LAKES OIL N.L.

(A.C.N. 004 247 214)

as operator for

MIRBOO RIDGE PTY LTD

(A.C.N. 060 663 934)

as permit holder

OPERATIONS PLAN

DRILLING PROPOSAL

MOREYS-1

EXPLORATION WELL

IN

PEP 169

Rev: 2

October 2011

AUTHORISATION

Hereto signed for and on behalf of:

MIRBOO RIDGE PTY LTD
ACN 060 663 934

By its duly appointed authority:

s 25

Name: s 25
Position:
Date: 26th September 2011

s 25

Witness Name: s 25
Position:
Date: 26th September 2011

List of Revisions:

Revision Number	Revision Date	Revised Section	Revision Details	Revised By
0	September 2011	Original	Complete Drilling Program	s 25
1	October 2011	7, 18, EMP	Changes as per DPI comments	
2	October 2011		Changes as per DPI comments	

BRIDGING DOCUMENT
MIRBOO RIDGE PTY LTD TO LAKES OIL N.L.

MIRBOO RIDGE PTY LTD
A.F.I.T. 060 663 934

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Collins Street West
Melbourne Vic. 8007
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7th August 2011

[redacted]
Lakes Oil N.L.
Level 14, 500 Collins St.
Melbourne 3000

Dear [redacted]

PEP 169 - Moreys-1 Drilling Operations

On behalf of Mirboo Ridge Pty Ltd, as Title Holder of PEP 169, I authorize Lakes Oil N.L. to act as operator in relation to conducting the drilling of the Moreys-1 well within our petroleum exploration permit PEP 169. As operator you will be responsible for all relevant activities in relation to the conduction of the workover and ensure that we meet the requirements of the Petroleum Act 1998, the Petroleum Regulations 2011 and the OH&S Act 2004.

This will include the duties necessary as the drilling operator including, but not limited to, the contracting of the required personnel to perform the necessary duties, negotiating and obtaining access with the relevant landowner, notifying and working with the relevant authorities to obtain the necessary approvals and supervising the conduction of the drilling operation.

We look forward to receiving a report on the results and please keep me advised on the progress of this drilling operation.

Yours sincerely,

[redacted]

Chairman
Mirboo Ridge Pty Ltd

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DRILLING PROPOSAL TO DRILL MOREYS-1

1. Prospect Data Sheet

Well Name:	Moreys-1
Permit:	PEP 169, Otway Basin, Victoria
Category:	Exploration well
Reference Map:	Timboon 1:25,000 Topographic 7421-2-2
Location:	AMG Co-ordinates 54 664320 E 5738880 N
Latitude Longitude	38° 29'00" S 142° 53'02" E
Seismic Line:	Heytesbury-Nirranda 3D (X-Line 2848, In-Line 10487)
Elevation:	G.L. 81m ASL
Objectives:	Flaxman's Formation Waarre "C" Sand Eumeralla Formation
Depth to Top Flaxmans Formation:	Top at approx. 1612m MSL
Depth to Top Waarre "C" Sand:	Top at Approx. 1645m MSL
Depth to Top Eumeralla Formation:	Top at Approx. 1750m MSL
Program Goal:	The objectives of the well are to test the significant amplitude anomalies present within the Flaxmans Formation and the underlying Warre "C" Sands observed within the 3D seismic dataset and to test the reservoir potential of the Eumeralla Formation at this location. The Waarre "C" Sands are the main producing reservoir across the greater Port Campbell Embayment.
Proposed Total Depth:	2000mGL
Estimated Drilling Cost:	[redacted]
Proposed Timing:	4th Quarter 2011
Proposed Duration:	Approx 3 weeks

2. Location

The Moreys-1 wellsite is located approximately 3km to the west of the township of Brucknell, approximately 18km to the northwest of the township of Port Campbell in the onshore Otway Basin. The wellsite is covered by the Heytesbury-Nirranda 3D Seismic Survey shot in 2001 with the well being sited at the intersection of X-Line 2848 and In-Line 10487. The wellsite is situated in the trough between the two main hydrocarbon producing areas in the Port Campbell Embayment. The wellsite is located close to the McIntee-1 and Tregony-1 discoveries which lie to the west and east of the proposed site respectively. The wellsite is situated on cleared grazing land used for dairy farming.

Address: Crown Allotment 85A, Corangamite Shire, Parish of Brucknell, County of Heytesbury.

Access to the site is via an established farm track running off the Timboon-Nullawarre Rd, a two lane road linking the townships of Brucknell and Nirranda East (Figure 1). Earthworks will involve establishing a gravel pad and upgrading part of the access track and the excavation of the sumps, cellar and flare pit. The rig camp will be situated on the same property approximately 300m to the south of the wellsite.

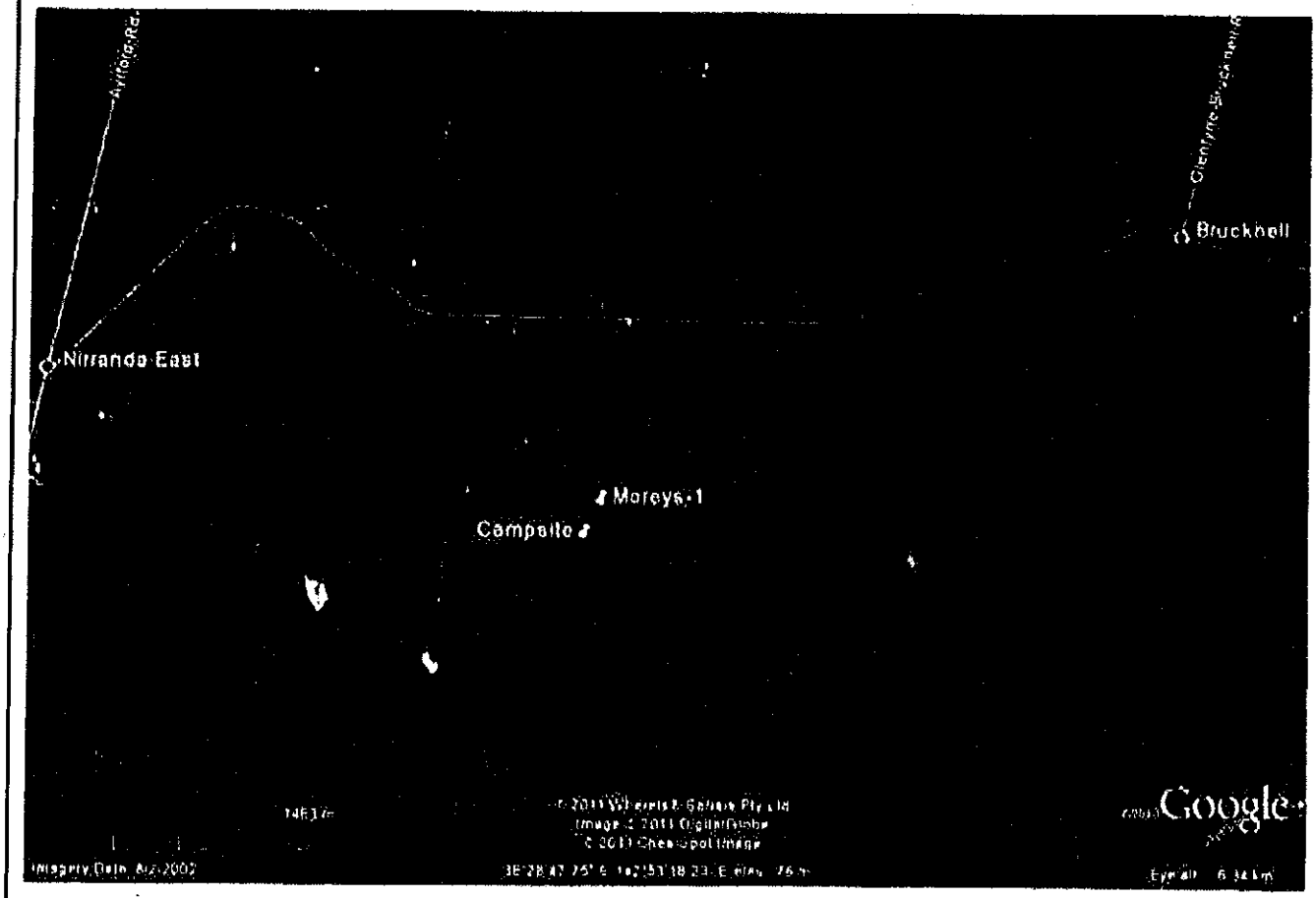

Figure 1. Moreys-1 Wellsite and Campsite Location Map

3. Regional Geology

The Otway Basin formed as a series of west-northwest trending extensional half-grabens along the south-eastern margin of the Australian continent as a result of the onset of rifting between Australia and Antarctica during the Late Jurassic. The basin covers an area of over 150,000 km^2, of which two-thirds is offshore, stretching from Cape Jaffa in the west to the Mornington Peninsula High (a NE-SW trending basement feature) in the east. The northern margin is taken as the limit of the Early Cretaceous/Tertiary deposition, roughly 60km onshore from the coast. The southern margin is generally accepted as the continental shelf, as the margin lies some 200-300km offshore in deep water and is, at present, poorly defined by seismic.

The stratigraphy, especially in the eastern Otway Basin, is poorly constrained due to a lack of deep (basement penetrating) wells and is based on outcrops of Eumeralla Formation in the uplifted areas and from the few deep wells drilled in the eastern half of the basin. Wedge shaped packages of locally derived, fluvial, quartz-rich arkosic sands (Pretty Hill Formation) were the first sediments deposited, in the lows formed by the developing half-grabens, before the basin was flooded with volcanoclastic sediments (Eumeralla Formation) transported into the basin from the east via a major fluvial braided river system. These sediments include both channel sandstones and overbank/floodplain and lacustrine mudstones.

The Late Cretaceous Sherbrook Group unconformably overlies the Eumeralla Formation following a significant period of uplift and erosion which resulted in the Otway Unconformity. The Waarre Formation is the basal formation of the Sherbrook Group and it is characterized by clean, quartzose sandstones, conglomerates, and minor siltstone and shale. It can be upwards of 600m thick in the offshore and is the main target reservoir sequence in the Port Campbell area. The Waarre Formation is characterized by four sand units labeled A through to D with the Waarre "C" Sands exhibiting the best reservoir characteristics and greatest reserves. The Waarre Formation is overlain by the Flaxman Formation which represents the first marine transgressive unit of the Sherbrook Group. It is typically an interbedded sand/shale unit dominantly composed of dark grey silty mudstone and fine grained grey brown sandstones with distinctive 'floating quartz' from coarse sand to pebbles and irregular Glauconite rich intervals. The uniform pyritic marine shale of the Belfast mudstone conformably overlies the Flaxman Formation and it passes conformably into the Nullawarre Greensand which is a distinctive green, glauconitic sandstone that occurs widely but sporadically in the Port Campbell and Tyrendarra Embayment's.

