565001

PremierOil
Australasia

T/RL1

YOLLA-2
WELL COMPLETION REPORT
VOLUME 1 of 2

SEPTEMBER 1998

OR-447

Appraisal Well Yolla-2

Geological Well Completion Report

Revised by:

V. Singleton,
Computer Geologist

Approved by:

B. Ulmer,
Operations Manager

Well: Yolla-2

Surface Location	Latitude	39° 51' 33.889"S	**Participating Interests**	
	Longitude	145° 48' 38.493"N	Premier Petroleum (Australia) Ltd	30.5%
	UTM Co-ordinates	398271.48 mE	Boral Energy Resources Ltd	30.5%
		5587154.23 mN	Cue Energy Resources Ltd	14.0%
	Elevation KB	12.5 m	CalEnergy	20.0%
	Water Depth	81.5 m	Santos Ltd	5.0%
Permit	T/RL1 Bass Basin, Australia		Primary Objective	Intra-Eastern View Coal (EVCM) measures sandstones of Palaeocene to early Eocene age
Spudded	21:00 hrs 9/4/98		Secondary Objective	Sandstones of Palaeocene-late Cretaceous age, onlapping the volcanics intersected in the base of Yolla-1
Reached T.D.	01:00 hrs 14/5/98			
Abandoned	13:00 hrs 30/5/98		**Cement Plug Depths (mMD)**	
Rig Released	13:00 hrs 30/5/98		3090 – 3000m 2850 – 2760m 1940 – 1850m	835 – 805m 175 – 130m
Deviated Well	Straight Hole			
Rig	Northern Explorer III			
Type	Drillship		**Casing Details**	

Hole Size	26"/36"	17 ½"	12 ¼"	Size (in)	Wt (lb/ft)	Depth mMD
Depth (mMD)	152	862	3164	30	310	152
				13-3/8"	68	853
Total Depth	3164m MDKB					

Formation Tops	**Depth (mMD)**	**Depth (mSS)**	**Thickness (m)**	**High/Low**	**Log TWT (ms)**
Torquay Group	94.0	-81.5	981.0		
Angahook Unit 1	1075.0	-1062.5	190.5	-19.5	
Angahook Unit 2	1265.5	-1253	12.5	-27.0	
Oligocene Volcanics	1278.0	-1265.5	38.0		
Angahook Unit 3	1316.0	-1303.5	152.0	-20.5	
Angahook Unit 4	1468.0	-1455.5	24.5	-14.5	
Oligocene Unconformity	1492.5	-1480	213.0		1288
Demons Bluff	1705.5	-1693	138.5	-26.5	1432
Eastern View Coal Measures (EVCM)	1844.0	-1831.5	1241.0	-42.5	1536
Top Igneous Intrusive	2579.0	-2566.0	33.0		1980
Base Igneous Intrusive	2612.0	-2599.5			
Top Z1 EVCM 2718 Sand	2763.5	-2751	29.0	3.5	2090
Top Z1 EVCM 2755 Sand	2792.5	-2780	67.0		2106
Top Z1 EVCM 2809 Sand	2859.5	-2847	36.0	14.5	2142
Top Z1 EVCM 2844 Sand	2895.5	-2883	36.5		
Top Z2 EVCM 2873 Sand	2932.0	-2919.5	76.0		
Top Z3 EVCM 2952 Sand	3008.0	-2995.5	22.0		
Top Z3 EVCM 2973 Sand	3029.5	-3017.0	55.0	29	2228
Top Volcanics	3085.0	-3072.5	79+		2256

WIRELINE LOGGING SUMMARY

SUITE/ RUN	TOOL STRING	INTERVAL (mMD)	BHT (°C)/TIME SINCE CIRC.	(Hrs)	PLAYBACK SCALES
1/1	PEX-Sonic	3084-1065	114	10	
1/2	MDT Pretests	3064 – 1876	132	42.	1:200 1:500 41 Pretests 3 samples
1/3	MDT Samples	3064 – 1876	132	42.5	1:200 1:500 3 Pretests 5 samples
1/4	VSP	3050 – 840	135	51	1:200 1:500
1/5	CMR – GR	3055 - 2860	140	64.5	1:200 1:500
1/6	FMS – NGT	3081 – 1800	142	78.5	1:200 1:500

CORE SUMMARY

Core	Interval (m)	Cut (m)	Recovered (m)	%
1	3033 – 3050.7m	17.7	17.7	100

WELL TESTING SUMMARY

Well was abandoned without testing

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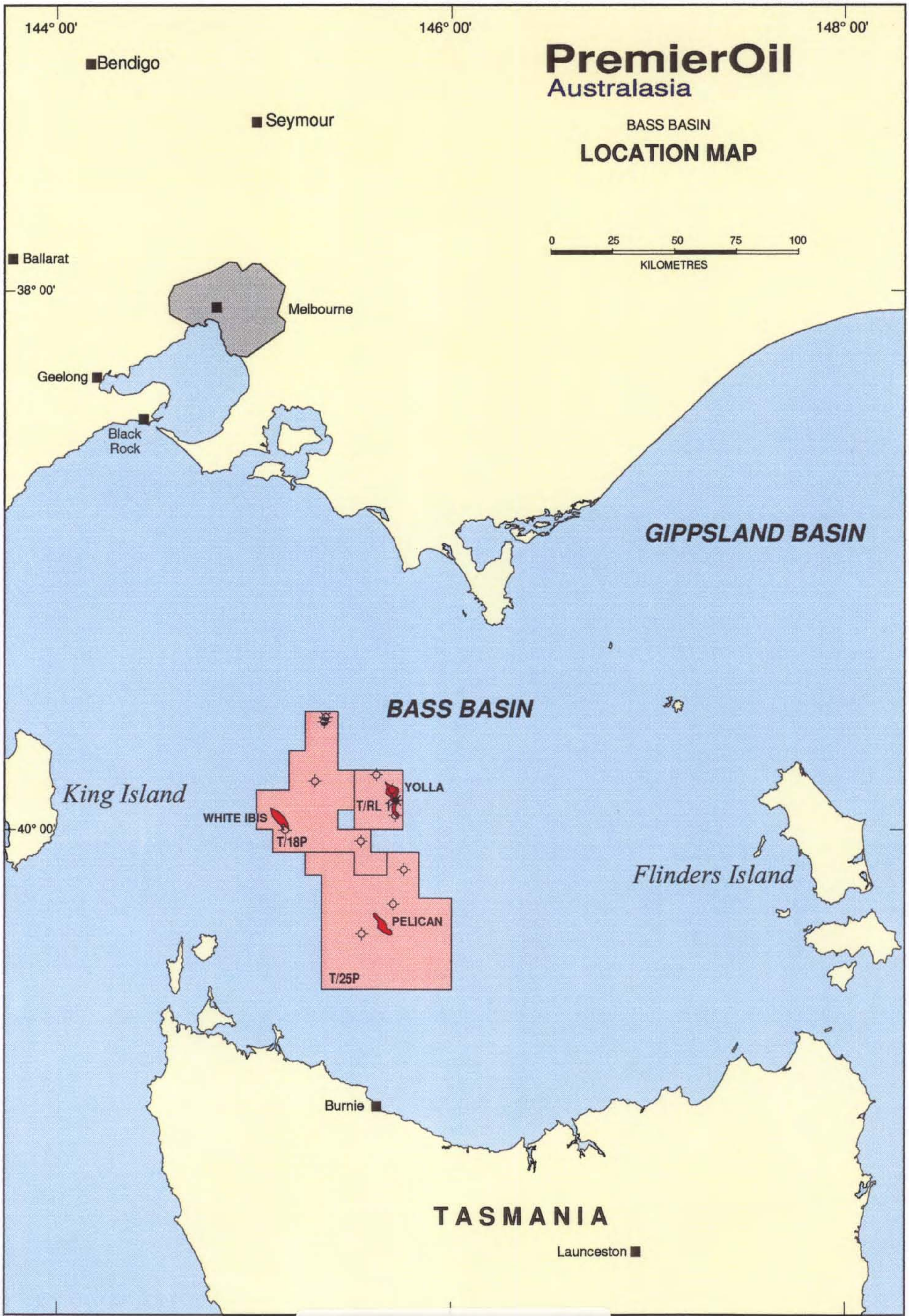
565008

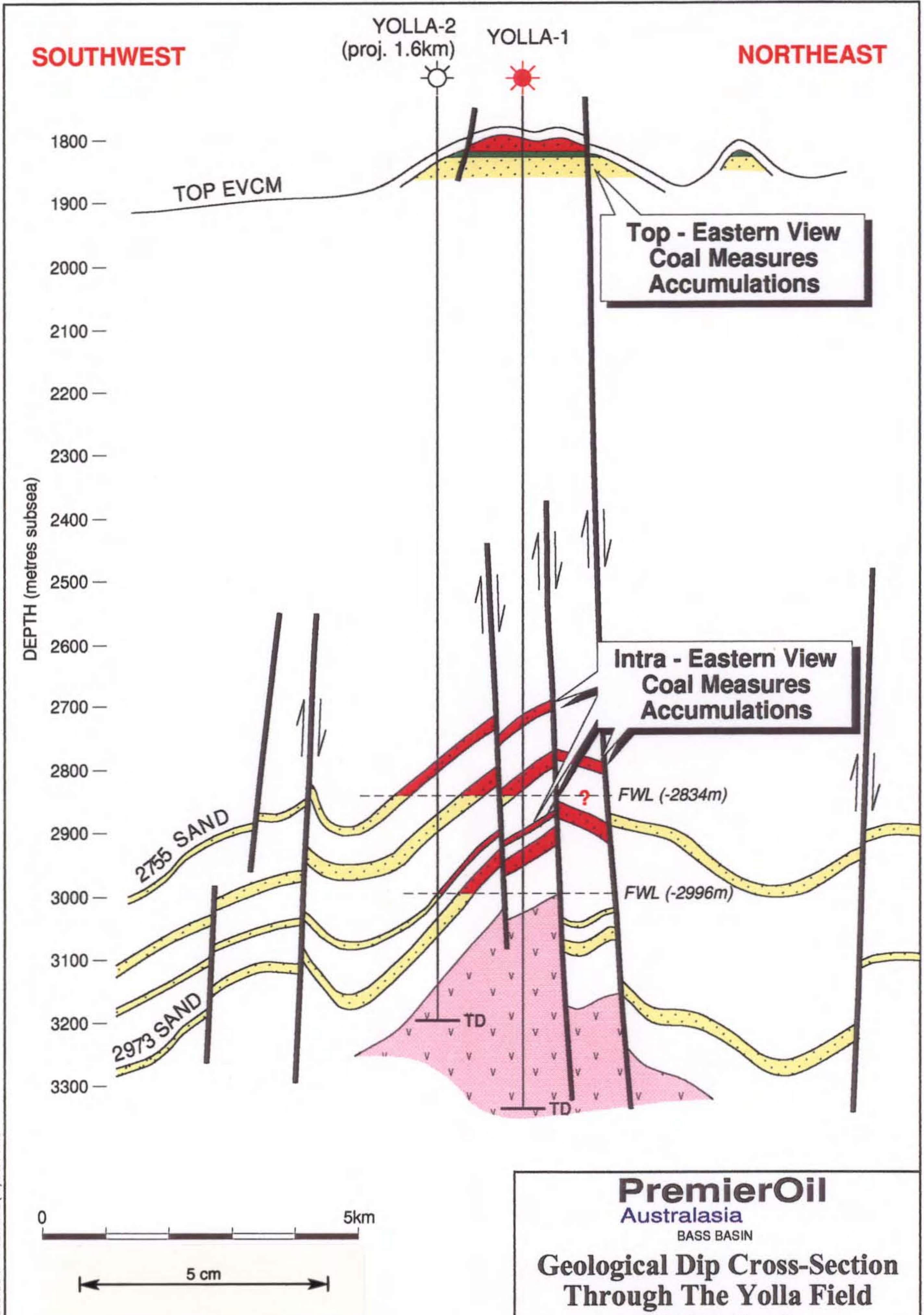


PBS98_53 Thu 10 Sep 98 (12:16PM)

FIGURE 1

5 cm

565009



PremierOil
Australasia
BASS BASIN

Geological Dip Cross-Section Through The Yolla Field

(Vertical Exaggeration x10)

AUG, 1998

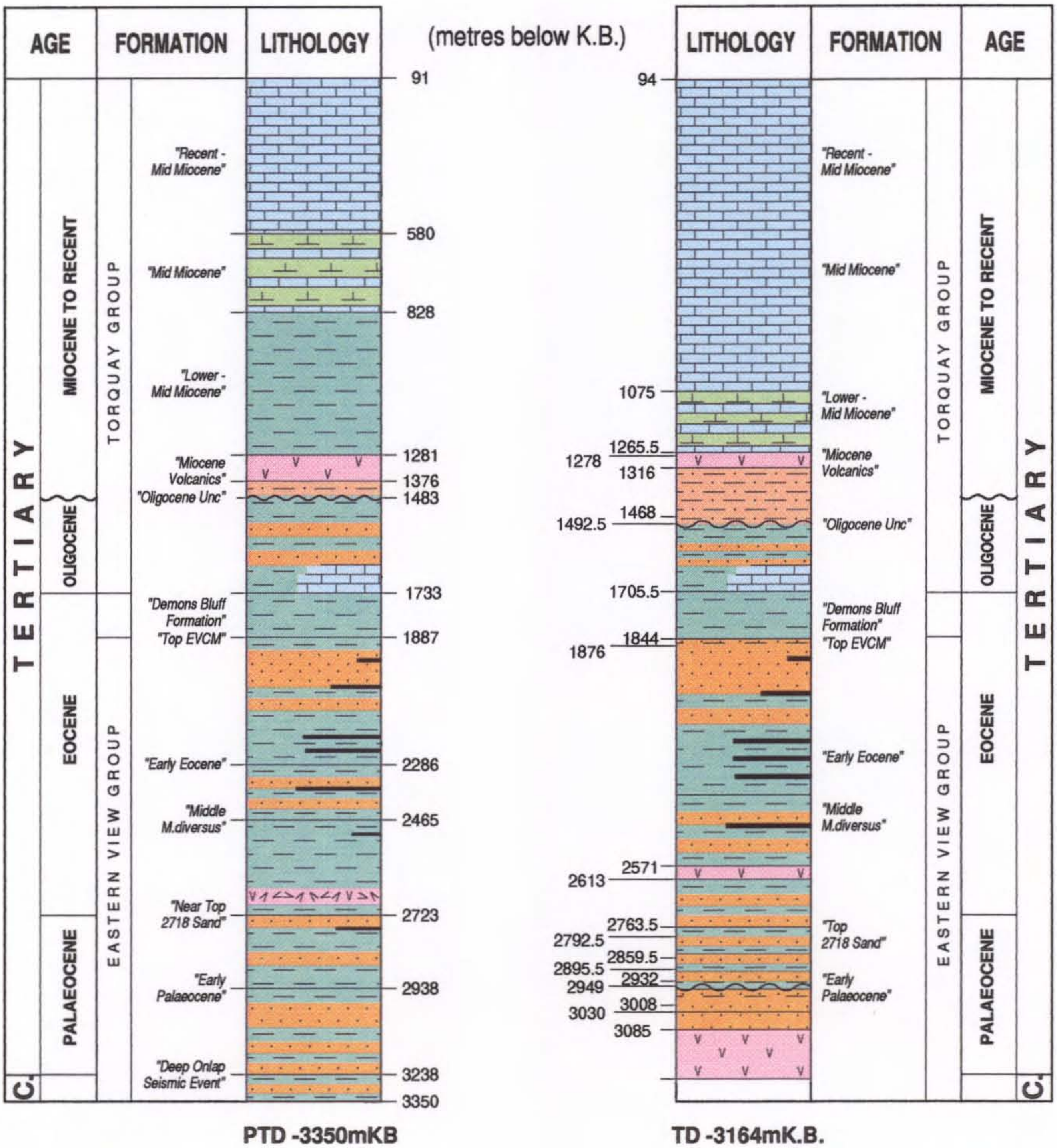
BIBRA DRAF... SERVICE (08) 9481 3113

PBS98_52 Thu 10 Sep 98 (12:30PM)

FIGURE 2

PREDICTED

ACTUAL



PremierOil
Australasia

YOLLA No. 2

Author : D.E. Date : JULY, 1998

5 cm

PREDICTED Vs ACTUAL

LOCATION : T/RL 1

LATITUDE : 39° 51' 33.889" S

LONGITUDE : 145° 48' 38.493" E

ELEVATION : 12.5mK.B.

T.D. : 3164mK.B.

PBS98_44 Thu 10 Sep 98 (12:27PM)

FIGURE 3

565011

BIBRA DRAFTING SERVICE (08) 9481 3113

PBS98_55 Fri 11 Sep 98 (11:29AM)

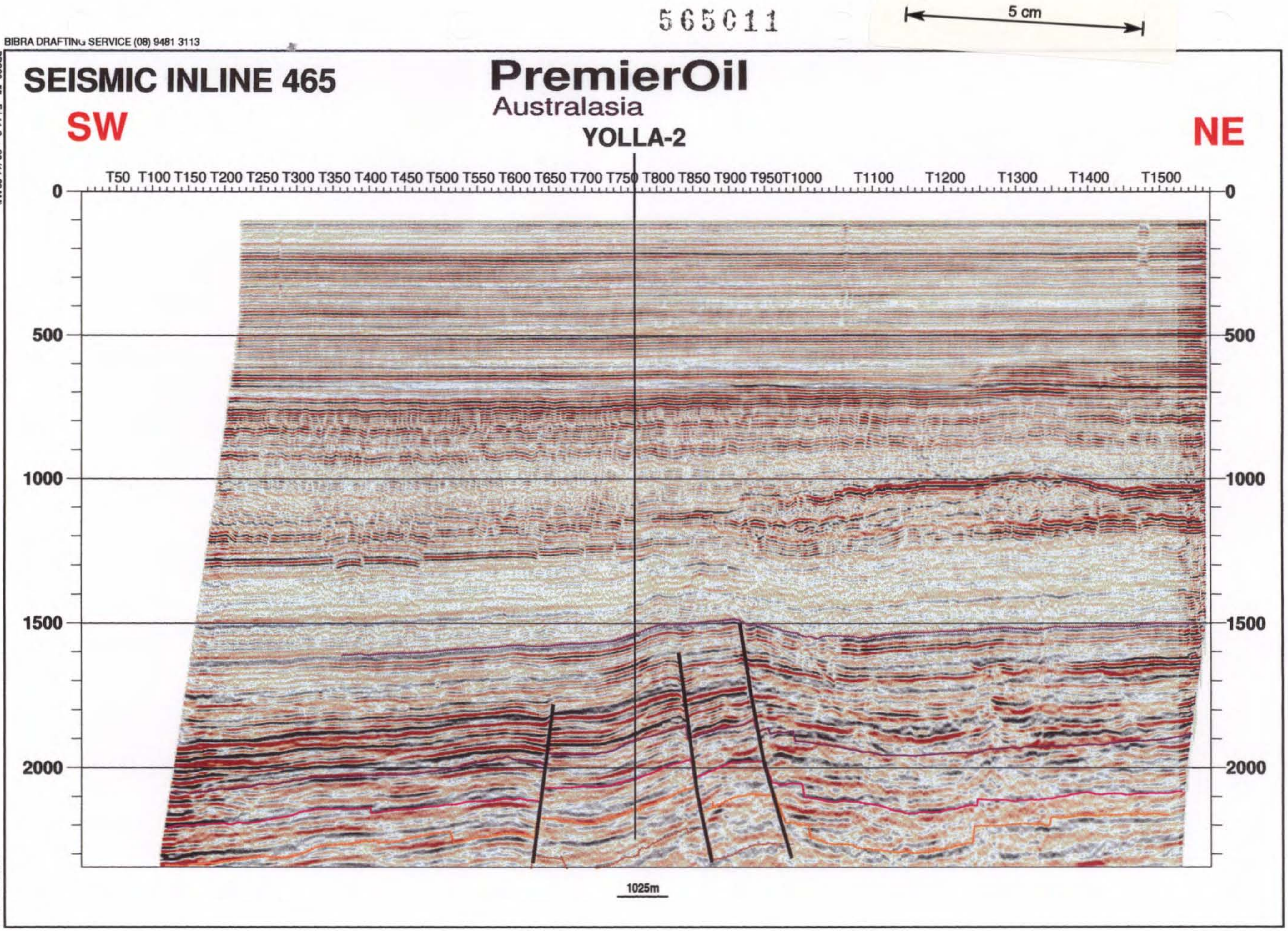


FIGURE 4

1. INTRODUCTION

1.1. Geological Summary

The Yolla-2 appraisal well was the first well drilled by the T/RL1 Joint Venture. The well was spudded on the 9 April 1998 in 81.5m of water using the Northern Explorer III Drillship. The field is located in the Bass Basin between Victoria and Tasmania Australia (Figure 1).

The Yolla-2 appraisal well was planned as a straight hole well, with a target location 2,350m SSE and approximately 45m down dip at reservoir level of Amoco's 1985 Yolla-1 oil and gas discovery.

Yolla-2 was designed primarily to intersect a proposed GWC in the Zone 3 Yolla-1 equivalent 2,973m sand (the lowermost Intra-EVCM sand), however, at this location the Zone 3 sand was encountered at 3,029m MD, 21m below the FWL of 3,008m (Figure 2).

The top of high porosity sand in the EVCM was intersected at 1,876m MD (crestal oil and gas in Yolla-1) had fluorescence and elevated gas levels in Yolla-2, but was confirmed as water wet from log and pressure data. This interpretation is consistent with fluid levels in Yolla-1.

Yolla–2 had nine clearly defined pre drill objectives, the table below summarises how these objectives were met:

Objective (TCM Sept 1997)	**Result**
To recover hydrocarbons from each of the separate gas zones encountered in Yolla-1.	Producible gas was only intersected in Zone 1b in the Yolla-2 well. Composition similar to Yolla-1. Some gas associated with water was recovered from the MDT sample point at 3044mKB in Zone 3and analysed on the rig, but it is uncertain whether this is a reliable indication of the composition of gas in Zone 3.
To establish the height of each of the gas zones encountered in the Yolla wells.	Intersection of water legs in Zone 1b and Zone 3, coupled with pressure gradient interpretation from MDT's have achieved this objective. The volume of gas in thin, isolated Zone 1a and Zone 2 sands is interpreted to bevery small.
To establish the productivity of major gas bearing intervals.	A DST was not conducted as: (a) Zone 3 sands were intersected below the GWC. (b) It was considered that test information from Zone 1 in Yolla-1 together with the calibration of reservoir porosity and permeability using the Zone 3 core and CMR data should be adequate to determine gas deliverability.

Objective (TCM Sept 1997)	Result
To test the hydrocarbon potential of sands onlapping the volcanic pile encountered at the base of Yolla-1.	The well intersected a section very similar to Yolla-1 without any significant additional section encountered.
To gain significant information on the quality and continuity of the gas bearing reservoirs.	Excellent correlation of sands is interpreted between Yolla-1 and Yolla-2. Analysis of logs, core and MDT data suggests more favourable reservoir characteristics at the Yolla-2 location than in Yolla-1.
To add "substantially" to proven reserves. *(Note that here we refer only to in-place volumes, not recoverable reserves).*	"Proven", if defined as mean expected OGIP above the lowest known gas in the Yolla Main Fault Block, has increased from 131 BCF to 228 BCF. "Proven plus Probable", if defined as mean expected OGIP down to the most likely free water level in the Yolla main fault block, has been reduced from 442 BCF (based on previous most likely to 317 BCF.
To ensure that, should the well be dry, the potential volume of gas left up-dip does not represent an economic accumulation.	Achieved.
To obtain a sample from the water leg for calibration of petrophysical parameters.	Achieved.
If possible obtain sufficient information such that no further appraisal wells will be required in the Yolla Main fault block.	It is unlikely that a further appraisal well will be required in the Yolla Main fault compartment. However this will ultimately depend on revised interpretations incorporating all well results.

The well reached a total depth of 3,164mMD on the 14 May 1998, at which time an extensive suite of wireline logs was acquired. The well was plugged and abandoned (Yolla-2 was not designed to be suspended for possible use as a production well because of its down flank position, in relation to any future field development) and the rig was released on 30 May 1998.

1.2. Drilling Summary

Mooring

The Northern Explorer III drillship was mobilised from Singapore and arrived at the Yolla-2 location on the 5th April, 1998 at 06:30 hours with the #2 anchor on bottom at 11:20 hours. The MV Pacific Commander was used for anchor handling. Several anchors would not hold tension and piggy back anchors were required. After weather delays during the mooring operations all the anchors were in place on the 9th April, 1998 at 14:00 hours. The final position of the Northern Explorer III at Yolla-2 was 2.3m on a bearing of 202.7°(T) from the called location. Yolla-2 was spudded on the 9th April, 1998 at 21:00 hours. The water depth was 81.5m.

36" Hole/30" Casing

A Hughes CR-1 26" bit with 36" hole opener was used to spud Yolla-2 and drilled to 151.9m. Guar Gum sweeps were pumped every single as well as taking an Anderdrift survey. The hole was displaced with Hi-Vis mud prior to making a wiper trip. After making a wiper trip to the seabed the hole was circulated clean and displaced with Hi-Vis mud prior to running the 30" conductor.

The 30" conductor was made up with the PGB tripped into the hole and cemented with the shoe set at 151.5m. The shoe was drilled out with the Hughes CR-1 26" bit and drilled to 153m prior to drilling the 17-1/2" hole section.

17-1/2" Hole/13-3/8" Casing

A Hughes GTX-C1 17-1/2" bit and new BHA were made up and drilled ahead from 153m to 441m using seawater and Guar Gum sweeps every single and taking Anderdrift surveys every stand drilled. A trip was made to repair the Top Drive System (TDS) during which time the weather deteriorated. After waiting on the weather some remedial work was required to the anchor pattern due to slippage. Drilling continued with the same bit from 441m to 862m pumping Hi-Vis sweeps prior to each connection and taking Anderdrift surveys. The hole was circulated clean and displaced with Hi-Vis mud. A multishot survey was run whilst tripping out of the hole. The Multishot survey indicated the hole deviation to be between 0.1° and 0.3°.

The 13-3/8" casing plus 18-3/4" wellhead joint were run and cemented as per the drilling program. The casing shoe was set at 853m. The anchor tensions were tested and the anchors re-run as necessary prior to running the BOP stack and riser. The BOP stack was pressure and function tested.

12-1/4" Hole

A Hughes 12-1/4" AG526 PDC bit and new BHA were run into the hole and drilled out the float collar, shoe track and shoe plus 3m of new formation to 865m. The hole was circulated clean and displaced with KCl/PHPA/Polymer mud prior to performing a FIT (EMW=1.75sg). Drilling proceeded from 865m to 1,404m. A wiper trip was made prior to drilling ahead to 1,485m. Mud losses downhole (20-100bbl/hr) were experienced over the interval 1,405m to 1,485m. A bit trip was made after conditioning the mud.

A Hughes 12-1/4" ATMGT-18 tri-cone bit was used to drill ahead from 1,485m to 2,306m. Mud losses were variable throughout this interval ranging up to 60bbl/hr.

A Hughes 12-1/4" BD447 PDC bit was made up and tripped into the hole. Drilling proceeded from 2306m whilst the mud weight was reduced from 1.14sg to 1.1sg to abate the mud losses. A bit trip was made at 2,580m due to the low rate of penetration. Mud losses throughout this interval were 10-20bbl/hr.

A Reed 12-1/4" EHP41HLK tri-cone bit was used to drill ahead from 2,580m. A succession of hard igneous formation (Dolerite) was intersected from 2,580m to 2,613m which dulled the bit. A trip was made at 2,738m due to the low rate of penetration.

A 12-1/4" Hughes ATMP-18 with new BHA were made up and RIH. Excessive cavings were noted on the trip in whilst reaming tight hole from 2,207m to 2,376m. Drilling proceeded from 2,738m. At 3,033m a trip was made to pick up the core barrel to cut Core # 1. The weather deteriorated after making up the core barrel and a BOP pressure test was started. The weather conditions worsened during the BOP test. Anchor tension could not be held and the rig thrusters could not hold location (working at 60% output only). The LMRP was unlatched resulting in 23:5 hours of non productive time waiting on weather.

A 12-1/4" Corpro CM365F PDC core bit with 18m core barrel was tripped into the hole and cut Core #1 from 3,033m to 3,050.7m. The barrel appeared to jam-off or was full after cutting 17.7m. The core barrel was tripped out of the hole and the core recovered at surface (recovery 17.7m, 100%).

A 12-1/4" Hughes ATMP-09 was made up and used to drill from 3,050.7m to reach a Total Depth of 3,164m at 00:30 hours on the 14th May, 1998. A short wiper trip was made prior to pulling out of the hole and rigging up the wireline loggers to run Suite #1 of the logging program. The first run PEX-CMR could not pass a bridge at 1,256m after two further attempts with different string combinations the tools would still not pass 1,256m. A wiper trip was made before recommencing logging. The logging runs comprising Suite #1 were:-

1. PEX-AS
2. MDT
3. VSP
4. CMR-GR
5. FMS-NGT

After completing the wireline logging Yolla-2 was plugged and abandoned with cement plugs over the following intervals: 3,090-3,000m, 2,850-2,760m, 1,940-1,850m, 835-805m and 175-130m. A bridge plug was set at 835m. After pulling the BOP stack the wellhead was retrieved prior to releasing the Northern

Explorer III at 13:00 hours on the 30 May 1998. Appendix 1 contains a detailed Yolla-2 Drilling Report

2. WELL HISTORY

2.1. Formation Sampling

Drilling parameters only were recorded down to the 13-3/8" casing shoe at 862m MD. Cuttings were collected in the 12-1/4" once the BOP's and marine riser were connected.

Drill cuttings sample collection and distribution is summarised in Table 1. Descriptions of cuttings are included in Appendix 2.

Sample Distribution	Hole Section	Frequency (m)	Unwashed (Sets)	Unwashed (Quantity)	Washed and Dried (Sets)	Washed and Dried (Quantity)
Premier Oil Australasia	12-1/4" Hole	5m to 1,750m 3m to TD	1 1	300g 300g	1 1	100g 100g
Boral	12-1/4" Hole	as above	1 1	300g 300g	1 1	100g 100g
Mineral Resources Tasmania	12-1/4" Hole	-	not required	-	1 1	100g 100g
BRS Canberra	12-1/4" Hole	-	not required	-	1 1	100g 100g

Additionally one Samplex sample tray was collected over the above intervals and retained at the wellsite until the completion of the drilling campaign.

2.1.1. Cores

A single core was cut in the Z3 2973 EVCM sand equivalent. The pre-drill program called for a core to be cut in the Z1 2809 EVCM sand equivalent, however when intersected this sand was water wet. It was decided at that time by the Joint Venture to drill ahead as the opportunity to cut a core in the prognosed Z3 2973 EVCM gas sand still existed. The Z3 2973 EVCM was eventually cored even though it was water wet to allow calibration of wireline logs and for sedimentological studies.

The heterogeneous nature of the top EVCM sands meant that previous attempts to cut and retrieve core in the 1985 Yolla-1 well by conventional means had been unsuccessful. Coring and subsequent analytical procedures for Yolla-2 were carefully planned.

The cores were cut using an antiwhirl face discharge core head with disposable aluminium inner core barrel. At the wellsite, the cores were cut into 1 metre long sections and stabilised with resin poured around the annulus between the core and aluminium barrel. The cores were then back loaded and shipped to Geotechs laboratory in Perth for processing and analysis.

The routine core analysis procedure included core gamma, slabbing, core photography, probe permeability and initial 1" plug cutting. The uncleaned (to save time) 1" plugs provided "quick" porosity/permeability/grain density measurements prior to receiving wireline log data to aid with initial petrophysical analysis.

1-1/2" plugs were also cut, cleaned and dried for porosity/permeability/grain density. The difference in results between the 1 and 1-1/2" plugs was negligible as would be expected in a core taken from a water bearing reservoir. Porosities range between 8 and 25% (mean 14.8%) with permeabilities up to 7.8 Darcies.

Special core analysis (SCAL) was also undertaken by Geotech Perth and included Electrical Properties, Brinell Hardness, Centrifuge and Porous Plate Capillary Pressures, Residual Gas Studies, Overburden Porosity and Permeability measurement, Centrifuge air-brine relative permeability. The SCAL results will be contained in a separate report. The slabbed cores were also logged in detail in order to obtain as much stratigraphical information as possible to assist preparation of a depositional model.

Wellsite core chip and detailed core descriptions are included in Appendices 3 & 4. Core gamma, core log, core analysis results and core photography are included in Appendix 5 of this report.

Table 2. Core Summary

Core	Interval (m)	Cut (m)	Recovered (m)	%
1	3033 – 3050.7m	17.7	17.7	100

2.1.2. Sidewall Cores

There were no sidewall cores taken in Yolla-2.

3. LOGGING AND SURVEYS

3.1. Wireline Logging

The following wireline logs were run in the 12-1/4" open hole section:

Table 3
Wireline Logging Summary

SUITE/ RUN	TOOL STRING	INTERVAL (mMD)	BHT (°C)/TIME SINCE CIRC. (Hrs)		PLAYBACK SCALES
1/1	PEX-Sonic	3084 – 1065	114	10	1:200 1:500
1/2	MDT Pretests	3064 – 1876	132	42.	41 Pretests 3 Samples
1/3	MDT Samples	3064 – 1876	132	42.5	3 Pretests 5 samples
1/4	VSP	3050 – 840	135	51	1:200 1:500
1/5	CMR – GR	3055 - 2860	140	64.5	1:200 1:500
1/6	FMS – NGT	3081 – 1800	142	78.5	1:200 1:500

Table 4
Mud Properties At Time Of Logging

Fluid Type	KCL/PHPA
Density (G/C3)	1.13
pH	8.8
Fluid Loss(C3)	5.5
Viscosity (sec)	44
Cl (ppm)	39,000
KCL (lb/bbl)	20
Rm	0.169 at 18°C
Rmf	0.149 at 19°C
Rmc	0.185 at 18°C

A record of the logging operation follows.

3.2. Yolla-2 Wireline Logging Record

INCOMPLETE OPERATIONS

14/5/98 13:30 - 15/5/98 03:45

Rig up PEX-CMR, and run in hole, the tools hung up at 1,256m. Numerous attempts were made to get past the obstruction. The tools were pulled out of the hole and the CMR tool removed from the string and the PEX only was run in hole (the wireline operator can get more aggressive with this tool when trying to pass obstructions). The PEX tool could not pass 1,256m and was pulled out of the hole. A conventional supercombo logging string was rigged up and run in hole, it was thought at the time that the flexibility of this tool may allow it to pass the obstruction however this tool string stood up at 1,256m. The logging tools were rigged down and a wiper trip to TD conducted. The drill string had to be washed and reamed across the interval.

PEX-SONIC (WITH HALS RUN CENTERED USING CME-Z)

16/5/98 04:30 - 12:45

Because of the hole conditions experienced in the incomplete operation above and fears that the hole condition may be deteriorating it was decided to modify the logging program after the wiper trip in order to collect sufficient data to make tentative decisions on whether to test the well. The string was run in hole experiencing some difficulty (sticky hole) at 1,269m, 1,290m, it was also decided as a precaution should the tool become stuck to log down. The data was not acquired in high resolution mode (1,800ft/hr) again as a precaution against the tool getting stuck. The sonic tool failed on the up log from 2,270m, sonic data from the down log 1,065 to 2,270m was spliced to the up log.

Sonic data from 850m to 1,065m is missing (not acquired on the incomplete operation or subsequent logging runs) as the hole is badly washed-out.

MDT

16/5/98 13:40 - 17/5/98 20:00

During the first run in hole 41 pretests were completed, and a sample acquired at 3,044m. The Pump-out module failed when taking a sample at 3,031m, an additional sample was acquired at 2,814.5m without pumping out. The tool was pulled out of the hole and the Pump-out module fixed (damaged 'o' ring found). The tool was then run back in hole and an additional 3 pretests and 5 more samples acquired. The Pump-out module did not have 100% functionality on the second run and occasionally had to be activated manually but samples could still be acquired.

- All water samples were found to be contaminated with filtrate except the first sample acquired at 3,044m. In addition the sample chamber containing the sample collected at 2,810m on the second run was found to be empty when opened in the laboratory.

VSP

17/5/98 20:00 - 18/5/98 10:00

Time was lost waiting for the crane to rig up the seismic gun. Whilst running in hole 2 downgoing levels were acquired with the 2 CSAT combo. At 2,640m the bottom CSAT would not accept commands from the MAXIS. Completed the rest of the survey with 1 CSAT, the results of which were satisfactory. In total 43 levels were collected, above 2,470m check shot only data was acquired, partly as a desire to reduce logging time because of hole deterioration fears (particularly above 1,400m) and secondly to compensate for the breakdown of the second CSAT. Further details about the VSP are included in Appendix 9.

CMR

18/5/98 10:00 - 23:00

This tool was initially planned to be run in combination with the PEX tool in order to further refine zones for MDT pressure and sample points. However it was decided to keep the tool in the logging program to calibrate/compare its response to the porosity and permeability measurements gained from core. This calibration will be completed following completion of special core analysis.. Once again crane operations delayed the start of this logging run. After the tool was tuned the station log and five sandstone sections were logged. The data was of good quality and matched well with PEX density data across water-wet sandstone formations.

FMS

18/5/98 23:00 - 19/5/98 07:10.

Dipmeter was run with the NGT (Spectral Gamma ray tool) from TD to 1,800m. FMS imagery data was acquired with two passes (to increase the density of data) over 3 zones. The Z&S (Asia) Imagery Study has previously been distributed.

3.3. Mudlogging

Geoservices provided 24 hour formation evaluation and pressure engineering data during Yolla-2 drilling operations. This information was provided to the operator in the form of reports, evaluation logs and via wellsite monitors. It was also the responsibility of the Geoservices crew to monitor pit volume and gas levels and report these to drilling personnel if tolerances were exceeded.

The mudlogging unit was operated by two data engineers and two mudloggers each working 12 hour shifts.

There are no gas data or cuttings descriptions from surface to 862mMD, prior to running the 13-3/8" casing, installing the marine riser and BOP's.

The mudlog is included as Enclosure 2.

3.4. Temperature Data

Maximum bottom hole temperatures were recorded during each wireline logging run, these are shown in Table 3. The Horner extrapolated bottom hole temperature (BHT) is 155°C at 3,164m MD. This is markedly higher then the 132°C Horner extrapolared bottom hole temperature calculated from Yolla-1 and has implications for cement chemistry and logging tool selection in future Yolla wells. The geothermal gradient to this depth is 4.52°C/100m assuming a sea floor temperature of 12°C.

3.5. Deviation Surveys

Directional control for this well was provided by EMS survey tools and inclination only Anderdrift MWD surveys. From the seabed to 152m, the Anderdrift MWD surveys were taken every single. A Totco survey was taken prior to pulling out of the hole to run 30" casing. Both tools showed 0.0° inclination. The 17-1/2" open hole was surveyed with the Anderdrift MWD tool every stand from 152m to 862m. An EMS survey was run prior to running the 13-3/8" casing data showed that from 837.6m to 183.2m inclination varied between 0.1 and 0.3 degrees. The Anderdrift tool was again utilised in the 12-1/4" hole (except when the coring assembly was in hole) maximum hole angle was 2.5 degrees this corresponded well with the 2.2 degrees recorded with the EMS tool. Deviation data is summarised in Appendix 6 (Anadrill EMS) and at the end of Appendix 1 (Anderdrift MWD and Totco).

3.6. Velocity Survey

A vertical incidence velocity survey was run by Schlumberger in open and cased hole. In total 43 levels were collected, above 2,470m check shot only data was acquired. The data were acquired in one logging run using the three component Dual Combinable Seismic Imager tool (CSI). An array of three Air-Guns was used as the source. The guns were positioned 5 metres below mean sea level. Recording was made on the Schlumberger Maxis 500 Unit using DLIS format. The velocity survey report is included in Appendix 8 for completeness (the JV having already a separate report with enclosures)

3.7. MDT

MDT pressure data acquired over the top EVCM sands plot on a water gradient of 1.45 psi/m. MDT pressures acquired over the Zone 1 sandstones indicate a gas gradient to 2,834mSS which falls in a claystone section between the Z1 2,755m and Z1 2,809m sands. The Zone 3 2,973m sand was wet in Yolla-2 the sands plotting on a water gradient of 1.43 psi/m. The data obtained from the MDT was sufficient to determine that a cased hole DST not be undertaken, as the Zone 1 had been tested in Yolla-1. Refer to Appendix 8 for interpreted results and Appendix 12 for PetroLabs Reservoir Fluid Study.

3.8. Petrophysical Analysis

Sand development in Yolla-2 is superior to that encountered in Yolla-1 in terms of net to gross ratio and porosity. Petrophysical analysis suggests between 14.6 to 15.08m of net hydrocarbon pay in the well all attributed to the Z1 2,755m Yolla-1 equivalent sand, 2,792m to 2,815.5m in Yolla-2. A detailed Petrophysical report is included in Appendix 7.

3.9. Permanent Abandonment

The well was permanently abandoned by setting 3 open hole cement plugs across the hydrocarbon bearing sands. One Baker K-1 bridge plug was set in the 13-3/8" casing, with one 30m cement plug on top of the bridge plug, and one surface cement plug was set higher up in the 13-3/8" casing. Additional details are contained in Appendix 1 Drilling Report.

4. GEOLOGY

4.1. Structure

The Yolla-2 appraisal well was designed to further evaluate the hydrocarbons present in the sands of the Eastern View Coal Measures (EVCM) encountered in the Yolla-1 discovery. The well was located 2,350m SSE of the Yolla-1 surface location and approximately 50m structurally lower at reservoir level.

The basic structural architecture of the Bass Basin was established during the Early Cretaceous rifting phase related to the pull apart of the Australian and Antarctic plates. A deep structural ridge, underlying Yolla, was probably formed at this time, and remained a positive structural feature throughout the deposition of the EVCM. Drape and compaction form the dominant structural mechanisms with faults showing growth and increasing intensity with depth.

The deep basalts encountered in the base of Yolla-1, probably sit on the Late-Cretaceous to Early-Tertiary boundary, and are related to a widespread volcanic episode at that time. Similar extrusives are found in the nearby Tilana-1 well, and on the western side of the Cormorant Trough at Aroo-1. The top of the volcanics were encountered at 3083mMD in the Yolla-2 well. By the Top EVCM a quiet structural period commenced, and continued throughout the deposition of the marine shale Demon's Bluff Formation, and the early part of the Torquay Group limestones, shales and calcareous claystones, until the Oligocene/Miocene unconformity boundary. At this time, the Cormorant Trough was structurally inverted, which was accompanied in the Yolla area by the development of a massive volcanic complex. Volcanoes were formed, and the seismic data indicate a long history of multiple and overlapping cones and eruptions. While some of the Palaeocene age faults show signs of reactivation and may have formed feeder conduits for the volcanic material, the majority of material was sourced up through a north-south trending fault system that dominates the structural picture from the Late Oligocene onwards. A second phase of this same episode was the intrusion of igneous material into the EVCM, forming sills. In Yolla-2 a dolerite sill was encountered at 2,579mMD and is 33m thick, much thinner (sub seismic) then the comparable sill in Yolla-1.

Following this concentration of activity during the Early Miocene, there followed a structurally quiet period, that has continued to the present day, during which the remaining Torquay Group limestones were deposited.

The top EVCM, in Yolla-2 was intersected approximately 42.5m high to prognosis at 1,844m. The top Z1 2,718mMD (Yolla-1 equivalent sand) was intersected 3.5m deep to prognosis at 2,763mMD, in Yolla-2. The FWL in the Z1 sand interval was identified at 2,846mMD in Yolla-2 and 3,008mMD in the Z3 sand. The lowermost sand was intersected 29m low to prognosis at 3029.5mMD.

Dipmeter (SHDT) data was acquired in the Yolla-2 well in 12-1/4" hole from 3,081m to 1,800m, FMS imagery was also collected over 3 intervals 3,080m to 3,000m, 2,925m to 2,760m, and 1,950m to 1,860m. The SHDT and FMS data shows beds dipping at between 3° and 5° in a broadly WNW-ESE or NW-SE depositional strike direction throughout the reservoir section. The dip pattern complies with the mapped reservoir surfaces. Z&S (Asia) Limited at the request of the Joint Venture undertook a detailed study of the Yolla-2 FMS imagery and produced a separate report (previously distributed to the Joint Venture).

4.2. Well Stratigraphy

The reservoir targets in the Yolla-2 appraisal well were the Intra-Eastern View Coal Measures sandstones of Palaeocene to Early Eocene age. The prognosed secondary target (sandstones of Palaeocene - Late Cretaceous sands onlapping the volcanics intersected at the base of Yolla-1) were not developed in Yolla-2.

Torquay Group (Early Miocene to Present Day) Seafloor to 1,075m MD

Claystone: light grey-very light grey, medium light grey, soft-firm, amorphous in parts, blocky-subblocky, sticky, grades to Calcilutite in parts, slightly-moderately calcareous, common mica flakes, trace black carbonaceous specks / laminae, trace forams, trace bryozoans, trace-abundant fossil fragments, trace pyrite nodules.

Limestone: off white-yellow grey--vpl orange–light grey, light-medium grey, plastic, sticky, moderately-very calcareous, slightly dolomitic, trace cryptocrystalline, trace medium brown-black oxidised Fe, trace very fine grained quartz silt, trace nautilus shell fragments, coral, trace-common fossil fragments, trace very fine grained quartz silt, trace disseminated & nodular pyrite, trace calcite.

Siltstone: light grey, very fine grained quartz, w/ light brown dolomitic matrix, poor vis porosity, no fluor.

Angahook Unit 1 1,075-1,265.5m MD

The Angahook Formation can be divided into four lithological units. The upper three were deposited in the Early Miocene, the fourth unit being deposited in the Early Eocene.

Claystone: light grey-very light grey, occasionally light brown grey & light medium grey-medium dark grey, calcareous, arenaceous in parts, silty, grades to Siltstone, common black carbonaceous specks, trace micromica, soft-sticky, occasionally firm, blocky-subblocky, fissile in parts, trace coal, trace-common disseminated pyrite, trace pyrite nodules, trace fossil fragments, trace red lithics, trace–rare siderite

Limestone: light grey-medium grey, off white-yellow grey, gen soft-sticky, moderatley hard in parts, plastic, moderately-very calcareous, slightly dolomitic in parts, microcrystalline, grades to Calcarenite in parts, trace calcite, trace shell fragments, trace forams.

Sandstone: light grey, rounded-subrounded, very fine grained, grades to Calcisiltite in parts, poor vis porosity, no fluor.

Coal: dark brown-black, firm-hard, silty, common disseminated pyrite

Angahook Unit 2 1,265.5-1,316m MD

Miocene Volcanics 1,278-1,316m MD

Claystone: generally as above, dark grey-medium dark grey, non-silty calcareous, firm, blocky-subblocky, common disseminated pyrite, trace black carbonaceous specks, trace quartz grains, trace micromica.

Volcanics: (Tuff): white-light pale blue green, firm-soft, subblocky, very slightly calcareous, trace calcareous grains, trace quartz grains.

Sandstone: clear-transparent-translucent, very fine grained grades to Siltstone, occasionally fine grained, subrounded-rounded, well sorted, trace calcareous cement, predominantly loose, no vis porosity, no fluor.

Siltstone: yellow white-brown white, very fine-silt quartz grains, firm-hard aggregates, rounded-subangular, well sorted, trace glauconite, trace carbonaceous specks, common strong calcareous cement, trace siliceous cement, moderately-poor vis porosity, no fluor.

Angahook Unit 3 1,316-1,468m MD

Siltstone: yellow white-brown white, very fine-silt quartz grains, firm-hard aggregates, rounded-subangular, well sorted, trace glauconite, trace carbonaceous specks, common strong calcareous cement, trace siliceous cement, moderately-poor vis porosity, no fluor.

Limestone: yellow white-grey white, light brown orange, soft-firm, amorphous, cryptocrystalline-microcrystalline, trace calcareous, slightly dolomitic in parts, trace fossil fragments, common pelletal glauconite inclusions, trace pyrite inclusions.

Claystone: dark grey-medium dark grey-light olive grey-moderate olive brown, light blue grey in parts, argillaceous, non slightly calcareous, firm, blocky-subblocky, subfissile-fissile in parts, common disseminated pyrite, trace black carbonaceous specks, trace quartz grains, trace-rare micromica, trace glauconite.

Sandstone: light grey-light brown, transparent-translucent grains, very fine grained, moderately hard-hard, very well sorted, rounded-subrounded, minor glauconite, trace carbonaceous specks, strong calcareous cement, nil vis porosity, nil fluor.

Siltstone: very light grey-off white-light brown white, firm-moderately hard, occasionally hard, subblocky-blocky, moderate-strong calcareous cement, moderately calcareous, very argillaceous, common very fine-fine grained quartz, grades to a Sandstone in parts, trace-common glauconite, trace disseminated pyrite.

Angahook Unit 4 1,468-1,705.5 m MD

1,468-1,492.5m MD

Limestone: medium-dark red brown, firm-hard, blocky, microcrystalline-cryptocrystalline, dolomitic, nil vis porosity.

Siltstone: very light grey-off white-light brown white, firm-moderately hard, occasionally hard, subblocky-blocky, moderately calcareous, very argillaceous, common very fine-fine grained quartz, grades to a Sandstone in parts, trace-common glauconite, trace disseminated pyrite, moderate-strong calcareous cement.

Claystone: light grey-light olive grey-light brown grey-medium grey, soft-occasionally firm, subblocky-blocky, moderately-strong calcareous, argillaceous/silty in parts, grading to arenaceous siltstone in parts, trace-common glauconite, trace pyrite, trace carbonaceous specks, trace mica, trace fossil fragments.

Oligocene Unconformity 1,492.5m MD

1,492.5-1,705.5m MD

Siltstone: very light grey-off white-light brown, becoming brown grey-medium brown-gr rd in parts, firm-occasionally moderately hard, subblocky-blocky, occasionally subfissile, moderately calcareous, very argillaceous, common very fine-fine grained quartz, trace-common glauconite, trace disseminated pyrite, trace pyrite nodules, good calcareous cement, trace limonite(?), trace fossil fragments, poor vis porosity, trace dull yellow fluor, no cut fluor, grading in parts to sandstone.

Sandstone: light grey-light brown-pale yellow brown-medium brown, silt sized-very fine-fine grained, moderately hard-hard, rounded-subrounded-subangular, moderately well sorted, trace glauconite, trace moderately strong calcareous cement, trace dolomitic cement, grading to dolomitic siltstone in parts, trace siliceous cement red with depth, common clay matrix, trace pyrite, trace micromica, trace carbonaceous specks, trace glauconite, trace limonite(?), trace coral, nil-poor vis porosity, trace dull yellow mineral fluor, no cut fluor, no residual ring.

Claystone: light grey-light olive grey-light brown grey-medium grey becoming medium olive grey-dark grey in parts, soft-occasionally firm, subblocky-blocky, non-slightly calcareous, argillaceous/silty in parts, grad to arenaceous siltstone in parts, trace-common glauconite, trace micromica, trace-common pyrite nodules, trace carbonaceous specks, trace fossil fragments,

Dolomite: light-medium brown-dark yellow brown, occasionally pale yellow brown, very hard-hard, predominantly cryptocrystalline, occasionally microcrystalline, occasionally sucrosic-waxy text, trace very fine quartz grains, trace glauconite, argillaceous in parts, grades to dolomitic siltstone in parts, no vis porosity, no fluor.

Demons Bluff Formation (Late Eocene) 1,705.5-1,844m MD

Siltstone: grey brown-medium brown-dusky brown-dusky yellow brown, moderately hard–firm, occasionally soft, dispersive-amorphous, subblocky-blocky, occasionally subfissile, argillaceous in parts, moderately dolomitic cement, common very fine grained quartz, grades to very fine grained Sandstone in parts, trace glauconite, trace micromica, trace-common disseminated pyrite, trace pyrite nodules, trace fossil fragments.

Sandstone: light brown to moderate yellow brown, very fine-occasionally fine grained, firm-occasionally hard aggregates, rounded to subrounded, well sorted, trace pyrite, trace micromica, trace carbonaceous specks, trace fossil fragments, common dolomitic cement, trace siliceous cement, common clay matrix, poor inferred porosity, no fluor.

Claystone: Light blue grey-dusky brown, dusky brown, occasionally dark grey-brown black-black, soft-plastic, occasionally firm, subblocky-blocky, occasionally subfissile-fissile, dispersive in parts, non-slightly calcareous, trace very fine grained quartz, trace micromica, common disseminated pyrite, occasionally pyrite nodules, trace black carbonaceous specks, trace fossil fragments.

Dolomite: light-medium brown, firm-hard, occasionally soft, blocky, microcrystalline, silty, trace very fine grained quartz, grades to dolomitic Sandstone in parts, dull yellow mineral fluor, no cut fluor.

Top Eastern View Coal Measures (EVCM) 1,844m MD

1,844-1,876m MD

Claystone: dark grey-medium dark grey brown, occasionally pale yellow brown, silty, trace calcareous, trace micromica, soft-dispersive, amorphous.

Siltstone: dark grey-medium dark brown-dusky yellow brown, soft-dispersive, occasionally firm-hard, blocky-subblocky, trace calcareous, very argillaceous, good dolomitic cement, trace micromica, trace pyrite, occasional very fine grained quartz, occasionally subfissile.

Sandstone: pale green grey, very fine to fine grained quartz, moderately hard friable aggregates, occasionally loose grains, moderately good sphericity, subangular to subrounded, well sorted, common-abundant glauconite, trace carbonaceous specks, trace weak calcareous cement, common siliceous matrix, moderately-poor inferred porosity, no fluor.

Top EVCM Sandstone Interval 1,876-1,944m MD

Siltstone: dark grey-medium dark brown-dusky yellow brown, soft-dispersive, occasionally firm-hard, blocky-subblocky, occasionally subfissile, trace calcareous, very argillaceous, good dolomitic cement, trace-common micromica, trace pyrite, trace glauconite, common carbonaceous laminae, occasionally very fine grained quartz.

Claystone: dark grey-medium dark grey brown, occasionally pale yellow brown, soft-dispersive, amorphous, silty, trace calcareous, trace micromica.

Coal: black-brown black-very dark brown, subfissile-blocky, brittle, dull-metallic-subvitreous lustre, silty, subconchoidal fracture common disseminated pyrite, trace quartz grains.

Sandstone: light brown grey-pale light green grey, very fine to coarse grained, predominantly coarse, commonly moderately hard aggregates, moderately good sphericity, rounded-subangular, moderately sorted, mainly siliceous cement, w/ overgrowths, moderate calcareous cement, common disseminated pyrite, trace-common glauconite, trace carbonaceous mat, trace siderite, trace siderite, moderate visual porosity,

Sandstone: light grey, translucent, very fine to coarse grained, predominantly coarse, common moderately hard, moderately good sphericity, rounded-subangular, moderately sorted, common disseminated pyrite, trace-common glauconite, trace carbonaceous mat, trace siderite, mainly siliceous cement, overgrowths, moderate calcareous cement, moderate visual porosity, no fluorescence.

Sandstone: as above, w/ trace clay matrix, white-very light grey, soft-plastic, occasionally firm, non calcareous, slightly silty, occasionally carbonaceous laminae, blocky-subblocky.

Intra EVCM Lithologies

1,944 – 2,166m MD

Sandstone: light grey, translucent, very fine-coarse grained, predominantly coarse, commonly moderate hard, firm aggregates, moderate good sphericity, rounded-subangular, moderately sorted, mainly siliceous cement, common disseminated pyrite, trace-common glauconite, trace carbonaceous matter, trace siderite, moderate calcareous cement, trace quartz overgrowths, moderate visual porosity, no fluorescence.

Claystone: light brown-light brown grey-light grey, soft-firm, subblocky-blocky, subfissile-fissile in parts, non-slightly calcareous, trace very fine grained quartz , grades to Siltstone in parts, argillaceous, trace black carbonaceous specks

Coal: black-very dark brownish black, firm-moderately hard, blocky-subfissile, subconchoidal fracture, metallic-subvitreous lustre, common-abundant disseminated pyrite interbedded with the coal.

Siltstone: brown-dark brown, firm, occasionally hard, non-calcareous, trace dolomitic cement, trace to common micromica, blocky-subfissile, trace very fine quartz grains, trace black carbonaceous specks/laminations, very carbonaceous in parts, poor visual porosity, no fluorescence.

