

301001

AMOCO AUSTRALIA PETROLEUM COMPANY

YOLLA No.1

DETAILED OPERATIONS PLAN

APRIL 1985

BASS BASIN T/14P TENEMENT

AMOCO AUSTRALIA PETROLEUM COMPANY

R.J. Walla

J.G. Rankin

OR.308

CONTENTS

	<u>Page</u>
I. Introduction	1
II. Summary	2
III. Discussion	3
A. Pre-Spud Preparations	3
B. 36" Hole & 30" Structural Casing	5
C. 26" Hole & 20" Conductor Casing	11
D. 17½" Hole & 13-3/8" Surface Casing	17
E. 12½" Hole & 9-5/8" Intermediate Casing	25
F. 8½" Hole & 7" Liner	33
IV. Appendix "A"	37
A. Casing Design	
B. Miscellaneous Data	
B1. Form 46	
B2. Predicted Lithology - (Prognosis)	
B3. Estimated Drilling Time Curve B3 - I Estimated Drilling Time Curve B3 - II	
B4. Location Map	
B5. Recommended Logging Program	
B6. Mud Logging/Engineering Services	
B7. Mud Logging Services	
B8. BOP Stack	
B9. BOP Test Requirements	
B10. Plug Requirements for P. & A.	

WELL PROGRAM - YOLLA No. 1

1. INTRODUCTION

Yolla No. 1 is a wildcat well to be drilled in the T/14 P Tenement in the Bass Strait off Australia. The primary objective of this well is to evaluate the early Eocene and late Cretaceous sands expected at ± 7100 ft. and ± 9300 ft. respectively below Mean Sea Level (MSL). The total depth is projected to be 14,000' MSL. The nearest offset wells are the Bass No. 1, Tarook No. 1, Nangkero No. 1 and the Poonboon No. 1.

This operational drilling program is based on the information available from the lithological prognosis and offset well data. Fundamental changes, in response to actual drilling conditions encountered, will be based on sound drilling practices in accordance with Company policy.

II. SUMMARY

Country: Bass Strait Australia

Well Name: Yolla No. 1

Proposed Location: Lat. : 39° 50' 18.75" South
 Long.: 145° 48' 22.00" East

SP Location: Intersection TNK - 4-12 and HB - 73A-169

Water Depth : Approx. 259 ft.

Rotary Kelly Bushing : Approx. 36.5 ft. above MSL

Authorised Total Depth : 14,000 ft. below MSL

Expected Drilling Time : 76 days

Well Objective : Early Eocene @ ±7100 ft.
 Late Cretaceous @ ±9300 ft.

Drilling Contractor/Rig : Global Marine Glomar R.F. Bauer (Drillship)

Estimated Spud Date : May 15, 1985

The operations plan calls for 30", 20", 13-3/8", 9-5/8" casing strings. A 7" liner to 14,000 ft. will only be run if necessary. Drilling procedures for each hole section are discussed separately.

DRILLING SECTIONS

The 36" hole will penetrate to approximately 300' below sea bed for the 7 joints of 30" casing to be run and cemented. The 36" hole will be drilled with a 26" bit and 36" hole opener.

A 17½" pilot hole will be drilled to about 1300' RKB below the sea bed (plus rat hole) with the 30" wellhead connector, riser dump valve and riser installed

on the 30" wellhead. After pulling the riser, the hole will be opened to 26" using a 17½" bit and 26" hole opener. The 20" casing will be set at about 1246' RKB, cemented, and the BOP stack installed. A 17½" hole will be drilled to about 5600' RKB (plus rat hole) and logged. The 13-3/8" casing will then be run and cemented. A 12½" hole will be drilled to about 14000' RKB, logged and, as necessary, 9-5/8" casing run and cemented. Drill stem tests will be run as necessary. The exact casing setting depths will be selected during drilling operations based upon the formations and hole conditions encountered. The 9-5/8" casing may be set higher (9184' est.) due to hole conditions and an 8½" hole drilled and a 7" liner run to 14,000' RKB.

DRILLING MUD

The 36" and 26" holes will be drilled with seawater using viscous sweeps to clean the hole at periodic intervals. The open hole will be filled with a gel based spotting mud when pulling out of the hole to log or run casing. A seawater gel mud will be used below the 20" casing. Mud weight will be kept to a minimum with full use of all available solids control equipment. Mud weight will be dictated by formation pressures and hole conditions.

LOGGING PROGRAM

The logging program will include a full set of logs run from TD to the 13-3/8" casing shoe and two (2) logs run to the 20" shoe. Multishot surveys will be run prior to running casing strings from the 20" onwards and at authorised TD. Also, a velocity survey will be run at TD. A conventional core may be cut at the top of any potentially productive zone at the discretion of wellsite geologist with the concurrence of the Resident Manager. Ample sidewall cores may be shot at any interval. Equipment will be available on the rig to drill stem test the well after setting the 13-3/8" casing string, and any other subsequent casing intervals as required.

III. DISCUSSION

A. PRE-SPUD PREPARATION

1. Pre-Spud Meetings - May 9, 1985.
 - a. A pre-spud meeting will be held in Hobart for all Amoco, contractor and service company personnel. Any modifications

required in the drilling program will be agreed upon at that time.

- b. A pre-spud meeting will be held on the rig for all wellsite personnel. This meeting will be conducted as early as possible.
2. Site Survey: Prior to arrival of rig, the location will be surveyed for bathymetric hazards, bottom conditions, and shallow gas. Marker buoys will be deployed as required.
 3. Positioning of Rig: The Glomar R.F. Bauer will move onto location, following a previously agreed route. Final positioning will be accomplished using a survey team that will be on location. The rig heading will be based on available weather data, provided prior to the arrival of the vessel on location.
 4. Advance Preparations:
 - a. Blow out prevention equipment should be inspected and tested in accordance with company policy as outlined in the APC Drilling Manual, Section C-5, and in accordance with manufacturer's and contractor's recommended practices. The pipe rams, shear rams, and fail safe valves should be stump tested to 5,000 psi minimum for 15 minutes. The annular preventers should be tested to 2,500 psi minimum. The choke manifold, kelly, kelly cocks, and safety valves should also be tested to 5,000 psi minimum.
 - b. All tools should be inspected and serviced, including all subsea equipment.
 - c. All mud tanks, valves, mixing, and solids control equipment should be thoroughly cleaned, inspected and serviced. A system schematic should be available or prepared illustrating proper valve positions, pump alignment, tankage and equipment, including the BOP equipment, the choke manifold, and degasser/mud gas separator equipment.
 - d. All drilling equipment should be serviced and inspected as needed to be ready to commence operations immediately upon

anchoring. Tubular goods will be inspected before use.

- e. Mix at least one pit of prehydrated Bentonite to use as a sweep pill for drilling the 36" hole while preparing to spud.
- f. Make up the initial BHA and stand back in the derrick.
- g. Check and prepare temporary guide base.
- h. Check and prepare permanent guide structure for straightness, compatibility with tools, wellhead, etc.

B. 36" HOLE AND 30" STRUCTURAL CASING

1. Spud: It is anticipated that a temporary guide base (TGB) will be used. Bring in the TGB and secure and load with weight material. Check and secure sonar targets, beacons, etc.. "J" in with running tool, bumpersub and HWDP. P/U and lower to sea bed. POOH. R/U and RIH with 26" bit on a 36" H.O., using the CIW temporary guide funnel attached to the D.P. and T.V. for guidance. Care should be taken to prevent washing out the sea floor while spudding. Initially, a flow rate of 300 gpm and a rotary speed of 30-40 rpm should be sufficient. Do not put weight on the bit until the first drill collar is below the TGB.

Carefully measure the RKB to sea level and RKB to sea bed based on SLM of the TGB landing string. Note the time of day and date and report this data on the morning report.

Keep weight on the bit to a minimum through this section of the hole. Enough hole should be drilled to accommodate 7 joints of 30" casing with about 15' of rat hole.

2. Bit and Hydraulics: Drill the hole with a 26" series 1-1-1 bit and 36" hole opener in one operation. Drill to $\pm 300'$ below mudline.

Recommended Drilling Parameters:

(a) Nozzles	as required
(b) Flow rate	1000 gpm
(c) Pump pressure	500 psi
(d) Weight on bit	0-10,000 lbs.
(e) RPM	60

3. Bottom Hole Assembly: 26" bit/36" hole opener/XO/12-8" drill collars/XO/HWDP. Use proper thread compound on drill collars.

