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ESSO AUSTRALIA LTD.

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BLACKBACK A-1 WELL

SUBSEA DEVELOPMENT DRILLING AND EVALUATION PROGRAM

SEDCO 702 SEMISUBMERSIBLE

Drilling Engineer:	MIKE BARRERA	**Date:** 26/1/99
Lead Engineer:	D J. Barker	**Date:** 26/1/99
Operations Superintendent:	I Mil Peroy P	**Date:** 27/1/99
Drilling Manager:	Robert C Haskin	**Date:** 27 JAN 99

NOTE: This program is to be used in conjunction with the Esso Floating Drilling Operations Manual and Supplemental Operations Manual

Esso Australia Limited

Blackback A-1 Well

Distribution List

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Esso Australia Limited
Blackback A-1 Well

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1.0 General Well Information

1.1 Introduction

The Blackback A-1 will be drilled and completed with the Sedco Forex 702 semisubmersible in 402m of water. It is planned to be the first of three subsea development wells in the 1999 Blackback Development Program; VIC L-20 License in Bass Strait, Offshore Australia. The well is designed to be drilled as a build and hold directional well at 59.5° maximum angle to 4663m MD, 2901m TVD DF. It is programmed to encounter the highly productive Latrobe (Cretaceous) encountered downdip in the Terakihi-1 exploration well. The A-1 is being drilled to completion first because of its expected high productivity and reserves base. It will also provide early reservoir information for further field development. An expected oil column thickness of 25m requires only one set (10m MD) of perforations, in the upper portion of the oil zone, due to the possibility of early water production from a strong water drive. Total depth of the well at 2901m TVD is programmed at 41m TVD below the OWC @ 2834m SS to allow for complete logging through the reservoir section and stratigraphic tie-in for the VSP run planned. No cores are planned.

Terakihi-1 is the closest offset and is located about 3.0 km to the northwest of the proposed A-1 surface location. The Terakihi-1 was drilled as a straight hole to 3040m in 1990 and encountered significant amounts of oil and gas before being temporarily plugged and abandoned, with a maximum mud weight of 9.5 ppg. H_2S was reported in the Terakihi-1 with levels of H_2S from formation samples reaching 400 ppm. CO_2 levels are reported up to 0.35% in the field area. Abnormal pressure is not expected in this well.

The Blackback A-1 well will be drilled as a directional hole from spud through its completion after batch setting of the first two casings in the A-3 and A-2/A-2A wells. Of the first three wells drilled in the Blackback Phase I Development, Blackback A-3 and A-2/A-2A will be drilled from spud through the setting of the 20" x 13-3/8" surface and 20" conductor casing respectively, and then suspended. The Blackback A-1 well will then be drilled conventionally and completed without an operational suspension. Results of the A-1 well will determine if the A-2 well will continue as planned or be replaced with the A-2A location well. Permanent downhole pressure/temperature gauges, with surface readout capability back to the Mackerel platform, will be installed in these wells to monitor reservoir performance at each well site. Special collision avoidance measures will be utilized because the rig will be located in a major northeast to southwest shipping lane as well as a recognized commercial fishing area.

1.2 Summary Drilling Plan

1. Position Rig over the Blackback A-1 Location and run/land the TGB within 2.5m of call location.
2. Drill 17-1/2" x 36" Hole to 505m, run and cement 30" structural casing with 2.37m± of stick-up.
3. Drill 17-1/2" x 26" Hole to 680m, run and cement 20" conductor casing and 18-3/4" wellhead.
4. Cut the 3/4" guidelines from the TGB. Run Completion Guidebase with the 3/4" guidelines.
5. Run BOP Stack. Directionally drill 17-1/2" hole from KOP @ 700m to 1310m MD and 59.5°.
6. Run and cement 13-3/8" surface casing at 1300m± MD. Test BOP Stack, Drill out with SBM.
7. Directionally drill 12-1/4" hole to 4663m MD, 2901m TVD. Run PEX\AIT\HNGS\DSI on WL..
8. Run and cement 10-3/4" x 9-5/8" Production Casing at 4650m± MD. Complete VSP Run.
9. Clean out Production Casing. Displace well with clean brine. Run Lower Completion with TCP guns.
10. Run Upper Completion on the Monobore Riser. Pull Drilling Riser and BOP Stack.
11. Run Subsea Tree on Monobore Riser. Perf well. Pull Monobore Riser and Run Tree Cap.

1.3 Data Security

All well data is confidential to Esso and should be discussed solely on a "need to know" basis. All IADC and any other well reports will be collected upon the completion of operations or other work. All contract personnel shall surrender all copies of the Blackback A-1 Drilling Program and any supplemental procedures, talley books, working notes, etc. upon the completion of operations. Data required for formal reports to be submitted for the completion of any work may be retained only until such time that the reports are submitted to Esso. Only Esso pre-approved personnel shall enter the mudlogging and WL/LWD units.

1.4 Well Data

Well Name:	Blackback A-1
Well Type/Depth:	Subsea Development to 4663m MD/2901m TVD
Well Service Category/Partners:	Standard/Esso (50% WI), BHPP (50% WI)
Block:	License VIC L-20-Offshore Victoria, Australia
Drilling Contractor:	Sedco Forex
Drilling Rig:	Sedco 702 Semisubmersible
Objectives:	Top of Latrobe Sands-Cretaceous Age (Oil & Gas)
Coordinates:	ANS/AGD AMG Zone 55, UTM, CM-147 Deg E
	Lat: 38° 32' 31.72" S, Long: 148° 33' 11.27" E X: 635,355m E, Y: 5,732,872m N (within 2.5m)
Water Depth:	402m
Rig DF-WL/DF-ML:	26m/428m (with 210° T Rig Heading)
Expected BHST:	194°± F
Directional Plan:	KOP @ 700m, ROB @ 3.0° Deg/30m to 59.5°. Build & Hold Well to TD, 50m Radius Target at the Top of Latrobe at 3053m North, 221m West of Surface Location. Target is @ 356° T Azimuth. Target TVD is @ 2835m
Key Control Wells:	BB-1, BB-2, BB-3, Hapuku-1, Terakihi-1
Estimate Well Days:	34 Target / 40 AFE
Critical Issues:	Hole Instability, Vessel Collision Avoidance, SIMOPS and subsea completions

1.5 Environmental Management Plan

A Blackback Environment Plan and Blackback Environmental Management Plan were submitted to the Department of Natural Resources and Energy, Minerals and Petroleum Victoria Section. Approval was granted with the VIC L-20 Petroleum License, which includes the Blackback Field. These will be bridged into the Floating Drilling Operations Manual Supplement issued for the Blackback Subsea Development Wells. All operations will be conducted in compliance with these plans and EAL's established waste management guidelines.

EAL's existing plans provide for offshore and onshore waste handling, chemical and materials inventory management, handling of radioactive and explosive materials, fuel transfer management, reporting and documentation guidelines, etc.

Operations on this well will be incorporated into EAL's Emergency Response and Oil Spill Contingency Plans as well as into their Incident Management System.

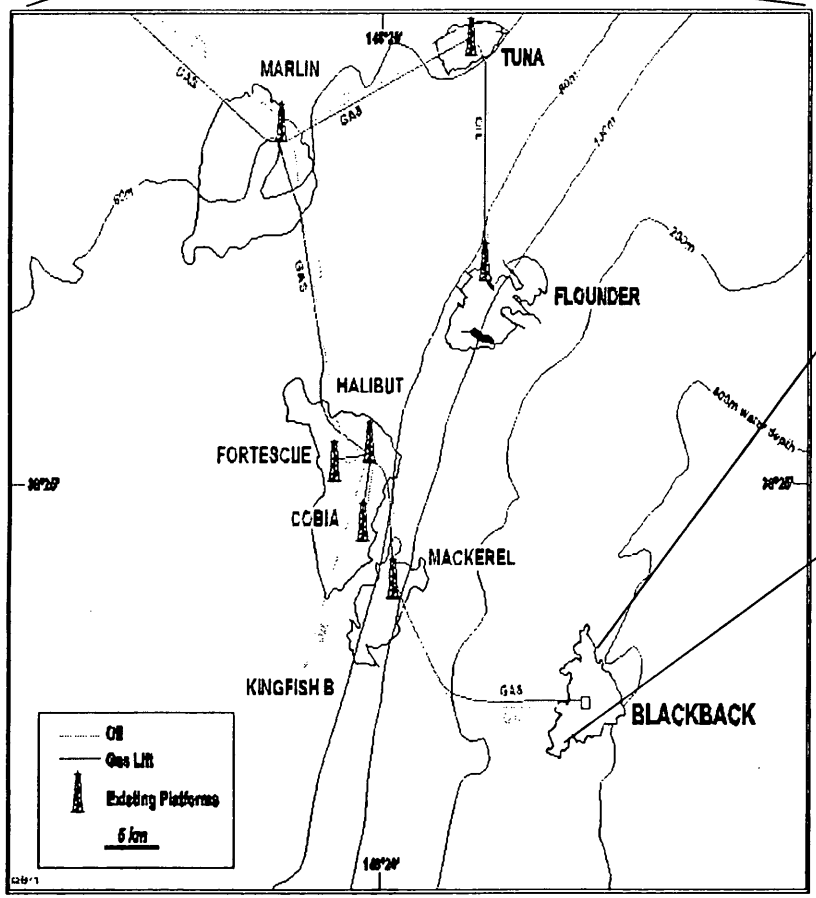
An emphasis will be on restocking and recycling of materials as much as practical. All materials handling and disposal practices will be in accordance with the applicable laws of Australia.

The drilling fluids proposed for use in the well are acceptable for ocean discharge in Australia including the associated formation cuttings as well as cementing returns, bulk materials and rig domestic effluent, wash, and ballast waters and BOP fluids.

If the rig and supply/tow vessels come directly to Esso from New Zealand, they must take on new ballast at the outer limit of Australian waters. This is mandated due to possible introduction of exotic species in the local marine environment.