2,166 – 2,288m MD

Sandstone: light grey to light brown grey, very fine to fine, occasionally fine to medium, friable to moderately hard, subangular to subrounded, angular in parts, moderate sorting, weak siliceous cement, locally dolomitic cement, common silty/argillaceous matrix, locally common kaolinitic matrix and inclusions, trace carbonaceous fragments, occasional muscovite flecks, trace argillaceous/ carbonaceous microlaminae, poor to nil porosity

Claystone: medium-dark grey, blue grey, grey brown in parts, firm, blocky-platy in parts, slightly micromicaceous, trace carbonaceous speck, trace disseminated pyrite, waxy texture.

Siltstone: medium brown, grey brown, soft to firm, massive to blocky, very argillaceous, slightly arenaceous, micromicaceous, trace carbonaceous fragments & microlaminae, trace lithic fragments, trace gastropods and coralline fragments in parts.

Coal: black to brown black, subbituminous to bituminous, brittle, blocky, silty/argillaceous in parts, dull-predominantly subvitreous to vitreous lustre, subconchiodal fracture.

2,288 – 2,328m MD

Sandstone: translucent, frosted, fine to predominantly medium, disaggregated to occasionally friable, subangular to subrounded, good sorting, weak dolomitic/sideritic cement in parts, locally common kaolinitic matrix decreasing with depth, trace carbonaceous fragments, rare nodular pyrite, occasionally orange brown cryptocrystalline to microcrystalline hard dolomitic inclusions, fair to good porosity, occasionally dull orange mineral fluorescence only.

Siltstone: medium brown, grey brown, soft to firm, occasionally moderately hard, massive to blocky, locally very argillaceous grading to Claystone, micromicaceous, trace muscovite, occasionally fossil fragments, trace carbonaceous/coaly fragments & microlaminae, trace lithic fragments, slightly arenaceous in parts.

Claystone: medium grey, medium dark grey, grey brown, firm, blocky, slightly silty in parts, micromicaceous, trace carbonaceous speck, disseminated pyrite in parts, trace glauconite/chlorite in parts, waxy.

2,328 – 2,421m MD

Siltstone: medium brown, grey brown, soft to firm, occasionally moderately hard, massive to blocky, locally very argillaceous grading to Claystone, micromicaceous, trace muscovite, occasionally fossil fragments, trace carbonaceous/coaly fragments & microlaminae, trace lithic fragments, slightly arenaceous in parts.

Sandstone: translucent-frosted grains, fine to predominantly medium, disaggregated to occasionally friable, subangular to subrounded, good sorting, weak dolomitic/sideritic cement in parts, locally common kaolinitic matrix decreasing with depth, trace carbonaceous fragments, rare nodular pyrite, occasionally orange brown cryptocrystalline to microcrystalline hard dolomitic inclusions, fair to good porosity, occasionally dull orange mineral fluorescence only.

Claystone: medium grey, medium dark grey, grey brown, firm, blocky, slightly silty in parts, micromicaceous, trace carbonaceous speck, disseminated pyrite in parts, trace glauconite/chlorite in parts, waxy.

Coal: black-dark brownish black, firm – brittle, blocky-subfissile, moderately argillaceous, silty in parts, waxy texture, vitreous to subvitreous lustre, conchoidal fracture.

2,421-2,473m MD

Sandstone: white to off white, light grey in parts, very fine to occasionally fine, friable, subangular, good sorting, abundant kaolitic matrix, matrix supported grades to arenaceous siltstone in parts, common sticky kaolitic aggregates, trace lithic fragments, trace altered feldspar(?) clasts, trace carbonaceous speck, nil porosity, no fluorescence.

Siltstone: brown grey, medium to dark brown, soft-firm, blocky-subfissile in parts, moderately to very argillaceous locally grades to Claystone, micromicaceous, trace lithic fragments, locally common carbonaceous/coaly fragments.

Coal: (Tr) black, brown black in parts, brittle, blocky, argillaceous, subbituminous to bituminous, subvitreous to locally vitreous lustre, subconchoidal fracture.

Igneous Intrusive Interval 2,571 – 2,613m MD

Dolerite: light grey green, light grey, translucent-off white, medium green in parts, black in parts, hard, blocky, brittle in parts, massive, predominantly medium-coarse crystalline olivine/ biotite/ quartz/ pyroxene, locally common black glassy occasionally microvesicular groundmass w/ metallic lustre, predominantly basaltic, Claystone: medium grey, medium dark grey, grey brown, firm, blocky, slightly silty in parts, micromicaceous, trace carbonaceous speck, disseminated pyrite in parts, trace glauconite/chlorite in parts, waxy.

2,328 – 2,421m MD

Siltstone: medium brown, grey brown, soft to firm, occasionally moderately hard, massive to blocky, locally very argillaceous grading to Claystone, micromicaceous, trace muscovite, occasionally fossil fragments, trace carbonaceous/coaly fragments & microlaminae, trace lithic fragments, slightly arenaceous in parts.

Sandstone: translucent-frosted grains, fine to predominantly medium, disaggregated to occasionally friable, subangular to subrounded, good sorting, weak dolomitic/sideritic cement in parts, locally common kaolinitic matrix decreasing with depth, trace carbonaceous fragments, rare nodular pyrite, occasionally orange brown cryptocrystalline to microcrystalline hard dolomitic inclusions, fair to good porosity, occasionally dull orange mineral fluorescence only.

Claystone: medium grey, medium dark grey, grey brown, firm, blocky, slightly silty in parts, micromicaceous, trace carbonaceous speck, disseminated pyrite in parts, trace glauconite/chlorite in parts, waxy.

Coal: black-dark brownish black, firm – brittle, blocky-subfissile, moderately argillaceous, silty in parts, waxy texture, vitreous to subvitreous lustre, conchoidal fracture.

2,421-2,473m MD

Sandstone: white to off white, light grey in parts, very fine to occasionally fine, friable, subangular, good sorting, abundant kaolitic matrix, matrix supported grades to arenaceous siltstone in parts, common sticky kaolitic aggregates, trace lithic fragments, trace altered feldspar(?) clasts, trace carbonaceous speck, nil porosity, no fluorescence.

Siltstone: brown grey, medium to dark brown, soft-firm, blocky-subfissile in parts, moderately to very argillaceous locally grades to Claystone, micromicaceous, trace lithic fragments, locally common carbonaceous/coaly fragments.

Coal: (Tr) black, brown black in parts, brittle, blocky, argillaceous, subbituminous to bituminous, subvitreous to locally vitreous lustre, subconchoidal fracture.

2,473-2,579m MD

Massive Siltstone locally altered by the igneous intrusive metamorphic areole.

Siltstone: brown grey, brown black, soft-firm, hard in parts, massive to blocky, very argillaceous grades to Claystone in parts, micromicaceous, trace to locally common carbonaceous fragments, trace lithic fragments, slightly siliceous in parts.

Shale: olive black brown black, moderately hard, micromicaceous, very carbonaceous grades to carbonaceous shale in parts, common disseminated pyrite, subfissile to fissile in parts.

Sandstone: light grey to off white to very light brown, very fine to fine grained, occasionally medium-coarse, predominantly fine, friable-hard, subangular-subrounded, poor to moderately sorted, common silaceous cement, trace white interstitial clay, trace carbonaceous specks, trace lithic fragments, trace pyrite, nil visible porosity, nil fluorescence.

Igneous Intrusive Interval 2,579 – 2,612m MD

Dolerite: light grey green, light grey, translucent-off white, medium green in parts, black in parts, hard, blocky, brittle in parts, massive, predominantly medium-coarse crystalline olivine/ biotite/ quartz/ pyroxene, locally common black glassy occasionally microvesicular groundmass w/ metallic lustre, predominantly basaltic, common micropyroxene, predominantly disaggregated crystals, trace tourmaline laths, becomes coarse-very coarse w/ abundant free quartz w/ mafic mineral inclusions w/ depth, moderately calcareous in parts, occasionally chloritic groundmass.

Claystone: light green grey, off white, light-medium grey, brown grey, blue grey in parts, tan, soft-disseminated, occasionally firm, massive-amorphous in parts, trace lithic fragments, occasionally slightly silty, trace altered mica, micromica in parts, trace gastropods/coralline fragments, trace medium brown cryptocrystalline dolomitic inclusions.

Sandstone: off white, very fine, friable, angular, good sorting, abundant kaolinite matrix, matrix supported, trace carbonaceous speck, no visual porosity, no fluorescence.

Siltstone: brown grey, brown black, firm, moderately hard in parts, massive-blocky, very argillaceous grades to Claystone in parts, locally common carbonaceous speck, micromica, trace lithic fragments.

2,612-2,763.5m MD

Massive Siltstone locally altered by the igneous intrusive metamorphic areole.

Siltstone: brown grey, brown black, soft-firm, hard in parts, massive to blocky, very argillaceous grades to Claystone in parts, micromicaceous, trace to locally common carbonaceous fragments, trace lithic fragments, slightly siliceous in parts.

Shale: olive black brown black, moderately hard, micromicaceous, very carbonaceous grades to carbonaceous shale in parts, common disseminated pyrite, subfissile to fissile in parts.

Sandstone: light grey to off white to very light brown, very fine to fine grained, occasionally medium-coarse, predominantly fine, friable-hard, subangular-subrounded, poor to moderately sorted, common silaceous cement, trace white interstitial clay, trace carbonaceous specks, trace lithic fragments, trace pyrite, nil visible porosity, nil fluorescence.

Claystone: light grey to pale yellow brown-pale brown to pale brownish green, soft to sticky, moderately hard to firm in parts, non calcareous, abundant silt to very fine grained quartz, grades to argillaceous siltstone in parts, trace black carbonaceous specks, trace lithic fragments, trace fossil fragments.

Coal: black, bituminous, brittle, blocky, vitreous lustre, subconchoidal to conchoidal fracture.

4.3. Reservoir

The Yolla-2 well intersected the top of the lower EVCM reservoir sands at 2,763mMD, 3.5m deep to prognosis. The reservoir sand development in Yolla-2 is superior to that encountered in Yolla-1 both in terms of net to gross ratio and porosity. A description of each of the reservoir intervals follows.

2,763.5–2,792.5m MD (Z1 EVCM 2718 sand)

Sandstone: off white-pale yellow brown, translucent, frosted, fine-predominantly medium, disaggregated, loose medium-coarse-very coarse grains, fining upwards, subangular to subrounded, good sorting, moderate cement aggregates in parts, rare kaolinite inclusions, trace biotite, trace nodular pyrite, grades to Siltstone in parts, poor-good porosity, occasionally bright yellow white fluorescence-trace dull yellow orange pinpoint fluorescence, slow streaming cut fluorescence reducing to nil, milky white-yellow crush cut fluorescence in parts, thin chalky white residue ring.

Siltstone: light grey-brown grey-occasionally brown black, soft-firm, moderately hard-hard, massive-blocky bcm subfissile-fissile, very argillaceous grades to Claystone & Shale in parts, micromica, trace-common carbonaceous fragments, trace lithic fragments, occasionally trace very fine arenaceous inclusions, moderately siliceous in parts.

2,792.5-2,859.5m MD (Z1 EVCM 2755 sand interval)

Sandstone: light grey-light brown, brown in parts, translucent, fine-medium grain, predominantly medium, occasional-common coarse grains, loose, rounded to subrounded, moderately well sorted, moderately cemented aggregates, trace carbonaceous specks, trace kaolinite matrix, trace lithic fragments, trace biotite, good inferred porosity, trace dull yellow orange pinpoint fluorescence, no cut fluorescence, no crush cut fluorescence.

Siltstone: light grey-brown grey-occasionally brown black, soft-firm, moderately hard-hard, blocky-platy in parts, very argillaceous grades to Claystone in parts, micromica, trace-common carbonaceous specks, trace lithic fragments, occasionally trace very fine arenaceous inclusions.

Sandstone: translucent-frosted grains, medium-coarse-very coarse, disaggregated, hard aggregates in parts, angular-subangular, poor sorted, strong siliceous cement, trace-common quartz over growths, nil-poor porosity, no fluorescence.

Sandstone: translucent-frosted, fine-medium, disaggregated, subangular to subrounded, good sorting, trace kaolinite inclusions, trace coarse fractured milky quartz, trace quartz over growths, fair-good porosity, no fluorescence.

2,859.5-2,895.5m MD (Z1 EVCM 2809 sand interval)

Sandstone: translucent, frosted grains, medium-pred coarse, becoming fine-medium, subangular to subrounded, moderately sorted, trace siderite cement coating, trace kaolinite inclusions, trace muscovite, trace very coarse fractured quartz, trace pale aggregates, disseminated pyrite, poor-fair-good porosity, trace dull orange mineral fluorescence-trace dull pale yellow patchy fluorescence, very weak diffuse cut, thin residual ring.

Siltstone: brown grey, light-medium brown in parts, off white-pale brown, firm-moderately hard, blocky, locally very argillaceous, micromica, locally common carbonaceous/coaly fragments/laminae, arenaceous in parts & grading to very fine silty sandstone.

Claystone: medium-dark grey, brown grey in parts, firm-moderately hard, blocky-subfissile, micromica, trace lithic fragments, smooth, waxy, homogeneous.

Coal: black, bituminous, brittle, blocky, vitreous lustre, subconchoidal-conchoidal fracture.

2,895.5-2,932m MD (Z1 EVCM 2844 sand interval)

Sandstone: light brown grey-very light grey, translucent-transparent, fine-medium grain, occasionally coarse-very coarse grain, predominantly loose, friable aggregates in parts, moderately sorted, subangular to subrounded, fine grained, well rounded, trace carbonaceous/coaly matter, trace pyrite, trace siderite cement, trace siliceous cement, trace kaolinite matrix, occasionally aggregates, poor-moderate inferred porosity, trace dull yellow fluorescence, nil cut/crush cut fluorescence.

Siltstone: grey black-dark grey-brown grey, light-medium brown in parts, predominantly dusky yellow brown in parts, firm-moderately hard, blocky, subfissile in parts locally very argillaceous, grades to Claystone in parts, micromica, locally common carbonaceous/coaly fragments/laminae, grades to carbonaceous Shale in parts, arenaceous in parts.

Claystone: medium grey-light medium grey-blue grey, yellow grey in parts, firm-moderately hard, blocky-subfissile, arenaceous, slightly calcareous, slightly siliceous in parts, smooth, waxy, homogeneous, trace carbonaceous matter, trace micromica.

2,932-2,949m MD (Z2 EVCM 2873 sand interval)

Sandstone: light grey-pale brown, off white, very fine-silty, becomes fine in parts, friable, subangular, good sorting, moderately siliceous cement in parts, trace abundant kaolinite matrix, matrix supported in parts, trace carbonaceous laminae, trace biotite, nil porosity, no fluorescence.

Siltstone: dark grey-brown grey, grey black, firm-moderately hard, blocky-platy in parts, locally very argillaceous, grades to Claystone in parts, micromica, locally light grey, very fine arenaceous inclusions, trace-common carbonaceous fragments, trace nodular & disseminated pyrite, trace fossil fragments.

2,949-3,008m MD

Claystone: light grey-medium grey-medium dark grey, yellow grey-orange grey in parts, moderately hard, blocky-subfissile, slightly micromica, slightly siliceous in parts, silty in parts, smooth, waxy, homogeneous.

Siltstone: pale yellow brown-medium brown-dark brown, occasionally black brown, firm-moderately hard, soft-sticky in parts, subblocky-subfissile, massive-amorphous, non calcareous, argillaceous, grades to Claystone in parts, siliceous cement in parts, trace lithic fragments, trace-common black carbonaceous specks, trace disseminated pyrite, trace fossil fragments, trace very fine grained quartz.

3,008-3,030m MD (Z3 EVCM 2952 sand interval)

Siltstone: brownish grey-medium grey brown, massive-blocky, very argillaceous grading to Claystone, micromicaceous, local traces of carbonaceous specks, trace light grey arenaceous inclusions, trace biotite, trace lithic fragments, slightly siliceous.

Sandstone: clear-translucent, frosted, fine-medium grained, subangular-subrounded, good sorting, clean, trace kaolinite inclusions, trace nodular pyrite, trace muscovite, trace coal fragments, dissaggregate, good porosity, no fluorescence.

3,030-3,083m MD (Z3 EVCM 2973 sand interval)

Core #1 was cut in the Z3 2,973m EVCM Yolla-1 sand equivalent, however at the Yolla-2 location the sands were water wet. 17.7m of core was cut and retrieved. The core starts 3m below the top of the Z3 2,973m sand at 3,030m and ends 1.3m above the base of the sand at 3,052m.

Depth matching of the cores to logs using the detailed lithological logs and core gamma-ray indicates that the core is off-depth: Core Depth + 2.4m = Log Depth.

This core spans most of the Zone 3 2,973m sand and consists of high energy channels, the basal sections of which contain pebbles up to 2cm in diameter. The channels alone are not diagnostic of any specific depositional environment. An argillaceous sand section in the core between 3038.6 and 3039.6m contains sedimentary features such as opposing current ripples and trace fossils including Teichichnus, Chondrites and Diplocraterion. This evidence suggests that the mudstones were deposited in a marginal marine setting , subject to tidal influences. By inference the channel sands were also probably located in a marginal marine setting.

Sandstone: off white-very light grey, translucent, frosted, very fine-very coarse grained, predominantly loose, friable–moderately hard aggregates, angular-subangular, occasionally subrounded, moderately sorted, strong siliceous cement in parts, common kaolinite matrix, trace carbonaceous specks, rare glauconite, trace lithic fragments, rare nodular pyrite, poor inferred porosity, no show.

Siltstone: brown grey, medium grey brown-brown black, massive-blocky, very argillaceous grades to Claystone, micromica, locally trace carbonaceous specks, rare biotite, trace lithic fragments, trace arenaceous inclusions in parts, slightly siliceous.

3,083-3,164m TD

Volcanics: off white to brown grey, dark grey, grey red, red brown, light to dark green, olivine basalt, trace to locally common dark green fine crystalline orthoclase/olivine/K feldspar/mafic mineral assemblage, firm to hard, massive to blocky, cherty in parts, locally sparry dolomitic/calcite infill. Occasionally orange brown weathered(?) tuffaceous horizons.

4.4. Hydrocarbon Occurrences

Table 5
Hydrocarbon Shows

Depth (m) MD	Total Gas (%)	Shows	Lithology
1902-1940	0.2%	Moderate solid yellow green fluoro, green-yellow white instant streaming cut fluoro, yellow white crush cut fluoro, trace milky white residual ring	Sandstone:- light brown grey to pale light green grey, very fine to coarse grained, moderately good sphericity rounded-subangular, moderately sorted, common pyrite & glauconite, trace carbonaceous & sideritic material. Common calcareous cement as overgrowths, mainly siliceous cement, predominantly coarse, commonly moderately hard, firm aggregates, moderate visual porosity.
2796-2817	43%	Nil to trace dull yellow orange pinpoint fluoro, no crush cut, no residual ring	Sandstone:- clear-light grey-light brown, brown in part, translucent, fine-medium grained, predominantly medium, occasionally coarse, rounded-subrounded, moderately well sorted, trace carbonaceous specs, kaolinite matrix &biotite. Loose, occasionally friable, good inferred porosity.
2874–2880	2%	Trace very dull yellow patchy fluoro, weak yellow white crush cut, thin yellow white residual ring	Sandstone:- clear-translucent, frosted, medium to predominantly coarse grained, subangular to subrounded, poor sorting, trace weak siliceous cement, trace kaolinite matrix/inclusions, trace Qtz over Growths & pyrite, disaggregated, occasional hard aggregates, fair-good porosity
3069-3075	3.5%	Trace bright yellow white pinpoint fluoro, no crush cut, no residual ring	Sandstone:- off white-light grey, translucent, coarse to very coarse grained, angular to subangular, moderately sorted, trace carbonaceous specs, predominantly loose, occasionally fine to medium grained, friable to moderately hard aggregates, poor inferred porosity.
3081-3090	5%	Trace dull yellow gold patchy direct fluoro, very weak diffuse crush cut, thin residual ring	Sandstone:- off white-light grey, translucent, medium to coarse grained, angular to subangular, moderately sorted, trace black carbonaceous specs, kaolinitic matrix & lithic fragments, friable to moderately hard aggregates, poor inferred porosity

5. SELECTED BIBLIOGRAPHY

"Yolla-2 Well Proposal T/RL1", 1998 Boral Energy Resources Ltd

"T/RL1 Well Prognosis Yolla-2 Bass Basin", March 1998 PremierOil Australia Pty Limited

"Yolla-2 Sedimentological Interpretation of Formation Micro-Scanner (FMS) Images Yolla-2" July 1998 Z&S (Asia) Limited

APPENDIX 1

DRILLING REPORT

By

Premier Oil

YOLLA-2

565041

PremierOil
Australasia

YOLLA-2
BASS BASIN, TASMANIA, AUSTRALIA

WELL COMPLETION REPORT

DRILLING REPORT

JUNE 1998

Exploration Well Yolla-2

Well Completion Report

Revised by:

V. Singleton,
Computer Geologist

Approved by:

B. Ulmer,
Operations Manager

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1. EXECUTIVE SUMMARY

Yolla-2 was drilled with the drillship "Northern Explorer III" in T/RL1, Bass Strait. The original cost and time estimates for drilling the well to 3700 metres, coring, logging, and abandoning the well were US$10.1MM and 35 days. Drilling operations were managed by Premier Petroleum (Australia) Limited on behalf of the permit Operator Boral Energy Resources Limited.

The drillship arrived at the Yolla-2 location, the Bass Strait Block T/RL1 at 02 45 hrs on 5th April 1998, and the well was spudded at 21:00 hours on the 9th April 1998. After drilling, logging and permanent abandonment, the rig was released from the well at 13:00 hrs on 30th May 1998. The drillship then moved to the White Ibis-1 location.

Yolla-2 is the first well drilled in the Bass Strait by Premier Oil Australasia. The well was a vertical exploration/appraisal well designed with twin geological objectives. The primary target was to appraise the hydrocarbon bearing potential of the Eastern View Coal Measures prognosed at a depth of 1886m MDRT. The secondary objective, possible sandstones of Palaeocene-Late Cretaceous age, onlapping the basal volcanics in Yolla-1 were not present.

Two 18m cores and a full suite of electric logs (and dependant upon shows optional MDT, FMS and CMR) were planned for formation evaluation. However, only one core was cut from 3033 to 3051m MDRT. A full logging suite with additional CMR, FMS, NGS and an extensive MDT program was conducted. Hole condition over the zones of interest was excellent resulting in high quality log data.

The well was drilled to 3,164m MDRT and logged in 41 days. Abandonment was achieved by setting three open hole cement plugs, one 13 $^3/_8$" bridge plug/cement plug combination and a surface cement plug. The 30" and 13 $^3/_8$" casing was severed and the wellhead housing recovered.

Following abandonment the Northern Explorer III departed the Yolla-2 bound for the White Ibis-1 location after a total of 56 days on site.

The final cost and time for anchoring, drilling, coring, logging, and abandoning the well were US$15.0 MM and 56 days.

2. WELL DATA SUMMARY

Well Name	:	Yolla-2
Classification	:	Exploration / Appraisal
Surface Location	:	Datum AGD 84
		Latitude 39° 51' 33.889" S Longitude 145° 48' 38.493" E
	:	AMG Zone 55 C.M. 147° East
		Eastings: 398271.48 mE Northings: 5587154.23 mN
Drillship Heading	:	271.2 (T)°
Drilling Contractor	:	Northern Offshore Ltd
Drilling Rig	:	Northern Explorer III
Rig on Location	:	02:45 hrs, 5th April 1998
Well Spudded	:	21:00 hrs, 9th April 1998
Rig Moved Off Location	:	13:00 hrs, 30th May 1998
Total Days on Well	:	56 days
Total Depth	:	3,164m MDRT (Drillers depth) 3,100m MDRT (Logger's HUD)
Rig Datum	:	RT-MSL - 12.5m WD - 81.5m RT-ML - 94m
<u>Hole Sections</u>		
26"/36"	:	152m MDRT
17 ½"	:	862m MDRT
12 ¼"	:	3164m MDRT
<u>Casing Setting Depths</u>		
30"	:	152m MDRT
13 3/8"	:	853m MDRT

3. WELL OBJECTIVES COMPLIANCE

Primary Well Objectives	Objectives Compliance
• Drill vertical well to test the early Eocene through late Cretaceous sands of Eastern View Coal Measures • Cut two 18m cores • Run full suite of electrical logs, & depending on shows: MDT, FMS and CMR • Conduct cased hole test if hydrocarbons found	• Drilled vertically (2.2 deg @ 3146m) to modified TD, Gas bearing sands were encountered • One 18 m core cut, 98% recovery. • Full logging suite ran, with two tool failures (MDT - repaired, CSAT). Array sonic not acquired. • No well test performed (Gas in Zone 1B only was previously tested at Yolla-1).
Secondary Well Objectives	**Objectives Compliance**
• Establish gas zone productivity • Confirm reservoir fluid • Conduct DST if hydrocarbons found	• Log and MDT data confirmed zone. • MDT samples obtained. • Data obtained for Zone 1B previously at Yolla-1.
Safety and Environmental Objectives	**Objectives Compliance**
• No lost time accidents. • Successfully utilise water based mud throughout the well. • Implement H2S procedures if required.	• No LTAs, 2 x reduced duty injury • Objective achieved, except for poor hole quality over 850-1315m RT • No H2S encountered.
Commercial Objective	**Objective Compliance**
• Mobilise rig, drill, log and abandon well within 35 days.	• Estimated Final Well Cost was 47.9% over the AFE.
Drilling Engineering Objectives	**Objective Compliance**
• Successfully drill well with modified casing program avoiding the need to TD in 216mm (8 ½") hole. • Drill all hole sections with water based mud and avoid stuck pipe occurrences. • Minimise formation damage particularly in reservoir section. • Minimise weather downtime	• Casing design successfully used to reach TD and test the well, but strategy resulted in some lost time during logging and failure to obtain all geophysical data. • Objective achieved. pipe was tight and stuck for four hours in 12 ¼" hole section. • Log data indicated limited formation damage. • Correct anchor pattern, wire length and rig heading minimised weather downtime. Different anchors were required to achieve required tensions.

4. SAFETY & ENVIRONMENTAL PERFORMANCE

The following safety & environmental statistics were recorded for the 56 days spent on the well:

Number of LTA during well	:	0 LTA
Restricted duty injuries	:	2
Minor injuries	:	15
Spills	:	None

The HSE incidents are detailed in Table 1. It should be noted that the incident rate drastically reduced with time from commencement of project.

5. COST & TIME SUMMARY

5.1. Cost Breakdown

Commercial performance can be presented as follows:

AFE cost	:	$ 10.108 MM
Actual total cost	:	$ 14.953 MM

This equates to an over run of $4.845 MM or 47.9 % above the original AFE.

Cost/m to TD, Logs	:	4 726 $/m
m/Day to TD, Logs	:	56.5 m/d

A full cost breakdown showing the AFE and Supplemental AFE breakdowns is in Appendix 1.

5.2. Major cost over-runs

The cost overruns were mainly due to the extended well time of 56 days, which was mostly a result of:

a) Initial anchoring on location.

b) Drilling related WOW.

c) Boat related WOW.

d) Problems cutting casing/retrieving wellhead at abandonment stage.

e) Logging – wiper trip (due to shallow hole problems) & tools (MDT, CSAT) failing.

f) Slow rig performance when running the BOP/riser for the first time.

g) ROV failures.

6. TIME BREAKDOWN

The planned scope of work from move on location/run anchors through to P&A was anticipated to take 35 days. The actual time to load out in Singapore, move to location in the Bass Strait, drill, log and P&A the well was 81 days, with time to move on location, drill, log & P&A being 56 days.

A time breakdown into Move, WOW, NPT and Operating time from contract commencement is shown in Figure 3.

6.1. Key Time Breakdowns

AFE days (drilling)	:	35
Actual days (drilling)	:	56
Lost time days (drilling)	:	18.5
Lost time (%)(drilling)	:	33 %

The drilling time depth curve and time distribution for Yolla 2 is shown in Figures 3 & 5.

The pie chart in Figure 5 shows the percentage time breakdown of drilling phase operations from spud to P&A.

7. FLAT TIME COMPARISON

7.1. 30" Conductor

The 30" conductor was run and cemented in 40 hours against a planned 18 hours. The forty hours includes 20 ¾ hours to make up the 18 ¾" wellhead housing, handle the 26" BHA, run in hole and drill out 30" shoe. The conductor casing was actually run in 18 hrs from running 30" conductor to recovering 30" CART.

7.2. 13 3/8" Casing

The 13 3/8" casing was run and cemented in 26 hours against a planned 24 hours, with only minor problems with rig tong jaws and the need to jet the wellhead clean prior to running BOP/riser.

7.3. BOP/Riser Running

The BOP/riser was run in approximately 4 ½ days against a planned 24 hours.

A large part of this time was spent installing the ball joint & making up the first riser joint and choke/kill flex loops prior to WOW (17 ¾ hrs) and WOW (11 hrs). The remaining time was due to slow running of riser, problems with leaking C&K seals, and scale/rust in the C&K lines.

While running BOP/riser, anchor handling operations were ongoing to re-run and piggy back anchors.

7.4. Abandonment

The abandonment of the Yolla-2 well took a total of approximately 10 days against a planned 2 days.

The time was mostly due to wait on weather downtime, and downtime due to problems cutting casing and recovering the wellhead.

8. DRILLING PERFORMANCE SUMMARY

8.1. What Went Right?

- Good boat performance during rig move & anchoring.
- Drillstring inclination at spud from Anderdrift tool – no Totco survey.
- Drilling performance in 17 ½" hole was better than planned.
- Good cement job on 13 3/8" casing achieved, despite plugs not appearing to release during displacement.
- BOP latched and pressure tested on first attempt.
- Good rockbit selection (ATM GT 18) prior to drilling volcanics.
- Early identification of washouts prevented further problems, i.e twist offs.
- Successful unlatching / re-latching of LMRP under severe weather conditions.
- Excellent coring performance utilising bumper subs.
- No LTIs during drilling operation.

8.2. Drilling Related Problems

- Unsuitable anchors initially used, requiring piggy backing of primary anchors.
- Inexperienced crews caused slow rig operations
- Severe storm caused anchor slippage requiring re-setting of anchors.
- TDS electrical problem – Varco engineer mobilised to rectify problem.
- Unable to stab 17 ½" assembly into wellhead due to ROV failure.
- Tam inflatable casing circulating packer did no work – unable to find problem with tool when returned to shore.
- Choke & kill lines on riser full of scale & rust.
- Incorrect torquing tools for ball joint.
- Poor supervision / organisation when running BOPs / riser.
- Centrifuge not working at start of 12 ¼" hole – no spare parts on board.

- Poor performance from heave compensator ruling out performance drilling.
- Washouts occurred in the drillstring.
- Initial problems running logs due to hole bridging off.
- Failure of logging tools (MDT, sonic tool & 2nd CSAT)
- Problems cutting 13 $^3/_8$" and 30" casing at abandonment stage.
- Problems with ROV during abandonment.
- Poor hole conditions between 850-1315mRT.

8.3. Lost Time Summary

- Initial anchoring on location.
- Drilling related WOW.
- Boat related WOW.
- Problems cutting casing/retrieving wellhead at abandonment stage.
- Logging – wiped trip & tools (MDT, CSAT) failing.
- Poor rig performance when running the BOP/riser for the first time.
- ROV failures.

9. DRILLING OPERATIONS SUMMARY

9.1. Rig Mobilisation

The Northern Explorer III was taken on contract by PremierOil Australasia from Northern Offshore Ltd in Singapore on 18.00 hrs, 10th March 1998. After initial stocking, the rig departed Singapore on 16th March 1998 bound for the drilling location in the Bass Strait. When sailing past Perth (March 25th 1998) some personnel – Drilling Supervisor, mud engineer - boarded the Northern Explorer III via chopper for the last part of the voyage.

To minimise the time required to handle the rigs anchor chains and to load the rig with the Australian equipment and materials the Northern Explorer III was re-directed to the Geelong shorebase. The rig arrived late on April 2nd and departed on the 4th April 1998.

The rig arrived on the Yolla 2 location at 02:45 hrs, 5th April 1998, with anchoring operations being completed at 17.00 hrs, 9th April 1998. All 8 anchors required the maximum of 750 ft of chain and piggy back anchors to secure the rig on the extremely hard seabed. Several anchors continued to slip that required larger StevPris anchors specifically designed for hard seabeds. Poor weather contributed to the delay's experienced during anchor handling.

Final position was confirmed at :

Latitude	:	39° 51' 33.889" S
Longitude	:	145° 48' 38.493" E

Rig Heading : 271.2° (T)

This was 2.3 m from the intended location on a bearing of 202.7°(T).

The following rig datum was established:

RT - MSL	:	12.5m
WATER DEPTH AT MSL	:	81.5m
RT-ML	:	94m

The total time from the rig being on contract to arriving on location was 26.36 days, with time from starting anchoring operations until spud being 4.59 days.

<u>Key Learning/Recommendations</u>

1. *The original Amoco Yolla 1 site survey was found to be less than adequate to determine actual seabed anchoring parameters.*

2. *Drill Ship cost effectively transported materials to site from Singapore and is a significant cost saving when considering drilling rig selection.*

3. *Bruce anchors required piggy-backing to achieve the planned proof load. Alternative (Stevpris) anchors were sourced and are recommended for use on future wells.*

4. *A site survey for the next well location was undertaken while drilling Yolla-2.*

9.2. 26"x 36" Surface Hole

26" x 36" Surface Hole Summary	
26" x 36" Surface hole from	94 m MDRT
26" x 36" Surface hole to	152 m MDRT
26" x 36" Surface hole length	58 m MDRT
Inclination at TD	0.0°

This section was drilled with a 26" Hughes Christensen CR-1 bit, in conjunction with a Servco GTA 36" hole-opener, to 152 m MDRT (58 m BML) using sea water and guar gum high-vis sweeps.

Prior to spud, an Anderdrift survey was run at the mudline, with inclination 1/2°. The well was spudded at 21:00 hrs, on the 9th April 1998 and the section was drilled trouble free. While drilling, Anderdrift surveys taken every single (TD inclination 0.0°), and guar gum sweeps (80-100bbls) were pumped every single. Prior to pulling out, the hole was swept with a 100 bbl guar gum pill and the hole was displaced to Hi-Vis gel mud. After checking for hole fill, a Totco survey was taken at 142.2m (0.0°) before pulling out of hole to run 30" conductor pipe.

9.3. 30" Conductor

The 30" shoe float was checked by draining water through, before the 30" conductor was stabbed through the PGB in the moonpool. A shoe joint and 3 intermediate joints were run, each joint being filled with seawater, and each ST2 connector being cleaned and inspected before being made up. The 30" housing assembly was made up to the conductor and lowered to the rotary table. The 30" CART (with 1 joint of DP stinger) was then made up to the 30" conductor housing assembly and lowered on HWDP and latched into the PGB.

When attempting to open the moonpool beams it was discovered that they were still welded with securing plates and that the hydraulic lines had been incorrectly installed. After rectifying this, the 30" conductor was run to the seabed on HWDP, stabbed into the 36" hole and run to TD without problems.

The 30" conductor was run to 152 m MDRT with top of PGB at 92.3 m MDRT. After pumping 120bbl of cement slurry good returns were observed. A total of 206bbls of slurry were pumped (200 % excess). Slurry was displaced with seawater to leave 2 m of cement inside the 30" casing. No backflow was observed and the 30" CART was backed out from the 30" housing and pulled out.

Key Learning/Recommendations

1. *26" x 36" BHA performed well in top hole.*

2. *Anderdrift tool worked well and its' continued use will save rig time.*

3. *Fluctuation in pit level measurements were experienced with Geoservice's new sonic type pit level indicators. PVC piping was procured and installed to provide an isolated column to the bottom of the pits to eliminate signal interference.*

4. *A problem occurred during the 30" cement job due to unfavourable routing of the cement slurry for recirculation through the densitometer. Only part of the slurry was routed through the densitometer. The routing was changed during the job so that all slurry was routed through the densitometer. The recommended setting of valves on the recirculating manifold has been documented in the cementing engineer's handover documents.*

9.4. Drilling Out Cement in 30" Conductor

A 26" BHA was run in hole and tagged hard cement at 149 m MDRT, 1m deeper than calculated. Hard cement and 30" shoe was drilled with seawater from 149m and the rathole was cleaned out to 152m. New formation was then drilled to 153m.

9.5. 17 ½" Hole Section

17 1/2" Hole Summary	
17 ½" hole from	152m MDRT
17 ½" hole to	862m MDRT
17 ½" hole length	609m MDRT
No. bit runs / Average ROP	2 / 63m/hr
Inclination at TD	0.5 deg

A 17 ½" Hughes Christensen GTX-C1 rock bit was used to drill this hole section. The hole was drilled from 153m MDRT to 441m MDRT with each single being swept with 35 bbl guar gum sweeps and Anderdrift surveys being taken every stand. Due to erratic increases in torque during drilling, the section from 377m to 360m was reamed and washed. After continued problems with the top drive system tripping out, a decision was made to pull out of hole. The bit was graded new.

Periods of WOW (39 hrs) and rehandling anchors/replacing ROV camera with rig camera (18 hrs) followed.

The same bit/BHA was then run in the hole to 410m MDRT without resistance. The bit was precautionarily washed down with 1000gpm from 410m to 426m MDRT, with a resistance of 5 to 10klbs indicating some possible fill. After rectifying a problem with the top drive torque wrench, the bit was reamed down from 426m to

428m MDRT with 1000gpm and 110rpm before the annulus packed off. The pipe was worked free, circulation established and the hole circulated clean.

After reaming down to 441m MDRT with 1100GPM and 110rpm, new hole was drilled to 862m with 35bbl high vis sweeps pumped, and Anderdrift surveys made, every stand. At section TD a 200bbl high vis gel sweep was pumped and the hole circulated clean at 1150gpm.

During the drilling of this section, the section TD was revised from 700m to 850m. This was done to take advantage of the more competent formation and give a better casing seat which would meet the minimum FIT requirements of 1.75sg.

The open hole was then displaced to 1.14sg high vis gel mud and an EMS survey was dropped prior to pulling out.

During pulling out to the shoe the string was filled with 1.14sg mud every stand, and only normal drag was experienced on the trip out. The wellhead was jetted with sea water through the bit, to clear cuttings from the wellhead area.

The EMS survey probe was recovered at surface, and the survey data down loaded (surveys from 837.6m to 183.2m MDRT all between 0.1 and 0.3 degrees).

9.6. 13 3/8" Surface Casing

20" Casing Summary	
Weight / Grade / Connection / Drift	101 kg/m / L80 / NewVAM / special drift
13 3/8" shoe at	853m MDRT
13 3/8" hole to	862m MDRT
Casing hanger at	92.3m MDRT
Burst / Collapse rating	4930/2270 PSI
Pressure test	1000psi

A total of 64 joints of 13 $^3/_8$" casing were run and cemented with the float shoe at 852m MDRT.

Some minor problems were experienced when running the casing. The TAM casing circulating packer appeared to be blocked when the crew tried to pump through to fill up the casing, so a fill line had to be rigged up. Also, initially the rig tongs did not fit around the collars, and the jaw links required to be changed out.

Prior to running in the hole the shoe float was checked by draining water through. The first 5 joints of casing were Baker-locked and re-torqued which initially slowed down the operation. Centralisers were pre-fitted over the first 150m of casing as per program and each joint was filled with sea water.

The casing was stabbed into the conductor and run to 755m MDRT without further problems. The 18 ¾" wellhead assembly was picked up from the derrick and made up to the casing. After recording the string weight (150klbs), the CART was backed out from the wellhead and subsea plug launching mandrel and plugs were installed. After filling up all voids the CART was made up to the wellhead again and the 13 $^{3}/_{8}$" casing was run on HWDP to 846m MDRT without resistance. A stand of HWDP was hit by the top drive while being made up to the string. Two singles of HWDP were badly bent and had to be laid down.

After adding a HWDP pup joint for space out, circulation was established at 7 BPM, the casing was washed down without resistance and the 18 $^{3}/_{8}$" wellhead was latched into the 30" wellhead housing with 13 $^{3}/_{8}$" casing shoe at 853m MDRT. Latching was confirmed by a 50klbs overpull.

The casing was circulated with 600bbls of sea water at 12.5BPM. The cement unit was lined up and the lines were pressure tested to 3500psi. The ball for the bottom plug was released and 568bbls of 1.44sg extended lead cement slurry was pumped at rates between 7 and 10 BPM. This was followed by 133bbl of 1.9 sg Class "G" at 3 to 5BPM. Problems were experienced with bulk cement delivery during the job due to insufficient rig air supply.

The dart for the top plug was released and chased from the cement unit with sea water at 1BPM. A pressure increase of 550psi was observed before dropping off to 95psi (theoretical shear is 1950psi). The slurry was then displaced with the rig pumps at 20BPM. After 117bbls were pumped the pressure increased to 1850psi, then dropped back to 1050psi, possibly indicating the plug shearing late.

No plug bump was observed after the calculated volume of displacement had been pumped. It was decided to precautionarily end displacement (no casing test), bleed off standpipe pressure and check for backflow. No backflow was observed and the CART was unlatched and the running / cementing string was pulled out of hole. A jetting sub was run and the PGB, wellhead and bullseyes were jetted clean.

After a period of 24 hrs of re-running anchors and preparing for running riser and BOP, the BOP running operation was started. The BOP cart was found to be seized and tugger lines had to be used to move the BOP cart to the BOP stump cavity for installing the VX ring gasket.

The ball joint was set in the spider, the choke & kill line flex loops were installed and the first riser joint was connected. The pressure line was balanced and a beacon was placed on the BOP. The first riser was made up to the BOP and the BOP and first riser joint was lowered into the water. Due to an upcoming weather front, a decision was made to stand down from running BOPs and recover them to the cart.

After 10 hrs of WOW (during which the BOPs were pressure tested) a revised weather forecast was received and running BOPs was resumed. On making up each joint, the box connections were cleaned, the kill & choke line stab seals and the riser connector seals were redressed and each joint was made up and pressure tested to 250psi (5 min) and 5000psi (10 min).

After making up 3 riser joints and 2 riser pup joints, the slip joint was picked up and landed out on the packer element. The riser landing joint was then picked up, made up to the slip joint and lowered. The kill & choke line goose necks were nippled up to the slip joint and the clamps made up. The MRTs were connected to the slip joint and kill & choke lines were tested, with the kill line stab seals needing to be replaced. The rig was then manoeuvred over the wellhead and the rig heading adjusted to align the BOPs over the guide posts.

The BOP was lowered, landed and latched with 35klbs were set down, and the BOP connector locked to the wellhead. This was positively checked with a 50klbs overpull. The locking pins were removed and the slip joint was telescoped out, the landing joint laid down and the diverter assembly installed. The diverter was function tested and both overboard lines flushing with water.

The kill & choke lines were then flushed with sea water, from the cementing unit, to remove any remaining rust/scale from the lines. The casing was tested to 1000psi for 30 min and found to be holding. Following the casing test, the BOP test plug was run and the BOP was tested (upper and lower annulars 5 min at 250psi and 10 min at 3500psi and upper, middle and lower pipe rams for 5 min at 250psi and for 10 min at 5000psi). All pressure tests held. The test plug was pulled and the wear bushing was run.

<u>**Key Learning / Recommendations**</u>

1. *Before WOW after having drilled to 441m MDRT, the ROV was jumped and the PGB was found completely covered with cuttings. The area was jetted through the bit on the way back in. A jetting sub was fabricated for use before running the BOP stack. Recommendation is to have the jetting sub ready to be run.*

2. *Storm damage to spider beams was experienced during heavy weather. The damage to cylinders and beams was repaired and the beams were secured more thoroughly in anticipation of future rough weather.*

3. *The top drive system failed on several occasions. The VARCO representative was mobilised and it was decided to keep him on the rig while drilling 17 ½" hole for monitoring the top drive performance and to be able to quickly rectify potential further problems. Despite a thorough ModuSpec inspection on this equipment there were still problems. Close attention to TDS is critical for all rig operations.*

4. *During a lift in heavy weather, the crane driver sat down weight on the ROV umbilical and damaged it. After the ROV was only tested on surface and later failed when launched. The need for proper operating procedures and timely*

reporting of any incidents and discussion in the morning meetings was pointed out to all personnel.

5. *Serious problems were experienced with the ROV camera. The rig camera was temporarily connected to the ROV monitor system, before the ROV camera problems could be traced back to circuit cards and fuses and rectified. ROV personnel were changed out with replacements reminded to keep on top of preventative maintenance and to immediately report any circumstances that might influence ROV operations.*

6. *A piece of airfreight (sonar for ROV) was bumped off the rig-bound chopper without knowledge of the offshore drilling supervisor. While no major problems were caused in this instance, the potential of serious consequences was identified and all involved parties - especially the helicopter operator - was notified to liaise with the drilling supervisors before bumping any freight.*

7. *When attempting to fill up the casing through the TAM packer during casing running operations, it was found impossible to pump through the packer. All valve settings to the TAM packer were double-checked and found to be open. The TAM packer could not be used for running the casing and was sent back to shorebase for inspection. The TAM representative could not find anything wrong with the tool and redressed it for load out for the next job. More thorough knowledge of equipment is required prior to use as there was nothing wrong with this piece of equipment and only required additional pressure to operate.*

8. *During running the 13 $^3/_8$" casing it was found to be very time consuming to back out, Bakerlock and re-torque the collars on the first casing joints. Therefore, 6 casing joints were sent back to Geelong shorebase for having them Bakerlocked and returned for the next well*

9. *During casing running operations, difficulties were experienced with fitting the rig tong onto the casing collars. The drilling contractor was instructed to identify the correct jaws and test fit them on 13 $^3/_8$" and 9 $^5/_8$" casing.*

10. *A problem occurred during the 13 $^3/_8$" cement job. The dart to shear the top cement plug was released and displaced down the drillpipe. After 3bbl (theoretically 2bbl) of displacement, the pressure increased to 550 psi (instead of a theoretically 1950psi required for shearing out the top plug). The pressure then dropped off to 95psi. It was questioned if the top plug went at that stage, or only later during displacement (after 11bbl), when another pressure spike of 1850psi was seen that later dropped back to 1050psi. The top plug was not bumped after the calculated displacement with the rig pumps, and therefore the casing could not be pressure tested right away. Consideration could be given to displacing the job using the Dowell unit rather than the rig pumps for greater accuracy. Exact volume of how much excess displacement could be pumped (if*

the plug should not bump) without risking over-displacement and a wet shoe should be calculated and agreed upon.

11. *Since problems were encountered when backing off the CART after the 13 $^3/_8$" cement job, it was suggested to mobilise a top drive cement head for future jobs. Due to non-availability of such a cement head in Australia this plan was not followed up further.*

12. *Several modifications were made to the rig to make operations more efficient, such as installing ladders and work platforms in the moonpool area and modifying the Vee door to enable BOP testing without hampering rig floor operations.*

9.7. 12 1/4" Hole Section

12 ¼" Hole Summary	
12 ¼" hole from	862m MDRT
12 ¼" hole to	3164m MDRT
12 ¼" hole length	2302m MDRT
No. bit runs / Average ROP	6 / 9.2m/hr
Inclination at TD	2°

During testing of the BOPs, drillpipe was drifted and flushed through, with stands of drillpipe being made up, and racked back.

A 12 ¼" Hughes Christensen AG526 PDC bit was made up and ran in hole with a kick drill conducted on the trip in. The bit was washed down from 780m to 818.5m MDRT, where cement/cement plugs were tagged. Plugs/hard cement was drilled from 818.5m to the float collar at 826m MDRT. The float collar and shoe track was drilled to 853m MDRT, where the float shoe was drilled. Some problems were encountered in this section with the string stabilisers hanging up on the float collar, making it necessary to ream this area several times. After drilling out the shoe at 853m MDRT the rat hole was cleaned out and 3 m of new formation was drilled with several high vis sweeps being pumped during drilling cement and shoe track.

The well was displaced with 1.1 sg KCl/PHPA mud and circulated for 30 minutes, prior to the bit being pulled back to inside the shoe and an FIT performed. No leak-off occurred, and a maximum EMW of 1.75sg was established.

Kill & choke line were flushed with mud and SCRs were taken before starting to drill 12 ¼" hole section.

Anderdrift surveys were taken every stand while drilling, showing inclination of 0 – 0.5°. Due to the performance of the rig compensator system many problems, such as string stalling, erratic torque, WOB & ROPs were experienced in this section. ROPs varied between 10 and 50m/hr in the claystone. At 1203m MDRT the survey frequency was reduced to every 150m, since surveys repeatedly indicated minimum inclination (0 to 0.5 deg).

The drilling problems caused due to the performance of the motion compensation were greatly aggravated below 1350m MDRT, when hard, well cemented siltstone was encountered. At 1404m MDRT, a wiper trip was performed back to the 13 $^3/_8$" shoe and was wiped twice due to drag from 1068m to 1030m MDRT. On the way back to bottom, the last stand was washed and reamed down as a precaution. When resuming drilling, the hole had to be circulated for 30 minutes to allow unloading of solids resulting from the wiper trip (blinding of shakers).

At 1431m MDRT temporarily self healing losses were experienced (20 to 100bph). As drilling continued from 1451m to 1485m MDRT, LCM was added to the active mud system, which reduced losses allowing drilling to continue.

At 1485m MDRT a decision was made to pull the bit due to poor ROP. The hole was circulated and conditioned in preparation for pulling out. On the way out the section from 1050m to 1000m MDRT was worked until normal drag was seen, as a 50klbs overpull was initially experienced through this section.

A new 12 ¼" Hughes Christensen ATMGT-18 tri-cone bit was made up to the BHA, and run into the hole. On the trip in, circulation was broken at 750m MDRT, and the bit was washed down from 1433m to 1485m MDRT.

SCRs were taken, the new bit bedded in and drilling resumed. The hole section down to 1771m MDRT was drilled with an average ROP of 13.4m/hr. Problems with high torque and string stalling continued throughout the drilling operation.

The hole section down to 2147m MDRT was characterised by frequent drilling breaks which all were flow checked negative. In the hole section down to 2232m MDRT, variable and erratic losses (+/- 30bph) were encountered and KwikSeal LCM was added, without noticeable effect.

After a short break due to bad weather (string pulled up one stand), drilling was resumed with continued slight losses. At 2306m MDRT bottoms up was circulated to prepare for pulling out for bit change due to poor ROP. On the trip out, tight hole was back-reamed from 1740m to 1720m MDRT, and flow checks were conducted with the bit at the 13 3/8" shoe and before pulling the BHA through the BOPs.

The pulled bit was found to have worn teeth and be 3/16" under gauge. The stabilisers were also found to be under gauge. A new near bit stabiliser and a 12 ¼" Hughes Christensen BD447 PDC bit were made up and run in the hole.

At the 13 $^3/_8$" shoe the well was circulated and the mud weight was reduced to 1.09 sg (by centrifuging) in an attempt to reduce the mud losses. A kick drill was conducted and the string was run to bottom, washing down through tight spots at

1550m and at 1699m MDRT. Two meters of fill were found when washing down the last stand to bottom at 2306 MDRT.

Drilling was resumed with continuous losses of about 20bph and with erratic torque. From 2306m MDRT to 2519m MDRT the losses decreased to 14bph with the majority of losses being lost on surface in mud cleaners and shakers. Downhole losses were estimated at 3bph.

The top drive was serviced, during which time the riser boosted to clean out potential cuttings accumulation in the riser.

Drilling continued with the ROP frequently decreasing to less than 2 m/hr. Drilling parameters (WOB, ROP) were varied, and the flow rate increased to counteract suspected bit balling. A caustic pill was pumped with little/no success. At 2580m MDRT a decision was made to pull out for bit change due to poor ROP. Prior to pulling out, a survey was attempted. At this point, it was found that the Anderdrift survey tool had failed.

The bit was changed for a new 12 ¼" Reed EHP41HLK tri-cone bit and a new Anderdrift tool was picked up and ran in hole. At the 13 $^{3}/_{8}$" shoe, the Anderdrift tool, the BOPs and failsafes were function tested, and the drilling line was slipped and cut.

The last 41m, to the bottom of the hole, had to be washed down due to hole fill. The newly drilled formation appeared to be very hard. The heave compensation, in combination with interbedded formations, made the drilling very difficult. From 2594m to 2613m MDRT almost 100% igneous intrusion was drilled at about 4m/hr. This was followed by a homogeneous siltstone/shale formation that drilled at 10m/hr.

A drilling break occurred at 2652m to 2656m MDRT and was flow checked and drilling continued. At 2661m MDRT an Anderdrift survey was taken, confirming 2 deg inclination that was measured at 2660m MDRT. Drilling continued to 2738m MDRT with ROPs varying between 2.7m/hr and 8 m/hr. An Anderdrift survey gave 1.5deg inclination. A decision was made to pull out for bit change due to poor ROP. Tight hole was worked from 2567m to 2560m MDRT on the trip out.

The bit was changed out for a new 12 ¼" Hughes Christensen ATM-P18, and a new jar was picked up before the trip back in. The hole had to be washed and reamed from 2207m MDRT. After becoming temporarily stuck during a connection at 2319m MDRT, the pipe had to be jarred free with 3 upwards blows. Following this incident, each stand was washed and reamed down until top of intrusion at 2580m MDRT. The bit was also washed down the last 16 m to bottom at 2738m MDRT, and drilling was resumed.

Drilling continued and breaks were encountered at 2762.5m, 2792m, at 2857m, 2897m MDRT. Each drilling break was flow checked - negative, and bottoms up was circulated for samples. At a depth of 2900m MDRT a sudden pressure drop during circulating bottoms up was experienced, indicating a string washout. Pipe was pulled out of hole and a wash out was found in first single of stand #16 off bottom, 0.5m below the tool joint box, in the slip area. The single was replaced, the pipe run into the hole and drilling was resumed. A second washout in the bottom single of stand #22 (0.5m above the pin) occurred when drilling at 2954m MDRT. After replacing the joint, the pipe was found to be stuck. Circulation was established and the pipe was freed by jarring downwards. The section from 2307m to 2328m MDRT was worked several times, before washing down to bottom and resuming drilling.

Liners were changed on the mud pumps, SCRs taken and oxygen scavenger was introduced into the mud system.

Another drilling break occurred at 3016m MDRT and from 3030m to 3033m MDRT. These were flow checked – negative - and bottoms up was circulated for sampling purposes.

Coring point was confirmed and the BHA was pulled out to run the coring assembly. Flow checks with BHA below 13 3/8" shoe and below BOPs were conducted.

When out of hole, the BOPs were tested and rising weather was observed. The weather situation worsened and when the riser angle exceeded 3 deg, the LMRP had to be unlatched, and the drillship moved off location. After waiting on weather for some 15 hrs the drillship was re-positioned over the wellhead and the lower marine riser package was landed and latched on the BOPs, with latching confirmed by overpull.

The coring assembly consisting of a Corepro low invasion CM365F PDC core head, 18m core barrel and 2 Baash Ross bumper subs was run in hole. Tight spots at 116m and 1973m MDRT were washed and reamed, and 10m fill found on bottom. The coring assembly was washed to bottom at 3000m MDRT.

Bottoms up was circulated (20 minutes on bottom, the rest at 3000m MDRT to prevent washing out sands). The coring assembly was washed down to bottom again and the ball was dropped. Drag weights up and down, torques at various RPM and SCRs were taken before starting to core.

The torque during coring was initially erratic, but got smoother after the RPM was increased from 60 to 100/140.

At 3051m MDRT, after cutting 18m of core the assembly was pulled. Flow checks with BHA below 13 $^{3}/_{8}$" shoe and below BOPs were conducted. After the BHA was racked back in the derrick, the inner core barrel was pulled and the core was cut and laid out in three 6m sections. Recovered 98 percent.

A new MAXGT-P09 was run in the hole to 3051m MDRT where drilling was resumed. A drilling break at 3082m MDRT was flow checked - negative. From 3090m MDRT volcanics were drilled continuously with a ROP from 8 to 10m/hr. TD was called at 3164m MDRT due to 74m of volcanics being drilled. Bottoms up was circulated, and a short wiper trip back to 3000m was undertaken. The hole section from 3060m to 3004m MDRT was backreamed due to excessive overpull. After running back to bottom, the EMS survey barrel was dropped and the string pulled out of hole, with tight spots from 2900m to 2700m MDRT. Flow checks with BHA below 13 $^{3}/_{8}$" shoe and below BOPs were conducted.

Retrieval of the EMS survey barrel, and downloading of data at surface, gave an inclination of 2.2 deg at 3147m MDRT.