4. Drilling Mud Program:

a) The 36" hole will be drilled using sea water with viscous sweeps as required by hole conditions or at connections.

b) The sweep pill volumes should be 75 bbls minimum to cover approximately 60 ft. of annulus. Increase volume as necessary for good cleaning.

c) Viscous Sweep Specifications:

1. Funnel VIS: 100+ secs
Density : 9.5 to 10.5 ppg

2. Composition:

20-25 ppb bentonite in drill water
1 ppb lime
± ¼ ppb Caustic
± ¼ ppb Soda Ash

d) Material Allocated for this Section

<u>MATERIAL</u>	<u>UNIT</u>	<u>SECTION TOTAL</u>
Bentonite	100 # /sx.	490
Lime	50 kg/sx.	25
Caustic	50 kg/dr.	4
Soda Ash	50 kg/sx.	4

5. Logging Program:

No logs will be run in this hole section.

6. Casing Program:

- a) The 36" hole will be drilled to a depth (approximately 300 ft. RKB) so that with 7 joints of 30" casing run and with the shoe resting just off bottom, the PGB will seat in the TGB. Check the 30" casing tally for exact measurements.
- b) At TD, sweep hole with 100 bbl (or vol. as required) viscous pill, make control trip, RIH to TD, sweep hole with viscous sweep, POH.
- c) R/U sonar reflectors, position transponders and Regan inclinometers as required.
- d) Make up a joint (40') of 30" casing with a welded duplex shoe, 5 joints of 30" (same type) casing, and the 40 ft. joint of 30" casing with the 30" wellhead welded to it (total 7 joints, approximately 300 ft.). All 30" joints to be equipped with Dril Quip Quik Stab Type connectors. Follow manufacturer's procedures and manufacturer's representatives' instructions in running of the 30" casing.
- e) Make up 5" DP stinger to within 30 ft. of the shoe, install the 30" casing running tool, lower through the rotary and make up the permanent guide base and the lockdown plate.

- f) Run the 30" string on HWDP and fill every joint with seawater. Continue running the 30" string and when the running tool is in the water fill the rest of the casing with seawater using rig pump and air bleeder valve installed in the ports on the running tool. Assure that D.P. running string is filled continuously.

Stab 30" casing shoe into TGB using OMB Arms Diving Bell and/or sonar guidance at shoe and T.V. monitor. Check slope indicator with T.V.. Hold with compensator after landing while cementing if required for minimum slope of future PGB.

- g) After cementing 30", relieve pump pressure from inner string and check for back flow. If back flow is observed, hold back pressure on the DP. WOC time is 8 hours.
- h) After surface samples are sufficiently firm, release 30" running tool assembly and POH.
- i) Prepare for running marine riser, 30" connector latch and riser dump valve assembly while waiting on cement.

7. Cementing Program:

- a) With the casing in position, establish circulation through the inner string with viscous pill, pump approximately 160 bbls. (36"/30" annulus volume + 40% excess or as necessary), chase with 50 bbls. sea water and commence cement slurry mixing and displacement. Watch for cement returns at sea floor with OMB camera.

- b) The Recommended Slurry Composition:

Class "G" + 2% CaCl_2

Water: 5 gal/sx

Wt: 15.8 ppg

Yield: 1.15 ft³/sx

c) The Recommended Slurry Volume:

The 36"/30" annulus volume is approximately 650 ft³. With 100% excess, the recommended slurry volume is 1300 ft³ or:

1130 sx "G" + 23 sx (80lbs/sx) CaCl₂

Mix water: 135 bbls sea water

Use NF -1 defoamer as needed. (.5 gal/10 bbl. = 6.8 gal)

d) Mixing , Pumping , and Thickening Times:

Total Vol.	:	1300 ft ³ (232 bbls)
Mixing Time	:	43 min. (30 ft ³ /mn)
Total Pumping Time	:	46 min. (assume 5" HWDP)
Est. Thick Time	:	Approximately 3 hr. 30 min.

Note: Mix and displace with cement pumps, estimated inner string volume (excluding surface lines) is about 11.5 bbls. Do not over-displace.

e) WOC Time:

Approximately 8 hours.

MATERIALS AND SERVICES FOR 36" HOLE/30" CASING

	<u>Quantity</u>
30" Conductor housing on 30" jt	2
30" casing - 1" wall	10
30" Float shoe on 30" jt	2
Drilling Template	1
Regan Inclinator	2
30" O-Rings	20
30" Lock Ring	2
Ring Depressor Screws	10
Sonar Reentry Beacon	2
26" Bit	1
17½" Bit	1
36" Holeopener	1
MUD MATERIALS	See Proposal
Class "G" Cement	1400 sx
CaCl ₂	25 sx

Casing Connector Engineer

Wellhead Engineer

Mud Engineer

Cementer

Oceaneering

C. 26" HOLE AND 20" CONDUCTOR CASING:

This section of hole will be drilled with a 17½" bit and after logging will be opened up with a 17½" bit and 26" hole opener.

A dump valve should be available for use on the riser as well as a riser fill valve assembly. If lost circulation is encountered on this section of hole, minimal time will be spent in trying to cure losses and drilling could proceed through such zone(s) with returns to the sea floor. This section of hole will be drilled with seawater and viscous sweeps.

1) Drillout from 30" casing:

- a) Drill 20 ft. of new hole with 26" bit.
- b) Run the 30" connector, dump valve assembly and ball joint on the riser. Install riser fill valve joint, slip joint and diverter.
- c) Latch up connector to the 30" housing. Observe operation with Arms II bell and T.V. monitor. Lock connector. Leave pressure locked in on the close port of the connector while in use.
- d) Nipple up riser, diverter, flow line, and diverter lines.
- e) Install diverter element and test by closing and opening on drill pipe and flow test.
- f) Since the well shall not be closed in on the 30" casing (diverter valve will always be opened before sealing element closed), no formation test is required.

2) Bit and Hydraulics Program:

- a) Clean out cmt. and drill out 30" casing shoe with 26" bit.
- b) Run between 10,000 and 30,000 lbs. on bit with about 120 rpm.

- c) Displace well and riser with sea water and observe. Open riser fill valve, drain slip joint, close fill valve and observe well for flow. If stable, release 30" connector and commence pulling riser.
- d) Open the hole to 26" using a 17½" bit and 26" hole opener with returns to sea floor.
- e) ROP should be controlled throughout this section to assure adequate hole cleaning.
- f) The Recommended Hydraulics Program:

17½"/26" Hole : 1000 gpm with 3-22/32 inch nozzles.

3. Bottom Hole Assembly:

17½"/26" Hole : 17½" bit/26" hole opener/1-8" DC/stabiliser/9-8" DC's/HWDP

4. Drilling Mud Program:

- a) This interval of hole will be drilled and opened with sea water to an approximate depth of 1300' RKB.
- b) When starting to drill this section prepare one reserve pit (450+ bbls as available) of sweep pill and one pit of kill mud.
- c) Sweep pill volumes should be 50 bbls in the 26" hole at approximately 90'-100' intervals or as hole conditions require.
- d) Monitor T.V. camera to see if returns can be seen.

- 1) Composition of Sweep Pill
 - 25-30 ppb Bentonite
 - 1 ppb Lime
 - ±½ ppb Caustic
 - ±½ ppb Soda Ash

- 2) Properties of Sweep Pill
 Funnel VIS: 100+
 YV : 26
 PH : 9.5 - 10.5

<u>MATERIAL</u>	<u>UNIT</u>	<u>SECTION TOTAL</u>
Bentonite	100#/sx	484sx
Caustic	100#/dr	7sx
Kwik Seal (M)	40#/sx	200sx
Lime	50kg/sx	35sx
Soda Ash	50kg/sx	4sx

5. LOGGING PROGRAM:

NO LOGS ARE PLANNED FOR THIS HOLE SECTION.

6. Casing Program:

- a) The 17½" hole will be drilled to approximately 1300' RKB and opened to 26" with returns to the sea floor. This will accommodate about 24 joints of 20", range 3 with approximately 25' minimum of rat hole.
- b) Upon reaching TD sweep the hole with a 100 bbl. viscous pill, and make a control trip to the 30" casing.
- c) Run in to bottom checking for fill and drag. If both are minimal, pull out of hole.
- d) The casing strings will consist of a shoe joint, approximately 23 intermediate joints and an 18 ¾" Cameron wellhead and housing joint.
- e) While running casing, continuously fill with seawater (every two joints, maximum interval).

- f) After making up the housing joint, run a drill pipe stinger into the casing to approximately 40 feet above the shoe. Attach the stinger to the housing running tool. Assure running string is filled.
- g) Run the casing, land the wellhead and cement the casing according to Section 7, using Arms Bell and T.V. for guidance and returns observation.
- h) If the float equipment holds pressure, pull out with running tool. WOC time is 8 hours.

