



FLOUNDER A-17a

FINAL WELL REPORT

Prepared by

Geoservices Overseas S.A.

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CONTENTS**SECTION 1 -- GENERAL WELL SUMMARY**

WELL DATA	4
MUDLOGGING	5
WELL SUMMARY	6
WELL PROFILE	7
TIME DEPTH CURVE	8
BIT SUMMARY	9
CASING and CEMENTING DETAILS	9
WELL DIRECTIONAL PROFILE	10
WELL DIARY	11

SECTION 2 -- GEOLOGICAL SUMMARY

FORMATION TOPS	16
GEOLOGICAL SUMMARY	16
GAS REPORT	20

SECTION 3 -- GEOSERVICES WELL LOGS

MASTERLOG --	1:500 scale from 2900 to 3660 metres 1:200 scale from 2900 to 3660 metres
DRILLING LOG --	1:1000 scale from 2900 to 3660 metres
GAS RATIO LOG --	1:500 scale from 2900 to 3660 metres

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

Section 1

General Well Summary

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1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

WELL DATA

Operator : Esso Australia Ltd
Platform : Flounder
Well name : Flounder A-17a
Country : Australia
Location : Gippsland Basin
Structure : Flounder T-1
Field : Flounder
Permit : Vic/ L11

Location AMG co-ordinates 5 758 711.37 mN 625 853.66 mE

Location local co-ordinates Lat: 38° 18' 39.158" S Long: 148° 26' 22.270" E

Target Local co-ordinates

Primary T-1	509.30 mS	1753.96 mE
Secondary T-6	491.30 mS	1918.99 mE
Secondary T-8	484.30 mS	1982.01 mE

Profile : Deviated
Reference depth : Rotary Table
RT to Seabed : 126.85 metres
RT above M.S.L. : 33.85 metres
Sea-water depth : 93.00 metres
Proposed total depth : 3607.0 metres
Actual total depth : 3660.0 metres
True vertical depth : 2878.01 metres
Spudded on : 05th August 2003
Total depth reached on : 12th August 2003

Drilling Contractor

Drilling Contractor : NABORS ISDL
Rig name : 453
Rig type : Platform

Drilling Phases

Diameter (inch)	From (m)	To (m)	Mud Type
6"	2900.0	3660.0	KCl / Glycol / PHPA

Cased Hole

Casing Diameter (inch)	Casing Type	Shoe Depth (m)
20"	Conductor	203.0 MDKB
7 ⁵ / ₈ "	Production	2894 .0 MDKB
4 ¹ / ₂ "	Liner	3656.2 MDKB

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

MUD LOGGING

Logging Unit Number: 137

Engineers: R. Pereira, M. Boyd, P. Rady, G. Fawns

Sampling Interval**Flounder A-17a**

Sample Type	Number of sets	Quantity per set	Sampling interval	From (m)	To (m)
Washed and Dried	3	100 grams	5 metres	2900	3660

Cuttings Distribution

Company	Washed and Dried Sample Set
Esso Australia	1
Victorian Department of Energy and Minerals	1
Australian Bureau of Resources	1

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

WELL SUMMARY

Flounder A-17a is a re-drill well designed to recover reserves from the T-1 sands, both from the capture of attic reserves, as well as reserves attributed to the damaged A17. The secondary objectives of the well are the T-6 and T-8 sands. The well was drilled to a Total Depth of 3660 m MDRT in 6" and completed with a single oil completion string of 3½" tubing in 4½" production liner.

Flounder A-17a was officially spudded at 06:30 hours on the 05th of August 2003 after setting a 7⁵/₈" whipstock and milling a window in the existing 7⁵/₈" casing from 2894 m to 2900.35 m.

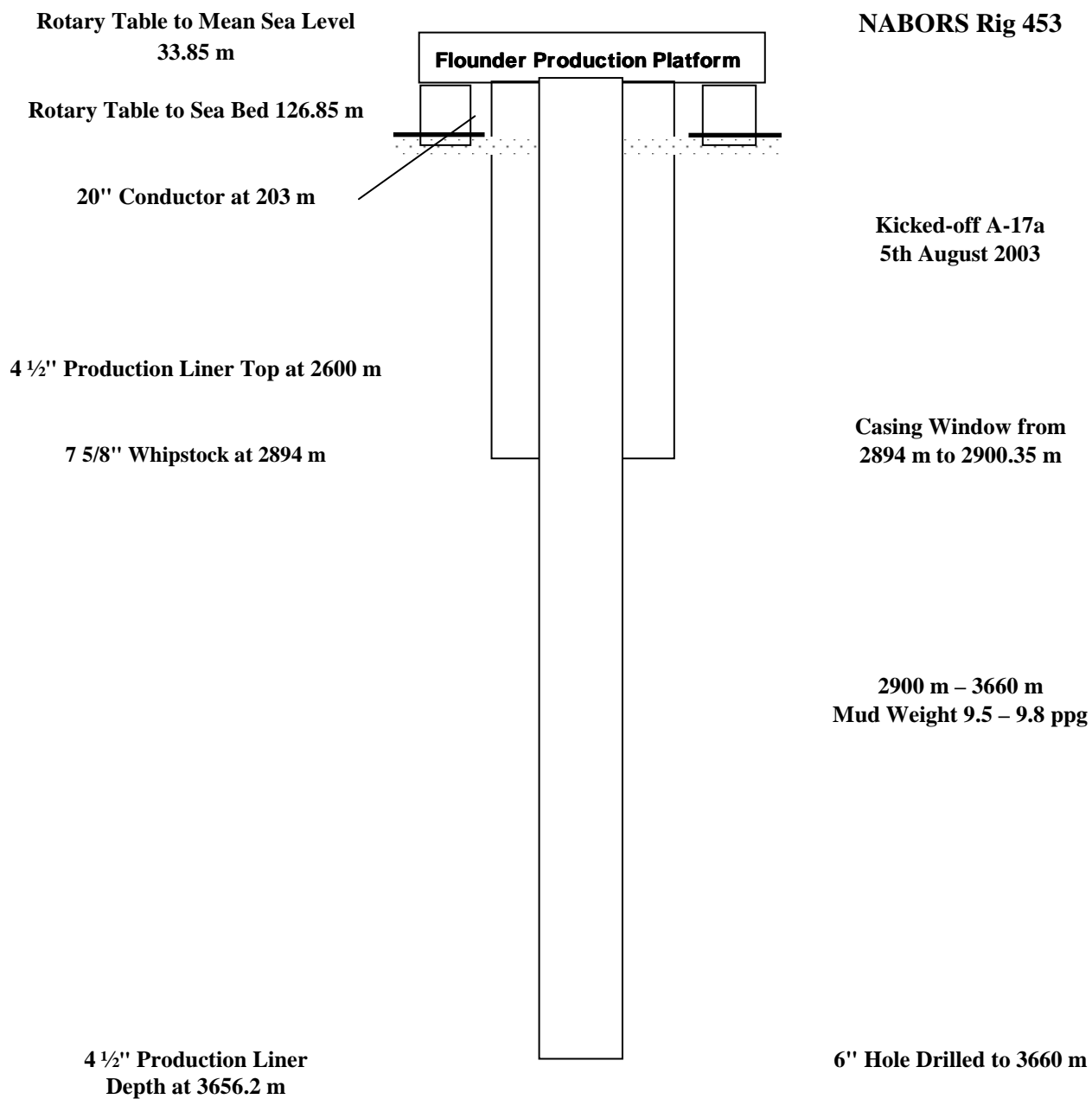
After pulling out with the milling assembly a 6" steerable / MWD drilling assembly was made up with a Smith XR30TODPD bit and run in the hole. The well was kicked-off and drilled to 2903 m and the hole circulated to condition the mud before a PIT (1234 psi at 9.3 ppg: 12.5 ppg EMW) was carried out. The bit was drilled, steered and rotated from 2903 m to 3040 m where it was pulled due to a slow penetration rate. The second bit a Smith XR30TODPD was run in hole after checking the BHA and drilled, steered and rotated ahead from 3040 m to 3283 m where it was pulled due to rotating hours and a new bit was run. This bit, a Smith XR30TODPD, was run in hole with a new motor and drilled to 3541 m where it was pulled due to rotating hours. The 4th Bit a Smith XR30TODPD drilled to TD at 3660 m.