Key Learning/Recommendations

1. *The presence of volcanics over the interval 1270m – 1310m prohibit the effective use of PDC bits. PDC's can be ran after the last volcanic section is drilled. Recommendation to determine if less aggressive PDC's can be efficiently used in this section. Using tri-cone bits through the volcanics followed by PDC's to be considered.*

2. *Due to the performance of the heave compensator system maintaining a constant WOB was not possible. Frequent top drive stalling, erratic torque (especially at RPMs of 150 and higher) and erratic WOB was seen during the drilling operations and had a negative influence on the ROP. For future drilling projects in this area in this time of the year, consideration should be given to the use of an alternative compensator system or, a more stable drilling unit.*

3. *The KCl/PHPA mud system generally worked well, but concentrations of KCl and PHPA need to be closely monitored to ensure sufficient inhibition of the formation to limit the clay dispersion. Cuttings generally looked firm and discreet. Also the low end rheology had to be slightly increased to aid hole cleaning when drilling with fast ROPs through clay sections. When losses were first experienced LCM was added to the active system and the losses were later found to be self healing. When losses occurred again deeper in the hole, the flow rate was slightly cut back and the mud weight was slightly reduced with good success at reducing losses. On future wells, mud weight should be kept to the minimum necessary for stability and well control purposes, and to keep losses to the minimum. A stock of various grades/types of LCM material should be maintained on the rig, with only treatable (acidisable) LCM used in the reservoir section.*

   Stage cementing equipment and external casing packers should be maintained on location in the event that casing requires to be cemented in a hole section where excessive losses are experienced.

4. *Exposed coal beds (2200m to 2580m MDRT) caused tight hole and stuck pipe situations, and significant time had to be spent back reaming. Back reaming features for the BHA could improve these problems, and should be incorporated in future BHAs. The coal seams might have also caused problems if casing would have had to be run. Consideration should be given to maintaining reamer shoes on the rig, for use when running casing if hole conditions dictate.*

5. *Two DP washouts occurred while drilling the 12 ¼" section. They were probably not caused by slip dyes but rather due to corrosion, pitting from inside or flexing (fatigue) around the friction welded area. Oxygen scavenger was added to the mud system to combat corrosion. It is recommended that a higher inspection standard (DS-1, Cat 5) is stipulated in future contracts, and that pipe is re-inspected prior to each well. Also, corrosion rates and mud oxygen scavenger content should be carefully monitored with appropriate action taken as required.*

6. *No problems were encountered during the coring operations, which went smoothly and swiftly with almost 100% core recovery. Effective use of alternate compensator devices proved to be effective.*

9.8. 12 1/4" Electric Logging Operations

The following wireline logs were run;

1. PEX-CMR was run to 1256m MDRT, where the tool stood up on a ledge. The two bow spring centralisers were suspected of pushing the tool to the side of wellbore and no hole finder was run on the bottom of the tool, only a conventional bull nose. The tool was pulled out of hole, the CMR was laid down and the PEX was run on its own. The tool, again, stood up at 1256 m MDRT, and the well was logged with the PEX from 1255 MDRT to the 13 3/8" shoe at 853m MDRT. GR was logged to the sea bed. The PEX pulled out of hole and laid out.

2. A triple combo tool (GR, LDL, CML, MSFL, DLL) was picked up, calibrated and run in hole. This tool also stood up at the ledge at 1256m MDRT. The tool was pulled out of hole, laid down and a bit picked up for a wiper trip.

   When running in hole with a 12 ¼" Hughes Christensen MAXGT-P09 rock bit, weight was taken at 1244m MDRT. The hole was found to be bridged off and had to be worked/circulated clear from 1244m to 1305m MDRT. Large amounts of dry and hard cuttings were unloaded at the shakers.

   From 1893m to 1920m MDRT, temporary bit plugging appeared to occur. The bit was washed down from 1964 m to 2600m MDRT, as a precaution. From 3000m to 3164 m MDRT, the bit was washed and reamed intermittently to TD, and the well was circulated clean at bottom, prior to pulling out of hole.

3. Sonic-PEX was run in hole, hanging up at 1260m and at 1290m MDRT but was worked through, and ran to 3100m MDRT, where the tool stood up on the volcanics. Two attempts to work through the obstruction proved unsuccessful. The well was logged up from 3100m MDRT to the 13 $^{3}/_{8}$" shoe with slight overpull being experienced. The logging suite was then pulled out of hole and laid down.

4. The MDT was run in hole and the zone of interest logged as per program. Pressure surveys were taken from 1913.3m to 3063.7m MDRT, a total of 44 pre-tests and 3 samples. When trying to take a sample at 3031m MDRT the pumpout module failed and the MDT tool had to be pulled for repairs. After a minor problem with the cable head was rectified, the MDT tool was run in hole to 2809.5m MDRT and the remaining 5 samples and pressures were taken as per program. The MDT tool was pulled out of hole after finishing the program at 1876m MDRT. Samples were recovered and the tool laid down.

5. VSP guns and hydrophones were lowered over the aft port and the VSP air guns were synchronised. The VSP tools were run in the hole. Depths were correlated and systems checked. The lower geophone was found to be faulty at 2690m MDRT. The suite was run to 3081m MDRT. The well was logged as per program, skipping the lowest level as lowest geophone did not work. Also, due to the malfunctioning lower geophone all 43 remaining levels had to be taken individually. The VSP logging suite was pulled out of the hole and laid down.

6. The CMR tool was run in hole and initially stood up at 1276m MDRT. The tool passed the obstruction on the second attempt without a problem. The well was logged as per additional program, and the CMR suite was pulled out of hole and laid down.

7. The FMS logging suite was rigged up and run in the hole. The tool ran to bottom without problems and the well was logged as per program. The FMS logging suite was pulled out of hole and laid down.

Key Learning/Recommendations

1. *A wiper trip had to be conducted since the tool suites could not get past a ledge at 1256m MDRT. Substantial amounts of solids were discharged at the shakers. The resistance and overpull that was seen on the wiper trip were not seen on the trip out, prior to picking up logging tools. On future wells, consideration should be given to undertaking a wiper trip back to the shoe, rather than a short wiper trip, prior to pulling out to run logs. In any event the hole should be swept from bottom with a combination of a low viscosity pill followed by a high viscosity to maximise hole cleaning.*

2. *There was no wireline x-over sub available that would have allowed the connecting of a hole finder (chain) on the bottom of the logging tool string. This should be considered for future logging operations.*

3. *With exception of a failure of the pumpout module during the MDT run, and the failure of the lower geophone during the VSP run, logging operations went relatively smooth after the un-scheduled wiper trip.*

4. *Only one (3044m) of the 5 MDT water samples sent to Petrolab, Adelaide, was not contaminated with mud filtrate. The optical fluid analyser in the MDT tool is therefore of questionable quality. In addition one (2810m) of the gas sample chambers was found to be empty when opened by Petrolab.*

9.9. Permanent Abandonment

The well was permanently abandoned by setting 3 open hole cement plugs across the hydrocarbon bearing sands. One Baker K-1 bridge plug was set in the 13 $^3/_8$" casing, with one 30m cement plug on top of the bridge plug, and one surface cement plug was set higher up in the 13 $^3/_8$" casing.

The three open hole plugs were set as balanced plugs all consisting of 49bbl of 1.9sg slurry, preceded by 10bbl of water ahead, followed by 1.5bbl of water behind and the necessary volume of mud to under-displace by +/- 4bbl.

Plug #1 was set from 3090m to 3000m MDRT, plug #2 was set from 2850m to 2760m MDRT and plug #3 was set from 1940m to 1850m MDRT.

The Baker K-1 bridge plug was set on wireline at 823m MDRT (correlated with CCL) in the 13 $^3/_8$" casing, 30m inside the 13 $^3/_8$" casing shoe.

Cement plug #4 was set just above the bridge plug from 820m to 790m MDRT. 10bbl of water ahead, 15bbl of 1.9sg slurry and 1.5bbl of water behind, as well as 43bbl of mud were pumped to achieve a balanced plug.

After finishing spotting plug #4 the well was displaced to corrosion inhibited mud, before plug # 5 was set from 175m to 105m MDRT using 35bbl of 1.9sg slurry. A balance plug was spotted with 10bbl of water ahead, 1.4bbl of water behind and 2bbl of mud displacement (underdisplaced by 2.5bbl).

The riser and BOPs were displaced to sea water and the cementing stinger pulled out and laid down. The diverter, was pulled, the slip joint collapsed and secured and the BOP and riser unlatched. After nippling down the kill & choke lines, the slip joint, riser and the BOPs were pulled. The guide wires were disconnected from the BOP and the BOP moved to storage position.

The casing cutting BHA for 13 $^3/_8$ " casing, including two Baash Ross bumpers subs, was run in hole and cutting commenced. Indications that the 13 $^3/_8$ " casing had been cut were seen after 30 minutes. The assembly was pulled and the longer knives installed to cut the 30" casing. The cutting assembly was run into hole to cut the 30" casing at 100m MDRT.

The string was observed to be walking severely, since there was no utility guide frame available. This resulted in a failure of one of the two bumper subs. The assembly had to be pulled and the bumper sub with the washed seals taken out of the string. The cutting assembly was, again, run in hole and cutting was resumed. After 5 hours of cutting, indications were seen that the 30" casing was cut and an attempt was made to pull the wellhead. This proved unsuccessful.

The cutting assembly was pulled, and upon retrieval of the cutting assembly at surface, the knives were found to be totally worn, the grapple fingers were twisted and bent, and the bearing on the marine swivel had failed. Due to deteriorating weather operations were ceased to wait on weather.

After more than two days of WOW, an attempt to retrieve the wellhead with CART (on HWDP) was made. This was also unsuccessful.

The repaired 30"casing cutting assembly was run in hole and cutting started again. The wellhead was seen to be rocking while the string kept stalling out. The cutting assembly was pulled once again and found to be severely damaged with the stop ring sheared free and a cutter blade sheared off. Another run to retrieve the wellhead with the CART was undertaken. This also proved unsuccessful.

The casing cutter was re-dressed to re-cut the 13 $^3/_8$ " casing, and run back into the hole. Difficulties were experienced in entering the wellhead with the cutting assembly, while rotating. After entering without rotating, it was found impossible to commence rotation. When the cutting assembly was retrieved at surface, the lower body of the cutter was found sheared off and only one knife remained on the tool.

A 12 ¼" mill was run in, tagged an obstruction at 95.94m MDRT, and pulled out of hole. A decision was made to sever the wellhead with explosive charges. A 90lb collision severance charge was made up, run into the wellhead and suspended off the wellhead on a T-bar. The rig was moved off location, to a safe distance, and the charge was detonated. The rig moved back onto location and the wellhead was inspected by ROV.

When it proved impossible to pull the PGB/wellhead with the guide wires, the CART was run in hole on HWDP to retrieve the wellhead. With 200 klbs overpull, the 18 ¾"wellhead was pulled free from the 30" housing, shearing the lock ring on the 30" housing. The PGB was retrieved using looped slings (PGB found to be cracked on surface), leaving the 30" housing in hole. After inspecting the 30" housing, with the ROV, it was concluded that the housing was not cut, and a decision was made to run another explosive severing charge.

The charge was stabbed into the wellhead with some trouble (ROV temporarily dis-orientated due to gyro failure), and the charge detonated after moving the rig off location by approximately 180m. The ROV was jumped to inspect the 30" stump, but after the mound of the well was finally found, the stump could not be located.

The area was swept over a 50m radius using the ROV camera and ROV sonar. The only object that could be traced was a spider beam that was lost from the drillship during a storm. It was concluded that the 30" housing had been obliterated by the detonation and had collapsed into the wellhead crater and was covered over by settling sea bottom sediments. Full approval to leave the wellhead in this condition was obtained by the DME.

The spider beam, which had been lost from the rig during a storm, was retrieved with a fishing hook to leave the sea bed completely clear, before anchors were retrieved and the rig departed site.

Key Learning/ Recommendations.

1. *During operations when running into the hole riserless a utilty guide frame was used to assist stabbing in the cutting tools. For future work a utilty guide frame should be available on the rig during riserless operations. Considerable time savings can be made compared to using the soft rope guides.*

2. *Severe problems were encountered when cutting the 13 $^3/_8$" and the 30" casing. A joint of 20" casing below the 18 $^5/_8$ " wellhead would make it possible to cut the two strings in one run greatly reducing problems during cutting operations.*

3. *During casing cutting operations, a bumper sub was damaged (blew a seal) probably due to the drill collars and bumper subs not being supported while rotating. Manufacture/modification of a universal guide frame is recommended for the next well.*

4. *Similar to the drilling phase, the unreliable ROV camera also hampered the P&A operations severely. Since most problems with the ROV seem to be of electronic nature it is proposed to look into having a full time electronics technician on the rig for the next well.*

5. *A spider beam was lost from the moonpool area during a storm. Adequate securing of all items on the rig that might move and could cause damage/get lost during heavy weather is to be ensured.*

9.10. Retrieve Anchors

Recovery of anchors and anchor line commenced on 28 May at 15:30 hrs. Two anchors were recovered before operations were shut down to wait on weather.

After a 24 hrs wait on weather period, anchor recovery re-commenced and all anchor recovery operations were completed, without problems, by 12:48 hrs on 30 May 1998, with the rig departing for White Ibis-1 location.

10. FORMATION PRESSURE EVALUATION

Computerised mudlogging and engineering data acquisition services were provided by GeoServices. A formation pressure evaluation log and over pressure log were maintained while drilling the well. These logs are enclosed in the GeoService Yolla-2 End of Well Report.

10.1. 17 ½" Hole

The 17 ½" hole was drilled using seawater and without marine riser in place. All returns were taken to seabed. The corrected 'D' exponent plot shows no overpressure in this hole section.

10.2. 12 ¼" Hole

The 12 ¼" hole was drilled with KCL/PHPA mud and marine riser in place. All returns were taken back across the shakers allowing for mud monitoring (mud weight, temperature, gas, etc.).

This hole section was drilled as a normally pressured well to TD at 3164m MDRT.

The overpressure plot takes into account the hole conditions and provides the most readable form to determine overpressure. Review of the overpressure log shows no major overpressure signs, and no hole problems were encountered while drilling this section to TD.

MDT tests show the formation to be normally pressured, with a maximum pore pressure of 1.0 SG at 3164m MDRT, and drilled with an overbalance of approx 450psi at 3033m MDRT, equating to 0.1 SG overbalance.

TABLES 1 & 2

TABLE 1

INCIDENT/ACCIDENT LOG

NORTHERN EXPLORER III – BASS STRAITS PROJECT

DATE	NAME	DESCRIPTION	CLASS'N	COMMENTS	CLOSED
April '98					
1/4/98	C. Hines	Laundry man fell down stairs bruised back.	RDI	Extremely bad weather. Signed himself off the ship.	✓
3/4/98	J. Doherty	Jumped over riser joint and landed on piece of ANGLE iron, bruising foot.	MI	Marine rating	✓
3/4/98	M. Sheenan	Integrated rating was guiding the deck crew at wharf when he turned and twisted his ankle on a fish plate	MI		✓
4/4/98	N/A	Crane knocked off navigation light in derrick.	Near Miss	CAR raised.	✓
8/4/98	I Hayward - Bryant	Second engineer was walking along starboard main deck when he tripped over a loose sling, bruising his left knee.	MI		✓
14/4/98	M. Keenan	Slipped and cut hand	MI	Handling anchors in heavy weather.	✓
14/4/98	J. Burgess	Rating on "Pacific Commander" boat was washed up the deck twice falling on his buttocks.	MI	Handling anchors in heavy weather	✓
16/4/98	D. Lansdale	Subsea engineer. Weld on HP pipework on compensator system flew off striking him on hand. Bruised hand.	MI	Very serious incident. All welded pipework done in S'pore to be MPI'd.	Completion still to be confirmed
16/4/98	T. Crocker	Floorman using riding belt swung into derrick beam, bruising hip.	MI		✓
17/4/98	N/A	Pipe block struck top of string, bending two joints of HWDP --- no personnel injuries.	Drilling incident	Human error.	✓
19/4/98	K. Rowley	Member of marine crew walked into hanging compensator wire, bruising cheek.	MI	Marine crew CAR raised.	✓
25/4/98	M. Pierce	Floorman trapped finger whilst installing elevator on drill pipe.	RDI		
29/4/98	S. Krissansen	Welder experienced slight pain in lower back whilst lifting lid from gang box – no personnel injuries.	MI		✓

INCIDENT/ACCIDENT LOG

NORTHERN EXPLORER III – BASS STRAITS PROJECT

DATE	NAME	DECRIPTION	CLASS'N	COMMENTS	CLOSED
May 98					
7/5/98	N/A	While swinging out port flare boom outboard bridge, pad eye parted from main frame (not weld failure), allowing boom to drop onto ships's side – no personnel injuries	Near miss	Materials failure	✓
8/5/98	N/A	Chaffing gear on bow mooring rope moved, rope chaffed through, broken end sprang from "Pacific Comander" hitting rig deck – no personnel injuries	Near miss	Could have be serious. Materials failure.	✓
9/5/98	M. Hooton	Greaser cut his right hand thumb whilst moving empty 44 gallon drum in engine room.	MI	PPE not being used.	✓
11/5/98	C. Turnbull	Assistant Driller collided with handrail whilst stepping from derrick lower to upper levels, bumping nose.	MI	Carelessness	✓
12/5/98	S. Kenny	Caustic entered gauntlet glove (correct PPE was being used) whilst Pump Man was moving chemical sacks in mud pump room.	MI	Damaged sacks	✓
12/5/98	J. Doherty	Marine crew member slipped and collided with ship's railing whilst recovering mooring rope by hand, bruising ribs.	MI	Insufficient personnel for task.	
13/5/98	R. Manning	Pump Man bumped lower back on grating whilst hosing out under grating in mud pump room.	MI	Carelessness.	✓
13/5/98	D. Anthony	Floorman fell into hole created by him removing grating whilst washing floor in mud pump room, after answering telephone.	MI	Carelessness	✓
15/5/98	N/A	Communications interference on driller's headset caused by loss of concentration, resulting in the stand of drill pipe getting bent by blocks creeping down. Incorrect use of communications system by others – no injuries	Incorrect communication use	Human error	✓

INCIDENT/ACCIDENT LOG

NORTHERN EXPLORER III – BASS STRAITS PROJECTS

DATE	NAME	DESCRIPTION	CLASS'N	COMMENTS	CLOSED
		May 98			
20/5/98	P. McCarthy	Welder was cutting angle iron using stand. Work piece fell from stand onton right foot, causing bruising.	MI	Inadequate restraint	✓
23/5/98	N/A	Accumulation of lint adjacent to drier drum in laundry room (hidden behind front panel) built up excessive heat, leading to smoldering. Lint build-up removal now part of preventative maintenance shedule – no injuries.	Inspection failure	New equipment being used	✓
25/5/98	N/A	Damaged insulation on welding cable caused overheating which led to small fire including debris below. All welding cable now inspected for damage prior to use, debris to be removed – no personnel injuries.	Near miss	Damaged insulation	✓
28/5/98	N/A	Crane operator landed load, narrowly missing oxygen cylinders already stored on deck. No personnel injuries, but action taken to further protect vulnerable cylinders on main deck.	Near miss	Action taked to relocate pressuried cylinders & ensure all valve caps present.	✓
30/5/98	N/A	While attempting to land a 14 tonne anchor in heavy seas onto the support vessel "Pacific Commander", load snagged on inboard crash rail Crane driver attempted to arrest swing but impact with outer sponson plating of NE III occurred, leaving hole 1.3m below main deck. Re-plated and painted same day. No personnel injuries.	Impact	Human error	✓

TABLE 2

Formation	Depths
Torquay Group	81-1075m MD
Angahook Unit 1	1075m MD
Unit 2	1265.5m MD
Oligocene Volcanics	1278m MD
Angahook Unit 3	1316m MD
Unit 4	1468m MD
Oligocene Unconformity	1492.5m MD
Demons Bluff	1705.5m MD
Top EVCM	1854m MD
Top EVCM Sand	1876m MD
Top igneous intrusive	2571m MD
Base igneous intrusive	2613m MD
Top Z1 EVCM 2718 sand	2763.5m MD
Top Z1 EVCM 2755 sand	2792.5m MD
Top Z1 EVCM 2809 sand	2859.5m MD
Top Z1 EVCM 2844 sand	2895.5m MD
Top Z2 EVCM 2873 sand	2932.0m MD
Early Palaeocene Unconformity	2949.0m MD
Top Z3 2952 sand	3008m MD
Top Z3 2973 sand	3030m MD
Top volcanics	3085m MD

FIGURES 1 - 5

565079

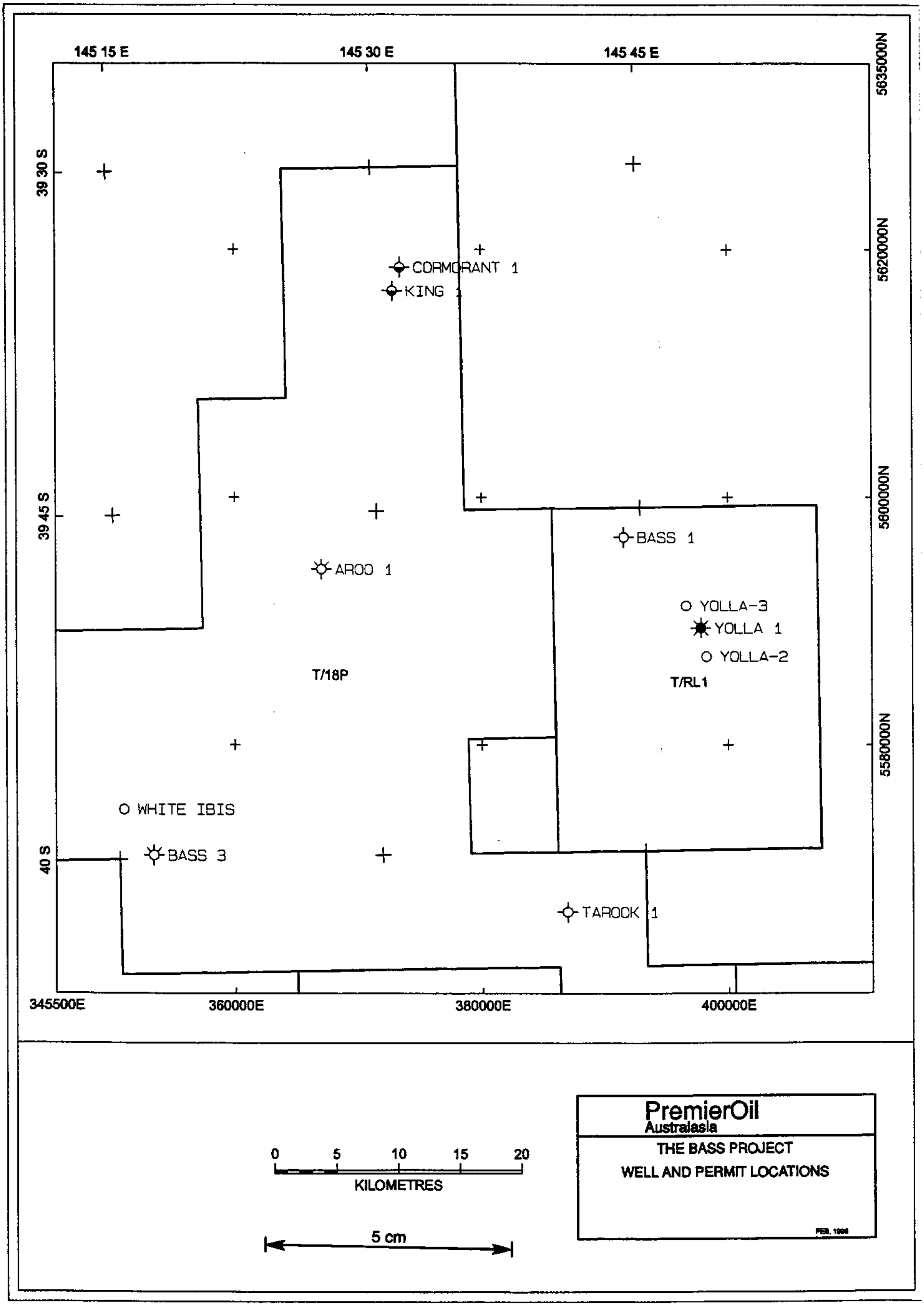


FIGURE I

Well Status After Abandonment

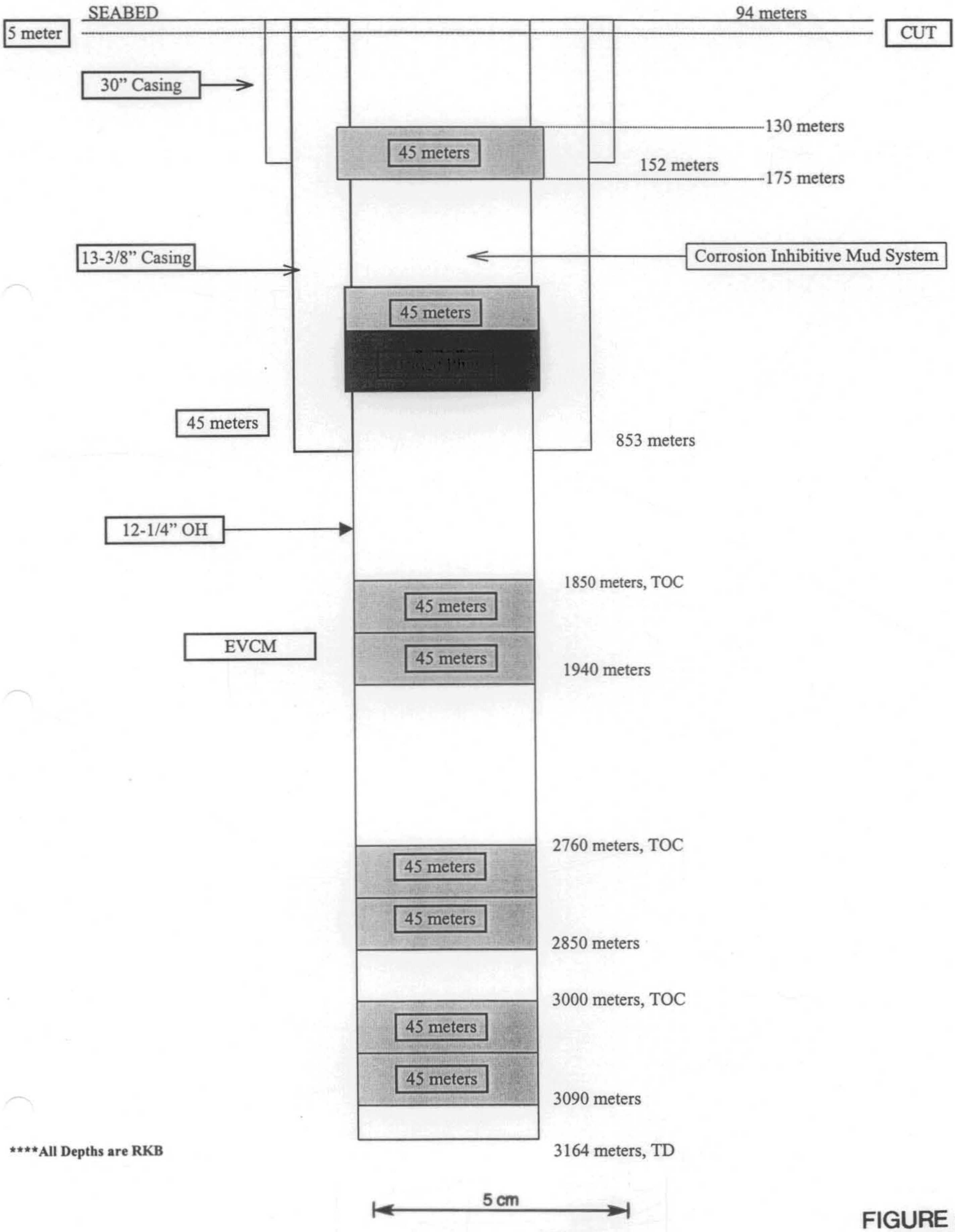


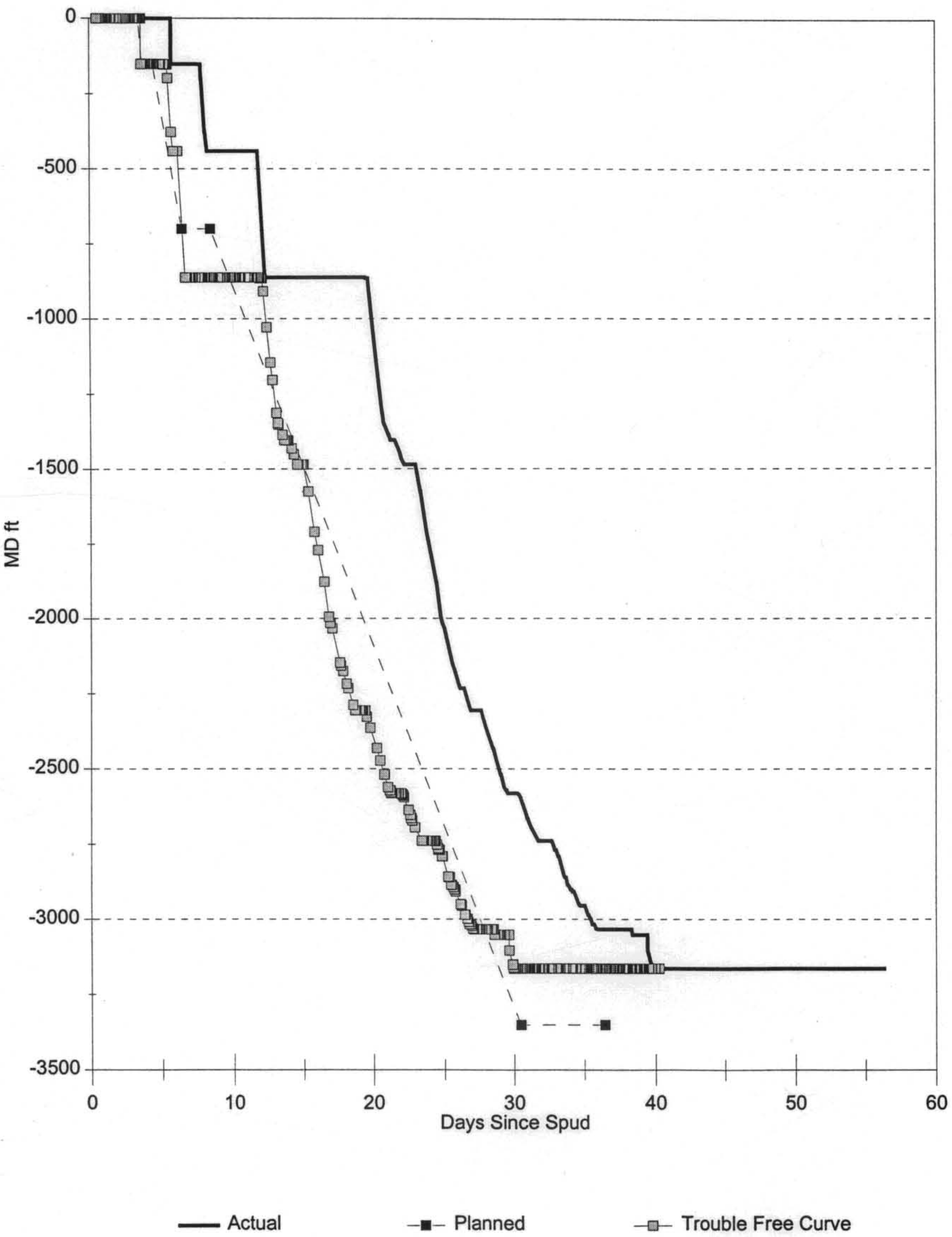
FIGURE 2

TIME BREAKDOWN DATABASE - single well overview

WELL : Yolla-2

Pacesetter : none selected

Days versus Depth



5 cm

FIGURE 3

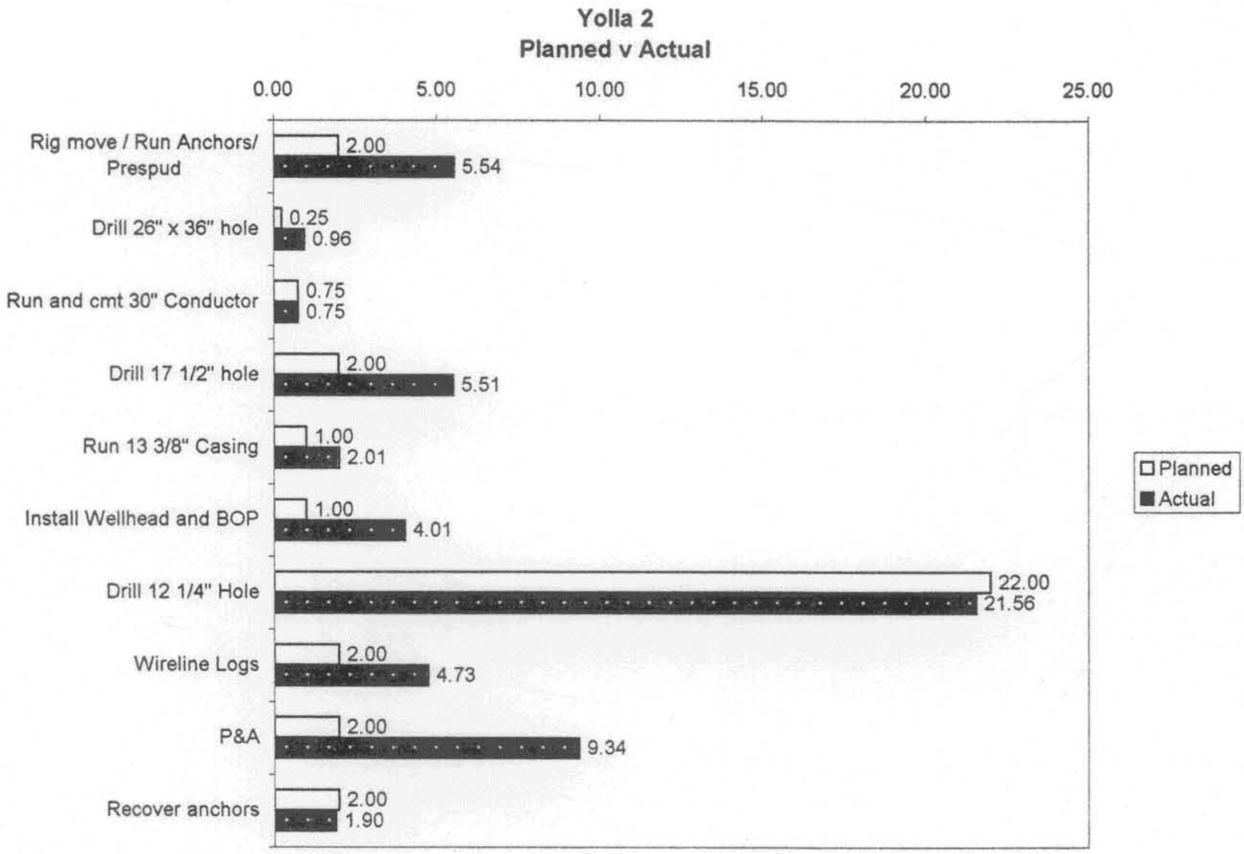
565082

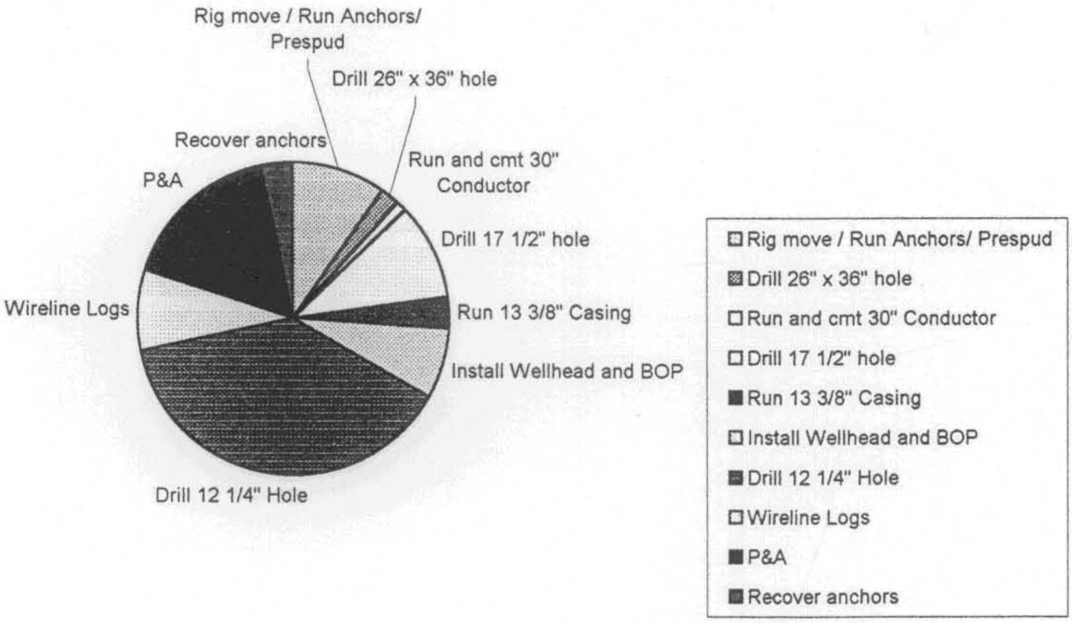
Yolla - 2

Time breakdown

Operation	Time Days	Cumm Days	Depth (m)
Move / run anchors	4.41	4.41	0
WOW	0.88	5.29	0
Complete runing anchors	0.25	5.54	0
Spud Well & drill 36 hole	0.96	6.49	153
Run & Cement conductor	0.75	7.24	153
Drill 17 1/2 hole	1.38	8.62	441
WOW	1.73	10.34	441
Re lay anchors	0.44	10.78	441
ROV failure	0.55	11.33	441
RIH, TDS failure (3hrs)	0.23	11.56	441
Drill to td 17 1/2 hole	1.19	12.75	862
Run & CMT 13 3/8 casing	2.01	14.76	862
Jet wellhead	0.11	14.87	862
Re lay anchors	0.84	15.72	862
Run BOP's	2.34	18.06	862
WOW	0.44	18.50	862
Cont run and land off BOP's	0.27	18.77	862
M/U drillpipe and RIH	0.75	19.52	862
Drill out shoe track & FIT	0.92	20.44	862
Drill 12 1/4 Hole .	1.58	22.02	1,404
Wiper trip	0.21	22.23	1,404
Drill 12 1/4 Hole	0.77	23.00	1,485
POH for bit change	0.74	23.74	1,485
Drill 12 1/4 Hole	2.41	26.15	2,033
Wiper trip WOW	0.27	26.42	2,232
Drill 12 1/4 Hole	0.54	26.96	2,306
POH for bit change	0.71	27.67	2,306
Drill 12 1/4 Hole	1.96	29.62	2,580
POH for bit change	0.60	30.23	2,580
Drill 12 1/4 Hole	1.54	31.77	2,738
POH for bit change	0.88	32.65	2,738
Drill 12 1/4 Hole	1.48	34.12	2,907
POH for washout	0.13	34.25	2,907
Drill 12 1/4 Hole	0.46	34.71	2,954
POH for washout	0.07	34.78	2,954
Drill 12 1/4 Hole	1.16	35.94	3,033
POH for core	0.40	36.33	3,033
M/U core barrel	0.19	36.52	3,033
Test BOP's	0.27	36.79	3,033
WOW, unlatch	0.90	37.69	3,033
Relatch, test conns	0.22	37.91	3,033
RIH with core barrel	0.43	38.33	3,033
Cut core	0.08	38.42	3,051
POH with core	0.44	38.85	3,051
Drill to TD	1.21	40.06	3,164
POH	0.27	40.33	3,164
Log	0.60	40.94	3,164
Wiper trip	1.02	41.96	3,164
Log	3.10	45.06	3,164
P&A	9.34	54.41	3,164
Recover anchors	1.90	56.30	3,164

FIGURE 4


Yolla 2
Planned v Actual
0.00
5.00
10.00
15.00
20.00
25.00
Rig move / Run Anchors/ Prespud
2.00
5.54
Drill 26" x 36" hole
0.25
0.96
Run and cmt 30" Conductor
0.75
0.75
Drill 17 1/2" hole
2.00
5.51
Run 13 3/8" Casing
1.00
2.01
Install Wellhead and BOP
1.00
4.01
Drill 12 1/4" Hole
22.00
21.56
Wireline Logs
2.00
4.73
P&A
2.00
9.34
Recover anchors
2.00
1.90
Planned
Actual


Rig move / Run Anchors/ Prespud
Drill 26" x 36" hole
Recover anchors
Run and cmt 30" Conductor
P&A
Drill 17 1/2" hole
Wireline Logs
Run 13 3/8" Casing
Install Wellhead and BOP
Drill 12 1/4" Hole
Rig move / Run Anchors/ Prespud
Drill 26" x 36" hole
Run and cmt 30" Conductor
Drill 17 1/2" hole
Run 13 3/8" Casing
Install Wellhead and BOP
Drill 12 1/4" Hole
Wireline Logs
P&A
Recover anchors

5 cm

FIGURE 5

APPENDIX I

WELL COST ESTIMATE

565085

Premier Oil

LICENCE : T/RL1
AREA : BASS STRAITS
WELL: YOLLA-2
A$1/US$ 0.60

Date 26-Jun-98
Report No.
Depth, m

	Days	57	47	35
		Supplemental AFE No 2 Total US$	Supplemental AFE No 1 Total US$	AFE 831 Total US$
A	*SITE PREP / ABANDON.*	**92181**	**63466**	**48750**
	Site survey - shallow gas	0	0	0
	Site survey - positioning	0	0	0
	Rig positioning	29721	30966	16250
	Mooring / riser analysis	0	0	0
	Well abandonment / susp.	62460	32500	32500
B	*RIG*	**8289648**	**7265041**	**6329820**
	Rig	8013226	7034641	6087500
	Supervision	0	0	0
	Fuel - HFO	3982	4003	0
	Fuel - diesel	270507	224658	229320
	Drill & pot water, MT	1934	1738	13000
	Additional accom./catering	0	0	0
C	*CONTRACTOR SERVICES*	**1970966**	**1156851**	**823288**
	Mud logging	105868	96664	72350
	Mud engineering	53906	57750	26250
	Cementing	179760	129600	135475
	Wireline logging	549228	391500	320050
	Directional surveying incl EMS rent	47909	45810	31025
	Directional drilling	84290	11010	0
	MWD / LWD	68500	84700	0
	Coring	59050	37365	36222
	Solids control	24621	19293	18400
	Testing	502000	0	0
	Casing / liner running	43856	85712	46628
	Wellhead services	22188	20803	14500
	ROV	229788	176644	115889
	Fishing	0	0	0
	Other contract services	0	0	6500
D	*DRILLING CONSUMABLES*	**455750**	**556651**	**441814**
	Casing Attachments	0	29150	16345
	Cement & Chemicals	49129	46000	29725
	Mud chemicals	235120	250000	165771
	Drill Bits	171501	231501	229973
	Liner Hangers	0	0	0
E	*WELLHEAD AND CASING*	**255031**	**275539**	**219861**
	Wellhead	111575	119075	78950
	30" casing	54028	54028	53900
	20" casing	0	0	0
	13-3/8" casing	89428	89436	74011
	9-5/8" casing	0	0	0
	7" casing	0	0	0
	Casing and wellhead insp.	0	13000	13000
F	*TOOLS AND EQUIPMENT*	**129841**	**106918**	**41691**
	Drilling tools	35208	31704	41691
	Fishing tools	76164	60135	0
	Mud shaker screens	1820	3000	0
	Turbine drilling equip.	0	0	0
	Other tools and equipment	16650	12079	0
G	*TRANSPORT. / COMMS.*	**2915729**	**2533164**	**1754797**
	Aircraft	318430	292068	194088
	Supply / Anchor Boats	2321734	1912216	1455065
	Road transport. / haulage	96524	96524	17245
	Couriers	5000	5485	0
	Communications	27330	49622	16250
	Port charges	70774	80207	32500
	Shipping charges	24162	32500	32500
	Storage charges	0	2475	650
	Agent fees	51777	62068	6500
H	*SHOREBASE / YARD*	**79667**	**96758**	**16042**
	Contract staff	30144	30144	0
	Office rental	17957	8225	7313
	Office equipment rental	0	1081	0
	Warehouse rental	0	2507	2230
	Yard rental	0	2820	0
	Cranes / forklift	28458	43364	0
	Base personnel	3108	8617	0
	Travel for contract staff	0	0	3250
	Base accom. / catering	0	0	3250
I	*GEOLOGICAL ANALYSIS*	**66500**	**66500**	**71500**
	Core analysis	34000	34000	39000
	Biostratigraphy	0	0	0
	Geochemical	6500	6500	6500
	VSP Processing	22750	22750	22750
	Petrography / palynology	3250	3250	3250
	Sedimentology	0	0	0
	Geological studies	0	0	0
J	*HSE*	**57918**	**84020**	**2958**
	Oil Spill Contingency Plan	0	0	0
	Management Systems	0	0	0
	Emergency Response Plan	30000	30000	0
	Safety / survival equipment	0	0	0
	Oil spill equipment	0	0	0
	Consultants and other	27918	54020	2958
K	*ADMINISTRATION*	**639582**	**652967**	**357685**
	Project Management	239989	214376	161116
	Drilling Supervision	127692	163375	0
	Wellsite geologists	47408	51359	30420
	Company allocated	120340	107497	114149
	Contract staff / consultants	104152	116360	52000
	Travel / subsistence	0	0	0
	Accomodation	0	0	0
	Taxation	0	0	0
	Insurance	0	0	0
	TOTAL US$	**14952812**	**12857874**	**10108205**

APPENDIX 2

WELL SUMMARY

Well History

565087

WELL: Yolla-2
RIG : Northern Explorer III

#	DATE	DEPTH	WELL HISTORY 24HR summary
1	04/04/98		Loaded rig and anchor handler. Proceeded to location.
2	05/04/98		Move to location & run anchors. Wait on anchor handler crew. Prepare to spud well.
3	06/04/98		Clear decks. Pretension 1st 4 anchors. Load 2nd 4 anchors & chain to work boat. MU csg running tool. Make mud. Test cmt unit. Clear holds. Commence MU tubulars.
4	07/04/98		Ran anchors & attempted test pulls without success. Loaded anchor handler with piggy backs & pennants, and piggied primaries. Cont MU tubulars for spud.
5	08/04/98		Re-set anchors & tension tested - negative. Recovered #5 to "Commander's " deck. W. O.W.
6	09/04/98	145	WOW before continuing with anchor operations. Moved rig over final location & test pulled anchors. Ran BHA to seabed. Spudded well & drilled 26"/36"hole.
7	10/04/98	152	Drilled 26"/36" hole from 145 -151.9m. Ran & cemented 30" conductor
8	11/04/98	153	MU 5" DP into stands. MU Emergengency hang-off tool, and put on rigfloor. MU new 17 1/2" BHA w/ 26" RR bit. RIH w/ 26" bit assy. Tagged TOC @ 149m. Drilled cmt, shoe & 1.1m new formation. POOH.
9	12/04/98	441	Drilled 17 1/2"hole to 441M. Elect/Mech problems with TDS. POOH for TDS repairs. WOW.
10	13/04/98	441	WOW
11	14/04/98	441	W.O.W - worked cranes - worked boats - "Commander" re-set #5 anchor - moved rig over well - recovered #6 anchor, found that chain had parted - reconnect #6 chain - jumped ROV - ran BHA to PGB - re-ran #6 anchor - attempt to repair ROV.
12	15/04/98	572	Wait on repairs to ROV - work anchors - jumped ROV - RIH with BHA - TDS repairs - drilled 17 1/2"hole 441 - 572m.
13	16/04/98	862	Drilled 17 1/2"hole to TD @ 862m. Displaced hole to 1.14sg hi-vis gel mud - dropped EMS - POOH pumping slowly - jetted PGB - POOH - RU for csg.
14	17/04/98	862	Safety Meeting - run csg - RU & circ csg/annulus - cement csg - pull running string - rig down - MU sub to jet wellhead - test pull anchors & re-set as necessary.

#	DATE	DEPTH	WELL HISTORY (24 hr Summary)
15	18/04/98	862	Jetted PGB clean - work anchors with new Stevpris anchors (in meantime, prepared equip & drillstring for 12 1/4"hole & running BOP) -
16	19/04/98	862	Set anchors - move rig off location - work on BOPs - MU Ball jt - MU 1st Riser jt - P/Test 1st riser jt - PU BOPs & secure - WOW
17	20/04/98	862	Run BOP & 1 jt riser - WOW - cont run BOP/riser.
18	21/04/98	862	Run BOP & riser - landed & latched - took 50K o/pull - stroke out Slip Jt & installed Diverter - P/tested 13 3/8" csg - RIH w/ test plug.
19	22/04/98	862	Tested BOP(on blue pod) - function test yellow pod - set wear bushing - MU 9 5/8" csg x/over - MU stands of DP - RIH BHA singling in DP.
20	23/04/98	908	RIH - Tag cement @ 818.5m - drill cmt - drill F/Collar, shoe track, & shoe - drill 3m new formation to 865m - perform FIT - drill 12 1/14" hole.
21	24/04/98	1,347	Drilled 12 1/4" hole through primarily claystone from 908 - 1347m.
22	25/04/98	1,431	Drill 12 1/4" hole - Circ - wiper trip to shoe - RIH - drill 12 1/4" hole.
23	26/04/98	1,485	Drill 12 1/4" hole to 1495m - Circ B.U. - POOH - PU new bit, NB stab - Adjusted diverter/flowline - Lost #1 anchor tension - RIH
24	27/04/98	1,710	RIH - precautionary ream last 2stds - drill 12 1/4" hole from 1485 - 1710m.
25	28/04/98	1,994	Drilled 12 1/4" hole. Cont to incur problems w/ compensator causing 15-20klbs variation in WOB. Downhole losses stabilized <10bph average.
26	29/04/98	2,175	Drilled 12 1/4" hole, with periods of formation-related high torque and string stalling. Increased downhole losses below 2133m.
27	30/04/98	2,288	Drilled 12 1/4" hole. Wiper trip 11 stands OK. Observe weather. RIH - drill 12 1/4" hole
28	01/05/98	2,328	Drill to 2306m. POOH for new PDC bit. RIH condition/ dilute mud. Drill to 2328m.
29	02/05/98	2,473	Drill 12 1/4" hole from 2328m to 2473m. Offload Mermaid Raider.
30	03/05/98	2,580	Drill 12 1/4" hole from 2473m - 2580m. Varying parameters in attempt to increase ROP. POOH for bit trip.
31	04/05/98	2,636	M/U new tri cone bit, RIH, Drill 2580m to 2636m. Drilling volcanic's.

#	DATE	DEPTH	WELL HISTORY (24 HR Summary)
32	05/05/98	2,738	Drilled 12 1/4" hole from 2636m -2738m, Circulate bottoms up prior to POOH
33	06/05/98	2,751	POOH, M/U new bit, RIH, Work tight hole to bottom. Drill 12 1/4" hole from 2738m - 2751m.
34	07/05/98	2,884	Drill 12 1/4" hole from 2751m - 2884m. Flow checking and circulating bottoms up from drilling breaks @ 2768m & 2860m.
35	08/05/98	2,954	Drill 12 1/4" hole from 2884-2900m. Circulate bottoms up. Drill 2900-2907m. POOH 16stds for washed out DP. Drill 2907-2954m. POOH 22stds for washed out DP
36	09/05/98	3,022	Jar free. RIH to bottom. Drill ahead 2954m - 3016m. Circulate bottoms up for sample. Drill ahead 3016m - 2022m.
37	10/05/98	3,033	Drill ahead to 3033m. Circulate bottoms up. POOH back reaming where neccessary. Attempt to RIH with core barrel but weather building. Rack coring assy back in derrick and test BOP's.
38	11/05/98	3,033	Rising weather - unlatch riser, WOW, Pull rig over location, Latch LMRP.
39	12/05/98	3,051	Complete BOP testing, RIH with Coring assembly. Core 17.5m. POOH.
40	13/05/98	3,160	Lay out core #1. RIH with drilling assembly. Drill from 3050.8m - 3160m.
41	14/05/98	3,164	Check Trip. drop EMS. POOH. R/U Schlum. RIH with PEX to 1256m - tools standing up - cannot pass.
42	15/05/98	3,164	Attempt to get modified logging suite down- could not pass 1256m. Make wiper trip.
43	16/05/98	3,164	Complete wiper trip. Rig up and run Schlumberger wireline logs.
44	17/05/98	3,164	Run MDT . Pump out module failure. Repair module. Complete MDT programme. RIH with VSP tools.
45	18/05/98	3,164	Perform VSP logging, POOH rig down VSP - rig up CMR. Perform CMR logging. POOH rig down CMR.
46	19/05/98	3,164	Complete FMS logging. Rig down Schlumberger. RIH with cement stinger. Set plug #1 & #2 of P&A programme.
47	20/05/98	3,164	Set abandonment plugs 3,4 & 5 with bridge plug below cement plug #4. Nipple down and unlatch BOP's and riser.

WELL: Yolla-2

565090

#	DATE	DEPTH	WELL HISTORY (24 HR summary)
48	21/05/98	3,164	Pull BOP's . Pull wear bushing.
49	22/05/98	3,164	Cut 13 3/8" casing. Attempt to cut 30" casing - bumper sub washed out. Continue to cut. POOH due to weather. WOW
50	23/05/98	3,164	WOW
51	24/05/98	3,164	WOW - Observe 2 guide posts free after moving rig back onto location. Pressure test suface system. Layout casing cutting tools - pick up HWDP.
52	25/05/98	3,164	WOW. ROV-inspect WH. Run & latch CART in WH-attempt to pull WH(no success) Ran cutter assy. Attempt to cut 30"csg.
53	26/05/98	3,164	RIH with casing cutting package, difficulties encountered landing out unable to rotate. POOH and observe lower 1.5m of cutting assembly sheared off. RIH with mill and tag 'fish'. POOH. M/U collision severance charge. R/U mini-ROV
54	27/05/98	3,164	Locate charge in wellhead. Move 180m off location, detonate charge. Move back to location. RIH with CART attempt to pull w/head -pull 20" stub & 18 3/4" housing. RIH & attach sling round PGB - pull to surface. Inspect 30" stump with ROV
55	28/05/98	3,164	Positioned & detonated collision severance charge 3.5m below wellhead. Performed seabed survey. Recovered moonpool spider beam. Began anchor recovery. L/D 5" DP.
56	29/05/98	3,164	L/D 5" DP. Perform rig maintenance while W.O.W.
57	30/05/98	3,164	Recovered anchors - prepare to move rig to next well White Ibis.