The Pebble Point Formation represents the earliest Tertiary sediment in the Otway Basin, and occurs as a pebbly conglomerate often directly overlying Otway Group. The Pember Mudstone of the Dilwyn Formation overlies the Pebble Point Formation, and occurs as a tan brown to grey shale which is dolomitic and slightly carbonaceous. The Dilwyn itself occurs as clear quartz sandstone. The Mepunga, Narrawaturk and Clifton Formations of the Oligocene Nirranda Group overlie the Dilwyn Formation. Within the Torquay area the Nirranda Group is represented by the Demons Bluff Formation.

The Gellibrand Marl and Port Campbell Limestone of the Heytesbury Group, and the Point Addis Limestone, Jan Juc Marl and Puebla Clay of the Torquay Group overlie the above, and represent open marine cool water carbonate conditions within the Otway Basin and Torquay Sub-Basin. These sediments were overlain by Eocene and Oligocene volcanics followed by Pliocene to Recent aged gravels and ferrugious sands.

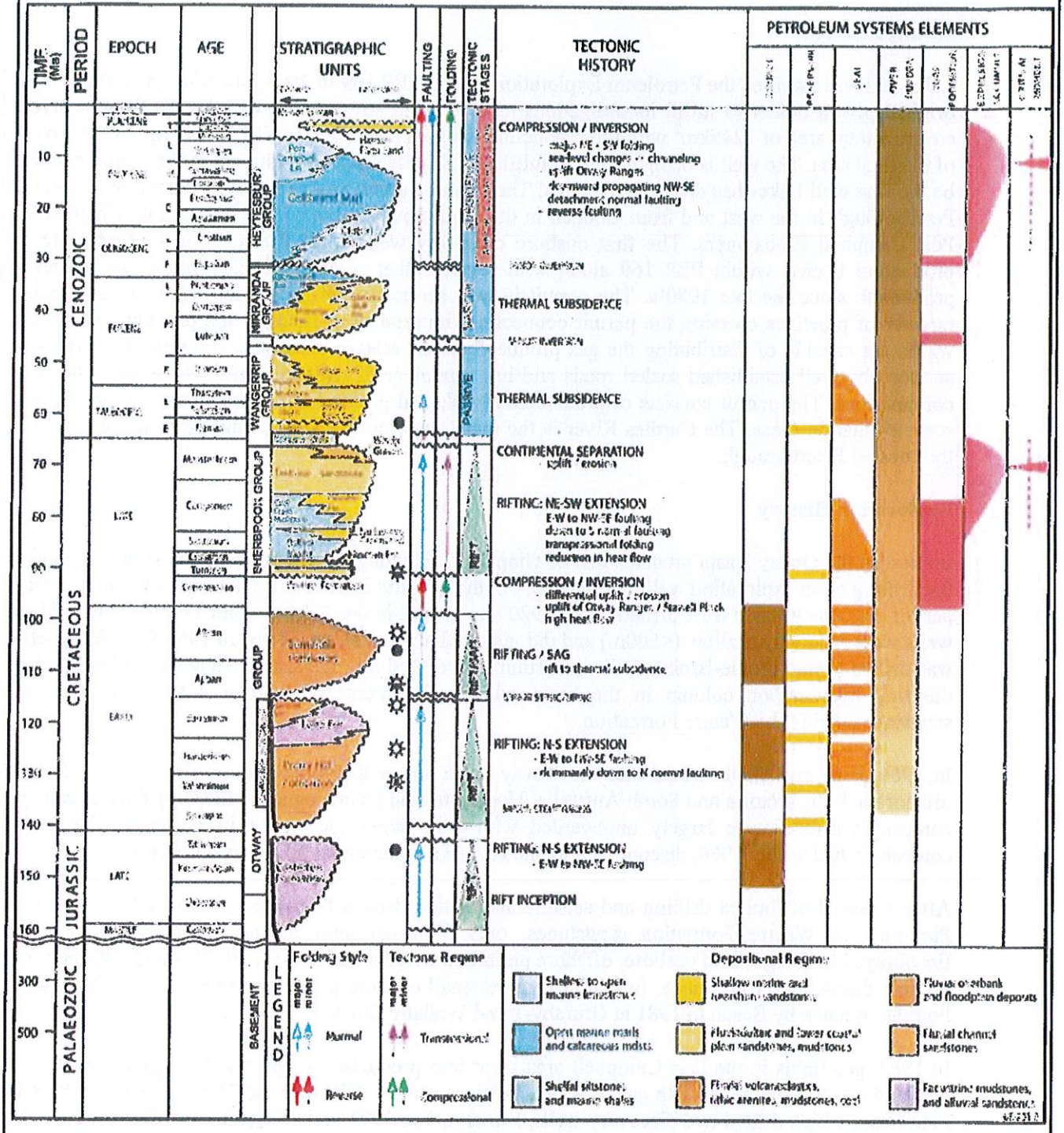

Figure 2. Lithostratigraphy, Otway Basin

Permit PEP 169

Lakes Oil was awarded the Petroleum Exploration Permit PEP 169 in 2008 following the failure of the original permit holder to fulfill its obligations to its farm-in arrangement with lakes Oil. The permit covers a total area of 1245km^2 with the production licenses controlled by Origin Energy exercised out of the total area. The well is being drilled to fulfill the 3rd year work commitment to the permit and will be the first well Lakes has drilled in the area. The permit extends from Kennedy's Creek in the east to Peterborough in the west and from Cobden in the north down to the coastline and covers half of the Port Campbell Embayment. The first onshore discovery well North Parratte-1 is located within a production license within PEP 169 along with several other producing fields which have been in production since the late 1980's. The permit is well serviced with production infrastructure with a number of pipelines crossing the permit connecting the producing fields to the production facilities which are capable of distributing the gas produced across eastern Australia. The permit is also well serviced by well established sealed roads and has a number of regional centres to service the local communities. The permit consists of predominantly cleared pastoral land used for dairy farming and some plantation areas. The Curdies River is the main water course which runs through the permit to the coast at Peterborough.

Exploration History

Interest in the Otway Basin predates that of Gippsland. Sightings of coastal bitumen strandings led to the drilling of an exploration well in Kingston, South Australia in 1892. The first wells in the Victorian part of the Otway Basin were drilled in the 1920's to 1940's in the Anglesea and Torquay areas. These wells were relatively shallow (<500m) and did not reach the Late Cretaceous. In 1959 Port Campbell-1 was drilled by the Frome-Broken Hill consortium and drilled into the Late Cretaceous and intersected the first hydrocarbon column in the basin which subsequently flowed at 4.2mmscfd from the sandstones within the Waarre Formation.

In 1966, Esso and Shell farmed into the Otway basin and with Frome-Broken Hill drilled 22 wells offshore in both Victoria and South Australia. Hoping to find an analogue for the Gippsland Basin, the company's efforts were largely unrewarded with only minor gas shows in Pecten-1. The major company's had left by 1976, discouraged by the lack of a commercial oil or gas discovery.

After a period of limited drilling and seismic acquisition, Beach Petroleum discovered gas in North Parratte-1 in Waarre Formation sandstones, only 3km northeast of the Port Campbell-1 well. Encouraged by the gas find onshore, offshore permits were awarded to Esso, Phillips and Ultramar, but no new discoveries were made. In contrast, more small onshore gas discoveries were in the Waarre Formation made by Beach in 1981 at Grumby-1 and Wallaby Creek-1.

In 1987, gas fields in the Port Campbell area went into production supplying the regional centres of Portland and Warrnambool with gas. In 1992, offshore permits VIC/P30 and 31 were awarded to BHP Petroleum, which drilled two discovery wells, Minerva-1 in 1993 and La Bella-1 in 1994, and two dry wells. After drilling three addition wells that recorded a few gas shows, BHP relinquished the permits in 1997, retaining the Minerva and la Bella fields.

Since 1999, there has been a resurgence in exploration activity in the Otway Basin with a joint venture led by Origin Energy undertaking a major exploration program that utilised state of the art seismic technology and resulted in the large Geographe and Thylacine gas discoveries, the latter in Tasmanian waters. In the onshore, the Santos joint venture exploration program, again using new 3D seismic techniques, discovered three new gas fields. In total 13 production licenses have been granted over onshore fields with in excess of 90bcf of gas produced thus far. Offshore 10 fields have been discovered with gas production increasing significantly as they are brought online.

Tectonic History

The establishment of the Otway Rift occurred in a bimodal quadrate fashion. Pre-existing lines of weakness projecting southwards from basement outcrops to the north are associated with the greenstone belts located at the contact between differing basement terrains. Across Victoria from west to east these include the Kyndalyn-Rocklands, Warrnambool-Stavely, Barrabool-Heathcote and Yinnar-Mount Wellington axes.

As the Otway basin commenced rift development in Jurassic to earliest Cretaceous times a half graben was established as a result of movement on a growth fault which soled out on a plane of decolement at depth. When this advancing half graben style encountered a pre-existing corridor of weakness a correction occurred which resulted in the establishment of a transfer fault. Often the sense of half graben developed changed on either side of the transfer fault.

Transfer faults are often associated with volcanism as they have no hade and originate at great depth. It has been found that the transfer faults exhibit themselves as a fault trench within the overlying sediments, the width of the trench being proportional to the depth to Moho. These corridors are associated with active seismicity. The Heathcote-Barrabool and Mount Wellington-Yinnar lineaments are both seismically active and numerous small scale earthquakes are associated with the Nerita transfer fault zone and the Selwyn Fault.

A failed rift is seen in the core of the Gippsland Basin, and as an extension into the Torquay Sub-Basin across the Mornington-King Island High, with the northern and southern platforms continuing to support the basin on both sides. In the Colac and Eastern Torquay Sub-Basin significant extension is seen in WNW-ESE directions with the major fault trends in NE directions as far west as the Barongarook High. Major thickening of the half-grabens occurs to the north. West of the Barongarook High (the Stoneyford High of Hill et al., 1994) the trends change to more one of ESE throughout the rest of the Otway Basin, where there is no basement support on the southern margins.