The hole was back reamed from 3660 mMDRT to the casing shoe prior to running in hole with Reeves Logging tools with the shuttle system.

A mud weight of 9.55 ppg was maintained to preserve hole stability while from 3350 m the mud weight had increased 9.60 ppg due to natural clays. Barablok was added prior to 3000 m to a concentration of 5 ppb in order to stabilise the Coals. Baracarb 25, 50, 100 were added at the start of the drilling phase to reduce seepage losses and enough was added to maintain a sufficient concentration for the whole well. Glycol and Baracor-129 were added to maintain mud properties.

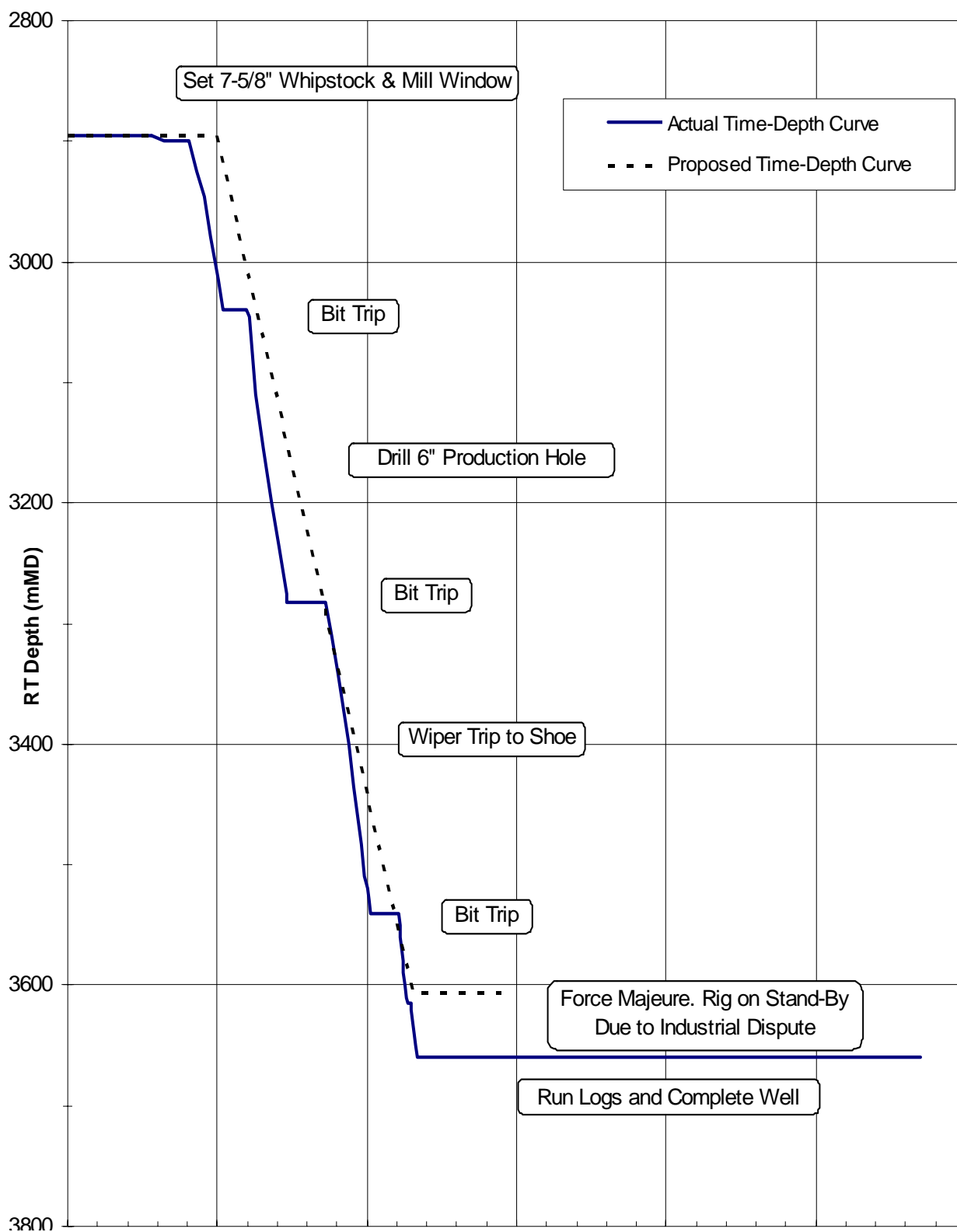
Flounder A-17a reached a Total Depth of 3660 m (2878.01 m TVDRT) at 21:30 hours on the 12th August 2003. The final survey at a depth of 3640.00 m had an inclination of 27.19° and an azimuth of 89.40°. The hole was logged, production liner run and the completion program executed. The well was handed over to production at 17:00 hours on the 29th August 2003.

