



LAKES OIL N.L.

(A.C.N. 004 247 214)

Registered Office:
Level 11
500 Collins Street
Melbourne Vic 3000
Phone: (03) 9629 1566

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Collins Street West
Melbourne Vic 8007
Fax: (03) 9629 1624

23 MAR 2007



PE910009

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16 February 2005

Mr. Horacio Haag
Manager Petroleum Operations
Safety & Environmental
Minerals & Petroleum Victoria
Department of Primary Industries
Level 16, 1 Spring Street
MELBOURNE VIC. 3000

Petroleum Regulation Unit

Correspondence No: _____
 Audit Reference: _____
 Incident Reference: _____
 Recfind No: _____
 Initials: _____
 Date: _____

Dear Sir,

BANJO-1 DRILLING PROPOSAL

Please find enclosed two copies of the Drilling Proposal for the Banjo No. 1 well to be located in PEP 155 onshore Victoria.

We would request your approval of this programme as soon as practical.

If you have any queries please contact Tim O'Brien on the above telephone number.

Yours sincerely
LAKES OIL N.L.

Margaret Rhodes
Office Manager

Petroleum Regulation Unit

Correspondence No: 4120
 Audit Reference: _____
 Incident Reference: _____
 Recfind No: _____
 Initials: KM Date: 24/6/05

910009 002



LAKES OIL N.L.

(A.C.N. 004 247 214)

as operator

PETROTECH PTY LTD

(A.C.N. 009 116 429)

as permit holder

FARMLINEES:

GIPPSLAND OFFSHORE PETROLEUM LTD

(A.C.N. 111 418 270)

RILO EXPLORATIONS PTY LTD

(A.C.N. 009 174 001)

DRILLING PROPOSAL

BANJO-1

Tim O'Brien
February, 2005

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910003 003

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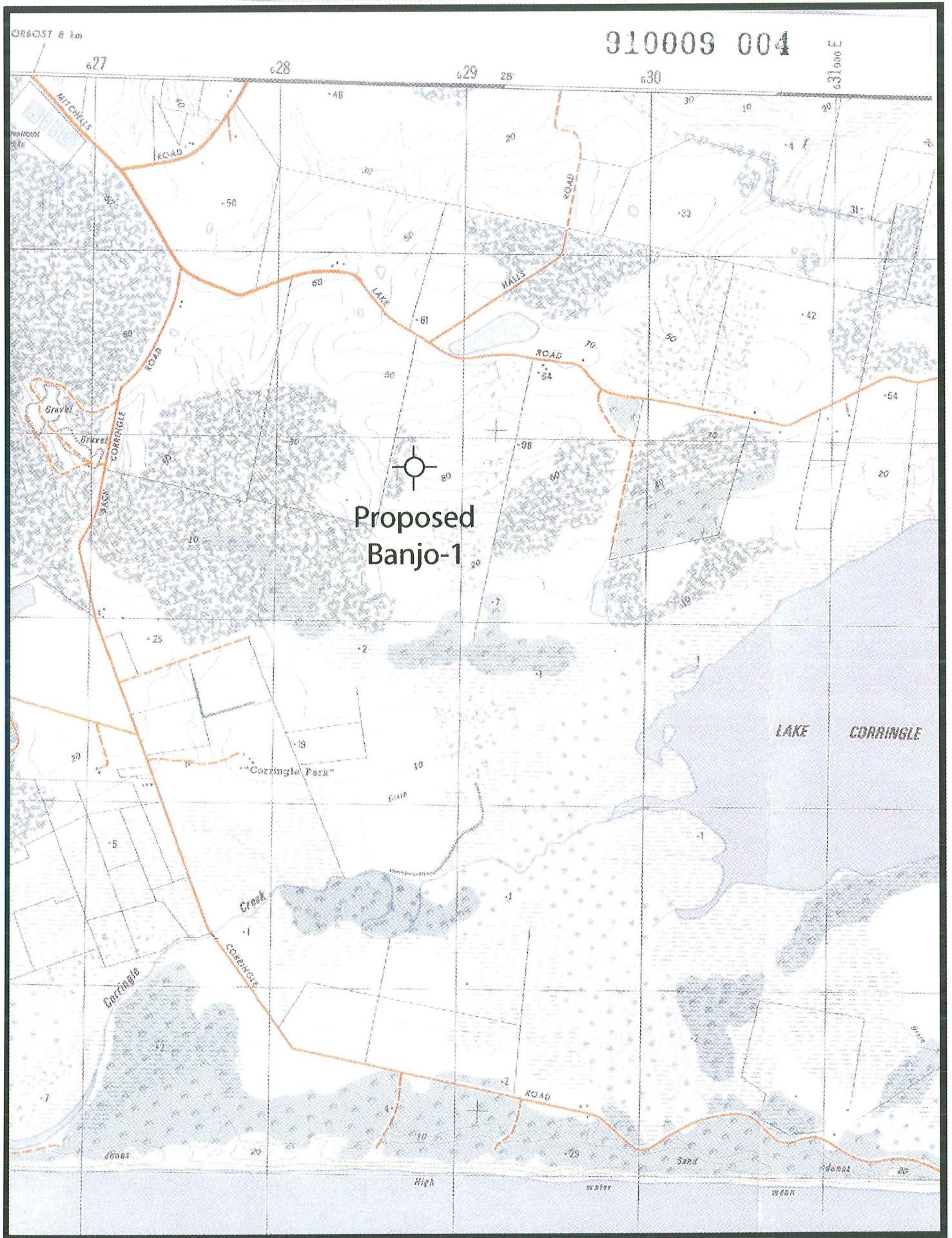


Figure 1: Topographic map of Banjo-1 wellsite location

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1. Well Name:

Banjo-1.

2. Permit:

PEP 155

3. Map reference:

Corringle Creek Topographic 8522-2-1. Scale 1:25,000

4. Location:

Off Lake Road, approximately 7km South of Orbost. South side of the Road.