4. Reason for Drilling

Moreys-1 is designed to test a faulted tilt block structure situated in the trough between the highly productive Port Campbell and Warrnambool Highs. A significant seismic anomaly is observed on the 3D seismic data set within the Flaxman Formation and the Waarre "C" Sands and the anomaly appears to extend well beyond structural closure up to the bounding faults on each side of the greater structure. The anomaly is analogous with anomalies present within known producing fields across the Port Campbell Embayment which gives greater confidence in the interpretation. The wellsite is close to producing fields on either side confirming that a hydrocarbon charge has passed through the area and the fact that the anomaly stops at the fault indicates that there is a good probability that the a competent seal exists across the fault. The location of the well to existing production infrastructure also means any discovery should be able to be developed quickly and efficiently greatly improving the potential economic gains. The size of the structure and greater fault bound area is significantly larger than the surrounding fields indicating that if fully charged a discovery could greatly increase the reserves of the Port Campbell Embayment. This is the first well to be drilled in the trough and will increase the prospectivity of a number of other anomalous features which have been identified in similar settings across the embayment.

5. Moreys-1 Prospect

Geological Prognosis

Age	Formation Top	Depth Meters GL	Thickness Meters
Early Miocene	Port Campbell Limestone	Surface	133
Early Miocene	Gellibrand Marl	133	271
Miocene-Oligocene	Clifton Formation	404	117
Oligocene-Eocene	Mepunga Formation	521	66
Eocene-Palaeocene	Dilwyn Formation	587	190
Palaeocene	Pember Mudstone	777	72
Palaeocene	Pebble Point Formation	849	67
Late Cretaceous	Paaratte Formation	916	366
Late Cretaceous	Skull Creek Mudstone	1282	163
Late Cretaceous	Nullawarre Greensand	1445	170
Late Cretaceous	Belfast Mudstone	1615	59
Late Cretaceous	Flaxman Formation	1674	52
Late Cretaceous	Waarre "C" Sands	1726	62
Late Cretaceous	Waarre "B" Sands	1788	12
Late Cretaceous	Waarre" A" Sands	1800	31
Early Cretaceous	Eumeralla Formation	1831	169+
TD		2000	

Table 1. Prognosed Lithology at Moreys-1

The field is located on the upthrown side of a tilted fault block within the trough running between the two main structural highs within the Port Campbell Embayment. The fault block is bound to the north by northerly dipping normal fault which is predicted to act as the seal along the northern edge of the structure with the Flaxman and Waarre Formations juxtaposed against the Belfast Mudstone. A significant seismic anomaly exists on the 3D data set and extends well beyond structural closure to the bounding faults in each direction. It ends abruptly at the northern bounding fault giving further confidence that the fault is sealing the greater fault bound structure. The structure lies in between a number of producing fields which exhibit similar seismic anomalies which gives greater confidence that the anomaly is associated with hydrocarbons.

There are three potential reservoirs within the structure in the Flaxman, Waarre and Eumeralla Formations. The Waarre is the main producing reservoir across the area with the Waarre "C" Sands being the most prolific reservoir within the basin. The Flaxman at this location appears to be significantly thicker then surrounding wells and it also has a significant anomaly present in the seismic dataset. There have been indications of hydrocarbons in surrounding wells in the Flaxman but no commercial discoveries. The underlying Eumeralla Formation has produced gas at over 1mmscfd from other wells in the area from tight but extensive reservoir sections. The Eumeralla is also one of the main sources for the basin and is generally gas saturated where sufficient porosity exists.

6. Environmental Impact Statement

Moreys-1 is located on previously disturbed land used for general farming practices (e.g. dairy farming, crops etc.) so there will be very little environmental disturbance caused by the upgrading of the access track and the establishment of the drillpad. A detailed EMP, addressing the environmental and rehabilitation issues, has been conducted by Coffey Geoscience and is an attachment of this proposal (Attachment 2).

7. Responsibilities, Reporting, Auditing and Consultation

The Operations Manager of Lakes Oil, [redacted], will be responsible for (as per the organisational chart below) the site, the conduction of the operation and for auditing, incident reporting, induction, monitoring emissions and discharges, stopping work for environmental breaches and management hazards and risks where there is significant change. He will be responsible for supervising the operation and ensuring that the contractors conduct the operation in a safe and environmentally responsible manner and ensuring that the risks addressed in Table 5.5 of the EMP are dealt with properly. He will be assisted by a drilling supervisor and between them they will ensure that the operation is conducted in a manner in line with good oilfield practices. The landowner and other local residents may be present to observe the operations and Lakes personnel will be responsible for ensuring that they are inducted and keep a safe distance at all times.

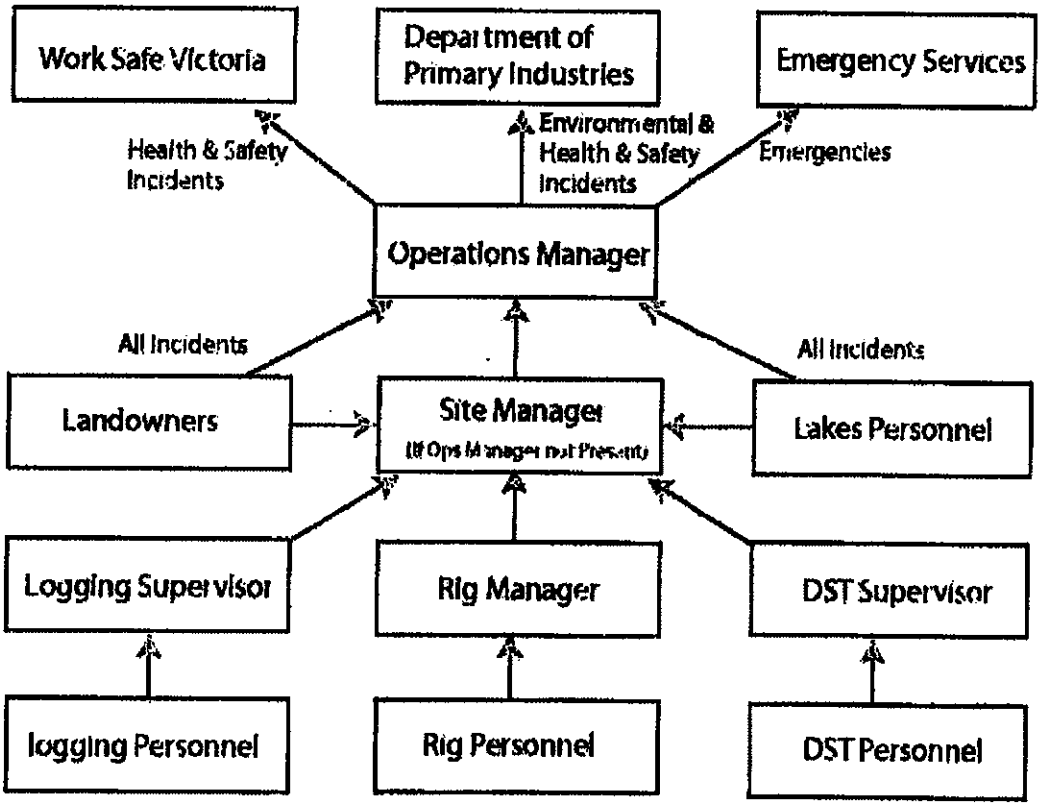

Figure 3. Organisational Chart for Moreys-1 Drilling Operations

A site specific pre-job environmental and health and safety induction will be conducted prior to any work commencing on the site and will include all personnel required onsite throughout the operation. The induction will cover all environmental and health and safety issues that relate to the operation and the reporting of any incidents. All potential hazards or incidents must be reported to the Operations Manager/Site Manager immediately so that they can be dealt with in a timely manner (see

organisational chart above for reporting procedures). Environmental incidents may include a fuel leak from machinery or a vehicle on site. Health and safety incidents may occur due to working with heavy or high pressure equipment and minor tripping or pinching hazards around the machinery or on the drillpad such as mud pump hoses.

If a hazard is observed or an incident does occur it must be reported as soon as is practically possible to the Operations Manager and a hazard or incident report form (see Attachment 6 section 8.12 & 8.13) must be completed and submitted to the relevant authority. Any serious unplanned releases of hydrocarbons or hazardous material to the environment or incidents requiring hospitalization must be reported to the authorities as described below. The Operations Manager will be responsible for ensuring that all incidents are reported to the relevant authority within the required timeframes.

Environmental Reporting

As per Regulation 22 (1): The holder of an authority must submit to the Minister a report of an incident arising out of a petroleum operation that —

- Causes, or could have caused, substantial damage to the environment, the integrity of the petroleum operation or the immediate area of the operation (whether above or below ground); or
- Is indicative of a possible future incident of that kind; or
- Occurs in circumstances where the operation has not been carried out in accordance with the operation plan

(2) The holder of an authority must give notice of a reportable incident to the Minister as soon as is practicable -

- after the reportable incident occurs; or
- if the operator is not initially aware of the reportable incident, after the operator becomes aware that it occurred.

(3) The notice under subregulation (2) must -

- be given orally or in writing;
- include the date, time and place of the reportable incident
- describe the steps taken to minimise the impact of the reportable incident.

(4) As soon as is practicable after the holder of an authority has given notice to the Minister under subregulation (2), the holder must give the Minister a written report that includes –

- the date, time and place of the reportable incident; and
- a description of the reportable incident; and
- any known or suspected causes of the reportable incident; and
- a description of the steps taken to minimise the impact of the reportable incident; and
- a description of the steps taken or proposed to prevent a recurrence of the reportable incident.

Health & Safety Reporting

All safety incident reporting must reflect the requirements of Part 5, Section 37-39 of the OHS Act and Section 32 of the DG Act. These sections define what constitutes an incident, the duty to notify of incidents and the duty to preserve a site after an incident has occurred. The Operations Manager will be responsible for ensuring that all incidents are reported to the relevant authority within the required timeframes. A full health & safety risk assessment along with preventative measures is found in Section 22 and the contact details for reporting any health and safety incident are found in Sections 25 & 26.

Operational Reporting & Auditing

Daily reports will be provided to the DPI during the drilling operations. A mid operation and end of operation audit will be performed to ensure that the operation is meeting its requirements under the Act. Following the completion of the drilling program a well completion report for each well will be submitted to the DPI, within 6 months, detailing the operation, the results achieved, the status of the well and an audit of the performance of Lakes Oil's management systems.