7. Cementing Program:

- a) Flush the annulus with a 100 bbl. minimum viscous pill. The pill should be followed with a 75 bbl. minimum seawater flush to prevent mud contamination of the cement. Returns to the sea bed should be observed with the OMB T.V. camera.
- b) Recommended Slurry Composition: (Lighter weight may be required to avoid formation breakdown)

1. Lead Slurry

- a) Class "G" + 2.1% Bentonite (pre hydrated)
- b) Slurry Density : 13.6 ppb (max)
- c) Water Requirements: 8.5 gal/sx
- d) Yield : 1.63 ft³/sx

2. Tail Slurry

- a) Class "G" + 2% CaCl₂
- b) Slurry Density : 15.8 ppb
- c) Water Requirements : 5.0 gal/sx
- d) Yield : 1.15 ft³/sx

c) Recommended Slurry Volumes:

1. Lead Slurry

- a) Total Volume : 3012 ft³
- includes 100% excess in open hole
- b) Cement Required : 1850 sx
- c) Water Required : 374 BBL.

2. Tail Slurry

- a) Total Volume : 460 ft³
- b) Cement Required : 400 sx
- c) CaCl₂ Required : 14 sx (2%)
- d) Defoamer as needed
- e) Water Required : 48 bbls.

d) Mixing, Pumping and Thickening Times:

1. Lead Slurry

- a) Mixing Time : 1 hr. 47 min. at 5 bbl/min.
- b) Thickening Time : 4+ hours

2. Tail Slurry

- a) Mixing Time : 16 min. at 5 bbl/min
- b) Thickening Time : 2.5 hours
- 3. Total Pumping Time : 2 hr. 3 min. at 5 bbl/min.

e) Displacement Volumes:

- 1. Stinger (32 joints 5" D.P.) : 17 bbls
- 2. Landing String (11 jts 5" HWDP) : 6 bbls
- 3. Surface Lines : 3 bbls (est)
- 4. 20" Shoe Joint : 7 bbls
- 5. Total Displacement : 33 bbls

f) Minimum WOC time is 8 hours.

MATERIALS AND SERVICES FOR 26" HOLE/20" CASING

	<u>Quantity</u>
18-3/4" 10,000 psi subsea wellhead on 20" pup jt	2
20" Crossover jt (Quik-Stab pin x Quik-Thread pin)	2
20" Casing	34
20" Float shoe on 20" jt	2
18-3/4" Wear Bushing	2
20" O-Ring	2
20" Lock Ring	1
Ring Depressor Screws	(12)
Jack Out Bolt	1
Lock Block	2
20" O-Rings	20
26" BIT	1
26" Holeopener	1
17½" BIT	2
26" Stabiliser	1
17½" Stabiliser (NB, S/S)	2
20" Klampons	4
20" Swedge	1
20" Power Tongs with Power unit	1
Mud Materials	see proposal
Class "G" Cement	1400 sx

Cameron Engineer

Casing Connector Manufacturers Engineer

Casing Tong Operator (Weatherford Lamb)

Cementer

Mud Engineer

Oceaneering

D. 17 1/2" HOLE AND 13 3/8" SURFACE CASING

1. This section will be drilled with a 17 1/2" bit then logged. The casing point has been tentatively selected at 5600' RKB, but the exact depth will be selected during drilling based on formations encountered and hole conditions.
2. Drillout from 20" and Casing Test:
 - a) After landing and successfully testing the BOP stack and reinstalling the 18-3/4" wear bushing, RIH with a 17 1/2" bit to drill out the shoe. Drill cement to 10' from the shoe. Use light WOB and slow RPM while the BHA is in the 20" casing.
 - b) Before drilling out the shoe, pressure test the 20" casing to 500 psi. Drill the shoe and two (2) feet of cement. Run a CCCT to 12.5 ppg or leak off which ever occurs first. Advise the Hobart drilling supervisor regarding the CCCT. Clean out the old hole and drill five (5) feet of new hole. Run a FCCT to 12.5 ppg on leak off which ever occurs first. Advise the Hobart drilling supervisor.
 - c) If a kick is encountered, the BOP's should not be used to close in the pressure on the 20" casing. Instead, the surface diverter system will be utilised.
 - d) Single shot surveys to be taken every 500' or on each dull bit whichever occurs first.
3. Bit and Hydraulics Program:
 - a) Due to the wildcat nature of this well, the bit selection will be determined by the drilling operations personnel. It is recommended that the initial bits be soft formation mill tooth bits, series 1-1 or 1-3. The bit performance should be evaluated carefully after each run, the APC Drilling

Manual, Section F, should be referred to for optimum bit operation, and drill-off tests should be conducted if hard drilling is encountered.

b) Recommended Drilling Parameters for 17½" hole:

Nozzles	:	18,18,18
Flow Rate	:	950 gpm
Pump Pressure	:	2700 Max
Weight on bit	:	55,000 lbs. maximum
RPM	:	120

Note: These values are for soft formation mill tooth bits and should be adjusted for other types. RPM limited to 60 until stabilisers are out of casing.

4. Bottom Hole Assemblies

a. The recommended BHA for the 17½" hole is:

17½" bit/1-8" monel/1-8" DC/stabiliser/8-10" DC/XO/1-HWDP,
JARS/13-HWDP.

5. Drilling Fluid Program:

a. For this section, a seawater, low-solids, lightly treated dispersed gel mud system will be used after drilling the 20" shoe with seawater.

The mud system has been designed based on the expected formation types with emphasis on simplicity of maintenance. It is planned to keep mud weight to a minimum to optimise drilling rates and prevent loss of circulation. However, the system can easily be weighted up for any abnormal pressures encountered. The key to maintaining acceptable properties in this system is effective solids control. Importance is also placed on the correct mixing procedure to achieve desired properties.

- b. Expected formations include clays, siltstones and fine sands; therefore, all solids control must be used continuously to keep drill solids content below 30 ppb. Failure to achieve this objective may result in lost circulation and loss of effective control of the drilling fluid properties. Controlled drilling will be used if necessary and the rate will be determined at that time. An analysis of the types of drilled solids as well as quantities will determine any additional treatment needed.

- d. A pH of 10-11 will be maintained for corrosion control including possible H₂S treatment.

- e. System Maintenance:
 - 1. All bentonite must be pre-hydrated and aged 16 hours or more in drillwater.
 - 2. To increase viscosity, pre-hydrated bentonite will be used. Mass dilute the active system as required.
 - 3. To reduce viscosity, dilute with sea water.
 - 4. Run fine mesh, high speed shakers, desander, desilter and centrifuge, if available.
 - 5. Sulfide level of the mud will be closely monitored and any H₂S will be treated out with a zinc carbonate compound.
 - 6. Maintain calcium levels at minimum.
 - 7. Potassium nitrate should be added as a filtrate tracer at 100 ppm.

6. Logging Program:

- a. Prior to pulling out to log, sweep the 17½" hole with a 75 bbl viscous pill and spot 75 bbls on bottom. Inform the logging personnel of the fluid column on bottom. Drop a multishot survey instrument prior to pulling out of the hole.
- b. Run the following log suites:
 1. DLL-GR-SP-CAL
(GR to seabed)
 2. LLS-GR-SP
- c. Sidewall cores may be taken upon the wellsite geologist's recommendation. Temperature logs or cement bond logs may be run as necessary.
- d. All logs are to be taped.

7. Casing Program:

- a. Total 13-3/8" casing depth is about 5600' RKB with N-80, 68#/ft. & 72#/ft. buttress threaded casing.
- b. Remove nominal seat protector from 20" housing.
- c. Do not rely solely on average torque values for proper make up of premium threads. Makeup markings must be reasonably close for proper engagement. Highlight makeup markings prior to running casing.
- d. After visually inspecting the float equipment, make up float shoe, one joint of casing, float collar, the rest of the casing string, and the casing hanger assembly. Space out shoe to land ±20 ft. off bottom.
- e. Use thread locking compound to lock the float equipment and the in-between connection (including the pin end of third joint made into the float collar), and the next casing coupling above.