BLACKBACK AREA MAP

OFFSHORE AUSTRALIA
BASS STRAIT, VIC



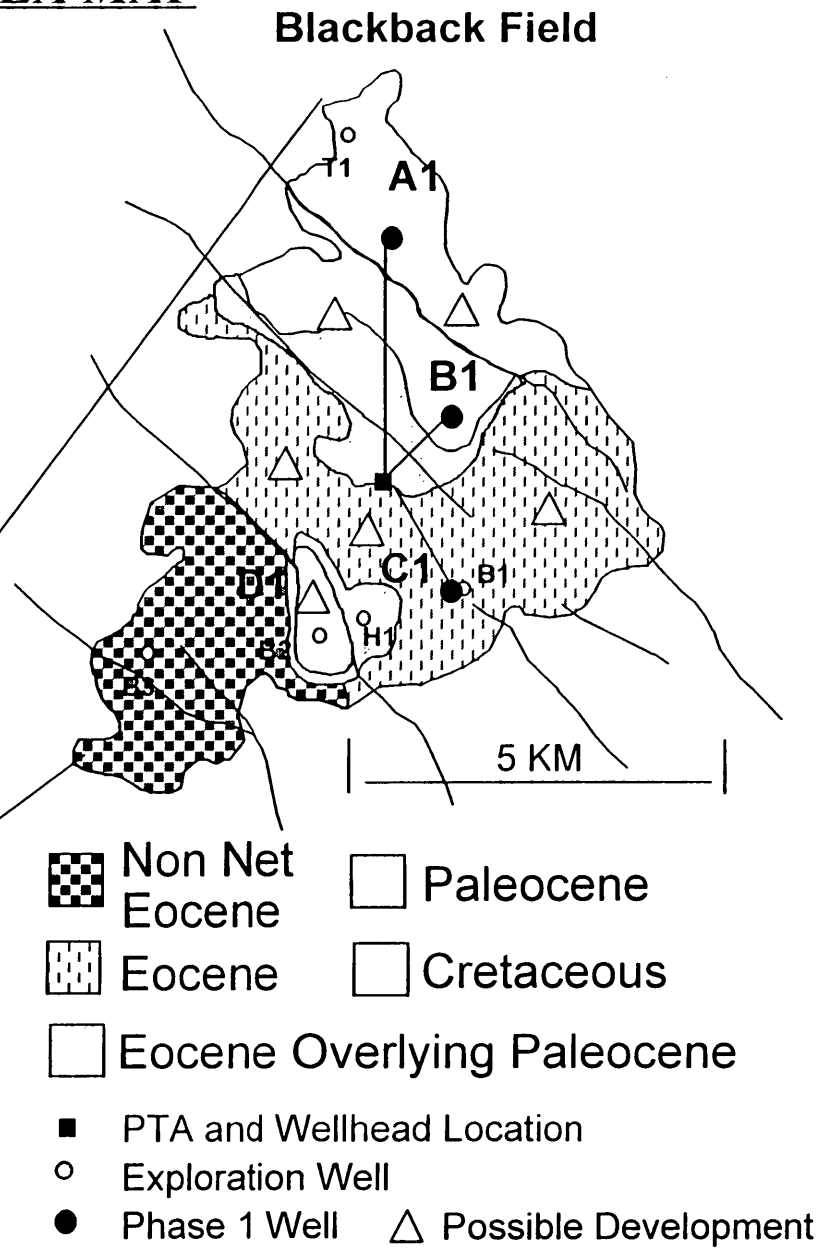


FIGURE 1-LOCATION MAP

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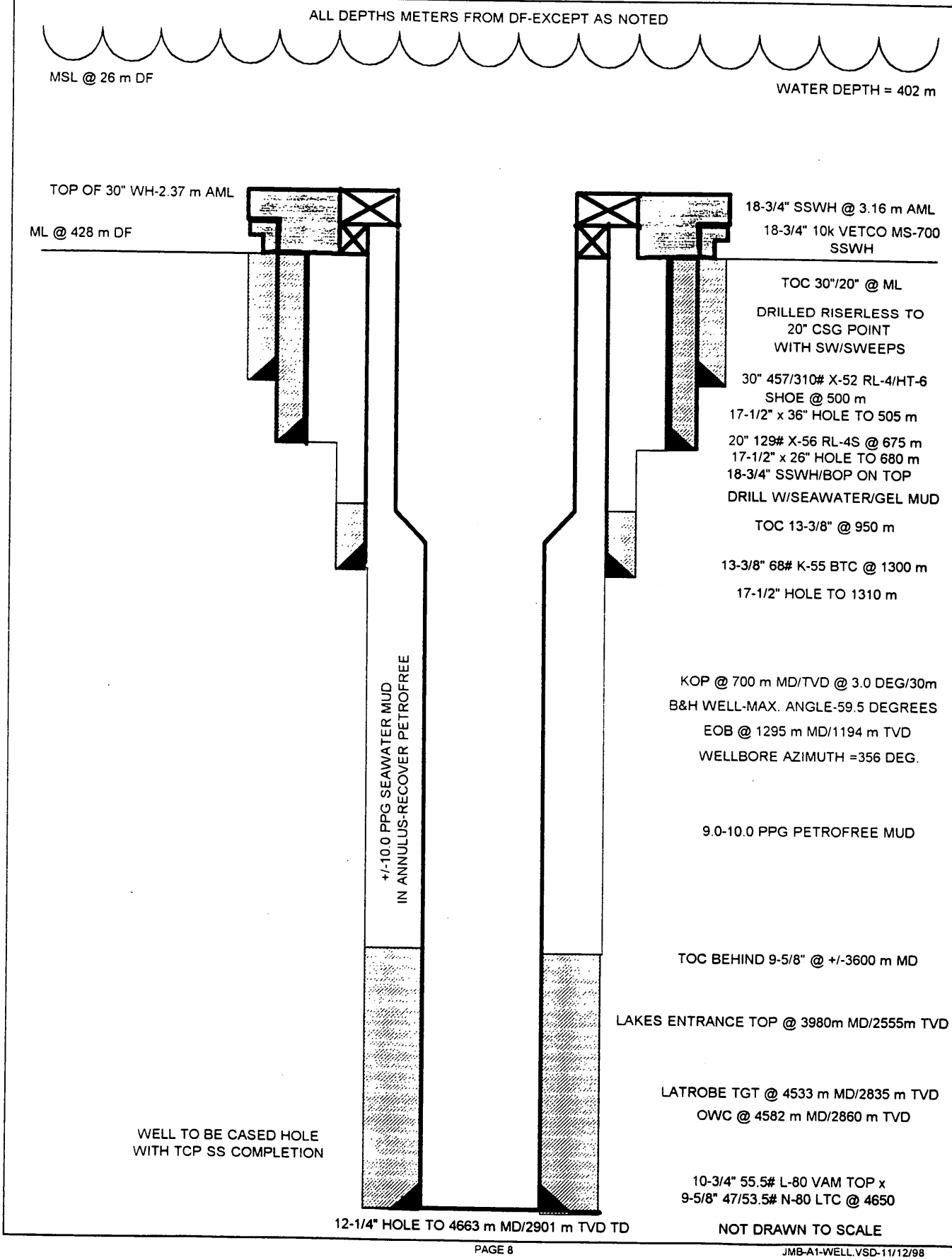
FIGURE 2

ESSO AUSTRALIA LTD.
BLACKBACK A-1
PROPOSED WELLBORE SKETCH



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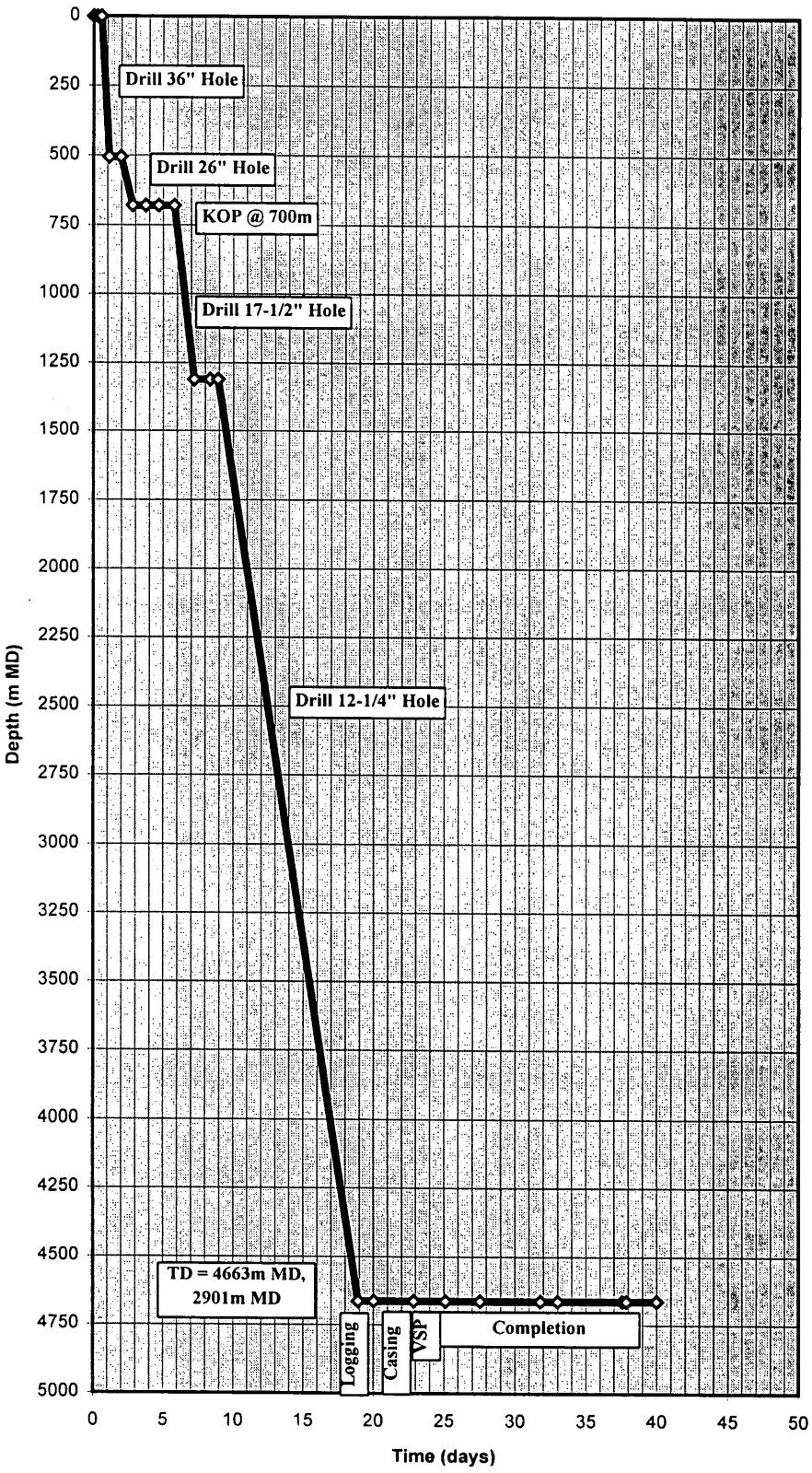
Blackback A-1

Days vs. Depth Curve (MD)

Lithology	Depth MD	Depth TVD	Formation Evaluation	Casing
	402	402		30" @500m MD 500m TVD
Gippsland	428	428		20" @ 675m MD, 675m TVD
	3980	2556		13-3/8" @ 1300m MD, 1194m TVD
Lakes Entrance			PEX	
Latrobe	4533	2835		10-3/4" X 9-5/8" @ 4650m MD, 2895m TVD
TD =	4663	2901		



Drilling Rig : Sedco Forex 702
Target Time: 40.0 **Days**
Proposed TD: 4663 **m MD**
2901 **m TVD**
Ave angle: 59.5 **deg**

2.0 Geology and Formation Evaluation

2.1 Well Objectives

1. Complete all operations TRI free and without unapproved discharges.

2. Determine reservoir quality, hydrocarbon content and productivity of the Latrobe interval at the A-1 well location. Drill the well and take a successful subsea completion in this interval on the initial attempt. Conduct all drilling and completion activities in a safe manner.

3. Confirm and evaluate the geological model and seismic mapping for this area of the Blackback field. Achieve the total depth objective for logging and completion.

4. Obtain quality formation evaluation data through mud logging, WL logging at TD and a cased-hole VSP run.

5. Maximize the ultimate recovery from the reservoir sands using gas lift as needed.

6. Maximize drilling efficiency through use of the best available and practical subsea drilling technology. Drill and complete the well at the minimum cost and minimize overall wellbore risks.

2.2 Predicted Lithology/Pore Pressures

Formation	Geologic Age	Depth to Top (m-DF) MD/TVD	Pore Pressure (ppg)	Primary Lithology
Gippsland Limestone	Miocene	428/428	8.5	Limestone/Siltstone
Lakes Entrance	Oligocene	3980/2556	8.5	Siltstone/Marl
Latrobe Group	Cretaceous	4533/2835	8.5	Sandstone/Siltstone
Total Depth	Cretaceous	4663/2901	8.5	

Angles at the formation tops are 59.5° for the Lakes Entrance and deeper in this build and hold angle well.

2.3 Formation Evaluation

2.3.1 Electric Logging

Depth Interval-m DF	Hole Size-Inches	Run No.	Log Type
TBD	12-1/4"	1	PEX\AIT\HNGS\DSI
		2	VSP (cased hole)

Notes:

1. A Schlumberger WL logging unit will be on the rig. Run PEX\AIT\HNGS\DSI tools. Have TLC capability available on the rig. Alternative logging tools may be run and extra runs conducted depending on the results obtained and could include conventional WL logging tools with TLC if necessary.

2.3.2 Cuttings Samples

Cuttings/Sample Type (three sets)	Interval-m MD (DF)	Frequency-m	Samples per Point
Washed/Dried in Cloth Bags (250 Gram)	680-4383	Every 30m from 20" Shoe to 150m above the Latrobe	3
Washed/Dried in Cloth Bags (250 Gram)	4383-4533	Every 10m from 150m above to actual Top of Latrobe	3
Washed/Dried in Cloth Bags (250 Gram)	4533-TD	Every 5m from the Top of Latrobe to Total Depth	3
Spot Samples	20" Shoe to TD	For Every Gas Peak	3

2.3.3 Mud Logging

Normal mud logging services will be utilized for all drilling below the 20" casing shoe. A fully computerized mud-logging unit will be used. On a timely basis, the data engineer will collect and plot all normal drilling parameters. Two-meter averages of drilling parameters will be plotted on a 1:100 scale. The appropriate EAL G&G staff will finalize this program at a later date. The following drilling parameters will be monitored and plotted on a continuous recorder while drilling below the 20" casing shoe at a minimum:

- Mud Weight (In/Out) and Rate of Penetration in mph
- Background Gas, Circulating Gas, Connection Gas and Trip Gas
- Any H_2S/ CO_2 Associated w/Background, Connection and Trip Gases
- Drill String Torque and Drag, Weight on Bit, Rotary RPM and Standpipe Pressure
- Mud Flow (In/Out) and Changes in the Active System Volume

The following equipment with suitable back up is among the equipment that must be available at all times:

- Hydrogen Flame Ionization Total Gas Detector
- Hydrogen Flame Ionization Gas Chromatograph
- H_2S Detectors w/sensors located at the bell nipple, gas trap, rig floor, active mud pits and shakers
- Drager-type portable gas detector for H_2S, CO_2 and SO_2 (mud engineer to have GGT)

Mud loggers will be provided additional instructions regarding equipment and procedures.

2.3.4 Coring

No conventional cores are planned in the well as programmed and no dedicated coring equipment is available on standby for this well in the area.

2.3.5 Well Completion

Well Completion Objectives:

- Conduct all well completion operations safely and successfully.
- Confirm the productivity of the completion interval and hydrocarbon content of the formations.
- Monitor reservoir pressure/temperature throughout the life of the well using a downhole gauge system.
- Maintain wellbore integrity throughout the life of the well.

Generalized Well Completion Program (Subject to Change):

1. Run and cement 10-3/4" x 9-5/8" production casing, displace cement with seawater.
2. Run 8-1/2" bit with 10-3/4" x 9-5/8" casing scrapers (single trip). Circulate well with seawater until clean. Displace wellbore with filtered and inhibited 8.9 ppg NaCl completion brine (provides 8.7 ppg and 150 psi overbalance at the reservoir when adjusted for temperature effects).
3. Run Gauge Ring & Junk Basket on WL. Consider additional runs depending on recovery.
4. Run and set Schlumberger Dual Pressure Firing Head perforating guns with a MAXR gun hanger on WL.
5. Run the Upper Completion Assembly with 4-1/2",12.6 ppf, S13Cr-80, Vam-Ace tubing including these major pieces of equipment:
    - WL Entry Guide
    - Halliburton Mirage Plug
    - Halliburton 3.437" x 3.260" RN No-Go Landing Nipple
    - 9-5/8" Halliburton MHP Hydraulic Packer w/Millout Extension
    - PBR Halliburton Seal Bore w/5" Bore & 20' Stroke Seal Assembly
    - Halliburton 3.688" R-Landing Nipple
    - Schlumberger DHPT Downhole Gauge Assembly (to be @ 2375±m TVD below the tbg hgr)
    - Camco Side Pocket Mandrel MMRG-4 w/SO2-30R Valve (to be @ 640±m TVD below the tbg hgr)
    - Camco TR-SCSSSV TRC-DH-5F (to be @ 573±m TVD-TH)
    - Camco RH-2 Landing Nipple for Back-Up SCSSSV Use (to be @ 50±m TVD below the tbg hgr)
    - ABB VG Tubing Hanger for MS-700 WH-4.5" x 2.375"-Dual Bore
6. Run the completion assembly to bottom while filling the string with Baroid XP-07 base oil. The XP-07 base fluid density is 6.4 ppg.
7. Orient, land and lock the tubing hanger in place.

8. Pressure down the monobore riser and 4-1/2" tubing to 4000 psi to set the hydraulic packer and test the entire tubing and hanger assembly as set. Pressure up an additional five (5) times to open the Mirage plug. Close TR-SCSSSV and bleed off pressure above it to inflow test the SCSSSV. Then, equalize pressure on both sides before opening and bleeding off. Pressure up the annulus safety valve control line to 5000 psi. Pressure test the production annulus to 3500 psi through the spare umbilical hydraulic hose. Close the annulus TR-SCSSSV and bleed off pressure from above the conduct an inflow test. Equalize the pressure, open the safety valve and bleed annulus pressure to zero.

9. Set and Test PXX plug in the production bore of the tubing hanger on WL.

10. Release the tubing hanger running tool. PU and allow the XP-07 base oil to U-tube from the monobore riser. Recover at a controlled rate for later use.

11. POH with the monobore riser assembly and the tubing hanger running tool. Circulate riser to seawater.

12. Disconnect BOP stack and move 30m off well and away from adjacent wells, pipeline and other subsea facilities. Pull BOP and Riser.

13. Prepare and run Subsea Tree on Monobore Riser. Land, latch and pull test the assembly on the subsea wellhead. Function test and pressure test tree valves to 5000 psi and flowline jumpers.