Community Notification

The proposed wellsite is situated on cleared farming land currently used for dairy farming practices to the west of the township of Brucknell. There are a number of residences along the Timboon-Nullawarre Rd within 2.5km of the proposed wellsite and they have all been notified of the planned operation (as they may be affected by the increased traffic) by a letter drop and no issues have been raised to date. There are no residences in direct line of sight of the wellsite due to its location down the slope from the top of the hill and the surrounding tree plots which block the view to all residences. The manager of the property lives in the closest residence and has given his consent for the drilling to proceed and has entered into an access agreement with Lakes (see Attachment 1). A second letter drop will be performed once timing is confirmed to everyone within 5km to ensure that they are all aware of the planned operations. Although, due to the relatively short duration, and low impact of the operation it is not expected that any major disturbance will be noticed by the surrounding community. The Corangamite Shire Council has been informed about the proposed operations and the local CFA and Police will be notified of the expected commencement date once it has been confirmed. Signage will be placed on the road to inform local traffic of the possibility of increased traffic movement on the surrounding roads. This is only expected to be noticed during the mobilisation and demobilization of the rig as the campsite will be within the property so there will be minimal increase in traffic during the actual drilling of the well.

A letter drop was conducted to the following properties

Date	[redacted]
30/08/11	
30/08/11	
30/08/11	
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30/08/11	
30/08/11	
30/08/11	
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30/08/11	
30/08/11	
30/08/11	
30/08/11	

Personal contact was made with the following residents within 1.5km of the proposed site

Date	[redacted]	[redacted]
24/10/11		
24/10/11		
24/10/11		
24/10/11		
24/10/11		
24/10/11		
24/10/11		

Table 2. Landowner Consultation List

8. Summary Drilling Program

1. Prepare the drill pad for the arrival of the drilling rig. The cellar and 340mm (13-3/8") surface conductor will be preset as part of the drill pad preparation
2. Mobilise the rig to the site and rig up over the hole
3. Drill 311mm (12-1/4") hole to 400m and set 244mm (9-5/8") surface casing with cement to surface.
4. Install BOP assembly and pressure test
5. Drill 216mm (8-1/2") hole from 400m to 2000m. If required a DST may be run within the Flaxman of Waarre Formations during drilling to test for the presence of hydrocarbons (if hole conditions allow)
6. Run wireline logs as per program
7. Complete evaluation testing as required either openhole or through casing if hole conditions require it.
8. Depending on evaluation testing complete and suspend hole in preparation for future work or plug and abandon the well and rehabilitate the site.

9. Bit Program

Bit #	Hole Size	Interval	Meters	Type
1	400 mm	Surface – 12	12	Auger
2	311 mm	12 – 400	388	1-1-7
3	216 mm	400 – 1200	800	4-1-7
4	216 mm	1200 – 2000	800	4-1-7

10. Hydraulic Program

(i) 311 mm Hole

- 2.0 m^3/min with 3 x 18 jets

(ii) 216 mm hole

- 1.7 m^3/min with 3 x 14 jets

High pump rates will need to be maintained to keep bit and hole clean.

11. Deviation Requirements

311mm section - surveys at 50m, 200m and at 400m TD.
216mm section – surveys on bit trips or at maximum 200m drilled and at TD prior to POOH

12. Mud Program

Hole Size	Interval	SG	Vis. (sec)	W.L. (ml)	Notes
400mm	0 – 12				Auger
311mm	12 – 400	1.10 – 1.15	45	<25	Gel/starch
216mm	400 – 2000	1.10 – 1.20	45	<10	KCL/PHPA

NOTE:
(a) Full mud checks will be performed three times daily under normal circumstances by the mud engineer and/or derrickman.
(b) Running checks of SG and viscosity will be performed by the rig crew every half-hour whilst circulating. A full check will be taken once each tour.

The top section is anticipated to consist of limestone and marls. Mud viscosity through this section will need to be kept high in order to clean and stabilise hole. The top of the Port Campbell Limestone and Gellibrand Marl are expected to contain some mud making clays so care will need to be exercised in order not to overload the annulus and keep mud viscosity under control.

A formation integrity test (FIT) will be taken after drilling 3m of new hole below the 244mm casing shoe.

The formations predicted to be encountered in Moreys-1 are expected to be normally pressured similar to the other wells drilled within the Port Campbell Embayment. The maximum bottom hole pressure is not expected to exceed 3000psi based on a normally pressured hydrostatic column of sea water.

13. Casing and Cementing Program

(i) 340mm (13-3/8") conductor:

Set at 12 m.

Cement: Grouted in place with rapid set concrete

(ii) 244mm (9-5/8") casing:

Set at 400m.

Minimum of 36#, K55, BTC, R3

Burst	-	24,323 kPa	Safety Factor	-	3.218
Collapse	-	13,958 kPa	Safety Factor	-	3.402
Tensile	-	256,363 kg	Safety Factor	-	11.937

Cement: Class G at 1.89 SG to surface.

(iii) 178mm (7") casing (if required):

Set at 2000m.

Minimum of 26#, K55, BTC, R3

Burst	- 34,411 kPa	Safety Factor	-	1.436
Collapse	- 29,851 kPa	Safety Factor	-	1.455
Tensile	- 188,636 kg	Safety Factor	-	2.432

Cement: Class G lead slurry 1.5 SG to 100m above the surface casing shoe, with a tail slurry at 1.89 SG.

The above values have been calculated assuming a normally pressured formation and a salt water gradient.

14. Formation Sampling

(i) Cuttings

Shaker samples will be taken at 10m intervals from surface to 1500m then 3m samples to 2000 (TD)
One set of washed and dried samples will be forwarded to the DPI Petroleum Branch
One set of washed and dried samples will be provided to Lakes Oil N.L.
One set of Samplex tray samples will be retained by Lakes Oil N.L.

(ii) Cores:

No conventional cores are to cut in this well but a RSCT may be run as part of the logging program

NOTE: A hotwire gas detector and chromatograph will be run continuously from drilling out of the 340mm (13-3/8") conductor to TD.

15. Logging Program

Logs will be run at 2000m (TD). At TD the following logging suites may be run:

- DLL/CAL/GR/SONIC/FDC/CNL - TD to 244mm (9-5/8") casing shoe, GR to surface.
- NMR – TD to 244mm (9-5/8") casing shoe (optional)
- RFT – TD to 244mm (9-5/8") casing shoe (optional)
- CBL – TD to surface or 200m above the top of cement (which ever comes first)

16. Testing Program

Any significant shows in the Flaxman, Waarre or Eumeralla Formations will be tested open hole utilizing either an off bottom or straddle DST tool on the way down if possible. If hole conditions do not permit an open hole test then the 7" casing string will be run and a cased hole DST will be conducted. Any hydrocarbons produced during the testing activity will be directed to the flare pit through the choke manifold and flared. Samples of any gas or fluids produced will be taken and the pressure across the choke manifold will be monitored to determine the flow rate. The samples collected in the downhole sample chambers will also be collected and sent for analysis with the collected surface samples.

17. Fluid Analysis

Any fluids (both hydrocarbons and formation waters) recovered from a DST will be collected for analysis by Amdel.

18. Equipment Specifications and Crew

HUNT ENERGY AND MINERAL CO AUSTRALIA PTY LTD

Rig 2 Drilling Equipment Specifications

Draw-works:	Mac Model - 400 (550hp) Single Drum Draw-works S/N 5-20-81. Lebus 1-1/8" main drum grooving. Hydraulic Catheads for safe operations with Tong Line Torque Gauge. McKinney 22" Single Rotor Hydromatic Brake 2 Engine Compound & Drillers Console, master skidded. Powered by 2 x skid/floor mounted Caterpillar Model 3406-TA air start diesel engines, F-11524-TC1 Twin Disc Torque Converters with Airflex 16-CB-500 clutches. Motor rating: 275hp at 1,800rpm each.
Rig Capacity:	Drilling Depth 2,300mtr + with 4-1/2" Drill Pipe
Substructure:	Box type, (G.L. to K.B. 14ft) 11' high (below rotary) x 18' wide x 40' long, fitted with all necessary & certified cross braces and Rotary support beams 8' load skids for one piece rig moving mudline manifold (4"), 36" folding walkways, stairways, hand rails and Drillers House (Dog house)
Derrick:	Al Hicks Model AH-100. Derrick height 105', Pen Type Cantilever Mast, 14' 9-3/4" leg Span. Maximum static hook load 265,000 lb with 8 lines Racking capacity for 4-1/2" Drill pipe 6,000' with 600' Bottom Hole Assy.
Crown Block:	Al Hicks Model AHC-300, 5 x 1-1/8" Sheaves including fast line and dead line sheaves.
Crown-O-Matic:	Koomey Mdl-TCB Crown Block Safety Device.
Floor Winch	Ingersoll Rand HU Series
Travelling Block:	Sowa Model S-150-4 , 150 Ton, 4 x 1-1/8" Sheave Unitized Block and Hook.
Rotary Swivel	Tri-Service Machine Model TSM-150 Swivel 150 ton Rating @ 100 RPM
Rotary Table:	Oilwell Model-175, (17-1/2"), oil bathe, c/w Varco "MSS" split Master Bushings.
Mud Pump:	**No.1** 1 x TSM 500 Power End C/W DA 500 Mattco Fluid End (7-1/2" x 16") Duplex Mud Pump, Api-8, S/N 262, Oteco 2" SRV, Belt driven by Caterpillar D-353-E diesel engine, Hydril K10 x 3000, Pulsation Dampener, Twin Disc PTO, Oilfield skid mounted.