- f. Fill up the shoe joint and the in-between joints before making up the float collar. Rig up a fill-up line to rig floor so that each joint can be filled while the next joint is being picked up. Make sure casing is totally full when 13-3/8" shoe has reached the 20" shoe. Monitor weight indicator to make sure casing is being filled properly. Fill running string while RIH.
 - g. Make up SSR (Sub-Surface Release) cementing equipment, 13-3/8" hanger assembly and running tool, and using HWDP, land in wellhead. Rabbit landing string as it is picked up to assure dart clearance.
 - h. Bump top plug with 500 psi over final pumping pressure, check float equipment. If float equipment holds, release running tool and flush out the wellhead. WOC time is 8 hours.
 - i. RIH with jetting tool and thoroughly wash BOP and wellhead area. Spot a clean gel pill in the wellhead seal area before pulling out of hole.
 - j. Run and install seal assembly as per wellhead manufacturer instructions. Test the seal assembly to 5000 psi with drill pipe to atmosphere. (maximum collapse rating of 13-3/8" casing is 2670 psi). If the seal assembly will not hold pressure, take remedial action according to manufacturer instruction.
 - k. After successfully testing the seal assembly and BOP stack, run wear bushing and commence cleanout operations.
8. Cementing Program:
- a. Circulate one and one half times the annulus volume or until bottoms up cavings have cleared up. Condition mud going in hole to reduce viscosity by dilution.
 - b. When ready to cement, drop bottom plug releasing ball, follow with 75 bbls sea water (if using unweighted mud) then with the cement slurry. Drop top releasing plug with 20 sx cement left to mix.

- c. With top plug released, switch to rig pumps and pump plug to its seat. Utilise both stroke counter and also actual pit volume measurement to time the top plug displacement.
- d. Do not exceed 6-8 bpm while displacing cement. Do not try to "catch" the plug, and do not overdisplace the cement.
- e. The recommended slurry compositions are:

Lead Slurry: Class "G" + 2.1% Bentonite (prehydrated)
 Water: 8.5 gal/sx
 Yield: 1.63 ft³/sx
 Slurry Wt : 13.6 ppg

Tail-in Slurry: Class "G" + 2% CaCl₂
 Water: 5.0 gal/sx
 Yield: 1.15 ft³/sx
 Slurry Wt : 15.8 ppg

- f. The recommended slurry volumes on the basis of cementing from 5680' RKB to 500ft. above the 20" shoe with 50% excess for open hole section are:

Lead Slurry: 3295 sx "G" + 65 sx Bentonite +
 668 bbl water.

Tail-in Slurry: 400 sx "G" + 48 bbl sea water.

- g. Mixing, Pumping and Thickening Time:

Lead Slurry:

Total Volume : 5391 ft³ (957 bbls)
 Mixing Time : 3 hr 0 min (at 30 ft³/min)

Tail-in Slurry

Total Volume	:	460 ft ³ (80 bbls)
Mixing Time	:	15 min (at 30 ft ³ /min)
Displacement Time	:	3 hr 0 min at 223 gpm
Total Pump Time	:	6 hr 14 min

MATERIALS AND SERVICES FOR 17½" HOLE 13-3/8' CASING

13-3/8" N-80 68 Premium Threaded Casing	6000 ft.
13-3/8" Hanger and pup	2
13-3/8" Seal Assembly	2
13-3/8" Wear Bushing	2
18-3/4" x 13-3/8" Casing Hgr Running Tool	1
13-3/8" Casing Hgr Running Tool Adapter	1
18-3/4" x 13-3/8" Seal Assembly Running and Testing Tool	1
17½" Bits	3
17½" Stabilisers	6
Drilling Jars	2
8" Monel	2
13-3/8" Float Shoe	2
13-3/8" Float Collar	2
SSR Plug Set	2
SSR Cementing Head and Launch Mandril	1
Thread Locking Compound	6
13-3/8" Klampons	6
Casing Thread Compound	7
13-3/8" Drift	1
Power Tongs with Power Unit	2
Mud Materials	see proposal
Class "G" Cement	4000 sx

MATERIALS AND SERVICES FOR 17½" HOLE 13-3/8' CASING

Logging Tools

Magnetic Singleshot

Cameron Engineer

Logging Crew

Directional Surveyor

Casing Crew

Cementer

Mud Engineer

Oceanengineering

E. 12 $\frac{1}{4}$ " HOLE AND 9-5/8" INTERMEDIATE CASING

1. This section of hole will be drilled with 12 $\frac{1}{4}$ " bits to approximately 14,000 ft RKB then logged, cased, and possibly production tested. This section of hole will be drilled with a sea water-gel-dispersed mud system. Keeping the mud weight low will be advantageous to interpreting drilling parameters, formation characteristics, and hole conditions. Unnecessarily weighted mud will mask formation effects and may lead to sticking or lost circulation. The objective formations may be cored when encountered. If productive formations are encountered, the formation may be drill stem tested after 9-5/8" casing is set.
2. Drillout from the 13-3/8" Casing with seawater and formation test. Then switch over mud system to salt water gel system.
 - a. After the BOP stack has been tested and the wear bushing installed, run in the hole with a 12 $\frac{1}{4}$ " bit and the drilling BHA.
 - b. Before drilling out the shoe, test casing to 2000 psi. Drill to the shoe and 2 ft. of cement. Run a CCCT to 13.6 ppg or leak off. Advise Hobart drilling superintendent of results.
 - c. Drill 5 ft. of new formation and perform a FCCT to 13.6 ppg or leak off. Advise drilling superintendent of results.
3. Bit and Hydraulics Program:
 - a. Recommended Drilling Parameters:

Nozzles	:	14, 14,15
Flow Rate	:	600 gpm
Pump Pressure	:	2000 psi
WOB	:	30-50 K lbs
RPM	:	120

Note: These values are for soft formation, mill tooth bits and should be adjusted for other types. RPM should not exceed 60 while stabilisers are in casing.

4. Bottom Hole Assembly:

- a. The following BHA is recommended:

Pendulum: 12 $\frac{1}{4}$ " bit/B.S./8"-Monel/1-8" D.C./Stab/13-8" DC
XO/HWDP/JARS/13 HWDP

- b. If deviation presents a problem, or additional WOB is required, the following BHA will be considered.

12 $\frac{1}{4}$ " bit/near bit stabiliser/short (15 feet) 8" drill collar/
stabiliser/ one 8" drill collar/stabiliser/ one 8" drill collar/
stabiliser/four 8" drill collars/XO/three 6 $\frac{1}{2}$ " drill
collars/XO/21 joints HWDP.

These stiff assemblies hold angle and any correction must be made prior to their use. These BHA's will tolerate high WOB's and may be used if the ROP of the formation is weight sensitive above acceptable weights for the BHA.

5. Drilling Mud Program:

- a. Recommended Mud Properties:

Specific changes to the recommended mud properties can be made as hole conditions require. However, mud weight and viscosity should not be increased arbitrarily or excessively.

Mud wt	:	8.8-9.2 ppg
pH	:	9.5 - 10.5
YP	:	8-16
API F/L	:	6-10
Gels	:	4/6
HTHP @ BHT:		16-24

b. Contingency actions: If troublesome shales are encountered, evaluate the cause of the problem before making drastic adjustments in mud properties or mud program.

c. Contingency actions:

If the total section is drilled with mud, 9400 bbls of unweighted mud will be used.

d. Materials allocated to this section:

<u>Material</u>	<u>Unit</u>	<u>Total</u>
Bentonite	100#/sx	2000sx
Drispac (R)	50#/sx	40sx
Drispac (SL)	50#/sx	128sx
Caustic	100#/dr	82 Drms
Bicarb	100#/dr	6sx
Barite	100#/sx	600sx
Lignosulfonate	50#/sx	240sx
Soda Ash	50/kg	17sx
Dextoid	50#/sx	200sx
Pot Nitrate	50KG/sx	15sx

6. Logging Program:

The following suites of logs are to be run in this section:

1. DLL-MSFL-IDL-CAL
2. LSS-GR-SP-CAL
3. NGS-GR-SP-CAL
4. HDT, VSP, CST

7. Coring Program:

A conventional core will be cut at the top of the zones with shows. If the zone appears potentially productive, then the possibility of a continuous coring program will be reviewed.

Core recovery in fractured formations is sometimes difficult. The following coring parameters have been shown to optimize recovery in some fractured limestone sections:

- a. Use of the largest practical barrel.
- b. Medium formation core head.
- c. Low rotating speeds: ±60 rpm.
- d. Low weight on bit: 10-15 K lbs.
- e. Space out for maximum core length before a connection is necessary.
- f. Normal circulating rates for the core barrel used.

8. Casing Program:

- a. A 12 $\frac{1}{4}$ " hole will be drilled to a TD of approximately 14,000 ft. RKB. This will accommodate 342 joints of casing with a ±25' rat hole.
- b. Upon reaching TD, sweep the hole with a 100 bbl viscous pill and drop multishot survey.
- c. Make a control trip to the 13-3/8" shoe and retrieve the survey, as required.
- d. Run in to bottom checking for fill and drag. If both are minimal, condition mud and pull out of the hole.
- e. Retrieve the 13-3/8" wear bushing.
- f. Visually inspect all float equipment beforehand.
- g. Make up the float shoe, followed by two joints of casing, and the float collar. Thread lock all connections for first three couplings (mill and field end).
- h. Follow manufacturer's recommendations while making up casing.
- i. Fill casing with mud as the next joint is being picked up.