APPENDIX 3

BIT RECORD

PremierOil Australasia
Yolla 2

BIT RECORD

565092 14/07/98

BIT N°	SIZE	MAKE	TYPE	IADC	SERIAL N°	TFA inch²	DEPTH OUT m	DIST DRLD m	DRLG HRS hr	TOTAL REVS	ROP m/hr	WOB MT	MOTOR RPM	BIT RPM	PUMP PRESS. psi	FLOW RATE lt/min	HSI	LITHOLOGY	VERT DEV deg	MUD TYPE	MUD WT sg	MUD PV/YP	DULL GRADE I	O	D	L	B	G	O	R
1RR	26	HTC	CR-1	1-1-1	B09CH	1.42	152.0	58	3.8	13400	32	3.5	-	100	1100	1200	0.1	NO RISER	0.0	SW	1.03		1	1	NO	A	1	I	NO	TD
1RR2	26	HTC	CR-1	1-1-1	B09CH	1.42	153.0	1	1.0	5000	2	10	-	95	1100	870	0.3	NO RISER	0.0	SW	1.03		1	1	NO	A	1	I	NO	BHA
2	17 1/2	HTC	GTX-C1	1-1-4	A15KA	0.942	441.0	441	5.6	41000	51	3.0	-	125	2500	1200	4	NO RISER	0.0	SW	1.03		0	0	NO	A	E	I	NO	RIG
2RR	17 1/2	HTC	GTX-C1	1-1-4	A15Ak	0.942	862.0	421	14.9	90000	36	8.0		130	3075	1120	4	NO RISER	0.0	SW	1.03		2	4	WT	G1/3	E	I	NO	TD
3	12 1/4	HTC	AG526	M2-2-1	1402214	0.552	1485.0	633	34.9	334560	9	1.5	-	170	2500	800	5	CLAYSTONE	0.0	KCl	1.01		1	0	CT	O	X	1/16	NR	PR/TQ
4	12 1/4	HTC	ATMGT-18	4-4-7	W15CB	0.451	2306.0	821	73.9	660398	10	14	-	156	3500	670	8	CLYSTN/COAL	0.0	KCl	1.13		3	3	WT	A	E	3/16	NO	PR
5	12 1/4	HTC	BD447	M4-3-3	1902101	1.399	2580.0	2306	37.3	367032	6	5	-	164	2125	650	0.6	CLYSTN/COAL	1.0	KCl	1.10		0	1	WT	N/T/S	X	1/16	NO	PR
6	12 1/4	REED	EHP41HLK	4-1-7	4308108	0.451	2738.0	158	35.5	228000	5	20	-	125	3600	703	7	VOLCANICS	1.5	KCl	1.11		6	5	CT/BT/CT	A	E	3/16	JD	PR
7	12 1/4	HTC	ATM-P18	4-4-7	V05BW	0.451	3033.0	295	48.1	442000	6	18	-	159	3600	671	6	SST/ CLYSTN	2.0	KCl	1.13		3	3	WT/CT/BT	A	E	1/16	NO	CP
8	12 1/4	ORPR	CM365F	M3-3-3	711001	1.150	3050.8	17.8	1.8	10408	10	3	-	98	587	308	-	SST	-	KCl	1.12									
9	12 1/4	HTC	MAXGT-P09	4-3-5	A64KA	0.543	3164.0	113	14.6	129600	8	15	-	160	3400	700	5	SST/VOLCANICS	2.0	KCl	1.13		1	1	WT	A	E	1/16	NO	TD

APPENDIX 4

BHA RECORD

BHA SUMMARY

565094

WELL : Yolla-2
DRILLING COMPANY : Northern Offshore
RIG : Northern Explorer III

Page 1

#	LENGTH	WT	WBJAR	STRNG	P/UPWT	S/OFFWT	TQ MAX	TQONBOT	TQ/O/BOT	HRS	BHA DESCRIPTION
1	175.42			120			14,000	10,000	9,000		26" Bit+36" H.O.+bit sub + x/over +Anderdrift + 9 x 8"DC +x/over + 9 x 5" HWDP
2	143.79	47	40	120	118	120	1,500	3,500	1,000		26"bit-17 1/2"NBstab c/w float-8"Anderdrift Tool-totco ring -8"Pony DC-17 1/2" Stab-8"DC-17 1/2"Stab-6x8"DC-Jar-3x8"DC -x/o-1 x HWDP- dart sub- HWDP.
3	143.26	47	40	120	118	120	8,000	5,000	2,000		17 1/2"bit-17 1/2"NBstab c/w float-8"Anderdrift Tool-totco ring -8"Pony DC-17 1/2" Stab-8"DC-17 1/2"Stab-6x8"DC-Jar-3x8"DC -x/o-1 x HWDP- dart sub- HWDP.
4	198.82	47	40	170	172	168	3,000	2,450	1,220		17 1/2"bit -17 1/2"NBstab c/w float - 8"Anderdrift - 8"Pony NMDC - 17 1/2" Stab - Totco ring - 8"NMDC - 17 1/2"Stab - 6x8"DC - Jar - 3x8"DC - x/o - 1 x HWDP - dart sub - 8 X HWDP.
5	198.43	56	38	210	200	205	16,000	5,410	2,250		12 1/4"PDC bit -12/14"NB Stab c/w float - 8"Anderdrift - 8"Pony NMDC - 12 1/4" Stab - Totco ring - 8"NMDC - 12 1/4"Stab - 6x8"DC - Jar - 3x8"DC - x/o - 1 x HWDP - dart sub - 8 X HWDP.
6	198.43	59	40	257	248	252	15,712	6,157	4,000		12 1/4" Tricone bit -12/14"NB Stab c/w float - 8"Anderdrift - 8"Pony NMDC - 12 1/4" Stab - Totco ring - 8"NMDC - 12 1/4"Stab - 6x8"DC - Jar - 3x8"DC - x/o - 1 x HWDP - dart sub - 8 X HWDP.
7	198.40	59	40	272	268	278	14,881	6,564	4,000		12 1/4" PDC bit -12/14"NB Stab c/w float - 8"Anderdrift - 8"Pony NMDC - 12 1/4" Stab - Totco ring - 8"NMDC - 12 1/4"Stab - 6x8"DC - Jar - 3x8"DC - x/o - 1 x HWDP - dart sub - 8 X HWDP.
8	198.40	59	40	282	290	275	11,790	6,013	4,000		12 1/4" rock bit -12/14"NB Stab c/w float - 8"Anderdrift - 8"Pony NMDC - 12 1/4" Stab - Totco ring - 8"NMDC - 12 1/4"Stab - 6x8"DC - Jar - 3x8"DC - x/o - 1 x HWDP - dart sub - 8 X HWDP.
9	226.68	63	46	310	325	300	12,225	7,719	3,000		12 1/4" rock bit -12/14"NB Stab c/w float - 8"Anderdrift - 8"Pony NMDC - 12 1/4" Stab - Totco ring - 8"NMDC - 12 1/4"Stab - 9x8"DC - Jar - 3x8"DC - x/o - 1 x HWDP - dart sub - 8 X HWDP.
10	221.48	57	40	305	315	300	14,900	8,000	365		PDC core bit-3 x 9 1/2" x 20' Corpro core barrel - 2 x Baash Ross drilling bumper subs - 8 x 8"DC - Jar - 3x8"DC - x/o - 1 x HWDP - dart sub - 8 X HWDP.
11	226.68	63	46	315	325	305	15,100	9,600	500		12 1/4" rock bit -12/14"NB Stab c/w float - 8"Anderdrift - 8"Pony NMDC - 12 1/4" Stab - Totco ring - 8"NMDC - 12 1/4"Stab - 9x8"DC - Jar - 3x8"DC - x/o - 1 x HWDP - dart sub - 8 X HWDP.

APPENDIX 5

MUD RECORD

MUD RECAP

WELL : Yolla-2

OPERATING CO.:Premier Oil

RIG : Northern Explorer III

MUD COMPANY : Dowell

TOTAL COST : $235,487.44

AVE DAILY COST $4,131.36

565096

R#	DATE	TYPE	DEPTH	TMP C	MW	VIS	PV	YP	GEL 10s	GEL 10M	F.L. API	CAKE	SOL	%HGS	%LGS	%DS	SND	MBT	PH	PM	PF	Cl	HARD /CA	PHPA	KCl%	K+	DAILY $
1	04/04/98																										
2	05/04/98	SW																				25,000					
3	06/04/98	Guar Gum			1.0	120																25,000					5,241
4	07/04/98	Guar Gum			1.0	120																25,000					
5	08/04/98	Guar Gum			1.0	120																25,000	135				924
6	09/04/98	Guar Gum			1.0	120																25,000	135				
7	10/04/98	Guar Gum	152		1.0	120													0.0	7.5			25,000	135				5,567
8	11/04/98	Guar Gum	153		1.0	120													0.0	7.5			25,000	135				1,649
9	12/04/98	Guar Gum	441		1.0	120													0.0	7.5			25,000	135				2,550
10	13/04/98	Guar Gum	441		1.0	120													0.0	7.5			25,000	135				0
11	14/04/98	Guar Gum	441		1.0	120													0.0	7.5			25,000	135				0
12	15/04/98	Gel	572		1.0	120														9.5			1,000	10				4,018
13	16/04/98	Gel	572		1.0	120														9.5			1,000	10				3,036
14	17/04/98	Gel	862		1.0	120														9.5			1,000	10				0
15	18/04/98	KCl	862		1.0																							4,228
16	19/04/98	KCl	862		1.0	54	11	24	10	12	8.4	1.0	4.7	93.0						10.0	2	0	30,000	120		6		5,646
17	20/04/98	KCl	862		1.1	54	11	24	10	12	8.4	1.0	2.6	95.0						10.0	2	0	30,000	120		6		6,601
18	21/04/98	KCl	862		1.1	54	11	24	10	12	8.4	1.0	2.7	95.0						10.0	2	0	30,000	120		6		0
19	22/04/98	KCl	862		1.1	54	11	24	10	12	8.4	1.0	2.7	95.0						10.0	2	0	30,000	120		6		1,821
20	23/04/98	KCl	907	16	1.1	56	11	22	8	10	8.2	1.0	1.7	96.0					0.0	9.5	1	0	32,000	100		6		4,008
21	24/04/98	KCl	1,300	42	1.1	58	16	36	10	14	5.3	1.0	3.8	94.0				.3	3.0	9.0	0	0	34,000	120		4	22,824	17,686
22	25/04/98	KCl	1,425	45	1.1	56	17	38	10	13	5.6	1.0	3.5	94.0				0	6.5	9.5	0	0	39,000	200		5	26,250	8,744
23	26/04/98	KCl	1,480	49	1.1	67	17	40	11	14	5.7	1.0	2.5	95.0				0	7.0	9.5	0	0	38,000	200		5	26,250	8,278
24	27/04/98	KCl	1,696	49	1.1	66	19	37	10	13	5.8	1.0	3.7	94.0				0	7.5	9.9	1	1	34,000	60		5	26,250	13,805
25	28/04/98	KCl	1,984	53	9.4	59	19	42	11	15	5.4	1.0	4.6	93.0				0	7.5	9.7	1	1	34,000	80		6	28,875	5,320
26	29/04/98	KCl	2,175	55	9.4	57	20	40	11	15	5.4	1.0	4.5	93.0				0	7.5	9.7	1	1	36,000	60		6	29,250	17,434
27	30/04/98	KCl	2,280	51	1.1	56	18	40	8	12	5.2	1.0	5.7	92.0				0	7.5	9.1	0	0	36,000	60		5	26,250	14,025
28	01/05/98	Active S	2,314	49	1.1	55	16	33	7	11	4.6	1.0	4.7	92.5				1.3		9.0	0	0	42,000			6	30,800	10,086
29	02/05/98	Active S	2,469	50	1.1	52	15	30	6	9	5.2	1.0	4.9	93.5				0.8		9.0		0	40,000			5	25,700	9,935
30	03/05/98	Active S	2,580	52	1.1	54	18	37	8	11	4.8	1.0	4.3	93.0				0.4		9.2		0	42,000			5	28,000	5,644
31	04/05/98	KCl PHPA	2,625	57	1.1	49	15	32	8	10	5.0	1.0	4.4	93.0				0.7		9.2		0	40,000			5	28,000	10,941
32	05/05/98	KCl PHPA	2,736	61	1.1	51	16	36	9	11	4.6	1.0	4.9	92.5				0.4		9.0		0	39,000			5	28,000	11,981
33	06/05/98	KCl PHPA	2,750	54	1.1	56	15	31	7	9	5.2	1.0	4.4	93.0				0.3		9.0		0	40,000			5	27,000	3,019
34	07/05/98	KCl PHPA	2,866	57	1.1	50	16	34	8	12	4.2	1.0	5.9	91.5				0.5		9.0		0	40,000			5	28,000	14,222
35	08/05/98	KCl PHPA	2,949	54	1.1	49	17	33	9	14	4.2	1.0	5.8	91.5				.6	7.5	9.0		0	41,000			6	31,000	7,327
36	09/05/98	KCl PHPA	3,016	57	1.1	47	17	33	9	14	4.6	1.0	5.7	91.5				0.4	7.5	8.8		0	42,000			6	21	4,166
37	10/05/98	KCl PHPA	3,033	57	1.1	48	17	32	9	14	4.4	1.0	5.7	91.5				0.3	7.5	8.8		0	42,000			6	21	6,921
38	11/05/98	KCl PHPA	3,033	29	1.1	57	17	31	10	13	4.0	1.0	5.3	92.0				0.3	7.5	8.5		0	42,000			6	31,000	0
39	12/05/98	KCl PHPA	3,050	39	1.1	46	16	28	10	13	4.6	1.0	5.2	92.0				0.3	7.5	8.7		0	42,000			6	32,500	4,979
40	13/05/98	KCl PHPA	3,150	62	1.1	44	13	29	8	12	5.2	1.0	5.3	92.0				0.4	7.5	9.0		0	40,000			6	31,000	7,765
41	14/05/98	KCl PHPA	3,164	64	1.1	47	13	31	9	16	5.2	1.0	5.5	92.0				0.4	7.5	9.0		0	38,000			6	29,000	420
42	15/05/98	KCl PHPA	3,164	63	1.1	44	12	28	8	14	5.5	1.0	6.4	91.0				.3	10.0	8.8		0	39,000			6	31,000	3,612
43	16/05/98	KCl PHPA	3,164	44	1.1	54	14	30	10	14	5.2	1.0	5.4	92.0				.3	10.0	8.7		0	39,000			6	31,000	0
44	17/05/98	KCl PHPA	3,164	35	1.1	50	14	28	9	13	4.8	1.0	5.4	92.0				.3	10.0	8.5		0	38,000			6	31,000	1,237
45	18/05/98	KCl PHPA	3,164	30	1.1	53	14	26	9	13	4.8	1.0	5.5	92.0				.3	10.0	8.5		0	38,000			6	31,000	140
46	19/05/98	KCl PHPA	2,850	67	1.1	44	12	28	9	14	5.5	1.0	5.4	92.0				.3	10.0	8.2		0	38,000			6	31,000	1,282
47	20/05/98	KCl PHPA	0	40	1.1	50	13	26	9	13	5.0	1.0	5.6	92.0				.3	10.0	8.5		0	37,000			6	29,000	1,230
55	28/05/98	KCl PHPA	3,164	30	1.1	53	14	26	9	13	4.8	1.0	5.5	92.0				.3	10.0	8.5		0	38,000			6	31,000	0

WELL : Yolla-2 | RIG : Northern Explorer III | TOTAL COST : $235,487.44

OPERATING CO.:Premier Oil | MUD COMPANY : Dowell | AV AILY COST $4,131.36

565097

R#	DATE	TYPE	DEPTH	TMP C	MW	VIS	PV	YP	GEL 10s	GEL 10M	F.L. API	CAKE	SOL	%HGS	%LGS	%DS	SND	MBT	PH	PM	PF	Cl	HARD /CA	PHPA	KCl%	K+	DAILY $
56	29/05/98	KCl PHPA	3,164	30	1.1	53	14	26	9	13	4.8	1.0	5.5	92.0			.3	10.0	8.5		0	38,000			6	31,000	0
57	30/05/98	KCl PHPA	3,164	30	1.1	53	14	26	9	13	4.8	1.0	5.5	92.0			.3	10.0	8.5		0	38,000			6	31,000	0

APPENDIX 6

CASING TALLIES

CASING SUMMARY

565099

WELL : Yolla-2

DIAMETER :	**30 "**	**L.O.T. :**	
CSG SHOE MD :	**151.50**	**F.I.T. :**	
CSG SHOE TVD :	**151.50**		

DESCRIPTION	LENGTH	CSG ID	WEIGHT	GRADE	THREAD
Housing jt	12.39	28.00	310.00	X-52	ST2
Intermediate jt	11.39	28.00	310.00	X-52	ST2
Intermediate jt	11.57	28.00	310.00	X-52	ST2
Intermediate jt	11.70	28.00	310.00	X-52	ST2
Shoe jt	12.12	28.00	310.00	X-52	ST2

DIAMETER :	**13.3/8 "**	**L.O.T. :**	
CSG SHOE MD :	**853.00**	**F.I.T. :**	**14.58**
CSG SHOE TVD :	**853.00**		

DESCRIPTION	LENGTH	CSG ID	WEIGHT	GRADE	THREAD
1 x jt	11.50	12.42	68.00	L80	N.VAM
1 x pup "A"	3.06	12.42	68.00	L80	N.VAM
62 x jts	713.40	12.42	68.00	L80	N.VAM
F/Collar jt	12.28	12.42	68.00	L80	N.VAM
Shoe jt	14.85	12.42	68.00	L80	N.VAM
WH jt	5.50	12.42	68.00	L80	N.VAM

APPENDIX 7

CASING & CEMENTING REPORTS

565101

PremierOil Australasia

CASING AND CEMENTING REPORT

Well : Yolla 2   Rig Name : Northern Explorer III

Casing Size (in) :	30" (762mm)	Open Hole Size (in) :	36"	Last Casing Size (in) :	N/A
Shoe Depth (mMD) :	151.5	Drillers Depth (mMD) :	151.9	Shoe Depth (mMD) :	N/A
Shoe Depth (mTVD) :	151.5	Depth (mTVD) :	151.9	Shoe Depth (mTVD) :	N/A

1. CASING RUN IN WELL

Nr. of Joints	Size mm	Weight (ppf)	Grade	Conn.	Centralizers Nr.	Centralizers Spac.	Make up length (m)	Setting Depth (m)	Comments
Shoe	762	310	GR B	ST2	-	-	12.115	151.5	
#2	762	310	GR B	ST2	-	-	11.700	127.7	
#3	762	310	GR B	ST2	-	-	11.385	116.3	
#4	762	310	GR B	ST2	-	-	11.570	104.7	
WH jt	762	310	GR B	ST2	-	-	12.390	92.3	
					-	-	-	-	
					-	-	-	-	
					-		-	-	
					-		-	-	
					-		-	-	
					-		-	-	
							-	-	

2. ELEVATIONS : RKB to

Top of Casing Hanger :	N/A	Top of Csg Head :	92.27	Top of Liner Hanger :	N/A

3. CASING RUN

Check trip after logging (Y or N ?)	N	Mud conditioning						Circulation	
HI-VIS pill before running (Y or N ?)	Y	Weight	1.03	PV	N/A	YP	N/A	Rate (bpm)	7
Nr. of threadlocked joints	0	Filtrate	NC	Gels	N/A			Duration (min)	60

4. CEMENT FORMULATION

Stage	Slurry	Cmt Class	Water and Additives (gps, kg/mt, lt/mt or %) H20 gps	CaCl2 %BWOC	D 47 gps						Slurry Density sg	Yield (ft3/sx)	Thick. Time hr:min
1	Tail	G	5.16	1.5	0.0102	-	-	-	-	-	1.9	1.18	2:00

5. CEMENT PLACEMENT

Stage	Slurry	Volume bbl	Lost bbl	Estimated TOC, m	Pre-calculated TOC, m	Comments
1	Tail	206	0	94/seabed	94/seabed	Pumped 195 % excess to allow for hole washout

6. DISPLACEMENT

Stage	Volume bbl	Rate bpm	Lost bbl	Bump Pressure	Test Duration	Floats Hold ?	Comments
1	55.0	8.00	0	N/A	N/A	Y	Float held.

7. REMARKS

Pumped 70bbls S/W flush prior to cementation, w/ 4 x 25kg sx Mica in last bbls to help identify cement returns to seabed for ROV.

Observed cement at seabed after 120 - 140bbls pumped, and good cement returns after +/- 160bbls

CEMENT COMPANY :	Dowell	CEMENTER :	Tony Lemon / Ku Tong
DRILLING ENGINEER :	Kim Dubravac	DRILLING SUPERVISOR :	Charles Stirrett

565102

PremierOil Australasia

CASING AND CEMENTING REPORT

Well : Yolla 2	Rig Name : Northern Explorer III

Casing Size (in) :	13 3/8" (340mm)	Open Hole Size (in) :	17 1/2" (445mm)	Last Casing Size (in) :	30" (762mm)
Shoe Depth (mMD) :	853.0	Drillers Depth (mMD) :	862.0	Shoe Depth (mMD) :	151.5
Shoe Depth (mTVD) :	853.0	Depth (mTVD) :	862.0	Shoe Depth (mTVD) :	151.5

1. CASING RUN IN WELL

Nr. of Joints	Size mm	Weight (ppf)	Grade	Conn.	Centralizers Nr.	Centralizers Spac.	Make up length (m)	Setting Depth (m)	Comments
Shoe	340	68	L-80	N.VAM	2	-	14.851	853.0	2 Centralizers on shoe jt
#74	340	68	L-80	N.VAM	2	-	11.502	838.1	2 Centralizers on jt #74
F/collar	340	68	L-80	N.VAM	1	-	12.279	825.9	1 Centralizers on F/collar jt
#72-40	340	68	L-80	N.VAM	1	-	386.301	439.6	1 Cent on jts 71, 69, 67, 65, & 63
#38-11	340	68	L-80	N.VAM	-	-	338.765	100.8	
Pup A	340	68	L-80	N.VAM	-	-	3.055	97.7	
WH	476	WH		N.VAM	-	-	5.497	92.3	RT to top 30" WH
					-		-	-	
					-		-	-	
					-		-	-	Jts Shoe through #71 Bakerloked
					-		-	-	
							-	-	

2. ELEVATIONS : RKB to

Top of Casing Hanger :	N/A	Top of Csg Head :	91.3	Top of Liner Hanger :	N/A

3. CASING RUN

Check trip after logging (Y or N ?)	N	Mud conditioning						Circulation	
HI-VIS pill before running (Y or N ?)	Y	Weight	1.03	PV	N/A	YP	N/A	Rate (bpm)	12.5
Nr. of threadlocked joints	5	Filtrate	NC	Gels	N/A			Duration (min)	60

4. CEMENT FORMULATION

Stage	Slurry	Cmt Class	H20 gps	D075 gps	D 47 gps						Slurry Density sg	Yield (ft3/sx)	Thick. Time hr:min
			Water and Additives (gps, kg/mt, lt/mt or %)										
1	Lead	G	14.78	0.5	0.01	-	-	-	-	-	1.44	2.52	5:40
2	Tail	G	5.190	-	0.01	-	-	-	-	-	1.89	1.17	4:20

5. CEMENT PLACEMENT

Stage	Slurry	Volume bbl	Lost bbl	Estimated TOC, m	Pre-calculated TOC, m	Comments
1	Lead	562	0	Seabed (94m)	Seabed (94m)	Pumped 100 % excess on the open hole volume.
2	Tail	133	0	779	700	

6. DISPLACEMENT

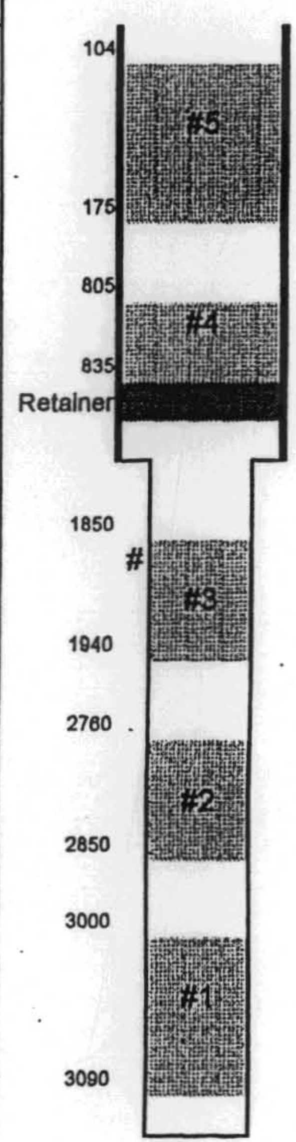
Stage	Volume bbl	Rate bpm	Lost bbl	Bump Pressure	Test Duration	Floats Hold ?	Comments
1	357	20	0	None	N/A	Y	Float held.

7. REMARKS

Erratic weights (14.4 - 15.6ppg) due to inadequate air supply while shipping cement from silos to cement unit surge tank, as a result of auxilliary rig Service air not being turned on. Observed pressure increase to only 550psi after dart released (not the expected 1950psi), and then return to 95psi. Observed pressure increase to 1850psi after 117bbls pumped - suspect top plug bumped late. Displaced theoretical volume to +/- 20m above the top of F/Collar. Plug didn't bump. Jetted wellhead after cementation.

CEMENT COMPANY :	Dowell	CEMENTER :	Tony Lemon / Ku Tong
DRILLING ENGINEER :	Kim Dubravac	DRILLING SUPERVISOR :	Charles Stirrett

		Plug #1	Plug #2	Plug#3	Plug #4	Plug #5
Top of Plug	m	3000	2760	1850	805	104
Bottom of Plug	m	3090	2850	1940	835	175
	Vol bbl	40.9	40.9	40.9	14.7	34.8
	Vol m^3	6.5	6.5	6.5	2.3	5.5
Slurry Volume	Excess	20%	20%	20%	-	-
	Tol bbl	49.1	49.1	49.1	14.7	34.8
	yield	1.15	1.15	1.15	1.15	1.18
Cement	sk	239.5	239.5	239.5	71.8	165.6
Drill water	gal/sk	4.97	4.97	4.98	5.04	-
	bbl	28.3	28.3	28.4	8.6	-
Sea water	gal/sk	-	-	-	-	5.18
	bbl	-	-	-	-	20.4
D047	gal/sk	0.01	0.01	0.01	0.01	0.01
Antifoam	tol gal	2.4	2.4	2.4	0.7	1.7
	gal/tank	0.8	0.8	0.8	0.8	0.8
D604M	gal/sk	0.07	0.07	0.05	-	-
Dispersant	tol gal	16.8	16.8	12.0	-	-
	gal/tank	5.8	5.8	4.1	-	-
D110	gal/sk	0.02	0.02	0.03	-	-
Retarder	tol gal	4.8	4.8	7.2	-	-
	gal/tank	1.7	1.7	2.5	-	-
	gal/sk	5.07	5.07	5.07	5.05	5.19
Mixing Fluid	bbl	28.9	28.9	28.9	8.6	20.5
	tank	3	3	3	1	2
Water Ahead	bbl	10	10	10	10	10
	Eq Height m	25.1	25.1	25.1	24.4	24.4
Water Behind	bbl	1.5	1.5	1.5	1.4	1.4
Displacement	bbl	173.4	159.4	106.4	45.5	4.6



565104

APPENDIX 8

LOT DATA

PremierOil Australasia

Formation Integrity Report

5 cm

Well Name : Yolla 2	Rig Name : Northern Explorer III

1. CASING DETAILS:

Size (in) :	13 3/8"	*Weight :*	68	*Grade :*	N. VAM
Shoe depth (m MD) :	853	*Shoe depth (m TVD) :*	853		

2. OPEN HOLE DETAILS

Size (in) :	12 1/4"	*Depth (m MD) :*	865	*Depth (m TVD) :*	865
Formation Type :	Claystone	*Formation Age :*	Torquay Grp		

3. MUD DETAILS

Type :	KCl/PHPA	*Density (sg) :*	1.07	*PV/YP :*	11 / 22	*FL :*	8.0

4. TEST PUMP DETAILS

Type :	Cmt Unit	*Contractor :*	Dowell	*Pump Operator :*	Yu

5. TEST DATA

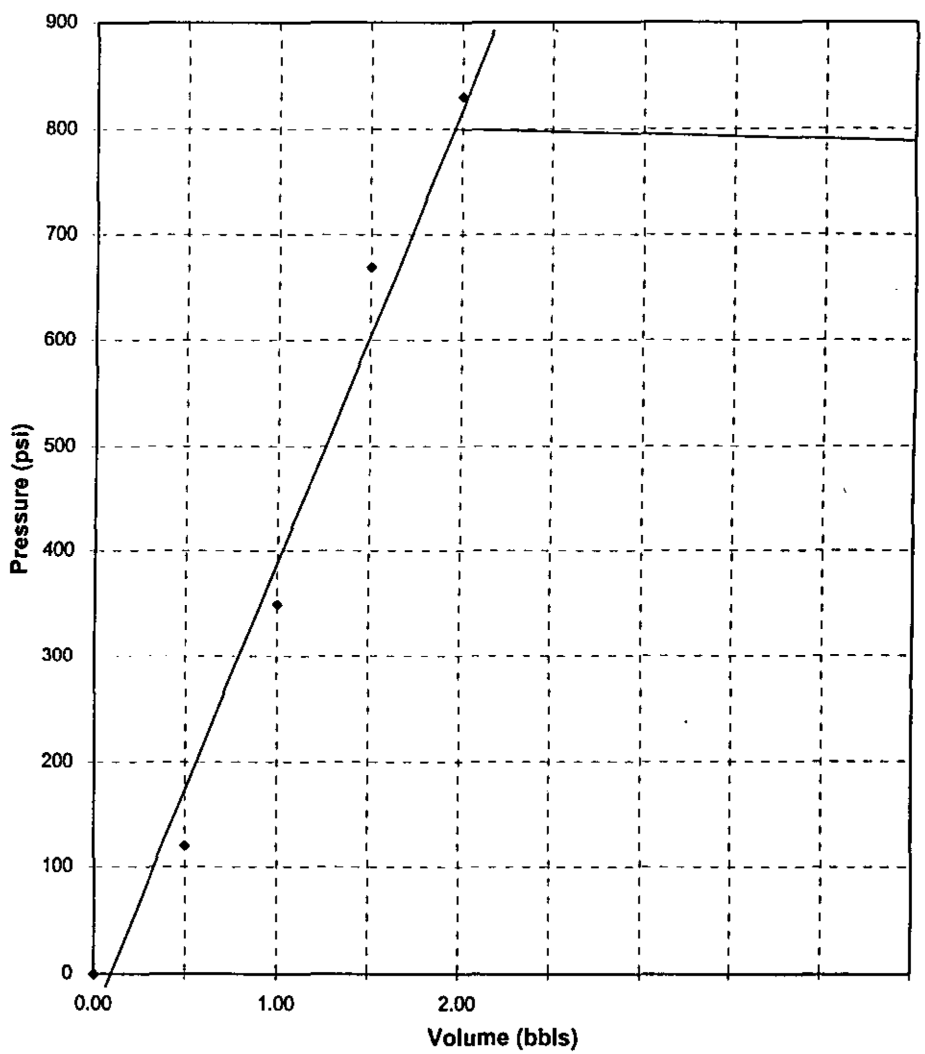
Time (min)	*Volume (bbl) Pumped*	*Volume (bbl) Cumulative*	*Pressure (psi)*
	0.00	0.00	0
	0.50	0.50	120
	0.50	1.00	350
	0.50	1.50	670
	0.50	2.00	830

Time (min)	*FALL DOWN*		*Pressure (psi)*
00:00	830.00	803.0	830
1:00			803
2:00			790
3:00			790
4:00			785
5:00			785
6:00			785
7:00			785
8:00			780
9:00			780
10:00			780

6. DATA ANALYSIS

Total Volume Pumped :	2 bbls	*Maximum Pressure Recorded :*	830 psi		
Leak off Observed :	No	*Leak off Pressure :*	N/A	*Time Held :*	10min
Volume Regained on Bleed Back :	2 bbls				
Formation Leak off EMW (sg) :	-	*Formation Integrity Test EMW (sg) :*	1.75 sg		

12 1/4" LOT



DRILLING SUPERVISOR : H. Knobl DRILLING ENGINEER : K. Dubravac

APPENDIX 9

SURVEY DATA

565107

Deviation Survey

WELL : Yolla-2

Wellhead Location				
	LAT.	DEG : 39	MIN : 51	SEC : 33.82
	LONG.	DEG : 145	MIN : 48	SEC : 38.53

MD (ft)	TVD1 (ft)	INCL (deg)	AZIMUTH (deg)	CORRECT AZ (deg)	DOGLEG (deg 100ft)	V SECT (m)	N/S	E/W
96.15		1.50						
103.00		0.50						
108.50		2.50						
122.00		0.50						
140.00		0.00						
142.20		0.00						
144.90		0.00						
164.00		0.00						
194.00		0.00						
223.00		0.00						
251.00		0.00						
280.00		0.00						
308.00		0.00						
337.00		0.00						
394.00		0.00						
450.00		0.00						
478.00		0.00						
507.00		0.00						
536.00		0.00						
563.00		0.00						
592.00		0.00						
621.00		0.00		12.63				
650.00		0.00						
679.00		0.00						
707.00		0.00						
737.00		0.00						
765.00		0.00						
798.00		0.00						
822.00		0.00						
837.00		0.00						
855.00		0.00						
874.00		0.00						
902.00		0.00						
929.00		0.00						
956.00		0.00						
984.00		0.50						
1,016.00		0.00						
1,045.00		0.00						
1,190.00		0.00						
1,232.00		0.00						
1,389.00		1.00						
1,475.00		0.00						
1,631.00		0.00						
1,710.00		0.00						
1,829.00		0.50						
1,994.00		0.00						
2,202.00		0.00						
2,348.00		0.00						
2,489.00		0.00						
2,575.00		1.00						
2,660.00		2.00						
2,661.00		2.00						
2,738.00		1.50						
2,892.00		2.00						
3,061.00		2.50						
3,150.00		2.00						
3,146.80		2.20	54.5	67.10				

APPENDIX 2

CUTTINGS DESCRIPTIONS

YOLLA-2

PREMIER OIL (AUSTRALASIA) LIMITED
YOLLA 2
LITHOLOGIC DESCRIPTIONS & SHOWS

DEPTH (from-to)	%	DESCRIPTIONS & SHOWS
855-860	90	CLAYSTONE: light grey-very light grey, soft-firm, amorphous in part, blocky-subblocky, grades to CALCILUTITE in part, calcareous, common mica flakes, trace black carbonaceous specks / laminae, trace forams, trace bryozoans, trace pyrite nodules.
	10	LIMESTONE: off white-pale yellow orange, plastic, sticky, moderately-very calcareous, slightly dolomitic, trace cryptocrystalline, trace medium brown-black oxidised Fe, trace nautilus, shell fragments, coral.
		*Sample heavily cement contaminated.
		Calcimetry: 5/5
860-865	90	CLAYSTONE: as above
	10	LIMESTONE: as above
		*Cement contamination
865-870	95	CLAYSTONE: as above
	5	LIMESTONE: as above
		*Cement contamination.
870-875	100	CLAYSTONE: generally as above, light grey–vlight grey, soft-firm, amorphous in part, grades to CALCILUTITE in part, slightly-moderately calcareous, common mica flakes, trace black carbonaceous specks, trace forams, trace pyrite nodules.
875-880	80	CLAYSTONE: as above
	20	LIMESTONE: as above
		Calcimetry: 22/0
880-885	100	CLAYSTONE: as above
	Tr	LIMESTONE: as above
885-890	85	CLAYSTONE: generally as above, light grey-very light grey, soft-firm, amorphous-washable in part, grades to CALCILUTITE in part, calcareous, common mica flakes, trace black carbonaceous specks, trace forams, trace-abundant fossil fragments, trace pyrite nodules.
	15	LIMESTONE: light-medium grey, soft, plastic, sticky, slightly dolomitic, grades to CALCILUTITE in part, trace-common fossil fragments, trace very fine grained quartz silt, trace pyrite.
		Calcimetry: 17/0
890-895	95	CLAYSTONE: as above
	5	LIMESTONE: as above
895-900	85	CLAYSTONE: as above
	15	LIMESTONE: as above
		Calcimetry: 17/0
900- 905	80	CLAYSTONE: as above

	20	LIMESTONE: generally as above, w/ trace disseminated pyrite, trace calcite.
905-910	80	CLAYSTONE: as above
	20	LIMESTONE: as above
		Calcimetry: 18/0
910-915	90	CLAYSTONE: very light grey-medium light grey, soft, amorphous, sticky, dispersive in part, silty calcareous, trace-common fossil fragments, trace disseminated pyrite.
	10	LIMESTONE: yellow grey–vpl orange–light grey, soft, plastic, sticky, dispersive, trace-common fossil fragments, trace calcite.
915-920	90	CLAYSTONE: as above
	10	LIMESTONE: as above
		Calcimetry: 20/0
920-925	90	CLAYSTONE: as above
	10	LIMESTONE: as above
925-930	90	CLAYSTONE: generally as above, very light grey-medium light grey, soft, amorphous, sticky, dispersive in part, silty calcareous, trace-common fossil fragments, trace disseminated pyrite.
	10	LIMESTONE: yellow grey–vpl orange–light grey, soft, plastic, sticky, dispersive, trace-common fossil fragments, trace calcite.
930-935	90	CLAYSTONE: as above
	10	LIMESTONE: as above
935-945	90	CLAYSTONE: as above
	10	LIMESTONE: as above
		Calcimetry: 16/0
945-950	90	CLAYSTONE: generally as above w/ trace siderite.
	10	LIMESTONE: generally as above w/ trace nautilus shells.
		Calcimetry: 20/0
950-960	90	CLAYSTONE: as above
	10	LIMESTONE: as above
		Calcimetry: 20/0
960-970	85	CLAYSTONE: as above
	15	LIMESTONE: as above
970-980	85	CLAYSTONE: light grey-medium light grey, soft, amorphous, sticky, firm in part, blocky-subblocky, silty calcareous, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments, trace very fine grained quartz silt.
	15	LIMESTONE: generally as above
980 -990	90	CLAYSTONE: as above, trace micromica
	10	LIMESTONE: as above
990-1000	85	CLAYSTONE: as above
	15	LIMESTONE: as above
1000-1010	85	CLAYSTONE: as above
	15	LIMESTONE: as above
		Calcimetry: 20/0

1010 -1020	85	CLAYSTONE: generally as above, light grey-medium light grey, soft, sticky, amorphous-washable, firm in part, blocky-subblocky, slightly to moderately calcareous, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments occasionally very fine grained quartz.
	15	LIMESTONE: as above.
		Calcimetry: 15/0
1020-1030	90	CLAYSTONE: as above
	10	LIMESTONE: as above
1030-1040	90	CLAYSTONE: as above
	10	LIMESTONE: generally as above, light grey-medium grey, yellow grey, plastic, sticky, mod-v calcareous, slightly dolomitic, grades to CALCARENITE in part, trace calcite, trace shell fragments.
	Tr	SILTSTONE: clear-light grey, very fine grained quartz, w/ light brown dolomitic matrix, poor vis porosity, no fluor.
		Calcimetry: 14/0
1040-1050	80	CLAYSTONE: as above
	20	LIMESTONE: as above
		Calcimetry: 9/0
1050-1060	90	CLAYSTONE: as above
	10	LIMESTONE: as above
		Calcimetry: 6/2
1060-1070	90	CLAYSTONE: very light grey-medium light grey, medium grey, soft, sticky, amorphous, blocky-subblocky, silty calcareous, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments.
	10	LIMESTONE: as above
1070-1080	95	CLAYSTONE: as above
	5	LIMESTONE: as above
		Calcimetry: 6/0
1080-1090	95	CLAYSTONE: as above
	5	LIMESTONE: as above
1090-1100	95	CLAYSTONE: light grey-very light grey, occasionally light brown grey, calcareous, soft-firm, blocky-subblocky, common micromica, trace black carbonaceous specks & laminae, trace rd lithics, common disseminated pyrite, trace very fine grained quartz silt, trace siderite.
	5	LIMESTONE: generally as above, light grey-medium grey, yellow grey, plastic, sticky, moderately-v calcareous, slightly dolomitic, grades to CALCARENITE in part, trace calcite, trace shell fragments.
	Tr	SANDSTONE: clear-light grey, rounded-subrounded, very fine grained, grades to CALCISILIGHTITE in part, poor vis porosity, no fluor.
1100-1110	95	CLAYSTONE: as above
	5	LIMESTONE: as above
	Tr	SANDSTONE: as above
1110-1120	95	CLAYSTONE: generally as above, getting lighter w/depth.

	5	LIMESTONE: as above
		Calcimetry: 6/0
1120-1130	100	CLAYSTONE: light grey-v light grey, occasionally light brown grey, silty calcareous, arenaceous in part, grades to SILTSTONE, common black carbonaceous specks, trace micromica, soft-sticky, occasionally firm, blocky-subblocky, silty fissile in part, trace coal, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments.
	Tr	LIMESTONE: as above.
		Calcimetry: 2/2
1130-1140	100	CLAYSTONE: as above
	Tr	LIMESTONE: as above
1140-1150	95	CLAYSTONE: as above
	5	LIMESTONE: as above
		Calcimetry: 4/3
1150-1160	95	CLAYSTONE: generally as above
	5	LIMESTONE: off white-yellow grey, soft-sticky, mod hard in part, moderately-very calcareous, slightly dolomitic in part, microcrystalline, trace forams, trace fossil fragments, no visual porosity.
1160-1165	95	CLAYSTONE: as above
	5	LIMESTONE: as above
1165-1170	95	CLAYSTONE: as above
	5	LIMESTONE: as above
1170-1180	95	CLAYSTONE: light grey-v light grey, occasionally light brown grey, silty calcareous, arenaceous in part, grades to SILTSTONE, common black carbonaceous specks, trace micromicaceous, soft-sticky, occasionally firm, blocky-subblocky, silty fissile in part, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments.
	5	LIMESTONE: generally as above, off white-yellow grey, soft-sticky, mod hard in part, moderately-v calcareous, slightly dolomitic in part, microcrystalline, trace forams, trace fossil fragments, no visual porosity.
1180-1190	95	CLAYSTONE: as above
	5	LIMESTONE: as above
		Calcimetry: 2/2
1190-1200	95	CLAYSTONE: as above
	5	LIMESTONE: as above
1200-1210	95	CLAYSTONE: as above
		Calcimetry: 10/0
	5	LIMESTONE: as above
1210-1220	95	CLAYSTONE: generally as above, light medium grey-medium dark grey, silty calcareous, arenaceous in part, grades to SILTSTONE in part, common disseminated pyrite, trace very fine quartz grains, trace micromica, trace-r siderite.
	5	LIMESTONE: as above
	Tr	COAL: dark brown-black, firm-hard, silty, common disseminated pyrite
1220-1230	95	CLAYSTONE: as above

	5	LIMESTONE: as above
		Calcimetry: 0/6
1230-1240	95	CLAYSTONE: as above
	5	LIMESTONE: as above
		Calcimetry: 0/10
1240-1250	95	CLAYSTONE: as above
	5	LIMESTONE: as above
		Calcimetry: 5/4
1250-1260	95	CLAYSTONE: generally as above, medium grey-medium dark grey, slightly to moderately calcareous, trace disseminated pyrite, trace fine grained quartz, trace carbonaceous specks/laminae, trace glauconite, rare siderite, trace-r yellow brown, mod hard, SILTSTONE.
	5	LIMESTONE: generally as above, off white-yellow grey, soft-sticky, mod hard in part, mod-v calcareous, slightly dolomitic in part, microcrystalline, trace forams, trace fossil fragments, no vis porosity.
		Calcimetry: 0/12
1260-1270	85	CLAYSTONE: as above
	15	LIMESTONE: as above
		Calcimetry: 9/10
1270-1280	10	VOLCANICS (TUFF): white-light pale blue green, very silty calcareous, trace calcareous grains, trace quartz grains, firm-soft, subblocky.
	85	CLAYSTONE: as above
	5	LIMESTONE: as above.
		Calcimetry: 10/14
1280-1290	80	CLAYSTONE: as above
	10	LIMESTONE: as above
	10	VOLCANICS: as above
		Calcimetry: 10/15
1290-1300	80	CLAYSTONE: as above
	10	LIMESTONE: as above
	10	VOLCANICS: as above
		Calcimetry: 5/13
1300-1310	90	CLAYSTONE: generally as above, dark grey-medium dark grey, non-silty calcareous, firm, blocky-subblocky, common disseminated pyrite, trace black carbonaceous specks, trace quartz grains, trace micromica,
	5	LIMESTONE: as above
	5	VOLCANICS: as above
	Tr	SANDSTONE: clear-transparent-translucent, very fine grained grades to SILTSTONE, occasionally fine grained, subrounded-rounded, well sorted, trace calcareous cement, predominantly loose, no vis porosity, no fluor.
		Calcimetry: 15/0
1310-1320	100	CLAYSTONE: as above

	Tr	SILTSTONE: yellow white-brown white, very fine-silt quartz grains, rounded-subangular, well sorted, trace glauconite, trace carbonaceous specks, common strong calcareous cement, trace siliceous cement, firm-hard aggregates, mod-p vis porosity, no fluor.
	Tr	LIMESTONE: as above
	Tr	SANDSTONE: as above
		Calcimetry: 5/5
1320-1330	80	CLAYSTONE: as above
	10	VOLCANICS: as above
	10	SILTSTONE: as above
		Calcimetry: 10/2
1330-1340	40	SILTSTONE: generally as above, yellow white-brown white, very fine-silt quartz grains, rounded-subangular, well sorted, trace glauconite, trace carbonaceous specks, common strong calcareous cement, trace siliceous cement, firm-hard aggregates, mod-p vis porosity, no fluor.
	50	CLAYSTONE: generally as above
	10	LIMESTONE: generally as above, yellow white-grey white, soft-firm, amorphous, cryptocrystalline-microcrystalline, trace calcareous, trace fossil fragments.
		Calcimetry: 8/6
1340-1345	50	CLAYSTONE: as above
	40	SILTSTONE: as above
	10	LIMESTONE: as above
		Calcimetry: 9/5
1345-1350	60	SILTSTONE: generally as above, yellow white-brown white, very fine-silt quartz grains, rounded-subangular, w sorted, trace glauconite, trace carbonaceous specks, common strong calcareous cement, trace siliceous cement, firm-hard aggregates, mod-p vis porosity, no fluor.
	30	CLAYSTONE: generally as above, , dark grey-medium dark grey, non-silty calcareous, firm, blocky-subblocky, common disseminated pyrite, trace black carbonaceous specks, trace quartz grains, trace micromica
	10	LIMESTONE: generally as above, yellow white-grey white, soft-firm, amorphous, cryptocrystalline-microcrystalline, trace calcareous, trace fossil fragments.
		Calcimetracey:10/15
1350-1355	50	CLAYSTONE: as above
	50	SILTSTONE: as above
		Calcimetry:
1355-1360	60	CLAYSTONE: as above
	40	SILTSTONE: as above
		Calcimetry: 20/7
1360-1365	70	CLAYSTONE: generally as above, dark grey-medium dark grey, silty calcareous, firm to moderately hard, blocky-subblocky, subfissile in part, common disseminated pyrite, trace black carbonaceous specks, r micromica, trace glauconite.
	30	SILTSTONE: as above
		Calcimetry:

1365-1370	60	CLAYSTONE: as above
	40	SILTSTONE: as above
		Calcimetry: 20/3
1370-1375	50	CLAYSTONE: as above, getting more fissile w/ depth.
	30	SILTSTONE: as above
	20	LIMESTONE: off white-grey, light brown-orange, slightly dolomitic, blocky, firm-hard, microcrystalline-cryptocrystalline, w/common pelletal glauconite inclusions, trace pyrite inclusions.
		Calcimetry: 40/14
1375-1380	50	CLAYSTONE: as above, w/ common pyrite nodules.
	30	SILTSTONE: as above
	15	SANDSTONE: light grey-light brown, transparent-translucent, very fine grained, very well sorted, rounded-subrounded, minor glauconite, trace carbonaceous specks, strong calcareous cement, mod hard-hard, nil vis porosity, nil fluor.
	5	LIMESTONE: as above
		Calcimetry: 15/8
1380-1385	50	CLAYSTONE: as above
	35	SILTSTONE: as above
	15	SANDSTONE: as above
	Tr	LIMESTONE: as above
		Calcimetry: 10/4
1385-1390	45	CLAYSTONE: as above
	40	SILTSTONE: as above
	15	SANDSTONE: as above
		Calcimetry: 30/7
1390-1395	40	CLAYSTONE: generally as above, medium grey-light olive grey to moderate olive brown, light blue grey in part, non-silty calcareous, soft-firm, blocky-subblocky, subfissile-fissile in part, common disseminated pyrite, common pyrite nodules, common fossil fragments, trace mica.
	45	SILTSTONE: generally as above, yellow white-brown white, very fine-silt quartz grains, rounded-subangular, w sorted, trace glauconite, trace carbonaceous specks, common strong calcareous cement, trace siliceous cement, firm-hard aggregates, mod-p vis porosity, no fluor.
	15	SANDSTONE: as above
		Calcimetry: 18/5
1395-1400	60	CLAYSTONE: as above
	30	SILTSTONE: as above
	10	SANDSTONE: as above
		Calcimetry: 30/7
1400-1405	75	CLAYSTONE: as above
	25	SILTSTONE: as above
		Calcimetry: 20/3

1405-1410	85	CLAYSTONE: generally as above, medium grey-light olive grey to moderate olive brown, non-silty calcareous, soft-sticky, blocky-subblocky, subfissile in part, trace disseminated pyrite, common fossil fragments, trace mica.
	15	SILTSTONE: as above
		Calcimetry: 22/11
1410-1415	80	CLAYSTONE: as above
	20	SILTSTONE: as above
	Tr	LIMESTONE:
		Calcimetry: 15/15
1415-1420	90	CLAYSTONE: light grey-light olive grey-light brown grey, mod-silty calcareous, argillaceous / silty in part, grad to arenaceous siltstone in part, soft-occasionally firm, subblocky-blocky, amorphous, trace-common glauconite, trace pyrite, trace carbonaceous specks, trace mica, trace fossil fragments,
	10	SILTSTONE: as above.
		Calcimetry: 12/16
1420-1425	90	CLAYSTONE: as above
	10	SILTSTONE: as above
		Calcimetry: 10/16
		* Sample heavily contaminated with LCM.
1425-1430	85	CLAYSTONE: as above
	15	SILTSTONE: as above
	Tr	LIMESTONE: off white-grey, light brown-orange, slightly dolomitic, blocky, firm-hard, soft in part, microcrystalline-cryptocrystalline, trace glauconite.
		Calcimetry: 10/9
1430-1435	85	CLAYSTONE: as above
	15	SILTSTONE: as above
	Tr	LIMESTONE: as above
		Calcimetry: 14/4
1435-1440	85	CLAYSTONE: generally as above, predominantly grey green-light olive grey.
	15	SILTSTONE: generally as above, yellow white-brown white, very fine-silt quartz grains, rounded-subangular, w sorted, trace glauconite, trace carbonaceous specks, common strong calcareous cement, trace siliceous cement, firm-hard aggregates, mod-p vis porosity, no fluor.
		Calcimetry: 1/13
		* Sample still heavily contaminated with LCM.
1440-1445	90	CLAYSTONE: as above
	10	SILTSTONE: as above
		Calcimetry: 2/11
1445-1450	90	CLAYSTONE: as above
	10	SILTSTONE: as above
		Calcimetry: 1/15
		* Sample up to 90% LCM

1450-1455	60	SILTSTONE: very light grey-off white-light brown white, mod calcareous, very argillaceous, grades to a SANDSTONE in part, common very fine-f grained quartz, trace glauconite, trace disseminated pyrite, subblocky-blocky, good calcareous cement, firm-occasionally mod hard.
	40	CLAYSTONE: as above
		Calcimetry: 0/13
1455-1460	70	SILTSTONE: as above
	30	CLAYSTONE: as above
1460-1465	60	SILTSTONE: as above
	40	CLAYSTONE: as above
	Tr	SANDSTONE: generally as above, light grey-light brown, transparent-translucent, very fine grained, very well sorted, rounded-subrounded, minor glauconite, trace carbonaceous specks, strong calcareous cement, mod hard-hard, nil vis porosity, nil fluor.
1465-1470	70	SILTSTONE: generally as above, very light grey-off white-light brown, mod calcareous, very argillaceous, grades to a SANDSTONE in part, common very fine-fine grained quartz, trace-common glauconite, trace disseminated pyrite, subblocky-blocky, good calcareous cement, firm-occasionally mod hard.
	30	CLAYSTONE: as above.
	Tr	SANDSTONE: as above.
		Calcimetry: 5/3
1470-1475	55	SILTSTONE: as above
	40	CLAYSTONE: generally as above, firming w/ depth, becoming more fissile.
	5	SANDSTONE: as above
	Tr	LIMESTONE: medium-dark rd brown, microcrystalline-cryptocrystalline, blocky, dolomitic, firm-hard, nil vis porosity.
1475-1480	60	SILTSTONE: as above
	35	CLAYSTONE: as above
	5	SANDSTONE: as above
		Calcimetry: 5/3
1480-1485	55	SILTSTONE: as above
	45	CLAYSTONE: light grey-light olive grey-light brown grey-medium grey, mod-strong calcareous, argillaceous / silty in part, grad to arenaceous siltstone in part, soft-occasionally firm, subblocky-blocky, trace-common glauconite, trace pyrite, trace carbonaceous specks, trace mica, trace fossil fragments,
	5	SANDSTONE: as above.
1485-1490	60	SILTSTONE: as above
	40	CLAYSTONE: as above
	Tr	SANDSTONE: as above
		Calcimetry: 1/11
1490-1495	60	SILTSTONE: as above
	35	CLAYSTONE: as above

	5	SANDSTONE: light grey-light brown, transparent-translucent, very fine grained, rounded-subrounded, well sorted, trace glauconite, trace coral, mod strong calcareous cement, trace siliceous cement, mod hard-hard, nil vis porosity, nil fluor.
		Calcimetry: 5/8
1495-1500	50	SILTSTONE: generally as above, very light grey-off white-light brown, mod calcareous, very argillaceous, grades to a SANDSTONE in part, common very fine-fine grained quartz, trace-common glauconite, trace disseminated pyrite, subblocky-blocky, good calcareous cement, firm-occasionally mod hard, no fluor.
	40	CLAYSTONE: light grey-light olive grey-light brown grey-medium grey, non-silty calcareous, argillaceous / silty in part, grad to arenaceous siltstone in part, soft-occasionally firm, subblocky-blocky, trace-common glauconite, trace pyrite, trace carbonaceous specks, trace fossil fragments,
	10	SANDSTONE: as above
		Calcimetry: 1/5
1500-1505	40	SILTSTONE: generally as above, becoming brown grey-gr rd in part.
	30	CLAYSTONE: as above, becoming medium grey-medium dark grey in part.
	30	SANDSTONE: as above.
		Calcimetry: 0/7
1505-1510	40	SILTSTONE: as above
	20	CLAYSTONE: as above
	40	SANDSTONE: as above
		Calcimetry: 0/7
1510-1520	40	SANDSTONE: light brown-pale yellow brown, very fine-f grained, subangular-subrounded, mod w sorted, firm to moderately hard, good calcareous/dolomitic cement, grading to SILTSTONE in part, trace glauconite inclusions, poor vis porosity, trace dull yellow fluor, no cut fluor.
	40	SILTSTONE: as above
	20	CLAYSTONE: medium grey-olive grey, non-silty calcareous, argillaceous / silty in part, grad to arenaceous siltstone in part, soft-occasionally firm, subblocky-blocky, fissile in part, trace glauconite, trace-common pyrite, trace carbonaceous specks, trace fossil fragments.
		Calcimetry: 0/6
1520-1530	50	SANDSTONE: as above
	30	SILTSTONE: as above
	20	CLAYSTONE: as above
		Calcimetry: 0/5
1530-1540	40	SANDSTONE 1: as above.
	25	SANDSTONE 2: light brown-medium brown, very fine-f grained, subangular-subrounded, mod w sorted, firm-hard, good dolomitic cement, silty calcareous, poor vis porosity, trace dull yellow mineral fluor, no cut fluor, no res ring.
	15	SILTSTONE: as above
	15	CLAYSTONE: as above, common pyrite nodules.
	5	
		Calcimetry: 5/15

1540-1550	30	SANDSTONE 1: as above
	40	SANDSTONE 2: as above
	15	SILTSTONE: as above
	10	CLAYSTONE: as above
	5	DOLOMITE: as above
		Calcimetry: 1/8
1550-1560	50	SANDSTONE: generally as above, light brown-medium brown, very fine-f grained, grading to dolomitic siltstone in part, subangular to subrounded, mod w sorted, firm-hard, good dolomitic cement, silty calcareous, poor vis porosity, trace dull yellow mineral fluor, no cut fluor, no res ring.
	25	SILTSTONE: generally as above, very light grey-off white-light brown, mod calcareous, very argillaceous, grades to a sandstone in part, common very fine-f grained quartz, trace-common glauconite, trace disseminated pyrite, subblocky-blocky, good calcareous cement, firm-occasionally mod hard, no fluor.
	20	CLAYSTONE: generally as above, light grey-gr brown, soft-sticky, occasionally firm, blocky-subblocky, subfissile-fissile in part, occasionally calcareous, trace carbonaceous specks, trace disseminated pyrite, trace micromica, common pyrite nodules, trace-common fossil fragments.
	5	DOLOMITE: as above
		Calcimetry: 3/14
1560-1570	60	SANDSTONE : as above
	25	SILTSTONE: as above
	10	CLAYSTONE: as above
	5	DOLOMITE: as above
		Calcimetry: 0/5
1570-1575	55	SANDSTONE : as above
	25	SILTSTONE: as above
	15	CLAYSTONE: as above
	5	DOLOMITE: as above
		Calcimetry: 0/10
1575-1580	60	SANDSTONE: generally as above, light brown-medium brown, very fine-fine grained, grading to dolomitic siltstone in part, subangular to subrounded, mod w sorted, firm-hard, good dolomitic cement, non-silty calcareous, poor vis porosity, trace dull yellow mineral fluor, no cut fluor, no res ring.
	15	SILTSTONE: as above
	15	CLAYSTONE: as above
	10	DOLOMITE: as above
		Calcimetry: 0/3
1580-1585	75	SANDSTONE: as above
	15	CLAYSTONE: as above
	10	DOLOMITE: as above
	Tr	SILTSTONE: as above
		Calcimetry: 0/8