Mud Pump:	**No.2** 1 only CSF-500 (Emsco style) Oilfield skid mounted Triplex Mud Pump powered by Cummins KTA-19 (600hp) diesel engine.
Standpipe:	Standpipe Manifold - 4" x 5,000lb Fitted with Demco 4" Gate Valve 1 only 3-1/2" ID x 55' x 4,000/8,000 psi Kelly Hose.
Mud System:	2 x 300bbl tanks incorporating 80bbl pill tank and 40bbl trip tank.
Shaker:	2 X D.F.E Linear motion SCR-01 Single three screen shakers.
Agitator:	Lighting 72Q7.5 Mixer c/w 25hp Exp Motor
Degasser:	48" Mud Gas Separator Vertical Skid Mounted
Desilter:	Harrisburg model 600-12 (600gpm) 12 x 4" cone assembly, with Mission 6" x 8" centrifugal pump driven by 50hp electric motor.
Desander:	Harrisburg 2 x 10" cone assembly with 6" x 8" centrifugal pump driven by 50hp electric motor.
Mud Mixing:	Demco style Hopper charged by 6" x 8" centrifugal pump driven by 50hp electric motor.
Blowout Preventers:	1 x 11" 5,000 TFI Double Gate BOP c/w ram sizes 2-7/8", 3-1/2", 4-1/2" & 7" Annular BOP: 1 x 11" 5,000 Hydril Style Spherical BOP
Accumulator:	Ross Hill G-180-E-20-2-AG (8 station) 180 gallon Accumulator with 1 x Triplex pump c/w 20hp 60Hz electric motor fitted with 2 only Haskel GW35 56:1 ratio backup Air Pumps c/w remote drillers console skid mounted.
Choke Manifold:	1 x Cameron Skid Mounted Manifold Consisting of: 7 x 2-1/16" x 3,000 Cameron Gate Valves 2 x CPI 2-1/16" x 5,000 Adjustable Chokes. 1 x 2-1/16" x 3M x 5M Tees/Crossovers and manifolding.
HCR/Choke Line:	1 x CIW 3-1/8" x 3,000 HCR & 1 x CIW 3-1/8" x 3,000
Kill Line:	2 x 2-1/6" x 5,000 Cameron manual valves. Continental Emsco XHP series 2" 15,000 WP swivel lines HCR

Instrumentation:	Martin Decker 7 Pen Record-O-Graph. Martin Decker "Clipper" Weight Type Indicator. Martin Decker GM-6 Series Mud pressure System. Martin Decker Pump Stroke Indicators. Totco TS Rotary Tong Torque System.
Mud Monitoring:	AOI-300 Series Flow Indicator System AOI Digital Read Out Stroke Counter AOI-1000 Series Pneumatic Mud Monitoring System
Survey Unit:	Totco Operating Unit No. 6 (P/N ABA8AT5N9) Double recorder 0-8 degree. Go-devil series
Pipe Spinner:	SSW10 style Q140-200 Pneumatic 3-1/2"-4-1/2" DP
Kelly Spinner:	Foster Model 77 Pneumatic
Kelly:	1 x 4-¼" Square x 40' Kelly with 6-5/8" Reg. LH Box up and 4" FH Pin down.
Upper Kelly Valve:	M&M Upper Kelly Cock 6-5/8" Reg. LH Pin/Box Connection 10,000 psi test.
Lower Kelly Valve:	M&M. 4-1/4" x 10,000 (4"IF Pin/Box) Canister type Lower Kelly Cock.
Stabbing Valve:	Flocon (4-1/2" IF) c/w rod and deflector.
Kelly Drive Bushing:	Varco 4-1/4" HDS
Drill pipe:	200 joints 4-1/2" Grade 'E' 16.6 lbs/ft Range 2 Drill pipe with 4" IF pin/box connections. 6 each 4-1/2" HWDP
Drill Collars:	3 each 8" OD Spiral x 2-13/16" x 29' 1 each 8" OD Spiral (6') Pony Collar. 26 each 6 ¼" OD Spiral & Slick x 2-13/16" ID x 30' Slip recess only, with 4"IF pin/Box connections.
Fishing Tools:	As required to fish Contractor's String
Handling Tools:	<u>Elevators:</u> 1 set 4-1/2" Drill pipe (18 deg) 1 set 7" Casing Single Joint 1 set 9-5/8" Casing Single Joint 1 sets 7" Casing Side Door 1 set 9-5/8" Casing Side Door 1 set 13-3/8" Casing Side Door

Slips:
1 set 4-1/2" Drill pipe
2 set 6-1/2" Drill Collar
1 set 7" Casing
1 set 9-5/8" Casing
1 set 13-3/8" Casing.

Safety Clamp
2 x Varco MP-R Safety Clamp

Main Floor Rotary Tongs
1 set (2) BJ Type "B" Rotary Pipe Tongs.
Range: 2-3/8" to 13-3/8"
1 only Landrilltools TQ340-35Y Casing Tong
c/w ,7", 9-5/8", 13-3/8" Jaws & Deutz 6cyl
Hydraulic Power Pack
1 Hillman Kelly 3700H Hydraulic Tubing Tong
c/w 2-3/8", 2-7/8" & 3-1/2" Jaws

Chain Tongs
1 set (2) 9-5/8" Casing Chain Tongs.

Subs:

Bit Subs
1 only 6-5/8" Reg. Box with float bore x 6-5/8" Reg. Box
3 only 4-1/2" Reg. Box with float bore x 4" IF Box
1 only 3-1/2" Reg. Box with float bore x 3-1/2" IF Box
1 only 7-5/8" Reg. Box x 6-5/8" Reg. Box

Pick Up Subs
2 only 6-5/8" Reg.
10 only 4" IF

X-over Subs
6-5/8" Reg. Pin x 4" IF Box Bottle Neck
2 only 4" IF Pin x 3-1/2" IF Box

Saver Subs
3-1/2" IF Pin x 4" IF Box (6-3/8"OD)
3-1/2" IF Pin x 3-1/2" IF Box
4" IF Pin x 4" IF Box

Casing/Tubing Drifts: 9-5/8'' Casing drift
7" Casing drift

Cup Tester: 9-5/8" Cameron Casing Cup Type (36LB)

Wire line Unit: HE-V-20-10-HP Hydraulic Wire line Unit
Capacity : (0.92 x 10,000 ft)

Welding Equipment: 1 x Lincoln AS-400-50 Diesel Powered Electric Welder.
1 only WIA Weldarc WC400 Electric Powered Welder s/n 402-8

Air Compressors:	1 only Compair model 6040 Rotary screw compressor 1 only Compair model 6050 Rotary screw compressor 1 only John Wood Co 200psi air receiver Serial # 500803-71
AC Generators:	1 x Cat 3406 c/w Brown Boveri Model 523 256 KVA output 1 x Cat 3306 DIT 225 KVA SR4 Alternator (1500 RPM)
Fuel Tanks:	250 Gallon day tank 2 only Ebara model 120/07 50HZ IP55 Fuel pumps 5,000ltr day tank
Water Tanks:	200bbl
Pipe Racks:	4 set 42" high x 28' long Triangle style pipe racks.
Pipe Bins:	3 skid mounted bins.
Catwalks:	2 x 22' (45' overall length)
Mud Lab:	Baroid No. 821 Mud Laboratory Kit.
Mud Saver:	Katch Kan
Cellar Pump:	Cellar Jet via mud pump/Wilden diaphragm pump
Rat/Mouse Hole:	1 x DHM 653 HOFCO down hole motor, 6-1/2" three stage Dyna-drill
Digger:	
Water Pump:	3" portable water pump with 3" suction and lay-flat to suit.
Mechanic Shop:	Oilfield skid mounted workshop/compressor house containing electric welder, drill press, hand tools and power tools.
Pressure Cleaner:	Spitwater Model 201
Payloader:	Caterpillar 966C rubber tyre loader, rated @ 8 tonne equipped with 7' tines & 4m^3 bucket. Serial # 78G2032M Arr # 3Y2908
Rig Vehicles:	1 x Toyota HJ-75 Station Wagon (Crew) 1 x Toyota HJ-75 (1- ton) pick-up UTE.
Rig Accommodation:	<u>Rig Manager Accommodation -</u> 1 x transportable unit 40' x 9' x 9' c/w sleeping quarters, ablution facilities & two separate offices. <u>Drilling Supervisors Accommodation -</u> 1 x transportable unit 40' x 9'x 9' c/w sleeping quarters, ablution facilities & two separate offices.
Fire Extinguishers:	12 x Certified Units located in strategic positions in and around the Rig and Camp.

Communications: **If required**	1 x V-Sat telephone and internet communication system – 81821 0906 1 x S-3000 Satellite Telephone (Optus) with fax – 0011 881 622 461 785 1 x Digital Mobile – 0145 124 796 1 x Iridium mobile Satellite phone – 0419 182 726
Camp	
Generator:	1 only Camp Generator House fully sound proofed 12m x 3m skid mounted c/w 14,000 litre capacity water tank Davey Water Pump 2 only Onan Generator sets 100kva Fuel tank capacity 7,000lts
Sleeping Units:	1 only 14.4m x 3m skid mounted 6 person bunkhouse c/w built in wardrobes, table, beds and bedding. 2 only 14.4m x 3m skid mounted 10 person bunkhouse c/w built in wardrobes, table, beds and bedding.
Kitchen-Dining:	1 only Kitchen/Diner/Cool room/Freezer Unit 14.4m x 3m skid mounted built-in combined freezer/chiller unit c/w commercial kitchen range/oven, microwave, deep fryer, mixer/blender, Bain Marie, fixed tables, chairs and all necessary utensils.
Recreation:	1 x Recreation Room/Clinic Unit 14.4m x 3m skid mounted c/w television, video & lounge chairs 1 x First Aid Room
Ablution:	1 x Ablution/Laundry/Store Unit 14m x 3m skid mounted c/w 315lt hot water unit, 4 x toilet bays and 5 x shower bays. Laundry c/w 2 x washing machines & 2 x dryers Storage area with built in shelving

19. General Drilling Procedures

19.1 Introduction

The Drilling Program shall be read in conjunction with the Lakes Oil NL Drilling Operations and Safety Manual, which contains Lakes Oil's general operating and well control guidelines, drilling equipment requirements and other procedures.

19.2 General Operating Guideline

All operating procedures and engineering design contained in this program are intended to be within the stated requirements of the Victorian Petroleum Act 1998 and Victorian Petroleum Regulations 2011. A copy of these documents shall be available in the Drilling Supervisor's office.

The Drilling Supervisor shall be responsible for ensuring that the procedural guidelines are implemented to the standard specified in this program and in the Drilling Operations and Safety Manual.

Changes to the procedures in this program will only be made after consultation with the Drilling Engineer, who will obtain approval from the Operations Manager.

A pre-spud safety meeting shall be conducted on site to ensure that all personnel are aware of the well objectives, aboriginal heritage issues, operating guidelines, environmental sensitivities of the location and reporting arrangements for this well.

19.3 Well Control Equipment & Procedures

Wells shall be shut in using the hard shut in technique. The preferred method for killing the well is the "Drillers" method. Refer to the Drilling Operations Manual for detailed procedures.

If any indications of a kick are noted then the well should be shut in immediately, shut in pressures monitored and the Operations Manager and Rig Manager notified.

All well control equipment shall be function tested daily, except the blind rams which shall be functioned on each trip out of the hole.

19.4 Drills and Safety Procedures

BOP Equipment, Drills and Testing

BOP drills shall be conducted with each crew, periodically, to ensure proficiency with the procedures for shutting in wells.

A kill drill shall be conducted prior to drilling out a new string of casing.

BOPs shall be pressure tested every 21 days after installation and initial testing.

Pipe rams and annular preventers shall be operated on a daily basis with blind rams being operated on each trip out of the hole. Manual closing controls are to be checked daily. This should be alternated between the Main Control Manifold, and the remote stations.

Flow Checks and Drilling Breaks

If there is any indication that the well may be flowing then a flow check shall be conducted immediately. Flow checks shall also be conducted prior to commencing a trip out of the hole, when the bit is at the shoe, prior to pulling the BHA through the BOP stack and if the well fails to take the calculated volume of fluid.