- j. Make up the SSR plug set, 9-5/8" casing hanger and running tool and land in the wellhead using HWDP. Drift HWDP. Keep running string filled.
- k. After bumping top plug with 500 psi greater than circulating pressure, check float equipment. If float equipment holds, release running tool and flush out the wellhead. WOC time is 10 hours.
- l. RIH with jetting tool and thoroughly wash BOP and wellhead area. Spot a clean gel pill in wellhead seal area before pulling the jetting tool out of hole.
- m. Run and install seal assembly as per wellhead manufacturer's instructions. Test the seal assembly to 5,000 psi with drill pipe to atmosphere (maximum collapse rating of 9-5/8", N-80 casing is 4750 psi. If the seal assembly will not hold pressure, take remedial action according to wellhead vendor instructions).
- n. After successfully testing the seal assembly and BOP stack, run wear bushing and commence cleanout operations.

9. Cementing Program

- a. The 9 5/8" casing will be cemented in one stage with the shoe at approximately 14,000 ft. (RKB).
- b. The annulus should be swept with a 100 bbl viscous pill to clean the hole. The mud should be circulated until the shaker screens are clean and the fluid is in a proper condition for cementing.
- c. A preflush should be pumped ahead of the cement to scour the hole and prevent mud contamination. Alternately, a scavenger or spacer slurry may be used.
- d. Recommended Slurry Composition:

1. Lead Slurry

- a. Class "G" + 2.1% bentonite (prehydrated)
- b. Slurry Density: : 13.6 ppg
- c. Water Requirement : 8.5 gal/sx
- d. Yield : 1.63 ft³/sx

2. Tail Slurry

- a. Class "G" + 0.06 gal/sx HR-6L.
- b. Slurry Density : 15.8 ppg
- c. Water Requirement : 5.0 gal/sx
- d. Yield : 1.15 ft³/sx

Note: Slurry design will be modified based on physical considerations (e.g. leak-off results) or on lab test results and recommendations.

- e. Recommended Slurry volumes to cover approximately 8,000 ft. of open hole plus 1000 ft. overlap is:

1. Lead Slurry

- a. Total Volume : 4230 ft³
- includes 50% excess for open hole
- b. Cement Required : 2595 sx
- c. Water reqd. : 525 bbls

2. Tail Slurry

- a. Total Volume : 460 ft³
- b. Cement Required : 400 sx
- c. Mix Water : 48 bbls

Note: Actual volumes will be based upon caliper results.

f. Mixing, Pumping and Thickening Times:

Lead SlurryMixing Time : 2 hours 21 minutes @ 30 ft³/minTail Slurry

Mixing Time : 15 minutes

Displacement Time : 2 hours 21 minutes at 7 BPM

Total Pumping Time : 4 hours 57 minutes

g. Displacement volumes in 9 5/8" casing : 985 bbls

h. Pressure required to bump plug : 500 psi

MATERIALS AND SERVICES FOR 12-1/4" HOLE 9-5/8" CASING

9-5/8" Buttress Threaded Casing	370 Jnts
9-5/8" Hanger and pup	2
9-5/8" Seal Assembly	2
9-5/8" Wear Bushing	2
18-3/4" x 9-5/8" Casing Hgr Running Tool	1
9-5/8" Casing Hgr Running Tool D.P. Adapter	1
18-3/4" x 9-5/8" Seal Assembly Run/Test Tool	1
12-1/4" BITS	15
12-1/4" Stabilizers	12
8" Monel	2
Drilling Jars	3
Coring Equipment (as per 8-1/2" hole)	
9-5/8" Float Shoe	2
9-5/8" Float Collar	2
SSR Plug Set	2
SSR Cementing Head and Launch Mandril	1
Thread Locking Compound	4
9-5/8" Klampons	6
Casing Thread Compound	12
9-5/8" Drift	1
9-5/8" Circulating Swage	1
Power Tongs With Power Unit	2
Casing Scraper	1
Mud Materials	see proposal
Class "G" Cement	3500 sx
HR-6L	100 gal
CFR-21	300 gal
DST Tools	
Surface Test Tools	
Logging Tools	
Magnetic Multishot	
Wellhead Engineer	
Logging Crew	
Directional Surveyor	
Casing Crew	
Cementer	
DST Crew	
Coring Crew	
Mud Engineer	

F. 8-1/2" HOLE AND 7" LINER:

1. In case the 12 $\frac{1}{4}$ " hole section is unable to reach 14,000' an 8 $\frac{1}{2}$ " section will be drilled. This section of hole will be drilled with 8 $\frac{1}{2}$ " bits to ATD, logged and possibly production tested as required. The objective formations may be cored when encountered. If production formations are encountered below the 9-5/8" shoe, the formation may be drill stem tested with a packer set in 9-5/8" casing.

If the well is considered commercial, or if drilling problems make setting casing necessary before reaching TD, a 7" liner may be run.

2. Drillout of Casing and Formation Test:

- a. After the BOP stack has been tested and the wear bushing installed, run in the hole with and 8 $\frac{1}{2}$ " bit and BHA.
- b. Before drilling out the shoe test casing to 3000 psi. Drill to the shoe and 2 ft of cement. Run a CCCT to 14 ppg or leak off. Advise drilling superintendent of results.
- c. Drill 5 ft of new formation and run a FCCT to 14 ppg or leak off. Advise drilling superintendent of results.

3. Bits and Hydraulics Program:

- a. Recommended Drilling Parameters:

Nozzle Size	:	to obtain 325 to 350 ft/sec. Run 2 nozzles, 1 blank
Flow Rate	:	320 to 350 gpm
Pump Pressure	:	3000 psi
WOB	:	20-35 K lbs
RPM	:	120

Note: The values are for soft formation mill tooth bits and should be adjusted for other types. RPM should not exceed 60 while stabilizers are in casing.

4. Bottom Hole Assembly:

- a. The following BHA is recommended:

8½" bit/B.S/6½" Monel/6½"DC/STAB/16-6½DC/XO/HWDP/JARS/13HWDP

5. Drilling Fluid Program:

To minimize the mud weight in an effort to maintain returns, a salt water system will be utilized as in the previous hole section. Should returns be lost, the annulus should be filled using seawater to control the well.

6. Logging Program:

The logging program will consist of the log suites detailed in the previous section. Sidewall cores and RFT's may be utilized as required.

7. Coring Program:

A conventional core will be cut in the top of the zones with shows using a fiber glass inner core barrel. If the zone appears potentially productive, then the possibility of a continuous coring program will be reviewed.

Core recovery in fractured formations is sometimes difficult. The following coring parameters have been shown to optimize recovery in some fractured limestone sections:

- a. Use of the largest practical barrel.
- b. Medium formation core head.
- c. Low rotating speeds : ±60 rpm.
- d. Low weight on bit : 10-15 K lbs.
- e. Space out for maximum core length before a connection is necessary.

- f. Normal circulating rates for the core barrel used.
- g. A fiberglass inner tube will be utilized.

8. Casing and Cementing Program:

If productive intervals are identified and it is desirable to set a liner, the running procedure and cement design will be issued at that time.

MATERIALS AND SERVICES FOR 8-1/2" HOLE (7" LINER)

8½" BITS
8½" Stabilizers
6½" Monel
Drilling Jars
6½" Maximum O.D. Drill Collars
6-3/4" x 4" x 60' Core Barrel
6-3/4" x 4" x 30' Core Barrel (Back Up)
60' Fiberglass Innertube
30' Fiberglass Innertube
CB 303 Core Head
Drill Stem Testing Tools
Surface Test Equipment
Logging Gear
Magnetic Multishot
Mud Materials
Coring Crew
Logging Crew
Directional Surveyor
DST Crew

RJW/JGR-

IV. APPENDIX, "A"

A. Casing Design

A1

B. Miscellaneous Data

B1. Form 46

B2. Predicted Lithology - (Prognosis)

B3. Estimated Drilling Time Curve B3 - I

Estimated Drilling Time Curve B3 - II

B4. Location Map

B5. Recommended Logging Program

B6. Mud Logging/Engineering Services

B7. Mud Logging Services

B8. BOP Stack

B9. BOP Test Requirements

B10. Plug Requirements for P & A.

