LAKES OIL N.L.

INVESTIGATOR-1

WELL COMPLETION REPORT

PEP 136 VIC.

GIPPSLAND BASIN

VICTORIA

PREPARED BY: J.GAUSDEN
J. GAUSDEN & ASSOCIATES PTY LTD
MARCH 2000

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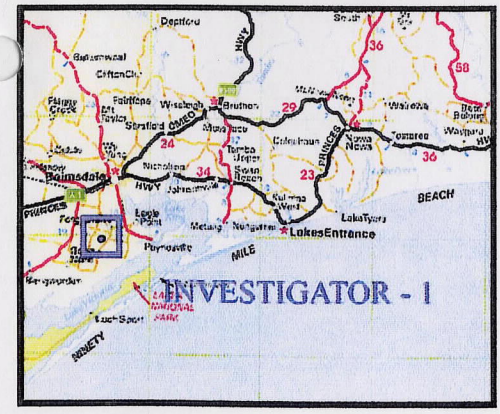
AERIAL PHOTOGRAPH OF THE INVESTIGATOR - 1 WELL LOCATION

After UPG99 Central Gippsland 1996 050 RUN 23 1-29 105



LAKES OIL N.L.

Figure 1

1.0 SUMMARY AND CONCLUSIONS

Investigator-1 was drilled as part of a program to investigate the potential for structural-stratigraphic entrapment of hydrocarbons within the lower portion of the Latrobe Group. Investigator-1 targeted a fault controlled area enclosing an embayment of lower Latrobe Group sediments. A critical risk factor for the play was the required development of adequate seals within the Latrobe Group to isolate the lower Latrobe Group reservoir sands. Hydrocarbon entrapment in Lower Latrobe Group sands has previously been demonstrated by the Seahorse field in the relatively near offshore Gippsland Basin, and oil migration to the onshore Basin by oil occurrences at Lakes Entrance and Woodside.

The Latrobe Group was found to be a little thinner than prognosis (80 m against 90 m on prognosis). No significant potentially sealing section was identified while drilling and the logs indicate only one thin claystone interbed from 622.5 m to 624 m. Such a thin claystone is unlikely to have sufficient areal extent to form an adequate top seal. The top of the lower Latrobe Group section is tentatively assigned to this claystone which in turn is 2 m above a 10 m brown coal seam. The detailed stratigraphic position of the brown coals is uncertain in this portion of the onshore basin. The nearby wells; Paynesville-1, Comley-1, and Farirhope-1, all have thinner Latrobe Group section than Investigator-1 and did not intersect any coal seams. The more distant Wrixondale-1 has a thicker 165 m section which includes some thin brown coals at the very top of the Latrobe Group as well as a 10 metre seam approximately 85 m into the Latrobe. The early Duck Bay-1 well approximately 5.5 km to the SE of Investigator-1also intersected an 18 metre coal seam 73 m into the Latrobe Group. It is possible that the basal seam in Investigator-1 correlates with these seams in Duck Bay-1 and Wrixondale-1, but it also appears likely that the position of the seams on this margin of the basin reflects local environment more than actual age. None of the wells have produced useful microfossil data for the Latrobe Group.

Basement was encountered 12 m high to prognosis and consists of an indurated sandstone and phyllitic claystone, probably of Ordovician age.

Background gas was first detected at approximately 532 m and increased gradually to average 0.1% total gas near the top Latrobe Group. There was a slight further increase to approximately 0.17% in the upper Latrobe sands and this is consistent with the solution gas known to be present in these sands in up dip water bores. Total gas readings also increased to the 0.4 to 0.5% range as the three brown coal sections were drilled from 588.5 m to 592 m, 598 m to 606 m, and 625.5 m to 635.5 m.. Below the lowermost coal, total gas readings reduce steadily to 0.05% at top basement (662 m) and to 0.02% at TD. (697 m). No hydrocarbon fluorescence was noted in the well.

The results of the well suggest that inadequate intra Latrobe Group sealing section was present to validate this style of structural – stratigraphic play. The lack of oil indications also suggests that the well did not intersect a migration pathway from the deeper basin. It would appear that in this general area a total Latrobe Group thickness in excess of 100 metres should be present if structural – stratigraphic plays are further pursued, in order to improve the probability of the presence of intra Latrobe seals.

2.0 WELL HISTORY

2.1 LOCATION

Co-ordinates:	Latitude:	37°54'50"
	Longitude:	147°36'46"
AMG Co-ordinates:		553870 E
		5803550 N

The well was located approximately 5.5 km. South of Bairnsdale, on a property jointly owned by Mr H. G. Kyle and Mr N.O. Kyle. The site was accessed from Comley Road, and then via a short rig road.

2.2 GENERAL DATA

Well Name: Investigator-1

Operator: Lakes Oil N.L.
Level 20
459 Collins St.
Melbourne 3000

Elevation: GL: 33 metres
KB: 34 metres (approximate)

Total Depth: Driller: 697 m.
Logger: 696.9 m.

Spudded: 06 October 1999, @ 02:30 hours.

TD. Reached: 09 October 1999, @ 10:00 hours.

Rig Released: 10 October 1999, @ 1700 hours

Time: Spud to TD, 3.3 days.

Status: Plugged and Abandoned, dry hole.

2.3 DRILLING DATA

2.3.1 Drilling Contractor: Sides Engineering Pty Ltd
25 Garden Road
Clayton 3168

2.3.2 Drilling Rig: Bourne 2000 THD. (See Appendix 1 for details)

2.3.3 Casing and Cementing Details:

2.3.3.1 Casing:

Conductor:	244mm set at 11 mKB prior to rig up.
Surface Casing:	178 mm set at 125 mKB. Cemented with 16 bbl. 15.4ppg Class G cement, displaced with mud, Plug bumped at 7000 Kpa

2.3.3.2 Cement Plugs:

Plug No: 1 Interval: 623 m. to 543 m. Method: Balanced
Cement: 16 bbl, 15.4 ppg Tested: No

Plug No: 2 Interval: 162 m. to 85 m. Method: Balanced
Cement: 16 bbl, 15.4 ppg. Tested: Tagged at 89 m. Tested plug to 500 psi.

Plug No: 3 Interval: 10 m. to Surface. Method: Pumped.
Tested: No.

2.3.3 Drilling Bits:

Bit No.:	RR1	2
Size:	216 mm	156 mm
Make:	Reed	Varel
Type:	S1GJ	L217
IADC Code:	1.1.4	2.1.7
Serial No:	379813	128048
Nozzles:	3 x 12	3 x 11
Depth in:	0 m	130 m
Depth out:	130 m	697 m
Total metres:	130	567 m
Total hours:	6.5	36.5
WOB (dN):	1.5	1.5
RPM:	110	100
Condition:	2.3.I	6.3.I

2.3.4 Drilling Fluids

A gel/polymer/KCl mud system was used from spud to TD.
Typical mud properties close to TD were as follows:

Density:	1.13 SG	Gels:	10/16
Viscosity:	41 sec.	Sand:	0.5%
Water Loss:	9.8 ml.	Solids:	na.
pH	10.0	K+:	15,000 mg/l.
Filter Cake	2 mm.	Chlorides:	13,500 mg/l.
PV/YP	16/18	Calcium:	85 mg/l.

2.3.5 Water Supply

Fresh water was supplied by tanker from the Bairnsdale town water supply.

2.4 FORMATION SAMPLING AND TESTING

2.4.1 Cuttings: Cuttings samples were collected at 10 m intervals from surface to 480 m, 5 m intervals from 485 m to 570 m, and 3 m from 573 m to TD. One washed and one unwashed sample was taken from each interval. The washed sample was divided into two splits stores in labelled plastic bags and one reference sample in a clear plastic samplex tray. One cut was provided to the Victorian DNRE and the remainder retained by the operator. See Appendix 3 for Cuttings Descriptions.

2.4.2 Cores: No cores were cut.

2.4.3 Tests: No formation tests were conducted.

2.5 LOGGING AND SURVEYS

2.5.1 Mud Logging:

A standard skid mounted Geoservices mud logging unit was employed. This provided continuous monitoring of mud gas including total gas and chromatographic breakdown, penetration rate, mud pump rates and mud pit levels. The Geoservices masterlog is included as Enclosure 2

2.5.2 Wireline Logging:

Wireline logging services were provided by Reeves using a standard truck mounted unit. Slim hole tools were employed. Two logging runs were undertaken as detailed below.