All drilling breaks and return flow abnormalities shall be flow checked.

Drill Break Procedure for target intervals:

The driller must report any rapid increase in ROP of about 2 times or more to the Wellsite Geologist (WSG). Drill one meter into the break and request the driller to conduct a flow check. The drill crew will also monitor total pit volume. If flow is observed the well should be shut in by the driller. Through the Flaxman and Waarre Formations it is recommended that all significant drill breaks be circulated out. WSG is to instruct the driller to circulate bottoms up (CBU). WSG is to check that the mudloggers have attenuated the gas detectors to allow for a rapid gas increase. WSG/mudlogger is to ensure that lag time is known accurately, and that pump stroke counters were zeroed at the commencement of circulation. WSG/mudlogger is to take a sample of mud from the flow line in the possum belly prior to, during and after catching the bottoms up sample. Closely monitor cuttings samples across the shakers for lithology changes and shows. In the event that no oil or gas shows are encountered after CBU WSG to inform the driller to drill ahead. In the event that shows are encountered WSG is to call head office for consultation.

19.5 Safety Meetings

Well control safety meetings shall be held prior to spud, as well as prior to drilling out each string of casing.

Pre-job safety meetings shall be held prior to conducting any non-routine or critical operations

Emergency engine shut down equipment shall be tested prior to the commencement of drilling and operated weekly on all engines.

Safety drills shall be held periodically at the discretion of the Operations Manager.

Pre tour safety meetings shall be held, reviewing the next 12 hours operations, and the Drilling Contractor's job safety assessment and work permit procedures should be followed.

19.6 Leak Off and FIT Tests

A 'leak-off test' or 'formation integrity test' will be conducted in the open hole after drilling 3m of new hole below the casing shoe. The purpose of the test is to determine the competence of the formation below the shoe and/or the competence of the primary cement job around the shoe.

The following is the recommended test procedure for the Formation Integrity Test (FIT) and Leak Off Test (LOT):

1. Drill out cement plus 3m of new formation using mud from the surface hole.

2. Circulate clean to a balanced mud weight.

Note: The fluid in the hole should be a mud, and not a fluid with no, or only dissolved, solids.

3. Pull the bit back into casing shoe.

4. Make sure the hole is filled up and close the BOP (Annular) around the drill pipe.

5. Rig up the test pump to the drill pipe or annulus. Use a pressure gauge of appropriate range mounted at the pump unit manifold.

6. Slowly pump mud until pressures begin to increase. Volume will start from this point.

7. Pump 0.25 bbl and wait for 2 minutes or the time required for the pressure to stabilize in case this takes longer.

8. Record the volume pumped, and the bleed back stabilized pressure.

9. Repeat items 6 & 7, plot pressures versus cumulative mud volume for each pumped volume increment.

10. Continue procedure until the final stabilized pressure after the waiting time reaches the design pressure for the FIT, stop pumping and bleed back to end the data collection for the FIT. For the LOT, continue injection cycles until the plot deviates from the expected pressure based on the injection volume. Keep well closed in to verify that a constant pressure has indeed been obtained.

11. Bleed off pressure and establish volume of mud lost to the formation on the LOT

    Note: If there is a solid float valve in the drill string, bleed off at the choke line, and not at the pump unit. If the float is ported then bleed off at the pump unit, and monitor the annulus pressure to ensure it is bled off before opening the Annular Preventer

12. Open the BOP (Annular) and resume drilling operations.

13. Record maximum stabilised pressure, TV depth and equivalent mud weight of this test on the next 'Daily Drilling Report' and the 'IADC' report. Transmit a copy of the LOT/FIT test to the Drilling Engineer.

19.7 24 HR Operations Procedures

The drilling of Moreys-1 will be conducted 24 hours a day with two crews working 12hr shifts. The 24hr operation is necessary to ensure the hole is drilled in a safe, secure and timely manner. Hole stability may be an issue if circulation is stopped for extended periods of time unless the mud has been conditioned to take this into account. It is not desirable to have to condition the mud for tripping out of the hole every day as it increases cost and doesn't allow the mud parameters to be optimized for best drilling performance. The high probability of hydrocarbons being present in the well also requires the well to be monitored at all times. The 24hr operation also greatly reduces the time it will take to drill the hole as a significant amount of time each day is wasted running in and out of the hole each day. Due to the location of the well in cleared farming land away (over 1km) from any residences it is not envisaged that a 24hr operation will cause any disturbance to the surrounding properties.

20.0 Detailed Drilling Procedures

20.1 Construct Location

1. The location will be scouted, pegged, surveyed and constructed to accommodate the chosen rig. This will be supervised by Lakes Oil NL and site work carried out by a local, competent earthworks contractor. Design of the flare and mud pits is as per the drilling rig site requirements in conjunction with the CFA and DPI requirements and recommendations.

2. The site contractor will install cellar.

3. The site contractor will install the 13-3/8" conductor casing down to 12m

4. The rat hole and mouse hole will be drilled by the rig.

5. The drill water source will be provided by the landowner water source. This water will be used both for drilling and cementing - subject to testing.

20.2 Conductor Casing: Drill 400mm (15-3/4") Hole Run 340mm (13-3/8") Casing.

1. The surface hole section initially comprises Recent Quaternary sediments and the Port Campbell Limestone with some sticky, interbedded clay near surface. It will be drilled using a pendulum crane with an auger, prior to the arrival of the main rig as part of the site preparation, to the section TD at +/- 12m.

2. The 340mm (13-3/8") casing conductor will be grouted back to surface.

20.3 Move On Location - Rig Up

1. The drilling contractor is on a 'lump sum' contract, for the period comprising:
   - Move on to location.
   - Rig up.
   - Drill the rat hole and mouse hole.
   - N/U riser/bell nipple and flowline etc.
   - Inspect rig.

   The well is to be drilled at a "day rate" following the Lump Sum rig move. Day rate operations commence, when the Lakes Operations Manager and Rig Manager agree on 'Rig Acceptance' following completion of the pre-spud rig inspection and the drilling of the rat and mouse holes.

2. The drilling contractor will cut the conductor above the cellar base, to suit the length of his riser/bell nipple. The bell nipple and flowline will be installed, and the drilling contractor will weld a nipple/ball valve in the conductor, below the bell nipple connection, to drain the bell nipple etc. A cellar pump should also be installed.

20.4 311 mm (12-1/4") Hole Drilling Sequence.

1. Conduct crew site inductions and pre-job safety meeting

2. Make up the 311mm (12-1/4") bit and BHA per program below in the Bottom Hole Assembly section 20.16.

3. Drill out the conductor using the spud mud as per program. In order to prevent washouts around the conductor/cellar area, keep the pipe moving, use low pump rate (200gpm) and minimum drilling parameters until the first 6-3/4" drill collar is below the conductor. Surveys will be conducted by a Totco survey tool at 50 m and thereafter at 200m and 400m (section TD).

4. Increase pump and drilling parameters to optimise rate of penetration as required. (see section below on Bit and Hydraulic details).

5. Continue to drill to casing point estimated to be at 400m. The casing point is approximately at the base of the Gellibrand Marl which should provide a competent seat for the casing shoe. Circulate hole clean at section TD and confirm that the lithology is competent.

6. Ream each connection twice to minimize any deviation and to clean up the hole.

7. Make wiper trips as hole conditions dictate. As a guide do not exceed 36 hours drilling between wiper trips.

8. Circulate the hole clean prior to all trips, and for at least 10 minutes prior to running any other surveys.

9. Using the 244 mm (9-5/8") casing tally, determine the actual casing setting depth to allow the braidenhead to be set at the desired height. Drill the 12-1/4" hole to fit the casing tally with no more than 3m of rathole. Ensure that the casing string is properly spaced out to have a casing collar at the required well-head level.

10. Maintain mud properties at 1.1 – 1.15 SG, 45 sec. viscosity, W.L. (ml) <25 with prehydrated bentonite and starch.

11. At section TD, circulate HiVis pill and circulate hole clean, conduct survey, wiper trip back to last wiped section. RIH to bottom, circulate HiVis pill and circulate hole clean, condition mud and POOH.

20.5 244 mm (9-5/8") Casing Sequence

1. Hold pre job safety meeting.

2. Rig up to run 9-5/8" casing. Make up float shoe. Check operation of the float. Thread lock the shoe track.

3. Ensure circulating swage and hose are on the rig floor before starting to run the casing.

4. Run casing to setting depth, completely fill every 5 joints and install centralisers as per running list.

5. Make up circulating swage to last joint but only circulate down if tight hole noted.

6. Make up circulating swage and circulate the landing joint down. Measure in to the required setting depth. Continue to circulate and reciprocate casing until shakers are clean, gas (if present) returns to background levels and a minimum of two annular volumes.

7. Condition the mud suitable for cementing (YP 12-14 max). Circulate at equivalent annular velocity used when drilling the open hole.

8. Pump 40 bbl water 'spacer' as per cementing section below.

9. Hold pre job safety meeting. Rig up cementing contractor. Make up 9-5/8" cement head. Put bottom plug into casing and install top plug into cement head. Pump 5 bbls water and pressure test lines to 1000 psi for 5 minutes.

10. Mix and pump cement slurry according to cementing section below. Three samples of the cement slurry should be collected. The slurry densities should be checked (use a pressurized mud balance if possible).

11. It is the responsibility of the cementing contractor and the drilling supervisor to ensure that both the top and bottom plugs are installed and released correctly.

12. Pump 5 bbls water behind to flush lines, release top plug and displace with 5 bbls of water. Displace cement with mud at 5 bpm. Slow down displacement rate +/- 20 bbls before plug bump. Bump plug to 500 psi above final circulating pressure and hold for 5 minutes, if necessary slowly pressure up to 1000 psi and test casing for 10 minutes. Release pressure and record flow back. Do not displace more than 100% of theoretical casing volume plus 50% of the shoe track volume.

    If the float does not hold, then pump back the volume of mud bled off, pressure up to the differential pressure of annulus to pipe, and WOC. If cement returns are observed during the job then divert to the sump.

12. Should good cement returns not reach surface, or if slumping occurs, a top-up cement job will be required. Run a 1" stinger 12m into the annulus circulate clean, and perform a top-up cement job with approximately 50 sacks cement and $CaCl^2$ (see cementing section below for top-up slurry details) to provide structural support for the BOP.

13. The 11" 3000 psi Casing head "A" section has a 9-5/8" BTC pin down and will be made up directly to the surface casing collar. Check for size and damage to the threads. Confirm all the requisite studs, nuts, ring gaskets, side outlet valves and fittings are all ready for assembly.