14. Pressure up annulus safety valve control line to 5000 psi. Pressure up production annulus to 3500 psi to test the tubing hanger to tree connection. Bleed both pressures to zero.

15. Rig-up wireline unit and pull the PXX plug from the tubing hanger. Pressure up riser and production tubing to 4500 psi to fire the perforating guns.

16. Open PTA valve and wing valve. Pump seawater down the monobore riser to displace riser fluids into the pipeline. Release the subsea tree running tool and POH with the monobore riser and completion and workover assembly.

17. Run tree cap on Tree Cap Running Tool and drillpipe.

18. Release the well to production.

3.0 Critical Issues & Offset Drilling Experience

3.1 Surface Hazards

This is currently an undeveloped offshore area without known pipelines, telecommunications cables or other man-made obstructions at or near the proposed drillsite. This situation changes with the laying of the proposed 8" x 12" insulated flowline, 2-1/2" gaslift and armored electro-hydraulic umbilical lines from EAL's Mackerel Platform. In addition, supporting facilities such as the PTA (Pipeline Termination Assembly), UTA (Umbilical Termination Assembly) and EDU (Electrical Distribution Unit) will be installed in the area surrounding the proposed Blackback development wells. The proposed mooring program is designed to straddle the subsea facilities in place and utilizes a 210° T rig heading and 45/45° anchoring pattern to avoid the pipeline area as much as possible. Simultaneous operations plans will be put in place to deal with dropped objects and other scenarios concerning the subsea production equipment.

The seafloor has relatively flat, moderate and steep slopes in this area with dips nearby up to 3-7 degrees. Based on analysis of the nearby soil samples and offset well results, foundation failure-related events are not expected. Guidebase settling and deviations have been experienced on some wells in the area, but not using subsea wellhead systems similar to the system proposed for this well. The seabed surface samples consist of brown, fine to medium grained shelly siliceous carbonate and dense to medium dense sands. Pipeline corridor survey results in the area indicate a submarine valley running in an east-west direction dominates the seabed topography in the Blackback area. The area to the south of this valley is dominated by a ridge trending northeasterly with a steep slope into the Blackback valley to the north. The proposed location for the subsea wells is at the end of this ridge in 402m of water. The location was selected to avoid a small nearby tributary valley that could have active sediment movements and cause bathymetry variations. Nearby sediment movements are not expected to impact the well area while drilling and completing these wells.

The well location is in an area of northeast to southwest shipping lanes. Special collision avoidance plans will be put in place for managing approaching vessel hazards. This area of Bass Strait is one of active commercial fishing activities, but fishing activities have not impacted previous floating drilling campaigns. There are no known shipwrecks or unexploded ordinance expected in the area that could pose a threat to operations or equipment. No seafloor debris was noted in the proposed well area during the site survey work. An ROV will be deployed when the rig is moored to verify the wellhead areas are clear of seafloor debris.

3.2 Shallow Hazards

A shallow hazards data review has been completed for the area. No seafloor or near seafloor hazards were noted in this work, nor experienced on any of the five offset wells drilled on the Blackback structure. Shallow gas has not been identified in any of the seismic surveys conducted over the structure. Shallow gas has not been experienced in offset wells (see the stick charts). No shallow gas was noted in any of the soil samples taken in this area.

Although shallow gas is not expected, the following precautions will be observed:

1. Riserless drilling will be conducted until the 20" casing point and this casing string is run and cemented. The Subsea BOP stack and marine riser system will be installed on the 20".

2. Drilling will not commence until the drilling crews are assessed capable of normal riserless drilling operations. Periodic, ongoing shallow gas drills will be conducted. Operational meetings will be held with rig personnel to finalize riserless drilling preparations, emergency response plans and personnel duties.

3. The ROV will be deployed near the wellhead to monitor for indications of gas flow during riserless operations.

4. Preparations will be put in place to move the rig off location should any significant flows be encountered which could effect the drilling unit and onsite personnel.

5. All watertight doors and vent hatches not in use will be closed.

6. Monitoring of pump pressure indications will be done to check for a sudden change that could indicate the well is flowing.

7. Non-ported drill pipe floats will be used while drilling riserless.

The surface hole will be drilled with a minimum mud weight to provide sufficient overbalance, yet minimize the chances of bit balling and hole swabbing. Standard Esso tripping practices will be employed to keep the hole full and prevent swabbing. A ported drill pipe float will be used in the drillstring once the BOP stack is run.

A riserless drilling procedure will be prepared and used on the rig.

3.3 Abnormal Pressure

Based on the Geologic Prognosis and offset well data, all geologic horizons are expected to be normally pressured. Abnormal pressure in this portion of Bass Strait is known to come in below the massive P. Mawsonii marine shale at 4000m± SS; much deeper than the top of Latrobe Group development target proposed for the Blackback A-1, A-2, A-3 and A-2A wells.

Although abnormal pressure is not expected, all abnormal pressure parameters will be monitored from surface casing to TD. A full service mud-logging unit will monitor and plot parameters.

Notes: 1) A trip book is to be maintained for all trips in and out of the well with the drilling riser in place.
2) On trips in the hole, fill the drill pipe and break circulation every 25 stands.

3.4 Hydrogen Sulfide/Carbon Dioxide

Hydrogen Sulfide (H_2S) concentrations up to 400 ppm have been observed in the Terakihi well test samples, but have not been detected in any of the other wells drilled on the Blackback structure. Thus, it is possible H_2S could be encountered in the A-1 well, which is being drilled near the Terakihi-1 well. Continuous monitoring of H_2S will be done from the 20" casing shoe to TD with mudlogging and installed H_2S detection equipment. Mud engineers will run a Garrett Gas Train, every 12 hours after entering the Latrobe, to monitor for H_2S, CO_2 and soluble sulfides. The well completion includes use of CRA materials to manage production in the associated sour and corrosive environment, in accordance with NACE MR-0175.

Carbon Dioxide (CO_2) may be present in small quantities (0.26-0.35%) based on the offset wells where no difficulties were experienced. Although SBM will be used, lime will be maintained onsite to treat out any CO_2 contamination problems.

3.5 Wellbore Stability

Hole instability problems are not anticipated until penetrating the Lakes Entrance formation. The Lakes Entrance is present across the Gippsland Basin and is characterized as a reactive shale, siltstone and claystone section with moderate surface areas (150-250$m^2/g\pm$). It is a highly water and time sensitive section where hole deterioration, mud rings, washouts, tight hole, excessive reaming and hole collapse have been observed frequently when drilling with WBM. These problems are more pronounced in deviated wellbores.

As an alternative to the water-base mud used on the previous offset wells, synthetic base mud (Petrofree) of the ester base family will be utilized for this well. This is based on highly successful results using it on EAL ERD platform wells nearby. It is being used to improve completion operations and eliminate the need for cemented 7" production liners. Petrofree has been successful in stabilizing even highly deviated wellbores across the Lakes Entrance, even with mud weights as low as 9.5-10.5 ppg, where water base mud in the past have sometimes required mud weights in excess of 11.0 ppg. Lower mud weight will be helpful when drilling through the Lakes Entrance and leaving it uncased while drilling the multi-darcy sandstone objectives in the Latrobe.

Hole instability will be managed by a combined chemical, mechanical and operational approach. The drilling fluid of 9.0-10.5 ppg Petrofree will be used to minimize the effects of shale and claystone hydration. Minimum mud weight guidelines will be utilized to maximize ROP and minimize the likelihood of differential sticking. A flow rate of 800-1000± gpm will be run in the 12-1/4" hole to maximize hole cleaning. A PDC bit/motor combination is proposed to assist in drilling this section as fast as prudent, while maintaining directional control, to minimize open-hole exposure time. Wiper trips will be conducted as required to minimize tight hole events based on true hole indications, with precautions taken on all trips to avoid swabbing or BHA sticking tendencies. Mud weight should be increased in stages at the onset of any formation instabilities.

Bridging in the shallow hole sections has been experienced in several Gippsland Basin wells while running casing. Normally, these bridges are encountered a short distance below the mudline (0-25m). Wiping the hole completely to the seafloor and displacing the entire wellbore with hi-vis mud in stages (to minimize the mud level drops while POH) is recommended to help prevent these shallow bridges.

Some minor unstable coal/volcanic sections have been encountered in offset wells. If required, this situation is handled with a combination of mud weight, increased cuttings carrying capacity, reaming and wiper trips. Usually the coal beds are relatively thin, but may require repeated reaming to break up coal chunks. Pyrite stringers are routinely encountered at the top of the Latrobe. PDC bits can be nursed through these stringers by limiting rotary speed (<80) and reducing WOB.

3.6 Hydrates

The formation of hydrates is a potential problem any deepwater location. Fortunately, none of these wells have experienced hydrate formation problems to date. However, in recent years, instances of hydrate formation in the BOP stack and other subsea equipment have been noted at several other offshore locations. In order to combat hydrate formation, the following steps are planned for this well where a seafloor temperature as low as 7 °C, 44 °F is expected in the subsea BOP area:

> **Drilling Fluid**: The non-aqueous Petrofree SBM (ester base) will suppress hydrate formation to enable gas kick circulation through the subsea BOP. The BOP stack will be circulated daily, down the choke and kill lines, to ensure they remain free. While the well is being drilled in the hydrocarbon objectives, a mud weight of 9.5-10.5 ppg will be maintained. This mud density provides 1.0-2.0 ppg over the maximum anticipated pore pressure.

Guidebase: A solid body Vetco Temporary Guidebase will be run. Gas percolation around the structural casing and conductor is diverted away from the subsea BOP stack because this unit is solid. Additionally, there is a hydrate seal on the BOP connector. No shallow hydrocarbon zones are expected.

Completion: The well completion is designed to prevent hydrate formation with the primary TR-SCSSSV being placed below the hydrate formation regime in the well. Production operations are designed to allow for methanol injection as needed to prevent hydrate formation during start-up and shutdown operations. A methanol slug will be pumped ahead of gas lift gas on initial displacement of the tubing X casing annulus.

3.7 Deepwater

The following steps have been taken to ensure this well can be drilled and completed considering challenges relevant to deepwater operations. Planned actions are given below under each particular challenge:

Wellhead Sinking: A string of 30" Structural Casing will be set at 500m± DF and cemented in 36" hole. The Vetco TGB will be run and provide additional bearing support against wellhead sinking; acting similar to a mud mat. Similar practices have provided acceptable results on offset wells with no wellhead sinking noted. No shallow water or gas flows have been experienced behind any shallow casing strings.

Shallow Hole Drilling: The well will be drilled riserless down to the 20" casing point, taking seawater gel sweeps and cuttings to the seafloor. This is the safest way to deal with any well control problems in deepwater, shallow hole sections (from a BOP equipment standpoint), which are not expected in this well nor found commonly in Bass Strait drilling. Basin-wide offset well experience does not indicate a need for pilot hole drilling.

Mooring: A computerized mooring analysis has been done, using Bass Strait marine conditions considered, on the proposed mooring system with 3" ORQ chain. Operating limits are not expected to exceed 50% of the mooring line breaking strength limit. The maximum anchor holding force expected is well within the predicted holding force of the 12 MT Stevpris anchors, hence piggybacking of anchors will likely not be required. A detailed mooring plan will be provided at a later date.

Riser Tensioning: As with mooring, a computerized riser analysis has been conducted to assess riser-tensioning guidelines required for the well. From this work, the tensioning required (400 kips) for riser stability with the proposed maximum mud weight is well within the limits of the rig equipment and provide contingency for the failure of one tensioner. The initial tension to be pulled on the riser will be specified later, with this tensioning not expected to be increased unless the mud weight rises above 10 ppg and/or vessel offset reaches 2% of the water depth or other marine conditions mandate additional tensioning.

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be cemented to the mudline. The completion riser is being evaluated in this area, including the effects of the near mudline cascade currents.

Well Control: Based on fracture gradient predictions for this site and offset wells, the 13-3/8" casing will be set so that its casing shoe will have formation integrity of at least 13.0-14.0± ppg. This is adequate for circulating out a gas kick relevant for Bass Strait area formations. Sufficient mud weight will be carried based on the geologic section to be drilled to prevent a gas kick considering historical pore pressures. The BOP stack will be function/pressure tested at the surface before it is run to the seafloor. The PIT limit above is adequate for cementing the surface pipe. The BOP will be circulated as pertinent before opening it to mitigate the effects of a riser kick and it will also have a means in place for ROV hot stab intervention to perform some stack functions subsea.

ROV: An ROV will be available on the rig to inspect the BOP stack and riser on a routine basis. The ROV will also perform other deepwater-related functions, as well as site clearance work and observing the well at the seafloor while drilling without the riser. During routine riser and BOP inspections, the ROV will survey the BOP package for indications of hydrate accumulations.

3.8 Lost Returns

No lost returns problems were experienced on the previous Blackback wells. The Gippsland Limestone has historically yielded higher fracture pressures than typical marine claystone formations. Based on these factors, no lost returns are anticipated in a conventional sense.

Some minor lost returns events have been experienced due to using the higher viscosity Petrofree muds. These losses have not been catastrophic in nature and dealt with in routine manners such as circulating to build filter cake, cutting the mud weight and spotting of LCM pills in some instances and adding of calcium carbonate to the mud system. Staging in the hole on trips will be utilized as necessary to break circulation in the Petrofree mud system which will typically develop higher gel strengths in lower temperature sections of the well after prolonged static conditions.

Minimum mud weight overbalances will be utilized when possible and with rheological properties and circulating rates monitored at all times to avoid losses. Mud properties will be run to promote filter cake formation with reasonable fluid loss levels run. LCM will be kept on location for spotting of any pills required in unusual circumstances, with the LCM to be onsite selected later during loadout planning work.

3.9 Drawdown Formations

The proposed Latrobe Group reservoir section is held in communication with other Bass Strait producing areas in the Latrobe Group aquifer. Hence the reservoir objective sands in this well may be drawndown, to as low as 7.9-8.4 ppg equivalent mud weight, as noted in other exploration wells in the area. Use of the Petrofree mud system in this multi-darcy interval should minimize differential sticking tendencies.

Drilling into the Top of the Latrobe Group should proceed cautiously when initially penetrating it to evaluate the risk of sticking through the monitoring of torque and drag parameters. Adequate BHA stabilization should be run at all times in this section and minimum BHAs used. The Petrofree mud allows for the addition of calcium carbonate to act as a plugging agent as needed across the Latrobe sands.