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

WELL PROFILE

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

TIME-DEPTH CURVE (measured depth)



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1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

BIT RUN SUMMARY

Bit	Size (")	Type	Jets	In (m)	Out (m)	Hours	Condition
1	6"	Smith XR30YTODPD	3 x 18	2900	3040	15.9	1-2-WT-A-EEE-IN-NO-BHA
2	6"	Smith XR30YTODPD	3 x 18	3040	3283	24.0	3-4-WT-A-EEE-1/16-ER-HR
3	6"	Smith XR30YTODPD	3 x 18	3283	3541	26.3	3-4-WT-A-EEE-1/16-ER/LT/BT/CT-HR
4	6"	Smith XR30YTODPD	3 x 18	3541	3660	9.9	5-6-A-A-E-1-ER-TD

CASING DATA

Type	Size (inches)	Weight (lb/ft)	Grade	Thread	Depth (mMDRT)
Conductor	20"	133	K-55	BTC	203
Production	7 ⁵ / ₈ "	44	N-80	BTC	2894
Liner	4 ½"	12.6	L-80	Sumo	3656.2

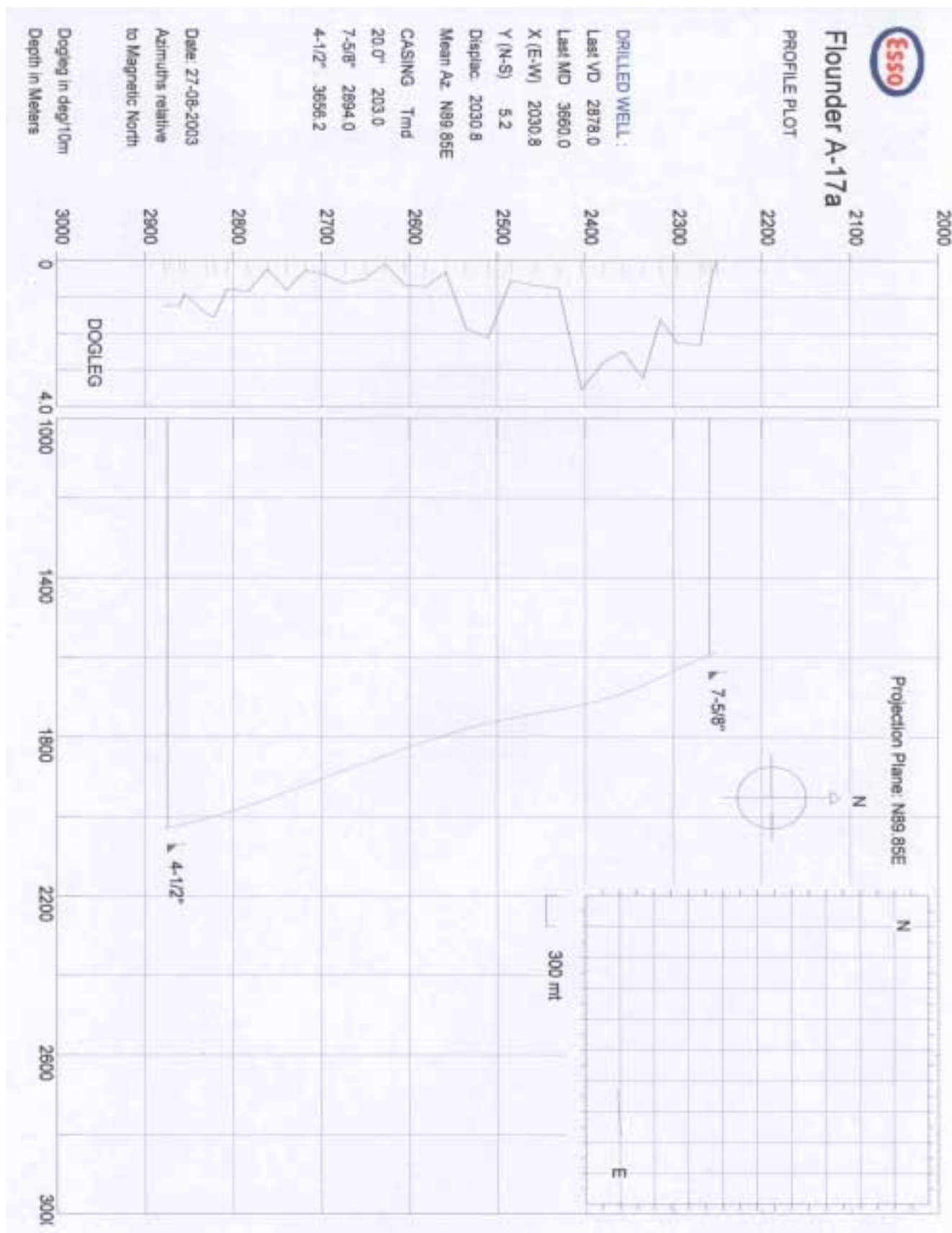
CEMENTING DATA

Casing Details	Cement Type	Dry Cement Volume (sx)	Cement Additives	Mix Water (bbls)	Slurry Volume (bbls)	Slurry Density (ppg)	Cement To / From (mMDRT)	Casing Pressure Test (psi)
4 ½" TAIL	HTB	318	HALAD 413L 32 gal / 10 bbls SCR-100L 2 gal / 10 bbls CFR-3L 5 gal / 10 bbls NF-5 0.25 gal / 10 bbls	36	63.4	15.8	2700.75 m 3565.25 m	3000 psi

