137	Gippsland Basin	Victoria

DRILLING ASSEMBLY		JET SIZE	CASING			MUD VOLUME (BBL)	
SIZE	TYPE		13 3/8 SURFACE	843	ft	HOLE	PITS
8.50	Magnet		SET @	256.9	M	464	475
LL PIPE	TYPE	Length	9 5/8 INT.	4177	ft	TOTAL CIRCULATING VOL.	
IZE 4.5	16.6 #	1893 Mtrs	SET @	1273	M	939	
RILL PIPE	TYPE	Length	PROD. or		ft	IN STORAGE	
-IZE 4.5	HW	46 Mtrs	LNR Set @		M		
LL COLLAR SIZE (")		Length	MUD TYPE				
6.25		178 Mtrs	KCl PHPA Polymer				

CIRCULATION DATA					
PUMP SIZE			CIRCULATION PRESS (PSI)	800	psi
6 X 8	Inches				
PUMP MODEL	ASSUMED EFF		BOTTOMS UP (min)	47	min
GD PZ8	97.0				
BBL/STK	STK / MIN		TOTAL CIRC. TIME (min)	106	min
0.0700	130				
BBL/MIN	GAL / MIN		ANN VEL. DP	175	
8.83	371		(ft/min) DCs	274	

MUD PROPERTIES			
SAMPLE FROM	Pit	Pit	
TIME SAMPLE TAKEN	09.30		
DEPTH (ft) - (m) Metres	2,117		
FLOWLINE TEMPERATURE °C / °F	49		
WEIGHT ppg / SG	9.05 1.086		
FUNNEL VISCOSITY (sec/qt) API @ °C	54		
PLASTIC VISCOSITY cP @ °C	21		
YIELD POINT (lb/100ft²)	21		
GEL STRENGTHS (lb/100ft²) 10 sec/10 min	2 3		
FILTRATE API (cc's/30 min)	5.6		
HPHT FILTRATE (cc's/30 min) @ °F			
CAKE THICKNESS API : HPHT (32nd in)	1		
SOLIDS CONTENT (% by Volume)	3.5		
LIQUID CONTENT (% by Volume) OIL/WATER	96.5		
SAND CONTENT (% by Vol.)	Tr		
METHYLENE BLUE CAPACITY (ppb equiv.)			
pH	8.8		
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)	0.05 0.75		
CHLORIDE (mg/L)	9,000		
TOTAL HARDNESS AS CALCIUM (mg/L)	120		
SULPHITE (mg/L)	120		
K+ (mg/L)	8,106		
KCl (% by Wt.)	1.5		
PHPA ppb	2.60		

MUD PROPERTY SPECIFICATIONS					
Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

OPERATIONS SUMMARY

Loose tong pin down hole.
Break down test tools and make up Bowen magnet.
RIH to 2103 m. Hole tight.
Wash down to 2117 m and tag fish. Circulate bottoms up. Pump pill and POH.
Hole tight at 2056 m and from 1971 - 1961 m. (Max OP 60 k.)
Recover fish. Lay down magnet.
Make up test tools and RIH.
Attempt DST # 4. Loose packer.
POH.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	964
(recirc from sump)		Desilter			
rill water		Downhole	25	+ FLUID RECEIVED	
ect Recirc Sump		Dumped		-FLUID LOST	25
er (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED		TOTAL LOST	25	FINAL VOLUME	939

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	3
Degasser	PB		Desilter	12		Shaker #2	3 x 175	3

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

Product	Price	Start	Received	Used	Close	Cost
ite	$ 7.50	600		40	560	$ 300.00

SOLIDS ANALYSIS	PPB	%
High Grav solids	19.0	1.30
Total LGS	21.0	2.20
Bentonite	5.0	0.50
Drilled Solids	16.0	1.70
Salt	8.0	0.5
n @ Hrs		
K @ Hrs		

BIT HYD. PRESS.DATA	
Jet Velocity	
Impact force	
HHP	
HSI	
Bit Press Loss	
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	9.40
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$300.00	$73,197.70

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908902 137

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	21	Date :	23-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	2117 to 2149		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE	
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor	
WELL NAME AND No	Gangell # 1	FIELD	LOCATION	STATE
		PEP 137	Gippsland Basin	Victoria

DRILLING ASSEMBLY		JET SIZE		
SIZE	TYPE	12	12	
8.50	Varel ETD 437			
LL PIPE	TYPE	Length		
SIZE 4.5	16.6 #	1895	Mtrs	
RILL PIPE	TYPE	Length		
E 4.5	HW	46	Mtrs	
LL COLLAR SIZE (")		Length		
6.25		208	Mtrs	

CASING			
13 3/8	SURFACE	843	ft
	SET @	256.9	M
9 5/8	INT.	4177	ft
	SET @	1273	M
	PROD. or		ft
	LNR Set @		M
MUD TYPE		KCl PHPA Polymer	

MUD VOLUME (BBL)	
HOLE	PITS
469	440
TOTAL CIRCULATING VOL.	
909	
IN STORAGE	
60	

CIRCULATION DATA			
PUMP SIZE		CIRCULATION PRESS (PSI)	2000 psi
6 X 8	Inches		
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	57 min
GD PZ8	97.0		
BBL/STK	STK MIN	TOTAL CIRC. TIME (min)	125 min
0.0700	107		
BBL/MIN	GAL MIN	ANN VEL. DP	144
7.27	305	(ft/min) DCs	225

MUD PROPERTIES

		Pit	Pit
SAMPLE FROM			
TIME SAMPLE TAKEN		16.30	20.00
DEPTH (ft) - (m)	Metres	2,131	2,149
FLOWLINE TEMPERATURE	°C / °F	48	53
WEIGHT	ppg / SG	9.15 1.098	9.15 1.098
FUNNEL VISCOSITY (sec/qt) API @	°C	57	50
PLASTIC VISCOSITY cP @	°C	20	20
YIELD POINT (lb/100ft²)		19	16
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		2 3	1 3
FILTRATE API (cc's/30 min)		4.5	4.8
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)		1	1
SOLIDS CONTENT (% by Volume)		4.0	4.0
LIQUID CONTENT (% by Volume) OIL/WATER		96.0	96.0
SAND CONTENT (% by Vol.)		Tr	Tr
METHYLENE BLUE CAPACITY (ppb equiv.)			5.0
pH		8.5	8.8
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)		0.05 0.65	0.08 0.70
CHLORIDE (mg/L)		9,000	9,000
TOTAL HARDNESS AS CALCIUM (mg/L)		160	120
SULPHITE (mg/L)		100	120
K+ (mg/L)		8,106	8,106
KCl (% by Wt.)		1.5	1.5
PHPA ppb		2.60	2.60

MUD PROPERTY SPECIFICATIONS

Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Fluid loss below 5 cc's due to general cooling of mud system.
Properties quite stable, with mud weight increasing slightly due to a few heavy weight pills recently.
Extra barite usage due to previous pill used but not recorded.

OPERATIONS SUMMARY

POH test tools and lay down same.
Make up bit and RIH.
Wash 21 m to bottom.
Drill to 2149 m. Circulate briefly and POH 1 stand.
Circulate bottoms up and POH.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
mix (drill water)		Desander		INITIAL VOLUME	939
(recirc from sump)	40	Desilter	11		
Drill Water		Downhole	20	+ FLUID RECEIVED	40
ect Recirc Sump		Dumped	40	-FLUID LOST	71
er (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	40	TOTAL LOST	71	FINAL VOLUME	909

Product	Price	Start	Received	Used	Close	Cost
ite	$ 7.50	560		80	480	$ 600.00
Biocide	$ 140.00	13		1	12	$ 140.00
stic Soda	$ 32.00	13		1	12	$ 32.00
PA (Praestol)	$ 120.00	86		4	82	$ 480.00
oda Ash	$ 27.50	5		2	3	$ 55.00
odium Sulphite	$ 39.50	33		4	29	$ 158.00

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	7
Degasser	PB		Desilter	12	5	Shaker #2	3 x 175	7

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter	9.2	12.8	1.50

SOLIDS ANALYSIS

	PPB	%
High Grav solids	23.0	1.60
Total LGS	23.0	2.40
Bentonite	5.0	0.50
Drilled Solids	18.0	1.90
Salt	8.0	0.5
n @ 20.00 Hrs	0.64	
K @ 20.00 Hrs	0.68	

BIT HYD. PRESS.DATA

Jet Velocity	442
Impact force	639
HHP	286
HSI	5.0
Bit Press Loss	1608
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	9.40
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$1,465.00	$74,662.70

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908902 138

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	22	Date :	24-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	2149 to 2149		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE	
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor	
WELL NAME AND No	Gangell # 1	FIELD	PEP 137	LOCATION: Gippsland Basin / STATE: Victoria

DRILLING ASSEMBLY		JET SIZE		
SIZE	TYPE	12	12	
8.50	Varel ETD 437			
LL PIPE	TYPE	Length		
SIZE 4.5	16.6 #	1895	Mtrs	
DRILL PIPE	TYPE	Length		
SIZE 4.5	HW	46	Mtrs	
LL COLLAR SIZE (")		Length		
6.25		208	Mtrs	

CASING			
13 3/8	SURFACE SET @	843 / 256.9	ft / M
9 5/8	INT. SET @	4177 / 1273	ft / M
	PROD. or LNR Set @		ft / M
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
469	400
TOTAL CIRCULATING VOL.	
869	
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE		CIRCULATION PRESS (PSI)	psi
6 X 8	Inches		
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	min
GD PZ8	97.0		
BBL/STK	STK / MIN	TOTAL CIRC. TIME (min)	min
0.0700			
BBL/MIN	GAL / MIN	ANN VEL. DP (ft/min) DCs	

MUD PROPERTIES

	Pit	Pit
SAMPLE FROM		
TIME SAMPLE TAKEN		
DEPTH (ft) - (m) Metres		
FLOWLINE TEMPERATURE °C °F		
WEIGHT ppg SG		
FUNNEL VISCOSITY (sec/qt) API @ °C		
PLASTIC VISCOSITY cP @ °C		
YELD POINT (lb/100ft²)		
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		
FILTRATE API (cc's/30 min)		
HPHT FILTRATE (cc's/30 min) @ °F		
CAKE THICKNESS API : HPHT (32nd in)		
SOLIDS CONTENT (% by Volume)		
LIQUID CONTENT (% by Volume) OIL/WATER		
SAND CONTENT (% by Vol.)		
METHYLENE BLUE CAPACITY (ppb equiv.)		
pH		
ALKALINITY MUD (Pm)		
ALKALINITY FILTRATE (Pf / Mf)		
CHLORIDE (mg/L)		
TOTAL HARDNESS AS CALCIUM (mg/L)		
SULPHITE (mg/L)		
K+ (mg/L)		
KCl (% by Wt.)		
PHPA ppb		

MUD PROPERTY SPECIFICATIONS

Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

OPERATIONS SUMMARY

POH.
Make up test tools and RIH.
Attempt DST # 5. Packer failure.
POH and lay down test tools.
Make up bit and RIH.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
(drill water)		Desander		INITIAL VOLUME	909
(recirc from sump)		Desilter			
Drill Water		Downhole	20	+ FLUID RECEIVED	
ect Recirc Sump		Dumped	20	-FLUID LOST	40
er (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED		TOTAL LOST	40	FINAL VOLUME	869

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	
Degasser	PB		Desilter	12		Shaker #2	3 x 175	

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

Product	Price	Start	Received	Used	Close	Cost

SOLIDS ANALYSIS

	PPB	%
High Grav solids		
Total LGS		
Bentonite		
Drilled Solids		
Salt		
n @ Hrs		
K @ Hrs		

BIT HYD. PRESS.DATA

Jet Velocity	
Impact force	
HHP	
HSI	
Bit Press Loss	
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
	$74,662.70

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908902 139

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	23	Date :	25-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	2149 to 2233		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE	
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor	
WELL NAME AND No	Gangell # 1	FIELD	LOCATION	STATE
		PEP 137	Gippsland Basin	Victoria

DRILLING ASSEMBLY		JET SIZE		
BIT SIZE	TYPE	12	12	
8.50	Varel ETD 437			
DRILL PIPE SIZE 4.5	TYPE 16.6 #	Length 1979 Mtrs		
DRILL PIPE SIZE 4.5	TYPE HW	Length 46 Mtrs		
DRILL COLLAR SIZE (") 6.25		Length 208 Mtrs		

CASING			
13 3/8	SURFACE SET @	843 ft / 256.9 M	
9 5/8	INT. SET @	4177 ft / 1273 M	
	PROD. or LNR Set @	ft / M	
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
487	420
TOTAL CIRCULATING VOL.	907
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE 6 X 8 Inches		CIRCULATION PRESS (PSI)	2000 psi
PUMP MODEL GD PZ8	ASSUMED EFF 97.0	BOTTOMS UP (min)	57 min
BBL/STK 0.0700	STK / MIN 110	TOTAL CIRC. TIME (min)	121 min
BBL/MIN 7.47	GAL / MIN 314	ANN VEL. (ft/min) DP	148
		DCs	232

MUD PROPERTIES

SAMPLE FROM		Pit	Pit
TIME SAMPLE TAKEN		12.00	20.30
DEPTH (ft) - (m)	Metres	2,177	2,215
FLOWLINE TEMPERATURE	°C / °F	51	52
WEIGHT	ppg / SG	9.10 1.092	9.15 1.098
FUNNEL VISCOSITY (sec/qt) API @	°C	45	48
PLASTIC VISCOSITY cP @	°C	17	19
YIELD POINT (lb/100ft²)		18	21
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		2 5	2 6
FILTRATE API (cc's/30 min)		7	7.1
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)		1	1
SOLIDS CONTENT (% by Volume)		3.9	4.2
LIQUID CONTENT (% by Volume) OIL/WATER		96.1	95.8
SAND CONTENT (% by Vol.)		0.25	0.25
METHYLENE BLUE CAPACITY (ppb equiv.)		5.0	5.5
pH		8.5	9.0
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)		0.05 0.65	0.10 1.00
CHLORIDE (mg/L)		8,500	9,000
TOTAL HARDNESS AS CALCIUM (mg/L)		140	120
SULPHITE (mg/L)		140	120
K+ (mg/L)		7,566	7,566
KCl (% by Wt.)		1.4	1.4
PHPA ppb		2.63	2.63

MUD PROPERTY SPECIFICATIONS

Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Lowered yield oint soon after drilling, along with low Fluid Loss at that time, led to Xantemp being used.

Once Fluid loss showed an increasing trend, AMC Pac-R was introduced and this stabilised the fluid loss around 7 cc's.

Barite added to pill tank so should not ned to mix pill on next trip.

Also, some written off due to damage when pallet tipped over and restacked.

OPERATIONS SUMMARY

RIH. Wash 2135 m to bottom.

Work junk sub.