APPENDIX A

CASING DESIGN

<u>SIZE</u>	<u>DEPTH FT. RKB</u>	<u>GRADE</u>	<u>WEIGHT #/FT</u>	<u>CONN</u>	<u>COLLAPSE PRESSURE/SF</u>	<u>BURST PRESSURE/SF</u>
30"	600	X-56	1" wall	Dril-Quip Quick-Stab	N/A	N/A : Diverter installed
20"	1337	X-56 or better	94	Dril-Quip Quick-Stab	286 psi/1.82	N/A : Diverter installed
13-3/8"	5600	N-80	68	Buttress	1330 psi/1.70	2142 psi/2.34
9-5/8"	11600	N-80	47	Buttress	2570 psi/1.8	614 psi/11.19
	14000	N-80	53½	Buttress	3230 psi/2.05	86 psi/92.21
7	14000	N-80	29	Buttress	4043 psi/1.74	86 psi/94.88
	9500 shoe				N/A	241 psi/33.86

NOTE: All casing strings are designed in accordance with the Petroleum (Submerged Lands) Act 1967.
Reference Casing Design.

301040

DRILLING AND COMPLETION PROGRAM

FILE No. 400
DATE 16 April, 1985

WELL NAME Yolla WELL NO. 1 FIELD Wildcat
COUNTRY Australia PROVINCE Bass Strait, Tasmania AREA
LOCATION Intersection Seismic Lines TNK-4-12/HR-73A-169 39° 50' 18.75" S
145° 48' 22.00" E
OBJECT Early Eocene @ 7100 FT Secondary Objective = Late Cretaceous @ 9300 FT

TYPE TOOLS	METHOD OF DRILLING	DEPTH INTERVAL	APPROXIMATE DEPTHS OF GEOLOGICAL MARKERS		
Rotary		Seabed to 14000 FT	ESTIMATED ELEVATION		
			MARKER	DEPTH	ELEVATION
			Sea Bottom	296' RKB	260' SS
			Demons Bluff	5311' RKB	5275' SS
			EVC	5576' RKB	5540' SS
			V.M. Diversus	7066' RKB	7030' SS
			V.L. Balmei	7916' RKB	7880' SS
			T. Longus	9256' RKB	9220' SS
			TOTAL DEPTH	14036' RKB	14000' SS
			* POSSIBLE PAY	** PROBABLE COMPLETION INTERVAL	

TYPE	SPECIAL SURVEYS	DEPTH INTERVAL, ETC.
DLL-GR-SP-CAL, LSS-GR-SP(GR -TO M.L.)		1250' - 5575' SS
DLL-MSFL-LDL-CNL		5575' - 14000' SS
LSS-GR-SP-CAL		5575' - 14000' SS
NGS-GR-SP-CAL		5575' - 14000' SS
HDT		5575' - 14000' SS

Shot on trips of every 300'
Logs to be run @ tentative casing depths or as needed to evaluate formations being drilled.
All logs to be taped.

TYPE	SPECIAL TEST	DEPTH INTERVAL, ETC.
RFT		As required
DST		As required
VSP (before TD if needed)		Seabed-TD

REMARKS
RFT as required to evaluate pore pressure. RFT & DST to evaluate shows identified by company geologist.

DRILL CUTTING SAMPLES		DRILLING TIME	
FREQUENCY	DEPTH INTERVAL	FREQUENCY	DEPTH INTERVAL
30'	1250' - 5575'		
15'	5575' - 7080'	Continuous	300' - TD
10'	7080' - 14000'		

REMARKS
7 sets of washed and dried samples as well as 2 large bags of samples, lightly washed and air dried, shall be collected at the above intervals. Note special requirements of Petroleum (submerged lands) ACT 1967, Clause 14. * *

MUD PROGRAM	APPROXIMATE INTERVAL	TYPE MUD	WEIGHT #/GAL	VISCOSITY SEC. API	W. L. CC/30M	OTHER SPECIFICATIONS
Seabed-	1296' RKB	Seawater	w/viscous	sweeps	-	-
	1296' - 14036' RKB	SW/GEL/DISP	8.8 to 9.2	-	6 - 10	Gel 4/10

REMARKS
Properties of the mud system are described in the detailed operations

* * Wet samples to be collected for Paleo - Palynology and detailed Geochemistry studies in 30' intervals where possible for the first to T.D. and from 5575' for the latter to T.D.

CASING PROGRAM	CASING STRING	EST. DEPTH	CASING SIZE*	HOLE SIZE*	SX. CEMENT	TYPE CEMENT	DESCRIPTION OF LANDING POINT, ETC.
CONDUCTOR	+	558' RKB	30"	36"	Determined	Class G + Additives	
SURFACE	+	1246' RKB	20"	26"	by	Class G + Additives	
INTERMEDIATE	+	5596' RKB	133/8"	17 1/2"	Caliper	Class G + Additives	
OIL STRING	+	9184' RKB	9-5/8"	12 1/4"	logs	Class G + Additives	
LINEAR CASING	+	14036' RKB	7"	8 1/2"		Class G + Additives	

- REMARKS
- All casing points are tentative and 95/8" casing setting depth will depend upon formation pore pressure
 - Cement compositions to be lab tested
 - 30" & 20" casing to be cemented by inner string method

* NORMAL THE TUBULAR GOODS ALLOCATION LETTER SPECIFIES CASING SIZES TO BE USED. HOLE SIZES WILL BE GOVERNED BY CONTRACT.

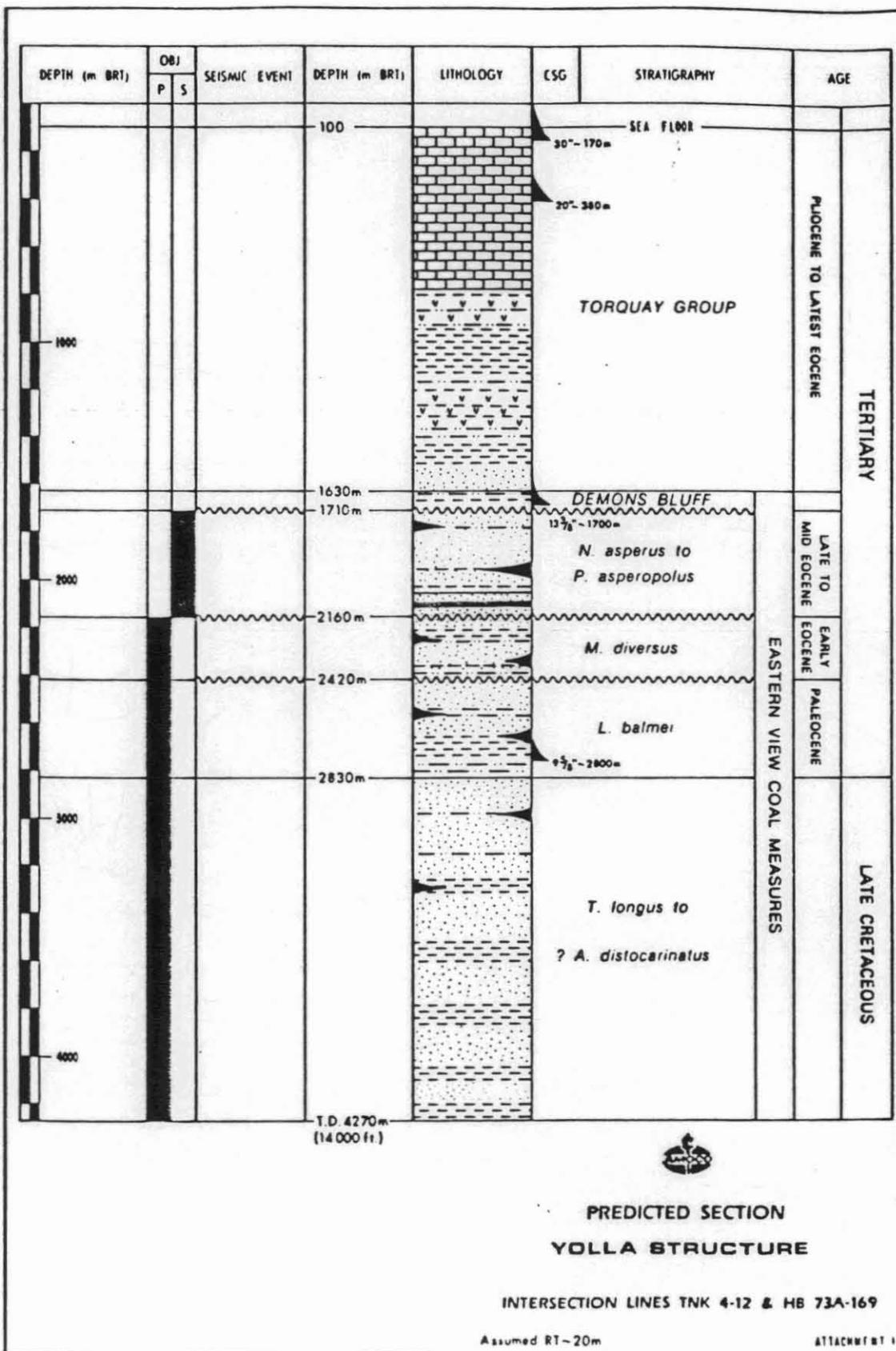
CORING PROGRAM Wellsite geologist will determine if any formations encountered should be cored. Full size cores will be cut as conditions permit. Side wall cores can be taken of shales and other formations of interest for Paleo, Geochemistry & Formations evaluation. Note special requirements of Petroleum (submerged lands) Act 1967 clause 14.