AMG (Aus.66) co-ordinates: 629249 E
5818736 NLatitude 37⁰ 46' 10" SLongitude 148⁰ 28' 03" E

Ground level is approximately 80 m. above MSL

5. Landowner/Property:

Mr. Robert. Nettleton

Lot 23 B C, Lake Rd, Shire of East Gippsland, Newmerella

6. Seismic Location:

Not applicable

7. Purpose:

Banjo-1 has been designed to provide stratigraphic and reservoir information regarding the Cunninghame Greensand and the underlying Colquhoun Gravel at this location (if they are present) as there has been very little exploration in this portion of the basin. It will test the competency of a large anticlinal structure which runs roughly E-W broadside to the coast. It will also test the extent of hydrocarbon migration from the spilling, offshore fields, up-dip towards this onshore portion of eastern Gippsland Basin.

8. Programme:

- Drill 9-7/8" hole to 30 m
- Run and cement 8" casing.
- Install & test BOP.
- Drill 5-7/8" hole to 250 m.
- Run and cement 4" casing.
- Install & test BOP.
- Continuously cut 2-1/2" core from 250m – TD at 600m.
- Complete evaluation testing/logging as required.
- Complete or abandon the hole



AGE	GROUP	ROCK UNIT	MAXIMUM THICKNESS		LITHOLOGY AND DEPOSITIONAL ENVIRONMENT	HYDRO-CARBONS	
			ONSHORE	OFF-SHORE		ONSHORE	OFF-SHORE
PLIOCENE	SALE	HAUNTED HILLS GRAVEL	110m	-	Gravels, sands and clays. Non Marine		
		BOISDALE FORMATION	200m	-	Interbedded sand, silt and clay, with minor gravels and coals. Non marine		
MIOCENE	SEASPRAY	JEMMYS POINT FORMATION	110m	290m	Calcareous sandstone with shell beds. Marine	●	
		TAMBO RIVER FORMATION	100m	150m	Glauconitic marl with marly and shelly limestone. Marine		
		GIPPSLAND LIMESTONE	800m	1500m	Fossiliferous limestone, marly limestone and marl. Marine	☀	☀
		LAKES ENTRANCE FORMATION SEACOMBE MARL MEMBER	225m		Fossiliferous calcareous mudstone and marl. Marine		
OLIGOCENE	LATE	GIFFARD SANDST MEMBER	15m	500m	Muddy sandstone, marly sandstone and sandy mudstone with glauconite and pyrite. Marine	●	☀
		TRARALGON FORMATION	1100m		Quartzose sandstone with minor coals, siltstone and claystone. Non marine	☀	●
EOCENE	LATROBE	BARRACOUTA FORMATION	510m	3000m	Coarse grained quartzose sandstones with minor interbedded siltstone, claystone and coal. Non Marine	☀	●
CRETACEOUS	GOLDEN BEACH	UPPER LIMIT					
		KIPPER FORMATION	400m	2000m	Interbedded sandstone and shale with minor coal. Non marine	☀	☀
		JUDITH FORMATION					
	STRZELECKI	WONTHAGGI FORMATION	2000m		Interbedded sandstones, shales and minor coal. Non Marine	☀	
		Tyers Sub Group					
		RINTOUL'S CREEK SANDSTONE	200m	5000m	Quartzose sandstone interbedded with mudstone and shales with minor coal. Non marine		
		TYERS CONGLOMERATE			Conglomerate, quartzite, mudstone and shales. Fluvial		
		DUCK BAY VOLCANICS			Lava and pyroclastics. Non marine		
		PALEOZOIC			BASEMENT		

Figure 3

310009 008

9. Geology:

The Lakes Entrance Oil Field is located on the Lakes Entrance Platform of the Gippsland Basin, which flanks the main depocentre on its north-east side. The stratigraphic section is truncated compared to offshore, consisting of Early Miocene to Recent sediments overlying either late Devonian granite or Ordovician metamorphics.

The well is designed to intersect the Lakes Entrance Fm Greensand member at approximately 330 m. Control is provided by 1920s and 1930s vintage wells with no electric logs. Bunga Creek-1 was cored through the Greensand and basal Lakes Entrance Formation, and should provide adequate control for most of the section. Refer Figure 5.

Well Prognosis

Age	Formation	Depth metres KB	Thickness metres
Pliocene	Haunted Hills Gravel	0.6	14.4
Miocene	Jemmy's Point Fm	15	35
Miocene	Gippsland Limestone	50	300
Late Oligocene	Lakes Entrance Fm (if present)	350	80
Oligocene	Colquhoun Gravels (if present)	430	20
	----- Unconformity -----		
Late Devonian	Granite Basement	450	
	Total Depth	600	

10. Safety & Environmental Risk Assessment:**(a) Safety**

No major hazards related to hydrocarbons are expected to be encountered at Banjo-1 based on the results of other wells drilled in the permit which have encountered only minor gas shows within the Gippsland Limestone, (drilled with percussion rigs), and heavy oil within the Greensand. Nonetheless the following measures will be put in place to minimise any possible risk.

- (b)** An annular BOP will be installed on the well following cementing of 4" casing.
- (c)** Continuous gas monitoring will be undertaken after drilling out of the surface conductor pipe until TD is reached.
- (d)** Drilltec have extensive experience of drilling in the onshore Gippsland Basin. Crews will be advised as to any hazards regarding the drilling programme for each day's work before commencing operations.
- (e)** The mud pits will be separate from the drill 'floor', and will constitute an 'electricals-free area' in order to minimise the chance of spark induced ignition. The exception is the motor for the mud agitator for the gas detector, which is electrically isolated, as is required by good oilfield practice.
- (f)** Rig personnel will be instructed as to the nature of the above risk, prior to the commencement of coring, and the appropriate remedial action to be taken.
- (g)** Barytes will be available on site in the event that it becomes necessary to weight up mud.

11. Occupational Health and Safety Manual:

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A copy of Contractor's OHS Manual will be available for inspection on site. A copy of Lakes Drilling Operations & Safety Manual and Emergency Response Plan for Gippsland Operations will also be available on site.