Drill ahead.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
Premix (drill water)		Desander		INITIAL VOLUME	869
(recirc from sump)	100	Desilter	9		
Drill Water		Downhole	34	+ FLUID RECEIVED	100
Direct Recirc Sump		Dumped	20	-FLUID LOST	62
Water (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	100	TOTAL LOST	62	FINAL VOLUME	907

Product	Price	Start	Received	Used	Close	Cost
AMC Pac-R	$ 161.00	65		5	60	$ 805.00
Barite	$ 7.50	480		80	400	$ 600.00
Biocide	$ 140.00	12		1	11	$ 140.00
Caustic Soda	$ 32.00	12		2	10	$ 64.00
PHPA (Praestol)	$ 120.00	82		6	76	$ 720.00
Sodium Sulphite	$ 39.50	29		4	25	$ 158.00
Xantemp	$ 535.00	22		3	19	$ 1,605.00

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	20
Degasser	PB		Desilter	12	4	Shaker #2	3 x 175	20

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter	9.2	12.4	1.50

SOLIDS ANALYSIS

	PPB	%
High Grav solids	20.8	1.40
Total LGS	26.4	2.80
Bentonite	5.5	0.50
Drilled Solids	20.9	2.30
Salt	8.0	0.5
n @ 20.30 Hrs	0.56	
K @ 20.30 Hrs	1.21	

BIT HYD. PRESS.DATA

Jet Velocity	454
Impact force	676
HHP	311
HSI	5.5
Bit Press Loss	1699
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	9.50
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$4,092.00	$78,754.70

MUD ENGINEER	Andre Skujins - Neil Kyberd	CITY	Adelaide Office	TELEPHONE	08 8338 7266

908902 140

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	24	Date :	26-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	2233 to 2328		

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor
WELL NAME AND No	Gangell # 1	FIELD: PEP 137	LOCATION: Gippsland Basin / STATE: Victoria

DRILLING ASSEMBLY		JET SIZE		
SIZE	TYPE	12	12	
8.50	Varel ETD 437			
DRILL PIPE SIZE 4.5	TYPE 16.6 #	Length 2074		
DRILL PIPE SIZE 4.5	TYPE HW	Length 46		
DRILL COLLAR SIZE (") 6.25		Length 208		

CASING			
13 3/8	SURFACE SET @	843 ft / 256.9 M	
9 5/8	INT. SET @	4177 ft / 1273 M	
	PROD. or LNR Set @	ft / M	
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
507	470
TOTAL CIRCULATING VOL.	977
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE 6 X 8 Inches		CIRCULATION PRESS (PSI)	2000 psi
PUMP MODEL GD PZ8	ASSUMED EFF 97.0	BOTTOMS UP (min)	62 min
BBL/STK 0.0700	STK / MIN 107	TOTAL CIRC. TIME (min)	134 min
BBL/MIN 7.27	GAL / MIN 305	ANN VEL. (ft/min) DP 144 / DCs 225	

MUD PROPERTIES

SAMPLE FROM		Pit	Pit
TIME SAMPLE TAKEN		13:00	24:00
DEPTH (ft) - (m)		2,283	2,330
FLOWLINE TEMPERATURE	°C °F	54	55
WEIGHT	ppg / SG	9.10 1.092	9.15 1.098
FUNNEL VISCOSITY (sec/qt) API @	°C	47	47
PLASTIC VISCOSITY cP @	°C	19	19
YIELD POINT (lb/100ft²)		20	19
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		2 6	2 5
FILTRATE API (cc's/30 min)		8.4	8.6
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)		1	1
SOLIDS CONTENT (% by Volume)		4.3	4.3
LIQUID CONTENT (% by Volume) OIL/WATER		95.7	95.7
SAND CONTENT (% by Vol.)		0.25	0.25
METHYLENE BLUE CAPACITY (ppb equiv.)		5.5	5.5
pH		9.0	8.8
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)		0.10 1.00	0.50 1.00
CHLORIDE (mg/L)		9,000	9,000
TOTAL HARDNESS AS CALCIUM (mg/L)		160	120
SULPHITE (mg/L)		120	100
K+ (mg/L)		7,566	7,566
KCl (% by Wt.)		1.4	1.4
PHPA ppb		2.60	2.50

MUD PROPERTY SPECIFICATIONS

Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Fluid Loss showing an increasing trend. continued treating with PAC-R via premix.

System stable throughout the day through slow drilling.

Maintaining sodium sulphite level above 100 mg/l

Controlling Mud Weight at 9.1 ppg with selective Desilter use

OPERATIONS SUMMARY

Drill Ahead from 2233m to 2328m

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
Mix (drill water)		Desander		INITIAL VOLUME	951
(recirc from sump)	80	Desilter	7		
Drill Water		Downhole	3	+ FLUID RECEIVED	80
ect Recirc Sump		Dumped		-FLUID LOST	10
ier (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	80	TOTAL LOST	10	FINAL VOLUME	1,021

Product	Price	Start	Received	Used	Close	Cost
C Pac-R	$ 161.00	60		6	54	$ 966.00
Biocide	$ 140.00	11		1	10	$ 140.00
ustic Soda	$ 32.00	10		2	8	$ 64.00
PA (Praestol)	$ 120.00	76		2	74	$ 240.00
ium Sulphite	$ 39.50	25		2	23	$ 79.00

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	24
Degasser	PB		Desilter	12	4	Shaker #2	3 x 175	24

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter	9.1	12.2	1.20

SOLIDS ANALYSIS

	PPB	%
High Grav solids	19.2	1.30
Total LGS	28.3	3.00
Bentonite	5.5	0.50
Drilled Solids	22.8	2.40
Salt	8.0	0.5
n @ 24:00 Hrs	0.58	
K @ 24:00 Hrs	0.99	

BIT HYD. PRESS.DATA

Jet Velocity	442
Impact force	639
HHP	286
HSI	5.0
Bit Press Loss	1608
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	9.50
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$1,489.00	$80,243.70

IN ENGINEER	Neil Kyberd	CITY	Adelaide Office	TELEPHONE	08 8338 7266

908902 141

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	25	Date :	27-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	2328 to 2350		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE	
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor	
WELL NAME AND No	Gangell # 1	FIELD	LOCATION	STATE
		PEP 137	Gippsland Basin	Victoria

DRILLING ASSEMBLY		JET SIZE		
SIZE	TYPE	12	12	
8.50	Varel ETD 437			
L PIPE	TYPE	Length		
IZE 4.5	16.6 #	2096 Mtrs		
RILL PIPE	TYPE	Length		
E 4.5	HW	46 Mtrs		
L COLLAR SIZE (")		Length		
6.25		208 Mtrs		

CASING			
13 3/8	SURFACE	843	ft
	SET @	256.9	M
9 5/8	INT.	4177	ft
	SET @	1273	M
	PROD. or		ft
	LNR Set @		M
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
511	460
TOTAL CIRCULATING VOL.	
971	
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE		CIRCULATION PRESS (PSI)	2000 psi
6 X 8 inches			
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	62 min
GD PZ8	97.0		
BBL/STK	STK / MIN	TOTAL CIRC. TIME (min)	134 min
0.0700	107		
BBL/MIN	GAL / MIN	ANN VEL. DP	144
7.27	305	(ft/min) DCs	225

MUD PROPERTIES		
	Pit	Pit
SAMPLE FROM		
TIME SAMPLE TAKEN		11:00
DEPTH (ft) - (m) Metres		2,350
FLOWLINE TEMPERATURE ^{0}C / ^{0}F		
WEIGHT ppg / SG		9.15 1.098
FUNNEL VISCOSITY (sec/qt) API @ ^{0}C		47
PLASTIC VISCOSITY cP @ ^{0}C		19
ELD POINT (lb/100ft^2)		18
GEL STRENGTHS (lb/100ft^2) 10 sec/10 min		2 5
FILTRATE API (cc's/30 min)		7.4
HPHT FILTRATE (cc's/30 min) @ ^{0}F		
CAKE THICKNESS API : HPHT (32nd in)		1
SOLIDS CONTENT (% by Volume)		4.0
LIQUID CONTENT (% by Volume) OIL/WATER		96.0
SAND CONTENT (% by Vol.)		Tr
METHYLENE BLUE CAPACITY (ppb equiv.)		5.5
pH		8.8
ALKALINITY MUD (Pm)		
ALKALINITY FILTRATE (Pf / Mf)		0.05 1.00
CHLORIDE (mg/L)		9,000
TOTAL HARDNESS AS CALCIUM (mg/L)		180
SULPHITE (mg/L)		140
K+ (mg/L)		7,566
KCl (% by Wt.)		1.4
PHPA ppb		2.50

MUD PROPERTY SPECIFICATIONS					
Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

OPERATIONS SUMMARY

Drill Ahead from 2328m to TD 2350m, reached at 06:30Hrs
Circulate hole clean, slug pipe and POH 5 std wiper trip to 2035m.
RIH with 1m of fill on bottom.
Pump 40bbl Hi Vis Sweep (Pac-R) and circulate the hole clean.
Slug pipe and POH to log.
Rig up and run logs. Finding 1m of fill.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
...ix (drill water)		Desander		INITIAL VOLUME	1021
(recirc from sump)	20	Desilter	11		
Drill Water		Downhole	14	+ FLUID RECEIVED	20
ect Recirc Sump		Dumped		-FLUID LOST	25
ier (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED	20	TOTAL LOST	25	FINAL VOLUME	1,015

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	8
Degasser	PB		Desilter	12	6.5	Shaker #2	3 x 175	8

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter	9.1	12.2	1.20

Product	Price	Start	Received	Used	Close	Cost
C Pac-LV	$ 161.00	37		4	33	$ 644.00
MC Pac-R	$ 161.00	54		1	53	$ 161.00
ite	$ 7.50	400		90	310	$ 675.00
ium Sulphite	$ 39.50	23		2	21	$ 79.00

SOLIDS ANALYSIS	PPB	%
High Grav solids	23.7	1.61
Total LGS	0.6	
Bentonite	5.5	
Drilled Solids	1.8	
Salt		0.5
n @ 11:00 Hrs	0.60	
K @ 11:00 Hrs	0.89	

BIT HYD. PRESS.DATA	
Jet Velocity	442
Impact force	639
HHP	286
HSI	5.0
Bit Press Loss	1608
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	9.55
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$1,559.00	$81,802.70

...N ENGINEER	Neil Kyberd	CITY	Adelaide Office	TELEPHONE	08 8338 7266

908902 142

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	26	Date :	28-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	2350 to 2350		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor
WELL NAME AND No	Gangell # 1	FIELD: PEP 137	LOCATION: Gippsland Basin / STATE: Victoria

DRILLING ASSEMBLY

		JET SIZE		
SIZE 8.50	TYPE Varel ETD 437	12	12	
DL PIPE SIZE 4.5	TYPE 16.6 #	Length 2096 Mtrs		
DRILL PIPE SIZE 4.5	TYPE HW	Length 46 Mtrs		
DL COLLAR SIZE (") 6.25		Length 208 Mtrs		

CASING

13 3/8	SURFACE SET @	843 ft	256.9 M
9 5/8	INT. SET @	4177 ft	1273 M
	PROD. or LNR Set @	ft	M
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)

HOLE	PITS
511	440
TOTAL CIRCULATING VOL. 951	
IN STORAGE	

CIRCULATION DATA

PUMP SIZE 6 X 8 Inches		CIRCULATION PRESS (PSI) psi
PUMP MODEL GD PZ8	ASSUMED EFF 97.0	BOTTOMS UP (min) min
BBL/STK 0.0700	STK / MIN	TOTAL CIRC. TIME (min) min
BBL/MIN	GAL / MIN	ANN VEL. (ft/min) DP DCs

MUD PROPERTIES

		Pit	Pit
SAMPLE FROM			
TIME SAMPLE TAKEN			15:00
DEPTH (ft) - (m)	Metres		2,350
FLOWLINE TEMPERATURE	°C / °F		
WEIGHT	ppg / SG		9.25 1.110
FUNNEL VISCOSITY (sec/qt) API @	°C		51
PLASTIC VISCOSITY cP @	°C		19
YELD POINT (lb/100ft²)			18
GEL STRENGTHS (lb/100ft²) 10 sec/10 min			2 5
FILTRATE API (cc's/30 min)			7.4
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)			1
SOLIDS CONTENT (% by Volume)			4.5
LIQUID CONTENT (% by Volume) OIL/WATER			95.5
SAND CONTENT (% by Vol.)			Tr
METHYLENE BLUE CAPACITY (ppb equiv.)			5.0
pH			8.8
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)			0.05 1.00
CHLORIDE (mg/L)			9,000
TOTAL HARDNESS AS CALCIUM (mg/L)			180
SULPHITE (mg/L)			120
K+ (mg/L)			7,566
KCl (% by WL)			1.4
PHPA ppb			2.50

MUD PROPERTY SPECIFICATIONS

Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Funnel Vis rising as mud temperature cools.

OPERATIONS SUMMARY

Continue Logging.
Make up DST tools.
RIH , set packers and run DST # 6
Pull free and pull up to second target.
Set packers, failed, pull up 1.5m and set packers successfully.
Run DST # 7

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
...x (drill water)		Desander		INITIAL VOLUME	1015
(recirc from sump)		Desilter			
Drill Water		Downhole	20	+ FLUID RECEIVED	
ect Recirc Sump		Dumped		-FLUID LOST	20
er (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED		TOTAL LOST	20	FINAL VOLUME	995

Product	Price	Start	Received	Used	Close	Cost
lite	$ 7.50	310		80	230	$ 600.00
Caustic Soda	$ 32.00	8		1	7	$ 32.00

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	
Degasser	PB		Desilter	12		Shaker #2	3 x 175	

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

SOLIDS ANALYSIS

	PPB	%
High Grav solids	23.7	1.61
Total LGS	0.5	
Bentonite	5.0	
Drilled Solids	2.4	
Salt		0.5
n @ 15:00 Hrs	0.60	
K @ 15:00 Hrs	0.89	

BIT HYD. PRESS.DATA

Jet Velocity	
Impact force	
HHP	
HSI	
Bit Press Loss	
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$632.00	$82,437.70

MN ENGINEER Neil Kyberd CITY Adelaide Office TELEPHONE 08 8338 7266

908902 143

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	27	Date :	29-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	2350 to	2350	

OPERATOR	Lakes Oil	CONTRACTOR	ODE		
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor		
WELL NAME AND No	Gangell # 1	FIELD	PEP 137	LOCATION	Gippsland Basin
				STATE	Victoria

DRILLING ASSEMBLY		JET SIZE		CASING			MUD VOLUME (BBL)	
SIZE	TYPE	12	12	13 3/8 SURFACE	843	ft	HOLE	PITS
8.50	Varel ETD 437			SET @	256.9	M	511	
DL PIPE	TYPE	Length		9 5/8 INT.	4177	ft	TOTAL CIRCULATING VOL.	
SIZE 4.5	16.6 #	2096		SET @	1273	M	511	
DRILL PIPE	TYPE	Length		PROD. or		ft	IN STORAGE	
SIZE 4.5	HW	46		LNR Set @		M		
DL COLLAR SIZE (")		Length		MUD TYPE				
6.25		208		KCl PHPA Polymer				

CIRCULATION DATA			
PUMP SIZE		CIRCULATION PRESS (PSI)	psi
6 X 8 Inches			
PUMP MODEL	ASSUMED EFF	BOTTOMS UP (min)	min
GD PZ8	97.0		
BBL STK	STK MIN	TOTAL CIRC. TIME (min)	min
0.0700			
BBL/MIN	GAL MIN	ANN VEL. DP (ft/min) DCs	

MUD PROPERTIES

		Pit	Pit
SAMPLE FROM			
TIME SAMPLE TAKEN			24:00
DEPTH (ft) - (m)			2,350
FLOWLINE TEMPERATURE	°C °F		
WEIGHT	ppg SG		9.25 1.110
FUNNEL VISCOSITY (sec/qt) API @	°C		52
PLASTIC VISCOSITY cP @	°C		19
YELD POINT (lb/100ft²)			18
GEL STRENGTHS (lb/100ft²) 10 sec/10 min			2 5
FILTRATE API (cc's/30 min)			7.4
HPHT FILTRATE (cc's/30 min) @	°F		
CAKE THICKNESS API : HPHT (32nd in)			1
SOLIDS CONTENT (% by Volume)			4.5
LIQUID CONTENT (% by Volume) OIL/WATER			95.5
SAND CONTENT (% by Vol.)			Tr
METHYLENE BLUE CAPACITY (ppb equiv.)			5.0
pH			8.8
ALKALINITY MUD (Pm)			
ALKALINITY FILTRATE (Pf / Mf)			0.05 1.00
CHLORIDE (mg/L)			9,000
TOTAL HARDNESS AS CALCIUM (mg/L)			180
SULPHITE (mg/L)			100
K+ (mg/L)			7,566
KCl (% by Wt.)			1.4
PHPA ppb			2.50

MUD PROPERTY SPECIFICATIONS

Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

System stable through long static period.