14. The space-out for the installation of the 11" Casing head will be such that the BOP assembly fits beneath the rig floor. A 9-5/8" casing landing joint may be provided to assist space out.

20.6 Nipple Up Casing Head and BOP

1. Hold pre job safety meeting.

2. Drain and flush riser, open turn-buckles and cut and raise conductor. Flush the riser clean to visually ensure correct placement of the casing collar.

3. Wait on cement a minimum of 6 hours from top up job or until surface cement samples are firm enough to support string weight. Slack off string and back out the landing joint. Rig down all casing running equipment.

4. Pump out and clean up cellar area and prepare Casing head while WOC. Ensure the casing is open at surface during WOC.

5. Install 11" 3,000 psi x 9-5/8" BTC Casing head "A" section and torque up to base of triangle.

6. Nipple up 11" 5,000 psi BOP stack with adaptor spool. Note: The BOP ram configuration should be 4½" pipe rams over blind rams.

7. Pressure test BOP stack, mud standpipe manifold, choke manifold and ancillary well control equipment. Test BOP's to 250 psi low for 5min and 1500 psi high for 10 min. Test annular preventor to 1500 psi. If possible use a side outlet sub to test in both directions at the same time.

20.7 Drill 216 mm (8-1/2") Hole and Run 178mm (7") Casing (if required)

1. Hold pre job safety meeting.

2. The 216mm (8-1/2") hole will be drilled to approximately 2000m; approximately 170m into the Eumeralla Formation.

3. Drill out the shoe track and 3m of new hole. Circulate clean to a balanced mud weight. Pull back to inside casing.

4. Perform FIT to 400 psi as outlined in the LOT/ FIT procedure to give an equivalent mud weight of approximately 14.8ppg.

5. Small amounts of fully pre-hydrated gel should be added to the mud to improve the filter cake and to extend the polymers. Maintain the mud weight and drilled solids as low as possible at all times by fully utilizing all the solids control equipment.

6. An openhole DST may be conducted across any significant hydrocarbon shows whilst drilling to TD or at TD prior to the running of the 7" production casing. Either an off bottom or inflate straddle test will be conducted depending on the length of the reservoir zone and the hole conditions.

7. If the well is to be completed the 178mm (7") production casing, will be run in the 216mm (8-1/2") hole with the shoe set at approximately 2000m.

8. On receipt of the casing, it should be laid out, numbered and strapped (including any pup and marker joints). The threads should be cleaned and visually inspected, and all joints drifted to the API size.

   Note: Threads must not be cleaned with diesel, use high pressure water instead.

9. The "B" section should be checked. Confirm all the requisite studs, nuts, ring gaskets, side outlet valves and fittings are all ready for assembly. Ensure there is a small hydraulic hand pump (with fittings) to pressure test the casing hanger and adapter.

10. Surveys will be conducted with a Magnetic Single Shot survey tool at 150m intervals to TD. A survey should be taken at TD prior to POH.

11. No abnormal pore pressures are anticipated in this well. However all pore pressure indicators should be closely monitored while drilling and any anomalies reported.

12. Prior to running the 7" casing the electric logging program will be run as per section 14. The logging program as planned is:

    Run 1: DLL/CAL/GR SONIC/FDC/CNL - T.D. to 7" shoe, GR to surface.
    Run 2: NMR – TD to 7" shoe (optional)
    Run 3: RFT – TD to 7" shoe (optional)

20.8 178 mm (7") Casing Sequence

1. Hold pre job safety meeting.

2. Rig up to run 178mm (7") casing. Make up float shoe and collar. Check operation of the float. Thread lock the shoe and collar track.

3. Ensure circulating swage and hose are on the rig floor before starting to run the casing.

4. Run casing to setting depth, completely fill every 5 joints and install centralisers as per running list.

5. Make up circulating swage to last joint but only circulate down if tight hole noted.

6. Make up circulating swage and circulate the landing joint down. Measure in to the required setting depth. Continue to circulate and reciprocate casing until shakers are clean, gas returns to background levels and a minimum of two annular volumes.

7. Condition the mud suitable for cementing (YP 12-14 max). Circulate at equivalent annular velocity used when drilling the open hole.

8. Pump 40 bbl water 'spacer' as per cementing section below.

9. Hold pre job safety meeting. Rig up cementing contractor. Make up 7" cement head. Put bottom plug into casing and install top plug into cement head. Pump 5 bbls water and pressure test lines to 1000 psi for 5 minutes.

10. Mix and pump lead and tail cement slurries according to cementing section below. Three samples of the cement slurry should be collected. The slurry densities should be checked (use a pressurized mud balance if possible).

11. It is the responsibility of the cementing contractor and the drilling supervisor to ensure that both the top and bottom plugs are installed and released correctly.

12. Pump 5 bbls water behind to flush lines, release top plug and displace with 5 bbls of water. Displace cement with mud at 5 bpm. Slow down displacement rate +/- 20 bbls before plug bump. Bump plug to 500 psi above final circulating pressure and hold for 5 minutes, if necessary slowly pressure up to 1000 psi and test casing for 10 minutes. Release pressure and record flow back. Do not displace more than 100% of theoretical casing volume plus 50% of the shoe track volume.

    If the float does not hold, then pump back the volume of mud bled off, pressure up to the differential pressure of annulus to pipe, and WOC. If cement returns are observed during the job then divert to the sump.

15. The 7-1/16" 5000 psi Tubing Spool "B" section has a 11" 3000psi flange which will be made up directly to the "A" Section. Check for correct ring gasket size and any damage to the studs. Confirm all the requisite studs, nuts, ring gaskets, side outlet valves and fittings are all ready for assembly.

16. The space-out of the installation of the 11' "A" section should have allowed for enough room for the 7-1/16" Tubing Spool to be fitted such that the BOP assembly fits beneath the rig floor.

20.9 Nipple Up Tubing Bowl and BOP

1. Hold pre job safety meeting.
2. Drain and flush riser, open turn-buckles and lift riser and BOP's. Flush the riser and BOP clean prior to removing.
3. Wait on cement a minimum of 6 hours from top up job or until surface cement samples are firm enough to support string weight. Install casing slips and tighten locking dogs. Slack off string and cut the casing above 11" flange leaving enough of a stub to seal within the tubing spool "B" section. Remove riser and BOP's. Rig down all casing running equipment.
4. Empty and clean mud tanks while WOC. Keep sufficient old mud to drill shoe track.
5. Pump out and clean up cellar area and prepare Tubing Head while WOC. Ensure the casing is open at surface during WOC.
6. Install 11" 3,000 psi x 7-1/16" 5,000psi Tubing Spool "B" section and tighten all studs and nuts.
7. Nipple up 11" 5,000 psi BOP stack with adaptor spool. Note: The BOP ram configuration should be 4½" pipe rams over blind rams.
8. Pressure test BOP stack, mud standpipe manifold, choke manifold and ancillary well control equipment. Test BOP's to 250 psi low for 5min and 1500 psi high for 10 min. Test annular preventor to 1500 psi. If possible use a side outlet sub to test in both directions at the same time.

20.10 Cased Hole Testing Sequence:

1. Hold pre job safety meeting.
2. Run CBL logging tool to confirm top of cement and quality of cement job and to correlate the perforating guns.
3. The number and length of testing intervals will be determined following the assessment of the drilling and logging results and the quality of the cement job.
4. The test intervals will be perforated and tested individually from the bottom up.
5. Conduct further safety meeting prior to picking up perforating guns. Ensure all unnecessary personnel are off the rig floor and appropriate JSA's are attached to the relevant permits.
6. RIH with 4-1/2" perforating guns to the first test interval, ensure accurate positioning from Gamma Ray depth correlation.
7. Fire perforating guns and POOH.
8. Lay out perforating guns and rig down wireline unit.
9. Make up inflatable straddle DST tools onto the 4-1/2" drill string, RIH and set packers at desired depth to straddle the perforated interval.

10. Rotate drill string to inflate the packers, apply weight to drillstring to ensure packers have set and to open the tool and conduct pre-flow. Ensure bubble hose and bucket are set up onto choke manifold

11. Conduct pre-flow for ten minutes before shutting tool to monitor initial build up.

12. Following shut-in apply weight to the tool again to open and conduct main flow for one hour (actual length may vary depending on flow results observed). If strong flow observed divert flow through the choke manifold to the flare pit and flare any hydrocarbons produced. Collect gas samples throughout main flow period and run through the chromatograph for analysis. Pressurised gas samples should be taken if possible.

13. Following the main flow shut-in the tool and monitor the pressure build up for at least twice the length of the flow period.

14. Following the final shut-in, unseat the packers, drop the bar to open the circulating port and reverse circulate the contents of the test tools. Collect samples at regular periods throughout the circulation for analysis

15. Once bottoms up is observed pump a heavy weight slug and POOH

16. Once on surface layout DST tools and rig up wireline to perforate next test interval. Repeat the above processes for each test interval.

20.11 Suspension or Abandonment

Following the drilling and testing programs, as long as the drilling results warrant it, it is planned to run the 7" production casing and either run the tubing completion into the well or suspend the well prior to running the completion at a later date once the analysis of the results has been completed.

If it is to be completed then 2-7/8" tubing will be run to just above the top producing perforated zone where the packer will be set and the tubing landed in the wellhead. A 2-9/16" Christmas tree will be installed onto the wellhead and the well suspended pending further testing. Any open zones above the packer setting depth will be squeezed off with cement prior to running the tubing.

All zones containing hydrocarbons will either be isolated behind casing or will be part of the completion and controlled by the wellhead so there is no threat of contamination of aquifers or movement of hydrocarbons whilst the well is suspended.

Note: If the well is being suspended pending future work the site restoration procedures will not be conducted until a suitable time after the full appraisal of the well has been conducted. Following this the site will be restored back to as closely as possible the original condition of the site or to the landowners wishes.

If the well is to be abandoned then all perforations will be squeezed off with cement with a cement plug left in the casing above the top perforation. A surface cement plug will be set just below the ground surface and all wellhead and rig equipment will be removed, the site rehabilitated back to as closely possible the pre-drilling condition and a well plaque erected on the nearest fence before being handed back to the landowner.

20.12 Drill Water Source

The drill water source will be supplied by the landowner either from a nearby dam or via their trough system. The dam will be used if sufficient water remains following the winter rains. Potable water for the camp will be sourced from a local water carter.

20.13 Directional Plan & Wellbore Surveying

General Notes:

A target tolerance of 150m radius has been specified for the well.

Single Shot surveys will be reported as read, and not corrected.

Survey Program

13-3/8" Conductor
The 13-3/8" conductor will not be surveyed but a spirit level will be used whilst grouting it in place.