1585-1590	75	SANDSTONE: generally as above, light brown-medium brown, very fine-fine grained, grading to dolomitic siltstone in part, subangular to subrounded, mod w sorted, firm-hard, good dolomitic cement, non-silty calcareous, poor vis porosity, trace dull yellow mineral fluor, no cut fluor, no res ring.
	20	CLAYSTONE: generally as above, light grey-gr brown, soft-sticky, occasionally firm, blocky-subblocky, subfissile-fissile in part, occasionally calcareous, trace carbonaceous specks, trace disseminated pyrite, trace micromica, common pyrite nodules, trace-common fossil fragments.
	5	DOLOMITE: generally as above, light-medium brown, very hard-hard, blocky, microcrystalline-cryptocrystalline, argillaceous in part, grades to dolomitic siltstone in part.
	Tr	SILTSTONE: as above
1590-1600	60	SANDSTONE: as above
	30	CLAYSTONE: as above
	10	DOLOMITE: as above
		Calcimetry: 10/22
1600-1610	60	SANDSTONE: as above
	30	CLAYSTONE: as above
	10	DOLOMITE: as above
		Calcimetry: 7/8
1610-1620	50	SILTSTONE:
	30	CLAYSTONE:
	20	SANDSTONE:
		Calcimetry: 0/12
1620-1630	55	SILTSTONE: generally as above, very light grey-off white-light brown, mod calcareous, very argillaceous, grades to a sandstone in part, common very fine-f grained quartz, trace-common glauconite, trace disseminated pyrite, subblocky-blocky, good calcareous cement, firm-occasionally mod hard, no fluor.
	30	SANDSTONE: light brown to moderate yellow brown, very fine to occasionally fine grained quartz, predominantly silt sized-very fine grained, rounded to subrounded, w sorted, trace pyrite, trace micromica, trace carbonaceous specks, trace fossil fragments, common dolomitic cement, trace siliceous cement, common clay matrix, firm-occasionally hard aggregates, poor inferred porosity, no fluor.
	15	CLAYSTONE: light-medium grey, soft-sticky, amorphous, and occasionally silty, occasionally subfissile, blocky, trace pyrite, trace fossil fragments.
		Calcimetry: 0/4
1630-1635	60	SILTSTONE: as above
	30	SANDSTONE: as above
	10	CLAYSTONE: as above
		Calcimetry: 0/9
1635-1640	50	SILTSTONE: as above
	40	SANDSTONE: as above
	10	CLAYSTONE: as above
		Calcimetry: 2/10

1640-1645	60	SILTSTONE: as above
	35	SANDSTONE: as above
	5	CLAYSTONE: as above
		Calcimetry: 2/12
1645-1650	60	SILTSTONE: generally as above, very light grey-off white-light brown, mod calcareous, very argillaceous, grades to a sandstone in part, common very fine-fine grained quartz, trace-common glauconite, trace disseminated pyrite, subblocky-blocky, good calcareous cement, firm-occasionally mod hard, no fluor.
	40	SANDSTONE: generally as above, light brown to moderate yellow brown, very fine-occasionally fine grained quartz, predominantly silt sized-very fine grained, rounded to subrounded, w sorted, trace pyrite, trace micromica, trace carbonaceous specks, trace fossil fragments, common dolomitic cement, trace siliceous cement, common clay matrix, firm-occasionally hard aggregates, poor inferred porosity, no fluor.
		Calcimetry: 0/10
1650-1655	50	SILTSTONE: as above
	45	SANDSTONE: as above
	5	DOLOMITE: medium brown-dark yellow brown, occasionally pale yellow brown, predominantly cryptocrystalline, occasionally microcrystalline, occasionally sucrosic-waxy text, trace very fine quartz grains, trace glauconite, very hard-hard, no vis porosity, no fluor.
		Calcimetry: 10/20
1655- 1660	60	SILTSTONE: as above
	30	SANDSTONE: as above
	10	DOLOMITE: as above
	5	CLAYSTONE: light grey-medium grey, soft-sticky, amorphous, occasionally silty, occasionally subfissile, blocky, trace pyrite, trace fossil fragments.
		Calcimetry: 10/32
1660-1665	65	SILTSTONE: as above
	25	SANDSTONE: as above
	5	DOLOMITE: as above
	5	CLAYSTONE: as above.
		Calcimetry: 10/10
1665-1670	70	SILTSTONE: as above
	30	SANDSTONE: as above
	Tr	CLAYSTONE: as above.
		Calcimetry: 15/25
1670-1675	60	SILTSTONE: generally as above, grey brown-medium brown, argillaceous in part, grades to SANDSTONE in part, mod dolomitic cement, common very fine grained quartz, trace glauconite, trace micromica, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments, trace limonite (?), mod hard –firm, subblocky-blocky, occasionally subfissile.
	35	SANDSTONE: as above
	5	DOLOMITE: as above

	Tr	CLAYSTONE: as above.
		Calcimetry: 5/14
1675-1680	60	SILTSTONE: as above
	35	SANDSTONE: as above
	5	DOLOMITE: as above
	Tr	CLAYSTONE: as above.
		Calcimetry: 10/16
1680-1685	65	SILTSTONE: as above
	30	SANDSTONE: as above
	5	DOLOMITE: as above
	Tr	CLAYSTONE: as above.
		Calcimetry: 0/20
1685-1690	60	SILTSTONE: generally as above, grey brown-medium brown, argillaceous in part, mod dolomitic cement, common very fine grained quartz, trace glauconite, trace micromica, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments, trace limonite(?), mod hard –firm, subblocky-blocky, occasionally subfissile.
	40	SANDSTONE: generally as above, light brown to moderate yellow brown, very fine-occasionally fine grained-very fine grained quartz, rounded to subrounded, w sorted, trace pyrite, trace micromica, trace carbonaceous specks, trace fossil fragments, common dolomitic cement, trace siliceous cement, common clay matrix, firm-occasionally hard aggregates, poor inferred porosity, no fluor
	Tr	DOLOMITE: as above
		Calcimetry: 0/27
1690-1695	70	SILTSTONE: as above
	30	SANDSTONE: as above
	Tr	DOLOMITE: as above
		Calcimetry: 10/7
1695-1700	65	SILTSTONE: as above
	35	SANDSTONE: as above
	Tr	DOLOMITE: as above
		Calcimetry: 0/10
1700-1710	65	SILTSTONE: generally as above, grey brown-medium brown, argillaceous in part, mod dolomitic cement, common very fine grained quartz, trace glauconite, trace micromica, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments, mod hard –firm, subblocky-blocky, occasionally subfissile.
	30	SANDSTONE: generally as above, light brown to moderate yellow brown, very fine-occasionally fine grained, rounded to subrounded, well sorted, trace pyrite, trace micromica, trace carbonaceous specks, trace fossil fragments, common dolomitic cement, trace siliceous cement, common clay matrix, firm-occasionally hard aggregates, poor inferred porosity, no fluor
	5	CLAYSTONE: Light blue grey-dusky brown, occasionally brown black, silty calcareous, trace very fine grained quartz, trace micromica, common disseminated pyrite, trace glauconite, soft-plastic, subblocky-blocky, dispersive in part.
		Calcimetry: 10/5

1710-1715	50	SILTSTONE: as above
	40	SANDSTONE: as above
	10	CLAYSTONE: generally as above, dusky brown, brown black-black, occasionally firm.
		Calcimetry: 0/7
1715-1720	50	CLAYSTONE: as above
	45	SILTSTONE: as above
	5	SANDSTONE: as above
		Calcimetry: 0/5
1720-1725	60	CLAYSTONE: as above
	40	SILTSTONE: as above
	Tr	SANDSTONE: as above
		Calcimetry: 0/3
1725-1730	70	CLAYSTONE: as above
	30	SILTSTONE: as above
	Tr	SANDSTONE: as above
		Calcimetry: 0/3
1730-1735	85	CLAYSTONE: generally as above, dusky brown-brown black-black, silty calcareous, trace very fine grained quartz, trace mica flakes, common disseminated pyrite, trace glauconite, soft-plastic, occasionally firm, subblocky-blocky, occasionally dispersive-washable.
	15	SILTSTONE: as above
	Tr	SANDSTONE: as above
		Calcimetry: 0/4
1735-1740	90	CLAYSTONE: as above
	10	SILTSTONE: as above
	Tr	SANDSTONE: as above
		Calcimetry: 0/4
1740-1745	90	CLAYSTONE: as above
	10	SILTSTONE: as above
		Calcimetry: 0/3
1745-1750	95	CLAYSTONE: as above
	5	SILTSTONE: as above
		Calcimetry: 0/3
1750-1752	95	CLAYSTONE: generally as above, dusky brown-brown black-black, slightly calcareous, trace very fine grained quartz, trace mica flakes, common disseminated pyrite, trace glauconite, soft-plastic, occasionally firm, subblocky-blocky, occasionally dispersive-washable.
	5	SILTSTONE: generally as above, grey brown-medium brown, argillaceous in part, mod dolomitic cement, common very fine grained quartz, trace glauconite, trace micromica, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments, mod hard –firm, subblocky-blocky, occasionally subfissile.
		Calcimetry: 0/2
1752-1755	95	CLAYSTONE: as above

	5	SILTSTONE: as above
		Calcimetry: 0/2
1755-1758	90	CLAYSTONE: as above
	10	SILTSTONE: as above
		Calcimetry: 0/10
1758-1761	90	CLAYSTONE: generally as above, light grey-grey, light blue grey in part, becoming more dark grey-dark brown black, soft-firm, subblocky, non calcareous, silty, occasionally silty, abundant pyrite.
	10	SILTSTONE: generally as above, dark brown-light brown, occasionally black, argillaceous, grades to very fine grained SANDSTONE in part, trace micromica, common disseminated pyrite, trace glauconite, trace fossil fragments, soft, subblocky, occasionally dispersive-amorphous.
		Calcimetry: 0/7
1761-1764	70	CLAYSTONE: as above
	30	SILTSTONE: as above
		Calcimetry: 0/8
1764-1767	60	SILTSTONE: generally as above.
	40	CLAYSTONE: generally as above.
		Calcimetry:
1767-1770	70	SILTSTONE: as above
	30	CLAYSTONE: as above
1770-1773	80	SILTSTONE: as above
	20	CLAYSTONE: as above
1773-1776	70	SILTSTONE: generally as above, grey brown-medium brown, argillaceous in part, mod dolomitic cement, common very fine grained quartz, trace glauconite, trace micromica, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments, mod hard –firm, subblocky-blocky, occasionally subfissile.
	30	CLAYSTONE: generally as above, light brown-light grey, slightly-non calcareous, trace very fine grained quartz, trace micromica, trace disseminated pyrite, soft-sticky, occasionally firm, subblocky-blocky, occasionally amorphous-washable.
1776-1779	70	SILTSTONE: as above
	30	CLAYSTONE: as above
1779-1782	80	SILTSTONE: as above
	20	CLAYSTONE: as above
1782-1785	70	SILTSTONE: as above
	30	CLAYSTONE: as above
1785-1788	60	SILTSTONE: as above
	40	CLAYSTONE: generally as above, getting firmer, subfissile-fissile.
1788-1791	60	SILTSTONE: as above
	40	CLAYSTONE: as above

1791-1794	80	SILTSTONE: generally as above, grey brown-medium brown, argillaceous in part, mod dolomitic cement, common very fine grained quartz, grades to SANDSTONE in part, trace glauconite, trace micromica, trace disseminated pyrite, trace pyrite nodules, trace fossil fragments, mod hard –firm, subblocky-blocky, occasionally subfissile.
	20	CLAYSTONE: as above, light brown-light grey, slightly-non calcareous, trace very fine grained quartz, trace micromica, trace disseminated pyrite, soft-firm, subblocky-blocky, occasionally subfissile-fissile.
		Calcimetry:
1794-1797	60	SILTSTONE: as above
	40	CLAYSTONE: as above
1797-1800	60	CLAYSTONE: mod brown-dusky brown, occasionally brown black, non calcareous, trace very fine grained quartz, trace micromica, occasionally silty, soft-sticky, subblocky, occasionally subfissile-fissile, common disseminated pyrite, occasionally pyrite nodules.
	40	SILTSTONE: generally as above.
1800-1803	50	SILTSTONE: as above
	50	CLAYSTONE: as above
1803-1806	70	SILTSTONE: generally as above, dark brown-light brown, occasionally black, good dolomitic cement, argillaceous, grades to very fine grained SANDSTONE in part, trace micromica, common disseminated pyrite, trace glauconite, trace fossil fragments, mod hard-firm, subblocky-subfissile.
		Calcimetry:
	30	CLAYSTONE: as above.
1806-1809	70	SILTSTONE: as above
	30	CLAYSTONE: as above
	Tr	DOLOMITE: light-medium brown, firm-hard, occasionally soft, blocky, microcrystalline, silty, trace very fine grained quartz, grades to dolomitic SANDSTONE in part, dull yellow mineral fluor, no cut fluor.
1809-1812	60	SILTSTONE: as above
	40	CLAYSTONE: as above
	Tr	DOLOMITE: as above
1812-1815	60	SILTSTONE: generally as above, medium brown-dusky brown-dusky yellow brown, good dolomitic cement, argillaceous, grades to very fine grained SANDSTONE in part, trace micromica, trace-common disseminated pyrite, trace glauconite, trace fossil fragments, firm-hard, blocky-subfissile.
	35	CLAYSTONE: medium light grey-medium dark grey-brown black, non calcareous, occasionally silty, blocky-subblocky, occasionally subfissile, friable, trace pyrite, trace black carbonaceous specks, trace fossil fragments.
	5	DOLOMITE: as above.
1815-1818	60	SILTSTONE: as above
	30	CLAYSTONE: as above
	Tr	DOLOMITE: as above
1818-1821	50	SILTSTONE: as above
	50	CLAYSTONE: as above

1821-1824	60	CLAYSTONE: generally as above, occasionally soft-sticky, subblocky, amorphous, washable.
	40	SILTSTONE: as above
1824-1827	60	SILTSTONE: as above
	40	CLAYSTONE: as above
1827-1830	60	SILTSTONE: dark grey-medium dark brown-dusky yellow brown, trace calcareous, very argillaceous, good dolomitic cement, trace micromica, trace pyrite, occasionally very fine grained quartz, soft-dispersive, occasionally firm-hard, blocky-subblocky, occasionally subfissile.
	40	CLAYSTONE: dark grey-medium dark grey brown, arenaceous in part, trace calcareous, trace micromica, soft-dispersive, amorphous.
1830-1833	70	SILTSTONE: as above
	30	CLAYSTONE: as above
	Tr	DOLOMITE: generally as above, light-medium brown, firm-hard, occasionally soft, blocky, microcrystalline, silty, trace very fine grained quartz, grades to dolomitic SANDSTONE in part, dull yellow mineral fluor, no cut fluor.
1833-1836	70	SILTSTONE: as above
	30	CLAYSTONE: as above
1836-1839	80	SILTSTONE: as above
	20	CLAYSTONE: as above
	Tr	DOLOMITE: as above
1839 -1842	60	SILTSTONE: as above
	40	CLAYSTONE: as above
	Tr	DOLOMITE: as above
1842-1845	60	CLAYSTONE: generally as above, dark grey-medium dark grey brown, arenaceous in part, trace calcareous, trace micromica, soft-dispersive, amorphous.
	40	SILTSTONE: generally as above, dark grey-medium dark brown-dusky yellow brown, trace calcareous, very argillaceous, good dolomitic cement, trace micromica, trace pyrite, occasionally very fine grained quartz, soft-dispersive, occasionally firm-hard, blocky-subblocky, occasionally subfissile.
1845-1848	60	CLAYSTONE: as above
	40	SILTSTONE: as above
1848-1851	50	CLAYSTONE: as above
	50	SILTSTONE: as above
1851-1854	60	SILTSTONE: as above
	40	CLAYSTONE: as above
	Tr	DOLOMITE: generally as above, light-medium brown, firm-hard, occasionally soft, blocky, microcrystalline, silty, trace very fine grained quartz, dull yellow mineral fluor, no cut fluor.
1854-1857	60	CLAYSTONE: dark grey-medium dark grey brown, occasionally pale yellow brown, silty, trace calcareous, trace micromica, soft-dispersive, amorphous.

	40	SILTSTONE: generally as above, dark grey-medium dark brown-dusky yellow brown, trace calcareous, very argillaceous, good dolomitic cement, trace micromica, trace pyrite, occasionally very fine grained quartz, soft-dispersive, occasionally firm-hard, blocky-subblocky, occasionally subfissile.
	Tr	DOLOMITICOMITE: as above.
1857-1860	50	CLAYSTONE: as above
	50	SILTSTONE: as above
	Tr	DOLOMITICOMITE: as above.
	Tr	SANDSTONE: clear, translucent, very fine-fine grained, subrounded-rounded, moderate-good sphericity, moderately well sorted, loose, good visual porosity, no fluorescence, no cut.
1860-1863	40	CLAYSTONE: as above
	60	SILTSTONE: as above
	Tr	SANDSTONE: as above
1863-1866	60	CLAYSTONE: as above
	40	SILTSTONE: as above
	Tr	SANDSTONE: as above
1866- 1869	60	CLAYSTONE: as above
	40	SILTSTONE: as above
	Tr	SANDSTONE: as above
1869-1872	50	CLAYSTONE: generally as above, dark grey-medium dark grey brown, occasionally pale yellow brown, silty, trace calcareous, trace micromica, soft-dispersive, amorphous.
	50	SILTSTONE: generally as above, dark grey-medium dark brown-dusky yellow brown, trace calcareous, very argillaceous, good dolomitic cement, trace micromica, trace pyrite, occasionally very fine grained quartz, soft-dispersive, occasionally firm-hard, blocky-subblocky, occasionally subfissile.
	Tr	SANDSTONE: generally as above, clear, translucent, very fine to fine grained, sub rounded to rounded, mod-good sphericity, mod w sorted, loose, good visual porosity, no fluor, no cut.
1872-1875	60	CLAYSTONE: as above
	40	SILTSTONE: as above
	Tr	SANDSTONE: pale light green grey, very fine to fine grained quartz, moderately good sphericity, subangular to subrounded, w sorted, common-abundant glauconite, trace carbonaceous specks, trace weak calcareous cement, common siliceous matrix, moderately hard friable aggregates, moderately-poor inferred porosity, no fluor.
1875-1878	40	CLAYSTONE: as above
	40	SILTSTONE: as above
	20	SANDSTONE: as above.
1878-1881	50	SILTSTONE: generally as above, dark grey-medium dark brown-dusky yellow brown, trace calcareous, very argillaceous, good dolomitic cement, trace micromica, trace pyrite, occasionally very fine grained quartz, soft-dispersive, occasionally firm-hard, blocky-subblocky, occasionally subfissile.
	30	SANDSTONE:

	20	CLAYSTONE: generally as above, dark grey-medium dark grey brown, occasionally pale yellow brown, silty, trace calcareous, trace micromica, soft-dispersive, amorphous.
1881-1884	40	SANDSTONE: as above
	40	SILTSTONE: as above
	20	CLAYSTONE: as above.
1884-1887	50	SILTSTONE: as above
	30	SANDSTONE: as above
	20	CLAYSTONE: as above.
1887-1899	20	SANDSTONE: light brown grey-pale light green grey, very fine-coarse grained, moderately good sphericity, rounded-subangular, moderately sorted, common disseminated pyrite, trace-common glauconite, trace carbonaceous mat, trace siderite, moderately calcareous cement, over growths, mainly siliceous cement, predominantly coarse, common moderately hard, firm aggregates, moderately visual porosity, no fluor.
	40	CLAYSTONE: as above
	40	SILTSTONE: as above
1899-1902	45	SILTSTONE: as above
	40	CLAYSTONE: as above
	15	SANDSTONE: as above
1902-1908	80	SANDSTONE: generally as above, light brown grey-pale light green grey, very fine-coarse grained, moderately good sphericity, rounded-subangular, moderately sorted, common disseminated pyrite, trace-common glauconite, trace carbonaceous mat, trace siderite, moderately calcareous cement, overgrowths, mainly siliceous cement, predominantly coarse, common moderately hard, firm aggregates, moderately visual porosity, FLUORESCENCE: trace-even pale yellow-white fluorescence, weak diff yellow white direct cut, slow bleeding crush cut fluor, thin yellow-milky white res ring.
	10	SILTSTONE: as above
	10	CLAYSTONE: as above
1908-1911	80	SANDSTONE: as above
	20	SILTSTONE: as above
1911-1914	90	SANDSTONE: as above
	10	SILTSTONE: as above
1914-1917	90	SANDSTONE: generally as above, light brown grey-pale light green grey, very fine to coarse grained, moderately good sphericity, rounded-subangular, moderately sorted, common disseminated pyrite, trace-common glauconite, trace carbonaceous mat, trace siderite, moderately calcareous cement, overgrowths, mainly siliceous cement, predominantly coarse, common moderately hard, firm aggregates, moderately visual porosity, FLUORESCENCE: trace-even pale yellow-white fluor, weak diff yellow white direct cut, slow bleeding crush cut fluor, thin yellow-milky white residual ring.
	10	SILTSTONE: generally as above, dark grey-medium dark brown-dusky yellow brown, trace calcareous, very argillaceous, good dolomitic cement, trace micromica, trace pyrite, occasionally very fine grained quartz, soft-dispersive, occasionally firm-hard, blocky-subblocky, occasionally subfissile.
1917-1920	85	SANDSTONE: as above, FLUOR: as above
	15	SILTSTONE: as above
1920-1923	85	SANDSTONE: as above, FLUOR: as above

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	10	SILTSTONE: as above
	5	COAL: black-v dark brown, subvitreous lustre, common disseminated pyrite, subfissile-blocky, brittle.
1923-1926	85	SANDSTONE: as above, FLUOR: as above
	10	SILTSTONE: as above
	5	COAL: as above
1926-1929	80	SANDSTONE: as above. FLUOR: trace solid dull yellow green-yellow fluor, very weak diffused dull yellow cut fluor, bleeding milky white crush cut fluor, milky white res ring.
	5	SILTSTONE: as above
	15	COAL: as above
1929-1932	85	SANDSTONE: as above, FLUOR: as above
	5	SILTSTONE: as above
	10	COAL: as above
1932-1935	90	SANDSTONE: as above, FLUOR: as above
	5	SILTSTONE: as above
	5	COAL: as above
1935-1938	85	SANDSTONE: as above
	15	SILTSTONE: as above
	Tr	COAL: as above
1938 -1941	85	SANDSTONE, generally as above, light brown grey-pale light green grey, very fine to coarse grained, moderately good sphericity, rounded-subangular, moderately sorted, common disseminated pyrite, trace-common glauconite, trace carbonaceous mat, trace siderite, moderately calcareous cement, overgrowths, mainly siliceous cement, predominantly coarse, common moderately hard, firm aggregates, moderately visual porosity, FLUORESCENCE: moderately solid yellow green fluorescence, green yellow-white instant streaming cut fluor, yellow white crush cut fluor, trace milky white residual ring.
	15	SILTSTONE: generally as above, dark grey-medium dark brown-dusky yellow brown, trace calcareous, very argillaceous, good dolomitic cement, trace micromica, trace pyrite, occasionally very fine grained quartz, soft-dispersive, occasionally firm-hard, blocky-subblocky, occasionally subfissile.
	Tr	COAL: as above, black-v dark brown, subvitreous lustre, common disseminated pyrite, subfissile-blocky, brittle.
1941-1944	100	SANDSTONE: as above, predominantly coarse to medium grained, occasionally very fine grained quartz, angular-subangular, moderately-poor sorted, calcareous cement, trace siliceous cement, trace clay matrix, no fluor.
	Tr	SILTSTONE: as above
	Tr	COAL: as above
1944-1947	100	SANDSTONE: as above
	Tr	SILTSTONE: as above
	Tr	COAL: as above
1947-1950	100	SANDSTONE: as above
	Tr	SILTSTONE: as above
1950-1953	70	SANDSTONE: as above

	30	COAL: black-brown black, dull subvitreous lustre, trace-common disseminated pyrite, subfissile-blocky, brittle
1953-1956	95	SANDSTONE: as above
	5	COAL: as above
1956-1962	95	SANDSTONE: as above
	5	COAL: as above
1962-1968	100	SANDSTONE: generally as above, clear-light grey, translucent, very fine to coarse grained, moderately good sphericity, rounded-subangular, moderately sorted, common disseminated pyrite, trace-common glauconite, trace carbonaceous mat, trace siderite, moderately calcareous cement, overgrowths, mainly siliceous cement, predominantly coarse, common moderately hard, firm aggregates, moderately visual porosity, no fluor.
	Tr	COAL: as above
1968-1974	100	SANDSTONE: as above, w/ trace white-v light grey, non calcareous, slightly silty, occasionally carbonaceous laminae, soft-plastic, occasionally firm, blocky-subblocky clay matrix.
	Tr	COAL: as above
1974-1980	100	SANDSTONE: as above
	Tr	COAL: as above
1980-1986	100	SANDSTONE: as above
	Tr	COAL: as above
1986-1992	100	SANDSTONE: generally as above, light grey-light brown grey, clear, translucent, very fine-very coarse grained, predominantly coarse, poor-moderate sphericity, angular-subrounded, moderately sorted, trace quartz overgrowths, predominantly siliceous cement, trace clay matrix, trace carbonaceous inclusions, predominantly loose, occasionally moderately hard aggregates, moderately inferred porosity, no fluor.
1992-1998	100	SANDSTONE: as above w/ up to 20% clay matrix.
1998-2004	100	SANDSTONE: as above
2004-2010	100	SANDSTONE: light brown grey-medium brown grey-white, argillaceous grades to SILTSTONE in part, common micromica, common disseminated pyrite trace glauconite, common carbonaceous laminae, soft-firm, subblocky-blocky, no fluor.
2010-2016	90	SANDSTONE: as above
	10	COAL: black-occasionally brown black, metallic lustre, silty, subconchoidal fracture, common disseminated pyrite veins, trace quartz grains, blocky-subfissile.
2016-2019	80	SANDSTONE: as above
	20	CLAYSTONE: light brown grey-white-light blue grey, non calcareous, silty, soft-amorphous, moderately hard in part, subblocky-blocky, occasionally subfissile.
	Tr	COAL: as above
2019-2022	65	SANDSTONE: as above
	35	CLAYSTONE: as above
2022-2025	60	SANDSTONE: as above
	40	CLAYSTONE: as above
	Tr	COAL: as above
2025-2028	60	SANDSTONE: as above
	40	CLAYSTONE: as above

	Tr	COAL: as above
2028-2031	40	COAL: black-occasionally brown black, silty, dull subvitreous lustre, platy, subconchoidal fracture, brittle.
	40	SANDSTONE: generally as above, light brown grey-medium brown grey-white, argillaceous grades to SILTSTONE in part, common micromica, common disseminated pyrite, trace glauconite, common carbonaceous laminae, soft-firm, subblocky-blocky, no fluor.
	20	CLAYSTONE: generally as above, light brown grey-white-light blue grey, non calcareous, silty, soft-amorphous, moderately hard in part, subblocky-blocky, occasionally subfissile.
2031-2034	50	SANDSTONE: as above
	20	COAL: as above
	20	CLAYSTONE: as above
	10	SILTSTONE: light-medium brown, firm-occasionally friable, subblocky, occasionally subfissile, argillaceous, grades to very fine grained SANDSTONE in part, non calcareous, trace carbonaceous specks, trace micromica, no fluor.
2034-2037	60	SANDSTONE: as above
	35	CLAYSTONE: as above
	5	SILTSTONE: as above
	Tr	COAL: as above
2037-2040	50	SANDSTONE: as above
	50	CLAYSTONE: as above
2040-2043	70	CLAYSTONE: light brown-light brown grey, non calcareous, argillaceous, trace carbonaceous specks, soft-firm, subblocky-occasionally subfissile.
	30	SANDSTONE: as above
	Tr	SILTSTONE: as above
2943-2046	80	CLAYSTONE: as above
	20	SANDSTONE: as above
	Tr	SILTSTONE: as above
2046-2049	60	SANDSTONE: clear-light grey, transparent-translucent, fine to m grained, occasionally very coarse grained, moderately w sorted, subangular-angular-subrounded, trace carbonaceous specks, trace white-brown matrix, moderately siliceous cement, firm-moderately hard aggregates, loose, g inferred porosity, no fluor.
	40	CLAYSTONE: as above
	Tr	COAL: generally as above, black-occasionally brown black, silty, dull subvitreous lustre, platy, subconchoidal fracture, brittle.
	Tr	SILTSTONE: as above
2049-2052	80	SANDSTONE: as above
	20	CLAYSTONE: generally as above, light brown-light brown grey, non calcareous, argillaceous, trace carbonaceous specks, soft-firm, subblocky-occasionally subfissile.
	Tr	SILTSTONE: as above
	Tr	COAL: as above
2052-2055	90	SANDSTONE: generally as above, w/ trace pinpoint, dull orange fluor, no cut fluor, no crush cut fluor.

	10	CLAYSTONE: as above
	Tr	SILTSTONE: as above
	Tr	COAL: as above
2055-2058	90	SANDSTONE: as above
	10	CLAYSTONE: as above
	Tr	SILTSTONE: as above
	Tr	COAL: as above
2058-2061	100	SANDSTONE: generally as above, predominantly medium to coarse grained, occasionally very coarse grained, loose, good inferred porosity, w/ trace pinpoint, dull orange fluor, no cut fluor, no crush cut fluor.
	Tr	CLAYSTONE: as above
	Tr	COAL: as above
2061-2064	99	SANDSTONE: clear-light grey-white, transparent-translucent, medium to coarse grained, occasionally very coarse grained, moderately well sorted, subangular-angular, loose, trace white-brown matrix, moderately siliceous cement, firm-moderately hard aggregates, moderately-g inferred porosity, no fluor.
	5	CLAYSTONE: light brown-light brown grey, non calcareous, argillaceous, and trace carbonaceous specks, soft-firm, subblocky-occasionally subfissile.
	Tr	COAL: as above
2064-2067	85	SANDSTONE: as above
	10	COAL: black-v dark brown, hard, brittle, blocky, vitreous-occasionally shiny lustre, occasionally silty.
	5	CLAYSTONE: as above
2067-2070	95	SANDSTONE: clear-white, translucent-transparent, medium-coarse grained, common c-very coarse grained, subangular to subrounded, moderately-poor sorted, occasionally siliceous cement, gen loose, occasionally fine to m grained aggregates, friable, good siliceous cement, occasionally brown stain, no fluor, no cut fluor.
	5	COAL: as above
	Tr	CLAYSTONE: as above
2070-2073	85	COAL: black-v dark brown, hard, brittle, blocky, vitreous to occasionally shiny lustre, occasionally silty.
	15	SANDSTONE: as above
	Tr	CLAYSTONE: as above.
2073-2076	60	COAL: as above
	40	SANDSTONE: as above
2076-2079	60	CLAYSTONE: light brown-light brown grey-light grey, non calcareous, argillaceous, trace black carbonaceous specks, soft-firm, subblocky-blocky, occasionally subfissile.
	40	SANDSTONE: generally as above, clear-light grey-white, transparent-translucent, medium-coarse grained, occasionally very coarse grained, moderately well sorted, subangular-angular, loose, trace white-brown matrix, moderately siliceous cement, firm-moderately hard aggregates, moderately-good inferred porosity, trace bright yellow orange mineral fluor, no cut fluor.
	Tr	COAL: as above
		Calcimetry: 0/0

2079-2082	60	SANDSTONE: as above
	40	CLAYSTONE: as above
	Tr	COAL: as above
		Calcimetry: 0/0
2082-2085	50	SANDSTONE: as above
	50	CLAYSTONE: as above
	Tr	COAL: as above
2085-2088	60	CLAYSTONE: light brown-light brown grey-light grey, non calcareous, trace very fine grained quartz grains, grades to SILTSTONE in part, argillaceous, trace black carbonaceous specks, soft-firm, subblocky-blocky, occasionally subfissile.
	40	SANDSTONE: white-light grey, translucent, medium -very coarse grained, subangular-angular, moderately sorted, loose, trace white-brown matrix, also fine to medium grained aggregates, grey orange-pale yellow orange, non calcareous, trace siliceous cement, moderately hard-friable, common mica, w/ trace pinpoint, dull orange fluorescence, no cut fluorescence, no crush cut fluor.
	Tr	COAL: as above
2088-2091	70	CLAYSTONE: as above
	30	SANDSTONE: as above
2091-2094	90	CLAYSTONE: as above
	10	SANDSTONE: as above
2094-2097	100	CLAYSTONE: generally as above, grey-light grey, very pale orange, soft-sticky, non calcareous, trace very fine quartz grains, argillaceous, trace black carbonaceous specks, subblocky, amorphous.
2097-2100	100	CLAYSTONE: as above
2100-2103	80	SANDSTONE: clear-white-pale grey brown, fine to coarse grained, predominantly medium grained, moderately w sorted, loose, trace white argillaceous matrix, weak calcareous cement, good inferred porosity, poor visual porosity, no fluor.
	15	CLAYSTONE: as above
	5	COAL: black-dark brown grey, silty, dull subvitreous lustre, brit-firm, grades to carbonaceous SILTSTONE in part.
		Calcimetry: 0/0
2103-2106	75	SANDSTONE: as above
	20	CLAYSTONE: as above
	5	COAL: as above
2106-2109	50	SANDSTONE, generally as above, clear-white-pale gr brown, fine to coarse grained, predominantly m grained, moderately w sorted, loose, trace white argillaceous matrix, weak calcareous cement, good inferred porosity, poor visual porosity, no fluor.
	30	CLAYSTONE: generally as above, grey-light grey, very pale orange, soft-sticky, non calcareous, trace very fine quartz grains, argillaceous, trace black carbonaceous specks, subblocky, amorphous
	20	COAL: generally as above, black-dark brown grey, silty, dull subvitreous lustre, brit-firm, grades to carbonaceous SILTSTONE in part.
2109-2112	60	SANDSTONE: as above
	30	CLAYSTONE: as above

	10	COAL: as above
2112-2115	80	SANDSTONE: generally as above, clear-light grey, medium-coarse grained, moderately sorted, subangular to subrounded, trace weak calcareous cement, trace- common argillaceous matrix, trace lithics, friable-loose, g inferred porosity, no fluor.
	20	CLAYSTONE: as above
2115-2118	70	SANDSTONE: as above
	25	CLAYSTONE: as above
	5	COAL: as above
21218-2121	60	SANDSTONE: as above
	35	CLAYSTONE: as above
	5	COAL: as above
2121-2124	70	SANDSTONE: as above, w trace/ medium brown, very fine to fine grained, grading to SILTSTONE in part, subrounded, moderately sorted, firm-friable, occasionally hard, non calcareous, trace carbonaceous specks, interbedded w/ dark brown-black, carbonaceous matter.
	25	CLAYSTONE: generally as above, grey-light grey, very pale orange, soft-sticky, non calcareous, trace very fine quartz grains, argillaceous, trace black carbonaceous specks, subblocky, amorphous.
	5	COAL: as above
2124-2127	60	SANDSTONE: as above
	40	CLAYSTONE: as above
	Tr	COAL: as above
2127-2130		SANDSTONE: white-light grey, translucent, medium -very coarse grained, subangular-angular, moderately sorted, loose, trace white-brown matrix, also fine to medium grained aggregates, white-light grey orange-pale yellow orange, non calcareous, trace siliceous cement, moderately hard-friable, common mica. Moderately-poor visual porosity, no fluor.
		CLAYSTONE: generally as above, grey-light grey, very pale orange, very pale green in part, soft-sticky, non calcareous, trace very fine quartz grains, argillaceous, trace black carbonaceous specks, subblocky, amorphous.
		COAL: generally as above, black-dark brown grey, silty, dull subvitreous lustre, brit-firm, grades to carbonaceous SILTSTONE in part.
2130-2133	50	CLAYSTONE: as above
	40	SANDSTONE: as above
	10	SILTSTONE: brown-dark brown, firm, occasionally hard, non calcareous, trace-common micromica, blocky-subfissile, trace very fine grained quartz, trace black carbonaceous specks/laminae, very carbonaceous in part, poor visual porosity, no fluor.
2133-2136	50	CLAYSTONE: as above
	50	SANDSTONE: as above
2136-2139	60	SANDSTONE: generally as above, white-light grey, translucent, medium -very coarse grained, subangular-angular, moderately sorted, loose, trace white-brown matrix, also fine to medium grained aggregates, white-light grey orange-pale yellow orange, non calcareous, trace siliceous cement, moderately hard-friable, common mica. Moderately-poor visual porosity, no fluor.

	20	CLAYSTONE: generally as above, grey-light grey, light blue grey, very pale green in part, soft-sticky, non calcareous, trace very fine quartz grains, argillaceous, trace black carbonaceous specks, subblocky, amorphous.
	20	COAL: black-v dark brown black, metallic-subvitreous lustre, common to abundant disseminated pyrite common interbedded w/ the coal, blocky-subfissile, subconchoidal fracture, firm-moderately hard.
1239-2142	60	SANDSTONE: as above
	40	COAL: as above
	Tr	CLAYSTONE: as above
2142-2145	50	COAL: as above, black-v dark brown black, metallic lustre, common–abd disseminated pyrite common interbedded w/ the coal, blocky-subfissile, subconchoidal fracture, firm-moderately hard.
	45	SANDSTONE: as above, white-light grey, translucent, medium -very coarse grained, subangular-angular, moderately sorted, loose, trace white-brown matrix, also fine to medium grained aggregates, white-light grey orange-pale yellow orange, non calcareous, trace siliceous cement, moderately hard-friable, common mica. Moderately-poor visual porosity, no fluor.
	5	CLAYSTONE: generally as above, grey-light grey, light blue grey, very pale green in part, soft-sticky, non calcareous, trace very fine quartz grains, trace black carbonaceous specks, subblocky, amorphous.
2145-2148	90	SANDSTONE: clear to translucent, frosted, light grey, medium predominantly coarse to very coarse, angular to subrounded, moderately sorting, predominantly clean, trace siliceous cement in fine grained aggregates, common very coarse fractured milky quartz, trace quartz over growths, disaggregated, fair to good porosity, no fluorescence.
	10	CLAYSTONE: m grey, blue grey, trace carbonaceous specks, slightly micromicaceous, smooth texture, homogeneous, soft to firm, blocky.
	Tr	COAL: as above.
2418-2151	60	SANDSTONE: predominantly as above, locally common fine aggregates w/- weak siliceous cement friable, good porosity, no fluor.
	20	CLAYSTONE: as above.
	20	COAL: as above.
	Tr	SILTSTONE: grey brown, locally very argillaceous grad to claystone in part, common carbonaceous fragments, trace lithic fragments, micromica, mottled texture, firm to moderately hard, blocky.
2151-2154	70	SANDSTONE: clear-translucent, frosted, light brown grey in part, medium-coarse, angular-subrounded, poor-moderately sorted, predominantly clean, weak calcareous cement in part, trace silty/argillaceous matrix in very fine to fine grained aggregates, loc common very coarse fractured milky quartz, occasionally quartz over growths, rare pyrite nodules, disaggregated, friable in part, fair-good porosity, no fluorescence.
	30	CLAYSTONE: as above.
	Tr	COAL: as above.
2154-2157	90	SANDSTONE: clear-translucent, frosted, medium -coarse, subangular to subrounded, moderately sorted, predominantly clean, weak siliceous cement in part, trace kaolinite inclusions, trace muscovite, trace very coarse milky quartz, occasionally quartz over growths, disaggregated, good porosity, no fluor.

	10	CLAYSTONE: medium-dark grey, blue grey, occasionally slightly silty, trace carbonaceous specks, micromica, smooth, predominantly homogeneous, firm, blocky.
	Tr	COAL: as above.
2157-2160	70	SANDSTONE: predominantly as above, becomes c, clean, trace kaolinite inclusions, disaggregated, good porosity, no fluor.
	20	CLAYSTONE: as above.
	10	SILTSTONE: grey brown, locally very argillaceous grades to claystone in part, common carbonaceous fragments & microlaminae, trace lithic fragments, micromica, becomes arenaceous in part grades to silty sandstone, mottled texture, firm to moderately hard, blocky.
2160-2163	50	SANDSTONE: clear-translucent, frosted, fine to predominantly medium, subangular to subrounded, moderate-good sorting, clean, trace coarse milky quartz float, disaggregated, fair-good porosity, no fluor.
	30	SILTSTONE: light to medium brown, grey brown, locally very argillaceous, micromica, trace muscovite, loc common coaly fragments, occasionally carbonaceous microlaminae, trace lithic fragments, locally very arenaceous grades to slightly sandstone, mottled texture in part, firm-moderately hard, blocky.
	20	CLAYSTONE: as above.
2163-2166	Tr	SANDSTONE: as above.
	70	SILTSTONE: predominantly as above, locally becomes very arenaceous grades to slightly sandstone in part, silty siliceous in part, moderately hard, locally hard.
	30	CLAYSTONE: as above.
2166-2169	20	SANDSTONE: clear-translucent, frosted, fine to m, subangular to subrounded, moderately sorted, clean, trace muscovite, occasionally coarse milky quartz float, disaggregated, fair-good porosity, no fluor.
	60	SILTSTONE: light-m brown, grey brown, light grey brown, argillaceous in part, micromica, trace chlorite, trace carbonaceous/coaly fragments, locally very arenaceous grades to silty sandstone, slightly siliceous in part, soft-firm, moderately hard-occasionally hard, blocky.
	20	CLAYSTONE: as above.
2169-2172	70	SANDSTONE: light brown grey-light grey, clear-translucent, very fine-predominantly fine, angular-subangular, good sorted, weak siliceous cement, loc dolomitic cement, trace silty/argillaceous matrix in part, trace nod pyrite, occasionally coarse milky quartz float, friable-occasionally hard, poor –nil porosity, no fluor.
	30	SILTSTONE: predominantly as above, becomes grey brown, slightly siliceous, moderately hard.
2172-2175	40	SANDSTONE: light grey, light brown grey, clear-translucent, very fine-f, angular-subangular, good sorting, weak siliceous cement, silty argillaceous matrix in part, trace kaolinitic inclusions, trace chlorite, trace carbonaceous laminae, occasionally coarse milky quartz, friable-occasionally moderately hard, poor-fair porosity, no fluor.
	20	SILTSTONE: as above.
	40	CLAYSTONE: medium -dark grey, blue grey, slightly micromicaceous, trace carbonaceous specks trace disseminated pyrite, waxy texture, firm, blocky-platy in part.
	Tr	COAL: black, bit, subvitreous-vitreous lustre, subconchoidal fracture, brit, blocky.
2175-2178	30	SANDSTONE: predominantly as above, becomes fine to occasionally m, loc common kaolinitic inclusions, trace muscovite in part, disaggregated in part, no fluor.

	40	CLAYSTONE: as above.
	30	COAL: predominantly as above, brown black in part, locally argillaceous/slightly.
2178-2181	50	CLAYSTONE: as above.
	30	SILTSTONE: light to medium brown, grey brown, very argillaceous, micromica, arenaceous in part, locally common carbonaceous/coaly fragments & laminae, soft-firm, disseminated in part, massive-blocky, amorphous in part.
	20	SANDSTONE: clear-translucent, frosted, light brown, very fine-f, m in part, angular-subangular, moderately-good sorting, loc silty/argillaceous matrix, trace kaolinite matrix & inclusions, trace carbonaceous fragments, trace muscovite, friable, poor porosity, no fluor.
2181-2184	50	SILTSTONE: as above.
	30	CLAYSTONE: as above.
	20	COAL: brown black-black, subbituminous-bituminous, argillaceous in part, subvitreous-vitreous lustre, subconchoidal fracture, brittle, blocky.
2184-2187	60	SANDSTONE: light brown grey, light grey, clear-translucent, very fine-predominantly fine-medium, angular-subangular, good sorting, trace siliceous cement in part, locally abundant silty matrix grades to silty sandstone in part, trace carbonaceous fragments, trace gastropod fragments, friable, very poor porosity, no fluor.
	30	SILTSTONE: as above.
	10	CLAYSTONE: as above.
2187-2190	90	SANDSTONE: clear-translucent, frosted, occasionally light brown, fine-predominantly medium to coarse, subangular to subrounded, moderately sorting, trace dolomitic cement in part, weak siliceous cement in part, slightly/argillaceous matrix in part, trace chlorite, trace rose quartz, trace milky quartz, fine grained friable aggregates, predominantly disaggregated, fair-good porosity, no fluor.
	10	SILTSTONE: as above.
	Tr	COAL: brown black-black, subbituminous-bituminous, argillaceous in part, subvitreous-vitreous lustre, subconchoidal fracture, brittle, blocky.
2190-2193	80	SANDSTONE: clear-translucent, frosted, c-occasionally very coarse, subangular to subrounded, moderately sorted, clean, trace quartz over growths, trace very coarse fracture milky quartz, trace coaly fragments, disaggregated, good porosity, no fluor.
	20	CLAYSTONE: medium -dark grey, blue grey, slightly micromicaceous, trace carbonaceous speck, trace disseminated pyrite, waxy texture, firm, blocky-platy in part.
	Tr	SILTSTONE: brown grey, m brown in part, very argillaceous, micromica, trace carbonaceous/coaly laminae, arenaceous in part, slightly siliceous, firm-moderately hard, blocky.
2193-2196	40	SANDSTONE: predominantly as above, becomes very coarse, trace kaolinite inclusions,
	40	SILTSTONE: light to medium brown, grey brown, very argillaceous, micromica, arenaceous in part, loc common carbonaceous/coaly fragments & laminae, soft-firm, disseminated in part, massive-blocky, amorphous in part.
	20	CLAYSTONE: as above.
2196-2199	65	SANDSTONE: generally as above, clear-translucent, frosted, coarse-occasionally very coarse, subangular to subrounded, moderately sorted, clean, trace quartz over growths, trace very coarse fractured milky quartz, trace coaly fragments, disaggregated, good porosity, no fluor.

	30	SILTSTONE: as above
	5	CLAYSTONE: as above
2199-2202	50	SANDSTONE: as above, predominantly coarse-very coarse grained, w/ trace dull orange mineral fluor, no cut fluor.
	50	SILTSTONE: as above
	Tr	CLAYSTONE: as above
2202-2205	60	SILTSTONE, generally as above, off white-light brown grey, very argillaceous, micromica, arenaceous in part, locally common carbonaceous/coaly fragments & laminae, soft-firm, disseminated in part, massive-blocky, amorphous in part.
	35	SANDSTONE: as above
	5	CLAYSTONE: as above
2205-2208	70	SANDSTONE: clear-white-off white, translucent, very fine to fine grained, subangular to subrounded, poor sorted, occasionally friable, firm-moderately hard non calcareous cement, trace quartz over growths, trace very coarse fractured milky quartz, trace siderite, poor visual porosity, trace dull yellow brown fluor, no cut fluor, no crush cut fluor.
	20	SILTSTONE: as above
	10	CLAYSTONE: as above
2208-2211	50	SANDSTONE: as above
	5	SILTSTONE: as above
	5	CLAYSTONE: as above
	40	COAL: brown black-black, subbituminous-bituminous, argillaceous in part, subvitreous-vitreous lustre, subconchoidal fracture, brittle, blocky.
2211-2214	30	SANDSTONE: as above
	5	SILTSTONE: as above
	5	CLAYSTONE: as above
	60	COAL: as above
2214-2217	40	SANDSTONE: clear-white-off white, translucent, very fine to medium grained, subangular to subrounded, poor sorted, occasionally friable, firm, moderately-weak siliceous cement, trace quartz over growths, trace siderite, trace clay matrix, poor visual porosity, no fluor.
	10	SILTSTONE: brown-dark brown-dark grey, carbonaceous, argillaceous in part, trace micromica, soft-firm, slightly-moderately calcareous, blocky-subfissile.
	10	CLAYSTONE: light grey-light green grey, soft-sticky, dispersive-washable, common disseminated pyrite, trace pyrite nodules, subblocky.
	40	COAL: generally as above, brown black-black, subbituminous-bituminous, argillaceous in part, subvitreous-vitreous lustre, subconchoidal fractured, brittle, blocky.
2217-2220	80	SANDSTONE: as above
	10	SILTSTONE: as above
	10	CLAYSTONE: as above
	Tr	COAL: as above

2220-2223	85	SANDSTONE: clear-white-v light grey, translucent-transparent, moderately-poor sphericity, fine to coarse grained, predominantly medium grained, subrounded-subangular, moderately w sorted, occasionally friable, weak siliceous cement, trace siderite, trace clay matrix, loose, good inferred porosity, no fluor.
	10	SILTSTONE: as above
	5	CLAYSTONE: as above
	Tr	COAL: as above
2223-2226	80	SANDSTONE: generally as above, clear-white-v light grey, translucent-transparent, moderately-poor sphericity, fine to coarse grained, predominantly medium grained, subrounded-subangular, moderately w sorted, occasionally friable, weak siliceous cement, trace siderite, trace clay matrix, loose, good inferred porosity, no fluor.
	10	SILTSTONE: generally as above, brown-dark brown-dark grey, carbonaceous, argillaceous in part, trace micromica, soft-firm, slightly-moderately calcareous, blocky-subfissile.
	10	CLAYSTONE: as above, light grey-light green grey, soft-sticky, dispersive-washable, common disseminated pyrite, trace pyrite nodules, subblocky.
	Tr	COAL: as above
2226-2229	60	SANDSTONE: clear-translucent, frosted, occasionally light brown, fine to coarse grained, predominantly fine to medium, subangular to subrounded, moderately sorted, trace dolomitic cement in part, weak siliceous cement in part, slightly/argillaceous matrix in part, trace chlorite, trace milky quartz, fine grained friable aggregates, predominantly disaggregated, fair-good porosity, no fluor.
	10	CLAYSTONE: as above
	30	COAL: brown black-black, subbituminous-bituminous, argillaceous in part, subvitreous-vitreous lustre, subconchoidal fracture, brittle, blocky.
	Tr	SILTSTONE: as above
2229-2232	90	SANDSTONE: light grey-white, transparent-translucent, medium to coarse grained, occasionally very coarse grained, predominantly medium, angular-subangular, moderately sorted, weak siliceous cement in part, white argillaceous matrix in part, trace milky quartz, trace mica, trace pyrite, fine to medium grained friable aggregates, predominantly loose, good inferred porosity, trace dull yellow orange fluor, no cut fluor, no crush cut fluor.
	10	COAL: as above
	Tr	CLAYSTONE: as above
	Tr	SILTSTONE: as above
2232-2235	90	CLAYSTONE: light grey-medium grey-light olive grey, occasionally slightly silty, trace carbonaceous specks, trace micromicaceous, smooth, predominantly homogeneous, firm, blocky.
	10	SANDSTONE: as above
	Tr	COAL: generally as above, brown black-black, subbituminous-bituminous, argillaceous in part, subvitreous-vitreous lustre, subconchoidal fracture, brittle, blocky.
2235-2238	95	CLAYSTONE: as above, light grey-medium grey-light olive grey, occasionally slightly silty, non calcareous, trace carbonaceous specks, trace micromica, smooth, predominantly homogeneous, firm, blocky.

	5	SANDSTONE: generally as above, light grey-white, transparent-translucent, medium-coarse grain, occasionally very coarse grained, predominantly medium, angular-subangular, moderately sorted, weak siliceous cement in part, white argillaceous matrix in part, trace milky quartz, trace mica, trace pyrite, fine-medium grain friable aggregates, predominantly loose, good inferred porosity, trace dull yellow orange fluorescence, no cut fluorescence, no crush cut fluorescence.
	Tr	COAL: as above
2238-2241	50	CLAYSTONE: medium dark grey, blue grey in part, slightly silty, trace carbonaceous speck, slightly micromicaceous, trace lithic fragments, waxy texture, firm, blocky.
	30	COAL: as above.
	20	SANDSTONE: light grey, light grey brown, occasionally clear-translucent, very fine-predominantly fine, angular-subrounded, moderately sorted, weak siliceous cement, occasionally siderite cement, silty/argillaceous matrix in part, trace carbonaceous fragments, occasionally clear medium quartz float, trace gastropods, friable, poor porosity, dull or mineral fluorescence only.
2241-2244	60	COAL: as above.
	20	CLAYSTONE: as above.
	10	SANDSTONE: predominantly as above, occasionally coarse quartz float, occasionally dark brown, orange brown, cryptocrystalline, hard flinty dolomitic inclusions.
	10	SILTSTONE: medium brown, grey brown, very argillaceous, slightly arenaceous, micromica, trace carbonaceous fragments & microlaminae, trace lithic fragments, soft-firm, massive-blocky.
2244-2247	40	COAL: as above.
	30	CLAYSTONE: as above.
	20	SANDSTONE: off white, light grey, light or brown in part, very fine-fine, occasionally medium, subangular to subrounded, moderately sorted, weak siliceous cement in part, loc abundant slightly/argillaceous matrix, trace coarse milky quartz float, occasionally kaolinite inclusions, rare quartz over growths, friable, poor-nil porosity, no fluorescence.
	10	SILTSTONE: as above.
2247-2250	60	CLAYSTONE: as above.
	20	SANDSTONE: light grey-light brown grey, very fine-fine, occasionally fine-medium, subangular to subrounded, moderately sorted, weak siliceous cement, loc dolomitic/siderite cement, common silty/argillaceous matrix, trace carbonaceous fragments, occasionally muscovite fleck, trace argillaceous/carbonaceous microlaminae, friable-moderately hard, poor-nil porosity, dull or mineral fluorescence only.
	10	SILTSTONE: predominantly as above, locally fossil fragments including gastropods and coral fragments.
	10	COAL: as above.
2250-2253	50	CLAYSTONE: as above.
	20	COAL: as above.
	20	SILTSTONE: as above.
	10	SANDSTONE: predominantly as above, locally common kaolinite inclusions, trace nodular pyrite.
2253-2256	60	CLAYSTONE: as above.

	30	SANDSTONE: off white-light brown, occasionally clear-translucent, very fine-fine, angular-subangular, good sorting, trace siliceous cement, abundant silty/argillaceous matrix, common kaolinite inclusions, trace nod pyrite, locally becoming very silty grading to silty sandstone, trace carbonaceous specks, friable, poor-nil porosity, no fluorescence.
	10	COAL: as above.
	Tr	SILTSTONE: as above.
2256-2259	50	SANDSTONE: light grey-pale brown, very fine-predominantly fine, angular-subangular, good sorted, abundant kaolinite matrix, silty matrix in part, trace biotite, trace carbonaceous fragments, trace nod pyrite, becomes silty in part grad to silty sandstone, friable, poor-nil porosity, no fluorescence.
	30	CLAYSTONE: as above.
	20	COAL: as above.
2259-2262	50	CLAYSTONE: medium grey, blue grey, grey brown in part, slightly silty, trace disseminated pyrite in part, trace lithic fragments, occasionally carbonaceous specks, waxy, firm, blocky-platy in part.
	30	COAL: black-brown black, subbituminous-bit, silty/argillaceous in part, dull-predominantly subvitreous lustre, subconchoidal fracture, brittle, blocky.
	20	SANDSTONE: predominantly as above becomes very silty grades to silty sandstone.
	Tr	SILSTSONE: medium brown, grey brown, very argillaceous, slightly arenaceous, micromica, trace carbonaceous fragments & microlaminae, trace lithic fragments, trace fossil fragments, soft-firm, massive-blocky.
2262-2265	50	CLAYSTONE: as above.
	40	SANDSTONE: as above.
	10	COAL: as above.
2265-2268	60	SANDSTONE: light brown, light brown grey, off white, very fine-fine, angular-subangular, good sorting, weak siliceous cement in part, trace dolomitic/siderite cement in part, common slightly/argillaceous matrix, abundant kaolinite matrix in part, trace carbonaceous/argillaceous microlaminae, trace coarse quartz float, trace lithic fragments, friable, poor-nil porosity, occasionally dull or mineral fluorescence only.
	30	CLAYSTONE: as above.
	10	COAL: as above.
2268-2271	40	SANDSTONE: predominantly as above, becomes increasingly argillaceous/silty grading to silty sandstone, trace nodular pyrite.
	30	CLAYSTONE: as above.
	20	SILTSTONE: grey brown, light brown, very argillaceous, locally common carbonaceous/coaly fragments, micromica, trace lithic, locally very arenaceous grading to arenaceous siltstone, soft-slightly dispersive, massive-amorphous.
	10	COAL: as above.
2271-2274	40	SILTSTONE: predominantly as above, trace gastropods, trace forams, very arenaceous grades to arenaceous siltstone.
	30	SANDSTONE: light grey, very light brown, off white, very fine-fine, angular-subangular, good sorting, weak siliceous cement, occasionally dolomitic/siderite cement, silty/argillaceous matrix, trace kaolinite matrix & inclusions, trace carbonaceous speck, trace muscovite, friable, very poor-nil porosity, trace dull or mineral fluorescence only.