OPERATIONS SUMMARY

Continue running DST # 7.
Pull free, reverse circulate until RC port blocked.
Circulate down pipe. slug pipe and POH.
Run Perforating tool and Perforate casing at 684m
RIH with DST tools
Inflate packers failed.
POH and service tools

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
(drill water)		Desander		INITIAL VOLUME	995
(recirc from sump)		Desilter			
Drill Water		Downhole	440	+ FLUID RECEIVED	
ect Recirc Sump		Dumped		-FLUID LOST	440
ier (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED		TOTAL LOST	440	FINAL VOLUME	555

Product	Price	Start	Received	Used	Close	Cost
lite	$ 7.50	230		30	200	$ 225.00

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	
Degasser	PB		Desilter	12		Shaker #2	3 x 175	

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

SOLIDS ANALYSIS

	PPB	%
High Grav solids	23.7	1.61
Total LGS	0.5	
Bentonite	5.0	
Drilled Solids	2.4	
Salt		0.5
n @ 24:00 Hrs	0.60	
K @ 24:00 Hrs	0.89	

BIT HYD. PRESS.DATA

Jet Velocity	
Impact force	
HHP	
HSI	
Bit Press Loss	
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
$225.00	$82,659.70

MN ENGINEER	Neil Kyberd	CITY	Adelaide Office	TELEPHONE	08 8338 7266

908902 144

RMN Drilling Fluids

DRILLING FLUID REPORT

Report #	28	Date :	30-Jan-2001
Rig No	30	Spud :	3-Jan-2001
Depth	2350 to 2350		Metres

OPERATOR	Lakes Oil	CONTRACTOR	ODE
REPORT FOR	Brent Speechley	REPORT FOR	Mick O'Connor
WELL NAME AND No	Gangell # 1	FIELD: PEP 137	LOCATION: Gippsland Basin / STATE: Victoria

DRILLING ASSEMBLY			JET SIZE		
SIZE	TYPE				
DRILL PIPE SIZE 4.5	TYPE 16.6 #	Length 2096 Mtrs			
DRILL PIPE SIZE 4.5	TYPE HW	Length 46 Mtrs			
DRILL COLLAR SIZE (") 6.25		Length 208 Mtrs			

CASING			
13 3/8 SURFACE SET @	843 ft	256.9 M	
9 5/8 INT. SET @	4177 ft	1273 M	
PROD. or LNR Set @	ft	M	
MUD TYPE	KCl PHPA Polymer		

MUD VOLUME (BBL)	
HOLE	PITS
263	
TOTAL CIRCULATING VOL.	263
IN STORAGE	

CIRCULATION DATA			
PUMP SIZE 6 X 8 Inches		CIRCULATION PRESS (PSI)	psi
PUMP MODEL GD PZ8	ASSUMED EFF 97.0	BOTTOMS UP (min)	min
BBL STK 0.0700	STK MIN	TOTAL CIRC. TIME (min)	min
BBL MIN	GAL / MIN	ANN VEL. (ft/min) DP / DCs	

MUD PROPERTIES	Pit	Pit
SAMPLE FROM		
TIME SAMPLE TAKEN		
DEPTH (ft) - (m) Metres		
FLOWLINE TEMPERATURE ^0C / ^0F		
WEIGHT ppg SG		
FUNNEL VISCOSITY (sec/qt) API @ ^0C		
PLASTIC VISCOSITY cP @ ^0C		
YIELD POINT (lb/100ft²)		
GEL STRENGTHS (lb/100ft²) 10 sec/10 min		
FILTRATE API (cc's/30 min)		
HPHT FILTRATE (cc's/30 min) @ ^0F		
CAKE THICKNESS API : HPHT (32nd in)		
SOLIDS CONTENT (% by Volume)		
LIQUID CONTENT (% by Volume) OIL/WATER		
SAND CONTENT (% by Vol.)		
METHYLENE BLUE CAPACITY (ppb equiv.)		
pH		
ALKALINITY MUD (Pm)		
ALKALINITY FILTRATE (Pf / Mf)		
CHLORIDE (mg/L)		
TOTAL HARDNESS AS CALCIUM (mg/L)		
SULPHITE (mg/L)		
K+ (mg/L)		
KCl (% by Wt.)		
PHPA ppb		

MUD PROPERTY SPECIFICATIONS					
Mud Weight	9.1	API Filtrate	6 - 8	HPHT Filtrate	
Plastic Vis	Min	Yield Point	12 - 18	pH	8.0 - 9.0
KCl	1.5 - 2.0%	PHPA	1.5 - 2.0	Sulphites	80 - 120

OBSERVATIONS

Nil Used

OPERATIONS SUMMARY

Continue Servicing DST Tools.
RIH with Test tools.
Inflate and run DST # 9.
Pull free POH.
RIH open ended and set cement plugs as per P & A program.

MUD ACCOUNTING (BBLS)

FLUID BUILT & RECEIVED		FLUID DISPOSED		SUMMARY	
(drill water)		Desander		INITIAL VOLUME	555
(recirc from sump)		Desilter			
Drill Water		Downhole	248	+ FLUID RECEIVED	
Direct Recirc Sump		Dumped		-FLUID LOST	248
Other (eg Diesel)		Shakers		+ FLUID IN STORAGE	
TOTAL RECEIVED		TOTAL LOST	248	FINAL VOLUME	307

SOLIDS CONTROL EQUIPMENT

	Type	Hrs		Cones	Hrs		Size	Hrs
Centrifuge			Desander			Shaker #1	3 x 175	
Degasser	PB		Desilter	12		Shaker #2	3 x 175	

	Overflow (ppg)	Underflow (ppg)	Output (Gal/Min.)
Desander		0	
Desilter		0	

Product	Price	Start	Received	Used	Close	Cost

SOLIDS ANALYSIS

	PPB	%
High Grav solids		
Total LGS		
Bentonite		
Drilled Solids		
Salt		
n @ Hrs		
K @ Hrs		

BIT HYD. PRESS.DATA

Jet Velocity	
Impact force	
HHP	
HSI	
Bit Press Loss	
CSG Seat Frac Press	3720
Equiv. Mud Wt.	16.9
ECD	
Max Pressure @ Shoe :	

DAILY COST	CUMULATIVE COST
	$82,659.70

MUD ENGINEER Neil Kyberd CITY Adelaide Office TELEPHONE 08 8338 7266

APPENDIX 6

WELL LOCATION SURVEY

051 446591

908902 147

KLUGE JACKSON CONSULTANTS PTY. LTD.

A.C.N. 004 778 947

SURVEYORS, ENGINEERS AND ESTATE PLANNERS

Office: Sale
Our Ref: 01045-02

DIRECTORS:
H. Peter Kluge
John Jackson

July 28th, 2001

TABLE OF SURVEY RESULTS

	Gangell - 1	Trifon - 1
AHD Level of Top of Plate	35.33	24.12
AMG Co-ordinate of Centre of steel rod.	Easting 517 204.74 Northing 5 759 221.30	Easting 516 753.18 Northing 5 760 387.27
Latitude	S 38°18'53.3438"	S 38°18'15.54536"
Longitude	E 147°11'48.4916"	E 147°11'29.79691"
Approximate AHD surface Level at Bore	35.0	24.5
Approximate AHD Level of Pad	35.3	24.7

Note: Table amended 28/07/2001 to include approximate pad level and surface level beside bore.

The AMG coordinates shown above are for Zone 55.

Coordinates are in AGD 66.

SALE
45 Macalister Street,
SALE, Vic 3850
(P.O. Box 47)
Telephone (03) 5144 3877
Facsimile (03) 5144 6591

MAFFRA
119 Johnson Street,
MAFFRA Vic 3860

Telephone (03) 5147 2126

TRARALGON
Suite 3/29 Breed Street,
TRARALGON Vic 3844
(P.O. Box 412)

Telephone (03) 5174 4808
Facsimile (03) 5174 6969

APPENDIX 7

CORE ANALYSIS

908902 150

Core Lab
PETROLEUM SERVICES

CORE LABORATORIES AUSTRALIA PTY LTD

447-449 Belmont Ave, Kewdale, Perth WA 6105
Tel : (61 8) 9353 3944 Fax : (61 8) 9353 1369
Email: corelab@corelab.com.au

20th February, 2001

Lakes Oil NL
PO Box 300
Collins St West
MELBOURNE VIC 8007

Attention : Mr. J. Mulready

Subject : Routine Core Analysis
Well : Gangell #1
File : PRP-01004

Dear Sir,

Presented herein is the final report of a routine core analysis study conducted on the plug samples from the above well that arrived at our Perth laboratory in mid January, 2001.

We appreciate the opportunity to present this service to you. Please contact us should you require any further information or assistance.

Yours sincerely,
Core Laboratories Australia Pty Ltd

Darryl Beer
Senior Core Analyst

INTRODUCTION

Core Laboratories Australia Pty Ltd (Core Lab) conducted a routine core analysis study on ten plug samples taken from the well Gangell #1 on behalf of Lakes Oil NL (Lakes Oil).
Services performed and presented in the report include:

- On-site core lay-out and plug sampling
- Permeability, porosity and grain density measurements

LABORATORY PROCEDURES

Initial Inventory

The 18m core recovered was laid out at the rig-site, cleaned and core depths marked. Once the samples had been taken, the core was packed into Pinus core trays.

Sample Preparation

Ten horizontal plug sample points were marked along the length of the core. Once identified, one-and-one-half inch diameter core plugs were drilled using water from the rig water source (bore water). The samples were washed of fines using the rig water, and numbered. They were then placed into labelled plastic bags, packed and couriered to our Perth facility via Express Post.

On arrival at our office, the samples were unpacked, checked against the packing list, and inspected for damage. They were then trimmed using tap water and dried in a humidity oven at approximately 65°C and 50 % relative humidity for three days.

The samples were cooled to room temperature in labelled snap-lock plastic bags.

Grain Volume and Grain Density

The weight, diameter and length of all samples were measured before they were processed through the Ultrapore™ porosimeter to determine grain volume. As a standard quality control measure, a calibration check plug was run after the samples. Grain density data is calculated from grain volume and sample weight data.

Permeability and Porosity

Permeability and pore volume measurements were made on all samples at ambient pressure in the CMS™300 automated core measurement system. A standard check plug was run after the samples.

Klinkenberg permeability (Kinf) values are obtained directly from the CMS-300, since it operates by unsteady-state principles. Porosity data was obtained by combining pore volumes from the CMS-300 data with grain volumes from the Ultrapore porosimeter.

Plug sample porosity, permeability and grain density data are tabulated on page 2.

POROSITY, PERMEABILITY AND GRAIN DENSITY (Ambient)

SAMPLE NUMBER	DEPTH (m)	800psig NOB PRESSURE			GRAIN DENSITY (g/cc)
		PERMEABILITY		POROSITY (%)	
		Kinf (md)	Kair (md)		
1	1566.7	0.445	0.606	18.9	2.68
2	1568.7	0.394	0.538	18.6	2.68
3	1570.7	0.416	0.577	19.5	2.68
4	1572.7	0.044	0.093	18.5	2.69
5	1574.7	0.119	0.202	18.3	2.69
6	1576.7	0.148	0.242	18.0	2.68
7	1578.7	0.037	0.078	17.4	2.68
8	1580.7	0.001	0.002	2.7	2.70
9	1582.7	0.035	0.058	16.2	2.70
10	1584.4	0.068	0.129	16.8	2.70

APPENDIX 8

DRILL STEM TEST REPORTS

by

AUSTRALIAN DST

COMPANY NAME	Lakes Oil N.L.
WELL NAME	Gangell # 1
LOCATION	PEP 137 Victoria
TICKET # and DST #	355 One
TESTED INTERVAL	659.00 to 691.00 m (32.00 m)
FORMATION	Top of Latrobe
TEST TYPE	Conventional Bottom Hole
TEST DATE	01-Jan-07

DRILL STEM TEST ANALYSIS

FINAL REPORT

AUSTRALIAN DST (AUSTRALASIA) PTY LTD.

COMPANY NAME : Lakes Oil N.L.
WELL NAME Gangell # 1
LOCATION : PEP 137 Victoria Permit:
TESTED INTERVAL : 659.00 to 691.00 m (32.00 m)

Province: Victoria

TICKET # : 355
DST # : One
FORMATION : Top of Latrobe
TEST DATE : 01-Jan-07

DST FINAL REPORT: OBSERVATIONS AND CONCLUSIONS

All Measurements are Metric except Pressures which are PSI.

The drillstem test run at the above location was mechanically successful. The pressures recorded are within the accuracy limits of the recorders used.

Run tools to test depth. Skidded 1 metre. Lost approximately 2 bbls in annulus. Tool open B.O.B. Weak to moderate blow through a 3.18 mm (1/8 inch) choke. Close tool for a 215 minute shutin then pull to fluid and reverse circulate fluid out of hole. Pulled out of the hole. The sample chamber recovery consisted of 3 litres of mud.

The charts indicate plugging during the flow period.

If you have any queries with respect to this report please contact your Australian DST Representative at 076 222655.

FLUID RECORDER INTERPRETATION

The fluid chart indicates the following :	Recovery m	Average Rate m3/day
Fluid in pipe prior to test	0.0	
PreFlow	210.0	68.1
Second Flow		
Third Flow		
Fluid into pipe after test		
Fluid remaining after test		

ANALYTICAL RESULTS for Fluid

BASIC HORNER INTERPRETATION

P* Initial Shutin	psig	Drawdown (ISI-FSI)/ISI*100	Nil
P* Second Shutin	psig	Initial Shutin Semilog Slope	psig
P* Final Shutin End Point	psig	Second Shutin Semilog Slope	psig
P* Final Shutin Radial Flow	psig	Final Shutin Semilog Slope (End Point)	psig
		Final Shutin Semilog Slope (Radial Flow)	psig

PLOT ANALYSIS

	STORAGE and SKIN	HORNER	
Transmissivity (kh/u)			md.ft/cp
Mobility (k/u)			md/cp
Flow Capacity (kh)			md.ft
Permeability (k)			md
Skin (s)			
Flow Efficiency			
Damage			
Radius of Investigation			feet

Predicted Capability for Acres

Stabilized Flow Rate (Calc Skin)	@	2100 psi	s =	=	bbls/day
Stabilized Flow rate (Skin Removed)	@	2100 psi	s =	0.00 =	bbls/day
Stabilized Flow Rate (Improved Skin)	@	2100 psi	s =	-4.00 =	bbls/day

AUSTRALIAN DST (AUSTRALASIA) PTY LTD.