3.10 Environmental Considerations

A detailed summary of the environmental conditions for the Blackback area is summarized in the Blackback Phase I Design Basis Memorandum and supporting documentation. A brief summary is given below:

1.	Maximum Significant Wave Height	10.1m
2.	99.9% Environment Wave Height	6.6m
3.	50.0% Environment Wave Height	1.7m
4.	Design Wind Speed Maximum	53.9 knots
5.	Typical Wind Direction	210-270° True
6.	Peak Wave Period	15.2 seconds
7.	Typical Wave Direction	210-270° True
8.	Maximum Operational Current	2.3 knots
9.	99.9% Environment Current	2.1 knots
10.	50.0% Environment Current	0.4 knots
11.	Design Minimum Water Temperature	7 °C/44 °F

Storms are typically from the southeast, south and southwest directions, with a maximum tidal surge for the area being 1.4m.

3.11 Other Drilling Experiences

1. Some gumbo has been experienced on several area wells while drilling in the Lakes Entrance horizons, which have resulted in gumbo attacks. Use of Petrofree mud should mitigate much of the problem. If gumbo problems persist, continue pumping until returns are free of gumbo slugs regardless of mud losses over the shakers.

2. A mud shearing system may be rigged up to assist mixing of mud chemicals to minimize chemical usage. Homogenizers have generally been proven ineffective in the region.

3.12 Drilling and Well Completion Risk Assessment Summary

In October 1998, a Blackback Phase I Drilling and Well Completion Risk Assessment was conducted and considered operations on the Blackback A-1 as well. The primary goal of this risk assessment is to communicate the significant risk events involved with the entire operation to all members of the Blackback Subsea Drilling and Well Completions Team. Also, the safeguards that are needed (preventative and mitigating measures) to reduce the operational risk of the scenarios are identified.

The results of the risk assessment, including a list of follow-up items, will be approved and distributed to all members of the team. Personnel associated with, and responsible for, the drilling and completion operations are to review the risk assessment, as well as the Generic Floater Risk Assessment, and be aware of the hazard scenarios and the safeguards to be put in place to reduce operational risks. It will be the responsibility of the members of the team to ensure that the identified preventative and mitigating measures for each hazard scenario are in place and incorporated into drilling and completion operations. All of the identified follow-up items are to be completed prior to assignment of the rig to Esso, or as soon as possible thereafter.

Note: This well is be drilled referencing the Esso Floating Drilling Operations Manual and Supplement, the EAL Platform Drilling Operations Manual (as applicable) and any Supplemental Programs issued.

2.0 Geology and Formation Evaluation

2.1 Well Objectives

1. Complete all operations TRI free and without unapproved discharges.

2. Determine reservoir quality, hydrocarbon content and productivity of the Latrobe interval at the A-1 well location. Drill the well and take a successful subsea completion in this interval on the initial attempt. Conduct all drilling and completion activities in a safe manner.

3. Confirm and evaluate the geological model and seismic mapping for this area of the Blackback field. Achieve the total depth objective for logging and completion.

4. Obtain quality formation evaluation data through mud logging, WL logging at TD and a cased-hole VSP run.

5. Maximize the ultimate recovery from the reservoir sands using gas lift as needed.

6. Maximize drilling efficiency through use of the best available and practical subsea drilling technology. Drill and complete the well at the minimum cost and minimize overall wellbore risks.

2.2 Predicted Lithology/Pore Pressures

Formation	Geologic Age	Depth to Top (m-DF) MD/TVD	Pore Pressure (ppg)	Primary Lithology
Gippsland Limestone	Miocene	428/428	8.5	Limestone/Siltstone
Lakes Entrance	Oligocene	3980/2556	8.5	Siltstone/Marl
Latrobe Group	Cretaceous	4533/2835	8.5	Sandstone/Siltstone
Total Depth	Cretaceous	4663/2901	8.5	

Angles at the formation tops are 59.5° for the Lakes Entrance and deeper in this build and hold angle well.

2.3 Formation Evaluation

2.3.1 Electric Logging

Depth Interval-m DF	Hole Size-Inches	Run No.	Log Type
TBD	12-1/4"	1	PEX\AIT\HNGS\DSI
		2	VSP (cased hole)

Notes:

1. A Schlumberger WL logging unit will be on the rig. Run PEX\AIT\HNGS\DSI tools. Have TLC capability available on the rig. Alternative logging tools may be run and extra runs conducted depending on the results obtained and could include conventional WL logging tools with TLC if necessary.

2.3.2 Cuttings Samples

Cuttings/Sample Type (three sets)	Interval-m MD (DF)	Frequency-m	Samples per Point
Washed/Dried in Cloth Bags (250 Gram)	680-4383	Every 30m from 20" Shoe to 150m above the Latrobe	3
Washed/Dried in Cloth Bags (250 Gram)	4383-4533	Every 10m from 150m above to actual Top of Latrobe	3
Washed/Dried in Cloth Bags (250 Gram)	4533-TD	Every 5m from the Top of Latrobe to Total Depth	3
Spot Samples	20" Shoe to TD	For Every Gas Peak	3

2.3.3 Mud Logging

Normal mud logging services will be utilized for all drilling below the 20" casing shoe. A fully computerized mud-logging unit will be used. On a timely basis, the data engineer will collect and plot all normal drilling parameters. Two-meter averages of drilling parameters will be plotted on a 1:100 scale. The appropriate EAL G&G staff will finalize this program at a later date. The following drilling parameters will be monitored and plotted on a continuous recorder while drilling below the 20" casing shoe at a minimum:

- Mud Weight (In/Out) and Rate of Penetration in mph
- Background Gas, Circulating Gas, Connection Gas and Trip Gas
- Any H_2S/ CO_2 Associated w/Background, Connection and Trip Gases
- Drill String Torque and Drag, Weight on Bit, Rotary RPM and Standpipe Pressure
- Mud Flow (In/Out) and Changes in the Active System Volume

The following equipment with suitable back up is among the equipment that must be available at all times:

- Hydrogen Flame Ionization Total Gas Detector
- Hydrogen Flame Ionization Gas Chromatograph
- H_2S Detectors w/sensors located at the bell nipple, gas trap, rig floor, active mud pits and shakers
- Drager-type portable gas detector for H_2S, CO_2 and SO_2 (mud engineer to have GGT)

Mud loggers will be provided additional instructions regarding equipment and procedures.

2.3.4 Coring

No conventional cores are planned in the well as programmed and no dedicated coring equipment is available on standby for this well in the area.

2.3.5 Well Completion

Well Completion Objectives:

- Conduct all well completion operations safely and successfully.
- Confirm the productivity of the completion interval and hydrocarbon content of the formations.
- Monitor reservoir pressure/temperature throughout the life of the well using a downhole gauge system.
- Maintain wellbore integrity throughout the life of the well.

Generalized Well Completion Program (Subject to Change):

1. Run and cement 10-3/4" x 9-5/8" production casing, displace cement with seawater.
2. Run 8-1/2" bit with 10-3/4" x 9-5/8" casing scrapers (single trip). Circulate well with seawater until clean. Displace wellbore with filtered and inhibited 8.9 ppg NaCl completion brine (provides 8.7 ppg and 150 psi overbalance at the reservoir when adjusted for temperature effects).
3. Run Gauge Ring & Junk Basket on WL. Consider additional runs depending on recovery.
4. Run and set Schlumberger Dual Pressure Firing Head perforating guns with a MAXR gun hanger on WL.
5. Run the Upper Completion Assembly with 4-1/2",12.6 ppf, S13Cr-80, Vam-Ace tubing including these major pieces of equipment:
    - WL Entry Guide
    - Halliburton Mirage Plug
    - Halliburton 3.437" x 3.260" RN No-Go Landing Nipple
    - 9-5/8" Halliburton MHP Hydraulic Packer w/Millout Extension
    - PBR Halliburton Seal Bore w/5" Bore & 20' Stroke Seal Assembly
    - Halliburton 3.688" R-Landing Nipple
    - Schlumberger DHPT Downhole Gauge Assembly (to be @ 2375±m TVD below the tbg hgr)
    - Camco Side Pocket Mandrel MMRG-4 w/SO2-30R Valve (to be @ 640±m TVD below the tbg hgr)
    - Camco TR-SCSSSV TRC-DH-5F (to be @ 573±m TVD-TH)
    - Camco RH-2 Landing Nipple for Back-Up SCSSSV Use (to be @ 50±m TVD below the tbg hgr)
    - ABB VG Tubing Hanger for MS-700 WH-4.5" x 2.375"-Dual Bore
6. Run the completion assembly to bottom while filling the string with Baroid XP-07 base oil. The XP-07 base fluid density is 6.4 ppg.
7. Orient, land and lock the tubing hanger in place.

8. Pressure down the monobore riser and 4-1/2" tubing to 4000 psi to set the hydraulic packer and test the entire tubing and hanger assembly as set. Pressure up an additional five (5) times to open the Mirage plug. Close TR-SCSSSV and bleed off pressure above it to inflow test the SCSSSV. Then, equalize pressure on both sides before opening and bleeding off. Pressure up the annulus safety valve control line to 5000 psi. Pressure test the production annulus to 3500 psi through the spare umbilical hydraulic hose. Close the annulus TR-SCSSSV and bleed off pressure from above the conduct an inflow test. Equalize the pressure, open the safety valve and bleed annulus pressure to zero.

9. Set and Test PXX plug in the production bore of the tubing hanger on WL.

10. Release the tubing hanger running tool. PU and allow the XP-07 base oil to U-tube from the monobore riser. Recover at a controlled rate for later use.

11. POH with the monobore riser assembly and the tubing hanger running tool. Circulate riser to seawater.

12. Disconnect BOP stack and move 30m off well and away from adjacent wells, pipeline and other subsea facilities. Pull BOP and Riser.

13. Prepare and run Subsea Tree on Monobore Riser. Land, latch and pull test the assembly on the subsea wellhead. Function test and pressure test tree valves to 5000 psi and flowline jumpers.

14. Pressure up annulus safety valve control line to 5000 psi. Pressure up production annulus to 3500 psi to test the tubing hanger to tree connection. Bleed both pressures to zero.

15. Rig-up wireline unit and pull the PXX plug from the tubing hanger. Pressure up riser and production tubing to 400 psi to fire the perforating guns.

16. Open PTA valve and wing valve. Pump seawater down the monobore riser to displace riser fluids into the pipeline. Release the subsea tree running tool and POH with the monobore riser and completion and workover assembly.

17. Run tree cap on Tree Cap Running Tool and drillpipe.

18. Release the well to production.

3.0 Critical Issues & Offset Drilling Experience

3.1 Surface Hazards

This is currently an undeveloped offshore area without known pipelines, telecommunications cables or other man-made obstructions at or near the proposed drillsite. This situation changes with the laying of the proposed 8" x 12" insulated flowline, 2-1/2" gaslift and armored electro-hydraulic umbilical lines from EAL's Mackerel Platform. In addition, supporting facilities such as the PTA (Pipeline Termination Assembly), UTA (Umbilical Termination Assembly) and EDU (Electrical Distribution Unit) will be installed in the area surrounding the proposed Blackback development wells. The proposed mooring program is designed to straddle the subsea facilities in place and utilizes a 210° T rig heading and 45/45° anchoring pattern to avoid the pipeline area as much as possible. Simultaneous operations plans will be put in place to deal with dropped objects and other scenarios concerning the subsea production equipment.

The seafloor has relatively flat, moderate and steep slopes in this area with dips nearby up to 3-7 degrees. Based on analysis of the nearby soil samples and offset well results, foundation failure-related events are not expected. Guidebase settling and deviations have been experienced on some wells in the area, but not using subsea wellhead systems similar to the system proposed for this well. The seabed surface samples consist of brown, fine to medium grained shelly siliceous carbonate and dense to medium dense sands. Pipeline corridor survey results in the area indicate a submarine valley running in an east-west direction dominates the seabed topography in the Blackback area. The area to the south of this valley is dominated by a ridge trending northeasterly with a steep slope into the Blackback valley to the north. The proposed location for the subsea wells is at the end of this ridge in 402m of water. The location was selected to avoid a small nearby tributary valley that could have active sediment movements and cause bathymetry variations. Nearby sediment movements are not expected to impact the well area while drilling and completing these wells.

The well location is in an area of northeast to southwest shipping lanes. Special collision avoidance plans will be put in place for managing approaching vessel hazards. This area of Bass Strait is one of active commercial fishing activities, but fishing activities have not impacted previous floating drilling campaigns. There are no known shipwrecks or unexploded ordinance expected in the area that could pose a threat to operations or equipment. No seafloor debris was noted in the proposed well area during the site survey work. An ROV will be deployed when the rig is moored to verify the wellhead areas are clear of seafloor debris.

3.2 Shallow Hazards

A shallow hazards data review has been completed for the area. No seafloor or near seafloor hazards were noted in this work, nor experienced on any of the five offset wells drilled on the Blackback structure. Shallow gas has not been identified in any of the seismic surveys conducted over the structure. Shallow gas has not been experienced in offset wells (see the stick charts). No shallow gas was noted in any of the soil samples taken in this area.

Although shallow gas is not expected, the well will be drilled as if shallow gas and other hazards are expected by taking the following precautions:

1. Riserless drilling will be conducted until the 20" casing point and this casing string is run and cemented. The Subsea BOP stack and marine riser system will be installed on the 20".

2. Drilling will not commence until the drilling crews are assessed capable of responding to a shallow gas incident in the riserless drilling sections of the well. Periodic, ongoing shallow gas drills will be conducted. Operational meetings will be held with rig personnel to finalize riserless drilling preparations, emergency response plans and personnel duties.

3. The ROV will be deployed near the wellhead to monitor for indications of gas flow during riserless operations.

4. Preparations will be put in place to move the rig off location should any significant flows be encountered which could effect the drilling unit and onsite personnel.

5. All watertight doors and vent hatches not in use will be closed.

6. Monitoring of pump pressure indications will be done to check for a sudden change that could indicate the well is flowing.

7. Non-ported drill pipe floats will be used while drilling riserless.

The surface hole will be drilled with a minimum mud weight to provide sufficient overbalance, yet minimize the chances of bit balling and hole swabbing. Standard Esso tripping practices will be employed to keep the hole full and prevent swabbing. A ported drill pipe float will be used in the drillstring once the BOP stack is run.

A riserless drilling procedure will be prepared and used on the rig.

3.3 Abnormal Pressure

Based on the Geologic Prognosis and offset well data, all geologic horizons are expected to be normally pressured. Abnormal pressure in this portion of Bass Strait is known to come in below the massive P. Mawsonii marine shale at 4000m± SS; much deeper than the top of Latrobe Group development target proposed for the Blackback A-1, A-2, A-3 and A-2A wells.