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

WELL DIRECTIONAL PROFILE

(Extracted from Geoservices ALS Software)



Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

WELL DIARY

1st August 2003	Prepare to skid rig. Skid upper package north to FLA A-17a, secure and reinstate same. Rig to and bleed down pressure in casing (test blind rams) and remove abandonment flange on stump. Attempt to pull to maximum safe working load of lift equipment and remove 'B' section. No go as studs seized. Cut and work studs free. Change out lower pipe rams to 4" solids. Continue to cut and work studs free on 'B' section
2nd August 2003	Cameron inspect 'A' section ring groove. Install 'B' section, Cameron energise, test 'P' seals and casing hanger void. Nipple up riser, BOP's, bell nipple and flow lines. Function test BOP control panels. Rig to and make up test assembly and pressure lines. HOWCO break circulation, flush all surface lines and conduct line test. HOWCO test BOP's choke and stand pipe. Break down surface lines and test assembly. Make up combo tool, run wear bushing and break down combo tool. Change out handling gear to 3½". Pick up and make up clean out BHA and run in hole to 2900 m. tag EZSV with 5 klb. Displace hole to 9.2 ppg mud. Rig up test assembly and surface, HOWCO break circulation and test lines. Pressure test casing to 2000 psi. Break down assembly. Pull out of hole.
3rd August 2003	Continue to pull out of hole, rack back BHA. Lay down watermelon mills, break and lay down bumper sub and Z jar. Slip and cut drill line. Rig service and inspect monorail. Pick up and make up whipstock and milling BHA as per Baker and run in hole to 334 m. Rig to and change handling gear to 4". Run in hole to 2889 m, rabbiting all tubulars. Rig up Schlumberger sheave at crown. Install side entry sub and prepare gyro running tool. Schlumberger run in hole with SDI gyro to UHBO sub. Sting into and establish tool face. Work string and orientate whipstock as per Anadrill instruction. SDI re-establishes tool face. Pull out of hole whilst SDI gyro well. Set whipstock.
4th August 2003	Set whipstock at 2894 m obtain milling parameters and commence to mill window from 2894 m to 2900.35 m. Flow check, pump slug and pull out of hole to 329 m. Rig to 3½" handling gear and continue to pull out of hole. Break down and lay out 4¾" drill collars and milling assembly. Rig service. Pick up and make up steerable BHA and run in hole. Shallow test MWD and continue to run in hole.
5th August 2003	Continue to run in hole to 2890 m. Obtain tool face and wash from 2890 m to 2900 m. Drill and steer 6" hole from 2900 m to 2903 m. Work string from 2903 m to 2890 m whilst circulate hole clean and condition mud to 9.3 ppg. Rig to and Howco test lines. Howco conduct P.I.T to 12.5 ppg EMW with 1234 psi. Run in hole from 2890 m to 2903 m and drill, steer and survey 6" to 2937 m. Rig up Schlumberger sheave and SDI run in hole and gyro survey well. Pull out of hole with SDI. Rig down SDI and Schlumberger. Drill, steer and survey 6" from 2937 m to 2979 m.
6th August 2003	Drill, steer and survey 6" from 2979 m to 3040 m. Circulate hole, racking back one stand every half hour to 2995 m. Flow check, pump slug and pull out of hole. Make up new bit to BHA and run in hole.
7th August 2003	Continue to run in hole to 2996 m. Precautionary wash and ream to bottom. Drill, steer and survey 6" hole from 3040 m to 3175 m. Rig service. Continue to drill, steer and survey 6" hole from 3175 m to 3198 m.
8th August 2003	Continue to drill, steer and survey 6" hole from 3198 m to 3283 m. Pump sweep and circulate hole clean whilst rack back from 3283 m to 3190 m. Pull out of hole from 3190 m to 3089 m. Backream and circulate hole clean from 3089 m to 2946 m. Continue to pull out of hole.

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

9th August 2003	Continue to pull out of hole, rack back BHA, breakout bit, flush and lay out motor. Pick up new motor and bit, shallow test assembly and set bend at 1.15°. Run in hole to 350 m. Fault find link drill / tilt controls on TDS. Continue to run in hole to 2881m. Slip and cut drill line. Rig service. Orientate tool face and run in from 2881 m to 3225 m. Wash and ream to bottom. Drill, steer and survey new hole from 3283 m to 3311 m.
10th August 2003	Drill, steer and survey new hole from 3311 m to 3483 m.
11th August 2003	Drill, steer and survey new hole from 3483 m to 3541 m. Pull out of hole for bit change. Make up new bit and run in hole.
12th August 2003	Run in hole to bottom, drill, slide and survey from 3541 m to 3660 m. Circulate bottoms up and backream out of hole.
13th August 2003	Backream out of hole to 2900 m, sweep and circulate hole clean, orientate tool face and pulled inside window to 2890 m and continue to pull out of hole and rack back BHA. Rig up Reeves, make up mule shoe and run in hole with 3½" DP to 60 m.
14th August 2003	Reeves make up Logging tools. Install into DP and run in hole with shuttle BHA from 60 m to 156 m, establish circulation rates. Run in hole to 731 m rabbiting all tubulars and establish circulation rates. Run in hole to 3660 m, rabbiting all tubulars. Pull out of hole from 3660 m to 3601 m. Pump dart to deploy tools, pressure increase to 3000 psi with no indication of shear. End of tools at 3652 m. Reeves conduct logs whilst pull out of hole from 3652 m to 2900 m. Continue to pull out of hole.
15th August 2003	Continue to pull out of hole to 207 m. Rack back HWDP, Reeves DP and Logging tools. Logging tools found damaged. Download Electric logs. Make up clean out BHA and run in hole to 3656 m, wash and ream last 2 stands. Pump sweep and rack back stands to 2588 m whilst circulate hole clean. Pull out of hole from 3588 m to 3475 m and run in hole to 3588 m. Backream from 3588 m to 2890 m and rotate and work string whilst circulate hole clean at 2890 m. Pull out of hole from 2890m to 2698 m.
16th August 2003	Pull out of hole from 2698 m to 200 m, rack back BHA and break out bit. Make up mule shoe and landing sub and run in hole with BHA, load source and continue to run in hole with BHA to 156 m. Attempt to circulate - pressure too high. Pull out of hole from 156 m to 60 m, remove source and clean running tool. Load source and run in hole from 60 m to 156 m, circulate 200 bbls – pressure stable but too high. Pull out of hole with BHA from 156 m to 60 m and check running tool – OK. Remove source and lay out logging tools, flush 3½" DP and circulating sub. Pick up and make up Reeves BHA and run in hole to 60 m, Reeves make up logging tools, load source and shallow test same. Run in hole with logging tools to 156 m and run in hole on 4" DP from 156 m to 1700 m.
17th August 2003	Run in hole on 4" DP from 1700 m to 3650 m. pull out of hole from 3650 m to 3596 m. Reeves displace messenger dart, end of log string at 3647 m, stuck pipe, work string and pull free 300K. Conduct Logs while pull out of hole from 3647 m to 2818 m. Flow check – OK. Pump slug and pull out of hole from 2818 m to 205 m. Flow check and pull out of hole to surface. Make up liner cement head and pressure test same. Check shoe and run in hole with liner.
18th August 2003	Run in hole with 4½" liner to 1038 m. Clear rig floor and pick up liner hanger. Make up liner hanger assembly, insert wiper plug and run in hole from 1038 m to 1057 m. Circulate 1½ times liner volume. Run liner on DP from 1057 m to 2890 m. Obtain parameters at shoe. Run liner on DP from 2890 m and wash to tag at 3659 m. Conduct space out from 3659 m to 3656 m. Circulate liner at 3656m. Attempt to rotate – no go. Torque in excess of 10K. PUWt – 215K, SOWt – 115K. Pick up and make up cement head. Rig up high pressure lines. Circulate 2 times bottoms up. Reduce gas from 111 units to below 20 units.