COMPANY NAME : Lakes Oil N.L. TICKET # : 355
WELL NAME Gangell # 1 Province: Victoria DST # : One
LOCATION : PEP 137 Victoria Permit: FORMATION : Top of Latrobe
TESTED INTERVAL : 659.00 to 691.00 m (32.00 m) TEST DATE : 01-Jan-07

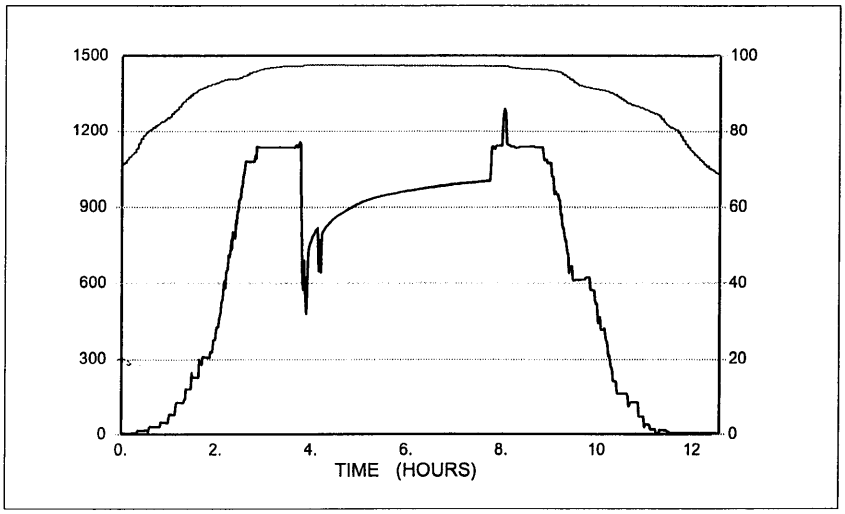
DST FINAL REPORT: FLUIDS, FLOWS AND PRESSURES

TEST PERIODS IN MINUTES

PreFlow	26	First Shutin	215
Second Flow	0	Second Shutin	0
Third Flow	0	Third Shutin	0

DOWNHOLE PRESSURE DATA

Recorder Number		080-522
Clock Type		EMP
Depth Metres		654.89
Pressure Port		INSIDE
		psi
Initial Hydrostatic	(A)	1136.0
Start Preflow	(B)	479.0
End Preflow	(B1)	643.0
First Shutin	(C)	1002.0
Second Flow	(D)	
End Second Flow	(E)	
Second Shutin	(F)	
Start Third Flow	(H)	
End Third Flow	(I)	
Third Shutin	(J)	
Final Hydrostatic	(G)	1143.0



BLOW DESCRIPTIONS

PREFLOW : Skidded 1 metre. Lost approximately 2 bbls in annulus. Open B.O.B. weak to moderate blow though a 3.18 mm(1/8 inch) choke. Charts indicate plugging.

SECOND FLOW :

TEST CONCLUSIVE

RECOVERY DURING TEST Cushion Type: None Amount:

LIQUID RECOVERY API Gravity: Salinity: Reverse Circulated: No

Total: 210.00 m 102.97 m in D.C. and 107.03 m in D.P.
210.00 m of Drilling fluid (Calculated from the Recorder above the tools)
m of Smple Chamber - 3 litres of mud
m of
m of
m of
m of

GAS RECOVERY GAS RATES Measured With: No gas to surface.

TIME (Min)	Orifice (mm)	PRESSURE (psi)	RATE (Mcf/d)	REMARKS

AUSTRALIAN DST (AUSTRALASIA) PTY LTD.

COMPANY NAME : Lakes Oil N.L. TICKET # : 355
WELL NAME Gangell # 1 Province: Victoria DST # : One
LOCATION : PEP 137 Victoria Permit: FORMATION : Top of Latrobe
TESTED INTERVAL : 659.00 to 691.00 m (32.00 m) TEST DATE : 01-Jan-07

DST FINAL REPORT: TOOLS AND GENERAL DATA - CONVENTIONAL BOTTOM HOLE

TOTAL TOOL TO BOTTOM OF TOP PACKER	14.75 Metres
TOOL IN INTERVAL	13.87 Metres
TOTAL TOOL	28.62 Metres
DRILL COLLAR IN INTERVAL	18.13 Metres
DRILL PIPE IN INTERVAL	0.00 Metres
TOTAL ASSEMBLY	46.75 Metres
DRILL COLLARS ABOVE TOOLS	102.97 Metres
DRILL PIPE ABOVE TOOLS	545.96 Metres
TOTAL DRILL COLLARS, DRILL PIPE AND TOOLS	695.68 Metres
TOTAL DEPTH	691.00 Metres
TOTAL STICKUP ABOVE KELLY BUSHING	4.68 Metres

DOWNHOLE PRESSURE RECORDERS

Rec #:	13780	10369	080-522				652	
Range	3900	3800	5000				3336	
Type EMP	24 Hr	24 Hr.	EMP	24 Hr	EMP	EMP	24 Hr	24 Hr
Depth:	645.18	651.54	654.89				664.97	
Position: Fluid	Fluid	Inside	Inside	Inside	Outside	Outside	Outside	Below

ADDITIONAL WELL, TEST AND PIPE INFORMATION

EVENT TIMES

Time Started In	16:45 Hours
Time on Bottom	20:50 Hours
Time Tool Opened	21:24 Hours
Time Tool Pulled	01:35 Hours
Time Out of Hole	06:00 Hours

PIPE, WEIGHT and MUD DATA

Drill Collar I.D.	71.4 mm
Drill Pipe I.D.	97.2 mm
Drill Collar Length	102.97 m
Drill Pipe Length	545.96 m
Weight Set on Packer	30000 Lbs
Initial String Weight	60000 Lbs
Weight Pulled	65000 Lbs
Tool Weight	5000 Lbs
Unseated String Weight	Lbs
Packer Size	279 mm
Mud Type	KCL/PHPA
Mud Weight	1138 kg/m3
Mud Viscosity	54 S/L3
Water Loss	12.0 cm3
Filter Cake	1.5 mm
Mud Drop	Yes bbls
Tool Chased	1.0 m

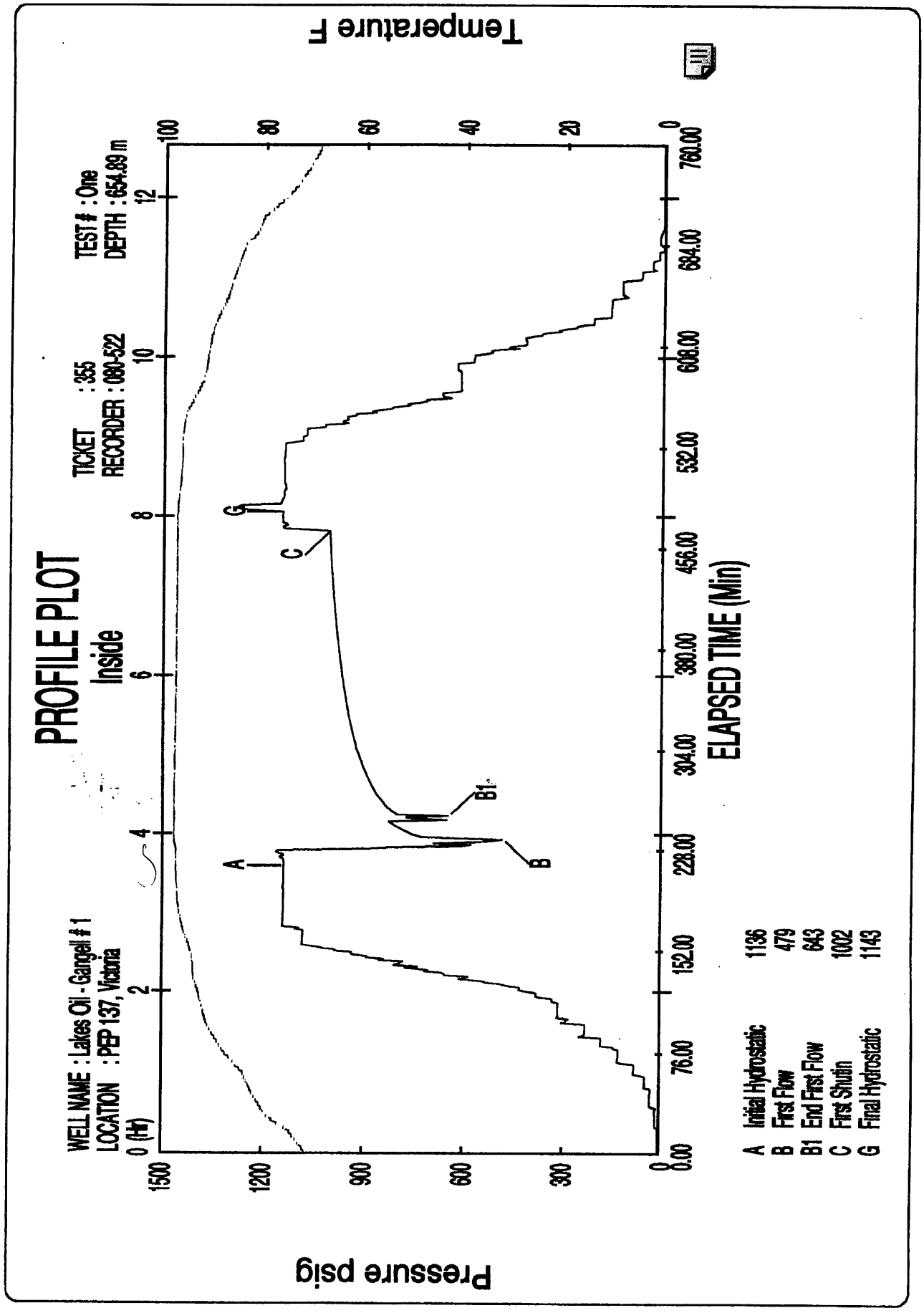
MISCELLANEOUS DATA

K.B. Elevation	40.00 m
Gr. Elevation	35.00 m
Total Depth	691.00 m
Hole Size	311 mm
Bottom Choke	19.05 mm
Hole Condition	Good
Formation Temperature	36 C
Amount Fill	0 m
Reverse Circulate	No
Fluid Cushion	
Type	None
Amount	
Type	
Amount	

SAMPLES TAKEN

Bottom Hole Sampler #	1
Fluid Samples	
Gas Samples	
Sent to	Customer
Tester	Chad McGuinn
Company Rep.	Brent Speechley

P.O. Sub			0.31
P.O. Sub			0.31
X.O. Sub			0.31
Rec		and	0.00
Rec	13780		1.52
Choke Sub			0.00
Shut in Tool			1.67
Hyd Tool and Sampler			2.72
Travel Sub			0.45
Tr Sub and Sampler			0.00
Tr Sub and Sampler			0.00
Squeeze Valve			0.00
Rec	10369	and	1.52
Rec	080-522	and	1.83
Rec			0.00
Jars			0.00
Safety Joint			0.66
Pump			0.00
Screen			0.00
Packer			2.43
Packer			1.02
Tool Above Interval			**14.75 m**
Depth			**659.00 m**
Stub			1.41
Prod Sub or Port			4.56
Rec		and	0.00
Rec		and	0.00
Rec	652		1.52
Perforations			5.17
X.O. Sub			0.00
D.Collar			0.00
D. Pipe			0.00
X.O. Sub			0.00
Receiver Sub			0.00
Stub			0.00
Comp. Blank.			0.00
Spacing2			0.00
X.O. Sub			0.31
D. Collar			18.13
D. Pipe			0.00
X.O. Sub			0.31
Perforations			0.00
Bullnose			0.59
Total Depth			**691.00 m**
Total Interval			**32.00 m**
Total Tool			**28.62 m**

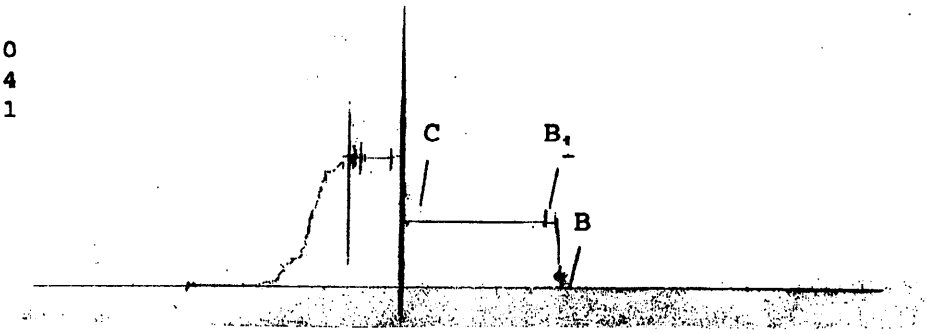

PROFILE PLOT
Inside
WELL NAME : Lakes Oil - Gangell # 1
LOCATION : PEP 137, Victoria
0 (Hr)
TICKET : 355
RECORDER : 080-522
TEST # : One
DEPTH : 654.89 m
Pressure psig
Temperature F
ELAPSED TIME (Min)
A Initial Hydrostatic 1136
B First Flow 479
B1 End First Flow 643
C First Shutin 1002
G Final Hydrostatic 1143

Well Name :Lakes Oil Gangell # 1
Location :PEP 37, Victoria

Ticket #:355
DST # :One

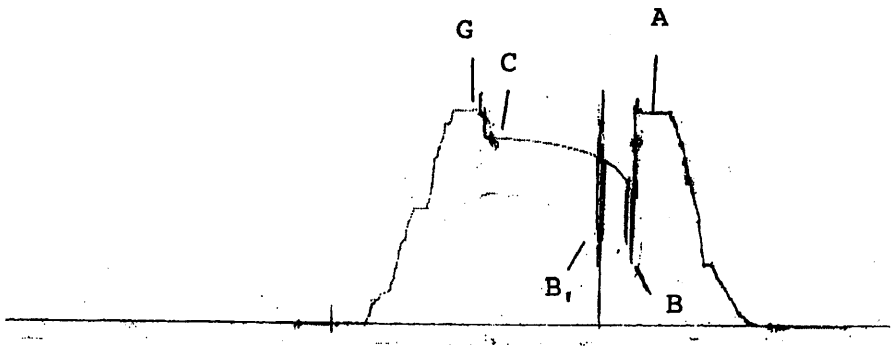
Recorder :13780
Depth :645.18
Port :Above