12. Environmental Hazard Assessment:**Environmental Impact Statement****Exploration Well Banjo # 1 in PEP 155**

Submitted for LAKES OIL N.L. by Chris Annear (Petroleum Support Services)

Wellsite location called: BANJO # 1 PEP 155

Proposed Location: Banjo # 1 (Proposed) is situated approximately 5.5kms North West of the small tourist and riverside/seaside town of Marlo and approximately 8kms South East of the tourist and farming community of Orbost.

Description of Natural Environment.

The proposed site is near the crest of remnant sand dunes which would be elevated approximately 80 metres above and 1.5kms away from Lake Corringel. This remnant dune system still supports some native vegetation consisting mainly of White Stringy Bark, Brown Stringy Bark, Sea Banksias and Bracken Fern. Towards the base of the dune system there are also some Southern Swamp Mohogany trees.

The preferred location is on an already cleared area near an existing fenceline and a proposed fenceline. (Photo 3 looking North) The preferred location is up near the vehicle, but for ease of rehabilitation the flatter surface in the foreground has been chosen. The new access road will be constructed on the existing cleared fenceline track centre of screen and to the left of the mature native trees. (Photo 2)

The soil type is complete sand to a depth of at least 10 metres. This is evidenced by a nearby excavated section of the sandhill, presumably in an attempt to establish a dam. This excavated area has been stabilised by native Brown Stringy Barks.

The soil colour and its ability to enable regrowth of cleared vegetation shows that there has been a healthy accumulation of organic matter in this usually fragile soil type.

There are White and Brown Stringy Barks in various proximities ranging from 20 – 50 metres away from the proposed drilling pad. None of these trees will be affected by the earthworks or drilling activities. All plant operators and wellsite personnel will be instructed to avoid any impact on these trees.

Observed animal droppings indicate wombat and wallaby activity. Whilst not observed, the Common Brushtail Possum, Common Wombat, Swamp and Red-necked Wallabies are known to dwell within and nearby these clumps native vegetation dotted along the stabilised dune system.

Native birds observed included a Wedge - tailed Eagle, Yellow tailed Black Cockatoo, and Blue Wrens. Crimson Rosellas were observed near the proposed site.

These birds would be expected in such environments of sparse mature Stringy Bark trees and a limited understory within cleared and pastured grazing land. (Photo 1, looking East)

Looking West across the proposed location (Photo 5) the Bracken Fern covers the area which will be cut and filled.



Photo 1: Banjo-1 wellsite facing East



Photo 2: Banjo-1 wellsite facing North along the access track

910009 011

(Photo 4 looking south). The pad will straddle the slashed firebreak track and the Bracken Fern to the left of screen.

There was no obvious evidence of previous Aboriginal activity on or around the original wellsite or access road. Given that the area has previously been cleared, levelled, gravelled then rehabilitated the possibility of finding additional evidence is very remote.

Due care and observation will be undertaken during the construction and excavation stages to ensure that no artefacts, objects or remains are uncovered or disturbed. If such things are found then the earthworks will stop and the relevant authorities will be notified.

Access.

Access to the site will be via the gravelled Lake Road.

An existing gateway will require widening then a new access track will be made south across the paddocks. The proposed placement of this track has been planned with full consultation with the landowner Mr Robert Nettleton.

Robert Nettleton has directed that the new track be directed across one of his dam walls. These sides of the wall will be clearly flagged to prevent any un-observant driver from straying too close to the lip of the dam wall.

Pad Construction.

Prior to any work being undertaken all contractors involved will be reminded of their obligations concerning Aboriginal artefacts, objects or remains; Occupational Health and Safety; protection of Native Flora and Fauna; Waste Management and Road Safety issues.

Adequate road warning signs will need to be deployed during the construction, drilling and cleanup stages of operations.

Total earthworks for this job will comprise a pad of approximately 60 metres by 40 metres and approximately 900 metres of access road.

The rubble for this pad will be from existing borrow pits and care will be taken to ensure that no importation of weeds occur.

There will be a sump dug to contain drilling fluids and drill cuttings.

This sump will be lined, mainly to contain and assist in recycling the drilling fluids.

A small flare pit will be dug. Excavated material from the sump will be piled around the sides and back of the flare-pit in case a flow test is required.

Rubbish removal contractors will provide rubbish skips to remove all rubbish from the site. These will then be carted away and the contents disposed of at a registered waste disposal site.

There will be need for at least two transportable buildings to provide office and bedding facilities.

No campsite will be required as personnel will be accommodated at nearby Marlo or Orbost.



Photo3: Banjo-1 wellsite facing North



Photo 4: Banjo-1 wellsite facing South

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A portable toilet will be provided and it shall be serviced on an as required basis.

Any generation of road dust by vehicles during the construction and cleanup stages will be minimised (if required) by the spraying of water onto Lake Road.

Road repair will be undertaken on an as required basis if the pad building and rig traffic has an adverse impact on this existing white metal Lake Road.

Drilling.

A water bore licence will not be required as the landowner has agreed to deliver water to the site from his existing dams.

The drilling operation is programmed to begin late Jan 2005 and the drilling rig should only take 15 to 18 days to complete its activities. A Bourne THD 25 VP drilling rig is planned for this. It may run on a 24 hour basis.

Crewsize.

The small scale operations require a rig crew of 3 with another 3 or 4 company persons for sampling and supervision.

Off-duty personnel will be transported by standard road vehicles to the accommodation at nearby Marlo or Orbost.

Liason.

Discussions have already been held with the landowner Robert Nettleton and a compensation agreement is being finalised.

The East Gippsland Shire have been notified about this proposed well.

A brief but fruitful meeting was held with Mr Stephen Henry from Dept of Environment and Sustainability. The purpose of the meeting was to establish a contact within the area and to discuss any relevant issues for the wellsite location.

If a flare test is required local emergency authorities including the Police, Ambulance and C.F.A. will be issued with mudmaps of the location as a precautionary measure.

A letter notifying Mr. Robert Douthat, the Cultural Heritage Officer for the Central Gippsland Aboriginal Health & Housing Co-operative of the proposed well will be forwarded by Lakes Oil to his organisation for comment.