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

19th August 2003

Howco test lines 500/5000 psi, 5 minutes. Pump setting ball and set liner as per Baker. Confirm with reduced pickup. Unable to rotate due to torque. Howco mix, pump and displace 63.6 bbls cement. Bump plug with 140.5 bbls. Hold 5 minutes, bleed back 1½ bbls. Floats held. Whilst attempt to set hanger 600 psi increase in DP. Recheck float. Set packer as per Baker. Reverse circulate well with seawater. No cement returns at surface. Reverse circulate clean with seawater. End of running tool at 2590 m. Circulate and reciprocate whilst displacing well to inhibited seawater. Rig down high pressure lines, stand cement head aside, pull out of hole from 2590 m to 2561 m and layout cement head. Pull out of hole from 2561 m to surface. 14 m of liner tool left in hole. Break down and layout partial recovery of run tool assembly. Break down and layout 6" drilling BHA from mast. Break down and layout cement head assembly. Spool new drum of drill line onto top drive and draw works.

20th August 2003

Transfer new drill line to drum. Slip new drill line to draw works. Pull wear bushing and jet BOP's. Layout jetting assembly, clear rig floor and function BOP remotes. Howco test lines and casing 300/3000 psi for 15 minutes. 5 bbls pumped, same bled back. Make up test assembly, test lines and BOP's 300/3000 psi for 5 minutes. Layout test assembly, run wear bushing and layout running tool. Service rig. Layout bails and elevators for non-destructive testing. Rig up HES wireline unit and sheaves. HES run lead impression block to 2614m. Rig down HES unit and sheaves. Pick up and make up spear assembly as per Baker and run in hole to 23 m. Run in hole with 4" DP from 23 m to 1600 m.

21st August 2003

Run in hole with 4" DP from 1600 m to fish at 2610 m. Roll pumps; engage fish as per Baker, 100 psi increase observed, set down 7K. Flow check. Pull out of hole from 2610 m to surface. No fish. Layout fish assembly. Rig up slick line. Run in hole with LIB to 2613m. Pull out of hole. Rig down slick line. Pick up and make up fish assembly. Change grapple from 2.641" to 1.929". Run in hole with 4" DP from 23 m to top of fish at 2610 m. Latch fish as per Baker with 30K overpull, pull free. Pull out of hole with 4" DP from 2610 m to 1832 m. Rig maintenance.

22nd August 2003

Rig maintenance. Pull out of hole from 1832 m to 23 m. Break and lay out fish and fishing assembly as per Baker. Force Majeure. Rig on stand-by with day shift crew due to industrial dispute.

23rd August 2003

Force Majeure. Rig on stand-by with day shift crew due to industrial dispute.

24th August 2003

Force Majeure. Rig on stand-by with day shift crew due to industrial dispute. Run in hole with 4" DP to 2268 m due to forecasted strong wind warning. Secure well. Force Majeure. Rig on stand-by with day shift crew due to industrial dispute.

25th August 2003

Force Majeure. Rig on stand-by with day shift crew due to industrial dispute.

26th August 2003

Force Majeure. Rig on stand-by with day shift crew due to industrial dispute. Pull out of hole with 4" DP from 2268 m to surface. Dress rig floor with 2³/₈" handling gear. Make up 3¾" clean out assembly and run in hole to 4 m. Pick up and run in hole with 2³/₈" DP from 4 m to 1068 m, drifting all tubulars. Circulate 1 x string volume whilst change out handling gear to 4". Rig service and inspect monorail. Run in hole with 4" DP from 1068 m to 3632 m, washing last 2 stands. Wash and ream from 3632 m to 3636 m. Circulate hole clean with sea water. Pump 30 bbls hi visible and displace well with inhibited sea water.

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

27th August 2003

Continue to displace well with inhibited sea water. Flow check and pull out of hole from 3636 m to 1068 m. Rig up 2³/₈" handling gear and dress rig floor to lay out 2³/₈" DP. Pull out of hole with 2³/₈" DP sideways to BHA at 4 m. Break and lay out bit and cross overs. Rig down 2³/₈" handling gear, remove excess equipment from rig floor. Make up running tool and pull wear bushing, lay out same. Make up jetting tool and jet BOP's and well head, lay out same. Change out LPR's to 3¹/₂" solids. Make up test assembly, rig up Howco and pressure test LPR's, lay out test assembly. Run wear bushing. Break and lay out combo tool. Rig up Schlumberger wireline and sheaves. Pick up and make up MAX R guns and run in hole, correlate and set at 3540 m (top shot). Schlumberger pull out of hole to surface and rig down sheaves. Rig to and retrieve wear bushing, break down running tool. Rig up Weatherford 3¹/₂" completion handling gear. Make up tail pipe assembly and run in hole with 3¹/₂" tubing.