A	IN Hydrostatic	:	
B	Preflow	:	0.0
B1	End Preflow	:	346.4
C	First Shutin	:	352.1
D	Second flow	:	
E	End 2nd flow	:	
F	Second Shutin	:	
G	FL Hydrostatic	:	
H	Third flow	:	
I	End third flow	:	
J	Third Shutin	:	



Recorder :10369
Depth :651.54
Port :Inside

A	IN Hydrostatic	:	1131.2
B	Preflow	:	332.0
B1	End Preflow	:	505.8
C	First Shutin	:	996.2
D	Second flow	:	
E	End 2nd flow	:	
F	Second Shutin	:	
G	FL Hydrostatic	:	1138.9
H	Third flow	:	
I	End third flow	:	
J	Third Shutin	:	

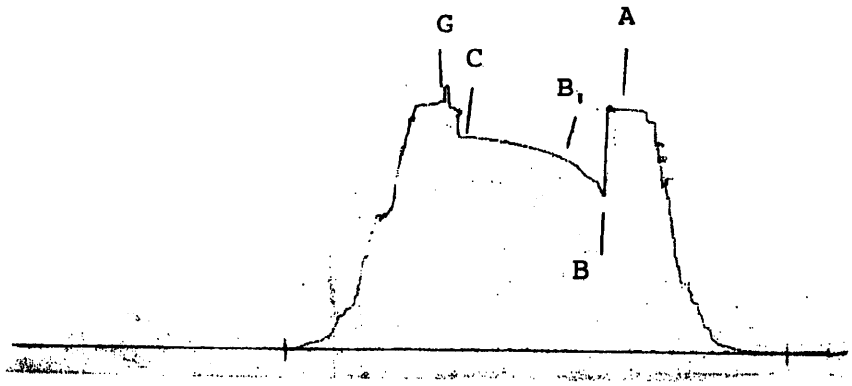


Well Name :Lakes Oil Gangell # 1
Location :PEP 37, Victoria

Ticket #:355
DST # :One

Recorder :652
Depth :664.97
Port :Outside

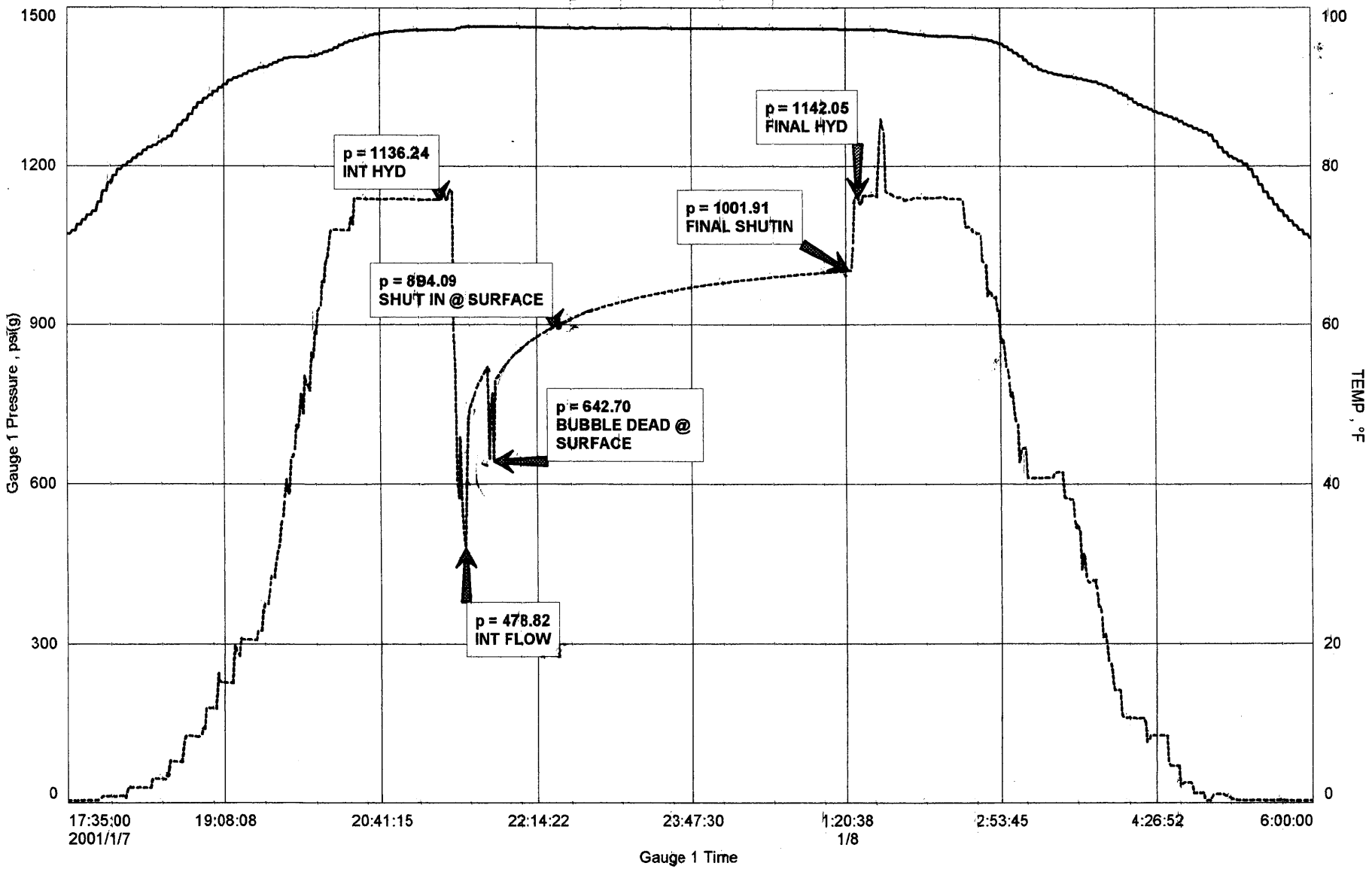
A	IN Hydrostatic	:	1152.6
B	Preflow	:	758.3
B1	End Preflow	:	915.3
C	First Shutin	:	1018.2
D	Second flow	:	
E	End 2nd flow	:	
F	Second Shutin	:	
G	FL Hydrostatic	:	1159.2
H	Third flow	:	
I	End third flow	:	
J	Third Shutin	:	



LAKES OIL N.L.
INSIDE EMP 654.89 M
Start Test Date: 2001/01/07
Final Test Date: 2001/01/08

GANGELL # 1
Job Number: DST # 1

GANGELL # 1



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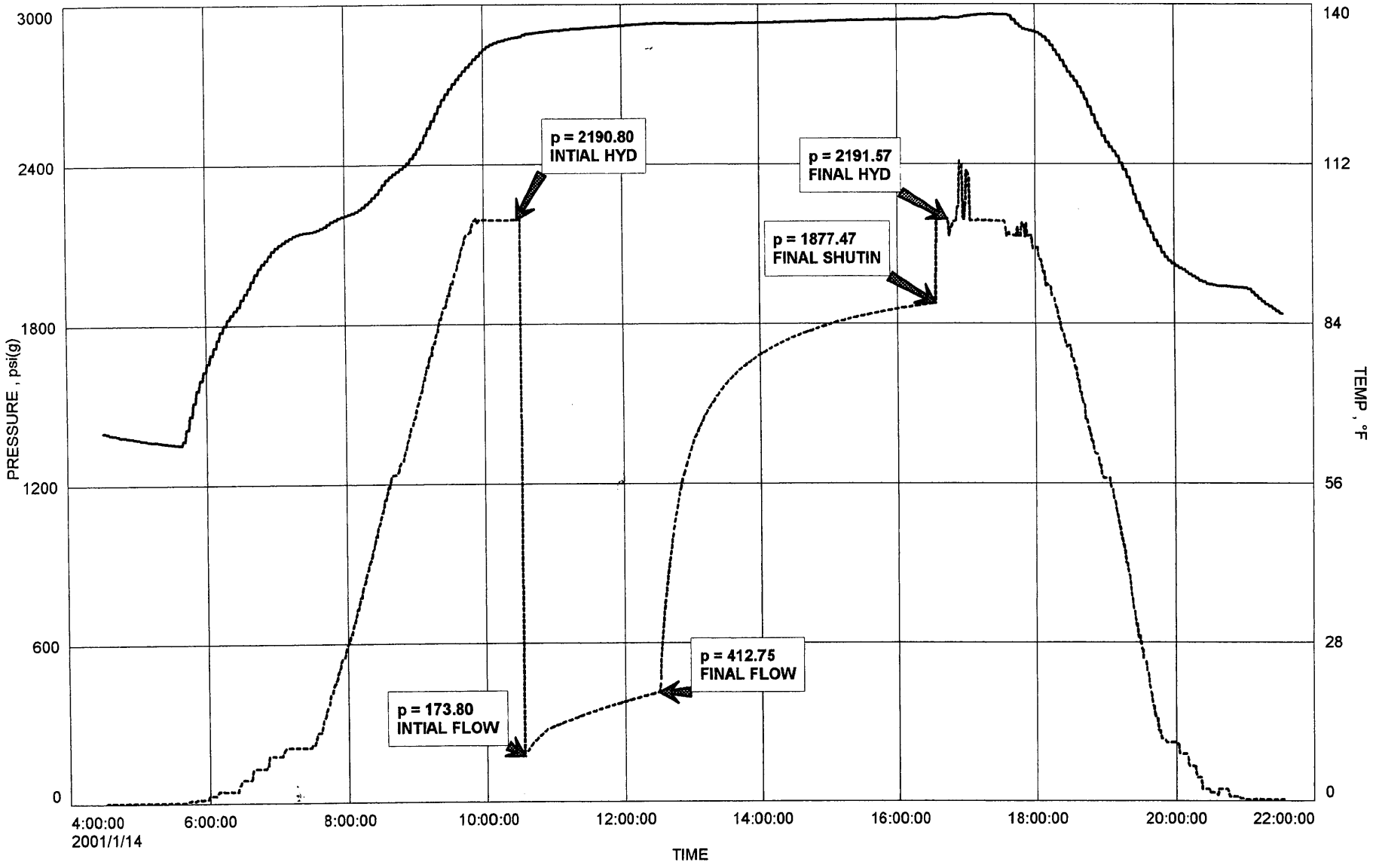
01 Ver 2.239

Fast

LAKES OIL N.L.
INSIDE EMP 1374.14 M
Start Test Date: 2001/01/14
Final Test Date: 2001/01/14

GANGELL # 1
Job Number: DST # 2

GANGELL # 1



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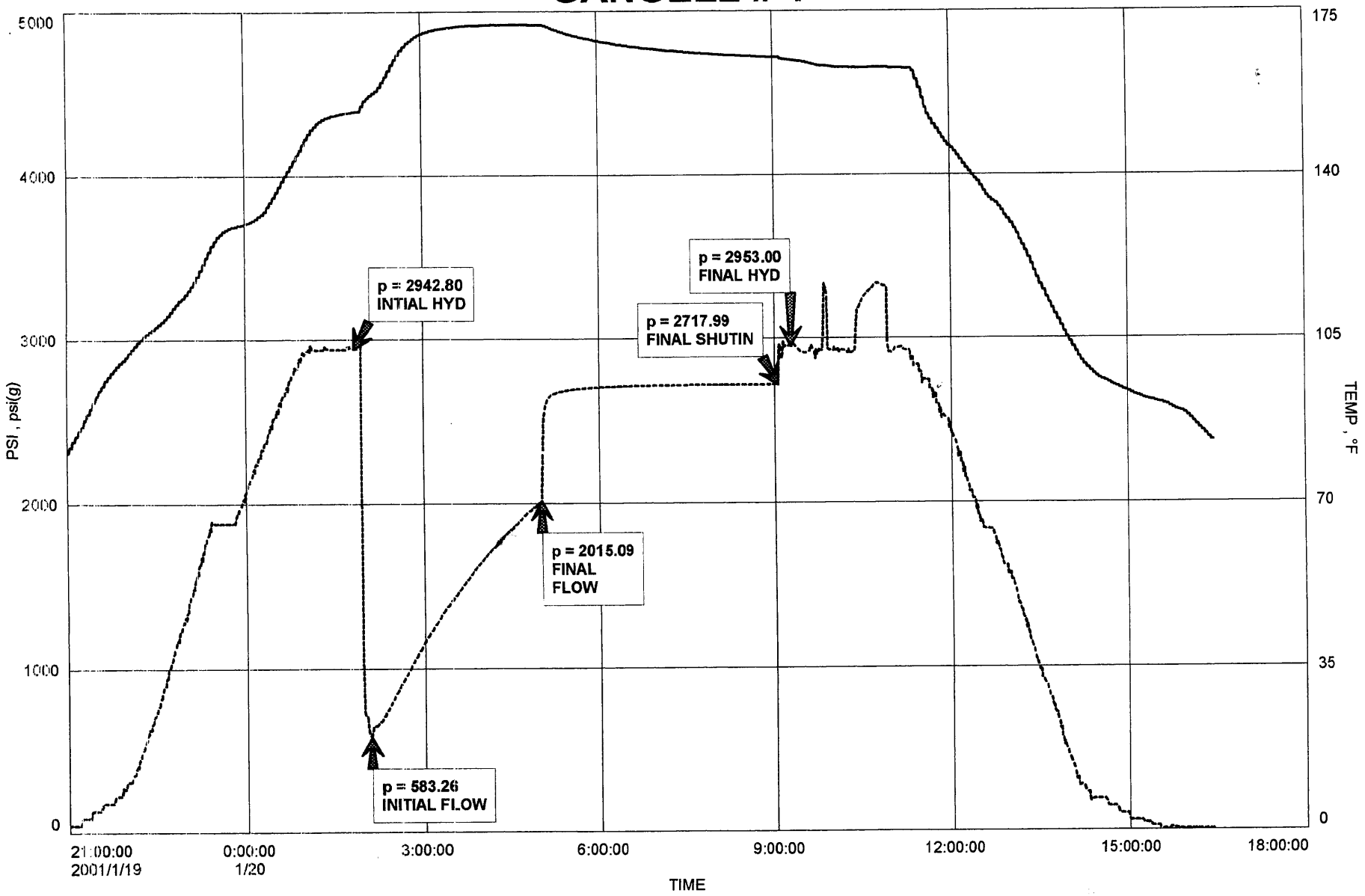
14-Jan-01 Ver 2.239