Although abnormal pressure is not expected, all abnormal pressure parameters will be monitored from surface casing to TD. A full service mud-logging unit will monitor and plot parameters.

Notes: 1) A trip book is to be maintained for all trips in and out of the well with the drilling riser in place.
2) On trips in the hole, fill the drill pipe and break circulation every 25 stands.

3.4 Hydrogen Sulfide/Carbon Dioxide

Hydrogen Sulfide (H_2S) concentrations up to 400 ppm have been observed in the Terakihi well test samples, but have not been detected in any of the other wells drilled on the Blackback structure. Thus, it is possible H_2S could be encountered in the A-1 well, which is being drilled near the Terakihi-1 well. Continuous monitoring of H_2S will be done from the 20" casing shoe to TD with mudlogging and installed H_2S detection equipment. Mud engineers will run a Garrett Gas Train, every 12 hours after entering the Latrobe, to monitor for H_2S, CO_2 and soluble sulfides. The well completion includes use of CRA materials to manage production in the associated sour and corrosive environment, in accordance with NACE MR-0175.

Carbon Dioxide (CO_2) may be present in small quantities (0.26-0.35%) based on the offset wells where no difficulties were experienced. Although SBM will be used, lime will be maintained onsite to treat out any CO_2 contamination problems.

3.5 Wellbore Stability

Hole instability problems are not anticipated until penetrating the Lakes Entrance formation. The Lakes Entrance is present across the Gippsland Basin and is characterized as a reactive shale, siltstone and claystone section with moderate surface areas (150-250$m^2/g\pm$). It is a highly water and time sensitive section where hole deterioration, mud rings, washouts, tight hole, excessive reaming and hole collapse have been observed frequently when drilling with WBM. These problems are more pronounced in deviated wellbores.

As an alternative to the water-base mud used on the previous offset wells, synthetic base mud (Petrofree) of the ester base family will be utilized for this well. This is based on highly successful results using it on EAL ERD platform wells nearby. It is being used to improve completion operations and eliminate the need for cemented 7" production liners. Petrofree has been successful in stabilizing even highly deviated wellbores across the Lakes Entrance, even with mud weights as low as 9.5-10.0 ppg, where water base mud in the past have sometimes required mud weights in excess of 11.0 ppg. Lower mud weight will be helpful when drilling through the Lakes Entrance and leaving it uncased while drilling the multi-darcy sandstone objectives in the Latrobe.

Hole instability will be managed by a combined chemical, mechanical and operational approach. The drilling fluid of 9.0-10.0 ppg Petrofree will be used to minimize the effects of shale and claystone hydration. Minimum mud weight guidelines will be utilized to maximize ROP and minimize the likelihood of differential sticking. A flow rate of 800-1000± gpm will be run in the 12-1/4" hole to maximize hole cleaning. A PDC bit/motor combination is proposed to assist in drilling this section as fast as prudent, while maintaining directional control, to minimize open-hole exposure time. Wiper trips will be conducted as required to minimize tight hole events based on true hole indications, with precautions taken on all trips to avoid swabbing or BHA sticking tendencies. Mud weight should be increased in stages at the onset of any formation instabilities.

Bridging in the shallow hole sections has been experienced in several Gippsland Basin wells while running casing. Normally, these bridges are encountered a short distance below the mudline (0-25m). Wiping the hole completely to the seafloor and displacing the entire wellbore with hi-vis mud in stages (to minimize the mud level drops while POH) is recommended to help prevent these shallow bridges.

Some minor unstable coal/volcanic sections have been encountered in offset wells. If required, this situation is handled with a combination of mud weight, increased cuttings carrying capacity, reaming and wiper trips. Usually the coal beds are relatively thin, but may require repeated reaming to break up coal chunks. Pyrite stringers are routinely encountered at the top of the Latrobe. PDC bits can be nursed through these stringers by limiting ROP (<80) and reducing WOB.

3.6 Hydrates

The formation of hydrates is a potential problem any deepwater location. Fortunately, none of these wells have experienced hydrate formation problems to date. However, in recent years, instances of hydrate formation in the BOP stack and other subsea equipment have been noted at several other offshore locations. In order to combat hydrate formation, the following steps are planned for this well where a seafloor temperature as low as 7 °C, 44 °F is expected in the subsea BOP area:

Drilling Fluid: The non-aqueous Petrofree SBM (ester base) will suppress hydrate formation to enable gas kick circulation through the subsea BOP. The BOP stack will be circulated daily, down the choke and kill lines, to ensure they remain free. While the well is being drilled in the hydrocarbon objectives, a mud weight of 9.5-10.0 ppg will be maintained. This mud density provides 1.0-1.5 ppg over the maximum anticipated pore pressure.

Guidebase: A solid body Vetco Temporary Guidebase will be run. Gas percolation around the structural casing and conductor is diverted away from the subsea BOP stack because this unit is solid. Additionally, there is a hydrate seal on the BOP connector. No shallow hydrocarbon zones are expected.

Completion: The well completion is designed to prevent hydrate formation with the primary TR-SCSSSV being placed below the hydrate formation regime in the well. Production operations are designed to allow for methanol injection as needed to prevent hydrate formation during start-up and shutdown operations. A methanol slug will be pumped ahead of gas lift gas on initial displacement of the tubing X casing annulus.

3.7 Deepwater

The following steps have been taken to ensure this well can be drilled and completed considering challenges relevant to deepwater operations. Planned actions are given below under each particular challenge:

Wellhead Sinking: A string of 30" Structural Casing will be set at 500m± DF and cemented in 36" hole. The Vetco TGB will be run and provide additional bearing support against wellhead sinking; acting similar to a mud mat. Similar practices have provided acceptable results on offset wells with no wellhead sinking noted. No shallow water or gas flows have been experienced behind any shallow casing strings.

Shallow Hole Drilling: The well will be drilled riserless down to the 20" casing point, taking seawater gel sweeps and cuttings to the seafloor. This is the safest way to deal with any well control problems in deepwater, shallow hole sections (from a BOP equipment standpoint), which are not expected in this well nor found commonly in Bass Strait drilling. Basin-wide offset well experience does not indicate a need for pilot hole drilling.

Mooring: A computerized mooring analysis has been done, using Bass Strait marine conditions considered, on the proposed mooring system with 3" ORQ chain. Operating limits are not expected to exceed 50% of the mooring line breaking strength limit. The maximum anchor holding force expected is well within the predicted holding force of the 12 MT Stevpris anchors, hence piggybacking of anchors will likely not be required. A detailed mooring plan will be provided at a later date.

Riser Tensioning: As with mooring, a computerized riser analysis has been conducted to assess riser-tensioning guidelines required for the well. From this work, the tensioning required (400 kips) for riser stability with the proposed maximum mud weight is well within the limits of the rig equipment and provide contingency for the failure of one tensioner. The initial tension to be pulled on the riser will be specified later, with this tensioning not expected to be increased unless the mud weight rises above 10 ppg and/or vessel offset reaches 2% of the water depth or other marine conditions mandate additional tensioning.

Marine Vibrations: As current passes across a riser column, vortex shedding can cause the riser to vibrate. The effects of this are more pronounced at deepwater locations and especially in high current environments. The wellplan provides for dealing with these vibrations in several manners. With the proposed 30" and 20" casing program, wellhead area rigidity is provided equivalent to that used at most deepwater sites worldwide. The first 30" casing joint will have 1.5" wall, a deepwater standard, and the 20" casing provided with 0.625" wall as well. This arrangement will assist in providing resistance to fatigue in the wellhead area. Also, the 30" and 18-3/4" wellhead assemblies will lock down together when the 20" casing is landed and this string is cemented to the mudline, providing additional resistance against vibration effects, as both the 30" and 20" casing strings will be cemented to the mudline. The completion riser is being evaluated in this area, including the effects of the near mudline cascade currents.

Well Control: Based on fracture gradient predictions for this site and offset wells, the 13-3/8" casing will be set so that its casing shoe will have formation integrity of at least 13.0-14.0± ppg. This is adequate for circulating out a gas kick relevant for Bass Strait area formations. Sufficient mud weight will be carried based on the geologic section to be drilled to prevent a gas kick considering historical pore pressures. The BOP stack will be function/pressure tested at the surface before it is run to the seafloor. The PIT limit above is adequate for cementing the surface pipe. The BOP will be circulated as pertinent before opening it to mitigate the effects of a riser kick and it will also have a means in place for ROV hot stab intervention to perform some stack functions subsea.

ROV: An ROV will be available on the rig to inspect the BOP stack and riser on a routine basis. The ROV will also perform other deepwater-related functions, as well as site clearance work and observing the well at the seafloor while drilling without the riser. During routine riser and BOP inspections, the ROV will survey the BOP package for indications of hydrate accumulations.

3.8 Lost Returns

No lost returns problems were experienced on the previous Blackback wells. The Gippsland Limestone has historically yielded higher fracture pressures than typical marine claystone formations. Based on these factors, no lost returns are anticipated in a conventional sense.

Some minor lost returns events have been experienced due to using the higher viscosity Petrofree muds. These losses have not been catastrophic in nature and dealt with in routine manners such as circulating to build filter cake, cutting the mud weight and spotting of LCM pills in some instances and adding of calcium carbonate to the mud system. Staging in the hole on trips will be utilized as necessary to break circulation in the Petrofree mud system which will typically develop higher gel strengths in lower temperature sections of the well after prolonged static conditions.

Minimum mud weight overbalances will be utilized when possible and with rheological properties and circulating rates monitored at all times to avoid losses. Mud properties will be run to promote filter cake formation with reasonable fluid loss levels run. LCM will be kept on location for spotting of any pills required in unusual circumstances, with the LCM to be onsite selected later during loadout planning work.

3.9 Drawdown Formations

The proposed Latrobe Group reservoir section is held in communication with other Bass Strait producing areas in the Latrobe Group aquifer. Hence the reservoir objective sands in this well may be drawndown, to as low as 7.9-8.4 ppg equivalent mud weight, as noted in other exploration wells in the area. Use of the Petrofree mud system in this multi-darcy interval should minimize differential sticking tendencies.

Drilling into the Top of the Latrobe Group should proceed cautiously when initially penetrating it to evaluate the risk of sticking through the monitoring of torque and drag parameters. Adequate BHA stabilization should be run at all times in this section and minimum BHAs used. The Petrofree mud allows for the addition of calcium carbonate to act as a plugging agent as needed across the Latrobe sands.

3.10 Environmental Considerations

A detailed summary of the environmental conditions for the Blackback area is summarized in the Blackback Phase I Design Basis Memorandum and supporting documentation. A brief summary is given below:

1.	Maximum Significant Wave Height	10.1m
2.	99.9% Environment Wave Height	6.6m
3.	50.0% Environment Wave Height	1.7m
4.	Design Wind Speed Maximum	53.9 knots
5.	Typical Wind Direction	210-270° True
6.	Peak Wave Period	15.2 seconds
7.	Typical Wave Direction	210-270° True
8.	Maximum Operational Current	2.3 knots
9.	99.9% Environment Current	2.1 knots
10.	50.0% Environment Current	0.4 knots
11.	Design Minimum Water Temperature	7 °C/44 °F

Storms are typically from the southeast, south and southwest directions, with a maximum tidal surge for the area being 1.4m.

3.11 Other Drilling Experiences

1. Some gumbo has been experienced on several area wells while drilling in the Lakes Entrance horizons, which have resulted in gumbo attacks. Use of Petrofree mud should mitigate much of the problem. If gumbo problems persist, continue pumping until returns are free of gumbo slugs regardless of mud losses over the shakers.

2. A mud shearing system may be rigged up to assist mixing of mud chemicals to minimize chemical usage. Homogenizers have generally been proven ineffective in the region.

3.12 Drilling and Well Completion Risk Assessment Summary

In October 1998, a Blackback Phase I Drilling and Well Completion Risk Assessment was conducted and considered operations on the Blackback A-1 as well. The primary goal of this risk assessment is to communicate the significant risk events involved with the entire operation to all members of the Blackback Subsea Drilling and Well Completions Team. Also, the safeguards that are needed (preventative and mitigating measures) to reduce the operational risk of the scenarios are identified.

The results of the risk assessment, including a list of follow-up items, will be approved and distributed to all members of the team. Personnel associated with, and responsible for, the drilling and completion operations are to review the risk assessment, as well as the Generic Floater Risk Assessment, and be aware of the hazard scenarios and the safeguards to be put in place to reduce operational risks. It will be the responsibility of the members of the team to ensure that the identified preventative and mitigating measures for each hazard scenario are in place and incorporated into drilling and completion operations. All of the identified follow-up items are to be completed prior to assignment of the rig to Esso, or as soon as possible thereafter.

Note: This well is be drilled referencing the Esso Floating Drilling Operations Manual and Supplement, the EAL Platform Drilling Operations Manual (as applicable) and any Supplemental Programs issued.