Run 1 Dual Resistivity – SP – GR 696 m to 123 m, GR to surface.
Run 2 Density – Caliper – GR 696 m to 123 m.
These logs are presented in a composite format as Enclosure 3

2.5.2 Deviation Survey:

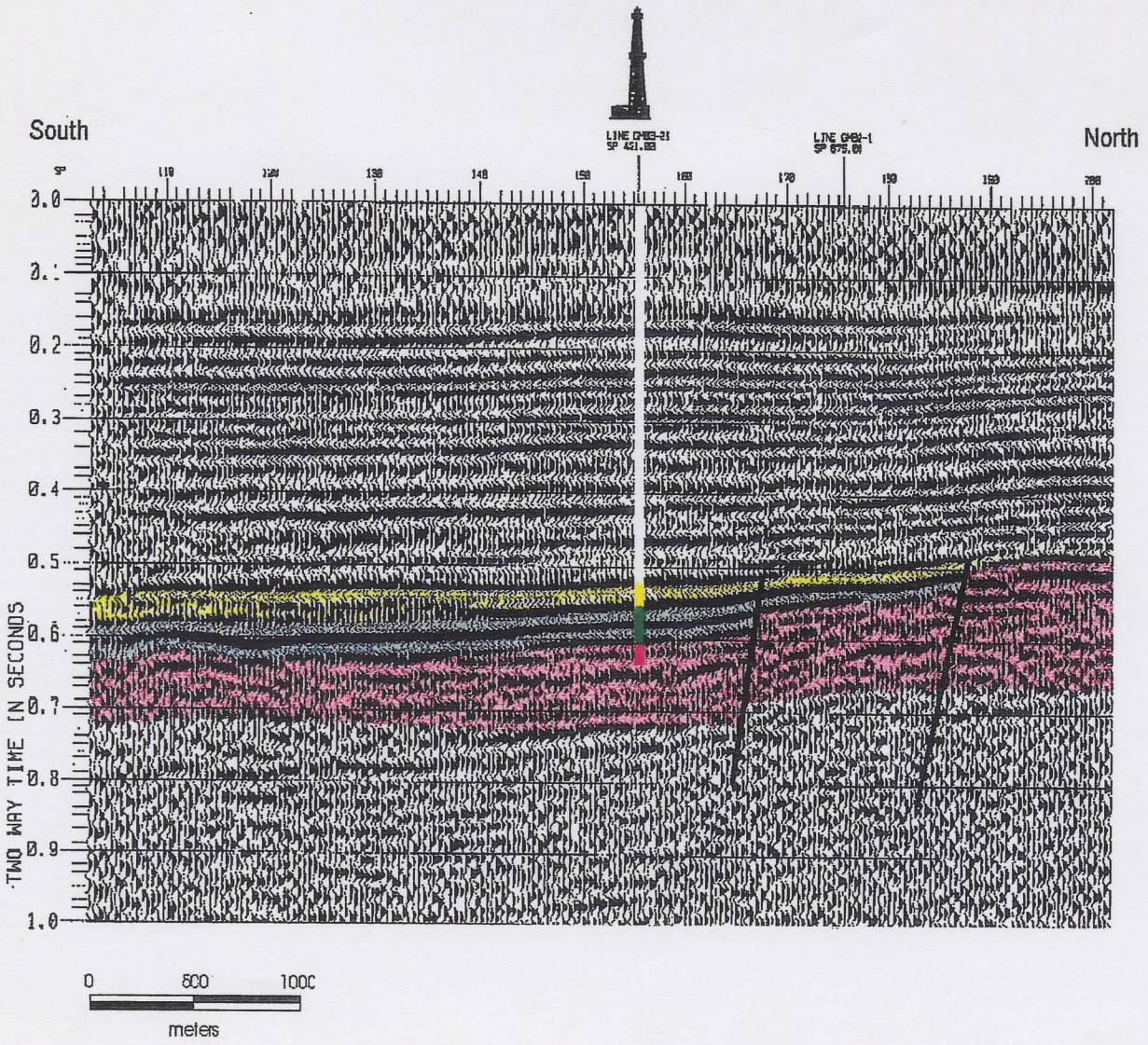
Two single shot surveys were run:
0.5 deg at 130 m; 1.0 deg at 697 m

2.5.3 Velocity Survey:

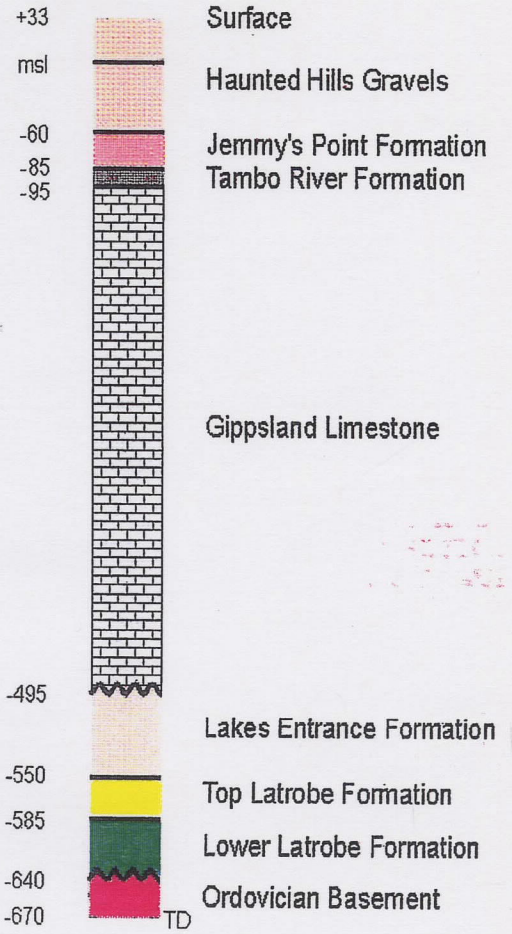
No velocity survey was recorded.

Section GM83A - 11 Investigator 1

Proposed Investigator 1



Well Prognosis at Investigator 1



3.0 RESULTS OF DRILLING

3.1 STRATIGRAPHY

The following stratigraphic intervals have been delineated using wireline log interpretation and cuttings analysis. The upper units were close to prognosis. The transitional Lakes Entrance Formation top was picked 19 metres high which probably reflects a small problem with the definition of this top. The Latrobe Formation top was also close to prognosis, but the unit was approximately 10 metres thinner than prognosis with basement intersected 12 metres high. No clear sealing section could be picked separating out the lower Latrobe Group units.

FORMATION	PROGNOSED (mKB)	ACTUAL (mKB)	THICKNESS (m)	DEPTH (mSS)	DIFFERENCE (m)
Haunted Hills Gravels	1	1	91	33	0
Jemmy's Point Formation	94	92	31	-59	2 low
Tambo River Formation	119	123	11	-90	4 low
Gippsland Limestone	129	134	376	-101	5 low
Lakes Entrance Formation	529	510	72	-477	19 high
Latrobe Formation	584	582	40.5	-549	2 high
Lower Latrobe units	619	622.5	39.5	-589.5	3.5 low
Basement (Ordovician)	674	662	35+	-629	12 high
TD	704	697		-664	

3.2 LITHOLOGICAL DESCRIPTION (Depths KB)
(Refer to Appendix 3 for detailed cuttings descriptions)

3.2.1 SALE GROUP

Haunted Hills Gravels (surface to 51 m)

From surface to 92 m.
SANDSTONE: pale yellowish orange to greyish yellow, unconsolidated, medium to very coarse grained, moderate to minor low sphericity clear to cloudy quartz, common yellowish orange argillaceous matrix adhering to grains, trace dark grey, dark brown, & black lithic grains, inferred good porosity. Upper part of section probably includes CLAYSTONE and/or abundant argillaceous matrix dispersing to mud system. Below 70m minor COAL: black, soft to brittle, woody texture, common very fine disseminated pyrite.

3.2.2 SEASPRAY GROUP

Jemmy's Point Formation (92 m to 123 m)

SANDSTONE **grading down unit to** SANDY CALCIRUDITE: light grey, unconsolidated, coarse to very coarse grained, sub angular to sub rounded moderate sphericity quartz, very coarse (rudite) calcareous fossil fragments including gasteropods, bivalves, corals. inferred good porosity in part (probable dispersive clay matrix), minor interbedded ARGILLACEOUS SILTSTONE: olive grey, soft, quartz silt, minor very fine sand, minor to common glauconite, rare carbonaceous grains, trace calcareous grains, trace reddish brown lithics, abundant argillaceous slightly calcareous matrix.

Tambo River Formation (123 m to 134 m)

SANDY CALCIRUDITE: very light grey to pinkish grey, returned unconsolidated, coarse to very coarse grained, calcareous fossil fragments calcareous fossil fragments predominantly corals and bryozoa, abundant sub angular to sub rounded quartz, probable dispersive clay matrix limiting porosity, rare interbedded CLAYSTONE: brownish grey, soft, amorphous, silty in part, trace carbonaceous flecks.

Gippsland Limestone (134 m to 510 m)

From 134 m to 210 m.
CALCIRUDITE: very light grey, rarely medium light grey and yellowish grey, medium to very coarse and granule size calcareous fossil fragments, grading to CALCARENITE towards base of unit, predominantly corals and bryozoa rare echinoid spines, bivalves, trace glauconite, inferred good porosity.