Fast

LAKES OIL N.L.
INSIDE EMP 1881.14 M
Start Test Date: 2001/01/19

GANGELL # 1
Job Number: DST 3

GANGELL # 1

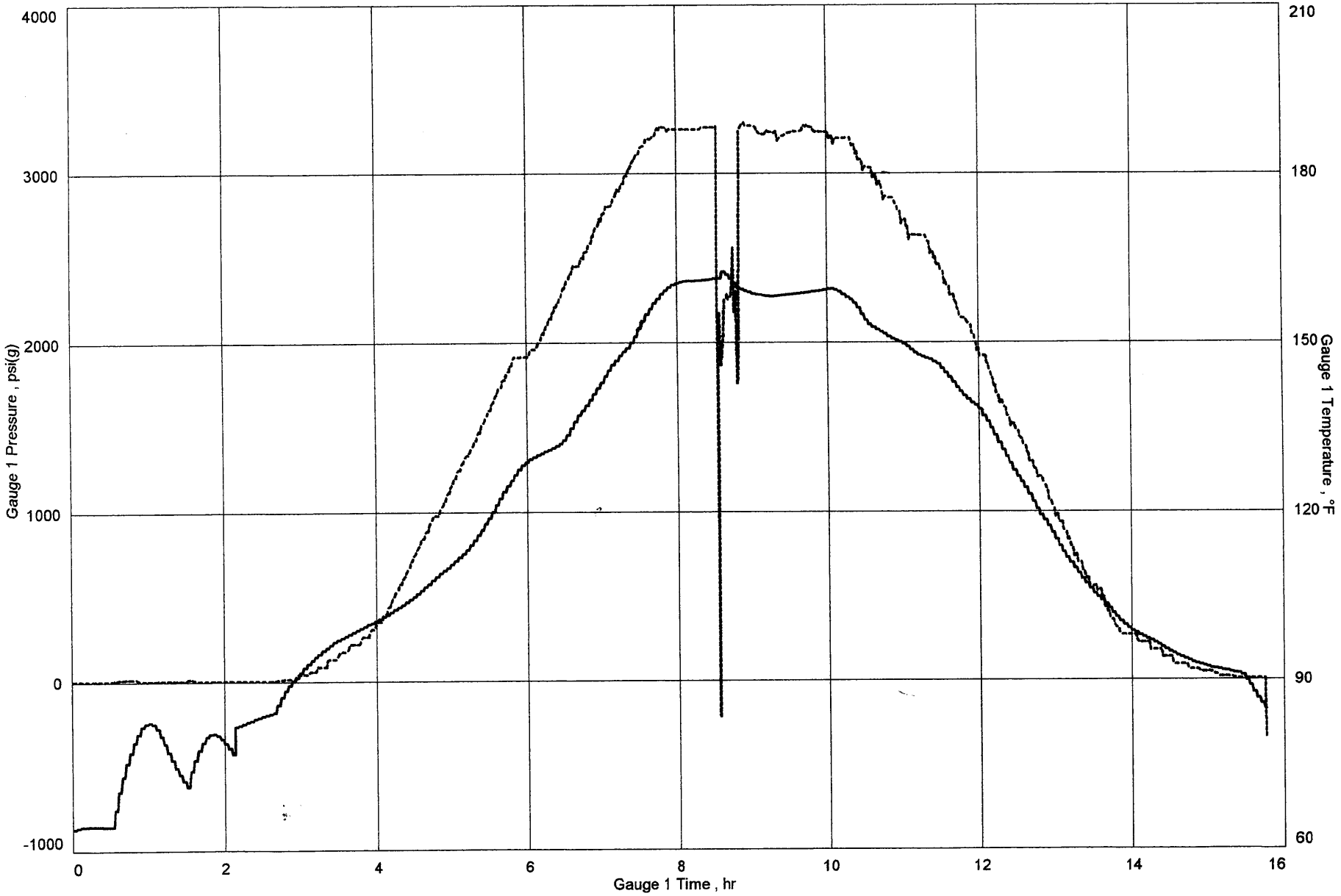


Fast

LAKES OIL N.L.
Start Test Date: 2001/01/22

GANGELL # 1

GANGELL # 1
Job Number: DST # 4



Fast

COMPANY	LAKES OIL N.L.		STATE	VIC	DATE	21/01/01
Well Name	GANGELL # 1		KB Elv	40	Ticket No	359
Well Loc	PEP 137 , VICTORIA		GR Elv	35	DST No	FOUR
Interval	2099.6- 2117	T.D. 1939 M	Test Type	CONV BOTTOM HOLE		

RECORDER DATA

Mins							
PF	Rec #			22200	13656	522	2313
SI	Range	lbs		6250	5925	5000	5800
SF	Clock	hrs		24	24	EMP	24
FS	Depth	m		2086.1	2092.5	2095.9	2103.6
			PSI	**PSI**	**PSI**	**PSI**	**PSI**
	Init Hyd						
	First Flow						
	Final flow						
	In.Shutin						
	Init. Flow						
	Final Flow						
	Fl. Shut-in						
	Final Hyd						
	In / Out			FLUID	IN	IN	OUT

RECOVERY

Total Fluid

	mtr.of	
	mtr.of	
	mtr.of	
	mtr.of	

GAS RECOVERY

Time Mins.	Orifice Ins	PSI	mcf/d

SURFACE CHOKE SIZE 1/ 8

BLOW DESCRIPTION 1st FLOW

TAG BOTTOM 6 M HIGH - TOOL OPEN SKID TO BOTTOM -
ANNULUS DROP - SIT EXTRA WEIGHT ON PACKERS -
ANNULUS DROP - PULL UP TO CLOSE TOOL & TRIP OUT

REMARKS

TIME DATA

PF Fr		to	hrs
IS Fr		to	hrs
SF Fr		to	hrs
FS Fr		to	hrs

T.START	15:30	hrs
T.ON BOT	22:20	hrs
T.OPEN	22:22	hrs
T.PULLED	22:37	hrs
T.OUT	6:30	hrs

TOOL DATA

Tool Wt	5 k	lbs
Wt. Set on Packer	40 K	lbs
Wt. Pulled Loose	130 K	lbs
Init. Str. Wt	116 k	lbs
Bot. Choke	0.75	ins
Hole Size	8.5	ins
D.Col ID	2 13/16	ins
D.Pipe ID	3.826	ins
HWDP ID	2 7/8	ins
D.C. Leng	166.52	m
D.P. Leng	1877.1	m
H.W.Leng	45.98	m

MUD DATA

Mud Type	KCL / PHPA
Weight	9.1 +
Vis.	54
W.L.	7.8
F.C.	1 Ml
Mud Drop	

GENERAL DATA

Amt.of Fill	6	m
Btm.H.Temp	162.5	F
Hole Cond	GOOD	
Packer Size	7.5	in
# of Packers	2	
Cushion Amt	N/A	m
Cushion Type	N/A	
Reversed Out	YES	
Tool Chased	YES	
Tester	CHAD Mc GUINN	
Co. Rep	BRENT SPEECHLEY	
Contractor	O.D.E.	
Rig No	30	

AUSTRALIAN D.S.T.

908902 169

AUSTRALIAN D.S.T. AUSTRALASIA PTY. LTD.

COMPANY : LAKES OIL N.L.

DATE : 23/01/01

WELL NAME : GANGELL # 1

D.S T. # : FOUR

FORMATION : STRZELECKI SST

TESTER : Chad McGuinn

TEST TYPE : CONVENTIONAL BOTTOM HOLE

TOOL TO BOTTOM OF PACKERS	14.42
INTERVAL TOOL	8.19
TOTAL TOOL	**22.61**
DRILL COLLARS IN INTERVAL	9.13
DRILL COLLARS ABOVE TOOL	166.52
H.W PIPE ABOVE TOOL	45.98
DRILL PIPE ABOVE TOOL	1871.15
PUP JOINT + CROSS OVER	5.95
TOTAL PIPE AND TOOL	**2121.34**
TOTAL DEPTH	**2117**
TOTAL DRILL PIPE ABOVE KB	**4.34**

UP JOINT		5.95	-4.34
DRILL PIPE	65 + D	1871.15	1.61
HEVI-WAITE PIPE	5	45.98	1872.76
DRILL COLLARS	14 + JARS	139.16	1918.74
PUMP OUT SUB		0.31	2057.9
DRILL COLLAR	1	9.19	2058.21
DROP BAR SUB		0.31	2067.4
DRILL COLLAR	2	18.17	2067.71
CROSS OVER		0.31	2085.88
FLUID RECORDER		1.52	2086.19
SHUT IN TOOL		1.67	2087.71
SAMPLE CHAMBER		1.02	2089.38
TRAVEL SUB		0.45	2090.4
HYD. TOOL		1.7	2090.85
INSIDE RECORDER		1.52	2092.55
E.M.P. RECORDER		1.83	2094.07
JARS		0	2095.9
SAFETY JOINT		0.66	2095.9
PACKER		2.01	2096.56
PACKER UP		1.11	2098.57
DEPTH			**2099.68**
PACKER DOWN		0.9	2099.68
PERFORATIONS		3.04	2100.58
OUTSIDE RECORDER		1.52	2103.62
PERFORATIONS		1.52	2105.14
CROSS OVER		0.31	2106.66
DRILL COLLARS	1	9.13	2106.97
CROSS OVER		0.31	2116.1
BULL NOSE		0.59	2116.41
DEPTH			**2117**

LAKES OIL N.L.

DRILL STEM TEST REPORT

Well : TRIFON - 1 **DST No. :** 4 **Date :** 28/12/2000

Test Interval : 2170 - 2210 **Formation :** Strezelecki

Water Cushion : - **Rw (water cushion) :** ohm/m @ °F

Open Hole : X **Cased Hole :** **Rw (make-up water) :** ohm/m @ °F

Type test : Inflate straddle - Australian DST 2nd test on same run - Re-set 15 metres higher than DST#3

REMARKS

Time	Remarks/Pressures	Time	Remarks/Pressures
0	Opened after re-set 15 metres higher than DST#3 – Same result - Gas @ RTSTM & water @ 900 bbl/day.	131	Shut in tool for 61 minute final shut-in.

Surface Flow Information Summary

Choke (ins)	GTS / FTS (min)	Flowing Time (min)	Pressure (psig)	Final Rate Gas (Mcfd)	Final Rate Oil / Water (BPD)	Field Analysis Gas	Oil API / Pour Pt
	39	262		RTSTM	Water @ 900	98 / 2 / Tr	-

Recovery

Reverse Circulated Full string of water

Fluid Chemistry		Make-up Water	Last Mud Check	Flare line water	
Density	S.G.		1.09		
Viscosity	sec/qt		34		
API Filtrate	cc/30 min		7.2		
pH	strip		8.5		
Pf / Mf		/	0.05 / 0.65		
Chlorides	mg/l		14000	12000	
Total Hardness	mg/l Ca		280		
KCl	%		2.5		
Restivity	**ohmm/m**	@ °F	@ °F	@ °F	@ °F

Pressure Recorder Data

	Bottom (outside)	Battery (inside)	Middle (inside)	Top (fluid)		Elapsed Time (min)
Depth	2173	2160	2162	2154	m	
Initial Hydrostatic Pressure		3339			psig	
1st Flow - Initial Pressure		3101	3130		psig	
1st Flow - Final Pressure		3121	3140		psig	131
1st Flow - Shut-in Pressure		3150	3255		psig	192
2nd Flow - Initial Pressure					psig	
2nd Flow - Final Pressure					psig	
2nd Flow - Shut-in Pressure					psig	
Final Hydrostatic Pressure					psig	
Final Bottom-hole Temperature		184			°F	

Samples Taken

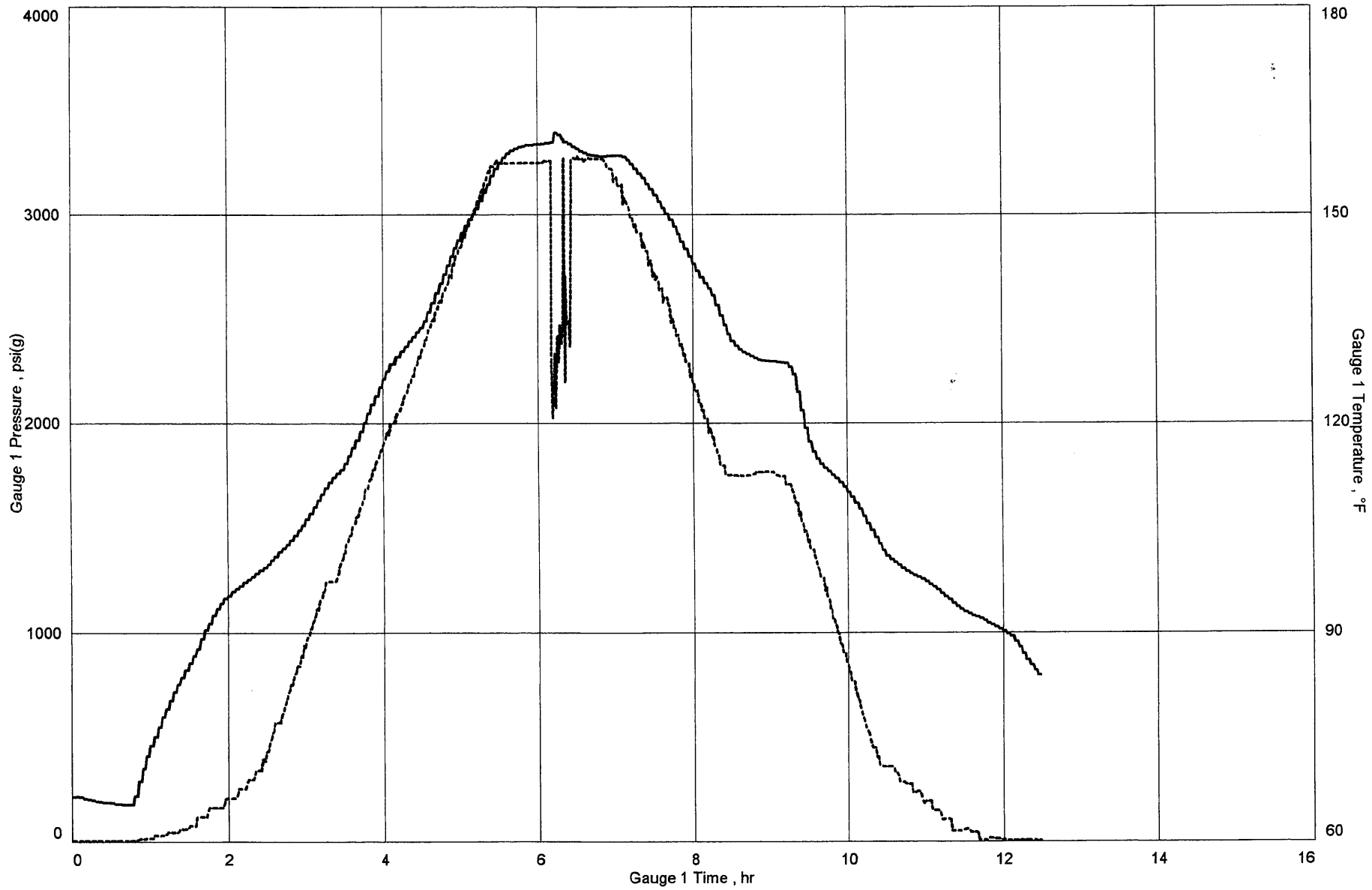
Gas : Oil : Condensate : Water : Dissolved HC

Sent to :

LAKES OIL N.L.
INSIDE EMP 2081.04 M
Start Test Date: 2001/01/23

GANGELL # 1
Job Number: DST # 5

GANGELL # 1



24-Jan-01 Ver 2.239

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AUSTRALIAN D.S.T. AUSTRALASIA PTY. LTD.

COMPANY : LAKES OIL N.L.