Environmental Impact.

Given the small scale of operation and the length of duration of this well the risk of environmental damage is very low.

All earthwork activities will occur over already cleared and re-pastured grazing land. There will be minimal damage to native vegetation by the construction of the road, pad, pits or flare-pit.

The drilling pad will be fenced to prevent access by the larger native animals and to prevent stock wandering on site during drilling or afterwards for the rehabilitation stage.



910009 013

Photo 5: Banjo-1 wellsite facing West

The derrick will be floodlit at night for safety reasons. This also provides illumination to help prevent accidental collision by any nocturnal native birdlife.

Risk of spillage from operational fuel/ oil reserves will be minimised by the bunding around the containment areas.

In the extremely unlikely event of a fuel spill the affected gravel could be bio-remediated on site or taken away to be dumped at a hazardous waste dump site.

Drill cuttings and drilling fluids will be removed from the lined pits and disposed of at an EPA approved dump site.

The relevant procedures set out in the Australian Petroleum Production & Exploration Association (APPEA) Code of Environmental Practice 1996 will be adhered to with probably one exception.

Topsoil for construction of the track will remain. The existing light sandy soil can be fragile and susceptible to bogging once the surface vegetation has been removed. Also, the landowner wishes for the track to remain.

The fencing around the pad will remain until the new growth can sustain stock foot traffic and grazing.

The pad material will probably be stockpiled for the landowner's later use.

Noise disturbance to dwellings will be minimal due the short duration of the drilling, the placement of the rig downhill and the at least 1000 metre distance to the nearest occupied dwelling.

It is anticipated that disruption to the local community, flora and fauna will be absolutely minimal during the pad construction, drilling and cleanup associated with Banjo # 1.

Monitoring.

Both the construction and drilling stages of this corehole will be monitored by company representatives.

Similarly, the clean up operations will be supervised to make sure that correct procedures are followed.

Post Well Audit

Once the cleanup has occurred the site will be rehabilitated and re-pastured to the landowner's satisfaction.

Monitoring of the return to pasture of the affected area will be undertaken.

An Environmental Audit will also be submitted to Petroleum Branch D.N.R.E. outlining the final impacts of the drilling and cleanup of Banjo # 1.

The contact person for all enquiries relating to the preparation, building and rehabilitating of the padsite will be Mr. Tim O'Brien.

His contact numbers are as follows:

Work: 03 96291566
Mobile: 0429961566
Fax: 03 96291624

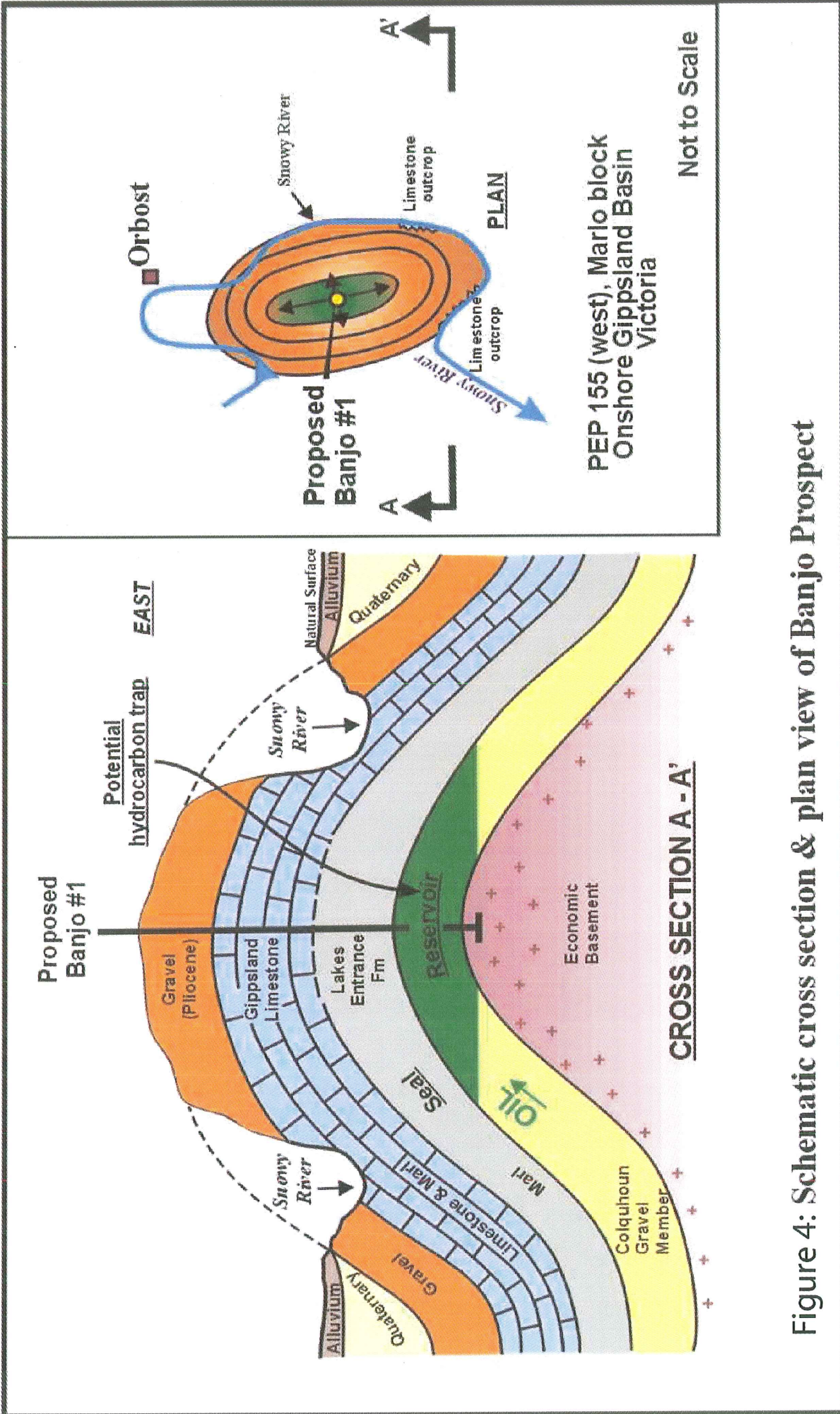


Figure 4: Schematic cross section & plan view of Banjo Prospect

13. Drilling Contractor:

Drilltec Pty Ltd
Drilling Depot Road
Morwell Vic. 3840
Details of the rig and BOP are included as Appendix 1.