BLACKBACK A-1 OFFSET WELL STICK CHARTS

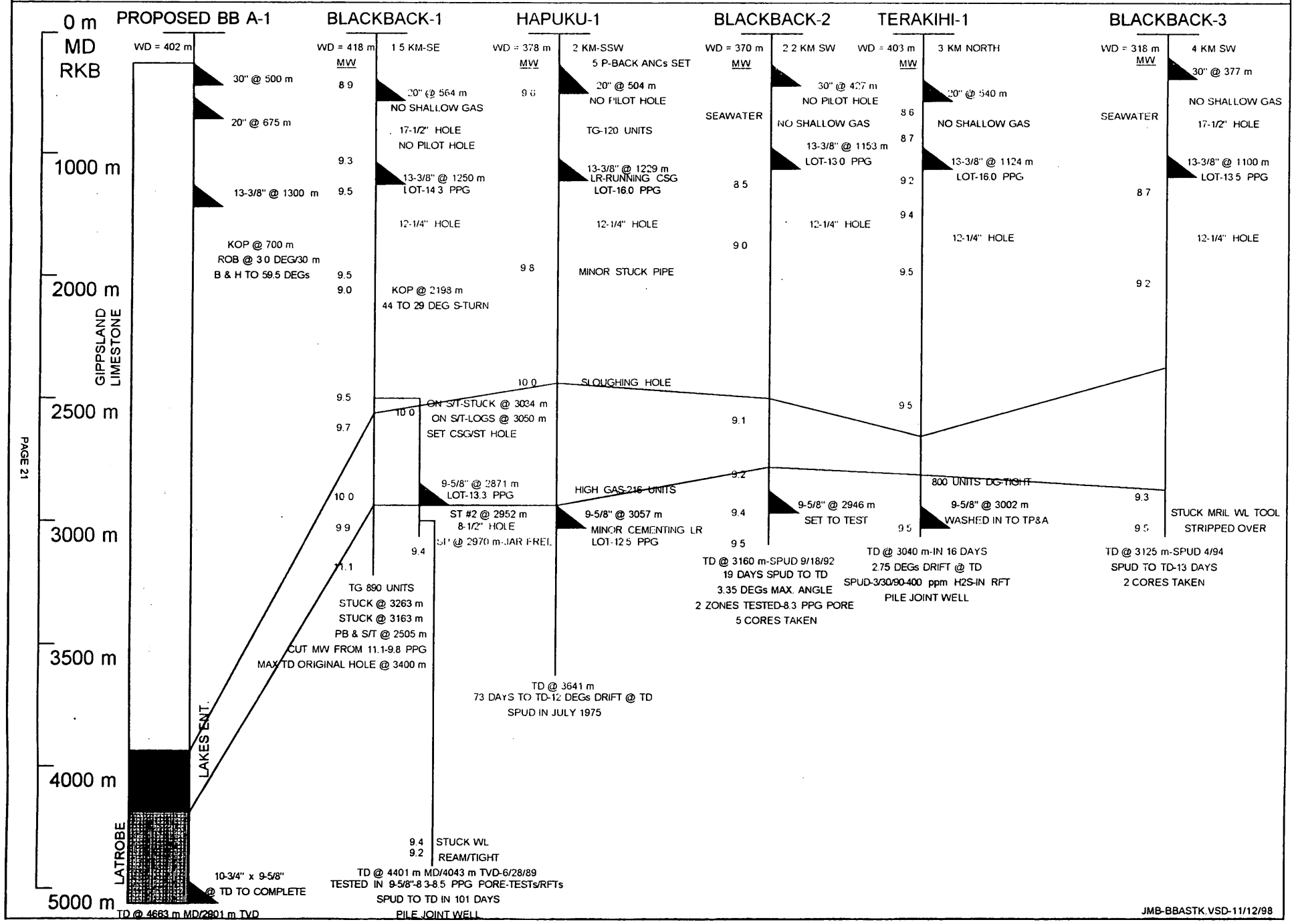

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FIGURE 4

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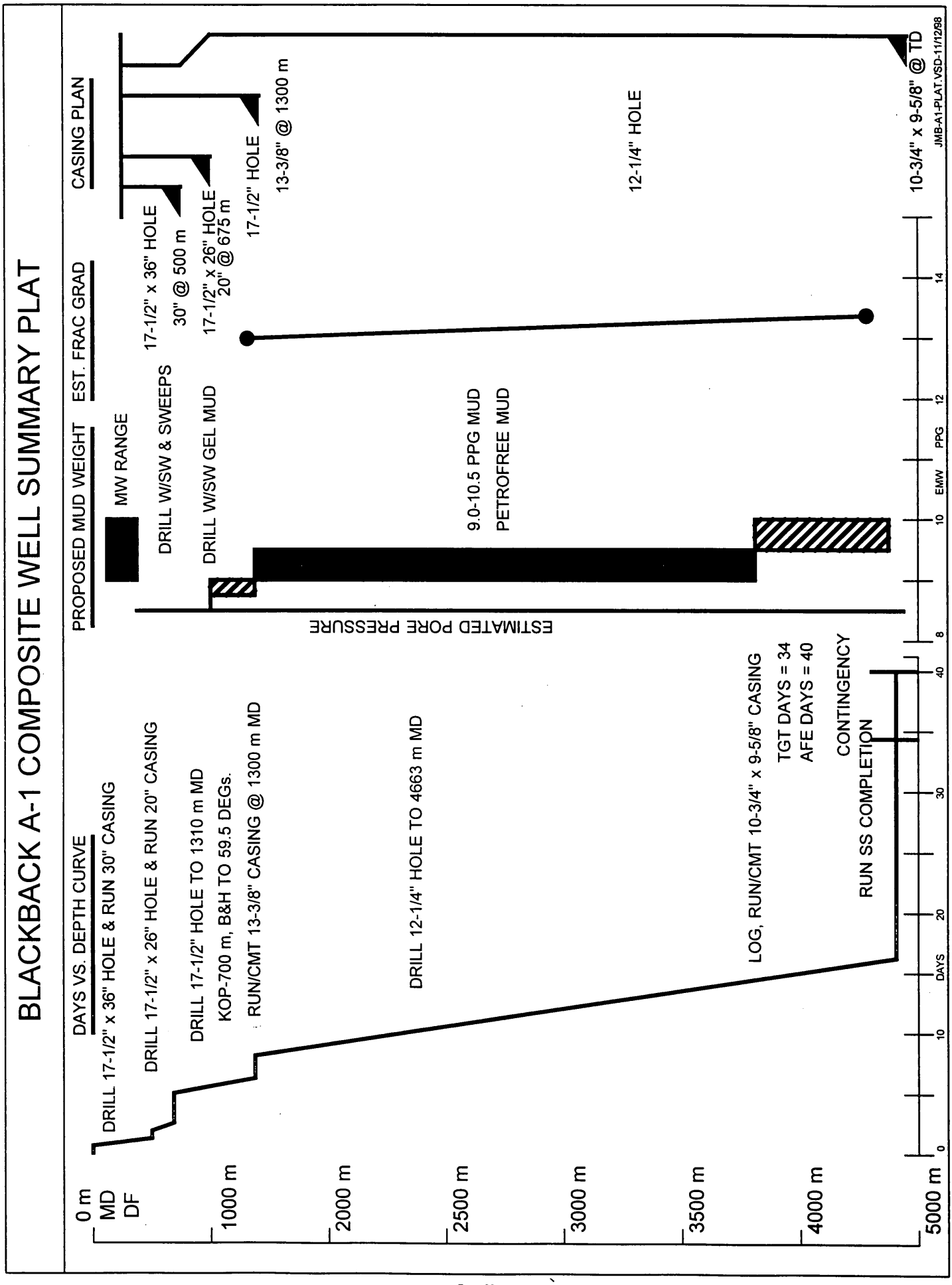
FIGURE 5


BLACKBACK A-1 COMPOSITE WELL SUMMARY PLAT
DAYS VS. DEPTH CURVE
DRILL 17-1/2" x 36" HOLE & RUN 30" CASING
DRILL 17-1/2" x 26" HOLE & RUN 20" CASING
DRILL 17-1/2" HOLE TO 1310 m MD
KOP-700 m, B&H TO 59.5 DEGs.
RUN/CMT 13-3/8" CASING @ 1300 m MD
DRILL 12-1/4" HOLE TO 4663 m MD
LOG, RUN/CMT 10-3/4" x 9-5/8" CASING
TGT DAYS = 34
AFE DAYS = 40
CONTINGENCY
RUN SS COMPLETION
PROPOSED MUD WEIGHT
EST. FRAC GRAD
MW RANGE
DRILL W/SW & SWEEPS
DRILL W/SW GEL MUD
9.0-10.5 PPG MUD
PETROFREE MUD
ESTIMATED PORE PRESSURE
CASING PLAN
17-1/2" x 36" HOLE
30" @ 500 m
17-1/2" x 26" HOLE
20" @ 675 m
17-1/2" HOLE
13-3/8" @ 1300 m
12-1/4" HOLE
10-3/4" x 9-5/8" @ TD
0 m
MD
DF
1000 m
2000 m
2500 m
3000 m
3500 m
4000 m
5000 m
DAYS
EMW
PPG
JMB-A1-PLAT.VSD-11/12/98

4.0 Well Design & Engineering

4.1 Directional Survey Program

The Blackback A-1 well is to be drilled as a 59.5° Build & Hold directional well with the following survey intervals:

Hole Size-Inches	Depth-m MD DF	Survey Interval-m	Survey Instrument
17-1/2" x 36"	428-505m	At TD-505m	Magnetic single shot
17-1/2" x 26"	505-680m	At 30m Intervals @ TD	Electronic multishot dropped at TD on TOH
17-1/2"	680-1310m	At 30m Intervals	Anadrill MWD
12-1/4"	1310m -4663m-TD	At 30m Intervals	Anadrill MWD

The target is defined by a 50m radius circle centered at 3053m North and 221m West (X = 635,125m E, Y = 5,735,935m N) of the proposed surface location and at 2835m TVD DF. This is on a 356° azimuth heading from the proposed surface location.

MWD surveys will be taken continuously while drilling. Stationary surveys will be taken every 30m once the hold angle has been established. All MWD surveys in the Latrobe are to be taken while drilling. Consideration will be given to laying down the non-magnetic components if practical for drilling in the objectives and possibly the mud motor. A program for four point roll tests should be established with at least one check depth set in the well.

The above survey program is preliminary subject to the establishment of the first three wells in the batch setting program. Once the three wells have been established, A-1/A-2A through 20" casing and A-3 through 13-3/8" casing, wellbore collision avoidance can be assessed, spider plots drawn and the final wellbore surveying needs assessed. This could include use of some gyro single shot surveys to kick-off depending on the likelihood of magnetic interference and wellbore intersection. No jetting is anticipated at this time. The A-1 well will be the first well drilled entirely to TD and must avoid the casings set in the A-3 and A-2/A-2A wells when kicking off in 17-1/2" hole.

4.2 Casing Program

Size	Depth-m MD DF	Nominal ID	Drift ID	Weight ppf	Grade	Conn.	Burst Rating psi w/DF	Collapse Rating psi w/DF	Tension Rating Pipe-kips w/DF	Tension Rating Con.-kips w/DF	Max. Calc'd Burst psi	Max. Calc'd Collap. psi	Max. Calc'd Tension kips	Burst Design DF	Coll. Design DF	Tension Design DF PB/Conn.
30"	426-438	26.970"	26.500"	457	X-52	RL-4-HT +	3479	3904	5251	4160	N/A	N/A	70	1.375	1.0	1.33/1.50
	438-500	27.500"	26.500"	310	X-52	RL-4	2319	1631	3562	3066	N/A	N/A	54	1.375	1.0	1.33/1.50
20"	425-675	18.630"	18.442"	129.3	X-56	RL-4S	2341	1449	1602	1200	951	978	92	1.375	1.0	1.33/1.50
13-3/8"	425-1300	12.415"	12.259"	68	K-55	BTC	2509	1950	803	866	2445	1877	197	1.375	1.0	1.33/1.50
10-3/4" x	425-1140	9.760"	9.604"	55.5	L-80	VAM TOP	5160	3573	959	850	3348	1893	629	1.25	1.125	1.33/1.50
9-5/8"	1140-3600	8.681"	8.525"	47.0	N-80	LTC	5496	4231	816	603	3348	4111	423	1.25	1.125	1.33/1.50
	3600-4650	8.535"	8.500"	53.5	N-80	LTC	6340	5884	935	709	3348	4879	129	1.25	1.125	1.33/1.50
4-1/2"	425-4420	3.958"	3.833"	12.6	S13 Cr-80	Vam-Ace	6744	6667	216	216	3348	4830	183	1.25	1.125	1.33/1.33

Notes:

1. Alternative weights, grades and connections may be substituted as long as they meet the design constraints. Make-up torques will be provided in any supplement procedures issued.
2. All casings to be run using Best-O-Life 2000 Thread Compound, except for the 10-3/4" which requires a metallic base API Modified thread compound such as Threadkote 706 to seal.
3. All calculated design loads are below the burst, collapse and tension ratings for the above tubulars, including derating for the safety factors shown. Verify running string loads before use.
4. The 13-3/8" casing burst design is based on a full column of gas in 12-1/4" hole assuming a 15.0 ppg leak-off at the 13-3/8" shoe. Special drift the 9-5/8" 53.5 ppf casing to 8.5".
5. Casing test pressures are 20" (1000 psi), 13-3/8" (2500 psi) and 10-3/4" x 9-5/8" (5000 psi). The 13-3/8" shoe is good for a 1.0 ppg, 50 bbl kick from TD w/9.5 ppg mud at the time.
6. PIT tests to be taken to leak-off on the 20" and 13-3/8" casing shoes. Expected leak-offs are 20" (12.0-13.0 ppg) and 13-3/8" (13.0-15.0 ppg).
7. Premium connections to be made up using the manufacturer's guidelines and approved thread compound.
8. Ensure all O-rings are run in the pertinent Vetco connectors and all shear tabs are installed in their threaded connections.
9. The 30" casing is to be run to stick-up 2.37m above the mudline and 18-3/4" wellhead to be 3.16m above the mudline when landed.
10. The 13-3/8" and 10-3/4" hangers will be locked in place when run in the MS-700 wellhead system with its weight set feature.
11. Run 30" casing top to bottom as 30" WH Jt. (w/RL-4HT), 2 x 30" 1" Wall Jts. (w/RL-4HT), 30" 1" Wall RL4-HT x RL-4 XO, 30" 1" Wall Jt RL-4 and 30" 1" Wall x Shoe Jt RL-4.

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4.3 Wellhead Program

A Vetco 18-3/4" MS-700 10,000 psi Wellhead System will be utilized for this well, with the highlights of the system as follows. The wellhead system is rated for H_2S service in accordance with NACE MR-0175.

1. A conventional Vetco Temporary Guidebase (TGB) will be utilized and will be the first assembly run when commencing well operations. This TGB will be fitted with two acoustic transponders welded onto it to track its position from the rig while running it to the seafloor to ensure it is placed within the 2.5m radius seafloor placement target for the wellhead assembly. Well cuttings and cement from the 30" hole section and casing job will be allowed to accumulate over the TGB, and will be dispersed by seafloor currents. The rig guidelines will be attached to this assembly when it is run to the seafloor. A bullseye will be run on the TGB.

2. The 30" casing will be fitted with a low-pressure 30" MS-700 Wellhead Assembly with 4 locator grooves for the Completion Guidebase (CGB) to be fitted over. Below the top of this wellhead, a gimble is fitted and clamped around the wellhead assembly to land on the TGB at the proper elevation. The top of the 30" wellhead assembly is to be placed 2.37m above the mudline for proper tie into the production facilities. Measurement of the angle on the 30" casing and orientation of the locator grooves for final CGB positioning is accomplished by a) a slope indicator and b) an ROV orientation tool utilizing a gyro.

3. An 18-3/4" 10,000 psi MS-700 High Pressure Wellhead will be run on top of the 20" casing and installed with its nominal seat protector (long wear bushing) in place. It will have an H-4 connector on its top profile. One trip weight set hanger and pack-off assemblies will be used inside this wellhead. This is a conventional wellhead assembly with no special modifications made to it for this project. When the 20" casing is cemented, the cement returns will be directed out 2 x 3" cementing ports in the 30" wellhead housing assembly and out over the TGB to be dispersed by seafloor currents.