DATE : 24/01/01

WELL NAME : GANGELL # 1

D.S T. # : FIVE

FORMATION : STRZELECKI SST

TESTER : Chad McGuinn

TEST TYPE : CONVENTIONAL BOTTOM HOLE

TOOL TO BOTTOM OF PACKERS		14.42
INTERVAL TOOL..		8.5
TOTAL TOOL		**22.92**
DRILL COLLARS IN INTERVAL		55.68
DRILL COLLARS ABOVE TOOL		148.35
H.W PIPE ABOVE TOOL		45.98
DRILL PIPE ABOVE TOOL		1880.66
PUP JOINT + CROSS OVER		0
TOTAL PIPE AND TOOL		**2153.59**
TOTAL DEPTH		**2149**
TOTAL DRILL PIPE ABOVE KB		**4.59**

PUP JOINT		0	-4.59
DRILL PIPE	66	1880.66	-4.59
HEVI-WAITE PIPE	5	45.98	1876.07
DRILL COLLARS	12+ JARS	120.99	1922.05
PUMP OUT SUB		0.31	2043.04
DRILL COLLAR	1	9.19	2043.35
DROP BAR SUB		0.31	2052.54
DRILL COLLAR	2	18.17	2052.85
CROSS OVER		0.31	2071.02
FLUID RECORDER		1.52	2071.33
SHUT IN TOOL		1.67	2072.85
SAMPLE CHAMBER		1.02	2074.52
TRAVEL SUB		0.45	2075.54
HYD. TOOL		1.7	2075.99
INSIDE RECORDER		1.52	2077.69
E.M.P. RECORDER		1.83	2079.21
JARS		0	2081.04
SAFETY JOINT		0.66	2081.04
PACKER		2.01	2081.7
PACKER UP		1.11	2083.71
DEPTH			**2084.82**
PACKER DOWN		0.9	2084.82
PERFORATIONS		3.04	2085.72
OUTSIDE RECORDER		1.52	2088.76
PERFORATIONS		1.83	2090.28
CROSS OVER		0.31	2092.11
DRILL COLLARS	6	55.68	2092.42
CROSS OVER		0.31	2148.1
BULL NOSE		0.59	2148.41
DEPTH			**2149**

COMPANY	LAKES OIL N.L.	STATE	VIC	DATE	24/01/01
Well Name	GANGELL # 1	KB Elv	40	Ticket No	360
Well Loc	PEP 137 , VICTORIA	GR Elv	35	DST No	FIVE
Interval	2084.8-2149M T.D. 2149 M	Test Type	CONV BOTTOM HOLE		

RECORDER DATA

Mins							
PF	Rec #			22200	13656	522	2313
SI	Range	lbs		6250	5925	5000	5800
SF	Clock	hrs		24	24	EMP	24
FS	Depth	m		2071.3	2077.6	2081	2088.7
			PSI	**PSI**	**PSI**	**PSI**	**PSI**
	Init Hyd						
	First Flow						
	Final flow						
	In.Shutin						
	Init. Flow						
	Final Flow						
	Fl. Shut-in						
	Final Hyd						
	In / Out			FLUID	IN	IN	OUT

RECOVERY

Total Fluid

	mtr.of	
	mtr.of	
	mtr.of	
	mtr.of	

GAS RECOVERY

Time Mins.	Orifice Ins	PSI	mcf/d

SURFACE CHOKE SIZE

BLOW DESCRIPTION 1st FLOW

TAG BOTTOM 10 M HIGH - OPEN TOOL SKID DOWN HOLE-
ANNULUS DROP - PULL UP & COME DOWNTO RESETTOOL -
TOOL OPEN SKIDING SLOWLY TO BOTTOM - ANNULUS
DROPING - PULL OUT OF HOLE -

REMARKS

TIME DATA

PF Fr		to	hrs
IS Fr		to	hrs
SF Fr		to	hrs
FS Fr		to	hrs

T.START	3:00	hrs
T.ON BOT	9:48	hrs
T.OPEN	9:50	hrs
T.PULLED	10:10	hrs
T.OUT	16:40	hrs

TOOL DATA

Tool Wt	15 K	lbs
Wt. Set on Packer	40 K	lbs
Wt. Pulled Loose	130 K	lbs
Init. Str. Wt	122 K	lbs
Bot. Choke	0.75	ins
Hole Size	8.5	ins
D.Col ID	2 13/16	ins
D.Pipe ID	3.826	ins
HWDP ID	2 7/8	ins
D.C. Leng	148.35	m
D.P. Leng	1880.66	m
H.W.Leng	45.98	m

MUD DATA

Mud Type	KCL / PHPA
Weight	9.1 +
Vis.	54
W.L.	7.8
F.C.	1 Ml
Mud Drop	

GENERAL DATA

Amt.of Fill	10	m
Btm.H.Temp	161.3	F
Hole Cond	GOOD	
Packer Size	7.5	in
# of Packers	2	
Cushion Amt	N/A	m
Cushion Type	N/A	
Reversed Out	YES	
Tool Chased	YES	
Tester	CHAD Mc GUINN	
Co. Rep	BRENT SPEECHLEY	
Contractor	O.D.E.	
Rig No	30	

AUSTRALIAN D.S.T.

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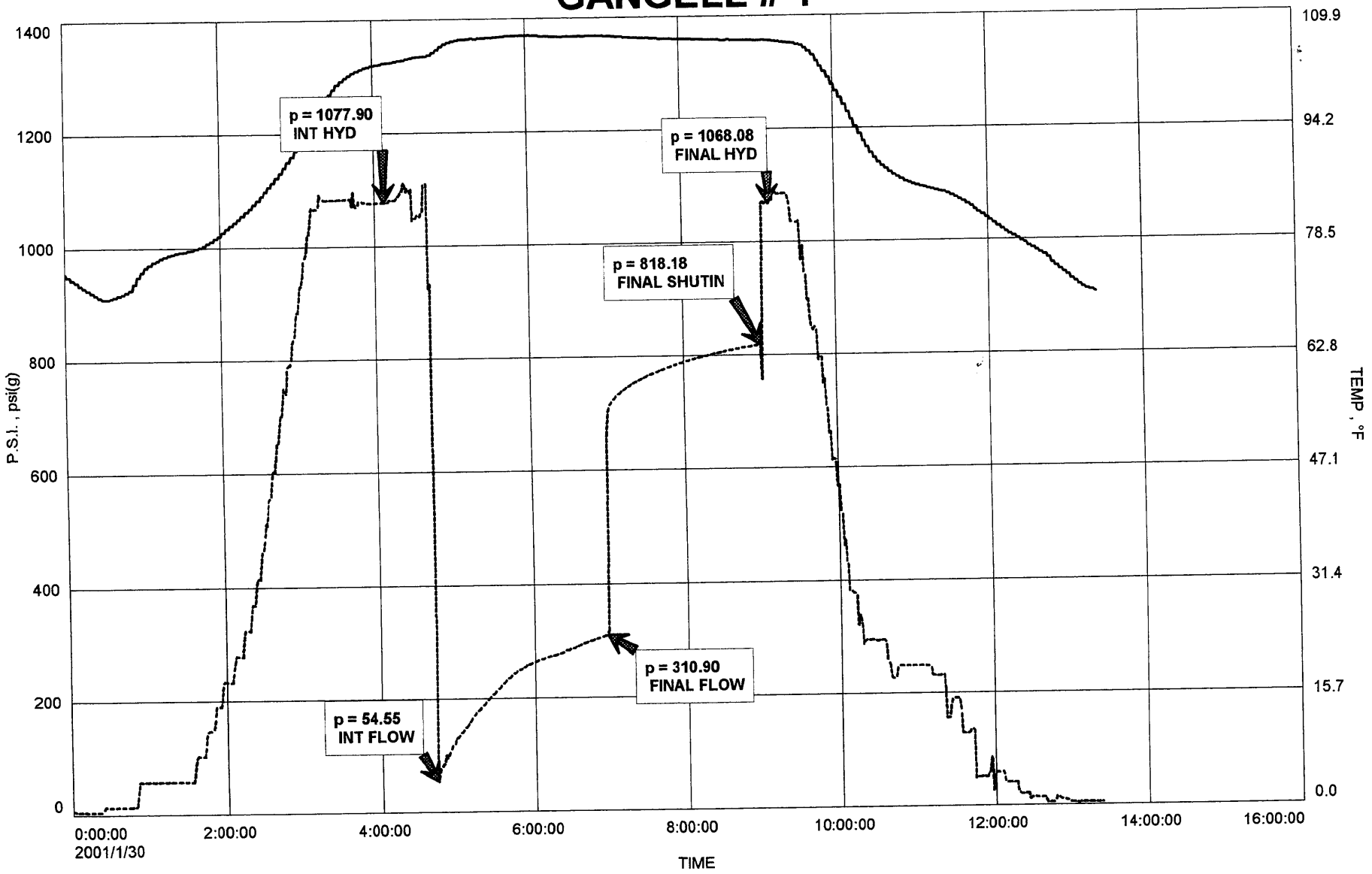
LAKES OIL N.L.
INSIDE EMP 661.77 M
Start Test Date: 2001/01/29
Final Test Date: 2001/01/30

GANGELL # 1
Job Number: DST # 9

GANGELL # 1



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APPENDIX 9

GAS & WATER ANALYSIS

Amdel Limited
A.C.N. 008 127 802

Petroleum Services
PO Box 338
Torrensville Plaza SA 5031

Telephone: (08) 8416 5240
Fax: (08) 8234 2933

22 February 2001

Lakes Oil NL
Challenge Tower
Level 5, 495 Collins Street
MELBOURNE VIC 3000

Attention: Jack Mulready

REPORT LQ10080

CLIENT REFERENCE: Request

WELL NAME/RE: Gangell-1, DST-3

MATERIAL: Water sample

WORK REQUIRED: Water analysis

AUTHOR'S NAME: Jason Mitchell

Please direct technical enquiries regarding this work, to the signatory below, under whose supervision the work was carried out. This report relates specifically to the sample or samples submitted for testing.

Brian L Watson
Manager
Petroleum Services

bw.cm

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1. INTRODUCTION

One (1) sample was received on 5th February 2001 for standard water analysis. All analysis was performed in accordance with APHA methods (19th Edition). This report is a formal presentation of results forwarded by facsimile on the 19th February 2001.

2. RESULTS

Results are presented on the following page.

amdel
Petroleum Services

TABLE 1 - WATER ANALYSIS

JOB NUMBER: LQ10080

WELL / ID: GANGELL-1, DST-3
SAMPLE TYPE: Fluid in String
SAMPLE POINT: Reverse Circulation
DATE COLLECTED: 19/01/01
DATE RECEIVED: 05/02/01

FORMATION:
INTERVAL:
COLLECTED BY: Client

PROPERTIES:

pH (measured) = 7.5
Resistivity (Ohm.M @ 25°C) = 0.29
Electrical Conductivity (µS/cm @ 25°C) = 34200
Specific Gravity (S.G. @ 20°C) = na
Measured Total Dissolved Solids(Evap@180°C) mg/L = na
Measured Total Suspended Solids mg/L = na

CHEMICAL COMPOSITION

CATIONS		mg/L	meq/L
Ammonium	as NH_4	na	na
Potassium	as K	200	5.12
Sodium	as Na	3464	150.67
Barium	as Ba	na	na
Calcium	as Ca	5624	302.11
Iron	as Fe	na	na
Magnesium	as Mg	nd	nd
Strontium	as Sr	na	na
Boron	as B	na	na
Total Cations		9288	457.90

ANIONS		mg/L	meq/L
Bromide	as Br	na	na
Chloride	as Cl	14458	407.27
Fluoride	as F	na	na
Hydroxide	as OH	nd	nd
Nitrite	as NO_2	na	na
Nitrate	as NO_3	0.4	0.01
Sulphide	as S	na	na
Bicarbonate	as HCO_3	461	7.56
Carbonate	as CO_3	nd	nd
Sulphite	as SO_3	na	na
Sulphate	as SO_4	96	1.99
Total Anions		15015.1	416.82

DERIVED PARAMETERS

a) Ion Balance (Diff*100/Sum) (%) = 4.70
b) Total Alkalinity (calc as $CaCO_3$) (mg/L) = 377
c) Total of Cations + Anions = 24303
(calculated dissolved salts)
d) Hardness (calc as $CaCO_3$) (mg/L) = 14043
e) Theoretical Total dissolved salts = 21888
(From Electrical Conductivity)

QUALITY CONTROL COMMENTS

Item	Actual Value	Acceptance Criteria	Satisfactory? (Yes/No)
Ion Balance (%) =	4.70	5%	Yes
Expected pH range		< 8.3	Yes
% difference between measured total dissolved solids and calc total dissolved salts (from ionic comp) =	na	5%	na

na = not analysed
nd = not detected
is = insufficent sample

If No - what action is recommended by Amdel

Amdel Limited
A.C.N. 008 127 802

Petroleum Services
PO Box 338
Torrensville Plaza SA 5031

Telephone: (08) 8416 5240
Fax: (08) 8234 2933

21 February 2001

Lakes Oil NL
PO Box 300
Collins Street West
MELBOURNE VIC 8007

Attention: Jack Mulready

REPORT LQ10106

CLIENT REFERENCE: Request

WELL NAME/RE: Gangell-1 DST-9

MATERIAL: Water sample

WORK REQUIRED: Water analysis

AUTHOR'S NAME: Jason Mitchell

Please direct technical enquiries regarding this work, to the signatory below, under whose supervision the work was carried out. This report relates specifically to the sample or samples submitted for testing.

Brian L Watson
Manager
Petroleum Services

bw.cm

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1. INTRODUCTION

One (1) sample was received on 13th February 2001 for standard water analysis. All analysis was performed in accordance with APHA methods (19th Edition). This report is a formal presentation of results forwarded by facsimile on the 19th February 2001.

2. RESULTS

Results are presented on the following pages.

Amdel
Petroleum Services

TABLE 1 - WATER ANALYSIS

JOB NUMBER: LQ10106

WELL / ID: Gangell-1, DST-9
SAMPLE TYPE: Water
SAMPLE POINT: PEP 157
DATE COLLECTED:
DATE RECEIVED: 13/02/01

FORMATION:
INTERVAL:
COLLECTED BY: Client

PROPERTIES:

pH (measured) = 12.6
Resistivity (Ohm.M @ 25°C) = 0.29
Electrical Conductivity (µS/cm @ 25°C) = 34100
Specific Gravity (S.G. @ 20°C) = na
Measured Total Dissolved Solids(Evap@180°C) mg/L = na
Measured Total Suspended Solids mg/L = na

CHEMICAL COMPOSITION

CATIONS		mg/L	meq/L
Ammonium	as NH_4	na	na
Potassium	as K	5120	130.95
Sodium	as Na	5876	255.59
Barium	as Ba	na	na
Calcium	as Ca	1320	70.91
Iron	as Fe	na	na
Magnesium	as Mg	nd	nd
Strontium	as Sr	na	na
Boron	as B	na	na
Total Cations		12316	457.44

ANIONS		mg/L	meq/L
Bromide	as Br	na	na
Chloride	as Cl	10740	302.54
Fluoride	as F	na	na
Hydroxide	as OH	nd	nd
Nitrite	as NO_2	na	na
Nitrate	as NO_3	0.1	0.00
Sulphide	as S	na	na
Bicarbonate	as HCO_3	863	14.15
Carbonate	as CO_3	3746	124.87
Sulphite	as SO_3	na	na
Sulphate	as SO_4	1012	21.07
Total Anions		16361.08	462.62

DERIVED PARAMETERS

a) Ion Balance (Diff*100/Sum) (%) = 0.56
b) Total Alkalinity (calc as $CaCO_3$) (mg/L) = 6952
c) Total of Cations + Anions = 28677
(calculated dissolved salts)
d) Hardness (calc as $CaCO_3$) (mg/L) = 3296
e) Theoretical Total dissolved salts = 21824
(From Electrical Conductivity)

QUALITY CONTROL COMMENTS

Item	Actual Value	Acceptance Criteria	Satisfactory? (Yes/No)
Ion Balance (%) =	0.56	5%	Yes
(from comparison of calculated vs theoretical salts derived from measured conductivity)			
Expected pH range		< 8.3	No - Recommend further testing
% difference between measured total dissolved solids and calc total dissolved salts (from ionic comp) =	na	5%	na

na = not analysed
nd = not detected
is = insufficent sample

If No - what action is recommended by Amdel

APPENDIX 10

PALYNOLOGY REPORT

Palynological analysis of cuttings samples from the Strzelecki Group in Gangell–1, onshore Gippsland Basin.

by

Alan D. Partridge

Biostrata Pty Ltd
A.C.N. 053 800 945
A.B.N. 39 053 800 945

Biostrata Report 2001/7

3rd February 2001

Palynological analysis of cuttings samples from the Strzelecki Group in Gangell–1, onshore Gippsland Basin.

by Alan D. Partridge

INTERPRETATIVE DATA

Summary.