	30	CLAYSTONE: as above.
	Tr	COAL: as above.
2274-2277	50	SANDSTONE: as above.
	30	SILTSTONE: as above.
	20	CLAYSTONE: as above.
2277-2280	60	SANDSTONE: predominantly as above, becomes very argillaceous/silty, grades to silty sandstone.
	20	SILTSTONE: as above.
	10	CLAYSTONE: as above.
	10	COAL: black-brown black, bituminous, subvitreous-vitreous lustre, argillaceous in part, subconchoidal fracture, brittle, blocky.
2280-2283	70	SANDSTONE: off white, light brown grey, occasionally clear-translucent, very fine-predominantly fine, angular-subangular, good sorted, weak siliceous cement, trace dolomitic/siderite cement, argillaceous/silty matrix, trace kaolinite inclusions, trace carbonaceous speck, trace muscovite, trace argillaceous/carbonaceous microlaminae in part, friable, very poor-nil porosity, trace dull or mineral fluorescence only.
	20	SILTSTONE: as above.
	10	CLAYSTONE: as above.
2283-2286	50	COAL: black-brown black, bituminous, subvitreous-vitreous lustre, argillaceous in part, trace amber inclusions, subconchoidal fracture, brittle, blocky, amber inclusions have bright pale yellow fluorescence, weak crush cut, spotty rare.
	30	CLAYSTONE: medium grey, blue grey, grey brown in part, slightly silty, trace disseminated pyrite in part, trace lithic fragments, occasionally carbonaceous speck, waxy, firm, blocky-platy in part.
	20	SILTSTONE: as above.
	Tr	SANDSTONE: predominantly as above, common kaolinite inclusions.
2286-2289	40	SILTSTONE: medium brown, brown grey, very argillaceous, arenaceous in part, common carbonaceous/coaly fragments microlaminae, micromica, common lithic fragments, soft-firm, disseminated in part, massive-blocky, amorphous in part.
	30	CLAYSTONE: as above.
	20	SANDSTONE: as above.
	10	COAL: black-brown black, bituminous, subvitreous-vitreous lustre, argillaceous in part, subconchoidal fracture, brittle, blocky.
2289-2292	40	SILTSTONE: medium brown, brown grey, very argillaceous, arenaceous in part, common carbonaceous/coaly fragments microlaminae, micromica, common lithic fragments, arenaceous in part grades to arenaceous siltstone, soft-firm, massive-blocky.
	30	SANDSTONE: predominantly as above, trace nodular pyrite.
	20	CLAYSTONE: as above.
	10	COAL: as above.
2292-2295	60	CLAYSTONE: medium grey-medium dark grey, trace silt in part, micromica, occasionally carbonaceous speck, homogeneous, waxy texture, firm-moderately hard, blocky-platy.
	20	SANDSTONE: as above.
	20	SILTSTONE: predominantly as above, trace gastropods.

2295-2298	40	SANDSTONE: light brown grey, very fine-fine, angular-subangular, good sorting, weak siliceous cement, silty matrix in part, trace kaolinite inclusions, trace carbonaceous speck, trace dark brown cryptocrystalline hard dolomitic inclusions, loose to friable, very poor porosity, no fluorescence.
	30	CLAYSTONE: as above.
	20	SILTSTONE: as above.
	10	COAL: black-brown black, bituminous, subvitreous-vitreous lustre, argillaceous in part, subconchoidal fracture, brittle, blocky.
2998-2301	70	SANDSTONE: as above.
	20	SILTSTONE: as above.
	10	CLAYSTONE: as above.
2301-2304	40	SILTSTONE: brown grey-dark grey, medium brown grey, loc very argillaceous, micromica, common carbonaceous/coaly laminae & fragments, loc arenaceous grades to arenaceous siltstone, firm-moderately hard, massive-blocky.
	30	SANDTSONE: as above.
	20	CLAYSTONE: as above.
	10	COAL: black-brown black, bituminous, subvitreous-vitreous lustre, argillaceous in part, subconchoidal fracture, brit, blocky.
2304-2307	60	SILTSTONE: as above.
	20	SANDSTONE: as above.
	10	CLAYSTONE: as above.
	10	COAL: as above.
2307-2310	60	CLAYSTONE: medium grey, medium dark grey, grey brown, slightly silty in part, micromica, trace carbonaceous speck, disseminated pyrite in part, trace glauconite in part, waxy, firm, blocky.
	40	SILTSTONE: light-medium brown, occasionally dark brown, tan, very argillaceous, slightly arenaceous in part, trace carbonaceous/coaly fragments, micromica, trace lithic fragments, occasionally mottled text, soft-disseminated, massive-amorphous.
2310-2313	40	CLAYSTONE: as above.
	30	SILTSTONE: predominantly as above, trace gastropods.
	30	SANDSTONE: clear-translucent, frosted, fine-medium, subangular to subrounded, good sorting, predominantly clean, trace kaolinite matrix & inclusions, trace nodular pyrite, disaggregated, good porosity, no fluorescence.
2313-2316	70	SANDSTONE: predominantly as above, trace coarse quartz float.
	20	CLAYSTONE: as above.
	10	SILTSTONE: medium brown, grey brown, locally very argillaceous grades to claystone, micromica, trace muscovite, occasionally fossil fragments, trace carbonaceous/coaly fragments & microlaminae, trace lithic, slightly arenaceous in part, soft-firm, occasionally moderately hard, massive-blocky.
2316-2319	40	SANDSTONE: predominantly as above, becomes medium, locally common kaolinite matrix, fair-good porosity, no fluorescence.
	40	CLAYSTONE: as above.
	20	SILTSTONE: as above.
2319-2322	60	SANDSTONE: as above.

	30	CLAYSTONE: as above.
	10	SILTSTONE: as above.
2322-2325	70	SANDSTONE: clear-translucent, frosted, fine-predominantly medium, subangular to subrounded, good sorting, weak dolomitic/siderite cement in part, common kaolinite matrix, trace carbonaceous fragments, rare nod pyrite, occasionally or brown cryptocrystalline to microcrystalline hard dolomitic inclusions, disaggregated-occasionally friable, fair-good porosity, dull or mineral fluorescence only.
	30	CLAYSTONE: as above.
	Tr	SILTSTONE: as above.
2325-2328	90	SANDSTONE: predominantly as above, minor kaolinite matrix, predominantly clean, good porosity.
	10	CLAYSTONE: predominantly as above, loc acicular pyrite in part.
	Tr	SILTSTONE: medium brown, grey brown, locally very argillaceous grades to claystone, micromica, trace muscovite, occasionally fossil fragments, trace carbonaceous/coaly fragments & microlaminae, trace lithic, slightly arenaceous in part, soft-firm, occasionally moderately hard, massive-blocky.
2328-2331	90	SANDSTONE: clear-translucent, frost, medium grained, subangular to subrounded, good sorting, clean, trace kaolinite inclusions, occasionally tan-orange brown cryptocrystalline to microcrystalline dolomitic inclusions, disaggregated, good porosity, no fluorescence.
	10	CLAYSTONE: as above.
	Tr	SILTSTONE: predominantly as above, locally becomes very carbonaceous grades to carbonaceous siltstone in part.
2331-2334	80	SILTSTONE: brown grey-brown black, moderately argillaceous, common very fine arenaceous laminae, micromica, loc common carbonaceous fleck, trace carbonaceous/coaly laminae, trace lithic fragments, firm-occasionally moderately hard, blocky-platy in part.
	20	SANDSTONE: predominantly as above, becomes fine-medium, trace chlorite in part, trace nodular pyrite.
	Tr	CLAYSTONE: as above.
2334-2337	70	COAL: brown black-black, subbituminous, moderately argillaceous, dull-subvitreous lustre, trace amber, brittle, blocky-subfissile.
	20	SILTSTONE: predominantly as above, disseminated in part, massive-amorphous.
	10	SANDSTONE: as above.
	Tr	CLAYSTONE: as above.
2337-2340	70	SILTSTONE: medium brown grey, grey brown, moderately argillaceous, micromica, common carbonaceous/coaly fragments, locally common coaly microlaminae, slightly arenaceous in part, mottled text in part, firm, blocky.
	10	SANDSTONE: as above.
	10	CLAYSTONE: as above.
	10	COAL: as above.
2340-2343	100	SILTSTONE: brown grey, grey black, dark brown in part, moderately-v argillaceous grad to claystone in part, common very fine arenaceous laminae, trace lithic fragments, micromica in part, trace shell fragments, trace pyrite fossil fragments, firm-occasionally moderately hard, blocky.

	Tr	SANDSTONE: as above.
	Tr	CLAYSTONE: as above.
2343-2346	90	SILTSTONE: as above.
	10	CLAYSTONE: medium grey, medium dark grey, grey brown, slightly silty in part, micromica, trace carbonaceous speck, disseminated pyrite in part, trace glauconite in part, waxy, firm, blocky.
2346-2349	75	SILTSTONE: as above.
	25	CLAYSTONE: as above.
	Tr	SANDSTONE: as above.
2349-2352	90	SILTSTONE: as above.
	10	CLAYSTONE: as above.
2352-2355	80	SILTSTONE: generally as above, brown grey, grey black, dark brown in part, moderately-very argillaceous grades to claystone in part, common very fine arenaceous laminae, trace very fine grained quartz grains, trace lithic fragments, micromica in part, trace black carbonaceous specks, trace shell fragments, trace pyrite fossil fragments, firm-occasionally moderately hard, blocky.
	20	CLAYSTONE: generally as above, medium grey, medium dark grey, grey brown, light olive grey in part, slightly silty in part, micromica, trace carbonaceous speck, disseminated pyrite in part, trace glauconite in part, waxy, firm, blocky.
2355-2358	90	SILTSTONE: as above.
	10	CLAYSTONE: as above.
2358-2361	80	COAL: black-dark brown black, subbituminous, moderately argillaceous, vitreous-subvitreous lustre, brittle-firm, conchoidal fracture, blocky-subfissile.
	20	SILTSTONE: as above
	Tr	CLAYSTONE: as above
2361-2364	90	SILTSTONE: generally as above, brown grey, grey black, dark brown in part, moderately-very argillaceous grades to claystone in part, common very fine arenaceous laminae, trace very fine grained quartz grains, trace lithic fragments, micromica in part, trace black carbonaceous specks, trace shell fragments, firm-occasionally moderately hard, blocky.
	5	CLAYSTONE: as above
	5	COAL: as above
2364-2367	90	SILTSTONE: as above
	10	CLAYSTONE: as above
	Tr	SANDSTONE: clear-white, translucent, frosted, fine-predominantly medium, subangular to subrounded, good sorting, weak dolomitic/siderite cement in part, common kaolinite matrix, trace carbonaceous fragments, rare nod pyrite, occasionally or brown cryptocrystalline to microcrystalline hard dolomitic inclusions, disaggregated-occasionally friable, fair-good porosity, dull or mineral fluorescence only.
	Tr	COAL: as above
2367 -2370	90	SILTSTONE: as above
	10	CLAYSTONE: as above
	Tr	SANDSTONE: as above

2370-2373	90	SILTSTONE: generally as above, brown grey, grey black, dark brown in part, moderately-very argillaceous grades to claystone in part, common very fine arenaceous laminae, trace very fine grained quartz grains, trace lithic fragments, micromica in part, trace black carbonaceous specks, trace shell fragments, firm-occasionally moderately hard, blocky.
	10	CLAYSTONE: generally as above, medium grey, medium dark grey, grey brown, predominantly medium grey, light olive grey in part, slightly silty in part, micromica, trace carbonaceous speck, trace fossils fragments, trace glauconite in part, waxy, firm, blocky-subblocky, subfissile in part.
	Tr	SANDSTONE: generally as above, clear-white, translucent, frosted, fine-predominantly medium, subangular to subrounded, good sorting, weak dolomitic/siderite cement in part, common kaolinite matrix, trace carbonaceous fragments, rare nod pyrite, occasionally or brown cryptocrystalline to microcrystalline hard dolomitic inclusions, disaggregated-occasionally friable, fair-good porosity, dull or mineral fluorescence only.
	Tr	COAL: as above
2373-2376	90	SILTSTONE: as above
	10	CLAYSTONE: as above
	Tr	SANDSTONE: as above
2376-2379	70	SILTSTONE: as above
	20	SANDSTONE: as above
	10	CLAYSTONE: as above
	Tr	COAL: as above
2379-2382	75	SILTSTONE: generally as above, pale yellow brown- brown grey, dark brown in part, moderately-very argillaceous, common very fine arenaceous laminae, trace very fine grained quartz grains, trace lithic fragments, micromica in part, trace black carbonaceous specks, trace shell fragments, firm-occasionally moderately hard, blocky.
	5	CLAYSTONE: as above
	Tr	SANDSTONE: As above
	20	COAL: black-dark brown black, moderately argillaceous, vitreous-subvitreous lustre, brit-firm, conchoidal fracture, blocky-subfissile.
2382-2385	80	SILTSTONE: as above
	10	CLAYSTONE: medium grey, medium dark grey, grey brown, predominantly medium grey, slightly silty in part, micromica, trace carbonaceous speck, trace fossils fragments, trace glauconite in part, firm, blocky-subblocky, subfissile in part.
	10	SANDSTONE: white-off white, clear-translucent, very fine to fine grained, subangular to subrounded, moderately sorted, moderately siliceous cement, slightly dolomitic, firm-friable, poor visual porosity, dull pale yellow fluorescence, no cut / no crush cut fluorescence.
	Tr	COAL: as above.
2385-2388	70	SILTSTONE: as above
	20	SANDSTONE: as above
	10	CLAYSTONE: as above
	Tr	COAL: as above
2388-2391	65	SILTSTONE: as above
	30	SANDSTONE: as above

	5	CLAYSTONE: as above
	Tr	COAL: as above
2391-2394	70	SILTSTONE: generally as above, yellow brown- brown grey, dark brown in part, moderately-v argillaceous, common carbonaceous laminae, trace very fine grained quartz grains, trace lithic fragments, micromica in part, trace-common black carbonaceous specks, trace shell fragments, firm-occasionally moderately hard, blocky.
	20	SANDSTONE: generally as above, white-clear, transparent-translucent, very fine to fine grained, moderately sorted, subangular to subrounded, good sphericity, slightly calcareous, firm-friable, good siliceous cement, common kaolinite matrix, loose in part, poor visual porosity, trace dull yellow mineral fluorescence, no cut/crush cut fluorescence.
	5	CLAYSTONE: as above, medium grey, medium dark grey, grey brown, predominantly medium grey, slightly silty in part, micromica, trace carbonaceous speck, trace fossils fragments, trace glauconite in part, firm, blocky-subblocky, subfissile in part.
	5	COAL: black-dark brown black, silty, waxy texture, vitreous lustre, moderately hard, blocky-subfissile.
2394-2397	75	SILTSTONE: as above
	20	SANDSTONE: as above
	5	CLAYSTONE: as above
	Tr	COAL: as above
2397-2400	90	SILTSTONE: light-medium brown, grey orange, non calcareous, argillaceous in part, trace-common carbonaceous laminae, trace very fine grained quartz, trace lithic fragments, trace-common micromica, trace-common black carbonaceous specks, trace fossils fragments, soft-firm, blocky-subfissile.
	5	SANDSTONE: as above, white-clear, transparent-translucent, very fine to fine grained, moderately sorted, subangular to subrounded, good sphericity, slightly calcareous, firm-friable, good siliceous cement, common kaolinite matrix, loose in part, poor visual porosity, trace dull yellow mineral fluorescence, no cut/crush cut fluorescence.
	5	CLAYSTONE: generally as above, becoming firmer, platy-fissile in part.
	Tr	COAL: as above
2400-2403	60	SILTSTONE: as above
	10	SANDSTONE: as above
	10	CLAYSTONE: as above
	20	COAL: generally as above, black-dark brown black, moderately argillaceous, silty in part, vitreous-subvitreous lustre, brittle-firm, conchoidal fracture, blocky-subfissile.
2403-2406	80	COAL: as above
	20	SILTSTONE: as above
	Tr	SANDSTONE: as above
2406-2409	65	COAL: as above
	30	SILTSTONE: generally as above, light-medium brown, grey orange, non calcareous, argillaceous in part, trace-common carbonaceous laminae, trace very fine grained quartz, trace lithic fragments, trace-common micromica, trace-common black carbonaceous specks, trace fossils fragments, soft-sticky, firm in part, blocky-subblocky.

	5	CLAYSTONE: generally as above, light grey-medium grey- medium dark grey- grey brown, predominantly medium grey, slightly silty in part, micromica, trace carbonaceous speck, trace fossils fragments, trace glauconite in part, soft-sticky, blocky-subblocky.
	Tr	SANDSTONE: as above
2409-2412	100	COAL: black-dark brown black, moderately argillaceous, silty in part, waxy texture, vitreous-subvitreous lustre, brittle-firm, conchoidal fracture, blocky-subfissile.
	Tr	SILTSTONE: as above
2412-2415	100	COAL: as above
	Tr	SILTSTONE: as above
2415-2418	100	COAL: generally as above, black-dark brown black, moderately argillaceous, silty in part, waxy texture, vitreous-subvitreous lustre, brittle-firm, conchoidal fracture, blocky-subfissile.
	Tr	SILTSTONE: as above
2418-2421	100	COAL: as above
	Tr	SILTSTONE: as above
2421-2424	70	SILTSTONE: light-medium brown, grey orange, non calcareous, argillaceous in part, trace- carbonaceous laminae, trace-common carbonaceous specks, trace very fine grained quartz, trace lithic fragments, trace-common micromica, soft-sticky, firm in part, blocky-subblocky.
	20	CLAYSTONE: light grey-medium grey- medium dark grey- grey brown, predominantly medium grey, slightly silty in part, micromica, trace carbonaceous speck, trace fossil fragments, trace glauconite in part, soft-sticky, blocky-subblocky.
	10	SANDSTONE: white-clear, transparent-translucent, very fine to fine grained, moderately sorted, subangular to subrounded, good sphericity, slightly calcareous, firm-friable, good siliceous cement, common kaolinite matrix, loose in part, poor visual porosity, trace dull yellow mineral fluorescence, no cut/crush cut fluorescence.
	Tr	COAL: as above
2424-2427	80	SILTSTONE: as above
	20	CLAYSTONE: as above
	Tr	SANDSTONE: as above
	Tr	COAL: as above
2427-2430	100	SILTSTONE: grey brown, grey black, medium-dark brown, moderately-very argillaceous, trace light grey very fine arenaceous laminae w/ trace kaolinite inclusions, trace carbonaceous fragments, micromica, soft-firm, blocky.
2430-2433	80	SILTSTONE: predominantly as above, locally common carbonaceous/coaly fragments occasionally grades to carbonaceous siltstone.
	20	CLAYSTONE: light-medium grey, medium dark grey- grey brown, slightly silty in part, micromica, trace carbonaceous speck, trace disseminated pyrite, soft-firm, blocky-platy.
	Tr	SANDSTONE: off white-light grey, occasionally clear-translucent, very fine, angular-subangular, good sorting, common kaolinite matrix, weak siderite cement in part, trace carbonaceous speck, friable, poor-nil porosity, pale yellow/gold mineral fluorescence only.
2433-2436	70	SILTSTONE: as above.
	20	SANDSTONE: predominantly as above, abundant kaolinite matrix.

	10	CLAYSTONE: as above.
	Tr	COAL: black, brown black in part, argillaceous, subbituminous-bit, subvitreous-loc vitreous lustre, subconchoidal fracture, brittle, blocky.
2436-2439	60	SILTSTONE: as above.
	40	SANDSTONE: white-off white, pale brown, very fine-silty, subangular, good sorting, abundant kaolinite matrix, trace carbonaceous speck, abundant sticky kaolinite aggregates, friable, nil-v poor porosity, no fluorescence.
2439-2442	80	SILTSTONE: as above.
	20	SANDSTONE: as above.
	Tr	COAL: black, brown black in part, argillaceous, subbituminous-bit, subvitreous-loc vitreous lustre, subconchoidal fracture, brittle, blocky.
2442-2445	60	SILTSTONE: as above.
	40	SANDSTONE: predominantly as above, becomes very fine-silt, abundant kaolinite matrix, grades to very argillaceous siltstone.
	Tr	COAL: as above.
2445-2448	70	SILTSTONE: brown grey, medium-dark brown, moderately-very argillaceous locally grades to claystone, micromica, trace lithic fragments, locally common carbonaceous/coaly fragments & microlaminae, soft-firm, blocky-subfissile.
	30	SANDSTONE: as above.
	Tr	COAL: as above.
2448-2451	100	SILTSTONE: predominantly as above, becomes very argillaceous grades to claystone.
	Tr	SANDSTONE: as above.
2451-2454	90	SILTSTONE: as above.
	10	SANDSTONE: as above.
2454-2457	60	SILTSTONE: predominantly as above, locally common carbonaceous/coaly microlaminae.
	40	SANDSTONE: white-off white, light grey in part, very fine-occasionally fine, subangular, good sorting, abundant kaolinite matrix, grades to arenaceous siltstone in part, common sticky kaolinite aggregates, trace lithic fragments, trace altered feldspar (?), trace carbonaceous speck, friable, nil porosity, no fluorescence.
	Tr	COAL: black, brown black in part, argillaceous, subbituminous-bit, subvitreous-loc vitreous lustre, subconchoidal fracture, brittle, blocky.
2457-2460	70	SANDSTONE: predominantly as above, occasionally coaly laminae, trace nod pyrite.
	30	SILSTSONE: as above.
	Tr	COAL: as above.
2460-2463	80	SANDSTONE: as above.
	20	SILTSTONE: as above.
2463-2466	90	SANDSTONE: as above.
	10	SILTSTONE: as above.
2466-2469	100	SANDSTONE: off white-light grey in part, very fine, subangular, good sorting, abundant kaolinite matrix, matrix supported, trace carbonaceous speck, trace mica, common sticky kaolinite aggregates, friable, nil porosity, no fluorescence.
	Tr	SILTSTONE: as above.

2469-2472	80	SILTSTONE: brown grey, medium-dark brown, moderately-very argillaceous locally grades to claystone, micromica, trace lithic fragments, locally common carbonaceous/coaly fragments, soft-firm, blocky-subfissile in part.
	20	SANDSTONE: predominantly as above, loc trace nod pyrite.
2472-2475	100	SILTSTONE: predominantly as above, becomes tan in part, grades to claystone.
	Tr	SANDSTONE: as above.
2475-2478	100	SILTSTONE: as above.
	Tr	SANDSTONE: as above.
2478-2481	80	SILTSTONE: grey brown, light-medium brown, very argillaceous grades to claystone in part, micromica, locally common carbonaceous/coaly fragments, occasionally light grey very fine-silty arenaceous laminae, trace lithic fragments, soft-firm, blocky-subfissile in part.
	20	COAL: black, bit, subvitreous-vitreous lustre, subconchoidal fracture, brittle, blocky.
2481-2484	70	SILTSTONE: as above.
	20	COAL: as above.
	10	SANDSTONE: off white, pale brown, very fine, subangular, good to moderate sorting, abundant kaolinite matrix, matrix supported, trace carbonaceous speck, sticky kaolinite aggregates, friable, nil porosity, no fluorescence.
2484-2487	90	SILTSTONE: predominantly as above, trace arenaceous inclusions in part.
	10	SANDSTONE: as above
2487-2490	90	SILTSTONE: grey brown, light-medium brown, very argillaceous grades to claystone in part, micromica, locally common carbonaceous/coaly fragments, occasionally light grey very fine-silty arenaceous laminae, trace lithic fragments, soft-firm, blocky-subfissile in part.
	10	COAL: black, bituminous, subvitreous-vitreous lustre, subconchoidal fracture, brittle, blocky.
2490-2493	90	SILTSTONE: predominantly as above.
	10	SANDSTONE: as above
2493-2496	95	SILTSTONE: predominantly as above.
	5	SANDSTONE: as above
	Tr	COAL: as above
2496-2499	100	SILTSTONE: generally as above, grey brown, light-medium brown, very argillaceous grades to claystone in part, micromica, locally common carbonaceous/coaly fragments, occasionally light grey very fine-silty arenaceous laminae, trace lithic fragments, soft-firm, blocky-subfissile in part.
	Tr	SANDSTONE: as above
2499-2502	100	SILTSTONE: as above
2502-2505	95	SILTSTONE: as above
	5	SANDSTONE: generally as above, off white, pale brown, very fine, grades to SILTSTONE in part, subangular, good to moderate sorting, abundant kaolinite matrix, matrix supported, trace carbonaceous speck, sticky kaolinite aggregates, good siliceous cement, hard- friable, poor visual porosity, no fluorescence.
2505-2508	80	SILTSTONE: as above
	20	SANDSTONE: as above

2508-2511	50	SANDSTONE: as above, white-off white, pale brown, very fine, grades to SILTSTONE in part, subangular, good to moderate sorting, common-abundant kaolinite matrix, matrix supported, trace carbonaceous speck, sticky kaolinite aggregates, good siliceous cement, hard- friable, poor visual porosity, no fluorescence.
	40	SILTSTONE: as above
	10	CLAYSTONE: medium light grey-medium dark grey, slightly silty in part, micromica, trace carbonaceous speck, trace disseminated pyrite, soft-firm, blocky-subblocky.
2511-2514	70	SILTSTONE: light medium grey to light brown-brown, argillaceous, grades to claystone in part, arenaceous, common micromica, trace-common black carbonaceous specks/laminae, trace very fine grained quartz, trace lithic fragments, firm-moderately hard, subblocky-subfissile.
	20	SANDSTONE: as above
	10	CLAYSTONE: as above
2514-2517	85	SILTSTONE: as above
	10	CLAYSTONE: as above, becoming very silty.
	5	SANDSTONE: as above
2517-2520	80	SILTSTONE: as above
	15	CLAYSTONE: as above
	5	SANDSTONE: as above
2520-2523	95	SILTSTONE: generally as above, light medium grey to light brown-pale brown, argillaceous, grades to claystone in part, arenaceous, common micromica, trace-common black carbonaceous specks/laminae, trace very fine grained quartz, trace lithic fragments, firm-moderately hard, subblocky-subfissile.
	5	CLAYSTONE: as above
	Tr	SANDSTONE: as above
2523-2526	90	SILTSTONE: as above
	10	CLAYSTONE: as above
2526-2529	30	SILTSTONE: as above
	70	COAL: black, slightly silty, dull-vitreous-subvitreous lustre, brittle-firm, conchoidal fracture, blocky-subfissile.
2529-2532	70	SILTSTONE: generally as above, light medium grey-light brown-pale brown, argillaceous, grades to claystone in part, arenaceous, common micromica, trace-common black carbonaceous specks/laminae, trace very fine grained quartz, trace lithic fragments, firm-moderately hard, subblocky-subfissile.
	30	SANDSTONE: off white-translucent, fine-coarse grain, predominantly medium grained, subangular to subrounded, moderately sorted, common white argillaceous matrix, very fine grained aggregates, friable-moderately hard, common loose, trace rose quartz, poor-moderately visual porosity, no fluorescence, no cut.
2532-2535	70	SILTSTONE: as above
	30	SANDSTONE: as above
2535-2538	60	SILTSTONE: as above, grades to very fine grained sandstone in part.
	40	SANDSTONE: as above
2538-2541	75	SANDSTONE: as above

	25	SILTSTONE: as above
2541-2544	70	SANDSTONE: clear-very light grey, frosted, translucent-transparent, medium-coarse grain, occasionally very coarse grained, poor sphericity, sub angular-angular, moderately sorted, loose, trace rose quartz, trace glauconite, fine-medium aggregates, moderate to poor siliceous cement, moderately hard-friable, slightly calcareous in part, poor-moderate inferred porosity, trace-common dull yellow orange mineral fluorescence, no cut/crush cut fluorescence.
	25	SILTSTONE: generally as above, light medium grey to light brown-pale brown, argillaceous, grades to claystone in part, arenaceous, common micromica, trace-common black carbonaceous specks/laminae, trace very fine grained quartz, trace lithic fragments, firm-moderately hard, subblocky-subfissile.
	5	CLAYSTONE: medium light grey-green grey, non calcareous, slightly silty in part, glauconite, trace micromica, trace carbonaceous speck, trace disseminated pyrite, soft-firm, -subblocky-subfissile.
2544-2547	65	SILTSTONE: as above
	25	SANDSTONE: as above
	10	CLAYSTONE: as above
2547-2550	65	SILTSTONE: generally as above, medium grey-light brown, becoming grey brown w/ depth, argillaceous, grades to claystone, arenaceous, common micromica, trace-common black carbonaceous specks/laminae, trace very fine grained quartz, trace lithic fragments, trace micromica, firm-moderately hard, subblocky-subfissile.
	25	SANDSTONE: as above
	10	CLAYSTONE: as above, grades to argillaceous siltstone in part.
2550-2553	60	SILTSTONE: as above
	30	SANDSTONE: clear-very light grey, frosted, translucent-transparent, medium-coarse grain, subangular-angular, moderately sorted, loose, trace rose quartz, trace glauconite, common kaolinite matrix, fine-medium aggregates, good siliceous cement, trace dolomitic cement, moderately hard-hard, friable in part, poor-moderate inferred porosity, trace dull yellow orange mineral fluorescence.
	10	CLAYSTONE: as above
2553-2556	75	SILTSTONE: as above
	15	SANDSTONE: as above
	10	CLAYSTONE: as above
2556-2559	80	SILTSTONE: generally as above, light brown- grey brown, very carbonaceous, argillaceous, grades to claystone, very slightly dolomitic, common micromica, trace very fine grained quartz, trace lithic fragments, trace micromica, firm-moderately hard, subblocky-subfissile.
	20	CLAYSTONE: medium light grey-medium grey, non calcareous, grades to siltstone in part, trace glauconite, trace micromica, trace carbonaceous speck, trace disseminated pyrite, trace fossils fragments, moderately hard-firm, blocky-subfissile.
	Tr	SANDSTONE: as above
2559-2562	60	SHALE: brown black, olive black, slightly silty in part, very carbonaceous, micromica, trace muscovite flakes, trace disseminated pyrite, smooth in part, homogeneous, firm-moderately hard, plastic in part, blocky-subfissile, fissile in part.
	30	SILTSTONE: predominantly as above, becomes dark brown grey, common carbonaceous fleck.

	10	SANDSTONE: off white, pale brown,, very fine-fine, angular-subangular, good sorted, weak siliceous cement, locally common kaolinite matrix, trace carbonaceous speck, friable, nil porosity, no fluorescence.
2562-2565	70	SHALE: predominantly as above, locally common disseminated & nodular pyrite, common muscovite flakes, homogeneous.
	20	SILTSTONE: as above.
	10	SANDSTONE: as above.
2565-2568	90	SHALE: brown black, olive black, very micromica, very carbonaceous locally grades to carbonaceous shale, common disseminated pyrite, smooth, homogeneous, firm, plastic in part, blocky, subfissile-fissile in part.
	10	SANDSTONE: as above.
2568-2571	100	SHALE: predominantly as above, locally abundant carbonaceous matter, grades to carbonaceous shale.
	Tr	SANDSTONE: as above.
2571-2574	50	SHALE: predominantly as above, trace nodular pyrite.
	40	CLAYSTONE: light green grey, light-medium grey, trace lithic fragments, occasionally slightly silty, trace altered mica, micromica in part, soft-disseminated, occasionally firm, massive-amorphous in part.
	10	SANDSTONE: off white, very fine, angular, good sorting, abundant kaolinite matrix, matrix supported, trace carbonaceous speck, friable, no visual porosity, no fluorescence.
2574-2577	40	SILSTSONE: brown grey, brown black, very argillaceous grades to claystone in part, locally common carbonaceous speck, micromica, trace lithic fragments, firm, moderately hard in part, massive-blocky.
	30	CLAYSTONE: as above.
	20	SHALE: as above.
	10	SANDSTONE: as above.
2577-2580	50	CLAYSTONE: off white, light green grey, blue grey in part, tan, trace lithic fragments, slightly micromica, disseminated, soft-firm in part, massive-amorphous. (Cuttings predominantly rock flour –PDC bit tripped due to low ROP)
	40	SILTSTONE: as above.
	10	SANDSTONE: AS above
2580-2583	80	DOLERITE: light grey green, translucent-off white, medium green in part, black in part, predominantly medium-coarse crystalline olivine/ biotite/ quartz/ pyroxene, locally common black glassy occasionally microvesicular groundmass, trace tourmaline laths, hard-brittle in part, massive.
	20	CLAYSTONE: medium grey, brown grey, silty in part, micromica, slightly siliceous, trace carbonaceous fragments, homogeneous, firm-occasionally moderately hard, blocky.
2583-2586	90	DOLERITE: predominantly as above, becomes fine grained crystalline, abundant black glassy groundmass w/ metallic lustre, predominantly basaltic, common micropyroxene, hard, blocky.
	10	CLAYSTONE: as above.
2586-2589	40	DOLERITE: as above.
	60	CLAYSTONE: predominantly as above, trace gastropods/coralline fragments, trace medium brown cryptocrystalline dolomitic inclusions.

2589-2592	90	DOLERITE: light grey, translucent, opaque, light green, coarse crystalline quartz/plagioclase/olivine w/ black glassy groundmass, trace pyroxene, trace pyrite, predominantly disaggregated crystals, hard in part.
	10	CLAYSTONE: as above.
2592-2595	80	DOLERITE: predominantly as above, abundant free quartz w/ mafic mineral inclusions, moderately calcareous in part.
	20	CLAYSTONE: as above.
2595-2598	100	DOLERITE: predominantly as above, becomes coarse-very coarse crystalline w/ abundant free quartz, common light-dark green olivine crystals, occasionally chloritic groundmass, common white calcite infill in fractures.
2598-2601	100	DOLERITE: light green, off white, coarse, crystalline quartz/plagioclase/feldspar, very calcareous, abundant chlorite/olivine groundmass, trace haematitic staining, trace disseminated pyrite, disaggregated-occasionally hard, massive.
2601-2604	90	DOLERITE: as above.
	10	CLAYSTONE: pale-light grey, grey brown, slightly dolomitic, trace carbonaceous flecks, trace disseminated pyrite, micromica, smooth, waxy, firm, blocky-subfissile (pyroclastic?).
2604-2607	80	DOLERITE: predominantly as above, becomes coarse-very coarse crystalline w/ abundant free quartz, common light-dark green olivine crystals, occasionally chloritic groundmass, common white calcite infill in fractures.
	20	CLAYSTONE: as above (pyroclastic?), trace light-medium brown microcrystalline dolomitic inclusions hard flinty.
2607-2610	90	DOLERITE: light-medium grey, occasionally light green, predominantly fine medium crystalline quartz/olivine in glassy groundmass, common pyrite, disaggregated, hard in part.
	10	CLAYSTONE: as above (pyroclastic?).
2610-2613	100	DOLERITE: predominantly as above, becomes coarse-very coarse crystalline w/ abundant free quartz, common light-dark green olivine crystals, occasionally chloritic groundmass, common white calcite infill in fractures trace pyrite, trace biotite, disaggregated, hard aggregates, massive.
2613-2616	60	DOLERITE: predominantly as above, becomes coarse crystalline in part.
	40	SILTSTONE: medium-dark brown, grey brown, very argillaceous, slightly siliceous, micromica, trace carbonaceous matter, soft-slightly dispersive, occasionally hard (contact metamorphic?), massive-blocky.
2616-2619	80	SILTSTONE: predominantly as above, becomes predominantly dark brown.
	20	DOLERITE: as above.
2619-2622	70	SILTSTONE: brown black, grey brown, very argillaceous, micromica, trace lithic fragments, moderately carbonaceous, soft-firm, disseminated in part, massive-blocky.
	20	SHALE: olive black, brown black, micromica, very carbonaceous grades to carbonaceous shale in part, common disseminated pyrite, moderately hard, subfissile-fissile in part.
	10	DOLERITE: as above.
2622-2625	60	SILTSTONE: predominantly as above, trace off white very fine-silty arenaceous inclusions w/ abundant kaolinite.
	40	SHALE: as above, trace disseminated pyrite.

2625-2628	40	SILTSTONE: predominantly as above, locally trace pyrite fossil fragments, trace gastropods, trace forams.
	60	SHALE: as above.
2628-2631	30	SILTSTONE: as above.
	70	SHALE: as above.
2631-2634	80	SILTSTONE: dark brown, brown black, very argillaceous, grades to claystone, micromica, trace lithic fragments, trace-common carbonaceous speck, soft-slightly dispersive, massive-blocky.
	20	SHALE: brown black, olive black, very carbonaceous grades to carbonaceous shale, micromica, trace-common disseminated pyrite, trace lithic fragments, homogeneous, moderately hard, subfissile-fissile.
2634-2637	100	SILTSTONE: as above.
2637-2640	100	SILTSTONE: brown grey, medium-dark brown, very argillaceous locally grades to claystone, micromica in part, trace lithic & carbonaceous fragments, soft-firm, occasionally moderately hard, massive-blocky, subfissile in part.
2640-2643	100	SILTSTONE: as above.
2643-2646	100	SILTSTONE: as above.
2646-2649	100	SILTSTONE: as above.
2649-2652	70	SILTSTONE: medium-dark brown, brown grey, very argillaceous grades to claystone, micromica, locally common carbonaceous fragments & microlaminae, trace lithic fragments in part, soft-firm, slightly dispersive, moderately hard in part, massive-blocky, subfissile in part.
	30	COAL: black, brown black in part, slightly argillaceous, subvitreous-loc vitreous lustre, subconchoidal fracture in part, brittle, blocky.
2652-2655	80	COAL: as above.
	20	SILTSTONE: as above.
2655-2658	60	SILTSTONE: as above.
	30	CLAYSTONE: tan-pale brown, abundant silt-very fine quartz grains, trace lithic fragments, very disseminated, amorphous.
	10	COAL: as above.
2658-2661	65	SILTSTONE: generally as above, medium-dark brown, brown grey, brown black in part, very argillaceous grades to claystone, micromica, locally common carbonaceous fragments & microlaminae, trace lithic fragments in part, soft-firm, slightly dispersive, moderately hard in part, massive-blocky, subfissile in part.
	30	CLAYSTONE: as above, pale yellow brown-pale brown, abundant silt-very fine quartz grains, trace lithic fragments, trace fossil fragments, soft-sticky, very dispersive-amorphous.
	5	COAL: as above
2661-2664	70	SILTSTONE: as above.
	30	CLAYSTONE: as above
	Tr	COAL: as above.
2664-2667	90	SILTSTONE: as above.
	10	CLAYSTONE: as above

2667-2670	75	SILTSTONE: generally as above, pale yellow brown-pa brown, dark yellow brown-greenish brown, slightly calcareous, abundant silt-very fine quartz grains, trace fossils fragments, soft-sticky, moderately hard in part, very dispersive-amorphous, subblocky in part.
	10	CLAYSTONE: as above
	5	SANDSTONE: off white-light grey, transparent-translucent, very fine to fine grained, rounded to subrounded, moderately well sorted, trace carbonaceous specks, moderately siliceous cement, trace white argillaceous matrix, moderately hard-friable, loose in part, poor visual porosity, no fluorescence.
	10	COAL: as above, black, brown black in part, slightly argillaceous, subvitreous-loc vitreous lustre, subconchoidal fracture in part, brittle, blocky.
2670-2673	80	SILTSTONE: as above.
	20	CLAYSTONE: as above
	Tr	SANDSTONE: as above, (Cuttings predominantly kaolinite matrix)
	Tr	COAL: as above
2673-2676	70	SILTSTONE: as above
	20	SANDSTONE: as above, white-off white, light grey, very fine-fine, grades to SILTSTONE in part, subrounded-subangular, good- moderate sorting, common-abundant kaolinite matrix, matrix supported, trace carbonaceous specks, trace pyrite, sticky kaolinite aggregates, good siliceous cement, hard- friable, poor visual porosity, no fluorescence.
	10	CLAYSTONE: as above
	Tr	COAL: as above
2676-2679	50	SILTSTONE: as above.
	40	SANDSTONE: as above
	10	CLAYSTONE: as above
2679-2682	60	SILTSTONE: generally as above, medium grey-dark grey, slightly calcareous, argillaceous in part, abundant silt-very fine quartz grains, trace fossil fragments, soft-sticky, moderately hard in part, very dispersive-amorphous, subblocky in part.
	30	SANDSTONE: light grey-off white-very light brown, very fine to fine grained, occasionally medium-coarse, predominantly fine grain, subangular to subrounded, poor-moderately sorted, good siliceous cement, trace white interstitial clay matrix, trace carbonaceous specks, trace pyrite, friable-hard, nil-trace visual porosity, no fluorescence.
	10	CLAYSTONE: as above, light grey-pale yellow brown-pale brown-grey green, abundant silt-very fine quartz grains, grades to argillaceous siltstone in part, trace lithic fragments, trace fossil fragments, soft-sticky, very dispersive-amorphous.
2682-2685	90	SILTSTONE: as above.
	10	CLAYSTONE: as above
	Tr	SANDSTONE: as above
2685-2688	90	SILTSTONE: as above, predominantly pale brown-dark yellow brown, brown black in part, grades to shale in part, blocky-subfissile.
	10	CLAYSTONE: as above
	Tr	SANDSTONE: as above
2688-2691	90	SILTSTONE: as above

	10	CLAYSTONE: as above
	Tr	SANDSTONE: as above
2691-2694	80	SILTSTONE: generally as above, medium grey-dark grey, dark yellow brown-brown black, non-slightly calcareous, argillaceous in part, grades to shale in part, abundant silt-very fine quartz grains, trace fossil fragments, soft-sticky, moderately hard in part, amorphous- subblocky, subfissile-fissile in part.
	10	SHALE: brown black, olive black, very micromicaceous, very carbonaceous, common disseminated pyrite, smooth, firm, plastic in part, blocky, subfissile-fissile in part.
	10	CLAYSTONE: generally as above (possibly cavings)
2694-2697	80	SILTSTONE: as above
	10	CLAYSTONE: as above
	10	SHALE: as above
2697-2700	80	SILTSTONE: as above, medium brown- dark yellow brown-brown black, non-slightly calcareous, argillaceous in part, grades to shale in part, abundant carbonaceous matter, occasionally dolomitic cement, abundant silt-very fine quartz grains, trace fossil fragments, soft-sticky, moderately hard- hard in part, amorphous- subblocky, subfissile-fissile in part.
	20	CLAYSTONE: as above
	Tr	SHALE: as above
2700-2703	80	SILTSTONE: as above
	20	CLAYSTONE: as above
2703-2706	90	SILTSTONE: generally as above, medium brown- dark yellow brown-brown black, non-slightly calcareous, argillaceous in part, grades to shale in part, abundant carbonaceous specks/laminae, occasionally dolomitic cement, abundant silt-very fine quartz grains, trace fossils fragments, soft-sticky, moderately hard- hard in part, amorphous- subblocky, subfissile-fissile in part.
	10	CLAYSTONE: as above
2707-2709	80	SILTSTONE: as above
	20	CLAYSTONE: as above
2709-2712	90	SILTSTONE: brown grey, dark brown, very argillaceous, micromica, occasionally carbonaceous specks, trace lithic fragments, trace medium brown very fine arenaceous laminae/inclusions in part, firm-moderately hard, slightly dispersive in part, massive-blocky, subfissile in part.
	10	COAL: black, bituminous, vitreous lustre, subconchoidal-conchoidal fracture, brittle, blocky.
2712-2715	100	SILTSTONE: predominantly as above, locally common fossil fragments including forams & coral fragments, trace light grey very fine-silty arenaceous inclusions.
	Tr	COAL: as above.
2715-2718	90	SILTSTONE: as above.
	10	SANDSTONE: off white, pale brown, very fine-silty, angular, good sorting, abundant kaolinite matrix, matrix supported, trace mica, trace carbonaceous specks, friable, nil porosity, no fluorescence.
2718-2721	90	SILTSTONE: as above.
	10	SANDSTONE: as above.

2721-2724	100	SILTSTONE: predominantly as above, becomes very disseminated (due to bit action/wear)
2724-2727	100	SILTSTONE: dark brown, brown grey, very argillaceous, micromica, rare pyrite nod, trace carbonaceous/coaly fragments, trace lithic fragments, siliceous in part, trace light grey very fine-silty siliceous cemented arenaceous inclusions, firm, hard in part, massive-blocky. (common dispersive clays due to bit wear).
2727-2730	100	SILTSTONE: as above.
2730-2733	100	SILTSTONE: predominantly as above, becomes siliceous, trace disseminated pyrite, hard.
	Tr	COAL: black, bituminous, vitreous lustre, subconchoidal-conchoidal fracture, brittle, blocky.
2733-2736	100	SILTSTONE: as above.
2736-2739	100	SILTSTONE: grey brown, medium brown in part, very argillaceous locally grading to claystone, micromica, trace biotite, trace carbonaceous specks, trace lithic fragments, slightly arenaceous in part, firm-moderately hard, blocky. (common dispersive clays due to bit wear).
2739-2742	100	SILTSTONE: brown grey, brown black, very argillaceous grades to claystone in part, micromica, trace-locally common carbonaceous fragments, trace lithic fragments, slightly siliceous in part, soft-firm, hard in part, massive-blocky.
2742-2745	100	SILTSTONE: predominantly as above, trace light grey very fine-silty siliceous arenaceous inclusions/laminae.
2745-2748	100	SILTSTONE: as above.
	Tr	COAL: black, bituminous, vitreous lustre, subconchoidal-conchoidal fracture, brittle, blocky.
2748-2751	100	SILTSTONE: as above.
2751-2754	100	SILTSTONE: as above.
2754-2757	100	SILTSTONE: brown grey, brown black, very argillaceous grades to claystone in part, micromica, trace carbonaceous fragments, trace lithic fragments, occasionally trace very fine arenaceous inclusions, moderately siliceous in part, soft-firm, moderately hard-hard, massive-blocky.
2757-2760	100	SILTSTONE: as above.
2760-2763	20	SANDSTONE: clear-translucent, frosted, fine-predominantly medium, subangular to subrounded, good sorting, clean, rare kaolinite inclusions, trace nodular pyrite, disaggregated, good porosity, no fluorescence.
2763–2766	50	SILTSTONE: as above
	50	SANDSTONE: as above
2766-2769	60	SILTSTONE: generally as above, brown grey, brown black, very argillaceous grades to claystone in part, micromica, trace carbonaceous fragments, trace lithic fragments, occasionally trace very fine arenaceous inclusions, moderately siliceous in part, soft-firm, moderately hard-hard, massive-blocky.
	40	SANDSTONE: as above, clear-off white-pale yellow brown, translucent, frosted, fine-predominantly medium, subangular to subrounded, good sorting, loose, medium grain moderately cement aggregates in part, rare kaolinite inclusions, trace nodular pyrite, disaggregated, poor- good- porosity, occasionally bright yellow white fluorescence, slow streaming cut fluorescence, milky white-yellow crush cut fluorescence, thin chalky white residue ring.

2769-2772	90	SILTSTONE: as above
	10	SANDSTONE: as above
2772-2775	95	SILTSTONE: as above
	5	SANDSTONE: as above
2775-2778	100	SILTSTONE: as above, light grey- brown grey- occasionally brown black, very argillaceous grades to claystone in part, micromica, trace-common carbonaceous fragments, trace lithic fragments, occasionally trace very fine arenaceous inclusions, moderately siliceous in part, soft-firm, moderately hard-hard, massive-blocky.
	Tr	SANDSTONE: as above
2778-2781	100	SILTSTONE: generally as above, predominantly brown grey-brown black, subfissile-fissile, carbonaceous, grades to Shale in part.
	Tr	SANDSTONE: as above, grades to Siltstone in part.
2781-2784	100	SILTSTONE: as above
	Tr	SANDSTONE: as above
	Tr	COAL: black, bituminous, vitreous lustre, grades to carbonaceous Shale in part, slightly silty, subconchoidal-conchoidal fracture, brittle, blocky-subfissile.
2784-2787	85	SILTSTONE: as above
	5	SANDSTONE: clear, translucent-transparent, frosted, medium-coarse grain, occasionally very coarse grained, subrounded-subangular, angular in part, poor sorted, loose, good inferred porosity, no fluorescence.
	10	COAL: as above.
2787-2790	90	SILTSTONE: as above
	10	SANDSTONE: as above, no fluorescence.
2790-2793	70	SILTSTONE: as above
	30	SANDSTONE: clear, translucent-transparent, frosted, coarse-very coarse grained, subangular-angular, moderately sorted, loose, common recrystallised quartzite, good inferred porosity, no fluorescence.
2793-2796	90	SILTSTONE: light grey- brown grey- occasionally brown black, very argillaceous grades to claystone in part, micromica, trace-common carbonaceous fragments, trace lithic fragments, occasionally trace very fine arenaceous inclusions, moderately siliceous in part, soft-firm, moderately hard-hard, massive-blocky.
	10	SANDSTONE: as above
2796-2799	90	SANDSTONE: clear-light grey-light brown, brown in part, translucent, fine-medium grain, predominantly medium, occasionally coarse grain, rounded to subrounded, moderately well sorted, trace carbonaceous specks, trace kaolinite matrix, trace biotite, loose, occasionally friable, good inferred porosity, trace dull yellow orange pinpoint fluorescence, no cut fluorescence, no crush cut fluorescence.
	10	SILTSTONE: as above.
2799-2802	100	SANDSTONE: as above
	Tr	SILTSTONE: as above
2802-2805	80	SANDSTONE: generally as above, clear-light grey-light brown, brown in part, translucent, fine-medium grain, predominantly medium, occasionally coarse grain, rounded to subrounded, moderately well sorted, trace carbonaceous specks, trace kaolinite matrix, trace lithic fragments, trace biotite, loose, good inferred porosity, trace dull yellow orange pinpoint fluorescence, no cut fluorescence, no crush cut fluorescence.

	20	SILTSTONE: generally as above, light grey- brown grey- occasionally brown black, very argillaceous grades to claystone in part, micromica, trace carbonaceous specks, trace lithic fragments, occasionally trace very fine arenaceous inclusions, soft-firm, moderately hard-hard, blocky.
2805-2808	80	SANDSTONE: as above
	20	SILTSTONE: as above
2808-2811	80	SANDSTONE: generally as above, fine-medium grain, occasionally coarse grain, common moderately cemented aggregates, nil-trace dull yellow orange fluorescence, no cut/crush cut fluorescence.
	20	SILTSTONE: as above.
2811-2814	80	SANDSTONE: as above
	20	SILTSTONE: as above
2814-2817	70	SANDSTONE: generally as above, clear-light grey-light brown, translucent, fine-coarse grain, predominantly medium, rounded-subangular, poor-moderately sorted, trace carbonaceous specks, trace lithic fragments, trace biotite, loose, good inferred porosity, trace-nil dull yellow orange pinpoint fluorescence, no cut/crush cut fluorescence.
	30	SILTSTONE: generally as above, light grey- brown grey- occasionally brown black, very argillaceous grades to claystone in part, micromica, trace carbonaceous specks, trace lithic fragments, occasionally trace very fine arenaceous inclusions, soft-firm, moderately hard-hard, blocky.
2817-2820	70	SANDSTONE: as above
	30	SILTSTONE: as above
2820-2823	80	SILTSTONE: brown grey-medium brown- occasionally brown black, very argillaceous grades to claystone in part, micromica, trace-common carbonaceous specks, trace lithic fragments, soft-firm, moderately hard-hard, blocky.
	20	SANDSTONE: as above, predominantly coarse grain, loose, good inferred porosity, no fluorescence.
2823-2826	90	SILTSTONE: as above
	10	SANDSTONE: as above
2826-2829	100	SILTSTONE: as above, brown grey-medium brown- occasionally brown black, non calcareous, very argillaceous grades to claystone in part, micromica, trace-common carbonaceous specks, soft-firm, moderately hard-hard, blocky.
2829-2832	100	SILTSTONE: as above
2832-2835	100	SILTSTONE: as above
2835-2838	100	SILTSTONE: grey black, brown black, occasionally medium brown, very argillaceous in part, grades to claystone, micromica in part, trace carbonaceous fragments, trace light grey fine arenaceous inclusions, slightly siliceous, firm-moderately hard, blocky-platy in part.
2838-2841	90	SILTSTONE: as above.
	10	SANDSTONE: clear-translucent, frosted, medium-coarse, angular-subangular, poor sorted, strong siliceous cement, trace-common quartz over growths, disaggregated, hard aggregates in part, nil-poor porosity, no fluorescence.
2841-2844	70	SILTSTONE: as above.

	30	SANDSTONE: predominantly as above, becomes coarse-very coarse, angular very coarse fractured quartz, trace feldspar, trace very coarse milky quartz, common white kaolinite inclusions, nil porosity, no fluorescence.
2844-2847	80	SILTSTONE: as above.
	20	SANDSTONE: predominantly as above, locally common slightly/argillaceous matrix.
2847-2850	90	SILTSTONE: brown grey, brown black, medium brown, loc very argillaceous grades to silty claystone, micromica, locally common carbonaceous specks, micromica, trace lithic fragments, locally off white-pale brown very fine-silty arenaceous inclusions/laminae, soft-firm, moderately hard, blocky-massive.
	10	SANDSTONE: as above.
2850-2853	100	SILTSTONE: as above.
	Tr	SANDSTONE: predominantly as above, becomes coarse, occasionally hard aggregates, tight.
2853-2856	100	SILTSTONE: predominantly as above, becomes arenaceous in part.
2856-2859	60	SANDSTONE: clear-translucent, frosted, fine-medium, subangular to subrounded, good sorting, trace kaolinite inclusions, trace coarse fractured milky quartz, trace quartz over growths, disaggregated, fair-good porosity, no fluorescence.
	40	SILTSTONE: as above.
2859-2862	70	SANDSTONE: clear-translucent, frosted, fine-predominantly medium, occasionally coarse, subangular to subrounded, moderately sorted, trace siderite cement, trace kaolinite matrix/inclusions, trace quartz over growths, trace nodular pyrite, trace coarse fractured milky quartz, disaggregated, good porosity, trace dull or mineral fluorescence only.
	30	SILTSTONE: as above.
	Tr	COAL: black, bituminous, vitreous lustre, subconchoidal-conchoidal fracture, brittle, blocky.
2862-2865	100	SANDSTONE: predominantly as above, trace coal fragments, trace siderite stained quartz.
	Tr	SILTSTONE: as above.
2865-2668	100	SANDSTONE: clear-translucent, frosted, medium-predominantly coarse, subangular to subrounded, moderately sorted, trace siderite cement coating, trace kaolinite inclusions, trace muscovite, trace very coarse fractured quartz, trace pale aggregates, disseminated pyrite, good porosity, trace dull or mineral fluorescence only.
2868-2871	100	SANDSTONE: predominantly as above, becomes fine-medium, no fluorescence.
2871-2874	90	SANDSTONE: clear-translucent, frosted, pale orange brown, fine-very coarse, angular-predominantly subangular to subrounded, poor sorting, trace weak siliceous cement, trace kaolinite matrix/inclusions, trace quartz over growths, trace nodular pyrite, trace fractured very coarse milky quartz, disaggregated, occasionally hard aggregates, fair-good porosity, trace dull or mineral fluorescence only.
	10	SILTSTONE: brown grey, light-medium brown in part, locally very argillaceous, micromica, locally common carbonaceous/coaly fragments/laminae, arenaceous in part, firm-moderately hard, blocky.
2874-2877	80	SANDSTONE: predominantly as above, locally common limonite stained quartz, locally common kaolinite matrix/inclusions, poor-fair porosity, trace dull pale yellow patchy fluorescence, very weak diffuse cut, thin residual ring.