14. Drilling Parameters:

The drilling contract is in a per metre format, effectively a turnkey price payable to the contractor on completion of the well. Lakes has the option to switch to day rate should this be required. The surface hole will be drilled with water and then bentonite: the remainder of the well will be drilled using a KCl polymer mud.

Mud properties will be monitored during drilling.

Spot carbide checks will be conducted periodically in order to check out the gas detector system. Regular checks of the Annular Preventer will be conducted during drilling

Cuttings samples will be collected every 3m from spud to the coring point at around 250m. A washed and unwashed sample will be provided to the DPI. A washed sample and a samplex tray sample will be retained by Lakes Oil N.L.

Since it is planned to continuously core most of the hole it is planned to only run a basic log (Gamma, CCL) from surface to TD

15. Site Restoration:

At the conclusion of drilling the pits will be emptied of drilling sludge, and filled in. The gravel removed will be removed from the pad and stockpiled for the landowner's use. Topsoil will be replaced, the site re-seeded and the temporary fencing removed. Drilling sludge will be disposed of at an appropriate waste site.

16. Landowner Compensation:

A compensation agreement has been reached with the landowner, Mr R. Nettleton, a copy of which is included as Attachment 1.

17. Schedule:

Subject to DPI approval, it is intended to commence operations on or about March 1st. Operations will be conducted during daylight hours, and are expected to last for around 28 days total.

18. Service Companies:

The following services will be contracted

Drilling:	Drilltec
Mud Chemicals:	Driller
Mud Logging:	Operator
Cementing:	Drilling Contractor
Electric Logging:	Scientific Drilling

Banjo-1 Time vs Depth Graph

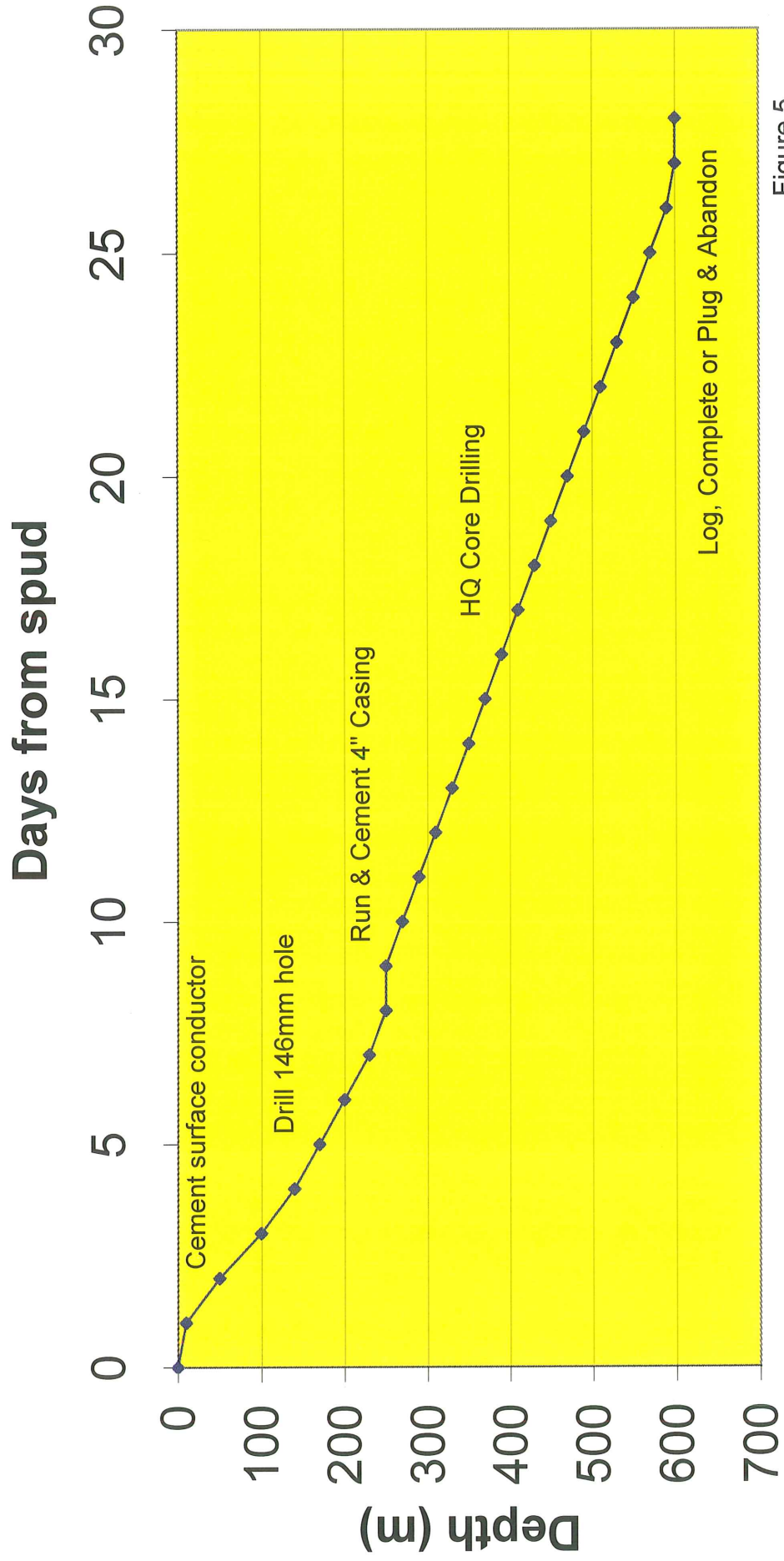


Figure 5

Log, Complete or Plug & Abandon

19. Emergency Services:Medical

Orbost Regional Health	5154 6666
Bairnsdale Hospital Reception	5150 3333
Emergency	5143 8770
Ambulance	000
<u>Police</u> Orbost	5154 1073
<u>Fire</u> Station Orbost	5154 1325
Fire Restriction Information	131599
<u>SES</u> Orbost	5154 2065
East Gippsland <u>Shire Council</u>	5151 9100