COMPLETION PROGRAM
No program is proposed at this time. Authorised program will be furnished upon decision to complete well.

GENERAL REMARKS

PREPARED BY J.G. Rankin	APPROVED: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>
	OPERATING AREA MANAGER	COMPANY MANAGER

PREDICTED LITHOLOGY



5 cm

DRILLING GRAPH

DRILLING PROGRESS IN Feet/Day

FIELD Wildcat WELL NAME Yolla No.1

PROJECTED T.D. 14000' ss FORMATION _____

MUD Seawater ; M.L. TO 1300'

Seawater/Gel ; 1300' TO 14000'

CSG. 30" @ 558' ; 13-3/8" @ 5600'

20" @ 1250' ; 9-5/8" @ 9187'

RIG R. F. Bauer CONT'R. G.M.

GRND. EL. 36.5' RDB. WL. Sealevel

WL. MUDLINE 259' RDB. ML. 296'

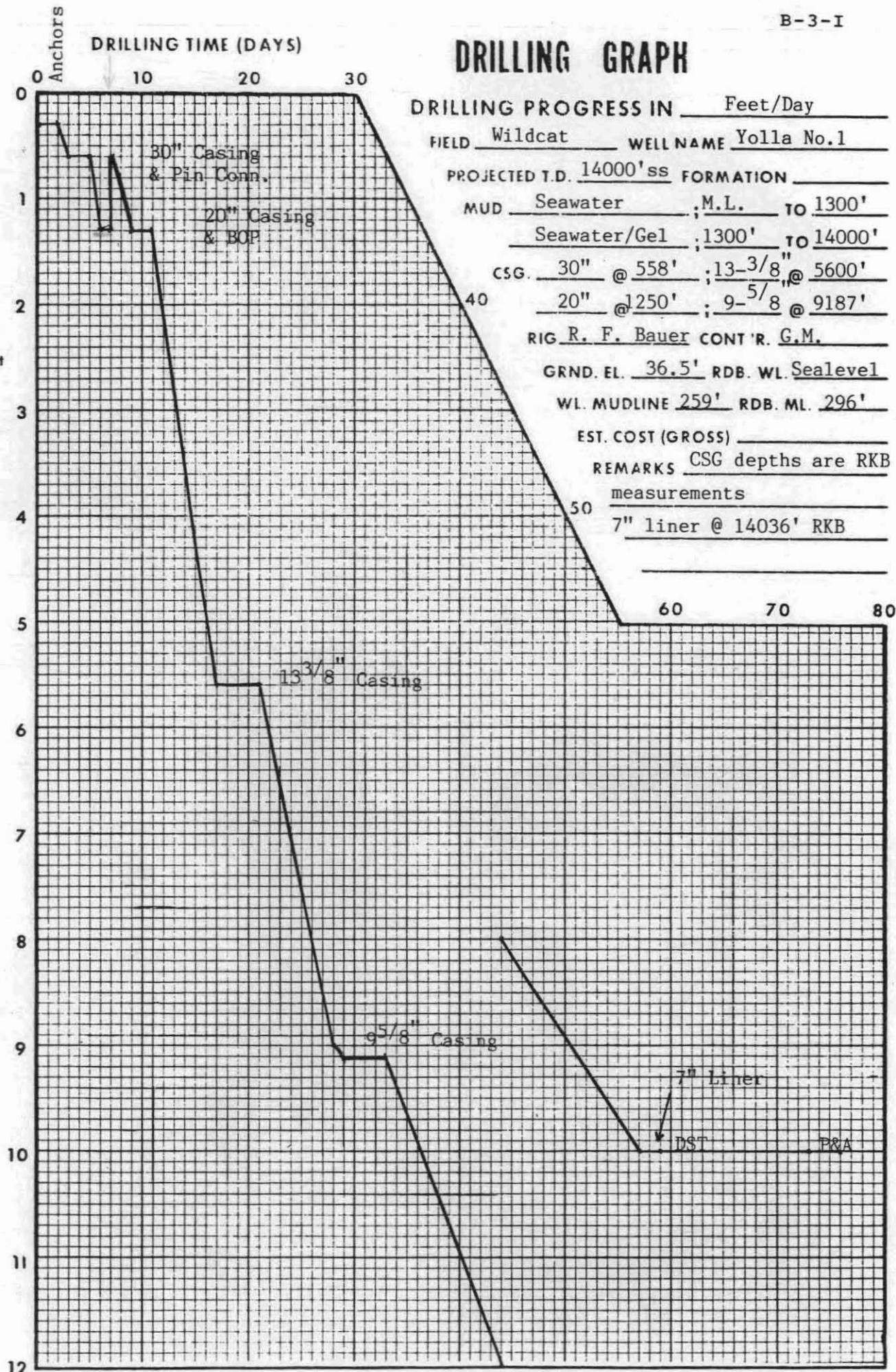
EST. COST (GROSS) _____

REMARKS CSG depths are RKB

measurements

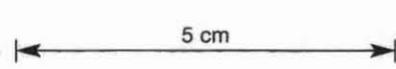
7" liner @ 14036' RKB

- M Bbls. Mud
- W Bbls. Water
- M₁ Cement
- P Csg. Press.
- rg Coring
- P Drill Pipe
- S Drill Stem Test
- F Fish For
- VC Gas Cut Mud
- OCM Oil Cut Mud
- B Plug Back
- R Repair Rig
- D Sidetrack
- P Tbg. Press.
- C Loss of Circ.



WELL DEPTH (THOUSANDS OF FEET)