From 210 m to 270 m.
CALCARENITE: very light grey to medium light grey, medium to very coarse rarely granule size calcareous fossil fragments, predominantly corals and bryozoa rare echinoid spines, bivalves, trace glauconite, inferred good porosity; with interbedded MARL: light olive grey, soft, dispersive in part, amorphous, common calcisilt, trace glauconite, grading to ARGILLACEOUS CALCILUTITE.

From 270 m to 430 m.
CALCARENITE: very light grey to medium light grey, medium to very coarse rarely granule size calcareous fossil fragments, predominantly corals and bryozoa rare echinoid spines, bivalves, foraminifera, trace glauconite, inferred poor porosity. Interbedded CALCISILTITE: light greenish grey, firm, silt to very fine sand sized carbonate grains, micritic minor argillaceous matrix, trace glauconite, nil visible porosity, pale yellow direct mineral fluorescence. Interbedded MARL: light olive grey to greenish grey, soft, dispersive in part, amorphous, common calcisilt, minor bioclastic fragments, trace glauconite.

From 430 m to 510 m.
Interbedded CALCARENITE, CALCISILTITE, and MARL as for previous interval, with minor interbeds of CALCAREOUS SILTY CLAYSTONE: medium grey to olive grey, firm, common very fine calcareous fragments, quartz silt, minor glauconite, argillaceous slightly micritic matrix, and CLAYSTONE: medium dark grey, soft, amorphous, common micrite, silty in part.

Lakes Entrance Formation (510 m to 582 m)

From 510 m to 560 m.
MARL: light olive grey to dark greenish grey, mottled medium grey in part, soft to firm, dispersive in part, amorphous, minor bioclastic fragments and calcareous flecks, grades to CALCAREOUS CLAYSTONE in part, trace glauconite, trace foraminifera; with interbedded CLAYSTONE: medium dark grey to brownish black, soft to firm, amorphous to sub fissile, trace to common micrite, grades to CALCAREOUS CLAYSTONE in part, silty in part.

From 560 m to 582 m.
Interbedded CLAYSTONE and MARL as for previous interval, with very minor GLAUCONITIC SANDSTONE: returned as single grains, fine to medium glauconite pellets, minor clear fine to medium sub rounded to sub angular quartz, rare nodular pyrite, no show.

3.2.3 LATROBE GROUP

Informal upper portion of Latrobe Group (582 m to 636 m)

From 582 m to 598 m.
SANDSTONE: very light grey, returned as single grains, fine to very coarse grained, predominant medium to coarse grained, sub rounded moderate sphericity clear and frosted quartz, rare glauconite, rare nodular pyrite, inferred very good porosity, no show; with minor interbedded SIDERITIC SILTSTONE: moderate brown to olive grey, hard, quartz silt, common very fine to fine quartz sand, grading to SANDSTONE in part, common calcareous grains, rare to minor glauconite, trace pyrite, abundant strong sideritic cement, tight, no show; and minor COAL: brownish black, soft, amorphous to blocky, minor very fine crystalline pyrite.

From 598 m to 606 m.
COAL: brownish black, soft, amorphous to blocky, minor very fine crystalline pyrite.

From 606 m to 626 m.
SANDSTONE: very light grey to pale yellowish brown, returned as single grains, fine to very coarse grained, predominant medium to coarse grained, sub rounded moderate sphericity clear and frosted quartz, common argillaceous carbonaceous staining, rare nodular pyrite, inferred very good porosity, no show.

From 626 m to 636 m.
COAL: brownish black, soft, amorphous to blocky.

Informal lower portion of Latrobe Group (626 m to 662 m)

SANDSTONE: very light grey, returned as single grains, fine to very coarse grained, predominant medium to coarse grained, sub rounded moderate sphericity clear and frosted quartz, argillaceous carbonaceous staining, trace nodular pyrite, inferred very good porosity, no show; trace SILTSTONE: medium grey, quartz silt grading to very fine sand, common silica cement, minor calcareous cement, rare carbonaceous material, no visible porosity, no show.

3.2.4 BASEMENT (Ordovician?) (402.5 m to 426 m TD)

From 662 m to 697 m.

Interbedded SANDSTONE (**Indurated**): medium light grey, hard, very fine to fine grained, grain boundaries indistinct, strong silica cement, rare pyrite cement and very fine crystalline vein pyrite, trace vein quartz, argillaceous micromicaceous matrix in part, tight, no show; and CLAYSTONE: (**Phyllitic Slate**): medium silvery grey, hard, sub fissile, abundant micromica.

3.3 HYDROCARBON INDICATIONS

3.3.1 Mud Gas Readings.

A flame induction total gas recorder and gas chromatograph were operational from spud to TD. The first detectable background gas was recorded at 532 m in the Lakes Entrance Formation. Gas background increased slowly through the Lakes Entrance formation from approximately 0.02% to 0.1% at the top Latrobe with no peak on intersection of the Latrobe Group Sandstones, but with peaks within the Latrobe Group up to 0.56% clearly associated with the Latrobe Group brown coals. The gas composition was 100% methane.

3.3.1 Sample Fluorescence

All samples were routinely examined for hydrocarbon fluorescence. No hydrocarbon fluorescence was detected. Selected portions of samples from the Lakes Entrance Formation and Latrobe Group were also tested for cut fluorescence and crush cut fluorescence in the absence of direct fluorescence and none was detected. Some mineral fluorescence was noted within the Gippsland Limestone.

4.0 GEOLOGY

4.1 Structural and Stratigraphic Setting

Investigator-1 was located to test a fault controlled enclosure of lower Latrobe Group. In the offshore areas, the total Latrobe Group thickness may approach 5000 metres, and these sediments are underlain by Cretaceous age sediments of the Strzelecki Group. In PEP 136, the Latrobe Group sediments thin rapidly to the north onto regional basement usually of Ordovician age. The potential trap was defined on the basis of re-interpretation of 1981 seismic lines and on offset well data. The well was located in a fault controlled embayment of the northward thinning Latrobe Group. The potential trap depended on the presence of a competent claystone seal or seals within the Latrobe Group and on the presence of upthrown sealing faults on the northern, western, and eastern boundaries of the embayment.

4.2 Porosity and Permeability

The density log suggests that porosity in the target Latrobe Group sands may reach 30%. Good permeability can be expected at this porosity level. In the absence of hydrocarbon indications no neutron log was run thus any porosity determinations are approximate. The sonic log was also not run, as it is known to produce unreliable results in these relatively unconsolidated sediments.

4.3 Conclusions: Contributions to Geological Knowledge.

The results of the well indicate that a thicker section of Latrobe Group sediments should be present if further prospects relying on an intra-Latrobe seal are to be pursued. The absence of any significant hydrocarbon shows also suggests that this well was not lying within an oil migration pathway from the deeper basin

APPENDIX 1

DETAILS OF DRILLING RIG

APPENDIX 1

DETAILS OF DRILLING RIG

Type:	Bourne 2000 THD
Mast:	Rated to 70 klb
Rotary:	Top Drive, 0 – 70 & 0 – 126 rpm
Power:	Detroit Diesel 6V/92TA power source, zone 1, class 1 with emergency shutdown system.
Pumps:	Ideco T-440, Dressed with liners for continuous drilling operations at 280 gpm @ 1000 psi. Emsco AA-10, Dressed with liners for continuous drilling operations at 280 gpm @ 800 psi. Water and mud transfer pump, 2", c/w suction and discharge hoses. Diaphram sump pump, 2", c/w suction and discharge hoses.
Weight Indicator:	Direct string readout gauge at drillers console.
Breakout Wrench:	Bourne 1500 hydraulic.
Mud Mixing:	Mud mixing hopper and necessary hoses and lines.
Tubulars:	900 m of 3.5" drill pipe. 9 joints of 6" OD drill collars with 4.5" FH connections 9 joints of 5" OD drill collars with 3.5" FH connections
Fishing Tools:	As required to fish Contractor supplied tubulars
Handling Tools:	As required for all contractor supplied tubulars. 7" casing lift elevator 7" casing slips General hand tools as required.
Stabiliser:	1 piece 8.5" OD stabiliser with4.5" FH connections

Rig Equipment List:

Well Control:	Annular preventer, 7 – 1/16", 3000 psi. Ram preventers, 7 – 1/16", 3000 psi., 3.5" pipe rams top, blind rams lower. Accumulator, 30 gallon bottles, control panel. Kill and choke valves and lines. Choke manifold, 3000 psi
Lighting:	2 units, freestanding light towers.
Forklift:	2 ton, all terrain forklift.
Survey:	Eastman 1 – 11/16", 0 – 8 deg. Go-devil.
Rig Personel:	Each 12 hour tour consisted of: 1 Toolpusher. 1 Driller. 2 Roustabouts.