20. Petroleum Branch Dept. Primary Industries:

Switchboard	136 186
Facsimile	9658 4550
Manager Petroleum Operations, & Safety	
<i>Mr H. Haag</i>	9658 4415
Mobile	0408 543 154
Manager Petroleum Resources	
<i>Mr K. Mehin</i>	9658 4542
Mobile	0419 597 010

21. Operator:*Lakes Oil Office:*

11/500 Collins St.	Ph:	9629 1566
Melbourne 3000	Fax:	9629 1624

Lakes' on-site representatives:

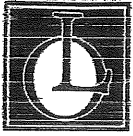
Tim O'Brien - Operations Manager & Wellsite geologist.
Phone 0429 961 566

Mr D. Sisely - Gas detector supervision and core sampling:
Phone 0427 770 802

Tim O'Brien
Lakes Oil N.L.
14 February 2005

ATTACHMENT 1

LANDOWNERS COMPENSATION AGREEMENT



LAKES OIL N.L.

A.C.N. 004 247 214

Registered Office:
Level 11,
500 Collins Street,
Melbourne, Vic. 3000

010009 021

P.O. Box 300, Collins Street West
Melbourne, Vic. 3007
Phone: (03) 9629 1566
Fax: (03) 9629 1624

**COMPENSATION AGREEMENT
PROPOSED BANJO-1 WELL**

***THE PETROLEUM ACT 1998
AND ASSOCIATED PETROLEUM REGULATIONS 2000***

An agreement to provide compensation for exploration on private land, located within Petroleum Exploration Permit 157.

THE PARTIES to this Agreement are:

Lakes Oil N.L. ("Lakes")
Level 11,
500 Collins Street,
Melbourne, Victoria 3000

{The Exploration Company}

and

Mr R. Nettleton
P.O. Box 333
Orbost, 3888
Victoria

{The Landowner}

Period of Agreement:

This Agreement shall commence on the day earth works begin on the property of the Landowner, and shall endure for six months, with the Exploration Company having the right to extend for a further six months upon payment in advance of the Compensation for the further six months.

The Private Land Subject of the Agreement:

Lot 23 B C, Shire of East Gippsland, Parish of Newmerella.

Compensation:

An amount of \$1,500 shall be payable to Mr R. Nettleton by Lakes upon commencement of earth works, which payment is for six months lease of the land. If Lakes wishes to have access to the land for a further six months, then a further \$1,500 is payable in advance as above.

Drilling Pad and Rehabilitation:

Lakes will undertake installation of the drilling pad and pits after notifying the Landowner and arranging access. At the conclusion of drilling Lakes will restore the drilling pad as closely as is reasonably possible to its original condition. The Landowner shall have the right to have the drill pad and its access remain after this agreement ceases, upon request.

Information to Landowner:

The Landowner will be provided with a copy of the bore's lithological log within 60 days of the conclusion of operations. At the completion of the well Lakes will make the well bore available to the landowner for conversion to a water bore at the landowners expense should he so desire. In the event that the well is converted to a water bore Lakes reserves the right of access to water from the bore, should this be required for future operations in the area. In this event ownership of the well will be transferred to the Landowner.

The landowner's reasonable costs of this agreement will be payable by Lakes.

Notice of Entry:

The Exploration Company agrees to notify the Landowner in advance of its entry to the land.


Petroleum Act Regulations:

A copy of the relevant portions of the Victorian Petroleum Act 1998 relating to compensation for landowners (sections 128 to 136) is attached to the Landowners copy of this agreement.

Signed for and on behalf of Lakes Oil N.L.:


----- Date: 14/12/04

Signed by Mr R. Nettleton


----- Date: 14-12-04

ATTACHMENT 2

RIG SPECIFICATIONS

R2

910009 024



BOURNEDRILL PTY. LTD.

A.C.N. 009 063 094
(Incorporated in Queensland)

PO BOX 99, BRISBANE MARKET 4106
133 BEATTY ROAD, ARCHERFIELD
BRISBANE 4108
QUEENSLAND AUSTRALIA

TELEPHONE : 61-7-3275 1311
FACSIMILE : 61-7-3277 5924
CABLES : "BETAM"BRISBANE

OUR SPECIFICATION NO: 10/98

FOR THE SUPPLY OF

ONE (1) ONLY

BOURNEDRILL THD25'VP' DRILLING RIG

FOR

GEO-ENG DRILLING PTY LTD

MORWELL 3840

VICTORIA

February 26 1998



Quality
Controlled
Company
MEMBER
2000-2001

310009 025



BOURNEDRILL PTY. LTD.

A.C.N. 009 003 084
(Incorporated in Queensland)

PO BOX 99, BRISBANE MARKET 4106
133 BEATTY ROAD, ARCHERFIELD
BRISBANE 4108
QUEENSLAND AUSTRALIA

TELEPHONE : 61-7-3275 1311
FACSIMILE : 61-7-3277 5924
CABLES : "RETAM"BRISBANE

OUR SPECIFICATION NO: 10/98

THD25'VP' DRILLING RIG

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- 1.12 LIGHTS
- 1.13 CONTROLS
- 1.14 HYDRAULIC SYSTEM
- 1.15 PTO
- 1.16 PAINTING
- 1.17 MANUALS



010009 026



BOURNEDRILL PTY. LTD.