12-1/4" Hole
The 12-1/4" hole will be deviation surveyed whilst drilling with a 'Single Shot' deviation instrument. The first survey will be taken at 50m. Subsequent surveys will be at 200m, and at the casing point.

8-1/2" Hole
The 8-1/2" hole will be surveyed every 200m to TD, at approximately 2000m, whilst drilling with a 'Single Shot' deviation instrument.

20.14 Drilling Fluid

General Guidelines

The following notes are for a general guideline only. The mud properties will be varied on site depending upon the drilling results and hole conditions.

The make up water should be tested prior to use as it may have an effect on the initial mud formulations. The drill water source will be potable water from a local town supply.

The 12-1/4" hole section will be drilled with a pre-hydrated Bentonite system. This will provide sufficient bridging of the shallow surface sediments The 8-1/2" hole section will be drilled with a 5% KCL/PHPA system which will be sufficient to prevent any swelling clays in the marls and claystones to cause hole problems. Losses are possible in the shallow sediments with sands interbedded with sticky clays/argillaceous silts. These are likely to cure themselves fairly quickly, however LCM treatments may be required if losses become severe. While drilling the 8-1/2" hole section any significant downhole mud losses should be treated immediately by circulating an LCM pill. If losses persist then an LCM pill should be spotted over the loss zone and allowed to soak.

Monitor tight hole and cavings, and make any mud weight increases as necessary. Maximum mud weight anticipated is 9.5 – 10.0ppg but will be dictated by hole conditions.

Dilution with water may be required as soon as mud-making clays are encountered to minimise mud rings and solids build up.

Barite should be used for all slugs prior to trips. Excessive amounts of Barite should only be used for weighting up as a last choice if there is a sudden well control issue due to its recent reclassification as a hazardous substance when in concentrations of greater then 6000ppm so all attempts should be made to maintain the concentration below this threshold to remove the disposal issues. MSDS for all mud additives will be available onsite and appropriate PPE and emergency wash areas will be available onsite at all times

The mud weight and drilled solids will need to be maintained as low as practical by maximizing the use of the finest possible shaker screens and the desilter/desander. Minimise hydrocyclone use where possible, as hydrocyclone volume discharge is often a major part of total volume losses in each well. Water loss should be tightly controlled.

20.15 Drilling Fluids Program

Hole Size	Interval	SG	Vis. (sec)	W.L. (ml)	Notes
400mm	0 - 12				Auger
311mm	12 – 400	1.10 – 1.15	45	<25	Gel/Starch
216mm	400 – 2000	1.10 – 1.20	45	<25	KCL/PHPA

NOTE:

(a) Full mud checks will be performed three times daily under normal circumstances by the mud engineer and/or derrickman.
(b) Running checks of SG and viscosity will be performed by the rig crew every half-hour whilst circulating. A full check will be taken once each tour.

The top section is anticipated to consist of limestone and marls. Mud viscosity through this section will need to be kept high in order to clean and stabilise hole. The top of the Port Campbell Limestone and Gellibrand Marl are expected to contain some mud making clays so care will need to be exercised in order not to overload the annulus and keep mud viscosity under control.

A formation integrity test (FIT) will be taken after drilling 3m of new hole below the 244mm casing shoe.

The formations predicted to be encountered in Moreys-1 are expected to be normally pressured similar to the other wells drilled within the Port Campbell Embayment. The maximum bottom hole pressure is not expected to exceed 3000psi based on a normally pressured hydrostatic column of sea water.

20.16 Bit and Hydraulics Program

The following table is the proposed bit and hydraulics program.

The rig has 1 x TSM 500 Duplex mud pump and 1 x CSF-500 Triplex mud pump.

The pumps will be dressed with 7-1/4" liners for both hole sections.

In the 12-1/4" hole section, flow rates should be initially limited to 200 gpm until the 6-3/4" DC's are below the conductor. Thereafter flow rates should be maintained at 400 gpm to optimise ROP, ensure proper hole cleaning, prevent cuttings overloading the annulus and prevent the formation of mud rings.

The final hydraulics should be calculated and verified on the rig site.

Bit Run No:	1	2	3
Bit	Tricone Insert	PDC	Tricone insert (if required)
Designation	Re-Run 4-1-7	New 519	New 4-1-7
Bit Size	12-1/4"	8-1/2"	8-1/2"
Nozzles (32)	4 x 18	3 x 14	3 x 14
WOB (kg)	5,000 to 10,000	2,000 to 6,000	5,000 to 10,000
RPM	80 to 100	80 to 110	80 to 110
Pumps (GPM)	300 to 450	250 to 350	250 to 350
Depth in (RT)	12m	400m	
Depth out (RT)	400m	2000m	
BHA			
Type / Component	Packed	Packed	Packed
Bit Sub & Float	yes	yes	yes
NBStab	12-1/4" NB	8-1/2" NB	8-1/2" NB
Non Mag Drill Collar	1 x 6-3/4" NMDC	1 x 6-3/4" NMDC	1 x 6-3/4" NMDC
Stabiliser	12-1/4" SS	8-1/2" SS	8-1/2" SS
Drill Collar	6-1/4"	6-1/4" x 2	6-1/4" x 2
Stabiliser	n/a	8-1/2" SS	8-1/2" SS
Drill Collar	6-1/4" x 10	6-1/4" x 10	6-1/4" x 10
Drilling Jars	n/a	6-1/2" SUP-R-JAR	6-1/2" SUP-R-JAR
Drill Collar	6-1/4" x 1	6-1/4" x 1	6-1/4" x 1
HWDP	4-1/2" x 4	4-1/2" x 4	4-1/2" x 4
X/O			

NOTES:

1. The NMDC should be run as the first full length 6-1/4" collar in the BHA
2. Near bit stabilizer shall be full gauge.
3. First stabiliser should be in gauge to $^{1}/_{16}$" undergauge.
4. Top stabiliser (if required) should be no more than $^{1}/_{8}$" undergauge when run in the hole.
5. Stabiliser OD shall be reported for trip in and trip out.
6. A Totco ring should be positioned above the float.
7. Maximum WOB shall be limited to 85% of the available buoyed weight below the drilling jars. Check when making up BHA.
8. Run ported float and Totco ring in 12-1/4" and 8-1/2" hole BHA.
9. Final BHA shall be determined on hole conditions and agreed between the Drilling Supervisor and Drilling Engineer

20.17 Well Head Details

The well will utilize the following wellhead equipment:

1. "A" Section - Braiden Head:
   11", 3K, Wood Group Pressure Control,
   Bottom connection: 9-5/8" BTC pin.
   Top connection: 11", 3K, RX-54 Flange.

2. "B" Section - Tubing Head Spool:
   WG-22-BP, 11" 3k x 7-1/16" 5K, Wood Group Pressure Control
   Bottom connection: 11", 3K, RX-54 Flange.
   Top connection: 7-1/16", 5K, RX-46 Flange.

3. "C" Section – Bonnet Flange:
   7-1/16" 5K x 2-9/16", 5K, Wood Group Pressure Control
   Bottom connection: 7-1/16", 5K, RX-46 Flange.
   Top connection: 2-9/16", 5K, RX-27 Flange.

4. "D" Section - Christmas Tree:
   2-9/16" 5K with 3-1/8" & 2-1/16" gate valves and 2-9/16" crown valve

If the well is to be completed for production 2-7/8" tubing will be run to just above the top perforations and the 2-9/16" Christmas Tree will be installed. The Christmas Tree will not be required if the well is plugged and abandoned.

Refer to the Wood Group Wellhead Equipment Manual for equipment and procedural details. Ring gaskets will installed between each flange to ensure a competent seal is achieved between the flanges. The studs and nuts will be made up in a cross flange pattern and will be continually tightened until a successful pressure tests is achieved.

A Wood Group engineer is available in Queensland and can be called to the rig if required.

20.18 Casing Design

Casing Setting Depths

<u>340mm (13-3/8") Conductor Casing</u>

The 340mm (13-3/8") conductor casing setting depth of 12m was selected to provide a competent shoe for drilling the 311mm (12-1/4") hole to 400 meters.

<u>244mm (9/8") Surface Casing</u>

The 244mm (9-5/8") surface casing setting depth of 400m was selected to provide a competent shoe for drilling the 216mm (8-1/2") hole to 2000m.

The casing string is 244mm (9-5/8"), 36ppf, K55, R3, BTC.

<u>178mm (7") Production Casing</u>

The 178mm (7") production casing will be set at the TD of the hole at 2000m. The casing will be run to allow all of the potential reservoirs to be tested with cased hole DST's to ensure a good seat is

obtained and to prevent the reservoirs from collapsing. The production casing will also allow adequate for the production tubing and downhole assembly to be run to the desired setting depth.

The casing string is 7", 26ppf, K55, R3, BTC.

2-7/8" Production Tubing

If required, a production tubing string will be run to just above the production zone to enable the well to be completed as a production well and to allow for further testing.

The tubing string is 2-7/8", 6.5ppf, J55, R2, EUE.

Casing Design Summary

Casing Specification					Casing Performance		
Casing Size (in)	Setting Depth (m RT)	Weight (lb./ft)	Grade	Conn	Burst Rating (kpa)	Collapse Rating (kpa)	Tensile Rating (kgs)
13-3/8	12	54.5	K55	BTC			
9-5/8	400	36	K55	BTC	24,323	13,958	256,364*
7	2000	26	K55	BTC	34,411	29,851	188,636*

*Body yield load limited + Coupling yield load limited

Safety Factors					
Casing Size / Specification	Depth (mKB)	Burst (P. test)	Collapse	Tension	
				Running	Pressure Test
13-3/8" (54.5# K55)	12	-	-	-	-
9-5/8" (36# K55)	400	3.218	3.402	11.937	
7" (26#, K55)	2000	1.436	1.455	2.432	

Casing Design Assumptions:

Burst:

Surface Casing: 1) Leak off pressure at the shoe with a gas gradient to surface.
2) Assumes a casing test pressure of 500 psi with mud on the inside of the casing and water on the outside of the casing.

Production Casing: Internal load capable of withstanding formation pressures in the Waarre Formation.
The mud behind the casing is assumed to have deteriorated to water.
Formation still at virgin pressure and production fluid is gas.

Burst Safety Factor Minimum 1.1

Collapse: Internal load equal to complete evacuation
External load equal to mud hydrostatic
Collapse Safety Factor Minimum 1.0

Tension:

Tension Running	Equal to un-buoyed weight
Tension Press Test	Equal to buoyed weight plus pressure test axial load
Tension Safety Factor	Minimum 1.6