APPENDIX 2

SUMMARY OF DRILLING OPERATIONS

LAKES OIL NL

DAILY DRILLING REPORT

Well:	**Investigator-1**	Report No:	**1**	Date:	**6-Oct-99**
2400 hr Depth:	**130**	Last Depth:	**0**	Day Progress:	**130m**
Total Fuel:		Fuel Usage:		Daily Cost:	**$116,912**
				Cumm Cost:	**$116,912**

0600 hr Operations: Installing BOP's
Remarks: No LTA's

BIT INFORMATION		
Bit Number	RR1	
Size (mm)	216	
Make	Reed	
Type	S1GJ	
IADC Code	1.1.4	
Serial Number	379813	
Nozzles (mm)	3x12	
Depth In (m)	0	
Depth Out (m)	130	
Total Metres	130	
Total Hours	6.5	
WOB (dN)	1.5	
RPM	110	
Condition	2.3.I	
HSI		
JV (m/sec)		

OPS BREAKDOWN (hrs)	
Drilling	6.5
Tripping	3.5
Surveys	
Coring	
Testing	
Circ Sample	
Casing	2.5
Cementing	1.0
Wireline	
Circ & Cond	1.0
Rig Service	2.0
Moved rig	1.5
Rig repairs	
WOC	3.5
Handle tools	
Total	21.5

MUD PROPERTIES		
Density	1.10	SG
Viscosity	39	sec
Water Loss	12.5	ml
pH	10.5	strip
Filter Cake	2	mm
PV/YP	10/20	cp/Pa
Gels		10s/10m
Sand	0.5	%
Solids		%
K+	8000	mg/l
Chlorides	7500	mg/l
Calcium	80	mg/l
PHPA		kg/m3
Day Cost	$2,936	
Cumm Cost	$2,936	

BHA: Bit, bit sub with float, 2 x 6" DC's, stabiliser, 1 x 6" DC

OPERATIONS SUMMARY

From	To	Time	Operation
			Prepared rig. Completed audit. Held prespud meeting with crews. Spudded well at 0230 hrs
0230	0530	3.0	Drilled 216mm hole f/0 to 100m
0530	0630	1.0	Rig repair to upper kelly cock and hydraulic bundle.
0630	1000	3.5	Drilled 216mm hole f/100m to 130m
1000	1030	0.5	Circulated hole clean.
1030	1200	1.5	Wiper trip
1200	1230	0.5	Circulated hole clean.
1230	1430	2.0	POH
1430	1600	1.5	Rigged to run casing. Moved rig.
1600	1800	2.0	Ran 10 jts 23# 178mm casing to 125m.
1800	1830	0.5	Circulated casing.
1830	1930	1	Rig repair to cement pump.
1930	2030	1	Mixed and pumped 16bbl 15.4ppg cement. Displaced with mud. Bumped plug with 7000 Kpa. Float held.
2030	2400	3.5	WOC. Removed conductor. Mixed and pumped 7bbl cement. Grouted top job.

CHEMICALS USED

Type	Unit Size	Qty
Aquagel	25 kg	80
Caustic soda	25 kg	3
CMC EHV	25 kg	4
Barite	25 kg	
Pot Chloride	25 kg	40
XCD Polymer	25 kg	2

SURVEYS

Depth	Incl	Azm
130m	0.5	

PUMP DATA

SPM	34	st/min
Output	920	l/min
Pressure	2400	kPa
AV DP		m/min
AV DC		m/min

Supervisor: Peter Dwyer

LAKES OIL NL

DAILY DRILLING REPORT

Well:	**Investigator-1**	Report No:	**2**	Date:	**7-Oct-99**
2400 hr Depth:	**381m**	Last Depth:	**130m**	Day Progress:	**251m**
Total Fuel:		Fuel Usage:		Daily Cost:	**$19,788**
				Cumm Cost:	**$136,700**

0600 hr Operations: Drilling 156mm hole at 465m
Remarks: No LTA's

BIT INFORMATION		
Bit Number	2	
Size (mm)	156	
Make	Varel	
Type	L217	
IADC Code	2.1.7	
Serial Number	128048	
Nozzles (mm)	3x11	
Depth In (m)	130	
Depth Out (m)		
Total Metres	251	
Total Hours	9.5	
WOB (dN)	1.5	
RPM	100	
Condition		
HSI		
JV (m/sec)		

OPS BREAKDOWN (hrs)	
Drilling	9.5
Tripping	3.0
Surveys	
FIT	0.5
Drill Cement	1.0
Circ Sample	
Repair Mudlog	1.0
Cementing	
Wireline	
Circ & Cond	
Rig Service	
Moved rig	2.0
Rig repairs	
WOC	1.5
BOP's	5.5
Total	24.0

MUD PROPERTIES		
Density	1.12	SG
Viscosity	38	sec
Water Loss	10.2	ml
pH	10.5	strip
Filter Cake	2	mm
PV/YP	8/30	cp/Pa
Gels	10/16	10s/10m
Sand	0.5	%
Solids		%
K+	9000	mg/l
Chlorides	8000	mg/l
Calcium	85	mg/l
PHPA		kg/m3
Day Cost	$690	
Cumm Cost	$3.626	

BHA: Bit, bit sub with float, 2 x 6" DC's, stabiliser, 1 x 6" DC

OPERATIONS SUMMARY			
From	To	Time	Operation
0000	0130	1.5	WOC
0130	0230	1.0	Installed casing head.
0230	0600	3.5	Installed BOP's. Function tested.
0600	0800	2.0	Moved rig over hole
0800	0900	1.0	Tested BOP's to 1500/7000kPa
0900	1200	3.0	Made up 156mm BHA. RIH
1200	1300	1.0	Drilled plug, shoe.
1300	1330	0.5	Circulated hole. Ran FIT to 11.5 ppge
1330	1730	4.0	Drilled 156mm hole f/131m to 218m
1730	1830	1.0	Repaired Geoservices air line
1830	2400	5.5	Drilled 156mm hole f/218m to 381m

CHEMICALS USED		
Type	Unit Size	Qty
Aquagel	25 kg	8
Caustic soda	25 kg	1
CMC EHV	25 kg	
Barite	25 kg	
Pot Chloride	25 kg	40
XCD Polymer	25 kg	

SURVEYS		
Depth	Incl	Azm

PUMP DATA		
SPM	34	st/min
Output	22	l/min
Pressure	4900	kPa
AV DP		m/min
AV DC		m/min

Supervisor: Peter Dwyer

915181 020

LAKES OIL NL

DAILY DRILLING REPORT

Well:	**Investigator-1**	Report No:	**3**	Date:	**8-Oct-99**
2400 hr Depth:	**639m**	Last Depth:	**381m**	Day Progress:	**258m**
Total Fuel:		Fuel Usage:		Daily Cost:	**$15,216**
				Cumm Cost:	**$152,589**

0600 hr Operations: Drilling 156mm hole at 685m
Remarks: No LTA's

BIT INFORMATION		
Bit Number	2	
Size (mm)	156	
Make	Varel	
Type	L217	
IADC Code	2.1.7	
Serial Number	128048	
Nozzles (mm)	3x11	
Depth In (m)	130	
Depth Out (m)		
Total Metres	555	
Total Hours	27	
WOB (dN)	1.5	
RPM	100	
Condition		
HSI		
JV (m/sec)		

OPS BREAKDOWN (hrs)	
Drilling	17.5
Tripping	3.5
Surveys	
FIT	
Drill Cement	
Circ Sample	0.5
Repair Mudlog	
Cementing	
Wireline	
Circ & Cond	
Rig Service	
Moved rig	
Rig repairs	2.5
WOC	
BOP's	
Total	24.0

MUD PROPERTIES		
Density	1.13	SG
Viscosity	41	sec
Water Loss	9.8	ml
pH	10.0	strip
Filter Cake	2	mm
PV/YP	16/18	cp/Pa
Gels	10/16	10s/10m
Sand	0.5	%
Solids		%
K+	15000	mg/l
Chlorides	13500	mg/l
Calcium	85	mg/l
PHPA		kg/m3
Day Cost	$806	
Cumm Cost	$4,432	

BHA: Bit, bit sub with float, 2 x 6" DC's, stabiliser, 1 x 6" DC

OPERATIONS SUMMARY

From	To	Time	Operation
0000	0200	2.0	Drilled 156mm hole f/381m to 425m
0200	0330	1.5	Rig repair to standpipe
0330	0930	6.0	Drilled 156mm hole f/425m to 497m
0930	1030	1.0	Rig repair to hoist chains
1030	1400	3.5	Wiper trip to shoe. Hole good
1400	2100	7.0	Drilled 156mm hole f/497m to 588m
2100	2130	0.5	Circulated sample
2130	2400	2.5	Drilled 156mm hole f/588m to 639m