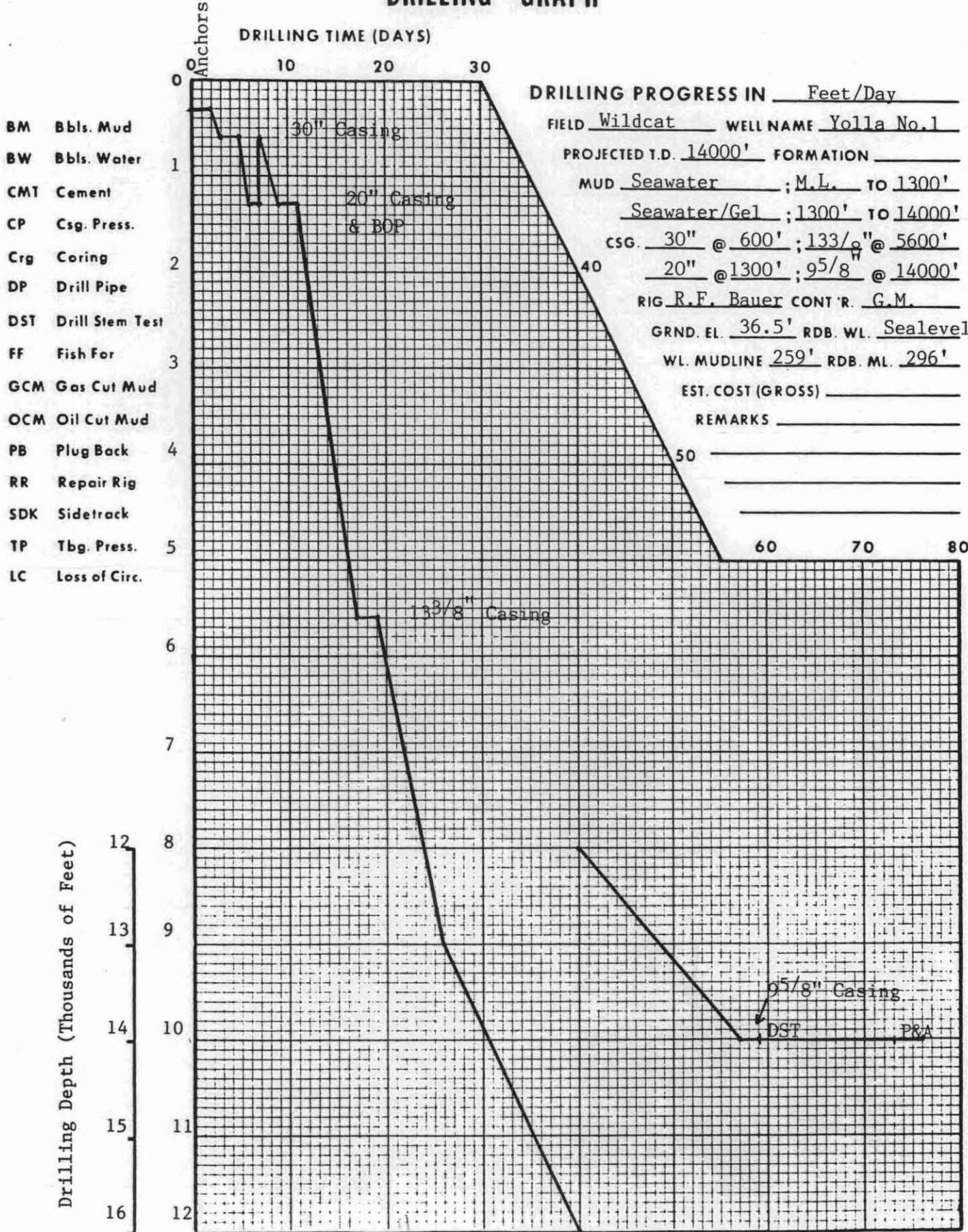
DATE



WELL NAME Yolla No. 1

FORM 2126-A 7-69

DRILLING GRAPH

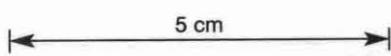


- BM Bbls. Mud
- BW Bbls. Water
- CMT Cement
- CP Csg. Press.
- Crg Coring
- DP Drill Pipe
- DST Drill Stem Test
- FF Fish For
- GCM Gas Cut Mud
- OCM Oil Cut Mud
- PB Plug Back
- RR Repair Rig
- SDK Sidetrack
- TP Tbg. Press.
- LC Loss of Circ.

Drilling Depth (Thousands of Feet)

DATE →

WELL NAME Yolla No. 1



Recommended Logging Program

<u>Casing</u>	<u>LOG SUITE</u>
13-3/8"	DLL-GR-SP-CAL LSS-GR-SP
<hr/>	
9-5/8"	DLL-MSFL-LDL-CNL LSS-GR-SP-CAL NGS-GR-SP-CAL HDT VSP CST RFT
<hr/>	
7"	AS ABOVE

Mud-Logging/Engineering ServicesRecommendations

The basic equipment to include the following:

1. Continuous Total Gas detector for total hydrocarbons with alarm and recorder (flame ionisation detector).
2. Gas chromatograph for C₁ through C₅ analysis of mud stream gases with recorder (flame ionisation detector).
3. Automatic penetration rate recorder giving drilling rate and kelly position (differential pressure transducer). Recommend digital indication of total depth.
4. Pump stroke counter - Dual pump stroke counter and totaliser giving analogue output of rate of both pumps and recordings.
5. Mud pit level indicator and pit volume totaliser - for active pit and totalised volume and recordings with high to low alarm settings.
6. H₂S and CO₂ detectors plus alarms.
7. Mud weight indicators - including alarm and recordings.
8. Mud temperature indicators.
9. Mud flow returns - indicators, including fill on trips and after trips.
10. Rotary speed indicators.
11. Rotary torque indicators.
12. Hook load/weight on bit, including recording drag on trips.
13. Standpipe pressure.
14. Casing shut-in pressure.
15. Calcimeter.
16. Nitrate tracer analysis.
17. Corrected "D" exponent, shale density and MBT.

Mud Logging Services

1. Collection, washing, describing, drying and logging of cutting samples as directed. The description to include.
 - a. lithologic analysis by microscope including visual determination of approximate porosity.
 - b. fluoroscopic examination of cuttings and cores with appropriate solvents for detection of hydrocarbons.
2. Gas detection
 - a. Continuous total gas detector for total hydrocarbons.
 - b. chromatograph analysis of C₁ to C₅.
3. The Well Master Log to include the above plus the following:
 - a. Rate of penetration.
 - b. Percentage cuttings lithology.
 - c. Valuated and interpreted lithology.
 - d. Description of cuttings, lithology and remarks, including MBT.
 - e. Bit data.
 - f. Wireline log runs.
 - g. Deviation survey data.
 - h. Mud rheological data.
 - i. Coring and formation test intervals.
4. The well master log is to be updated daily or at the discretion of the wellsite geologist.
5. Onsite source bed evaluation includes quantitative and qualitative analysis of hydrocarbon source rock. (Provided these days by a no. of mud logging companies).

Other supplementary services to be provided as requested by drilling engineer/wellsite geologist.

1. BOP Equipment:

- a. The Glomar R.F. Bauer is equipped with a 24" nom. Regan KFDH diverter system complete with two 10" forward/aft overboard lines, remote actuated control ball valves and H T-2 handling tool.
- b. It is also equipped with an 18-3/4", 10,000 psi WP Cameron BOP guidelineless system certified for H₂S service in accordance with AP standards and N.A.C.E. Mr-01-75 consisting of the following:
 1. Two (2) Cameron double type "U" - 18-3/4", 10,000 psi WP ram preventers with wedgelocks. Each equipped with four (4) 3-1/8" 10,000 psi WP side outlets, cavities fitted with three (3) sets 5" drillpipe rams and one (1) set shearing blind ram.
 2. 18-3/4", 10,000 psi WP Cameron wellhead collet connector.
 3. Two (2) each 18-3/4", 5,000 psi WP Hydril annular preventers, fitted with nitrile packing elements. (One annular in the LMRP).
 4. 18-3/4", 10,000 psi WP Cameron lower marine riser collet connector.
 5. Two (2) choke lines and one (1) kill line, each containing one (1) 3-1/16", 10,000 psi WP 90° angle valve and one (1) 3-1/16" 10,000 psi WP straight valve. Valves are hydraulically operated, failsafe close, with pressure assist close.
 6. Two (2) each, 10,000 psi WP straight through failsafe open valves, hydraulic close, hydraulic assist open. Valves mounted on LMRP for testing choke and kill lines independent of BOP.
 7. Cameron guidelineless re-entry system.
 8. Running and testing tools for BOP stack.

9. One (1) test stump.
 10. Stack is complete with guide frame and pick up attachments.
- c. It is also equipped with:
1. One (1) pressure balanced 21" Regan CR ball joint (10° max. deflection) with 21" Regan FCH-8 box on top of extension.
 2. Two (2) kill and choke female stab subs for riser connection.
 3. Two (2) Coflexip choke and kill flex hoses 3" ID x 10,000 psi W.P.
 4. Package is complete with guide frame and Retrievable Koomey Dual Pod Wedge - remote control hydraulic actuating system.

10. BOP Test Requirements

Australian regulations specify the following BOP equipment test requirements:

BOP Element	After Installation	Prior To Csg. Drillout	Following Disconnection of Pressure Seals	7 Days From Last Test	Trip
Connector, Choke & Kill Lines	5000 psi	5000 psi	5000 psi	5000 psi	N/A
Annular	70% Rating	70% Rating	70% Rating	Function	N/A
Pipe Rams	5000 psi	5000 psi	5000 psi	Function	Function
Shear & Blind Rams	Function	Min. 70% CSG Burst	Function	Function	Function

The regulations additionally require that all such tests be recorded in the drillers log (IADC report).

11. PLUG REQUIREMENTS FOR P & A

Application	Cement		Equipment & Remarks
	Top of Cmt.	Bottom of Cmt.	
<u>Uncased Hole</u>			
Oil & Gas Zones	100' Above Zone	100' Below Zone	No Cmtg. Equip. Reqd.
Fresh Water Zones	100' Above Zone	100' Below Zone	No Cmtg. Equip. Reqd.
Workable Minerals	300' Above Zone	300' Below Zone	Contact Director of Mines for Definition of Workable Minerals
<u>Cased Hole</u>			
w/Open Hole Below or w/Open Hole Below	100' Above Shoe 50' Above Retainer	100' Below Shoe 100' Below Shoe	No Cmtg. Equip. Reqd. Cmt. Retainer 100' to 50' Above Shoe
w/Open Hole Below & Possible Lost Circ.	50' Above Bridge Plug	Top of Bridge Plug	Permanent Bridge Plug 0' to 100' Above Shoe
<u>Open Perfs</u>			
Cmt Plug	100' Above Top of Interval	100' Below Bottom of Interval	No Cmtg. Equip. Reqd.
w/Bridge Plug	50' Above B.P.	To pf B.P.	Bridge Plug 0'-150' Above Interval Note: Perfs Must Be Isolated From Below
<u>Misc.</u>			
Casing Stubs	100' Above Casing	100' Below Casing	Retainer Optional
Liners	100' Above Liner Top	100' Below Liner Top	Retainer Optional
Annular Space	As Reqd.	As Reqd.	Not Read If Space Not Open to Uncased Hole
Surface Plug (inside string)	0'-150' Below Sea Floor	Variable	Must Be At Least 150' Long