28th August 2003

Continue to run in hole with 3¹/₂" tubing to 2158 m. Pick up and make up TRSSV, HES connect control line and pressure test same. Continue to run in hole with completion tubing to 2603 m. Make up circulating head, wash and sting into liner tie back extension from 2603 m to no go at 2611 m. Pull out of hole and lay down 2 joints for space out. Make up 2 x 0.66 m and 4 x 1.88 m pup joints. Retrieve 3 x gauze pads that were dropped off slips.

29th August 2003

Retrieve 3 x non slip gauze pads from annulus that dropped off from slips whilst running tubing. Make up hanger and landing joints. Cameron terminate control line and retest same. Land hanger, engage same and conduct 10K overpull. Rig up high pressure lines whilst Cameron pressure test hanger seal. Howco pressure test tubing to 3000 psi. Lock in same. Test annulus to 2800 psi and bleed down. Disengage hanger running tool, break down same and clear rig floor. Cameron run BPV. Nipple down BOP's, riser and drill spool. Cameron terminate control line and pressure test same. Nipple up T.H.A.F, Xmas tree and wing valves. Cameron pressure test shell and upper void and SLR seals. Prepare to skid rig. Rig released at 17:00 hours.

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

Section 2

Geological Summary

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

FORMATION TOPS

DESCRIPTION	MD (m) RT	TVD (m) RT	TVD (m) SS
Top of Latrobe Group	Not Applicable		
Base Tuna Flounder Channel	2910	2271	-2237.15
Shallow Coal Marker	2952	2300	-2266.15
MPM Coal	3024	2350	-2316.15
T Shale	3115	2427.8	-2393.95
Top T-1.1 Sand	3195	2501.5	-2467.65
Top T-1.2 Sand	3254	2551.9	-2518.05
Top T-3 Sand	3315	2601.3	-2567.25
Top T-4 Sand	3365	2641.8	-2607.95
Top of T-6 Sand	3451	2707.0	-2673.15
Top of T-7 Sand	3498	2743.1	-2709.25
Top T-8 Sand	3535	2772.1	-2738.25
TD	3660	2878.0	-2844.16

GEOLOGICAL SUMMARY**LATROBE GROUP:**

2900 m – 2910 m

SILTSTONE**SILTSTONE**

Brown grey to grey brown, argillaceous, trace very fine arenaceous, common very carbonaceous grading to COAL in part, minor disseminated pyrite, firm, sub-blocky to sub-fissile.

BASE TUNA FLOUNDER CHANNEL:

2910 m – 2952 m

SILTSTONE with minor interbedded SANDSTONE and minor COAL**SILTSTONE:**

Brown grey to grey brown, argillaceous, trace very fine arenaceous, common very carbonaceous grading to COAL in part, minor disseminated pyrite, firm, sub-blocky to sub-fissile.

SANDSTONE:

Clear to translucent, occasionally very light grey to pale olive aggregates, fine to medium, occasionally coarse, moderate sorting, sub-angular to sub-rounded, minor weak dolomitic cement in part, trace pale grey argillaceous matrix in part, minor carbonaceous specks, predominantly loose grains, occasionally friable aggregates, poor visible & inferred porosity, no fluorescence.

COAL:

Dark brown, dull, occasionally sub-vitreous, laminations, brittle to firm, sub-fissile, hackly, silty grading to SILTSTONE in part.

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

SHALLOW COAL MARKER:

2952 m – 3024 m

Interbedded SANDSTONE, SILTSTONE and COAL**SANDSTONE:**

Clear to translucent, medium to coarse, occasionally very coarse with depth, sub-angular to sub-rounded, occasional angular, moderate sorted, weak calcareous/dolomitic cement, occasional pyritic cement, minor dispersive light brown matrix, generally loose quartz grains, occasional friable to hard aggregates, occasionally nodular pyrite, poor to fair inferred porosity, no fluorescence.

SILTSTONE:

Light olive grey to medium grey, light olive brown to light brown, argillaceous, non calcareous, abundant carbonaceous specks, common micro-micaceous, trace dispersive pyrite, dispersive to soft, firm in part, amorphous to sub-blocky.

COAL:

Black to brown black, dull to sub-vitreous, brittle to moderate hard in part, sub-fissile, rare pyrite.

MID PALAEOCENE MARKER:

3024 m – 3115 m

SANDSTONE with minor SILTSTONE and minor COAL**SANDSTONE:**

Clear to translucent, frosted, medium to coarse, occasionally very coarse, moderate well sorted, sub-angular to angular, trace strong siliceous cement, trace strong dolomitic and pyritic cement, rare quartz overgrowths, rare carbonaceous detritus, trace light brown argillaceous matrix, predominantly loose, occasionally moderate hard to hard, fair inferred porosity, good inferred porosity in part, rare pale mineral fluorescence.

SILTSTONE:

Moderate brown to light brown, brown grey to medium grey, argillaceous, non calcareous, trace micro-micaceous, rare nodules pyrite, rare carbonaceous micro-laminations, firm, sub-blocky to sub-fissile.

COAL:

Black, hard, vitreous, conchoidal, brittle, sub-blocky.

T SHALE:

3115 m – 3195 m

SILTSTONE with minor SANDSTONE**SILTSTONE:**

Medium grey to brown grey, olive green in part, argillaceous, micro micaceous in part, glauconitic in part, non-calcareous, carbonaceous in part, locally grading to shale, rare nodular pyrite, soft to firm, amorphous to sub-blocky.

SANDSTONE:

Clear to translucent, coarse to very coarse, sub-angular to angular, occasionally sub-rounded, moderate to well sorted, strong siliceous and pyritic cement, trace dolomitic cement, rare argillaceous matrix, rare quartz overgrowths, abundant loose quartz, fair to good inferred porosity, no fluorescence.