CHEMICALS USED

Type	Unit Size	Qty
QBII	25 kg	8
Caustic soda	25 kg	
CMC EHV	25 kg	
Barite	25 kg	
Pot Chloride	25 kg	40
XCD Polymer	25 kg	

SURVEYS

Depth	Incl	Azm

PUMP DATA

SPM	34	st/min
Output	22	l/min
Pressure	5200	kPa
AV DP		m/min
AV DC		m/min

Supervisor: Peter Dwyer

LAKES OIL NL — DAILY DRILLING REPORT

Well:	**Investigator-1**	Report No:	**4**	Date:	**9-Oct-99**
2400 hr Depth:	**697m**	Last Depth:	**639m**	Day Progress:	**58m**
Total Fuel:		Fuel Usage:		Daily Cost:	**$18,820**
				Cumm Cost:	**$173,009**

0600 hr Operations: RIH with DP
Remarks: No LTA's

BIT INFORMATION		
Bit Number	2	
Size (mm)	156	
Make	Varel	
Type	L217	
IADC Code	2.1.7	
Serial Number	128048	
Nozzles (mm)	3x11	
Depth In (m)	130	
Depth Out (m)	697	
Total Metres	567	
Total Hours	36.5	
WOB (dN)	1.5	
RPM	100	
Condition	6.3.I	
HSI		
JV (m/sec)		

OPS BREAKDOWN (hrs)	
Drilling	9.5
Tripping	7.0
Surveys	
FIT	
Drill Cement	
Circ Sample	0.5
Repair Mudlog	
Cementing	
Wireline	6.5
Circ & Cond	0.5
Rig Service	
Moved rig	
Rig repairs	
WOC	
BOP's	
Total	24.0

MUD PROPERTIES		
Density	1.13	SG
Viscosity	41	sec
Water Loss	9.8	ml
pH	10.0	strip
Filter Cake	2	mm
PV/YP	16/18	cp/Pa
Gels	10/16	10s/10m
Sand	0.5	%
Solids		%
K+	15000	mg/l
Chlorides	13500	mg/l
Calcium	85	mg/l
PHPA		kg/m3
Day Cost	$1,922	
Cumm Cost	$6,554	

BHA: Bit, bit sub with float, 2 x 4-3/4" DC's, stabiliser, 1 x 6" DC

OPERATIONS SUMMARY

From	To	Time	Operation
0000	0100	1.0	Drilled 156mm hole f/639m to 651m
0100	0130	0.5	Circulated sample
0130	1000	8.5	Drilled 156mm hole f/651m to 697m
1000	1200	2.0	Made wiper trip to 490m
1200	1230	0.5	Circulated hole clean
1230	1730	5.0	POH
1730	2400	6.5	Rigged up wireline. Ran Elogs

CHEMICALS USED

Type	Unit Size	Qty
QBII	25 kg	2
Caustic soda	25 kg	2
CMC EHV	25 kg	
Aquagel	25 kg	-5
Pot Chloride	25 kg	
XCD Polymer	25 kg	

SURVEYS

Depth	Incl	Azm
697m	1.0	

PUMP DATA

SPM		st/min
Output		l/min
Pressure		kPa
AV DP		m/min
AV DC		m/min

Supervisor: Peter Dwyer

915181 022

LAKES OIL NL

DAILY DRILLING REPORT

Well:	**Investigator-1**	Report No:	**5**	Date:	**10-Oct-99**
2400 hr Depth:	**697m**	Last Depth:	**697m**	Day Progress:	**0**
Total Fuel:		Fuel Usage:		Daily Cost:	**$77,090**
				Cumm Cost:	**$250,099**

0600 hr Operations: Rig released
Remarks: No LTA's

BIT INFORMATION		
Bit Number		
Size (mm)		
Make		
Type		
IADC Code		
Serial Number		
Nozzles (mm)		
Depth In (m)		
Depth Out (m)		
Total Metres		
Total Hours		
WOB (dN)		
RPM		
Condition		
HSI		
JV (m/sec)		

OPS BREAKDOWN (hrs)	
Drilling	
Tripping	5.0
Surveys	
FIT	
Drill Cement	
Circ Sample	
Repair Mudlog	
Cementing	2.0
Wireline	4.0
Circ & Cond	0.5
Rig Service	
Tag/test	0.5
Rig repairs	
WOC	4.0
BOP's	1.0
Total	17.0

MUD PROPERTIES		
Density		SG
Viscosity		sec
Water Loss		ml
pH		strip
Filter Cake		mm
PV/YP		cp/Pa
Gels		10s/10m
Sand		%
Solids		%
K+		mg/l
Chlorides		mg/l
Calcium		mg/l
PHPA		kg/m3
Day Cost		
Cumm Cost	$6,554	

BHA:

OPERATIONS SUMMARY

From	To	Time	Operation
0000	0400	4.0	Ran Elogs. Rigged down.
0400	0630	2.5	RIH with DP to 623m
0630	0700	0.5	Circulated hole clean
0700	0800	1.0	Mixed and pumped 16 bbl 15.4 ppg cement. Displaced over interval 623m to 543m
0800	0830	0.5	POH to 500m. Circulated DP
0830	1000	1.5	POH to 162m. Circulated DP
1000	1100	1.0	Mixed and pumped 16 bbl 15.4 ppg cement. Displaced over interval 162m to 85m
1100	1130	0.5	POH
1130	1530	4.0	WOC
1530	1600	0.5	Tagged cement plug at 89m. Tested plug to 500 psi.
1600	1700	1	Laid out BOP. Removed casing head. Welded steel cap on 178mm casing stub
			Rig released at 1700 hrs 10 Oct 99

CHEMICALS USED		
Type	Unit Size	Qty

SURVEYS		
Depth	Incl	Azm

PUMP DATA		
SPM		st/min
Output		l/min
Pressure		kPa
AV DP		m/min
AV DC		m/min

Supervisor: Peter Dwyer

APPENDIX 3

DETAILED CUTTINGS DESCRIPTIONS

APPENDIX 3

DETAILED CUTTINGS DESCRIPTIONS

WELL: INVESTIGATOR-1 PERMIT: PEP 136 VIC

DEPTH (m)	%	CUTTINGS DESCRIPTION 8.5" Hole Section Geologist: J. Gausden
20	100	SANDSTONE: white to very light grey, unconsolidated, fine to coarse grained, predominantly fine to medium grained, sub rounded moderate sphericity clear to cloudy quartz, trace iron stained quartz, trace dark grey lithic grains, inferred very good porosity.
30	100	SANDSTONE: generally as above, predominantly coarse to very coarse grained, trace with moderate yellowish brown ferruginous argillaceous matrix.
40	100	SANDSTONE: pale yellowish orange to greyish yellow, unconsolidated, medium to very coarse grained, moderate to minor low sphericity clear to cloudy quartz, common yellowish orange argillaceous matrix adhering to grains, trace dark grey, dark brown, & black lithic grains, inferred good porosity.
50	100	SANDSTONE: as above.
60	100	SANDSTONE: as above, trace silver black mica, trace to rare ferruginous argillaceous cement / matrix.
70	95 5	SANDSTONE: generally as above, includes 5% coarse greenish black mica flakes. COAL: black, soft to brittle, woody texture, common very fine disseminated pyrite.
80	100 tr	SANDSTONE: as above. COAL: as above.
90	90 5 5	SANDSTONE: as above. COAL: as above. SILTY CLAYSTONE: medium dark grey, soft, dispersive, abundant quartz silt in argillaceous matrix, trace reddish brown lithic grains, trace calcareous, trace calcareous fossil fragments.
100	80 20	SANDSTONE: light grey, unconsolidated, coarse to very coarse grained, 90% sub angular to sub rounded moderate sphericity quartz, 10% very coarse (rudite) calcareous fossil fragments including gasteropods, bivalves, corals. inferred good porosity (probable dispersive clay matrix) SILTY CLAYSTONE: medium dark grey, soft, dispersive, abundant quartz silt, minor very fine sand, argillaceous matrix, slightly calcareous.
110	60 40	SANDSTONE: generally as above, but 50% quartz, 50% calcareous fossil fragments. ARGILLACEOUS SILTSTONE: olive grey, soft, quartz silt, minor very fine sand, minor to common glauconite, rare carbonaceous grains, trace calcareous grains, trace reddish brown lithics, abundant argillaceous slightly calcareous matrix.
120	50 50	SANDSTONE: (SANDY CALCIRUDITE): very light grey to pinkish grey, unconsolidated, coarse to very coarse grained, 30% quartz, 70% calcareous fossil fragments as above. ARGILLACEOUS SILTSTONE: as above.
130	50 40 10	SANDSTONE: as above. ARGILLACEOUS SILTSTONE: as above. CLAYSTONE: brownish grey, soft, amorphous, silty in part, trace carbonaceous flecks.