	20	SILTSTONE: predominantly as above, locally becomes very argillaceous grades to claystone.
2877-2880	70	SANDSTONE: predominantly as above, becomes medium-coarse, abundant kaolinite matrix, Trace dull pale yellow patchy fluorescence, very weak diffuse cut, thin residue ring.
	30	SILTSTONE: as above.
2880-2883	80	SANDSTONE: clear-translucent, frost, pale brown, fine-predominantly medium, angular-subrounded, moderately sorted, abundant kaolinite matrix, common fractured milky quartz float, trace muscovite, common pale brown Fe stained quartz, trace feldspar, trace quartz over growths, friable-disseminated aggregates, poor-fair porosity, trace dull or mineral fluorescence only.
	20	SILTSTONE: as above.
2883-2886	30	SANDSTONE: off white-pale brown, very fine-fine, angular-subangular, good sorting, abundant kaolinite/silty matrix, occasionally coarse milky fractured quartz float (cavings?), trace carbonaceous speck rare nodular pyrite, friable, nil porosity, no fluorescence.
	50	CLAYSTONE: medium-dark grey, brown grey in part, micromica, trace lithic fragments, smooth, waxy, homogeneous, firm-moderately hard, blocky-subfissile.
	20	SILTSTONE: as above.
2886-2889	10	SANDSTONE: predominantly as above, becomes very fine grades to silty sandstone.
	60	CLAYSTONE: as above.
	30	SILTSTONE: as above.
2889-2892	70	SILTSTONE: generally as above, brown grey, light-medium brown in part, locally very argillaceous, micromica, locally common carbonaceous/coaly fragments/laminae, arenaceous in part, firm-moderately hard, blocky.
	30	CLAYSTONE: as above
	Tr	SANDSTONE: as above
2892-2895	65	SILTSTONE: as above.
	30	CLAYSTONE: as above
	5	SANDSTONE: as above
2895-2898	60	SILTSTONE: as above, brown grey, light-medium brown in part, locally very argillaceous, micromica, locally common carbonaceous/coaly fragments/laminae, arenaceous in part, firm-moderately hard, blocky.
	30	CLAYSTONE: generally as above, medium grey-light medium grey-blue grey, arenaceous, grades to Siltstone in part, slightly calcareous, trace carbonaceous matter, trace micromica, firm-moderately hard, blocky-subfissile.
	10	SANDSTONE: as above
2898-2901	60	SANDSTONE: light brown grey-very light grey, translucent-transparent, fine-medium grain, occasionally coarse grain, moderately sorted, subangular to subrounded, fine grained, well rounded, trace carbonaceous matter, trace pyrite, trace siderite cement, trace siliceous cement, trace kaolinite matrix, occasionally aggregates, generally loose, disaggregated, moderately-good inferred porosity, no show.
	30	SILTSTONE: as above
	10	CLAYSTONE: as above.
2901-2904	60	SANDSTONE: as above

	20	SILTSTONE: as above
	20	CLAYSTONE: as above
2904-2907	40	SANDSTONE: generally as above, light brown grey-very light grey, translucent-transparent, fine-medium grain, occasionally coarse grain, moderately sorted, subangular to subrounded, fine grained, well rounded, trace carbonaceous matter, trace pyrite, trace siderite cement, trace siliceous cement, trace kaolinite matrix, occasionally aggregates, generally loose, disaggregated, moderately-good inferred porosity, no show.
	30	CLAYSTONE: generally as above
	30	SILTSTONE: as above, brown grey, light-medium brown in part, locally very argillaceous, micromica, locally common carbonaceous/coaly fragments/laminae, grades to carbonaceous Shale in part, arenaceous in part, firm-moderately hard, blocky, subfissile in part.
2907-2910	60	SANDSTONE: generally as above, common fine grain aggregates, firm-friable, poor inferred porosity, trace dull yellow fluorescence, nil cut/crush cut fluorescence.
	30	SILTSTONE: generally as above, brown grey, light-medium brown in part, locally very argillaceous, micromica, locally common carbonaceous/coaly fragments/laminae, arenaceous in part, firm-moderately hard, blocky.
	10	CLAYSTONE: as above, medium grey-light medium grey-blue grey, arenaceous, homogeneous, waxy, slightly calcareous, trace carbonaceous matter, trace micromica, firm-moderately hard, blocky-subfissile.
2910-2913	60	SANDSTONE: as above
	20	SILTSTONE: as above
	20	CLAYSTONE: as above
2913-2916	40	SANDSTONE: light grey-pale brown, milky, frosted, transparent-translucent, medium-coarse grain, occasionally very coarse grained, subangular to subrounded, occasionally angular in part, moderately sorted, trace carbonaceous specks, trace disseminated pyrite, weak siliceous cement, trace white clay matrix, predominantly loose, friable aggregates in part, good inferred porosity, nil visual porosity, trace dull pale yellow fluorescence, no cut/crush cut fluorescence.
	40	SILTSTONE: as above
	20	CLAYSTONE: as above
2916-2919	40	SILTSTONE: generally as above, brown grey, light to medium brown, locally very argillaceous, micromica, locally common carbonaceous/coaly fragments/laminae, arenaceous in part, firm-moderately hard, blocky.
	30	SANDSTONE: as above, light grey-pale brown, milky, frosted, transparent-translucent, medium-coarse grain, occasionally very coarse grained, subangular to subrounded, occasionally angular in part, moderately sorted, trace carbonaceous specks, trace disseminated pyrite, weak siliceous cement, trace white clay matrix, predominantly loose, friable aggregates in part, good inferred porosity, nil visual porosity, trace dull pale yellow fluorescence, no cut/crush cut fluorescence.
	30	CLAYSTONE: as above.
2919-2922	60	SILTSTONE: as above
	30	CLAYSTONE: generally as above, medium grey-light medium grey-blue grey, arenaceous, homogeneous, waxy, slightly calcareous, trace carbonaceous matter, trace micromica, firm-moderately hard, blocky-subfissile.
	10	SANDSTONE: as above

2922-2925	70	SILTSTONE: dark grey-brown grey, grey black, locally very argillaceous grades to claystone in part, micromica, locally very fine arenaceous inclusions, trace-common carbonaceous fragments, firm-moderately hard, blocky-platy in part.
	30	CLAYSTONE: medium grey-medium dark grey, yellow grey in part, slightly micromica, slightly siliceous in part, smooth, waxy, homogeneous, moderately hard, subfissile.
	Tr	SANDSTONE: off white, clear-translucent, fine, angular-subangular, moderately sorted, strong siliceous cement, trace kaolinite matrix, trace carbonaceous/coaly fragments, locally coarse milky quartz float, friable-moderately hard, nil porosity, no fluorescence.
2925-2928	80	SILTSTONE: as above.
	20	CLAYSTONE: as above.
2928-2931	90	SILTSTONE: grey black-predominantly dusky yellow brown, very argillaceous grades to claystone, trace disseminated pyrite in part, micromica in part, predominantly smooth, homogeneous, soft-sticky, firm-moderately hard in part, massive-blocky.
	10	CLAYSTONE: as above.
2931-2934	60	SILTSTONE: as above.
	30	SANDSTONE: off white-pale brown, light grey, very fine-fine, medium in part, subangular, good sorting, weak siliceous cement, abundant kaolinite matrix, trace carbonaceous specks, trace biotite, friable, nil porosity, no fluorescence.
	10	CLAYSTONE: as above.
2934-2937	70	SILTSTONE: as above.
	30	SANDSTONE: light grey-pale brown, off white, very fine-silty, subangular, good sorting, abundant kaolinite matrix, matrix supported, trace carbonaceous laminae, trace biotite, friable, nil porosity, no fluorescence.
	Tr	CLAYSTONE: as above.
2937-2940	90	SILTSTONE: as above.
	10	SANDSTONE: predominantly as above, becomes fine in part, moderately siliceous cement in part, trace nod pyrite, no porosity, no fluorescence.
2940-2943	100	SILTSTONE: dark grey-brown grey, grey black, locally very argillaceous, grades to claystone in part, micromica, locally light grey, very fine arenaceous inclusions, trace-common carbonaceous fragments, firm-moderately hard, blocky-platy in part.
	Tr	SANDSTONE: as above.
2943-2946	90	SILTSTONE: predominantly as above, trace nodular & disseminated pyrite.
	10	SANDSTONE: light grey-pale brown, fine, subangular, good sorting, abundant argillaceous/silty matrix, matrix supported in part, trace carbonaceous fragments, trace glauconite, trace lithic fragments, friable, nil porosity, no fluorescence.
2946-2949	100	SILTSTONE: predominantly as above, becomes locally moderately carbonaceous, trace fossil fragments.
2949-2952	80	SILTSTONE: as above.
	20	CLAYSTONE: medium grey-medium dark grey, yellow grey in part, slightly micromica, slightly siliceous in part, smooth, waxy, homogeneous, moderately hard, subfissile.
	Tr	SANDSTONE: as above.
2952-2955	80	SILTSTONE: as above.

	20	CLAYSTONE: as above.
2955-2958	75	SILTSTONE: generally as above, dark grey-brown grey, grey black, occasionally brownish black-black, locally very argillaceous grades to claystone in part, micromica, locally light grey very fine arenaceous inclusions, trace-common carbonaceous specks/laminae, firm-moderately hard, blocky-subfissile, platy in part.
	25	CLAYSTONE: as above, medium grey-medium dark grey, orange grey in part, trace black specks, slightly micromica, smooth, waxy, homogeneous, moderately hard, blocky-subfissile.
2958-2961	80	SILTSTONE: as above
	20	CLAYSTONE: as above
2961-2964	70	SILTSTONE: as above
	30	CLAYSTONE: as above
2964-2967	80	SILTSTONE: generally as above, medium-dark brown, black brown, arenaceous in part, argillaceous, grades to Claystone in part, trace black carbonaceous specks, trace disseminated pyrite, trace fossil fragments, trace very fine grained quartz, firm-moderately hard, subblocky-subfissile.
	20	CLAYSTONE: medium grey-medium dark grey, orange grey in part, slightly micromica, silty in part, smooth, waxy, homogeneous, moderately hard, blocky-subfissile.
2967-2970	80	SILTSTONE: as above
	20	CLAYSTONE: as above
2970-2973	80	SILTSTONE: as above
	20	CLAYSTONE: as above
2973-2976	70	SILTSTONE: generally as above, pale yellow brown-medium brown-dark brown, black brown, non calcareous, argillaceous, grades to Claystone in part, trace lithic fragments, trace-common black carbonaceous specks, trace disseminated pyrite, trace fossil fragments, trace very fine grained quartz, firm-moderately hard, soft-sticky in part, subblocky-subfissile, massive-amorphous in part.
	30	CLAYSTONE: light grey-medium grey-medium dark grey, orange grey in part, non-slightly calcareous, trace micromica, silty in part, homogeneous, moderately hard, blocky-subfissile.
2976-2979	80	SILTSTONE: as above
	20	CLAYSTONE: as above
2979-2982	90	SILTSTONE: as above
	10	CLAYSTONE: as above
2982-2985	90	SILTSTONE: as above, pale yellow brown-medium brown-dark brown, occasionally black brown, non calcareous, argillaceous, grades to Claystone in part, trace lithic fragments, trace-common black carbonaceous specks, trace disseminated pyrite, trace fossil fragments, trace very fine grained quartz, firm-moderately hard, slightly siliceous cement, soft-sticky in part, subblocky-subfissile, massive-amorphous in part.
	10	CLAYSTONE: as above, light grey-medium grey-medium dark grey, orange grey in part, non-slightly calcareous, trace micromica, silty in part, homogeneous, moderately hard, blocky-subfissile.

2985-2988	80	SILTSTONE: as above, pale yellow brown-medium brown-dark brown, occasionally black brown, non calcareous, argillaceous, grades to Claystone in part, trace lithic fragments, trace-common black carbonaceous specks, trace disseminated pyrite, trace fossil fragments, trace very fine grained quartz, firm-moderately hard, slightly siliceous cement, soft-sticky in part, subblocky-subfissile, massive-amorphous in part.
	20	CLAYSTONE: as above, light grey-medium grey-medium dark grey, orange grey in part, non-slightly calcareous, grades to Siltstone in part, trace micromica, predominantly homogeneous, waxy, firm-moderately hard, blocky-subfissile.
2988-2991	80	SILTSTONE: as above
	20	CLAYSTONE: as above
2991-2994	90	SILTSTONE: grey black-brown black, very argillaceous in part, grades to claystone, micromica, locally moderately carbonaceous, slightly arenaceous in part, slightly siliceous, firm-predominantly moderately hard, hard in part, massive-blocky.
	10	CLAYSTONE: medium dark grey-dark grey, slightly siliceous, trace carbonaceous specks, trace disseminated pyrite & pyritized fossil fragments, waxy texture, homogeneous, blocky-subfissile.
2994-2997	100	SILTSTONE: as above.
2997-3000	100	SILTSTONE: predominantly as above, becomes medium brown, very argillaceous grades to Claystone.
3000-3003	100	SILTSTONE: predominantly as above, trace light grey, very fine-fine arenaceous inclusions.
3003-3006	100	SILTSTONE: brown grey-brown black, light-medium brown in part, locally very argillaceous, locally grades to claystone, trace-common carbonaceous fragments in part, micromica, trace disseminated pyrite, trace lithic fragments, slightly siliceous in part, firm-moderately hard, massive-blocky.
3006-3009	90	SILTSTONE: as above.
	10	SANDSTONE: clear-translucent, frosted, fine-medium, subangular to subrounded, good sorting, trace kaolinite matrix, trace nodular pyrite, disaggregated, good porosity, no fluorescence.
3009-3012	70	SILTSTONE: as above.
	30	SANDSTONE: off white-light grey, clear-translucent, frosted, very fine-fine, angular-subrounded, good sorting, common kaolinite matrix, matrix supported in part, rare medium-coarse fractured quartz grains, trace quartz over growths, friable-disaggregated, poor-good porosity, no fluorescence.
3012-3015	80	SILTSTONE: as above.
	20	SANDSTONE: predominantly as above, becomes fine-medium, weak siliceous cement, common kaolinite matrix, fair-good porosity, no fluorescence.
3015-3018	80	SILTSTONE: brown grey, medium grey brown, very argillaceous grades to Claystone, micromica, locally trace carbonaceous specks, trace light grey very fine arenaceous inclusions/laminae, trace lithic fragments, soft-firm, massive-blocky.
	20	SANDSTONE: off white, pale brown, very fine-fine, occasionally medium, angular-subangular, moderately-good sorting, trace siliceous cement, abundant kaolinite matrix, trace quartz over growths, trace coarse fractured quartz, friable, disaggregated in part, poor porosity, no fluorescence.
3018-3021	90	SILTSTONE: as above.

	10	SANDSTONE: predominantly as above, becomes very fine, abundant kaolinite matrix, trace coarse milky quartz float, trace nodular pyrite.
3021-3024	100	SILTSTONE: predominantly as above, common off white-light grey very fine arenaceous inclusions.
3024-3027	100	SILTSTONE: brown grey, medium grey brown, very argillaceous grades to Claystone, micromica, locally trace carbonaceous specks, trace light grey very fine arenaceous inclusions, trace biotite, trace lithic fragments, slightly siliceous, massive-blocky.
3027-3030	70	SILTSTONE: as above.
	30	SANDSTONE: clear-translucent, frosted, fine grained, subangular, good sorting, predominantly clean, trace kaolinite matrix, rare nodular pyrite, disaggregated, good porosity, no fluorescence.
3030-3033	60	SANDSTONE: clear-translucent, frosted, fine-medium, subangular to subrounded, good sorting, clean, trace kaolinite inclusions, trace nodular pyrite, trace muscovite, trace coal fragments, disaggregated, good porosity, no fluorescence.
	40	SILTSTONE: as above.
3033-3050.7		Core #1 see core description Appendix 3b for core chip sample descriptions.
3050.7-3054	50	SANDSTONE: off white-light grey, translucent, coarse-very coarse grained, angular-subangular, moderately sorted, trace carbonaceous specks, predominantly loose, friable –moderately hard aggregates, poor inferred porosity, no show.
	30	SILTSTONE: brown grey, medium grey brown, very argillaceous grades to Claystone, micromica, locally trace carbonaceous specks, trace lithic fragments, slightly siliceous, massive-blocky.
	20	CLAYSTONE: medium dark grey-dark grey, slightly siliceous, trace carbonaceous specks, trace disseminated pyrite, waxy texture, homogeneous, blocky-subfissile. Possibly hole cavings.
3054-3057	50	SANDSTONE: as above
	30	SILTSTONE: as above
	20	CLAYSTONE: as above
3057-3060	70	SILTSTONE: generally as above, brown grey-medium grey brown, very argillaceous, grades to Claystone in part , micromicaceous, locally trace carbonaceous specks, trace lithic fragments, slightly siliceous, mass-blocky
	10	SANDSTONE: generally as above, off white-light grey, translucent, coarse to very coarse grained, angular-subangular, moderately sorted, trace carbonaceous specks, predominantly loose, occasionally friable-moderately hard aggregates, poor inferred porosity, no show.
	20	CLAYSTONE: generally as above, medium dark grey-dark grey, slightly siliceous, trace carbonaceous specks, trace disseminated pyrite, waxy, homogeneous, blocky-subfissile.
3060-3063	50	SILTSTONE: as above
	40	CLAYSTONE: as above
	10	SANDSTONE: as above.
3063-3066	40	SILTSTONE: generally as above, occasionally grey brown-dusky yellow brown, very carbonaceous, grades to Shale in part , blocky-subfissile.
	40	SANDSTONE: as above
	20	CLAYSTONE: as above

3066-3069	40	SILTSTONE: as above, brown grey-medium grey brown, occasionally grey brown-dusky yellow brown, very carbonaceous, grades to SHALE in part , trace to common disseminated pyrite, micromicaceous, trace lithic fragments, slightly siliceous, mass-blocky.
	40	SANDSTONE: as above, off white-light grey, translucent, coarse to very coarse grained, angular to subangular, moderately sorted, trace carbonaceous specks, predominantly loose, occasionally friable-moderately hard aggregates, poor inferred porosity, no show.
	20	CLAYSTONE: as above, medium dark grey-dark grey, non calcareous, slightly siliceous, trace carbonaceous specks, trace disseminated pyrite, waxy, homogeneous, blocky to subfissile.
3069-3072	50	SILTSTONE: as above
	30	SANDSTONE: generally as above, off white-light grey, translucent, coarse to very coarse grained, angular to subangular, moderately sorted, trace carbonaceous specks, predominantly loose, occasionally fine to medium grained, light grey-light brown, friable-moderately hard aggregates, poor inferred porosity, trace bright yellow white pinpoint fluor, no cut, no crush fluor.
	20	CLAYSTONE: generally as above, occasionally brown black, very carbonaceous, thin, platy-fissile in part .
3072-3075	50	SILTSTONE: as above
	30	SANDSTONE: as above
	20	CLAYSTONE: as above
3075-3078	60	SILTSTONE: as above
	20	SANDSTONE: as above, off white-light grey, translucent, coarse to very coarse grained, angular to subangular, moderately sorted, predominantly loose, light grey-light brown, friable-moderately hard aggregates, poor inferred porosity, no show.
	10	SHALE: brown black, dark brown, very carbonaceous, grades to Coal in part , silty, non calcareous, trace micromicaceous, blocky-subfissile, fissile to platy in part
	10	CLAYSTONE: as above
3078-3081	80	SILTSTONE: brown grey-medium grey brown, occasionally grey brown-dusky yellow brown, non calcareous common carbonaceous specks, trace to common disseminated pyrite, micromicaceous, trace lithic fragments, slightly siliceous, mass-blocky.
	10	SHALE: as above.
	10	CLAYSTONE: as above
	Tr	SANDSTONE: as above
3081-3084	70	SILTSTONE: as above
	10	SANDSTONE: off white-light grey, translucent, medium to coarse grained, angular to subangular, moderately sorted, predominantly loose, trace kaolinitic matrix, trace black carbonaceous specks, trace lithic fragments, light grey-light brown, friable-moderately hard aggregates, poor inferred porosity, trace dull yell gold patchy fluorescence, very weak diffuse crush cut, thin res ring.
	Tr	SHALE: as above
	10	VOLCANICS: tuff, light grey-off white, abundant altered feldspar, trace to common very fine to fine grained quartz, comm kaolinitic matrix, soft-moderately hard, firm to brittle in part , blocky-subfissile.
	10	CLAYSTONE: as above

3084-3087	60	SILTSTONE: generally as above, brown grey-medium grey brown, occasionally grey brown-dusky yellow brown, non calcareous, very carbonaceous, grades to silty Shale in part , trace to common disseminated pyrite, micromicaceous, trace lithic fragments, slightly siliceous, mass-blocky.
	10	CLAYSTONE: as above
	30	VOLCANICS: as above
	Tr	SANDSTONE: as above, trace dull yellow gold patchy fluorescence, very weak diffuse crush cut, thin residual ring.
3087-3090	80	VOLCANICS: off white-light brown grey, ignimbritic, cherty in part, cryptocrystalline, trace pyroxene/biotite inclusions, vesicular in part, flinty, hard, brittle, blocky-platy, sharp.
	20	SILTSTONE: brown black, olive black, very argillaceous, very carbonaceous grades to carbonaceous siltstone in part, trace lithic, trace fine arenaceous inclusions, firm to moderately hard, blocky-subfissile in part.
	Tr	SANDSTONE: light grey, brown grey, fine, subangular subrounded, moderately-good sorting, moderately siliceous cement, trace kaolinitic matrix, common carbonaceous fragments, trace coarse fractured quartz, trace biotite, friable-moderately hard, poor porosity, trace dull yellow gold patchy fluorescence, very weak diffuse crush cut, thin residual ring.
3090-3093	90	VOLCANICS: predominantly as above, becomes slightly weathered, firm-hard, blocky-platy.
	10	SILTSTONE: predominantly as above, locally carbonaceous/coaly inclusions.
3093-3096	90	VOLCANICS: as above.
	10	SILTSTONE: as above.
3096-3099	100	VOLCANICS: off white-light brown grey, pale yellow, ignimbritic, cherty in part, predominantly cryptocrystalline, occasionally vesicular with quartz infill, weathered in part, firm-hard, very hard, flinty, occasionally subconchoidal fracture, blocky-platy.
3099-3102	100	VOLCANICS: as above.
3102-3105	100	VOLCANICS: medium dark grey, brown grey, dark green, grey red in part, cryptocrystalline-microcrystalline, common microcrystalline orthoclase/feldspar/olivine/mafic mineral assemblage, trace pyrite nodules , firm-hard, blocky.
3105-3108	100	VOLCANICS: as above.
3108-3111	100	VOLCANICS: off white-brown grey, grey red, ignimbritic, trace dark green fine crystalline orthoclase/olivine/feldspar/mafic mineral assemblage phenocrysts(?), firm to hard, massive to blocky.
3111-3114	100	VOLCANICS: as above.
3114-3117	100	VOLCANICS: predominantly as above, becomes grey red.
3117-3120	100	VOLCANICS: light-dark green, grey red in part, medium dark grey, fine crystalline olivine/pyroxene/feldspar/mafic mineral assemblages, trace nodular pyrite, locally common red shards, firm-moderately hard, hard to very hard in part, massive to blocky.
3120-3123	100	VOLCANICS: medium dark grey-dark grey, dark green, fine crystalline orthoclase/k feldspar/olivine/mafic mineral assemblages, trace vein pyrite, hard to very hard, blocky.
3123-3126	100	VOLCANICS: predominantly as above, locally dusky red in part.

3126-3129	100	VOLCANICS: dark grey, dark green, abundant olivine possibly olivine basalt, trace vein calcite common tourmaline laths, occasionally free fine to medium quartz, fine crystalline orthoclase/muscovite/feldspar/pyroxene mineral assemblages, hard to very hard in part, massive to blocky.
3129-3132	100	VOLCANICS: predominantly as above, trace welded pyrite, cherty in part, very hard.
3132-3135	100	VOLANICS: predominantly as above, becomes light green in part, moderately calcareous, trace free medium to coarse feldspar, slightly weathered in part, firm-moderately hard, hard in part, massive to blocky.
3135-3138	100	VOLANICS: predominantly as above, common olive grey, pyritic tuffaceous phenocrysts.
3138-3141	100	VOLANICS: medium to dark green, dark grey, olivine basalt, fine crystalline olivine/pyroxene/muscovite/orthoclase mineral assemblages, cherty in part, trace light to medium brown coarse crystalline dolomite/calcite infill, trace free quartz, hard, blocky.
3141-3144	100	VOLANICS: as above.
3144-3147	80	VOLANICS: as above.
	20	TUFF(?): orange brown, oxidised, micaceous, trace mafic mineral inclusions, trace white clay veins, soft, massive.
3147-3150	80	VOLANICS: as above.
	20	TUFF(?): as above.
3150-3153	100	VOLCANICS: medium to dark green, dark grey, off white-light brown, red brown, basaltic, common fine crystalline olivine/biotite/orthoclase/mafic mineral assemblage, common calcite/dolomite spar infill, trace disseminated/welded pyrite, tuffaceous in part, firm-hard, massive to blocky.
3153-3156	100	VOLCANICS: as above.
3156-3159	100	VOLCANICS: predominantly as above, trace free coarse fractured quartz.
3159-3162	100	VOLCANICS: as above.
3162-3164	100	VOLCANICS: predominantly as above, common pink to red brown cryptocrystalline tuff, soft, massive.
		Total Depth of 3164m Reached at 0030 hours on the 14th May, 1998.

APPENDIX 3

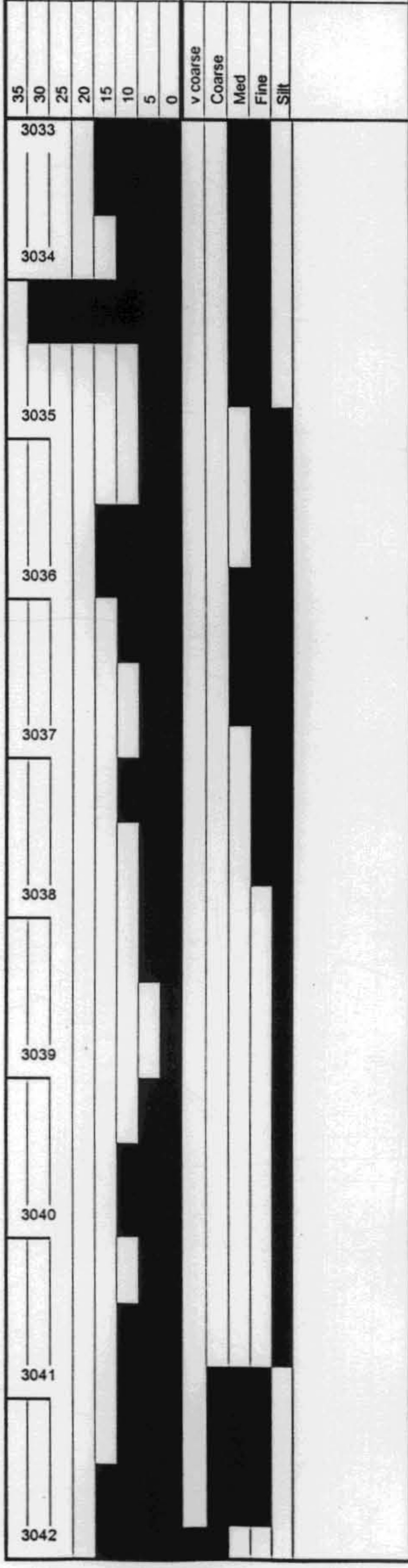
CORE CHIP DESCRIPTIONS

YOLLA-2

565172

PREMIER OIL (AUSTRALASIA) - WELLSITE CORE DESCRIPTIONS

Permit:T/RL 1 Well:YOLLA 2 Core No:1 Formation:EVCM Described by:K. Frankiewicz	Interval: 3033 mRt - 3050.5 mRt Cut: 17.7 metres Recovered: 17.7 metres % Rec: 100% Core Bit: 12 1/4" Corepro CM365F	Date: 12/05/98 Lat: 39° 51' 33.82" S Long:145° 48' 38.53" E KB: 12.5m GL: -81.5m



DEPTH	LITHOLOGICAL DESCRIPTIONS and REMARKS	H/C INDICATIONS (Good / Fair / Poor)
3033	**3033m: SANDSTONE:** off white-very light grey, clear, frosted, translucent, fine-medium grained, subangular-subrounded, moderately well sorted, strong siliceous cement, common kaolinite matrix, occasional very coarse milky quartz inclusions, trace nodular pyrite, trace lithic fragments, hard, nil visible porosity.	No show
3034	**3034m: SANDSTONE:** off white-light brownish grey, translucent, fine-medium grained, subangular-subrounded, moderate sorting, strong siliceous cement, common kaolinite matrix, trace nodular pyrite, trace lithic fragments, trace muscovite, hard, nil visible porosity.	No show
3035	**3035m: SANDSTONE:** clear-off white-light brownish grey, frosted, translucent, very fine-fine grained, grades to Siltstone in part, strong siliceous cement, common kaolinite matrix, trace lithic fragments, trace glauconite, trace carbonaceous inclusions, firm-hard, blocky.	No show
3036	**3036m: SANDSTONE:** off white-light grey-light brownish grey, very fine-medium grained, predominantly fine, well cemented, common kaolinite matrix, trace glauconite nodules, trace carbonaceous inclusions, trace lithic fragments trace muscovite, firm, nil visible porosity.	No show
3037	**3037m: SANDSTONE:** off white-light grey frosted, very fine-fine grained, good siliceous cement, common kaolinite cement, trace carbonaceous matter, trace lithic fragments, trace glauconite.	No show
3038	**3038m: SILTSTONE:** brownish grey-brownish black, very argillaceous, trace light grey arenaceous inclusions, trace carbonaceous specks, trace lithic fragments/biotite, siliceous massive, blocky.	No show
3039	**3038.9m: SILTSTONE:** medium light grey-brownish grey, very argillaceous, grading to claystone in part, trace very fine grained light grey arenaceous inclusions, trace lithic fragments, trace carbonaceous specks, massive, blocky.	No show
3040	**3039.85m: SANDSTONE:** light grey-light brown, fine-coarse grained, predominantly medium, subangular-subrounded, well sorted, strong siliceous cement, common carbonaceous inclusions/laminae, trace lithic fragments, hard, poor visible porosity.	No show
3041	**3040.9m:SANDSTONE:** off white-light brown, coarse-very coarse grained, subrounded-angular, moderately sorted, strong siliceous cement, common kaolinite matrix, trace lithic fragments occasional pebble inclusions, firm-hard, poor visible porosity.	No show
3042		

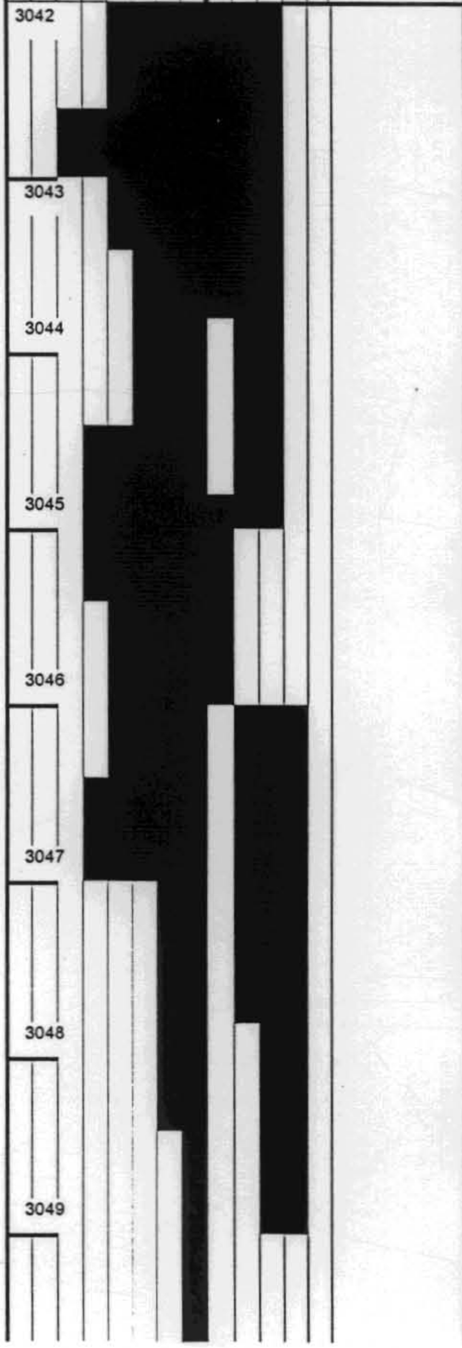
5 cm

565173

PREMIER OIL (AUSTRALASIA) - WELLSITE CORE DESCRIPTIONS

Permit:T/RL 1	Interval: 3033 mRt - 3050.5 mRt	Date: 12/05/98
Well:YOLLA 2	Cut: 17.7 metres	Lat: 39° 51' 33.82" S
Core No:1	Recovered: 17.7 metres	Long:145° 48' 38.53" E
Formation:EVCM	% Rec: 100%	KB: 12.5m
Described by:Frankiewicz	Core Bit: 12 1/4" Corepro CM365F	GL: -81.5m

DEPTH ROP m/hr (35 30 25 20 15 10 5 0) — LITHOLOGY Grain Size (v coarse, Coarse, Med, Fine, Silt)



LITHOLOGICAL DESCRIPTIONS and REMARKS	H/C INDICATIONS	Good	Fair	Poor
3041.9m: SANDSTONE: off white-light brown-frosted, translucent, medium-coarse grained, very coarse in part, subrounded, moderate sorted, fine grained quartz, intergranular matrix, common kaolinite matrix, siliceous cement, trace carbonaceous matter, friable, poor visible porosity.	No show			
3042.9m: SANDSTONE: generally as above, w/ trace pyrite nodules, friable, poor visible porosity.	No show			
3044m: SANDSTONE: light grey-light brown, frosted, translucent, medium-coarse grained, occasional very coarse milky quartz inclusions moderately sorted, strong siliceous cement, occasional kaolinite matrix, trace black carbonaceous specks, firm-friable, poor visible porosity.	No show			
3044.9m: SANDSTONE: light grey-off white, milky-frosted, translucent, very coarse-pebble sized grains, subrounded, well sorted, slightly siliceous cement, common kaolinite matrix, quartz grains matrix supported, firm-friable, poor-moderate visible porosity.	No show			
3045.9m: SANDSTONE: generally as above, grading to coarse-medium grained, firm-friable, poor visible porosity.	No show			
3046.9m: SANDSTONE: light grey-off white-milky-frosted, fine-coarse grained, subangular-subrounded, poorly sorted, moderate siliceous cement, common kaolinite cement/matrix, occasional very coarse milky quartz inclusions, trace carbonaceous specks, firm-hard, poor visible porosity.	No show			
3047.9m: SANDSTONE: fine-medium grained, occasional very coarse milky quartz inclusions, subangular-subrounded, moderately sorted, trace lithic fragments/carbonaceous matter/glauconite, trace disseminated pyrite/pyrite nodules, well cemented, common kaolinite matrix, poor-moderate visible porosity.	No show			
3048.9m: SHALE: dark grey-blackish brown-olive black, micromicaceous, very carbonaceous, occasional disseminated pyrite, smooth, firm, plastic in part, trace very fine quartz in parts, firm, blocky, subfissile-fissile in part.				

5 cm

565174

3050	3049.9: **SILTSTONE:** medium light grey-light brown, argillaceous, common very fine grained quartz, grades to sandstone in part, trace lithic fragments, trace carbonaceous specks/laminae, micromicaceous, siliceous, common kaolinite matrix, firm-hard, blocky.	No show
3051	3050.7m: **SILTSTONE:** generally as above, very argillaceous, hard-very hard, blocky.	No show

5 cm

APPENDIX 4

CORE LOGS AND DESCRIPTIONS

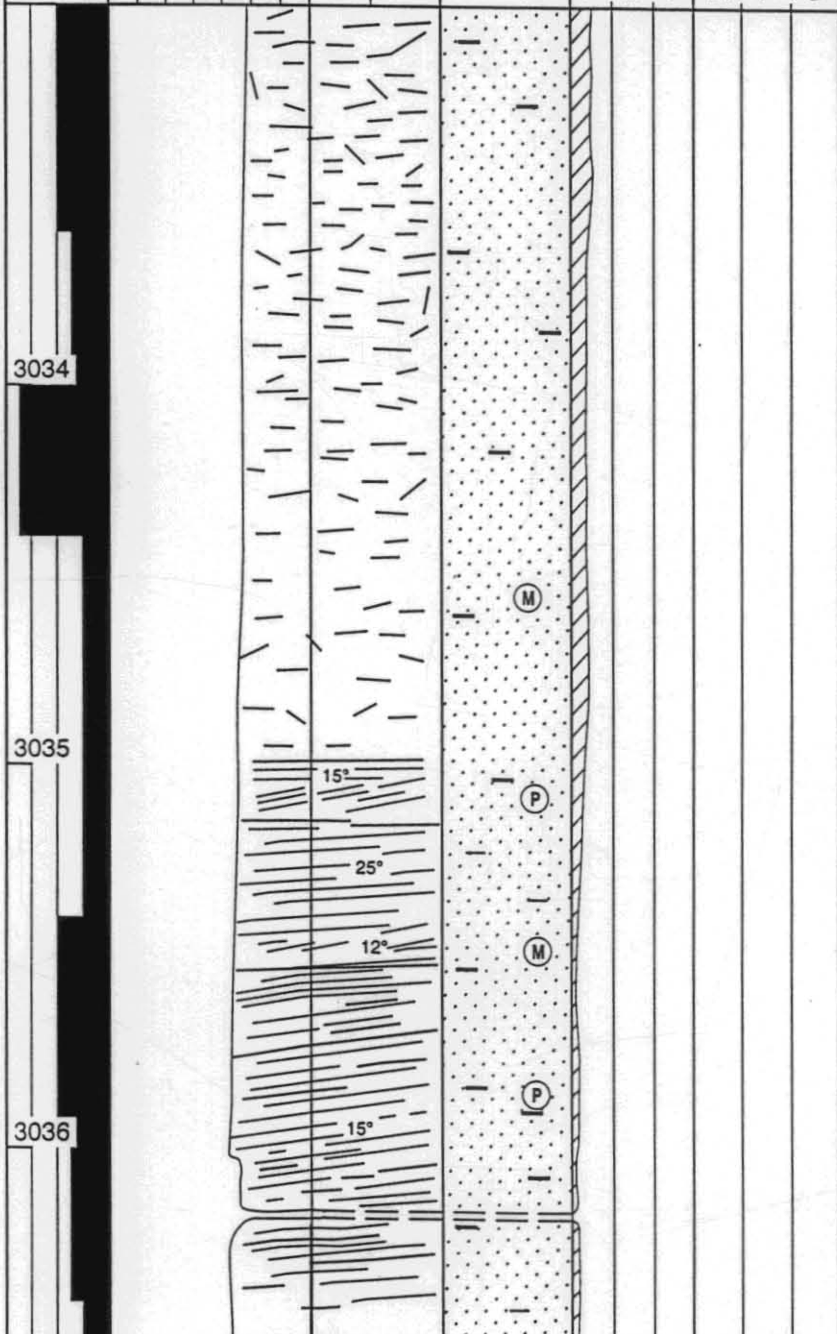
YOLLA-2

565176

PREMIER OIL (AUSTRALASIA) - WELLSITE CORE DESCRIPTIONS

Permit:	TRL/1	Interval:	3033 -3037 m	Date:	29/05/98
Well:	Yolla No.2	Cut:	17.7m	Lat:	39° 51' 33.82"
RIG:	Northern Explorer III	Recovered:	17.7m	Long:	155° 48' 38.53"
Core No:	#1	% Rec:	100	KB:	12.5m
Formation:	EVCM	Core Barrel:	12 1/4" Corepro Al Sleeve	GL:	-81.5m
Described by:	K. Frankiewitz\D. Evans	Mud Type:	KCL/PHPA	RT:	12.5m

DEPTH Rop m/hr (40 20 0) | GRAIN SIZE AND SEDIMENTARY STRUCTURES — SAND (P G VC C M F VF), MUD (Z C) | LITHOLOGY | VISUAL POROSITY (P M F) | HYDROCARBON STAINING (TR F G) | HYDROCARBON INDICATIONS | DESCRIPTION



Depth	Hydrocarbon Indications	Description
3033	No Show	**3033m: SANDSTONE:** off white-very light grey, clear, frosted, translucent, fine-medium grained, subangular-subrounded, moderately well sorted, strong silaceous cement, common kaolinite matrix, occasional very coarse milky quartz inclusions, trace nodular pyrite, trace lithic fragments, hard, nil visible porosity.
3034	No Show	**3034m: SANDSTONE:** off white-light brownish grey, translucent, fine-medium grained, subangular-subrounded, moderate sorting, strong silaceous cement, common kaolinite matrix, trace nodular pyrite, trace lithic fragments, trace muscovite, hard, nil visible porosity.
3035	No Show	**3035m: SANDSTONE:** clear-off white-light brownish grey, frosted, translucent, very fine-fine grained, grades to Siltstone in part, strong silaceous cement, common kaolinite matrix, trace lithic fragments, trace glauconite, trace carbonaceous inclusions, firm-hard, blocky.
3036	No Show	**3036m: SANDSTONE:** off white-light grey-light brownish grey, very fine-medium grained, predominantly fine, well cemented, common kaolinite matrix,trace glauconite nodules, trace carbonaceous inclusions, trace lithic fragments trace muscovite, firm, nil visible porosity.

5 cm

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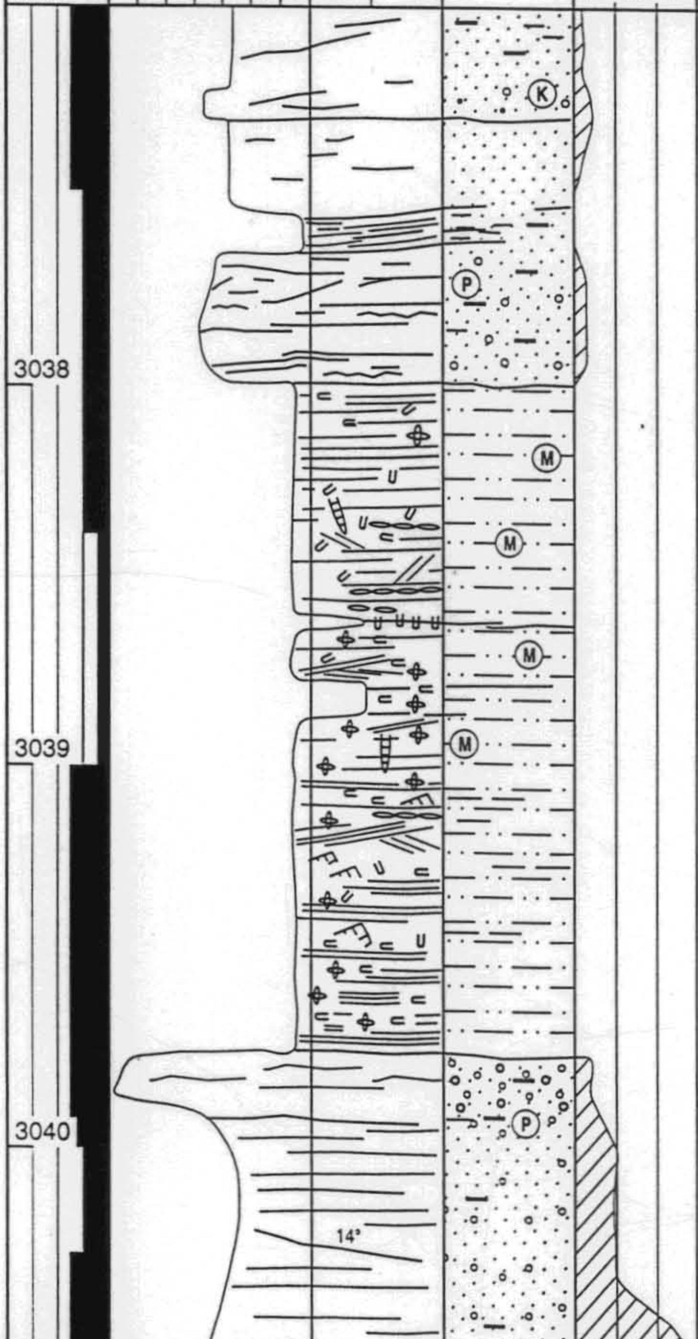
565177

PREMIER OIL (AUSTRALASIA) - WELLSITE CORE DESCRIPTIONS

Permit:	TRL/1	Interval:	3037-3041m	Date:	29/05/98
Well:	Yolla No.2	Cut:	17.7m	Lat:	39° 51' 33.82"
RIG:	Northern Explorer III	Recovered:	17.7m	Long:	155° 48' 38.53"
Core No:	#1	% Rec:	100	KB:	12.5m
Formation:	EVCM	Core Barrel:	12 1/4" Corepro Al Sleeve	GL:	-81.5m
Described by:	K. Frankiewitz\D. Evans	Mud Type:	KCL/PHPA	RT:	12.5m

DEPTH Rop m/hr (40, 20, 0) | GRAIN SIZE AND SEDIMENTARY STRUCTURES: SAND (P, G, VC, C, M, F, VF), MUD (Z, C) | LITHOLOGY | VISUAL POROSITY (P, M, F) | HYDROCARBON STAINING (TR, F, G) | HYDROCARBON INDICATIONS | DESCRIPTION



Depth	Hydrocarbon Indications	Description
3037m	No Show	**3037m: SANDSTONE:** off white-light grey frosted, very fine-fine grained, good silaceous cement, common kaolinite cement, trace carbonaceous matter, trace lithic fragments, trace glauconite.
3038m	No Show	**3038m: SILTSTONE:** brownish grey-brownish black, very argillaceous, trace light grey arenaceous inclusions, trace carbonaceous specks, trace lithic fragments/biotite, silaceous massive, blocky.
3038.9m	No Show	**3038.9m: SILTSTONE:** medium light grey-brownish grey, very argillaceous, grading to claystone in part, trace very fine grained light grey arenaceous inclusions, trace lithic fragments, trace carbonaceous specks, massive, blocky.
3039.85m	No Show	**3039.85m: SANDSTONE:** light grey-light brown, fine-coarse grained, predominantly medium, subangular-subround, well sorted, strong silaceous cement, common carbonaceous inclusions/laminae, trace lithic fragments, hard, poor visible porosity.

5 cm

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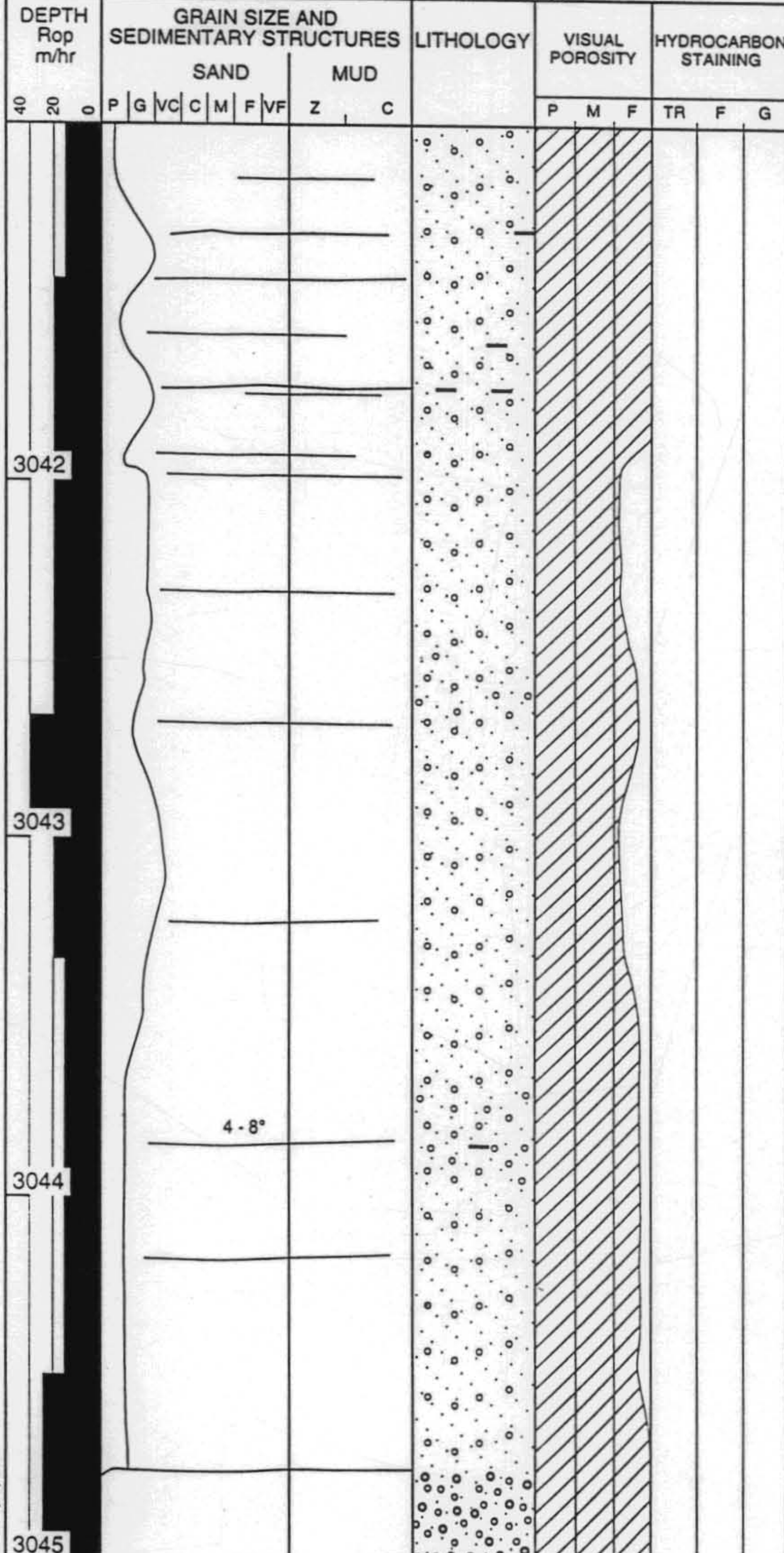
565178

PREMIER OIL (AUSTRALASIA) - WELLSITE CORE DESCRIPTIONS

Permit:	TRL/1	Interval:	3041-3045m	Date:	29/05/98
Well:	Yolla No.2	Cut:	17.7m	Lat:	39° 51' 33.82"
RIG:	Northern Explorer III	Recovered:	17.7m	Long:	155° 48' 38.53"
Core No:	#1	% Rec:	100	KB:	12.5m
Formation:	EVCM	Core Barrel:	12 1/4" Corepro Al Sleeve	GL:	-81.5m
Described by:	K. Frankiewitz\D. Evans	Mud Type:	KCL/PHPA	RT:	12.5m



HYDROCARBON INDICATIONS	DESCRIPTION
No Show	**3040.9m:SANDSTONE:** off white-light brown, coarse-very coarse grained, subrounded-angular, moderately sorted, strong silaceous cement, common kaolinite matrix, trace lithic fragments occasional pebble inclusions, firm-hard, poor visible porosity.
No Show	**3041.9m: SANDSTONE:** off white-light brown-frosted, translucent, medium-coarse grained, very coarse in part, subrounded, moderate sorted, fine grained quartz, intergranular matrix, common kaolinite matrix, silaceous cement, trace carbonaceous matter, friable, poor visible porosity.
No Show	**3042.9m: SANDSTONE:** generally as above, w/ trace pyrite nodules, friable, poor visible porosity.
No Show	**3044m: SANDSTONE:** light grey-light brown, frosted, translucent, medium-coarse grained, occasional very coarse milky quartz inclusions moderately sorted, strong silaceous cement, occasional kaolinite matrix, trace black carbonaceous specks, firm-friable, poor visible porosity.

5 cm

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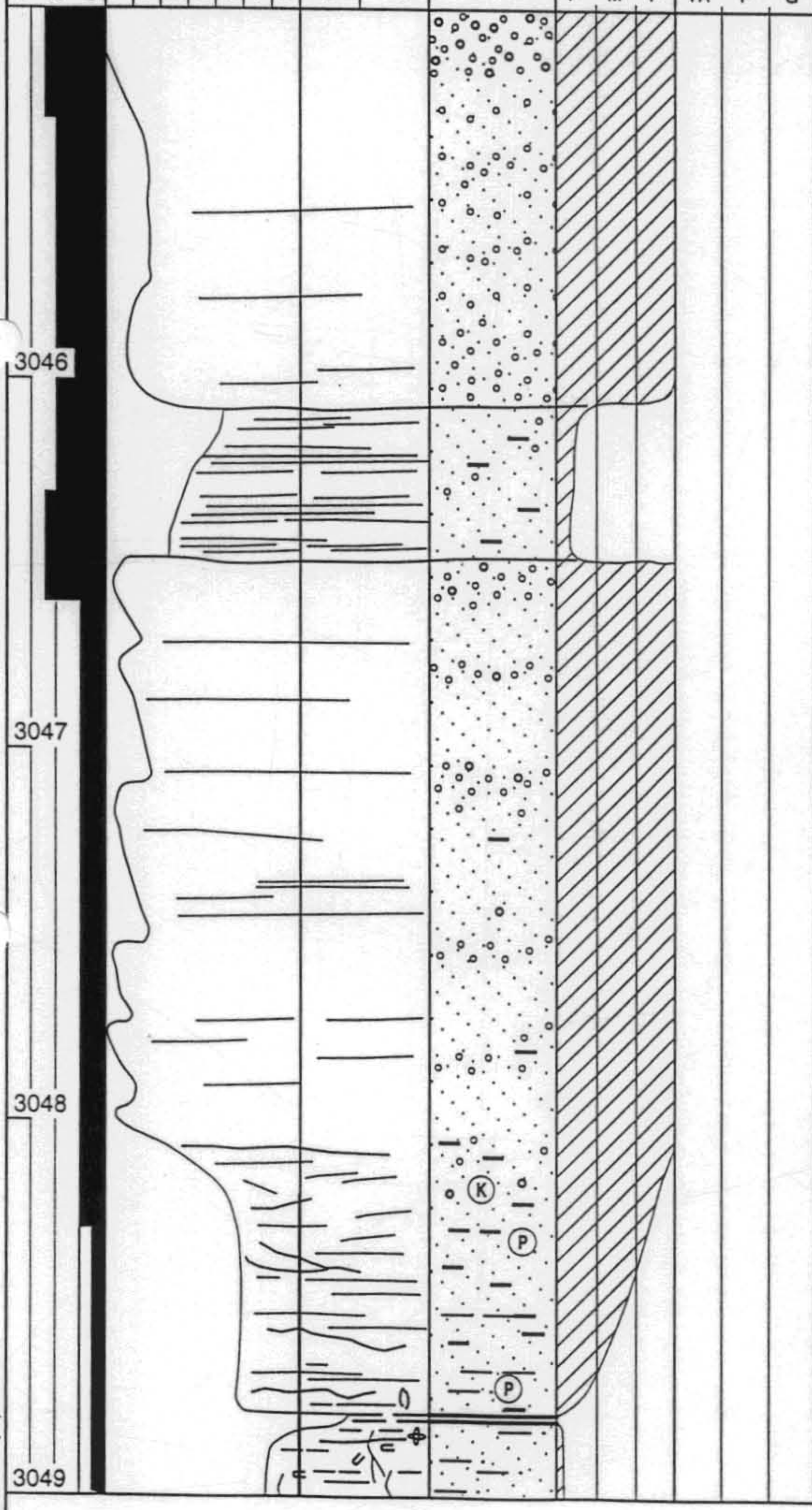
Australasia

565179

PREMIER OIL (AUSTRALASIA) - WELLSITE CORE DESCRIPTIONS

Permit:	TRL/1	Interval:	3045-3049m	Date:	29/05/98
Well:	Yolla No.2	Cut:	17.7m	Lat:	39° 51' 33.82"
.IG:	Northern Explorer III	Recovered:	17.7m	Long:	155° 48' 38.53"
Core No:	#1	% Rec:	100	KB:	12.5m
Formation:	EVCM	Core Barrel:	12 1/4" Corepro Al Sleeve	GL:	-81.5m
Described by:	K. Frankiewitz\D. Evans	Mud Type:	KCL/PHPA	RT:	12.5m

DEPTH Rop m/hr (40 20 0)	GRAIN SIZE AND SEDIMENTARY STRUCTURES SAND (P G VC C M F VF) MUD (Z C)	LITHOLOGY	VISUAL POROSITY (P M F)	HYDROCARBON STAINING (TR F G)	HYDROCARBON INDICATIONS	DESCRIPTION
					No Show	**3044.9m: SANDSTONE:** light grey-off white, milky-frosted, translucent, very coarse-pebble sized grains, subrounded, well sorted, slightly silaceous cement, common kaolinite matrix, quartz grains matrix supported, firm-friable, poor-moderate visible porosity.
3046					No Show	**3045.9m: SANDSTONE:** generally as above, grading to coarse-medium grained, firm-friable, poor visible porosity.
3047					No Show	**3046.9m: SANDSTONE:** light grey-off white-milky-frosted, fine-coarse grained, subangular-subrounded, poorly sorted, moderate siliceous cement, common kaolinite cement/matrix, occasional very coarse milky quartz inclusions, trace carbonaceous specks, firm-hard, poor visible porosity.
3048					No Show	**3047.9m: SANDSTONE:** fine-medium grained, occasional very coarse milky quartz inclusions, subangular-subround, moderately sorted, trace lithic fragments/carbonaceous matter/glauconite, trace disseminated pyrite/pyrite nodules, well cemented, common kaolinite matrix, poor-moderate visible porosity.
3049						



5 cm

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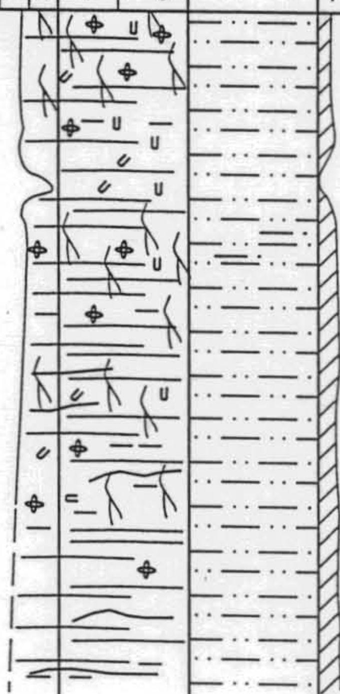
565180

PREMIER OIL (AUSTRALASIA) - WELLSITE CORE DESCRIPTIONS

Permit:	TRL/1	Interval:	3049-3051m	Date:	29/05/98
Well:	Yolla No.2	Cut:	17.7m	Lat:	39° 51' 33.82"
RIG:	Northern Explorer III	Recovered:	17.7m	Long:	155° 48' 38.53"
Core No:	#1	% Rec:	100	KB:	12.5m
Formation:	EVCM	Core Barrel:	12 1/4" Corepro Al Sleeve	GL:	-81.5m
Described by:	K. Frankiewitz\D. Evans	Mud Type:	KCL/PHPA	RT:	12.5m

DEPTH Rop m/hr (40 20 0)	GRAIN SIZE AND SEDIMENTARY STRUCTURES (SAND: P G VC C M F VF; MUD: Z C)	LITHOLOGY	VISUAL POROSITY (P M F)	HYDROCARBON STAINING (TR F G)	HYDROCARBON INDICATIONS	DESCRIPTION
					No Show	**3048.9m: SHALE:** dark grey-blackish brown-olive black, micromicaceous, very carbonaceous, occasional disseminated pyrite, smooth, firm, plastic in part, trace very fine quartz in parts, firm, blocky, subfissile-fissile in part.
3050					No Show	**3049.9: SILTSTONE:** mediium light grey-light brown, argillaceous, common very fine grained quartz, grades to sandstone in part, trace lithic fragments, trace carbonaceous specks/laminae, micromicaceous, silaceous, common kaolinite matrix, firm-hard, blocky.
					No Show	**3050.7m:SILTSTONE:** generally as above, very argillaceous, hard-very hard, blocky.
3051						
3052						



5 cm

PremierOil
Australasia

RIBRA DRAFT... SERVICE (08) 9481 3113

PBS98_50 Sat 25 Jul 98 (03:43PM)

APPENDIX 5

ROUTINE CORE ANALYSIS AND CORE PHOTOGRAPHY

By

GEOTECHNICAL SERVICES PTY LTD

YOLLA-2

565182

ROUTINE CORE ANALYSIS REPORT

YOLLA -2

Prepared for:

Premier Oil Australia Pty Limited

June 1998

GEOTECH GEOTECHNICAL SERVICES PTY LTD

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ROUTINE CORE ANALYSIS

YOLLA-2

CONTRACT NO: 972108

WORK PROGRAMME

Task	No. samples/ Length	Remarks
CORE HANDLING/ANALYSIS		
(i) Gamma ray	17.7m	
(ii) Core description	17.7m	Carried out by Mr David Evans
(iii) Core slabbing, 1/3-2/3	17.7m	Core slabbed in aluminium sleeves
(iv) Core photography (2/3 section)	17.7m	4m/frame format, white and UV light
(v) Core slabbing, 1/6-1/6	17.7m	1/3 section slabbed to give 1/6 section for Mines Dept in Tasmania and 1/6 section for BRS
PLUGGING/CLEANING/DRYING		
(vi) Cut/trim horizontal plugs	19	"Dirty" (Unextracted) 1" diameter horizontal plugs for "quick" routine analysis taken at *ca.* 1 m intervals.
(vii) Cut/trim horizontal plugs	60	"Clean" (Solvent extracted) $1^1/_2$" diameter horizontal plugs for routine analysis taken at *ca.* 0.3m intervals.
(viii) Cut/trim vertical plugs	4	Cut parallel to core axis at selected depths.
(ix) Clean horizontal and vertical plugs	64	Solvent extraction using hot solvents
(x) Dry horizontal and vertical plugs	83	Convection oven, 95°C
MINI-PROBE PERMEAMETRY		
(xi) Permeability measurement on 2/3 section	136	Measurement taken at *ca.* 10cm intervals
CORE PHOTOGRAPHY		
(xii) 4m/frame format	5	White light.
ROUTINE CORE ANALYSIS		
(xiii) Porosity/grain density/ permeability measurements on horizontal "dirty" (unextracted) and "clean" (solvent extracted) plugs at ambient conditions.	80	See table 3 for details
(xiv) Porosity/grain density/ permeability measurements on vertical plugs at ambient conditions.	4	See table 3 for details

Analyses for core plug samples

	No. sample	No. measurements										
		Ambient conditions						Overburden conditions				
		ϕ^a	k_h^b	k_{max}^c	k_{90}^d	k_v^e	GD[f]	ϕ^a	k_h^b	k_{max}^c	k_{90}^d	k_v^e
Horizontal plugs												
(i) "dirty" (unextracted)	19	19	19	-	-	-	19	-	-	-	-	-
(ii) "clean" (solvent extracted)	60	60	58	-	-	-	60	-	-	-	-	-
Vertical plugs	4	4	-	-	-	4	4	-	-	-	-	-

[a] ϕ = helium porosity
[b] k_h = air permeability, horizontal plugs
[c] k_{max} = air permeability along direction of sediment transport, whole core pieces
[d] k_{90} = air permeability perpendicular to k_{max}, whole core pieces
[e] k_v = air permeability, vertical plugs/whole core pieces
[f] GD = grain density

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1. INTRODUCTION

Yolla-2 (T-RL-1) was cored on the 14 May 1998 and 17.7m of core was recovered over the depth interval 3033.00-3050.70m. The 5¼ " diameter core was cut using water based drilling mud and retrieved in fluted aluminium tubes.