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

T 1.1 – SAND:

3195 m – 3252 m

SANDSTONE with minor SILTSTONE**SANDSTONE:**

Clear to translucent, opaque, occasionally off white, medium to coarse, occasionally fine, common very coarse, moderately to well sorted, sub-angular to sub-rounded, common angular, trace strong dolomitic and pyritic cement, weak siliceous cement, rare lithics and carbonaceous detritus, trace silty matrix, trace quartz overgrowths, trace glauconite and pyrite nodules, common loose quartz, common firm to hard aggregates, fair inferred porosity, minor good inferred porosity, fluorescence.

FLUORESCENCE:

3210-3240 m trace to 10% bright to dull greenish yellow pin point fluorescence, no crush cut, faint white ring residual.

SILTSTONE:

Light grey, light green grey, argillaceous, occasionally fine arenaceous grading to SANDSTONE, trace disseminated glauconite, soft, rare firm, sub-blocky.

T 1.2 – SAND:

3252 m – 3315 m

SANDSTONE interbedded with SILTSTONE and minor COAL**SANDSTONE:**

Clear to translucent, occasionally frosted, minor light grey, medium to coarse, occasionally very coarse, moderately well to poorly sorted, sub-angular to sub-rounded, common angular, common strong dolomitic cement, trace pyritic cement, trace white kaolinite matrix, locally light grey silty matrix, trace carbonaceous detritus, trace glauconite specks, dominantly loose, common hard to very hard aggregates, poorly visible and inferred porosity, trace dolomitic mineral fluorescence, fluorescence.

FLUORESCENCE:

3275-3290 m trace to 10% moderate bright even yellow green fluorescence, very slow yellow white crush cut, faint white ring residual, poorly show.

SILTSTONE:

1) Light grey brown to light grey, light olive grey, occasionally medium brown, occasionally orange brown, very silty, micro-micaceous, abundant carbonaceous specks, rare pyrite nodules, very soft to dispersive, amorphous.

2) Medium to dark brown, carbonaceous, abundant, micro-micaceous, disseminated pyrite, grading to silty COAL in part, firm to brittle, sub-blocky to sub-fissile.

T 3 – SAND:

3315 m – 3365 m

SILTSTONE interbedded with SANDSTONE**SILTSTONE:**

Light grey brown to light grey, dark grey to dark grey brown, argillaceous in part, micro-micaceous, carbonaceous in part, rare disseminated pyrite, dispersive to very soft, locally firm to moderate hard, amorphous to sub-blocky, sub-blocky to sub-fissile in part.

SANDSTONE:

Clear to translucent, fine to medium, occasionally coarse, moderate sorted, loose quartz, common aggregates with strong siliceous and pyrite cement, dolomitic cement in part, rare quartz overgrowths, trace nodular pyrite, rare lithics and carbonaceous detritus, hard, very poorly visible porosity, trace to 5% dull yellowish green dolomitic mineral fluorescence.

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

FLUORESCENCE: 3360-3365 m trace pale patchy yellow green fluorescence, very slow crush cut, trace dolomitic mineral fluorescence, faint ring residual.

T 4 – SAND:

3365 m – 3451 m **SILTSTONE interbedded with SANDSTONE and minor COAL**

SILTSTONE: Light brown to light brown grey, locally light brown, argillaceous, arenaceous in part grading to very fine SANDSTONE, carbonaceous in part grading to COAL, micro-micaceous, grading to SHALE in part, trace disseminated and common nodular pyrite, soft to dispersive, firm in part, amorphous to sub-blocky, blocky in part.

SANDSTONE: Clear to translucent, off white to light grey in part, light brown to light brown grey in part, very fine to very coarse, predominantly fine to coarse, sub-angular to sub-rounded, moderate sorted, weak to locally strong dolomitic/ siliceous cement, locally common light brown silty to minor off white kaolinite matrix, common nodular and disseminated pyrite, common carbonaceous micro-laminations, trace mica, loose, common friable to hard aggregates, ti visible porosity grading to poorly inferred porosity, trace to 10% dull dolomitic mineral fluorescence.

FLUORESCENCE: 3365-3375 m trace pale patchy yellow green fluorescence, very slow crush cut, trace dolomitic mineral fluorescence, faint ring residual.

COAL: Black to brown black, minor silty, brittle, conchoidal, vitreous, earthy, sub-fissile-sub-blocky.

T 6 – SAND:

3451 m – 3498 m **SILTSTONE interbedded with SANDSTONE and minor COAL**

SILTSTONE: Light grey to light grey brown, light brown, argillaceous, arenaceous in part grading to very fine SANDSTONE, carbonaceous, micromicaceous, abundant very fine carbonaceous specks, trace disseminated and common nodular pyrite, soft to dispersive, firm in part, amorphous to blocky, sub-blocky in part.

SANDSTONE Light grey, clear to translucent, very fine to medium, silty in part and commonly coarse, poorly sorted, subangular to subrounded, dolomitic and local pyritic cement, local siliceous cement, predominantly light grey argillaceous with white kaolinitic matrix in part, lithic and carbonaceous fragments, grading to very arenaceous SILTSTONE in part, loose, fair to moderately hard aggregates, very poor visual and fair inferred porosity, trace dolomitic mineral fluorescence.

COAL Dark brown to black, dull to earthy, occasionally sub-vitreous, brittle to hard, fissile to blocky, sub-conchoidal to occasionally hackly fracture, silty in part grading to carbonaceous SILTSTONE.

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

T 7 – SAND:

3498 m – 3535 m

SANDSTONE with SILTSTONE and trace COAL**SANDSTONE**

Clear to translucent, occasionally off white, medium to coarse, dominantly medium, moderately well sorted, subangular to subrounded, common strong dolomitic cement, light grey argillaceous matrix, common nodular pyrite, common carbonaceous flecks, predominantly loose, common hard aggregates, poor to occasionally fair visual and inferred porosity, trace dolomitic mineral fluorescence, no show.

SILTSTONE

Light grey to light brown grey, argillaceous, common fine arenaceous material grading to SANDSTONE in part, common carbonaceous microlaminations, common nodular pyrite, soft to occasionally firm, sub-blocky.