WELL: INVESTIGATOR-1 PERMIT: PEP 136 VIC

DEPTH (m)	%	CUTTINGS DESCRIPTION 6.125" Hole Section — Geologist: J. Gausden
140	90	**CALCIRUDITE:** very light grey to medium light grey, very coarse to granule size calcareous fossil fragments predominantly corals and bryozoa rare echinoid spines, bivalves, rarely dolomitic, inferred good porosity.
	10	**ARGILLACEOUS SILTSTONE:** olive grey to dark greenish grey, soft, quartz silt, minor very fine sand, common calcareous grains, minor to common glauconite, rare carbonaceous grains, abundant argillaceous slightly calcareous matrix.
150	100	**CALCIRUDITE:** as above.
160	100	**CALCIRUDITE:** as above.
170	100	**CALCIRUDITE:** as above.
180	100	**CALCIRUDITE:** generally as above, but white to very light grey minor yellowish grey, grading to CALCARENITE, trace very fine glauconite.
190	100	**CALCIRUDITE:** very light grey, rarely medium light grey and yellowish grey, medium to very coarse and granule size calcareous fossil fragments, grading to CALCARENITE, predominantly corals and bryozoa rare echinoid spines, bivalves, trace glauconite, inferred good porosity.
200	100	**CALCIRUDITE:** as above.
210	100	**CALCIRUDITE:** as above.
220	80	**CALCIRUDITE:** as above.
	20	**MARL:** light olive grey, soft, dispersive in part, amorphous, common calcisilt, trace glauconite, grading to ARGILLACEOUS CALCILUTITE.
230	60	**CALCIRUDITE:** as above.
	40	**MARL:** as above.
240	60	**CALCIRUDITE:** as above.
	40	**MARL:** as above.
250	70	**CALCIRUDITE:** as above.
	30	**MARL:** as above.
260	80	**CALCARENITE:** very light grey to medium light grey, medium to very coarse rarely granule size calcareous fossil fragments, grading to CALCIRUDITE, predominantly corals and bryozoa rare echinoid spines, bivalves, trace glauconite, inferred good porosity.
	20	**MARL:** as above.
270	80	**CALCARENITE:** as above.
	20	**MARL:** as above.
280	70	**CALCARENITE:** as above.
	20	**CALCISILTITE:** light grey, firm, silt to very fine sand sized carbonate grains, micritic minor argillaceous matrix, trace glauconite.
	10	**MARL:** as above.
	trace	Coarse clear sub rounded quartz grains.
290	60	**CALCARENITE:** as above.
	30	**CALCISILTITE:** as above.
	10	**MARL:** as above.
300	50	**CALCARENITE:** as above.
	40	**CALCISILTITE:** as above, light greenish grey in part.
	10	**MARL:** as above.

310	50	CALCARENITE: as above, rare foraminifera.
	40	CALCISILTITE: light greenish grey, firm, silt to very fine sand sized carbonate grains, micritic minor argillaceous matrix, trace glauconite, nil visible porosity. FLUORESCENCE: 100% pale yellow direct fluorescence, no cut, no crush cut, no residue, interpreted as carbonate mineral fluorescence.
	10	MARL: as above.
	trace	Medium to coarse, clear, sub rounded quartz grains.
320	50	CALCARENITE: as above.
	30	CALCISILTITE: as above.
		FLUORESCENCE: 80% mineral fluorescence as above.
	20	MARL: as above.
	trace	Medium to coarse, clear, sub rounded quartz grains.
330	40	CALCARENITE: as above.
	30	CALCISILTITE: as above.
		FLUORESCENCE: 80% mineral fluorescence as above.
	30	MARL: light olive grey to greenish grey, soft, dispersive in part, amorphous, common calcisilt, trace glauconite.
340	40	CALCARENITE: very light grey to medium light grey, medium to very coarse rarely granule size calcareous fossil fragments, predominantly corals and bryozoa rare echinoid spines, bivalves, foraminifera, trace glauconite, inferred poor porosity.
	20	CALCISILTITE: as above.
		FLUORESCENCE: 80% mineral fluorescence as above.
	40	MARL: as above.
350	40	CALCARENITE: as above.
	20	CALCISILTITE: as above.
		FLUORESCENCE: 80% mineral fluorescence as above.
	40	MARL: as above.
360	40	CALCARENITE: as above.
	20	CALCISILTITE: as above.
	40	MARL: as above.
370	40	CALCARENITE: as above.
	10	CALCISILTITE: as above.
	50	MARL: as above.
380	40	CALCARENITE: as above.
	10	CALCISILTITE: as above.
	50	MARL: as above..
390	30	CALCARENITE: very light grey to light grey, very fine to very coarse grained bioclastic fragments, predominantly corals, trace foraminifera, trace glauconite, inferred poor porosity.
	20	CALCISILTITE: as above.
	50	MARL: as above.
400	30	CALCARENITE: as above.
	20	CALCISILTITE: as above.
	50	MARL: light olive grey to greenish grey, soft, dispersive in part, amorphous, common calcisilt, minor bioclastic fragments, trace glauconite.
410	40	CALCARENITE: as above.
	20	CALCISILTITE: light grey, firm, silt to very fine sand sized carbonate grains, micritic minor argillaceous matrix, trace glauconite.
	40	MARL: as above.
420	40	CALCARENITE: as above.
	20	CALCISILTITE: as above.
	40	MARL: as above.

430	40	**CALCARENITE:** as above.
	10	**CALCISILTITE:** as above.
	40	**MARL:** as above.
	10	**CALCAREOUS SILTY CLAYSTONE:** medium grey to olive grey, firm, common very fine calcareous fragments, quartz silt, minor glauconite, argillaceous slightly micritic matrix.
	trace	**CLAYSTONE:** medium dark grey, soft, amorphous, common micrite, silty in part.
		FLUORESCENCE: 20% pale yellow mineral fluorescence.
440	30	**CALCARENITE:** as above.
	10	**CALCISILTITE:** as above.
	30	**MARL:** as above.
	20	**CALCAREOUS SILTY CLAYSTONE:** as above.
	10	**CLAYSTONE:** as above.
		FLUORESCENCE: 20% pale yellow mineral fluorescence.
450	20	**CALCARENITE:** as above, trace medium sub rounded clear quartz..
	10	**CALCISILTITE:** as above.
	30	**MARL:** as above.
	30	**CALCAREOUS SILTY CLAYSTONE:** as above, rare fine glauconite.
	10	**CLAYSTONE:** as above.
		FLUORESCENCE: 20% pale yellow mineral fluorescence.
460	30	**CALCARENITE:** as above, trace medium sub rounded clear quartz..
	10	**CALCISILTITE:** as above.
	20	**MARL:** as above.
	30	**CALCAREOUS SILTY CLAYSTONE:** as above, rare fine glauconite.
	10	**CLAYSTONE:** as above.
		FLUORESCENCE: 20% pale yellow mineral fluorescence.
470	30	**CALCARENITE:** as above, trace medium sub rounded clear quartz.
	20	**MARL:** as above.
	30	**CALCAREOUS SILTY CLAYSTONE:** as above, rare fine glauconite.
	20	**CLAYSTONE:** as above.
480	20	**CALCARENITE:** as above.
	30	**MARL:** as above.
	30	**CALCAREOUS SILTY CLAYSTONE:** as above.
	20	**CLAYSTONE:** as above.
485	20	**CALCARENITE:** as above.
	20	**MARL:** as above.
	30	**CALCAREOUS SILTY CLAYSTONE:** as above.
	30	**CLAYSTONE:** medium dark grey, brownish grey in part, soft, amorphous to sub fissile, common micrite, grades to CALCAREOUS CLAYSTONE in part, silty in part.
490	20	**CALCARENITE:** as above.
	30	**MARL:** light olive grey to greenish grey, mottled medium grey in part, soft to firm, dispersive in part, amorphous, minor bioclastic fragments and calcareous flecks, grades to CALCAREOUS CLAYSTONE in part, trace glauconite.
	20	**CALCAREOUS SILTY CLAYSTONE:** as above.
	30	**CLAYSTONE:** as above.
495	20	**CALCARENITE:** as above.
	20	**MARL:** as above.
	20	**CALCAREOUS SILTY CLAYSTONE:** as above.
	40	**CLAYSTONE:** as above.