Two cuttings samples from the deepest 250 metres penetrated in Gangell–1 were analysed to determine the age of the oldest sediments penetrated. The samples at 2115 and 2350m contained moderately diverse spore-pollen assemblages diagnostic of the Strzelecki Group, and both are assigned to the *Crybelosporites striatus* Zone. Age of the samples is Early Albian to possibly latest Aptian. The samples also contained low numbers of organic-walled algal cysts, which indicate the presence of transient lacustrine depositional environments within the Strzelecki Group.

Introduction.

The cuttings samples were analysed as urgent samples, to determine the age of the deepest sediments penetrated prior to plugging and abandonment of Gangell–1. The samples were couriered, a week apart from Sale to Laola Pty Ltd in Perth where they were received and processes on the 24th and 31st January. The palynological slides were returned to Melbourne overnight by Ansett Air Cargo and collected directly from the airport, for immediate microscope examination. Two Provisional Reports were submitted on 25th January and 1st February.

Both samples gave high yields of organic matter (kerogen) which contained a high concentration of spores and pollen and rare to frequent fresh-water algal cysts and microscopic fungal remains. Preservation of the palynomorphs was poor to fair with the deeper sample showing a discernable higher maturation. The visual Thermal Alteration Index (TAI) for the deeper sample was in the range 2.3 to 2.4 suggesting penetration of the hydrocarbon mature zone.

Discussion of Assemblages.

The two cuttings samples from analysed from Gangell–1 well contain moderate diversity assemblages which can be assigned to the *Crybelosporites striatus* spore-pollen Zone of Dettmann (1963) and Dettmann & Playford (1969) on the rare to

frequent presence of the eponymous species. A younger *C. paradoxa* Zone age is precluded by absence of the eponymous species *Coptospora paradoxa* and accessory index species such at *Cicatricosisporites pseudotripartitus*, *Perotrilites majus* and *Pilosisporites grandis*. Assignment to the older *C. hughesii* Zone (also referred to as the *Pilosisporites notensis* Zone by Morgan *et al.*, 1995) is considered unlikely in the absence of *Cyclosporites hughesii* and *Cooksonites variabilis* in the samples, although it is conceded that there is no clear extinction of species at the top of this older zone that allows for positive identification. The possibility that *Crybelosporites striatus* is caved into the deeper sample is considered highly unlikely as specimens of *C. striatus* are darker (more carbonised) in the deeper cuttings, compared to the shallower sample.

The assemblages are dominated by spores (>70% of total count), with *Cyathidites* spp., (average 26%), *Ruffordiaspora australiensis* (average 16%), and *Osmundacidites wellmanii* (average 10%) the most abundant spores. The remainder of the assemblages consists mainly of bisaccate gymnosperm pollen lumped together as *Podocarpidites* spp. (average 22%).

Both samples contain *Sigmopollis carbonis* a small (<20µ) microfossil algae that has been compared to morphologically similar Holocene algae occurring in eutrophic to mesotrophic freshwater environments (Srivastava, 1984). The shallower sample also contain *Schizosporis reticulatus*, a palynomorph long thought to be an algal cyst, which has recently been reinterpreted as possible resting eggs of a rotifera (van Geel, 1998).

Comparison with other wells.

Few well in the Gippsland Basin have drilled into the Strzelecki Group at equivalent depths to that penetrated at Gangell–1. In the onshore portion of the basin only the early wells Woodside–2 drilled in 1955 to a depth of 2701mTD, and Wellington Park–1 drilled in 1961/1962 to a depth of 3661mTD, penetrate deeper. In both these well the available palynological data is quite old and must be interpreted with caution. In the Woodside–2 well the *C. striatus* Zone is identified in core samples between 1951.3m and 2100.7m, with the older *C. hughesii* Zone recorded in deeper cores between 2372.9m and 2701m (Dettmann, 1959). In the deep Wellington Park–1 well the deepest reliable age date for the *C. striatus* Zone is at the relatively shallow depth of 1323m, while the underlying *C. hughesii* Zone is

interpreted to lie between 2086m and 2565m, based on the youngest occurrence of *Cooksonites variabilis* and oldest occurrence of *Pilosisporites notensis* in very low diversity assemblages (Dettmann, 1965). The bottom 1000 metres in the well lacks any datable assemblages.

In the offshore portion of the basin only two wells penetrate the Strzelecki Group at equivalent depths. In Perch–1 well drilled in 1968 to a depth of 2867mTD the *C. striatus* Zone is identified between 1229 and 2513m with the underlying 350 metres penetrated inconclusively dated (Dettmann, 1968). In the more recent Tarra–1 well drilled in 1983 to a depth of 2905m the *C. striatus* Zone is identified from 2599 to 2879m, effectively throughout the entire 325 metres of Strzelecki Group penetrated (Harris, 1983).

The above four widely spaced wells reveal that there is only limited control on the age of the thick Strezelecki Group in the central portion of the Gippsland Basin. Although the record of the *C. striatus* Zone to a depth of 2350m in Gangell–1 is the deepest in the onshore portion, it is not inconsistent with the datings in other wells. In Woodside–2 there is a 370 metre sampling, extending to comaparable depths which could largely belong to the zone. Wellington Park–1 has an even more extensive sampling gap below the *C. striatus* Zone, but this well is also located on the high north side of Rodedale Fault where an estimated 400 to 500 metres has been eroded from the top of the Strzelecki Group (based on estimated thickness of the missing *C. paradoxa* and *P. pannosus* Zones in that well). In addition the two offshore wells show that the *C. striatus* Zone can be much thicker and extend much deeper than onshore. Overall the comparisons reveal just how poor the age control in the deep wells.

References

DETTMANN, M.E., 1959. Upper Mesozoic microfloras in well cores from Woodside and Hedley, Victoria. *Proceedings Royal Society of Victoria, vol.71*, pt.2, p.99-105.

DETTMANN, M.E., 1963. Upper Mesozoic microfloras from southeastern Australia. *Proceedings Royal Society of Victoria, vol.77*, pt.1, p.1–148, pl.1-27.

DETTMANN, M.E., 1965. Palynological report on Woodside Wellington Park No.1 well. Unpublished report, 4p. (9th August).

DETTMANN, M.E., 1968. Palynological report on Esso Perch A-1 well. Unpublished report, 14p. (2 October — PE990889).

DETTMANN, M.E. & PLAYFORD, G., 1969. Palynology of the Australian Cretaceous: a review. **In** *Stratigraphy and palaeontology. Essays in honour of Dorothy Hill*, K.S.W. Campbell, editor, A.N.U. Press, Canberra, p.174–210.

HARRIS, W.K., 1983. Tarra No.1 well Gippsland Basin. Palynological Examination and Kerogen typing of sidewall cores. Unpublished report, 11p. (25 September — PE990881).

HELBY, R., MORGAN, R. & PARTRIDGE, A.D., 1987. A palynological zonation of the Australian Mesozoic. **In** *Studies in Australian Mesozoic Palynology*, P.A. Jell, editor, *Memoir Association Australasian Palaeontologists 4*, p.1-94.

MORGAN, R., ALLEY, N.F., ROWETT, A.I. & WHITE, M.R., 1995. Biostratigraphy. **In** *The Petroleum Geology of South Australia. Volume 1: Otway Basin*, J.G.G. Morton & J.F. Drexel, editors, *Mines and Energy South Australia, Report Book 95/12*, p.95-101.

SRIVASTAVA, S.K., 1984. Genus *Sigmopollis* from the Maastrichtian Scollard Formation, Alberta (Canada), and its algal affinity. *Pollen et Spores 26*, p.519-530.

VAN GEEL, B. 1998. Are resting eggs of the rotifer *Hexarthra mira* (Hudson 1871) the modern analogs of *Schizosporis reticulatus* Cookson and Dettmann 1959? *Palynology, vol.22*, p.83–87.

BASIC DATA

Table 1. Species distribution list for Gangell–1 cuttings samples.

Sample Type:	Cuttings	Cuttings
Depth :	2115m	2350m
SPORE–POLLEN		
Aequitriradites spinulosus	0.8%	X
Baculatisporites spp.	2.3%	6.0%
Ceratosporites equalis	0.8%	
Cibotiumsporites juriensis	X	
Cicatricosisporites/Ruffordiaspora spp.	X	
Clavatipollenites hughesii	0.8%	
Corollina torosa	X	X
Couperisporites tabulata		cf.
Crybelosporites striatus	2.3%	
Cyathidites australis	12.3%	2.6%
Cyathidites minor	16.2%	19.8%
Dictyophyllidites spp.	3.1%	1.7%
Falcisporites grandis	X	X
Foraminisporis asymmetricus	X	X
Foraminisporis wonthaggiensis	X	
Foveosporites canalis	0.8%	
Gleicheniidites spp.	0.8%	
Januisporites spinulosus	X	
Klukisporites scaberis		X
Leptolepidites verrucosus		X
Marattisporites scabratus		0.9%
Matonisprites cooksoniae	X	
Microcachryidites antarcticus	1.5%	3.4%
Neoraistrickia truncata		0.9%
Osmundacidites wellmanii	12.3%	7.8%
Pilosisporites notensis	0.8%	
Pilosisporites parvispinosum	X	
Podocarpidites spp.	20.8%	24.1%
Polycingulatisporites clavus	X	X
Reticulatisporites pudens	X	
Retitriletes spp.	1.5%	3.4%
Retitriletes austroclavatidites	X	X
Retitriletes douglasii		X
Retitriletes eminulus	X	
Retitriletes facetus	X	

Table 1. Species distribution list for Gangell-1 cuttings samples.

Sample Type:	Cuttings	Cuttings
Depth :	2115m	2350m
SPORE-POLLEN		
Ruffordiaspora australiensis	11.5%	19.8%
Stereisporites pocockii	2.3%	3.4%
Stereisporites antiquisporites	X	
Trichotomosulcites subgranulatus	2.3%	0.9%
Triletes undiff.	2.3%	2.6%
Triporoletes reticulatus	0.8%	
MICROPLANKTON		
Schizosporis reticulatus	X	
Sigmopollis carbonis	3.1%	X
OTHER PALYNOMORPHS		
Fungal spores/hyphae	0.8%	0.9%
Reworked Spores & Pollen	X	1.7%
Aratrisporites spp.	X	X
Horriditriletes ramosa	X	
Quadrisporites horridus		X
Total Count :	**130**	**116**

PE605543

This is an enclosure indicator page.
The enclosure PE605543 is enclosed within the container PE908902 at this location in this document.

The enclosure PE605543 has the following characteristics:

ITEM_BARCODE	PE605543
CONTAINER_BARCODE	PE908902
NAME	Encl.1 Pt.1 Gangell-1 Composite Well Log
BASIN	GIPPSLAND
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	COMPOSITE_LOG
DESCRIPTION	Encl.1 Part1 Gangell-1 Composite Well Log, Scale 1:500, by Lakes Oil N.L., W1312. PEP157. Enclosure 1 Part 1 contained within " Well Completion Report" [PE908902].
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	28-FEB-2001
DATE_RECEIVED	02-NOV-2001
RECEIVED_FROM	Lakes Oil NL
WELL_NAME	Gangell-1
CONTRACTOR	Lakes Oil NL
AUTHOR	
ORIGINATOR	Lakes Oil NL
TOP_DEPTH	0
BOTTOM_DEPTH	1350
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE605544

This is an enclosure indicator page.
The enclosure PE605544 is enclosed within the container PE908902 at this location in this document.

The enclosure PE605544 has the following characteristics:

ITEM_BARCODE	= PE605544
CONTAINER_BARCODE	= PE908902
NAME	= Encl.1 Pt.2 Gangell-1 Composite Well Log
BASIN	= GIPPSLAND
ONSHORE?	= Y
DATA_TYPE	= WELL
DATA_SUB_TYPE	= COMPOSITE_LOG
DESCRIPTION	= Encl.1 Pt.2 Gangell-1 Composite Well Log, Scale 1:500, by Lakes Oil N.L., W1312, PEP157. Enclosure 1 Part 2 contained within "Well Completion Report" [PE908902].
REMARKS	=
DATE_WRITTEN	=
DATE_PROCESSED	= 28-FEB-2001
DATE_RECEIVED	= 02-NOV-2001
RECEIVED_FROM	= Lakes Oil NL
WELL_NAME	= Gangell-1
CONTRACTOR	= Lakes Oil NL
AUTHOR	=
ORIGINATOR	= Lakes Oil NL
TOP_DEPTH	= 1150
BOTTOM_DEPTH	= 2350
ROW_CREATED_BY	= DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)

PE605542

This is an enclosure indicator page.
The enclosure PE605542 is enclosed within the container PE908902 at this location in this document.

The enclosure PE605542 has the following characteristics:

ITEM_BARCODE	PE605542
CONTAINER_BARCODE	PE908902
NAME	Encl.2 Gangell-1 Mud Log
BASIN	GIPPSLAND
ONSHORE?	Y
DATA_TYPE	WELL
DATA_SUB_TYPE	MUD_LOG
DESCRIPTION	Encl.2 Gangell-1 Formation Evaluation Mud Log, Scale 1:200, by Geoservices Logging for Lakes Oil N.L., W1312, PEP157. Enclosure 2 contained within "Well Completion Report" [PE908902].
REMARKS	
DATE_WRITTEN	
DATE_PROCESSED	
DATE_RECEIVED	02-NOV-2001
RECEIVED_FROM	Lakes Oil NL
WELL_NAME	Gangell-1
CONTRACTOR	Lakes Oil NL
AUTHOR	
ORIGINATOR	Lakes Oil NL
TOP_DEPTH	0
BOTTOM_DEPTH	2350
ROW_CREATED_BY	DN07_SW

(Inserted by DNRE - Vic Govt Mines Dept)