T 8 – SAND:

3535 m – 3660 m (TD)

SANDSTONE with interbedded SILTSTONE and minor COAL**SANDSTONE**

Clear to translucent, fine to medium, grading to medium to coarse with increasing depth, dominantly medium, occasionally coarse, occasionally very coarse, locally moderate to well sorted, sub-angular to sub-rounded, trace weak to locally strong dolomitic cement in part, common pyritic cement in part, trace lithic fragments, trace carbonaceous detrital material, muscovite, abundant loose quartz grains, common well cemented aggregates, poor to fair visual and inferred porosity, trace yellow white dolomitic fluorescence.

SILTSTONE

Brown grey to light brown grey, olive grey in part, occasionally yellow brown, argillaceous, minor fine arenaceous material, minor carbonaceous specks, micromicaceous in part, predominantly soft to firm, occasionally moderately hard, sub-blocky to amorphous, blocky in part.

COAL

Black to dark brown, blocky to sub-fissile, firm to hard, brittle, sub-vitreous to earthy lustre, sub-conchoidal fracture, trace pyrite, locally grading to dark brown SHALE.

Revision	Date	Issued by	Approved by	Remarks
1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

GAS REPORT

Gas was present on exiting from the 7" casing in low concentrations.

Throughout the predominantly siltstone interval beneath the base of the Tuna Flounder Channel, gas levels varied between a low of 10 and a maximum of 21 units. There were coal seams in this section but there were no large gas increases associated with these.

Gas levels increased shortly after passing through the Shallow Coal Marker, generally the gas levels continued to increase through this zone until reaching the Mid Palaeocene Marker. The composition of the gases in this zone was generally high in methane. The amount of coal in the returned cuttings also increased at the base of this zone and minor amounts of coal was present throughout.

After passing through the Mid Palaeocene Marker, gas levels remained steady with a moderate gradual decrease (from 50 units to 20 units) at the Top of The T-Shale. The composition of the gases in this zone also changed after passing through the coals near the Mid Palaeocene Marker to a less methane rich mixture. This was a predominantly sandstone interval.

Throughout the T-shale, the gas composition gradually changed to a methane rich mix once again. The siltstone in this zone was carbonaceous and this compositional change was possibly related to that. A peak gas reading for the well was observed at the base of the T shale at 3191.5 mMDRT of 725 units.

At the top of the T1.1 Sand gas levels averaged between 250 and 300 units with peaks of up to 370 units. The composition of the gases in this zone began at 87% methane and varied slightly throughout. A small change (less than 1%) was noticed in the abundance of pentane (C5) on entering the T1.1 sands. In some places throughout the T1.1 to T3 sands this correlated to both a change in the Wetness and Balance ratios on the Gas ratio plot and with minor fluorescence observed in cuttings at 3210 mMDRT, 3275 mMDRT, 3360 mMDRT and 3405 mMDRT.

Throughout the T4, T6, T7 and T8 sands methane ratios stayed between 84% and 91% with occasional increases in the ratio of heavier (C3 to C5) gases. Background gas levels throughout these zones varied from 50 units to a high of 250 units in some places. A peak gas reading of 481 units for the T sands was recorded at 3413 mMDRT in the T4 Sand section. Background gas levels generally remained above 100 units for the rest of the well.

Localised increases in background gas were attributed to both lithology variations and the penetration rate, which was dependant upon the drilling method (being either rotary or slide) carried out at the time. No CO₂ or H₂S was detected while drilling Flounder A-17a.

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1	27-08-2003	Geoservices Unit 137	Base Mud logging Coordinator	

Gas Peaks through the Latrobe Group

Depth metres	Total Gas units	C ₁ %	C ₂ %	C ₃ %	iC ₄ %	nC ₄ %	iC ₅ %	nC ₅ %
2930.0	21	0.16	0.02	0.01	Tr	Tr	Tr	Tr
2952.0	18	0.16	0.03	0.02	Tr	Tr	Tr	Tr
2957.5	38	0.40	0.07	0.04	Tr	0.01	Tr	Tr
2993.5	30	0.31	0.04	0.02	Tr	0.01	Tr	Tr
3029.0	65	0.81	0.12	0.06	0.01	0.01	Tr	Tr
3045.5	97	0.85	0.13	0.08	0.01	0.02	0.01	0.01
3116.0	28	0.18	0.03	0.03	0.01	0.01	Tr	0.01
3158.5	110	0.99	0.14	0.08	0.01	0.02	0.01	0.01
3175.0	302	2.97	0.27	0.11	0.01	0.02	0.01	0.01
3192.0	619	6.52	0.51	0.26	0.02	0.04	0.01	0.01
3202.0	367	4.12	0.34	0.17	0.02	0.04	0.01	0.01
3216.5	350	4.19	0.35	0.19	0.02	0.04	0.01	0.01
3243.0	266	3.15	0.35	0.21	0.03	0.04	0.01	0.01
3252.5	186	2.27	0.26	0.13	0.02	0.03	0.01	0.01
3317.0	114	1.15	0.10	0.04	0.01	0.01	Tr	0.01
3339.0	92	1.08	0.11	0.04	Tr	0.01	Tr	0.01
3363.0	225	2.22	0.16	0.06	0.01	0.01	Tr	Tr
3365.5	240	2.40	0.17	0.06	0.01	0.01	Tr	Tr
3392.0	338	3.52	0.31	0.09	0.01	0.02	Tr	0.01
3413.5	481	4.92	0.32	0.12	0.01	0.03	0.01	0.01
3454.0	214	1.88	0.15	0.06	0.01	0.02	0.01	0.01
3490.0	174	1.66	0.14	0.05	0.01	0.01	Tr	0.01
3504.0	395	4.08	0.24	0.08	0.01	0.01	Tr	Tr
3530.0	86	0.69	0.08	0.03	Tr	0.01	Tr	Tr
3535.5	352	3.50	0.25	0.08	0.01	0.02	Tr	0.01
3546.0	195	1.75	0.20	0.09	0.01	0.02	0.01	0.01
3557.0	115	0.81	0.09	0.05	0.01	0.01	Tr	Tr
3582.5	190	1.66	0.13	0.05	0.01	0.01	Tr	Tr
3595.0	225	2.07	0.15	0.05	0.01	0.01	Tr	Tr
3633.5	321	2.83	0.20	0.06	0.01	0.01	Tr	0.01
3655.0	152	1.38	0.11	0.04	Tr	0.01	Tr	Tr

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