4. The Completion Guidebase (CGB) will be run and landed at the seafloor after the 20" casing is run and cemented with the 18-3/4" wellhead in place. It is fitted with 4 removable posts that will stay in place for the life of the well, but can be removed if damaged. The SS BOP and Completion Tree will be fitted over this base during the course of the well. The post tops are fitted to accomodate Regan GL-4 guideline overshots. The CGB has orienting fins which will line up with the grooves on the 30" housing assembly to line up properly when installed and pull tested. Before the CGB has been installed on the well, the TGB guidelines will be cut using the ROV. The CGB will be run with the 3/4" rig guidelines reinstalled. Its frame allows for running and orientation of the completion tree and other production equipment.

5. The 13-3/8" Casing Hanger and Pack-Off run on this well will be a conventional MS-700 unit. The 10-3/4" Casing Hanger and Pack-Off utilized will have Inconel 925 inlay in its upper body section and inner top section where it will seal with the tubing hanger.

6. The tubing hanger will be dual bore 4" (production) x 2" (annulus-gas lift) with four-1/4" ports for the SCSSSVs, production and annulus bores and a fifth port for the electrical downhole gauges.

7. The subsea tree will be a dual bore 5" (production) x 2" (gas lift) 5000-psi tree, rated for H_2S service.

4.4 Drilling Fluids Program

A. Water Base Mud Systems

Hole	Depths-m MD	System	MW PPG	PV Cp	YP Lb/100 ft2	Gels 10s/10m	API WL cc/30 min	pH	%LGS	Total Solids-%
17-1/2" x 36"	428-505	Seawater/Sweeps	8.5+	N/C	N/C	N/C	N/C	N/C	N/C	N/C
17-1/2" x 26"	505-680	Seawater/Sweeps	8.5+	N/C	N/C	N/C	N/C	N/C	N/C	N/C
17-1/2"	680-1310	Seawater/Gel	8.7-9.0	4-6	8-20	<6/<15	N/C	8.5-9.0	<8	<11%

B. Petrofree Ester Base Mud

Hole	Depths-m MD	System	MW PPG	PV Cp	6 RPM Reading	HTHP @ 250° F (ml/30m)	Electrical Stability (volts)	Excess Lime (ppb)	Chlorides mg/l	LG Solids-%
12-1/4"	1310-3700	Petrofree	9.0-9.5	<30	9-12	<6	>500	0.5-1.0	200,000	<6%
	3700-4663	80/20 Ester WR	9.5-10.5	<35	9-12	<6	>500	0.5-1.0	200,000	<6%

Notes:

1. Run HTHP on the Petrofree mud at 120° C, 500 psi. Run GGT every 12 hours on mud checks below 3000 m for H_2S, CO_2 and soluble sulfides. Additional mud weight may be required to combat formation instabilities, especially in the Lakes Entrance formation. Run the finest mesh screens practical on the shakers at all times and run the centrifuges at all times for fine solids discharging. Weight up only as required.

2. All mud checks must conform to the latest edition of API RP 13B-1 and "Exxon Water & Ester Base Mud Testing Guidelines". Report "in" and "out" mud properties, corrected for lag time. Run PV, YP and 10 sec/10 minute gel strengths at 120° F. Report all mud losses, discharges and the amount of water/ester additions. Measure and report chlorides and calcium content of the make-up waters.

3. Measure alkalinities/pH w/a pH meter and keep calibration references onsite for all mud testing equipment. Run Aw <0.75 with Ester.

4. Use the following base mud formulations:

SW/Gel Mud
Bentonite (5-20 ppb)
Lime (1/2-1 ppb)
Caustic Soda (0-1 ppb)
(Run Flocculated)

Petrofree Ester Mud (Per bbl)

Petrofree Ester (0.74 bbl)	Fresh Water (0.17 bbl)
EZ-MUL NTE (8 ppb)	RM-63 (1.0 ppb)
DURATONE (8 ppb)	OMC-42 (0.5 ppb)
GELTONE II (2 ppb)	CaCl2-78% (37 ppb)
Lime (1.25 ppb)	Barite (As Required)

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4.5 Bit and Hydraulics Program

Hole Size	Interval-m MD	Bit Type	IADC Code	Nozzles (32nds)	WOB Kips	RPM	GPM	Pump Pressure-psi	DP AV fpm
17-1/2" x 36"	428-505	SS33SGJ4 Center Jet	1-1-5	3 x 20, 16C HO-Open	0-5	50-150	250-800	800-1100	19
17-1/2" x 26"	505-680	SS33SGJ4 Center Jet	1-1-5	3 x 20, 16C HO-Open	0-20	50-150	800-1200	1500-2000	45
17-1/2"	680-1310	SS33SGJ4 Center Jet	1-1-5	3 x 20, 16C	0-20	80-160	1000-1200	3600	87
12-1/4"	1310-4270	FS2563 PDC	M 3-2-3	7 X 19 "	0-45	80-300	750-1000	3600	146
	4270-4663	(Security) "	"		"	"	800-900	4200	154

Notes:

1. Mud pumps are 3 x Oilwell A-1700 PT and 6-1/2" liners are assumed installed for use to 3200 psi through 17-1/2" hole, then with 6" liners used in 12-1/4" hole capable of being run at 3600 psi. Liners of 5-1/2" may be needed, near TD, to achieve 4200 psi.

2. Bits types and parameters are from offset reviews and intended to serve as a guide. Run low WOB to spud and start the well straight.

3. For all wells, use one 17-1/2" bit with the 36" HO, one 17-1/2" bit with the 26" HO and one new bit on each of the three 17-1/2" hole sections.

4. Resize nozzles based on onsite conditions and pump performance, including on bottom loadings.

5. Optimize bit weight and rotary speed as prudent using drill-off tests and rerun them as needed.

6. Deeper in the 12-1/4" hole, consideration should be given to laying out some HWDP, Motor, etc. components to improve hydraulics and depending on the directional and hole cleaning performance in the actual well.

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4.6 Cementing Program

Hole	Casing	Depth-m MD	Slurry Type	Slurry Volume	O. Hole Excess	Slurry Wt-ppg	Yield cf/sx	Mix Water	BHST °F	Additives	Comments
36"	30"	428-500	Tail	1130 sx (232 bbls)	150%	15.8	1.15	Seawater 5.0 gps	45	2% CaCl2	Through Inner 5" DP Cementing String with returns to the mudline. 10' in Shoe.
26"	20"	428-675	Lead	340 sx (135 Bbls)	100%	12.5	2.21	Seawater 12.5 gps	60	0.45 gps Econolite	Through Inner 5" DP Cementing Stinger with returns to the mudline. 20' in Shoe. Use 152m Tail.
			Tail	1340 sx (275 Bbls)	100%	15.8	1.15	Seawater 5.0 gps	60	1% CaCl2	
17-1/2"	13-3/8"	970-1310	Tail	960 sx (195 bbls)	None	15.8	1.15	Seawater 5.0 gps	105	Neat	450m Column Plus Float Area Volume. Use Top Wiper Plug 16-Cent/12 S. Collars
12-1/4"	10-3/4" x 9-5/8"	3600-4650	Lead	340 sx (128 bbls)	None	12.5	2.10	Fresh 12.2 gps	194	Retarder Extender	Dual Wiper Plugs Centralizer & Stop Collar Program to be Provided Later with Final Cement Blend. Use 500m Tail to Cover Latrobe Sands.
			Tail	480 sx (98 bbls)	None	15.8	1.15	Fresh 5.0 gps	194	Fluid Loss Retarder Dispersant	

Notes:

1. SSR, PDC Drillable Float Equipment and Wiper Plug and Dart to be used for the 13-3/8" casing job (non-rotating type).
2. All cement designs noted here are preliminary and may be revised based on actual well conditions encountered, field blend testing and actual cementing depths. Ensure all applicable pilot/field blend tests are run for all cementing jobs.
3. All cement volumes to be recalculated prior to each job, using any caliper logs available and well actual static/circulating temperature data.
4. A detailed casing and cementing program will be issued for each casing job.

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4.7 Bottom Hole Assembly Program

A. Spud Through Build Angle Section

17-1/2" x 36" Hole	17-1/2" x 26" Hole	17-1/2" Hole-Kick-Off BHA
17-1/2" Tri-Cone Bit 36" Hole Opener Float Sub (FS) w/Non-Ported Float 1-36" Welded Stabilizer 1-8" Non-Magnetic Drill Collar 5-8" Steel Drill Collars 12-5" HWDP 5" 19.5 ppf S-135 DP	17-1/2" Tri-Cone Bit 26" Hole Opener Float Sub (FS) w/Non-Ported Float 1-8" Non-Magnetic Drill Collar 1-8" Steel Drill Collar 1-26" Welded Blade Stabilizer 8-8" Steel Drill Collars 8" Jars-Hydraulic 12-5" HWDP 5" 19.5 ppf S-135 DP	17-1/2" Tri-Cone Bit 9-5/8"-A962XP Motor-1.15°-17-1/4" UBHS Float Sub (FS) w/Non-Ported Float 8" Non-Magnetic Pony Drill Collar 8" Power Pulse MWD Section 16" Non-Magnetic String Stabilizer 1-8" Non-Magnetic Drill Collar 3-8" Steel Drill Collars 8" Jars-Hydraulic 30-5" HWDP 5" 19.5 ppf S-135 DP
XOs not shown-Run Totco Ring Above Stab	XOs not shown-Run Totco Ring Above FS	XOs not shown-Run Orient. Sub above Stab

Overpull Designs

17-1/2" x 36" Hole	17-1/2" x 26" Hole	17-1/2" Hole-Kick-Off BHA
Mud Weight-8.5 ppg Total Bouyed Weight BHA/HWDP-40 kips Total Bouyed Weight Drillpipe-21 kips Total Bouyed Weight Drillstring-61 kips 5" 19.5 ppf S DP Tensile Yield-560 kips **Total Remaining Overpull-499 kips**	Mud Weight-8.5 ppg Total Bouyed Weight BHA/HWDP-60 kips Total Bouyed Weight Drillpipe-30 kips Total Bouyed Drillstring Weight-90 kips 5" 19.5# S-135 DP Tensile Yield-560 kips **Total Remaining Overpull-470 kips**	Mud Weight-9.0 ppg Total Bouyed Weight BHA/HWDP-57 kips Total Bouyed Weight Drillpipe-90 kips Total Bouyed Drillstring Weight-147 kips 5" 19.5# S-135 DP Tensile Yield-560 kips **Total Remaining Overpull-413 kips**

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B. Production Hole Hold Angle Section

Hole Size	Depths m MD	BHA Description	Comments
12-1/4"	1310-3083	12-1/4" PDC Bit/9-5/8" A962XP Motor-0.78° w/12-1/8" UBHS/Float Sub/ 11-3/4" String Stab/8" Pony NMDC/8" Power Pulse MWD/8" NMDC/8" Jars/ 21-5" HWDP/5" 19.5 ppf S-135 DP to Surface (Run Orienting Sub Above MWD)	To Hold Angle @ 59.5°. Can Run HWDP/DP in Compression. **Ten. Margin-198 kips Tor. Margin-2k ft-lbs**

Notes:

1. Premium Class DP is to be used. Run Spiral DCs for all BHAs. HWDP/DP/Jars can be run in compression in 12-1/4" hole.

2. Ensure the supplier sets the hydraulic jars for compressive service in advance. Use trip book for all trips. Have Sperry AGS onsite if LWD is to be run.

4.8 Drill Collar Properties

Tube OD	Tube ID	Wt.-ppf	Wt-31 ft.	Conn. OD	Type	BSR	M/U Torque-ft/lbs	DC1 OD	DC2 OD	Stiffness Ratio
8"	2-13/16"	150.0	4650	8.00"	6-5/8" Regular	2.60	53,000	8"	5" HW	4.63

Notes:

1. Exxon Recommended BSR Design: $2.25 \leq BSR \leq 2.75$. API RP-7G Acceptable BSR Range: $1.90 \leq BSR \leq 3.20$.

2. Torque Values for Non-Magnetic DCs should be 85-90% of values. Exxon Recommended Stiffness Ratio: $SR \leq 5.5$.

3. M/U Torque for 7-5/8" Reg. Bits is 34,000-40,000 ft-lbs. M/U for 6-5/8" Reg. Bits is 28,000-32,000 ft-lbs.

4. M/U Torque for 5" HWDP is 29,500 ft-lbs. Stabilizers to be of the open wrap design (270° Wrap). Excess DP M/U Torque may be req'd.

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4.9 Well Control Equipment and Testing

Casing	Section	Top Flange	Casing Burst (psi)	MASP (psi)	Subsea BOP Stack Installed	BOP Size & Rating	Annular Test* (k psi)	Pipe Ram Test* (k psi)	Blind Ram Test* (k psi)	Choke & Kill Lines/Valves Test (k psi)	Choke Manifold Test (k psi)
30"	Riserless	30" WH	2319	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20"	17-1/2"	18-3/4" 10k psi	2341	951	2-Annular 4-Rams	18-3/4"-5k 18-3/4"-10k	2.5/1.0	2.5/1.0	2.3/1.0	3.5/1.0	3.5/1.0
13-3/8"	12-1/4"	"	2509	2445	"	"	2.5/2.5	2.5/2.5	2.5/2.5	2.5/2.5	2.5/2.5
10-3/4" x 9-5/8"	Complete Well	"	5160	3348	"	"	3.5/3.5	5.0/5.0	5.0/5.0	5.0/5.0	5.0/5.0

Notes:

* **Upon initial installation on the subsea wellhead, the annular and pipe rams shall be tested to the maximum test pressure that component will be subjected to during drilling operations. Initial annular test pressure is 3,500 psi. Initial pipe ram test pressure is 5,000 psi.**

1. Pressures shown above are Initial Nipple-Up/Subsequent Test. Precede all high-pressure tests with a 200-psi low-pressure test.
2. The BOP Stack Ram Arrangement is to be Top-Blind/Shear, UPR-3-1/2" to 7-5/8" VBR, MPR-5" Pipe, LPR-5" Pipe.
3. Pressure test frequency: 1) At nipple-up, 2) Every 14 days, 3) Each new tubular string run.
4. All tests must be held stabilized for a minimum of 10 minutes. Test choke manifold out of the critical path.
5. Test blind rams against the casing in the well during the casing test.
6. After installation of the riser, pump through the diverter system and test it for leaks.
7. Stump test BOP stack to its full rated working pressures with water before running it, if possible.
8. Pressure testing of the BOP stack to be alternated between subsea control pods and function the stack on the other pod.