A.C.N. 009 863 094
(Incorporated in Queensland)

PO BOX 99, BRISBANE MARKET 4105
133 BEATTY ROAD, ARCHERFIELD
BRISBANE 4108
QUEENSLAND AUSTRALIA

TELEPHONE : 61-7-3275 1311
FACSIMILE : 61-7-3277 5924
CABLES : "BETAM" BRISBANE

OUR SPECIFICATION NO: 10/98

GROUP 1

1. DRILLING RIG

1.1 GENERAL DESCRIPTION

The BOURNEDRILL THD25'VP' is a multi-purpose, self contained, all hydraulic robust top head drive drilling rig, mounted on a suitable truck chassis, designed primarily for rotary drilling by direct mud circulation. Also equally capable of air blast and down-the-hole hammer drilling, (when connected to an auxiliary air supply), and is especially suited for water well drilling purposes.

1.2 CAPACITY

The Bournedrill THD25'VP', when equipped with suitable accessories and options, in favourable conditions and operated by experienced personnel, has the following capacity based on 100% of the component manufacturer's specification utilised to 80%.

Open hole 152 mm (6 inch) diameter to a depth not less than 305 metres (1000 ft) when using 88.9 mm (3.5 inch) diameter drill pipe, and 240 metre (787 ft) using 114.3 mm (4.5 inch) diameter flush jointed drill pipes, (calculated on 6200 kg drill string weight).

1.3 FRAME

The mast, all drilling, hoisting, mud pump and hydraulic components are supported on an electrically welded structural steel frame work, consisting of heavy duty main members of suitable size, reinforced with cross members and covered with 4 mm non-slip floor plate, providing maximum rigidity.



Quality
Assured
Company
Scottsdale, PA
800-451-4294

910009 027

OUR SPECIFICATION NO: 10/98

1.3 FRAME - Continued

Built into each corner of the frame are four (4) fully enclosed hydraulic levelling jacks, individually controlled, with large flexible foot pads and automatic safety locking valves, capable of supporting the complete drilling unit during the drilling operation.

The main frame is securely fastened to the truck chassis and incorporated are heavy duty toolboxes for carrying hand tools and small spare parts. A drill pipe storage rack, complete with an external pipe slide, is mounted to the right hand side of rig deck with sufficient storage capacity of not less than 100 metres of 3.5 inch FJ x 6 metre drill pipes.

Folding driller's and helper's platforms are mounted at the rear of the frame.

1.4 MAST

The Bournedrill M10 series mast is constructed from high quality, high strength (350 mPa grade steel) rectangular hollow sections (RHS), electrically welded and suitably braced and reinforced for maximum strength and rigidity.

The single piece mast has a total gross capacity of 14000 kg (30800 lb) with a rated safe load capacity of 10000 kg (22000 lb), capable of withstanding bending when lifting casing from the side.

It is equipped with a heavy duty crown block consisting of three (3) only 300 mm (11.81 inch) diameter sheaves fitted with sealed precision rolling bearings, aligned over the centreline of the bore hole and the drawworks drums.

The mast is raised and lowered by two (2) double acting, single stage, hydraulic cylinders, each fitted with flow restrictors and safety check valves allowing safe lowering in case of hydraulic failure. Mast rests on a front support built into the front of the frame for travelling.

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1.4 MAST - Continued

The mast length of 10 metres (32.81 ft) provides a clear working height suitable for handling up to 8 metre (26 ft) casing and drill pipes with travelling block above the breakout table.

Fitted to the mast base is a slip guide breakout table, to guide and support the drill pipe when drilling and breaking out. The table has a clear opening of 360 mm (14.17 inch) diameter.

1.5 ROTARY TOP HEAD

The two (2) speed rotary top head drive provides either clockwise or anti-clockwise rotation to the drill rods. It is an hydraulically driven gearbox, fitted with precision spur type gears cut from high quality alloy steel, heat treated for long efficient life, mounted on taper roller bearings, lubricated in an oil bath, and provides the following characteristics:

- Low speed 0 - 60 RPM at torque up to 1000 kg/metre (7218 lbs/ft).
- High speed 0 - 120 RPM at torque up to 500 kg/metre (3609 lbs/ft).
- Maximum load capacity 16000 kg (35200 lb).

The head can be hydraulically unlocked and swung away off the centre of the hole, to enable fast tripping of the drill pipe from the hole and maximum casing to be handled using the drilling winch.

The head is fitted with a built-in fluid and air swivel 76.2 mm (3 inch) inside diameter with field replaceable packings.

The output spindle has a 102 mm (4 inch) API IF Pin and is floating to protect threads during make-up and breakout and dampened to reduce impact damage of the bearings, and is fitted with a 73 mm (2 7/8 inch) API IF pin saver substitute or to customer's selection.

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OUR SPECIFICATION NO: 10/98**1.6 PULLDOWN/PULLBACK/
FEED**

A single, double acting hydraulic cylinder actuates the high speed pulldown, pullback and feed of the top head drive head through a 2:1 ratio, double heavy duty roller chain relays, and provides the following operating characteristics:

- Maximum working stroke 7.5 metres (25 ft 7 inches).
- Maximum pullback force variable up to 10000 kg f (22000 lb f).
- Maximum pulldown force variable up to 10000 kg f (22000 lb f).

A micro-feed system is incorporated to provide an infinite adjustment to the feed force and speed rate up to 6.1 metres (20 ft) per minute.

1.7 DRAWWORKS Main Drum

The Bournedril model W12/2, two (2) speed, hydraulically driven drilling winch has a maximum bare drum single line pull of 5454 kg (12000 lb) at speeds up to 30 metres (98 feet) per minute or up to 60 metres (196 feet) per minute at a line pull of 2727 kg (6000 lb).

The winch lowering is controlled in forward and reverse direction by an integral automatic failsafe brake, which is not subject to bad weather conditions and is also provided with a counter balance valve for added braking safety.

The winch drum is fitted with 50 metres (164 ft) of 14 mm (9/16 inch) diameter 18 x 7 non-spinning wire rope with safety clevis.

Sandreeel

The hydraulically driven sandreeel has a maximum bare drum single line pull of 1000 kg (2200 lb) at speeds up to 120 metres (394 ft) per minute.

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The sandreel lowering is controlled in forward and reverse direction by an integral automatic failsafe brake, which is not subject to bad weather conditions and is also provided with a counter balance valve for added braking safety.