500	20	**CALCARENITE:** as above.
	20	**MARL:** as above.
	20	**CALCAREOUS SILTY CLAYSTONE:** as above.
	40	**CLAYSTONE:** as above
		Wiper trip to shoe @ 498mKB.
505	10	**CALCARENITE:** as above.
	40	**MARL:** as above.
	10	**CALCAREOUS SILTY CLAYSTONE:** as above.
	40	**CLAYSTONE:** as above
510	10	**CALCARENITE:** as above.
	50	**MARL:** light olive grey to dark greenish grey, mottled medium grey in part, soft to firm, dispersive in part, amorphous, minor bioclastic fragments and calcareous flecks, grades to CALCAREOUS CLAYSTONE in part, trace glauconite, trace foraminifera.
	40	**CLAYSTONE:** as above
515	10	**CALCARENITE:** as above.
	40	**MARL:** as above.
	50	**CLAYSTONE:** medium dark grey to brownish black, soft to firm, amorphous to sub fissile, trace to common micrite, grades to CALCAREOUS CLAYSTONE in part, silty in part.
520	50	**MARL:** as above.
	50	**CLAYSTONE:** as above.
		(10% CALCARENITE interpreted as cavings)
525	50	**MARL:** as above.
	50	**CLAYSTONE:** as above.
530	50	**MARL:** as above.
	50	**CLAYSTONE:** as above.
	tr	fine to medium sub rounded quartz grains.
535	50	**MARL:** as above.
	50	**CLAYSTONE:** as above.
540	50	**MARL:** as above.
	50	**CLAYSTONE:** as above.
	tr	fine to medium sub rounded to sub angular quartz grains.
545	50	**MARL:** as above.
	50	**CLAYSTONE:** as above.
	tr	fine to medium sub rounded to sub angular quartz grains.
550	50	**MARL:** as above.
	50	**CLAYSTONE:** as above.
	tr	fine to medium sub rounded to sub angular quartz grains.
555	40	**MARL:** as above.
	50	**CLAYSTONE:** as above.
	10	**SANDSTONE:** single grains, fine to coarse grained, poorly sorted, clear to yellowish translucent sub rounded to sub angular quartz, rare fine to medium glauconite pellets, trace pyrite, inferred fair porosity, no show.
560	30	**MARL:** as above.
	70	**CLAYSTONE:** brownish grey to olive grey, soft to firm, minor to common quartz silt, grading to SILTY CLAYSTONE in part, minor micrite, trace to minor glauconite.
	tr	**SANDSTONE:** as above.

565	20	**MARL:** as above.
	70	**CLAYSTONE:** as above.
	10	**GLAUCONITIC SANDSTONE:** single grains, fine to medium glauconite pellets, minor clear fine to medium sub rounded to sub angular quartz, rare nodular pyrite, inferred fair porosity, no show.
570	20	**MARL:** as above.
	75	**CLAYSTONE:** as above.
	5	**GLAUCONITIC SANDSTONE:** as above.
573	20	**MARL:** as above.
	75	**CLAYSTONE:** as above.
	5	**GLAUCONITIC SANDSTONE:** as above.
576	20	**MARL:** as above.
	70	**CLAYSTONE:** as above.
	10	**GLAUCONITIC SANDSTONE:** as above.
579	10	**MARL:** as above.
	50	**CLAYSTONE:** as above.
	20	**GLAUCONITIC SANDSTONE:** as above.
	20	**SIDERITIC SILTSTONE:** moderate brown to olive grey, hard, quartz silt, rare very fine to fine quartz sand, common calcareous grains, rare to minor glauconite, trace pyrite, abundant strong sideritic cement, tight, no show.
582	10	**MARL:** as above.
	40	**CLAYSTONE:** as above.
	30	**GLAUCONITIC SANDSTONE:** as above, grading to quartz sand with common glauconite.
	20	**SIDERITIC SILTSTONE:** as above, grading to sideritic very fine to fine SANDSTONE in part.
585	90	**SANDSTONE:** very light grey, returned as single grains, fine to very coarse grained, predominant medium to coarse grained, sub rounded moderate sphericity clear and frosted quartz, rare glauconite, rare nodular pyrite, inferred very good porosity, no show.
	10	**SIDERITIC SILTSTONE:** moderate brown to olive grey, hard, quartz silt, common very fine to fine quartz sand, grading to SANDSTONE in part, common calcareous grains, rare to minor glauconite, trace pyrite, abundant strong sideritic cement, tight, no show.
588	90	**SANDSTONE:** as above, trace medium dark grey coarse lithic grains.
	10	**SIDERITIC SILTSTONE:** as above.
591	90	**SANDSTONE:** as above.
	10	**COAL:** brownish black, soft, amorphous to blocky, minor very fine crystalline pyrite.
594	80	**SANDSTONE:** as above, common very fine crystalline pyrite cement.
	15	**SIDERITIC SILTSTONE:** as above.
	5	**COAL:** as above.
597	85	**SANDSTONE:** generally as above, common yellow brown stained quartz, no show.
	5	**SIDERITIC SILTSTONE:** as above.
	10	**COAL:** as above.
600	60	**SANDSTONE:** very light grey to pale yellowish brown, returned as single grains, fine to very coarse grained, predominant medium to coarse grained, sub rounded moderate sphericity clear and frosted quartz, common argillaceous carbonaceous staining, rare nodular pyrite, inferred very good porosity, no show.
	40	**COAL:** as above.
603	40	**SANDSTONE:** as above.
	60	**COAL:** as above.
606	50	**SANDSTONE:** as above.
	50	**COAL:** as above.

609	90 10	**SANDSTONE:** as above, trace medium dark grey lithic grains. **COAL:** as above.
612	90 10	**SANDSTONE:** as above, trace medium dark grey lithic grains. **COAL:** as above.
615	100	**SANDSTONE:** as above.
618	100	**SANDSTONE:** as above.
621	100	**SANDSTONE:** as above, trace moderate brown rounded coarse lithic grains.
624	100	**SANDSTONE:** as above.
627	90 10	**SANDSTONE:** as above. **COAL:** as above.
630	50 50	**SANDSTONE:** very light grey, returned as single grains, fine to very coarse grained, predominant medium to coarse grained, sub rounded moderate sphericity clear and frosted quartz, argillaceous carbonaceous staining, trace nodular pyrite, inferred very good porosity, no show. **COAL:** brownish black, soft, amorphous to blocky.
633	30 70	**SANDSTONE:** as above. **COAL:** as above.
636	40 60	**SANDSTONE:** as above. **COAL:** as above.
639	90 10	**SANDSTONE:** as above. **COAL:** as above.
642	95 5	**SANDSTONE:** as above, predominantly coarse to very coarse grained. **COAL:** as above.
645	90 10	**SANDSTONE:** as above. **COAL:** as above.
648	95 5 tr	**SANDSTONE:** as above. **COAL:** as above. **SILTSTONE:** medium grey, quartz silt grading to very fine sand, common silica cement, minor calcareous cement, rare carbonaceous material, no visible porosity, no show.
651	95 5	**SANDSTONE:** as above, predominantly coarse to very coarse grained. **COAL:** as above.
654	90 10	**SANDSTONE:** as above. **COAL:** as above.
657	95 5	**SANDSTONE:** very light grey, returned as single grains, fine to very coarse grained, predominant medium to coarse grained, sub rounded to sub angular, moderate sphericity clear and frosted quartz, trace quartz overgrowths, trace nodular pyrite, inferred very good porosity, no show. **COAL:** as above.
660	95 5	**SANDSTONE:** as above. **COAL:** as above, interpreted as cavings.
663	100	**SANDSTONE:** as above.
666	100 tr	**SANDSTONE:** as above. **CLAYSTONE:** medium light grey, silvery sheen, firm, fissile, abundant mica and micromica. (Possibly weathered basement, phyllitic shale)
669	20 30 50	**CLAYSTONE: (Phyllitic Slate):** medium silvery grey, hard, sub fissile, abundant micromica. **SANDSTONE (Indurated):** medium light grey, hard, very fine to fine grained, grain boundaries indistinct, strong silica cement, rare pyrite cement and very fine crystalline vein pyrite, trace vein quartz, argillaceous micromicaceous matrix in part, tight, no show. Cavings

672	30	**CLAYSTONE: (Phyllitic Slate):** as above.
	40	**SANDSTONE (Indurated):** as above.
	30	Cavings
675	30	**CLAYSTONE: (Phyllitic Slate):** as above.
	50	**SANDSTONE (Indurated):** as above.
	20	Cavings
678	30	**CLAYSTONE: (Phyllitic Slate):** as above.
	60	**SANDSTONE (Indurated):** as above.
	10	Cavings
681	20	**CLAYSTONE: (Phyllitic Slate):** as above.
	60	**SANDSTONE (Indurated):** as above, trace white feldspar, minor pyrite cement and veinlets.
	20	Cavings
684	20	**CLAYSTONE: (Phyllitic Slate):** as above.
	60	**SANDSTONE (Indurated):** medium light grey, minor dark grey, hard, very fine to fine grained quartz, minor dark grey smoky quartz, grain boundaries indistinct, trace white feldspar, strong silica cement, rare to minor pyrite cement and very fine crystalline vein pyrite, trace vein quartz, argillaceous micromicaceous matrix in part, tight, no show.
	20	Cavings
687	20	**CLAYSTONE: (Phyllitic Slate):** as above.
	60	**SANDSTONE (Indurated):** as above.
	20	Cavings
690	20	**CLAYSTONE: (Phyllitic Slate):** as above.
	60	**SANDSTONE (Indurated):** as above.
	20	Cavings
693	20	**CLAYSTONE: (Phyllitic Slate):** as above.
	60	**SANDSTONE (Indurated):** as above.
	20	Cavings
696	20	**CLAYSTONE: (Phyllitic Slate):** as above.
	60	**SANDSTONE (Indurated):** as above.
	20	Cavings
697	20	**CLAYSTONE: (Phyllitic Slate):** as above.
TD	60	**SANDSTONE (Indurated):** as above.
	20	Cavings
Reached TD 697 mKB @ 09:45 hrs, 9/10/1999		