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5.0 Drilling Operations Sequence

Note: Supplemental procedures will be issued for each phase of the operation.

5.1 Move-On and Rig-Up

1. Position the rig by readjusting the moorings from the Blackback A-2 to the Blackback A-1 well with a bow heading of 210° True and within 5m of the call location. Place the rig as close to the call location as possible and practical using the onsite rig positioning company and rig positioning QC representative. The mooring arrangement and anchor line operating tensions to be as established with the detailed mooring procedure issued for the Blackback Phase I Development. P/U the 17-1/2" x 36" Hole BHA specified in the Bottom-Hole Assembly Program and complete as many items out of the critical path as practical, such as pick-up of the DP for TDS use, etc.

2. M/U the Vetco TGB with the acoustic transponder and slope indicator mounted on it and TGB running tool assembly. Run and Set the Vetco TGB at the mudline on 3/4" rig guidelines shackled to it using the Vetco running tool assembly, monitoring its descent to the seafloor on the acoustic receiving equipment from the rig. Land the TGB within 1m± of the call location and confirm it. Once the onsite positioning staff are satisfied with the position of the TGB, release from it and POH with the TGB running tool assembly. Note and report the inclination reading on the TGB from the bullseye on it.

5.2 17-1/2" x 36" Hole/30" Structural Casing (0-505m)

1. M/U 17-1/2" Bit/36" HO BHA and RIH to mudline. Spud well and drill to 505m± (for 2.37m± stick-up) using seawater and gel sweeps, taking returns to the seafloor. Monitor for hole washout, shallow gas and cutting dispersion using the ROV to observe in the wellhead area and to ensure the drillstring spuds as straight as possible. Use very little WOB when drilling the first few meters and mainly RPMs as there is a near mudline hard streak in some Bass Strait areas which causes some wells to drill this hole section deviated. Take a magnetic single shot at TD. Hole angle to be 1-1/2° or less.

2. Sweep hole and perform a wiper trip to the mudline. Do not pull the hole-opener out of the hole. Spot hi-vis mud in the well to run casing while POH in stages. Ensure TGB has not settled and remains at an acceptable angle to run casing. L/D the 36" Hole BHA components when POH. TGB inclination to remain at 3-1/2° or less at all times.

3. Run and cement the 30" casing at 500m with the 30" wellhead top and elevator gimble at 2.37m± above the mudline (gimble landed out on the TGB) and at an inclination of 1.0° or less. The elevator gimble is to be clamped around the 30" before it is run just below the 30" wellhead. The 30" WHRT is to be fitted with an inclination bullseye and ROV orienting post on its tool joint for use subsea. Run a 5" DP stinger below the 30" WHRT inside the 30" casing to 50'± above the 30" shoe. The orienting grooves on the 30" wellhead housing must be oriented relative to the ROV orienting post at the surface before the assembly is run subsea. Use adequate soft lines to run the 30" casing. Land the 30" casing with the 30" WH landed on the TGB. Read the inclination on the bullseye as well as orientation on the ROV post and orienting grooves. Ensure acceptable readings are obtained.

4. Cement the 30" casing by pumping down the 30" running string and through the 5" DP stinger and 30" shoe, leaving 20' of cement inside the casing string and cement in the annulus to the mudline. Displace cement with seawater. Monitor cement returns with ROV. WOC 2± hours, keeping the 30" as straight as possible. Before releasing the 30" WHRT, confirm the final inclination and ROV orientation post readings from the WHRT. Release the assembly and POH with the running string. Verify the final wellhead stick-up and report it on the DDR.

5.3 17-1/2" x 26" Hole/20" Conductor Casing (505-680m)

1. M/U the 17-1/2" bit x 26" Hole Opener BHA and RIH and drill out cement in the 30" casing. Drill ahead to 680m riserless using seawater and sweeps as required for hole cleaning. Observe for shallow gas and cuttings dispersion in the wellhead area with the ROV. Upon reaching 680m, pull a wiper trip to the 30" shoe, RIH and drop an electronic multishot survey tool in the well to survey at 30m stations while POH. Fill the hole with hi-vis mud in stages while POH and recover and download the multishot tool.

2. Run the 20" casing, with the 18-3/4" 10,000 psi Vetco MS-700 Wellhead, to 675m±.. Ensure the nominal seat protector is installed. Latch the 18-3/4" Wellhead into the 30" Wellhead and test pull the latch to 50 kips. Cement to the mudline using an inner string of 5" DP run to 50'± above the 20" shoe. Displace the cement with seawater. Verify 18-3/4" wellhead stick-up, which should be at 3.16m± and report it on the DDR.

3. Cut the 3/4" rig guidelines at the TGB and recover them. Run and latch the Vetco Completion Guidebase (CGB) over the 30" Wellhead Housing with its running tool and using ROV assistance. Pull test the CGB latch up to 20 kips. The rig 3/4" guidelines to be installed and run with the CGB. POH with the CGB running tool assembly.

5.4 17-1/2" Hole/13-3/8" Surface Casing (680-1310m)

1. Move the 15m NNE (330° heading from location) to run LMRP. Reposition rig over well location. Run the 18-3/4", 10,000-psi BOP stack and riser. Function and pressure test the BOP equipment to 200/3500 psi. Test the 20" casing, BOP WH Connector and Shear Rams to 1000 psi. Function test the diverter system. Follow Sedco/EPR riser tensioning guidelines starting with an initial tension as mutually agreeable to Esso and Sedco. Record the weight of the BOP stack, LMRP and entire system with riser, in the water, before the BOP stack is landed on the wellhead.

2. P/U the 17-1/2" Hole Directional Drilling Motor BHA with SS33SGJ4 Tri-Cone Bit as specified in the Bottom Hole Assembly Program and RIH to tag the TOC inside the 20" casing. Pump through the diverter system with seawater. Drill out the 20" shoe while displacing the hole with 8.7-9.0 ppg SW/Gel mud. Drill 3m of new hole and conduct a PIT to a maximum EMW of 14.0 ppg. The expected LOT is 12.0-14.0 ppg. The mudloggers must be rigged up to commence mudlogging operations by the commencement of this hole phase.

3. Directionally drill the well from a 700m MD kick-off point and build angle using the motor BHA at 3.0°/30m from 700m MD to 1295m MD, where a total deviation of 59.5° is to be reached while drilling at an azimuth of 356° degrees True. Make an additional 15m± MD of hole to reach 1310m MD/1196m TVD. Drill this hole section using 8.7-9.0 ppg SW/Gel mud. Take MWD surveys at least every 30m and on the fly as much as possible. Circulate at 800-1200 gpm while drilling ahead. Use the spider plot developed after the A-1 well when 20" casing was set and gyro single shots to kick-off as needed. Stay away from the offset wells A-3 and A-2 noted on the spider plot.

4. At TD, circulate the hole clean with a highside toolface and ensure the hole is stable. Pump a 100-bbl hi-vis sweep and circulate the hole clean. Pull wiper trip to the 20" shoe. Strap out of the hole.

5. Run and cement the 13-3/8" casing at 1300m± MD using a Vetco MS-700 Hanger and Weight set Seal Assembly. Use PDC Drillable float equipment and an SSR top & bottom plug set with ball and dart (to be PDC drillable as well and non-rotating equipment used). Set the seal assembly and pressure test the seal assembly and BOP stack to 200/2500 psi. Test the 13-3/8" casing against the blind rams to 2500 psi. Continue to manage riser tension per Sedco/EPR guidelines.

5.5 12-1/4" Hole/10-3/4" x 9-5/8" Production Casing (1310-4663m)

1. P/U the 12-1/4" Hole Directional Drilling Motor BHA with a PDC Bit as specified in the Bottom Hole Assembly Program. RIH to tag the TOC inside the 13-3/8" casing. Drill out the 13-3/8" shoe while changing over the well to Petrofree Ester Base Mud. Drill 3m of new hole while holding angle and conduct a PIT to a maximum MW of 14.5 ppg maximum.

2. Directionally drill the 12-1/4" hole using the mud motor and MWD/PDC bit assembly to 4663m± MD using Petrofree mud. Hold angle at 59.5° degrees and azimuth at 356° degrees True. Take MWD surveys every 30m on the fly as often as practical. Use the maximum flow rate obtainable without, producing mud losses over the shakers, to keep the hole clean. Plot torque and drag on the rig to assess need for wiper trip(s), which will be done based on hole conditions. Weight up the mud system only as mandated by hole instability problems, but have at least 10.0 ppg mud weight by 3800m MD, above the Lakes Entrance formation, which is predicted at 3980m± MD. Raise MW, up to 10.5 ppg, only if needed for hole stability. Add BARACARB to the mud system only if mud seepage losses occur in the Latrobe. Monitor the position of this well relative to the Terakihi-1 well while drilling ahead.

3. Upon reaching total depth, circulate the hole clean with a highside toolface. Pull a wiper trip to the 13-3/8" shoe. RIH and circulate the hole clean and condition the mud to run casing. Strap out of the hole. Run PEX\AIT\HNGS\DSI logs in open hole.

4. Run and cement the 10-3/4" x 9-5/8" casing at 4650m± MD using a Vetco MS-700 Hanger and Weight set Seal Assembly. Use PDC Drillable float equipment and a dual 10-3/4" x 9-5/8" tapered SSR plug set and dart (to be PDC drillable as well). Set the seal assembly and pressure test the seal assembly and BOP stack to 200/5000 psi. Test the 10-3/4" x 9-5/8" casing against the blind rams to 5000 psi. The Petrofree mud to be recovered by pumping SW mud ahead of the cement. Completion details to follow.

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Schlumberger Anadrill

Esso Australia Ltd

WELL	FIELD	STRUCTURE
Blackback A-1	Blackback Gippsland Offshore	Blackback Sedco 702

Magnetic Parameters	Surface Location	Miscellaneous
Model: BGS 1998	Lat: S 38 32 29.964 Lon: E 148 33 10.301	Slot: Slot 2 Plan# : BB A-1 Rev3
Dip: -69.044° Mag Dec: 13.379°	North: 5732870.00 m East: 635338.00 m	Elev Ref: Rotary Table(26.00m above MSL)
Date: November 11, 1998 FS: 60300.8 nT	Grid Conv: -0.9677° Scale Fact:0.9998	Date Drawn: 12:53:31PM 27-Nov-1998

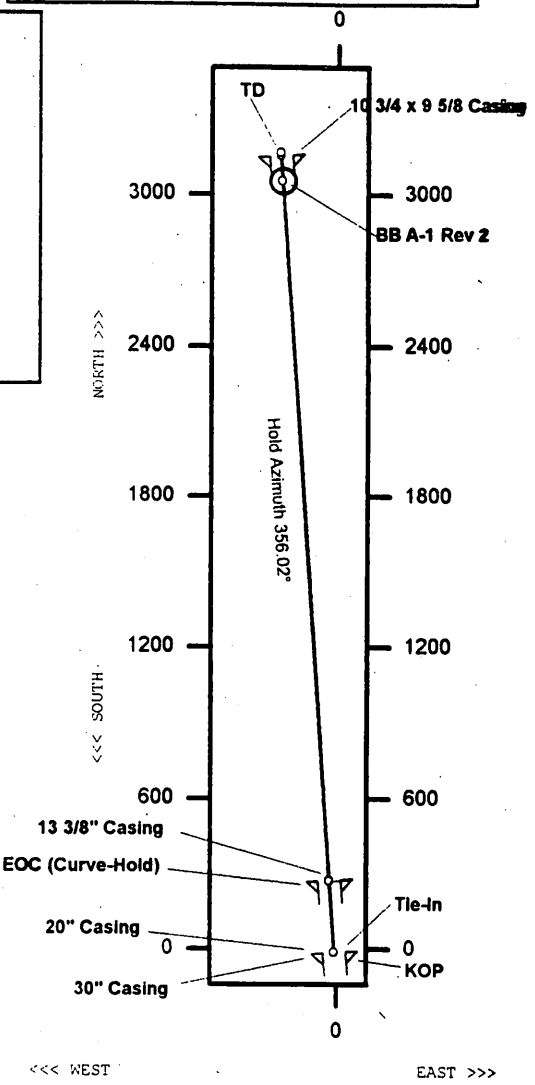
Surface Location: North:5732870.00 m, East:635338.00 m UTM Zone 55S, Meters

Target Name	Grid Coord N(+)/S(-) m	Grid Coord E(+)/W(-) m	TVD m	Local Coord VSEC m	Local Coord N(+)/S(-) m	Local Coord E(+)/W(-) m	Shape	Major Axis
BB A-1 Rev 2	5735935.00	635125.00	2835.00	3072.93	3150.53	- 221.04	Circle	100.0

Critical Points	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
Tie-In	450.00	0.00	356.0	450.00	+0.00	- 13.00	- 8.00	0.00
30" Casing	500.00	0.00	356.0	500.00	+0.00	- 13.00	- 8.00	0.00
20" Casing	675.00	0.00	356.0	675.00	+0.00	- 13.00	- 8.00	0.00
KOP	700.00	0.00	356.0	700.00	+0.00	- 13.00	- 8.00	0.00
EOC (Curve-Hold)	1295.39	59.54	356.0	1193.88	292.50	166.81	- 27.59	3.00
13 3/8" Casing	1300.00	59.54	356.0	1196.21	286.47	272.78	- 27.86	0.00
BB A-1 Rev 2	4532.64	59.54	356.0	2835.00	3072.93	3150.53	- 221.04	0.00
10 3/4 x 9 5/8 Ca	4650.00	59.54	356.0	2894.49	3174.09	3253.45	- 228.05	0.00
TD	4662.83	59.54	356.0	2901.00	3185.15	3264.48	- 228.82	0.00

From(m)	To(m)	Action
450	700	Drill Tangent Hold on inc 0.00° Hold on Az 356.02° From 450 m TVD to 700 m TVD
700	1295	Build 3.00°/30m From inc 0.00° to 59.54° On Az 356.02° From 700 m TVD to 1194 m TVD
1295	4663	Drill Tangent to TD Hold on inc 59.54° Hold on Az 356.02° From 1194 m TVD to 2901 m TVD

PLAN VIEW Scale (1 cm = 300 meters)



Vertical Section View

Vertical Section Departure at 356.00 deg from (-13.0, -8.0). (1 cm = 200 meters)

Proposal
Survey

Grid North
Tot Corr (E 14.35°)
Mag Dec (E 13.38°)
Grid Conv (W 0.97°)

Quality Control
Date Drawn: 27-Nov-1998
Drawn by: Hardy Walker
Checked by: David de Freitas
Client OK: _____