The winch drum is fitted with 300 metres (984 feet) of 9 mm (3/8 inch) 6 x 19 wire rope.

1.8 MUD PUMP

The duplex 5 x 6 model reciprocating double acting power pump has a 152 mm (6 inch) stroke and is capable of being fitted with a range of liner sizes. Sizes between 76.2 mm and 127 mm (3 inch and 5 inch) diameter, with discharge volumes ranging from 262 up to 757 litres per minute (69 - 200 GPM), at pressures ranging from 62.92 down to 21.79 kg/cm² (895 - 310 PSI).

The pump is driven by a high torque hydraulic motor and fitted with a large diameter flywheel. The pump is set up for slush type service with standard API piston assemblies and wing guide type taper valve bodies and seats, inserts and springs.

Discharge Manifold

The discharge manifold is connected to the duplex pump and is formed using heavy wall steel pipe 76.2 mm (3 inch) inside diameter.

Fitted to the manifold are the type 'F' Cameron style (0 - 1000 PSI) pressure gauge, adjustable shear relief valve, surge chamber, air actuated main valve and mixing valve.

The manifold is connected to the stand pipe attached to the mast and then from the stand pipe to chocks on swivel coupling on the swivel by 76.2 mm (3 inch) wire braid high pressure hoses, complete with high pressure fittings.

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OUR SPECIFICATION NO: 10/98**1.8 MUD PUMP – Continued**

Provision is made for the attachment of auxiliary air supply to the manifold for air blast and down-the-hole hammer drilling and is complete with valve and fittings.

Suction Line

The 102 mm (4 inch) ID steel suction manifold, which is attached to the intake flange, is fitted with a quick change coupling and includes a 6.1 metre (20 ft) heavy duty, reinforced suction hose with mating quick action coupling, check valve and strainer.

Accessories

All special wrenches, valve seat and liner pullers are securely packed in the lockable toolbox.

1.9 INJECTOR

The rig is fitted with an hydraulically driven reciprocating type injection pump for injecting water, foam and other agents into the delivery line. Delivery rate is adjustable from 0 up to 30 litres per minute (0 – 8 gallon per minute) at a maximum pressure of at least 21.79 kg/cm² (310 PSI).

The pump delivery is fitted with a surge chamber, adjustable relief valve, check valve and 6.1 metre (20 ft) x 32 mm (1 1/4 inch) suction hose complete with all fittings.

1.10 BREAKOUT

An hydraulic actuated 1220 mm (48 inch) 'Rigid' wrench with replaceable jaws is fitted at the base of the mast. When used in conjunction with the breakout table, enables precise make up and breakout of tool joints on drill pipe and drill collars etc.

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- 1.11 LUBRICATOR The rig is fitted with a positive displacement type lubrication oiler for down-the-hole hammer operation with direct injection into the air line with adjustable oil flow between 0.5 and 1.2 litres per hour at pressures up to 17.58 kg/cm² (250 PSI). The reservoir capacity is sufficient for a minimum of 12 hours operation.
- 1.12 LIGHTS Six (6) HD weather proof drilling lights are fitted in strategic positions on the mast and frame for night operation and are powered from the rig's electrical system.
- 1.13 CONTROLS All drilling controls are conveniently grouped and located at the driller's control position. All gauges, indicators and controls are clearly and permanently identified in English.

ENGINE

- Emergency Stop
- Throttle
- Oil Pressure
- Water Temperature
- Charge Indicator
- Tachometer

DRILL

- Levelling Jacks
- Mast Lift
- Breakout
- Rotary Head (2 speeds)
- Pulldown/Pullback/Feed
- Mud Pump
- Injection Pump
- Oiler
- Drawworks
- Sandreel
- Flow Controls
- Feed Pressure
- Rotary Pressure
- Hydraulic Oil Pressure
- Hydraulic Oil Level and Temperature
- Level Indicator

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OUR SPECIFICATION NO: 10/981.14 HYDRAULIC
SYSTEM

Power is transmitted to the rig components by hydraulic fluid, using components with sufficient proven capacity for sustained operation in severe ambient temperature. Hydraulic pumps are mounted to the power take off which directs power from the truck engine.

The large capacity hydraulic oil tank is baffled with its oil level above the pumps to provide positive suction head. Lockable shut off valve is provided to stop oil flow during maintenance of system. Fitted to the tank is the filler breather and oil level/temperature indicator.

The system is provided with three (3) independent circuits:

- (A) Rotary Top Head Drive, Drawworks, Pulldown and Pullback Circuit
- (B) Mud Pump and Injection Circuit
- (C) Auxiliary Circuit (Microfeed, Levelling Jacks, Mast Lift and Breakout)

Three (3) stage filtration is provided in the circuitry by:

- Suction Strainer
- Return Line Filters
- Magnetic Particle Trap

All filters are easily accessible for servicing and are fitted with restriction indicators.

The THD hydraulic system is designed to operate under ambient temperatures up to 50°C. A heavy duty fan ventilated oil cooler, with a heat dissipation capacity in excess of 40000 BTU's per hour, maintains oil temperature below maximum recommended range of 70°C.

1.15 PTO

Driven by power taken off the truck engine through a dynamically balanced torque tube. Fully enclosed, full torque, split shaft design with six (6) strand precision roller chain and heat treated sprockets.

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OUR SPECIFICATION NO: 10/98

1.15 PTO - Continued

Chain adjustment is possible with an eccentric idler, lubricated in an oil bath. PTO engagement is by an air control positioned in the truck cabin.

Hydraulic pumps to supply power to the various rig functions are mounted directly to, and driven by, this PTO compound case.

1.16 PAINTING

The drilling rig will be painted, after thorough cleaning and careful preparation, using highest grade primers and high gloss enamel finish coats, suitable for extreme conditions, in standard Bournedrill colours of off white mast over turquoise green machinery deck. Or, painted in client's choice of single colour.

1.17 MANUALS

Three (3) sets of manuals covering operation, service, maintenance and spare parts are supplied on delivery.