APPENDIX 4

AMDEL
WATER ANALYSIS

Amdel Limited
A.C.N. 008 127 802

Petroleum Services
PO Box 338
Torrensville Plaza SA 5031

Telephone: (08) 8416 5240

23 February 2000

915181 033

Lakes Oil NL
PO Box 300
MELBOURNE VIC 8007

Attention: Jack Mulready

REPORT LQ8716 Pt 2

CLIENT REFERENCE: Request

WELL NAME/RE: Investigator-1

MATERIAL: Water Sample

WORK REQUIRED: Water Analysis

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

1. INTRODUCTION

One (1) sample was received on 7th February 2000 for standard water analysis (WA-10-01). All analyses were performed in accordance with APHA methods (19th Edition). This report is a formal presentation of results forwarded by facsimile on 15th February 2000.

2. RESULTS

The results are presented on the following page.

amdel

Petroleum Services

TABLE 1 - WATER ANALYSIS

JOB NUMBER: 8716

WELL / ID: INVESTIGATOR-1
SAMPLE TYPE: Water
SAMPLE POINT: Sump at well site
DATE COLLECTED:
DATE RECEIVED: 07/02/00

FORMATION:
INTERVAL:
COLLECTED BY: Client

915161 035

PROPERTIES:

pH (measured) = 7.7
Resistivity (Ohm.M @ 25°C) = 0.88
Electrical Conductivity (µS/cm @ 25°C) = 11320
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	ANIONS		mg/L	meq/L
Ammonium	as NH_4	na	na	Bromide	as Br	na	na
Potassium	as K	2600	66.50	Chloride	as Cl	3152	88.79
Sodium	as Na	1100	47.85	Fluoride	as F	na	na
Barium	as Ba	na	na	Hydroxide	as OH	nd	nd
Calcium	as Ca	nd	nd	Nitrite	as NO_2	na	na
Iron	as Fe	na	na	Nitrate	as NO_3	nd	nd
Magnesium	as Mg	nd	nd	Sulphide	as S	na	na
Strontium	as Sr	na	na	Bicarbonate	as HCO_3	462	7.57
Boron	as B	na	na	Carbonate	as CO_3	nd	nd
				Sulphite	as SO_3	na	na
				Sulphate	as SO_4	454	9.45
Total Cations		3700	114.34	**Total Anions**		4068	105.82

DERIVED PARAMETERS

a) Ion Balance (Diff*100/Sum) (%) = 3.87
b) Total Alkalinity (calc as $CaCO_3$) (mg/L) = 378
c) Total of Cations + Anions = (measured dissolved salts) 7768
d) Hardness (calc as $CaCO_3$) (mg/L) = not applicable

d) Theoretical Total dissolved salts = (From Electrical Conductivity) 7245

QUALITY CONTROL COMMENTS

Item	Actual Value	Acceptance Criteria	Satisfactory? (Yes/No)
Ion Balance (%) =	3.87	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

PE613787

This is an enclosure indicator page.
The enclosure PE613787 is enclosed within the container PE915181 at this location in this document.

The enclosure PE613787 has the following characteristics:

ITEM_BARCODE	= PE613787
CONTAINER_BARCODE	= PE915181
NAME	= Investigator-1 Composite Well Log (1/2)
BASIN	= GIPPSLAND
OFFSHORE?	= Y
DATA_TYPE	= WELL_LOG
DATA_SUB_TYPE	= HARDCOPY-PAPER
DESCRIPTION	= Sheet One
REMARKS	= 10-OCT-1999
DATE_WRITTEN	=
DATE_PROCESSED	= Lakes Oil N.L.
DATE_RECEIVED	=
RECEIVED_FROM	= 02-FEB-2005
WELL_NAME	=
CONTRACTOR	=
AUTHOR	=
ORIGINATOR	= HW00_SW
TOP_DEPTH	=
BOTTOM_DEPTH	=
ROW_CREATED_BY	=

(Inserted by DNRE - Vic Govt Mines Dept)

PE613788

This is an enclosure indicator page.
The enclosure PE613788 is enclosed within the container PE915181 at this location in this document.

The enclosure PE613788 has the following characteristics:

ITEM_BARCODE = PE613788
CONTAINER_BARCODE = PE915181
NAME = Investigator-1 Composite Well Log (2/2)
BASIN = GIPPSLAND
OFFSHORE? = Y
DATA_TYPE = WELL_LOG
DATA_SUB_TYPE = HARDCOPY-PAPER
DESCRIPTION = Sheet Two
REMARKS = 10-OCT-1999
DATE_WRITTEN =
DATE_PROCESSED = Lakes Oil N.L.
DATE_RECEIVED =
RECEIVED_FROM = 02-FEB-2005
WELL_NAME =
CONTRACTOR =
AUTHOR =
ORIGINATOR = HW00_SW
TOP_DEPTH =
BOTTOM_DEPTH =
ROW_CREATED_BY =

(Inserted by DNRE - Vic Govt Mines Dept)

PE613789

This is an enclosure indicator page.
The enclosure PE613789 is enclosed within the container PE915181 at this location in this document.

The enclosure PE613789 has the following characteristics:

ITEM_BARCODE = PE613789
CONTAINER_BARCODE = PE915181
NAME = Investigator-1 Formation Evaluation Log
BASIN = GIPPSLAND
OFFSHORE? = Y
DATA_TYPE = WELL_LOG
DATA_SUB_TYPE = HARDCOPY-PAPER
DESCRIPTION =
REMARKS = 09-OCT-1999
DATE_WRITTEN =
DATE_PROCESSED = Lakes Oil N.L.
DATE_RECEIVED =
RECEIVED_FROM = 02-FEB-2005
WELL_NAME =
CONTRACTOR =
AUTHOR =
ORIGINATOR = HW00_SW
TOP_DEPTH =
BOTTOM_DEPTH =
ROW_CREATED_BY =

(Inserted by DNRE - Vic Govt Mines Dept)

PE613790

This is an enclosure indicator page.
The enclosure PE613790 is enclosed within the container PE915181 at this location in this document.

The enclosure PE613790 has the following characteristics:

ITEM_BARCODE	= PE613790
CONTAINER_BARCODE	= PE915181
NAME	= Investigator-1 Dual Laterolog
BASIN	= GIPPSLAND
OFFSHORE?	= Y
DATA_TYPE	= WELL_LOG
DATA_SUB_TYPE	= HARDCOPY-PAPER
DESCRIPTION	= Depth Based Data - Maximum sampling increment 10cm.
REMARKS	= 09-OCT-1999
DATE_WRITTEN	=
DATE_PROCESSED	= Lakes Oil N.L.
DATE_RECEIVED	=
RECEIVED_FROM	= 02-FEB-2005
WELL_NAME	= 696.1
CONTRACTOR	= 1
AUTHOR	=
ORIGINATOR	= HW00_SW
TOP_DEPTH	=
BOTTOM_DEPTH	=
ROW_CREATED_BY	=

(Inserted by DNRE - Vic Govt Mines Dept)

915181 040

PE613791

This is an enclosure indicator page.
The enclosure PE613791 is enclosed within the container PE915181 at this location in this document.

The enclosure PE613791 has the following characteristics:

ITEM_BARCODE	= PE613791
CONTAINER_BARCODE	= PE915181
NAME	= Investigator-1 Dual Laterolog
BASIN	= GIPPSLAND
OFFSHORE?	= Y
DATA_TYPE	= WELL_LOG
DATA_SUB_TYPE	= HARDCOPY-PAPER
DESCRIPTION	= Depth Based Data - Maximum sampling increment 10cm.
REMARKS	= 09-OCT-1999
DATE_WRITTEN	=
DATE_PROCESSED	= Lakes Oil N.L.
DATE_RECEIVED	=
RECEIVED_FROM	= 02-FEB-2005
WELL_NAME	= 696.1
CONTRACTOR	= 1
AUTHOR	=
ORIGINATOR	= HW00_SW
TOP_DEPTH	=
BOTTOM_DEPTH	=
ROW_CREATED_BY	=

(Inserted by DNRE - Vic Govt Mines Dept)