To facilitate transportation to the laboratory, the core was cut into one metre sections and resinated at the wellsite. The stabilized core was then packed into plastic core boxes .Upon arrival at Geotech on the 15 May 1998, the core sections were laid out and checked for any discrepancies and discontinuities.

After surface core gamma logging, the core which was encased in the aluminium sleeves was slabbed into 1/3-2/3 sections. The core sections were examined under ultraviolet (UV) light to check for any fluorescence caused by the presence of hydrocarbons.

One-inch diameter "dirty" (unextracted) horizontal core plugs for "quick" poroperm measurements were taken at *ca.* 1.0m intervals on the slabbed 1/3 section.

In addition, 60 horizontal and 4 vertical core plugs of 1 ½" in diameter were taken at *ca.* 0.3m intervals and at selected depths respectively. Very coarse to pebbly samples which were cut using liquid nitrogen are indicated on the remarks column of the poroperm data table.

Mini-probe (profile) permeametry was carried out on the semi-dried 2/3 slabbed sections of the core at *ca.* 10cm intervals.

All the plug samples, except those selected for "quick " poroperm measurements were cleaned by Soxhlet extraction using hot solvents (toluene/methanol) and then dried in a convectional fan forced oven to ensure constant weight.

Ambient porosity, grain density and air permeability measurements were performed on all the horizontal and vertical plugs.

This report includes all final routine core analysis data, cross-plot and 1:200 depth plot. A copy of the core analysis data is also furnished on a 3 1/2" diskette (Excel 97 spreadsheets). Core photographs are presented separately to this report in the *Yolla-2 Core Photography folio.*

2. PRELIMINARY CORE HANDLING

The core sections were removed from plastic boxes immediately upon arrival at the laboratory to enable them to pass through the gamma ray logger.

3. GAMMA RAY LOGGING

Measurements were performed using a broad band scintillation detector coupled to a Ludlum Measurements Model 2200 scale ratemeter. A conveyer belt was used to pass the core sections beneath the detector at a uniform rate of *ca.* 1m min^{-1}. An IBM-compatible personal computer fitted with a DAPA I/O board (DAPA Scientific, Australia) and running DAPA chromatography software was used for data acquisition and processing. The data sampling rate was set at 0.2Hz.

The gamma ray log for the core is presented in Figure 2.

4. CORE SLABBING

The core was slabbed 1/3-2/3 using 10% KCl brine as lubricant..

One-third core sections were subsequently slabbed in half to give a 1/6 section for the Mines Department of Tasmania and a 1/6 section for despatch to the Bureau of Resource Sciences in Canberra.

5. PLUG SAMPLING

Plug samples

The "dirty" and "clean" core plugs were 1" and $1^1/_2$" in diameter respectively, with a maximum length of 2".

All plug samples were cut with surface set diamond core bits using 10% KCl as lubricant for the well cemented sections and liquid nitrogen for very coarse grained to pebbly sandstones.

Horizontal plug samples were cut perpendicular to the core axis. Vertical core plugs were taken along the core axis.

Plug trimming was performed using a trim saw fitted with dual circular masonry blades. 10% KCl or liquid nitrogen was used as lubricant. depending on the lithology.

5.1 Horizontal plugs

Horizontal plug samples were taken at *ca.* 0.3m intervals along the 2/3 slabbed section. Offcuts obtained from plug trimming were set aside for either petrology analysis or storage.

5.2 Vertical plugs

Vertical plugs were cut at selected depths along the 2/3 slabbed section. Trim offcuts were set aside for either petrology or storage.

6. CORE PHOTOGRAPHY

Two-third slabbed core sections were photographed with the core encased in aluminium tubes.

Four metres per frame format photographs were taken in white light using a professional medium-format SLR camera. One set of A4 size prints was made and is furnished separately to this report in the *Yolla-2 Core Photography* folio.

All negatives are archived at Geotechnical Services Pty Ltd.

7. MINI-PROBE PERMEAMETRY

Mini-probe permeametry was performed at *ca.*10cm depth intervals along the slabbed surface of the 2/3 sectioned core (Table 2). Freshly slabbed core sections were allowed to dry in air prior to carrying out measurements. Test locations were carefully selected so as to exclude visible fractures.

All measurements were carried out using an FPP300 steady state field probe permeameter [Stim-Lab – formerly known as Edinburgh Petroleum Services Ltd (EPS)] linked to an EPS core frame tracking bed module. A closed cell Neoprene probe tip was used for all core sections analysed, irrespective of lithology or grain size.

8. SAMPLE PREPARATION

The "clean" plug samples were cleaned by solvent extraction using hot toluene and then methanol in a Soxhlet apparatus to remove residual hydrocarbons and salts, respectively.

Extracted plug samples were dried at 95°C in a top-ventilated, fan-forced convection oven until constant weights were achieved. Samples were allowed to cool to room temperature in an evacuated desiccator prior to carrying out poroperm measurements.

9. POROSITY, PERMEABILITY AND GRAIN DENSITY MEASUREMENTS

9.1 *Porosity and grain density measurements*

Helium porosities for horizontal and vertical core plugs were determined at ambient conditions.

Ambient helium porosities were measured in a matrix cup using a Coberly-Stevens porosimeter. Pore volumes were calculated from Boyle's Law (i.e. $P_1V_1 = P_2V_2$) and expressed as a fraction of the bulk volume

$$\phi = (V_p / BV) \times 100$$

where ϕ = porosity (%)

V_p = pore volume (cm^3)

BV = bulk volume (cm^3)

Bulk volumes were determined by the mercury displacement technique using a customised digital displacement pump. Very coarse grained /pebbly plugs were wrapped in teflon before the measurements to prevent mercury from invading the pore throats.

Grain densities were then calculated from the expression

$$GD = w/GV$$
$$= w/(BV - V_p)$$

where GD = grain density ($g\ cm^{-3}$)

w = weight of sample (g)

GV = grain volume (cm^3)

Calculated ambient porosities and grain density values for horizontal and vertical plug samples are presented in Table 3.

9.2 *Permeability measurements*

Air permeabilities were determined at ambient conditions for all horizontal and vertical core plugs.

All core plug permeabilities were measured using a DGP200 steady state digital gas permeameter [Stim-Lab formerly known as Edinburgh Petroleum Services Ltd (EPS)]. At ambient measurements, samples were loaded into a QRCH200 Series Hassler-type coreholder (EPS) at a confining pressure of 400psi.

Permeability values were calculated using Darcy's equation

$$k_g = (\mu Q_b P_b L)/(A \delta p P_m)$$

where k_g = gas permeability (darcies)

μ = gas viscosity (cp)

Q_b = atmospheric gas flow rate ($cm^3 s^{-1}$)

P_b = base or atmospheric pressure (atm)

δp = differential pressure (atm)

P_m = mean sample gas pressure (atm)

L = length of sample (cm)

A = cross sectional area of sample (cm^2)

Ambient permeabilities for horizontal/vertical core plugs are presented in Table 3.

10. DISCUSSION

No hydrocarbon fluorescence was observed throughout the slabbed sections of the core.

The mini-probe permeabilities were comparatively lower than the corresponding plug data in the highly permeable, very coarse to pebbly sections of the core. This is probably due to equipment limitation as some of the sand grains are larger than the probe orifice. As agreed by Mr David Evans of Premier Oil, no mini-probe measurements were taken on the very tight shaly section of the core from 3037.50-3040.00m. Some very low permeability data from the bottom of the core (3048.80-3050.70m) took more than 30 minutes to stabilise.

The poroperm and grain density values correspond very well with the lithology. Low porosities and permeabilities were exhibited by shaly, fine grained sandstones, whereas higher porosities and permeabilities were associated with very coarse to pebbly sandstones.

The plug permeabilities ranged from less than zero point one to tens of millidarcies in the tighter shaly to very fine grained section of the core .The very coarse grained to pebbly section from 3041.00 to 3047.00m had permeabilities which ranged from one to more than ten Darcies.

High grain densities at 3038.14m (2.72 g/cc) and 3039.06m (2.73 g/cc) are due to the presence of dense shale. The low grain density at 3037.84m is caused by a layer of carbonaceous lamination. The high density of 2.75 g/cc exhibited by the plug at 3050.17m is not very apparent. Perhaps it contains a higher percentage of siderite or other heavy minerals.

TABLE 1

Yolla-2 core (as received)

Box sect.	Core no.	Box depth markings (m)	Nominal core length (m)	Core interval recovered (m)	Recovered core length (m)
1	1	3033.00-3034.00	1.00	3033.00-3034.00	1.00
2	1	3034.00-3035.00	1.00	3034.00-3035.00	1.00
3	1	3035.00-3036.00	1.00	3035.00-3036.00	1.00
4	1	3036.00-3037.00	1.00	3036.00-3037.00	1.00
5	1	3037.00-3038.00	1.00	3037.00-3038.00	1.00
6	1	3038.00-3038.95	0.95	3038.00-3038.95	0.95
7	1	3038.95-3039.85	0.90	3038.95-3039.85	0.90
8	1	3039.85-3040.90	1.05	3039.85-3040.90	1.05
9	1	3040.90-3041.90	1.00	3040.90-3041.90	1.00
10	1	3041.90-3042.90	1.00	3041.90-3042.90	1.00
11	1	3042.90-3044.05	1.15	3042.90-3044.05	1.15
12	1	3044.05-3044.90	0.85	3044.05-3044.90	0.85
13	1	3044.90-3045.90	1.00	3044.90-3048.90	1.00
14	1	3045.90-3046.90	1.00	3045.90-3046.90	1.00
15	1	3046.90-3047.90	1.00	3046.90-3047.90	1.00
16	1	3047.90-3048.90	1.00	3047.90-3048.90	1.00
17	1	3048.90-3049.90	1.00	3048.90-3049.90	1.00
18	1	3049.90-3050.70	0.80	3049.90-3050.70	0.80
Total			17.70		17.70

TABLE 2

MINI-PROBE PERMEAMETER MEASUREMENTS

Company: PREMIER OIL AUSTRALIA PTY.LTD.
Well: YOLLA-2
Permit: T-RL-1
Country: AUSTRALIA
Core #: 3033.00-3050.70M

Date: June 1998
File No.: CA98052

Depth (m)	Permeability (mD)		Depth (m)	Permeability (mD)		Depth (m)	Permeability (mD)	
3033.08	6.1		3040.74	1675		3045.73	3613	
3033.14	5.7		3040.87	1433		3045.87	7877	
3033.26	7.5		3040.95	723		3045.97	1974	
3033.35	6.1		3041.05	2001		3046.05	1288	
3033.44	5.9		3041.18	2914		3046.15	6.7	
3033.56	5.5		3041.26	3457		3046.25	11	
3033.67	9.0		3041.37	2016		3046.35	4.7	
3033.75	10		3041.46	2967		3046.46	2.6	
3033.84	13		3041.53	3674		3046.60	353	
3033.94	18		3041.66	2527		3046.70	390	
3034.05	11		3041.75	3492		3046.78	456	
3034.15	10		3041.87	2440		3046.85	362	
3034.20	11		3041.93	1922		3046.97	630	
3034.35	12		3042.07	2774		3047.05	289	
3034.45	10		3042.16	2277		3047.15	404	
3034.55	21		3042.25	2307		3047.26	384	
3034.65	14		3042.37	1710		3047.35	569	
3034.75	19		3042.44	4450		3047.45	315	
3034.88	12		3042.54	2702		3047.55	71	
3034.95	7.8		3042.63	2436		3047.67	655	
3035.05	0.93		3042.75	3150		3047.75	122	
3035.15	0.33		3042.85	2787		3047.86	52	
3035.25	2.5		3042.95	3615		3047.95	40	
3035.35	3.9		3043.05	3025		3048.05	132	
3035.45	5.2		3043.15	3008		3048.15	40	
3035.55	3.5		3043.26	2099		3048.25	64	
3035.65	29		3043.35	3263		3048.35	189	
3035.75	42		3043.45	3301		3048.45	138	
3035.84	42		3043.58	3142		3048.53	65	
3035.93	3.8		3043.68	3100		3048.68	31	
3036.05	7.8		3043.75	2497		3048.80	0.20	
3036.18	12		3043.85	1194		3048.95	0.26	
3036.30	4.9		3043.95	1978		3049.05	0.57	
3036.40	7		3044.08	2566		3049.15	0.51	
3036.50	53		3044.23	1604		3049.25	0.44	
3036.61	38		3044.40	3194		3049.37	1.8	
3036.70	13		3044.54	2815		3049.57	1.9	
3036.80	68		3044.68	1244		3049.68	2.3	
3036.97	123		3044.78	771		3049.85	1.6	
3040.05	43		3045.03	339		3049.98	1.8	
3040.13	21		3045.15	290		3050.05	0.64	
3040.25	24		3045.27	1232		3050.17	0.72	
3040.35	39		3045.33	2659		3050.67	<0.1	
3040.45	12		3045.43	3200		3050.70	2.0	
3040.55	26		3045.54	4846				
3040.65	1694		3045.63	1974				

TABLE 3

AMBIENT POROPERM/GRAIN DENSITY DATA FOR HORIZONTAL/VERTICAL CORE PLUGS

Company: PREMIER OIL AUSTRALIA PTY.LTD.
Well: YOLLA-2
Permit: T-RL-1
Country: AUSTRALIA
Core #: 3033.00-3050.70M

Date: June 1998
File No.: CA98052

Depth (m)	HORIZONTAL PLUGS EXTRACTED			HORIZONTAL PLUGS UNEXTRACTED			VERTICAL PLUGS EXTRACTED			REMARKS
	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kh (md) 400psi	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kh (md) 400psi	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kv (md) 400psi	
3033.00				12.4	2.65	6				
3033.03	14.1	2.67	7.5							
3033.35	15.7	2.68	12							
3033.74	17.9	2.70	28							
3033.94	18.3	2.71	34							
3034.00				16.3	2.69	22				
3034.05							16.8	2.69	14	
3034.28	15.8	2.68	14							
3034.55	16.4	2.68	18							
3034.82	16.5	2.67	22							
3035.00				6.6	2.68	0.04				
3035.15	9.2	2.69	<0.1							
3035.45	13.9	2.67	2.6							
3035.75	16.9	2.67	54							
3036.00				14.4	2.67	5.9				
3036.04	15.7	2.68	8.4							

TABLE 3

AMBIENT POROPERM/GRAIN DENSITY DATA FOR HORIZONTAL/VERTICAL CORE PLUGS

Company: PREMIER OIL AUSTRALIA PTY.LTD.
Well: YOLLA-2
Permit: T-RL-1
Country: AUSTRALIA
Core #: 3033.00-3050.70M

Date: June 1998
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Depth (m)	HORIZONTAL PLUGS EXTRACTED			HORIZONTAL PLUGS UNEXTRACTED			VERTICAL PLUGS EXTRACTED			REMARKS
	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kh (md) 400psi	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kh (md) 400psi	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kv (md) 400psi	
3036.35	13.7	2.68	2.4							
3036.65	18.3	2.70								
3036.95	18.3	2.67	208							
3037.00				16.0	2.66	98				
3037.24	12.6	2.67	1.2							
3037.54	5.2	2.67								
3037.84	10.7	2.63	0.26							Carbonaceous lamination
3038.00				6.3	3.01	0.01				
3038.02							5.4	2.88	<0.1	
3038.14	4.5	2.72	0.26							Dense shale
3038.45	6.0	2.71	<0.1							
3038.74	5.8	2.70	<0.1							
3039.00				5.9	2.69	0.02				
3039.06	5.4	2.73	<0.1							Dense shale
3039.35	4.2	2.70	<0.1							

TABLE 3

AMBIENT POROPERM/GRAIN DENSITY DATA FOR HORIZONTAL/VERTICAL CORE PLUGS

Company: PREMIER OIL AUSTRALIA PTY.LTD.
Well: YOLLA-2
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Depth (m)	HORIZONTAL PLUGS EXTRACTED			HORIZONTAL PLUGS UNEXTRACTED			VERTICAL PLUGS EXTRACTED			REMARKS
	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kh (md) 400psi	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kh (md) 400psi	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kv (md) 400psi	
3039.59	9.4	2.67	0.54							
3039.94	16.8	2.66	30							
3040.00				17.5	2.66	91				
3040.20	16.1	2.66	15							
3040.50	15.0	2.67	30							
3040.81	20.7	2.66	1678							Cut with Liquid Nitrogen
3040.93				21.7	2.64	3050				Cut with Liquid Nitrogen
3041.10	21.4	2.66	2828							Cut with Liquid Nitrogen
3041.40	25.4	2.67	6672							Cut with Liquid Nitrogen
3041.70	23.2	2.67	4725							Cut with Liquid Nitrogen
3041.93				22.1	2.64	4536				Cut with Liquid Nitrogen
3042.03	24.8	2.67	>10000							Cut with Liquid Nitrogen
3042.33	22.1	2.66	7329							Cut with Liquid Nitrogen
3042.63	24.6	2.66	6364							Cut with Liquid Nitrogen
3042.95	23.6	2.66	4877							Cut with Liquid Nitrogen

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TABLE 3

AMBIENT POROPERM/GRAIN DENSITY DATA FOR HORIZONTAL/VERTICAL CORE PLUGS

Company: PREMIER OIL AUSTRALIA PTY.LTD.
Well: YOLLA-2
Permit: T-RL-1
Country: AUSTRALIA
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Date: June 1998
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Depth (m)	HORIZONTAL PLUGS EXTRACTED			HORIZONTAL PLUGS UNEXTRACTED			VERTICAL PLUGS EXTRACTED			REMARKS
	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kh (md) 400psi	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kh (md) 400psi	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kv (md) 400psi	
3043.00				23.3	2.64	2532				Cut with Liquid Nitrogen
3043.03							24.5	2.66	7598	Cut with Liquid Nitrogen
3043.21	24.5	2.66	>10000							Cut with Liquid Nitrogen
3043.53	23.1	2.66	6406							Cut with Liquid Nitrogen
3043.81	18.6	2.65	3271							Cut with Liquid Nitrogen
3043.95				21.1	2.64	1730				Cut with Liquid Nitrogen
3044.16	22.8	2.67	2573							Cut with Liquid Nitrogen
3044.39	23.2	2.66	6083							Cut with Liquid Nitrogen
3044.64	24.6	2.66	>10000							Cut with Liquid Nitrogen
3044.96	17.5	2.67	588							Cut with Liquid Nitrogen
3045.00				18.2	2.65	503				Cut with Liquid Nitrogen
3045.05							15	2.65	40	Cut with Liquid Nitrogen
3045.28	18.9	2.67	2513							Cut with Liquid Nitrogen
3045.55	24.7	2.67	>10000							Cut with Liquid Nitrogen
3045.95	23.9	2.66	9066							Cut with Liquid Nitrogen

TABLE 3

AMBIENT POROPERM/GRAIN DENSITY DATA FOR HORIZONTAL/VERTICAL CORE PLUGS

Company: PREMIER OIL AUSTRALIA PTY.LTD.
Well: YOLLA-2
Permit: T-RL-1
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Date: June 1998
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Depth (m)	HORIZONTAL PLUGS EXTRACTED			HORIZONTAL PLUGS UNEXTRACTED			VERTICAL PLUGS EXTRACTED			REMARKS
	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kh (md) 400psi	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kh (md) 400psi	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kv (md) 400psi	
3046.00				25.1	2.64	16119				Cut with Liquid Nitrogen
3046.14	13.8	2.68	6.1							
3046.45	12.1	2.67	2.4							
3046.75	18.6	2.66	873							Cut with Liquid Nitrogen
3047.00				20.2	2.65	2803				Cut with Liquid Nitrogen
3047.05	18.7	2.67	304							
3047.35	19.0	2.67	1100							Cut with Liquid Nitrogen
3047.67	18.2	2.67	674							Cut with Liquid Nitrogen
3047.95	15.0	2.68	17							
3048.00				13.2	2.66	12				
3048.19	16.2	2.66	319							
3048.55	14.1	2.66	87							
3048.84	3.7	2.69	<0.1							
3049.00				2.7	2.68	0.01				
3049.15	11.2	2.69	<0.1							

TABLE 3

AMBIENT POROPERM/GRAIN DENSITY DATA FOR HORIZONTAL/VERTICAL CORE PLUGS

Company: PREMIER OIL AUSTRALIA PTY.LTD.
Well: YOLLA-2
Permit: T-RL-1
Country: AUSTRALIA
Core #: 3033.00-3050.70M

Date: June 1998
File No.: CA98052

Depth (m)	HORIZONTAL PLUGS EXTRACTED			HORIZONTAL PLUGS UNEXTRACTED			VERTICAL PLUGS EXTRACTED			REMARKS
	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kh (md) 400psi	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kh (md) 400psi	Helium porosity (%) Ambient	Grain density (g cm-3)	Air permeability Kv (md) 400psi	
3049.44	4.3	2.70	<0.1							
3049.73	13.0	2.68	0.24							
3049.97	12.3	2.69	0.16							
3050.00				11.5	2.69	0.13				
3050.17	13.0	2.75	0.36							Siderite (?)
3050.69	3.9	2.70	<0.1							
3050.70				3.4	2.69	0.02				

GEOTECH
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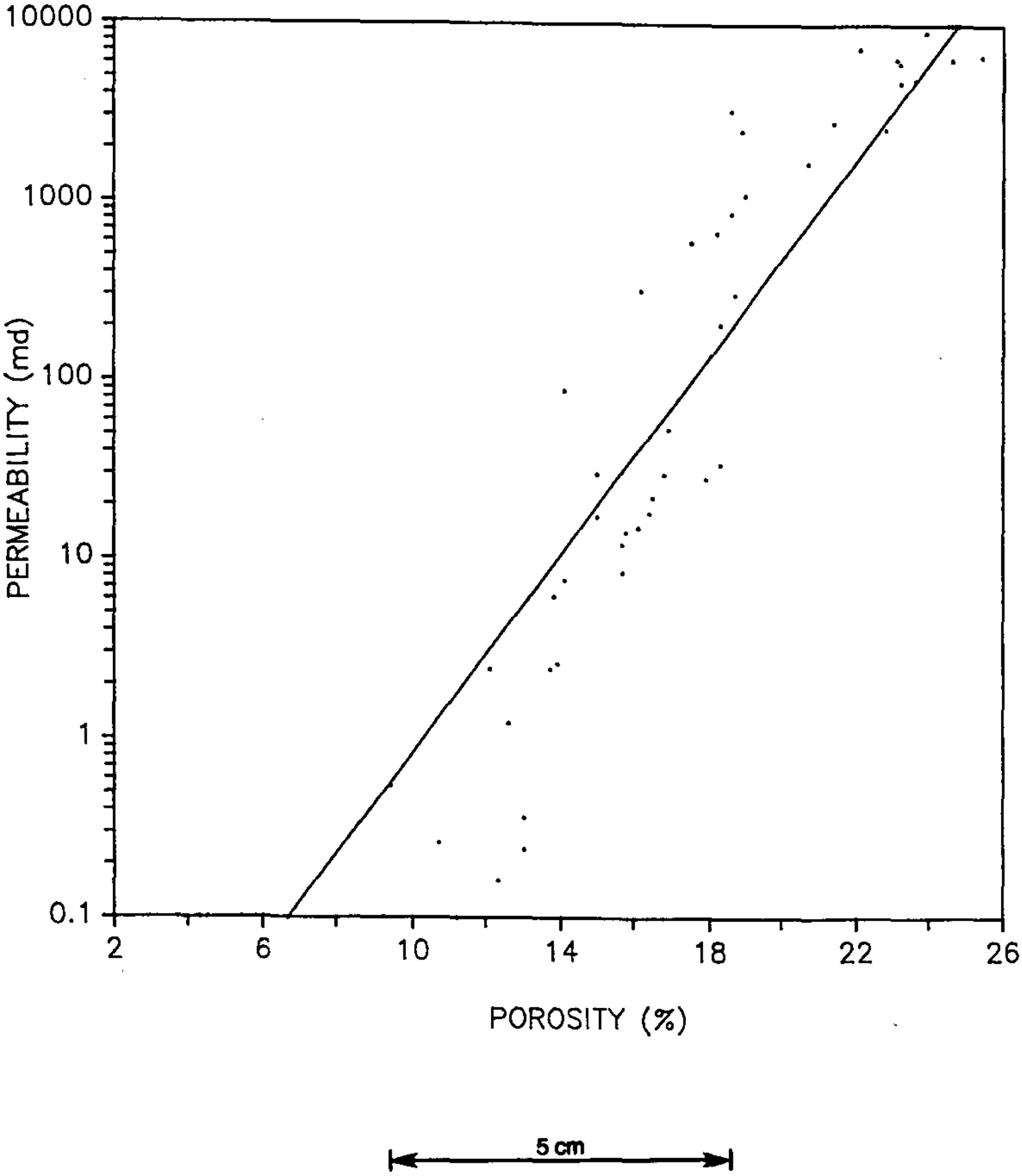
565201

FIGURE 1

POROSITY vs PERMEABILITY

(EXTRACTED HORIZONTAL PLUGS)

CLIENT	PREMIER OIL AUSTRALIA PTY LTD
WELL	YOLLA-2
DATE	JUNE 1998
FILE NO.	CA98052
NO. DATA POINTS	58



GEOTECH
GEOTECHNICAL SERVICES PTY LTD

FIGURE 2

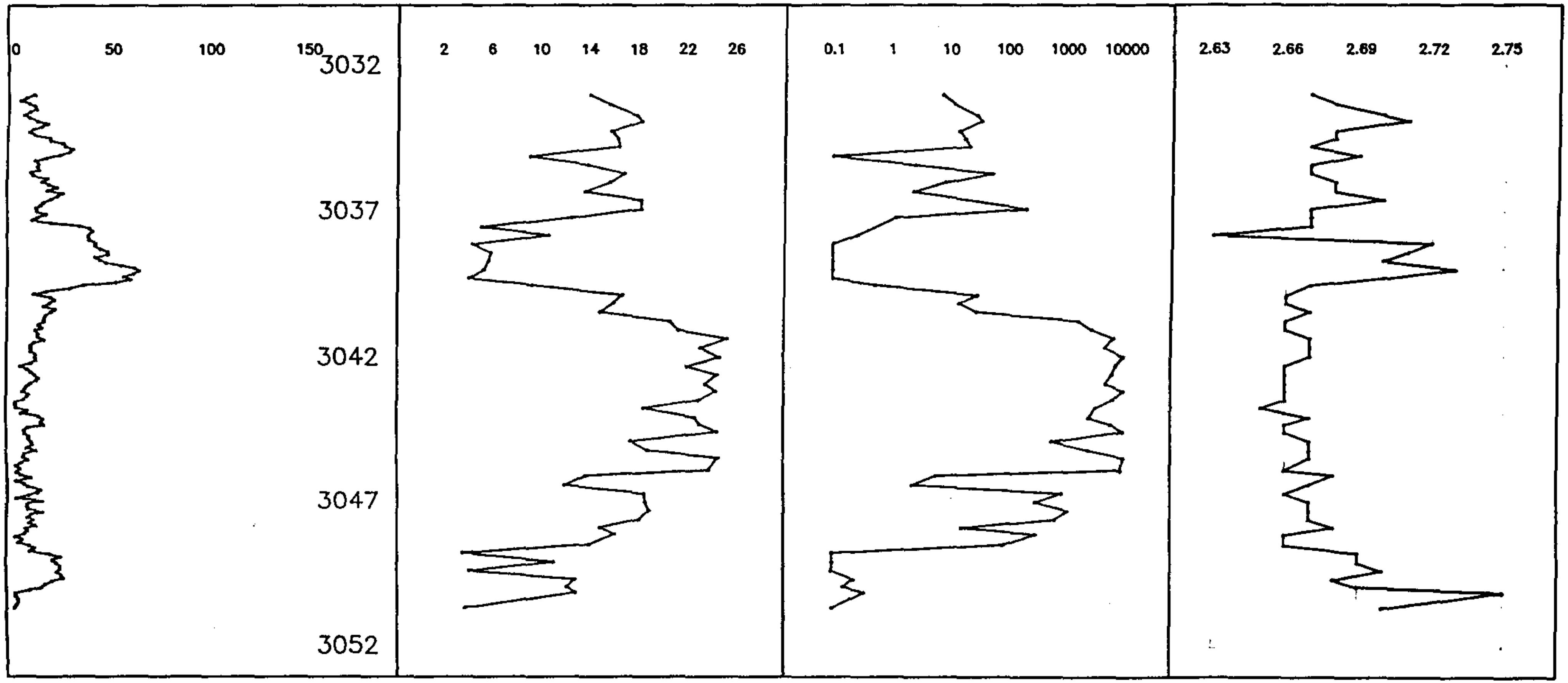
CORE LOG

5 cm

COMPANY	PREMIER OIL AUSTRALIA PTY LTD	DATE	JUNE 1998
WELL	YOLLA-2	SCALE	1:200
CORE	1 (3033.00-3050.70m)	FILE No	CA98052

(EXTRACTED HORIZONTAL PLUGS)

GAMMA LOG (API UNITS) | DEPTH (m) | HELIUM POROSITY (AMBIENT) (%) | AIR PERMEABILITY (AMBIENT) (md) | GRAIN DENSITY (g/cc)



GEOTECH

Yolla-2

Routine core analysis

Disk data

File name	Contents	Format
GR98052.XLS	Gamma ray data	Excel 97
CA98052.XLS	Ambient porosity/grain density/permeability data for unextracted and extracted horizontal and vertical plugs /Mini-probe permeametry	Excel 97

YOLLA - 2

CORE PHOTOGRAPHY

Prepared for:

Premier Oil Australia Pty Limited

June 1998

GEOTECH GEOTECHNICAL SERVICES PTY LTD

41- 45 Furnace Road, Welshpool, Western Australia. 6106
Locked Bag 27, Cannington, Western Australia. 6107

Telephone: (08) 9458 8877
Facsimile: (08) 9458 8857
Email: geotech@iinet.net.au

1. INTRODUCTION

Yolla-2 (T-RL-1) was cored on 14 May 1998 and 17.7m of core was recovered over the depth interval 3033.00-3050.70m. The core was 5 $^{1}/_{4}$" in diameter and was cut using water based drilling mud. It was retrieved in fluted aluminium tubes and resinated at the wellsite. The 1m long 2/3 slabbed sections of the core were photographed with the core encased in aluminium tubes.

This folio contains one set only of A4 size 4m/frame format white light photographs of the slabbed core (2/3 sections).

Ambient porosity/permeability/grain density data obtained at each core plug location are presented on transparent overlays accompanying the white light prints. Additional data pertaining to the core can be found in the Yolla-2 Core Analysis (Routine) Report.

2. METHODS

All core photographs were taken with a Pentax 645 medium-format SLR camera equipped with an SMC Pentax-A 645 75mm 1:2.8 lens using Kodak Pro 100 colour negative film (ISO 100). Focusing was achieved using a split image/microprism viewfinder.

White light photography was carried out using two opposing pairs of synchronous Elinchrom 23 flash units. Polarizer filters were fitted to both the flash units and camera to eliminate reflected light. The camera shutter speed and aperture was set at 1/60s and f/8-f/11, respectively.

All core sections were lightly sprayed with 10% w/w KCl brine immediately prior to the white light photographs being taken to improve the visibility of beddings/laminations and other features in the core.

265206

PREMIER OIL AUSTRALIA
YOLLA - 2

3033M

ϕ =14.1
Kh =7.5
GD =2.67

ϕ =15.7
Kh =12
GD =2.68

ϕ =17.9
Kh =28
GD =2.70

ϕ =18.3
Kh =34
GD =2.71

3034M

ϕ =15.8
Kh =14
GD =2.68

ϕ =16.4
Kh =18
GD =2.68

ϕ =16.5
Kh =22
GD =2.67

3035M

ϕ =9.2
Kh =<0.1
GD =2.69

ϕ =13.9
Kh =2.6
GD =2.67

ϕ =16.9
Kh =54
GD =2.67

3036M

ϕ =15.7
Kh =8.4
GD =2.68

ϕ =13.7
Kh =2.4
GD =2.68

ϕ =18.3
Kh =Unsuit
GD =2.70

ϕ =18.3
Kh =208
GD =2.67

5 cm

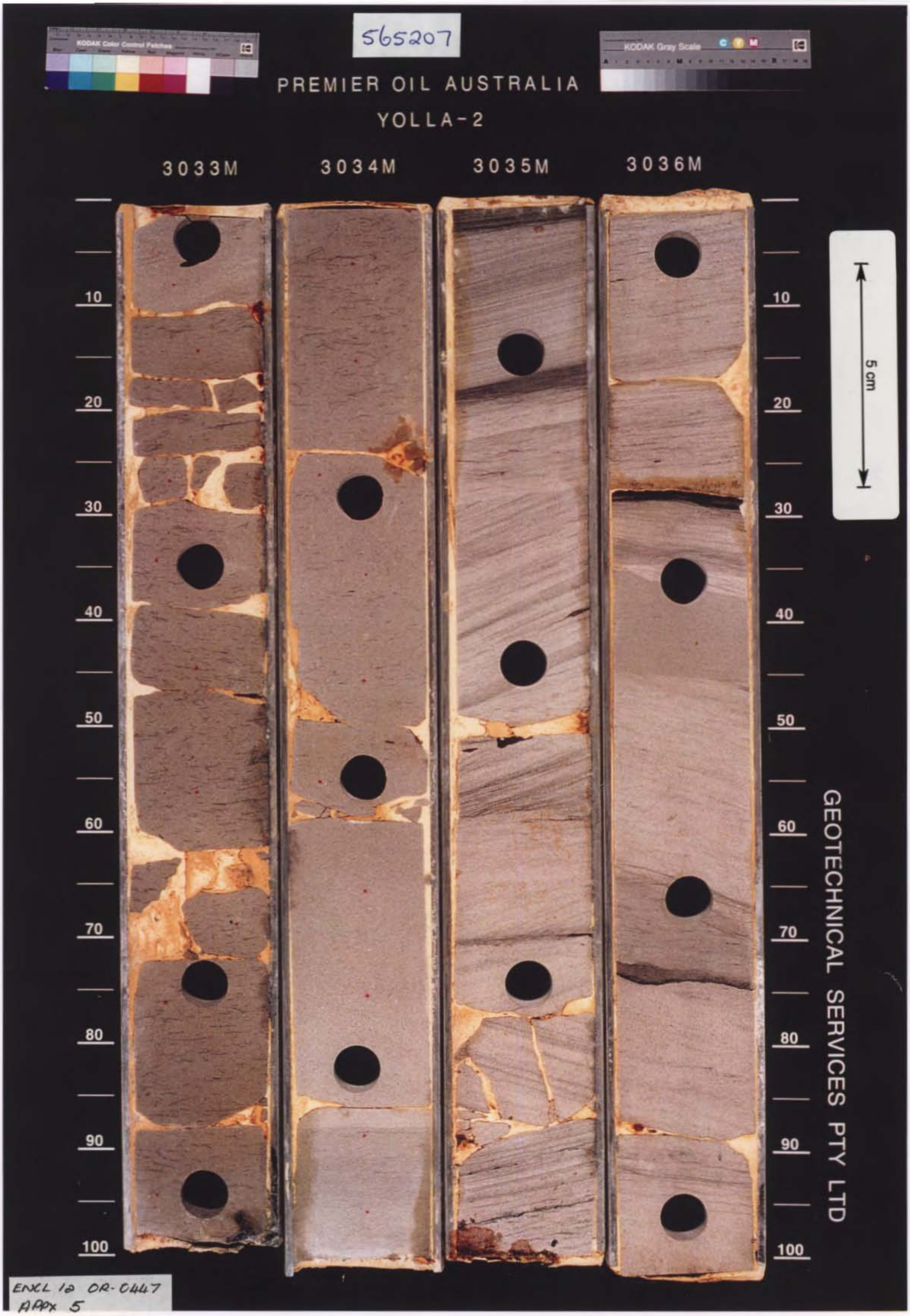
GD=Grain density g cm-3

ϕ=Helium Porosity % Ambient

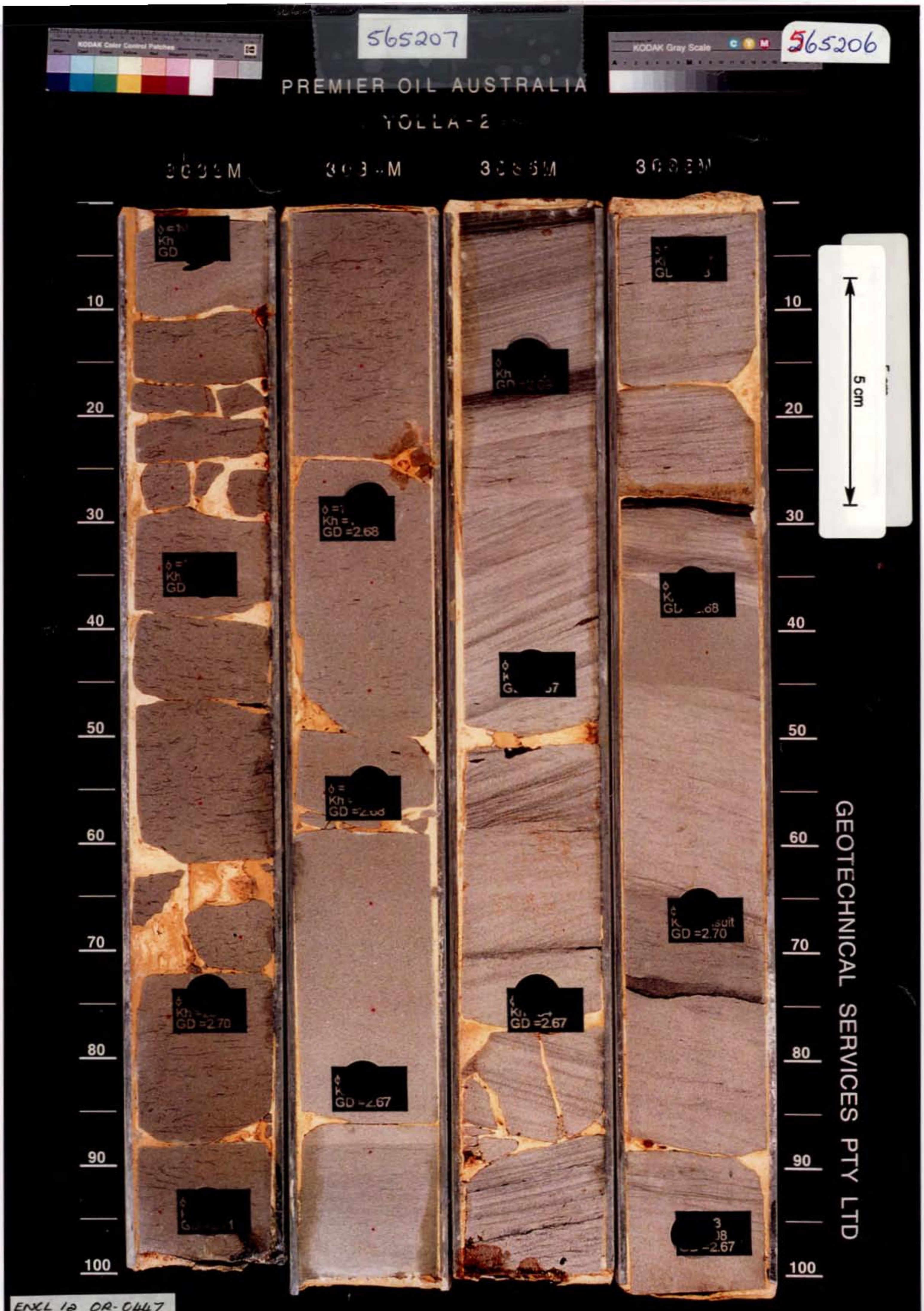
Unsuit=Unsuitable

Kh = Air Permeability (md)

ENCL. 1 OR-0447
APPX 5



ENCL 12 OR-0447
APPx 5



ENCL 1a OR-0447

ENCL. 1 OR-0447
Appx 5

565208

5 cm

PREMIER OIL AUSTRALIA
YOLLA - 2

3037M

ϕ =12.6
Kh =1.2
GD =2.67

ϕ =5.2
Kh =Unsuit
GD =2.67

ϕ =10.7
Kh =0.26
GD =2.63

3038M

ϕ =4.5
Kh =<0.1
GD =2.72

ϕ =6.0
Kh =<0.1
GD =2.71

ϕ =5.8
Kh =<0.1
GD =2.70

3039M

ϕ =5.4
Kh =<0.1
GD =2.73

ϕ =4.2
Kh =<0.1
GD =2.70

ϕ =9.4
Kh =0.54
GD =2.67

ϕ =16.8
Kh =30
GD =2.66

3040M

ϕ =16.1
Kh =15
GD =2.66

ϕ =15.0
Kh =30
GD =2.67

ϕ =20.7
Kh =1678
GD =2.66

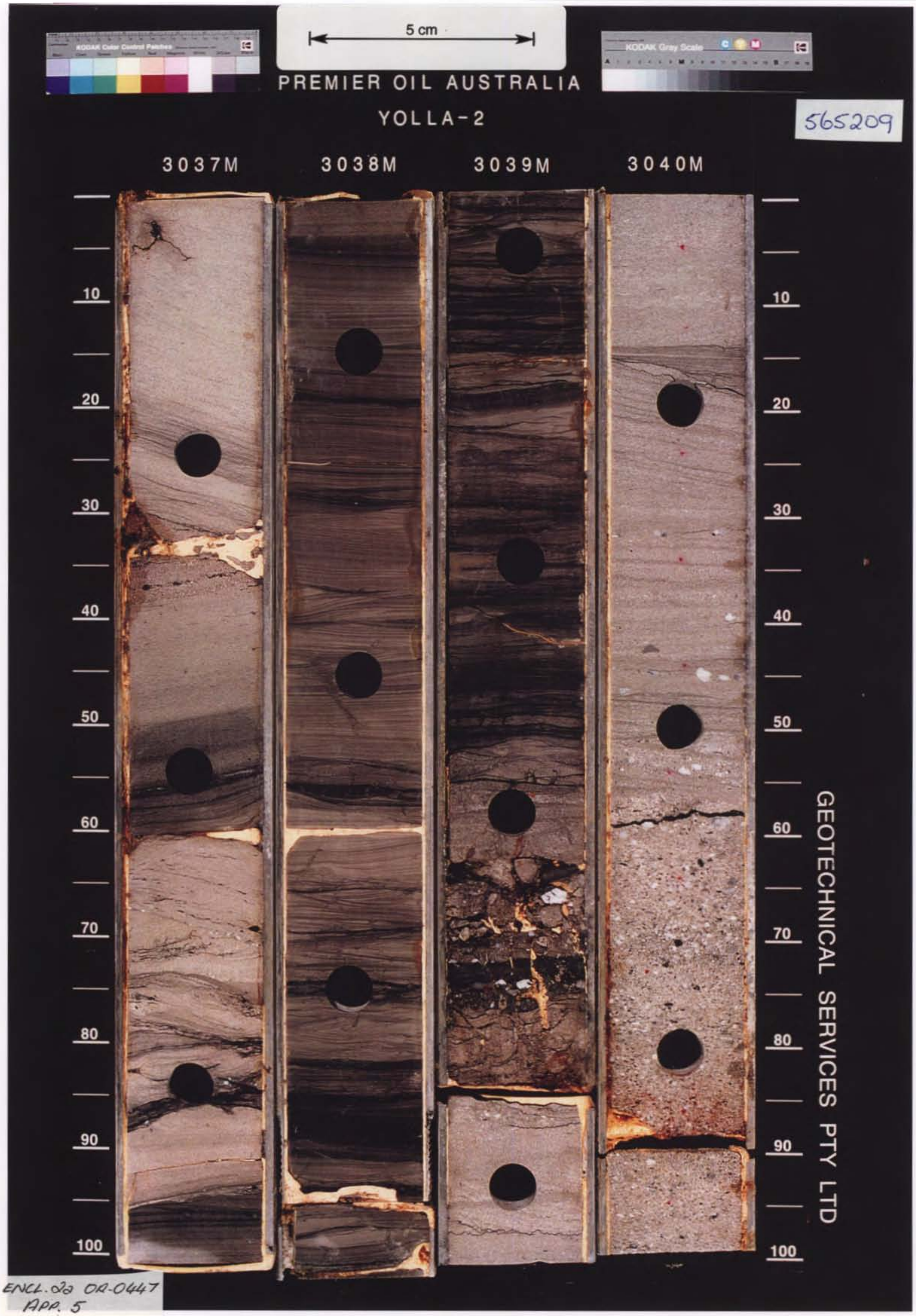
GD=Grain density g cm-3

ϕ=Helium Porosity % Ambient

Unsuit=Unsuitable

Kh = Air Permeability (md)

ENCL. 2 OR-0447
ADDX 5



ENCL. 2a OR-0447
APP. 5

565208

565209

ENCL.2 OR-0447
APPX 5

565210

5 cm

PREMIER OIL AUSTRALIA
YOLLA - 2

GD=Grain density g cm-3

ϕ=Helium Porosity % Ambient

Unsuit=Unsuitable

Kh = Air Permeability (md)

3041M

ϕ =21.4
Kh =2828
GD =2.66

ϕ =25.4
Kh =6672
GD =2.67

ϕ =23.2
Kh =4725
GD =2.67

3042M

ϕ =24.8
Kh =>10000
GD =2.67

ϕ =22.1
Kh =7329
GD =2.66

ϕ =24.6
Kh =6364
GD =2.66

ϕ =23.6
Kh =4877
GD =2.66

3043M

ϕ =24.5
Kh =>10000
GD =2.66

ϕ =23.1
Kh =6406
GD =2.66

ϕ =18.6
Kh =3271
GD =2.65

3044M

ϕ =22.8
Kh =2573
GD =2.67

ϕ =23.2
Kh =6083
GD =2.66

ϕ =24.6
Kh =>10000
GD =2.66

ϕ =17.5
Kh =588
GD =2.67

ENCL. 3 OR.0447
APP. 5

565211

ENCL.52 OR.0447
APPX5

565210

565211

ENCL. 3 OR-0447
APP. 5

5 cm

565212

PREMIER OIL AUSTRALIA
YOLLA - 2

3045M	3046M	3047M	3048M
		ϕ =18.7 Kh =304 GD =2.67	
	ϕ =13.8 Kh =6.1 GD =2.68		ϕ =16.2 Kh =319 GD =2.66
ϕ =18.9 Kh =2513 GD =2.67		ϕ =19.0 Kh =1100 GD =2.67	
	ϕ =12.1 Kh =2.4 GD =2.67		
ϕ =24.7 Kh =>10000 GD =2.67			ϕ =14.1 Kh =87 GD =2.66
		ϕ =18.2 Kh =674 GD =2.67	
	ϕ =18.6 Kh =873 GD =2.66		
			ϕ =3.7 Kh =<0.1 GD =2.69
ϕ =23.9 Kh =9066 GD =2.66		ϕ =15.0 Kh =17 GD =2.68	

GD=Grain density g cm-3

ϕ=Helium Porosity % Ambient

Unsuit=Unsuitable

Kh = Air Permeability (md)

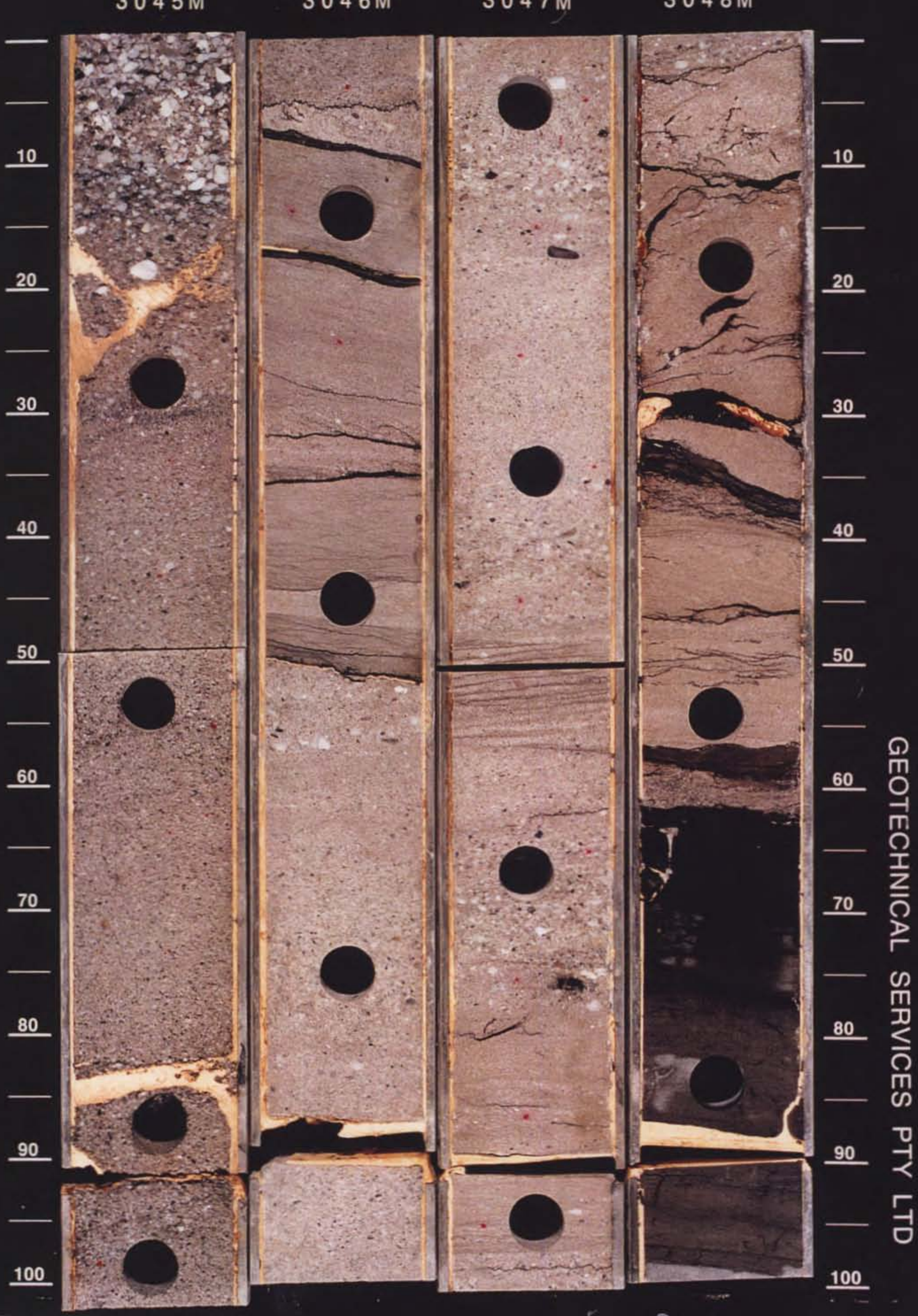
ENCL 4 OR-0447
APPX 5

5 cm

PREMIER OIL AUSTRALIA

YOLLA-2

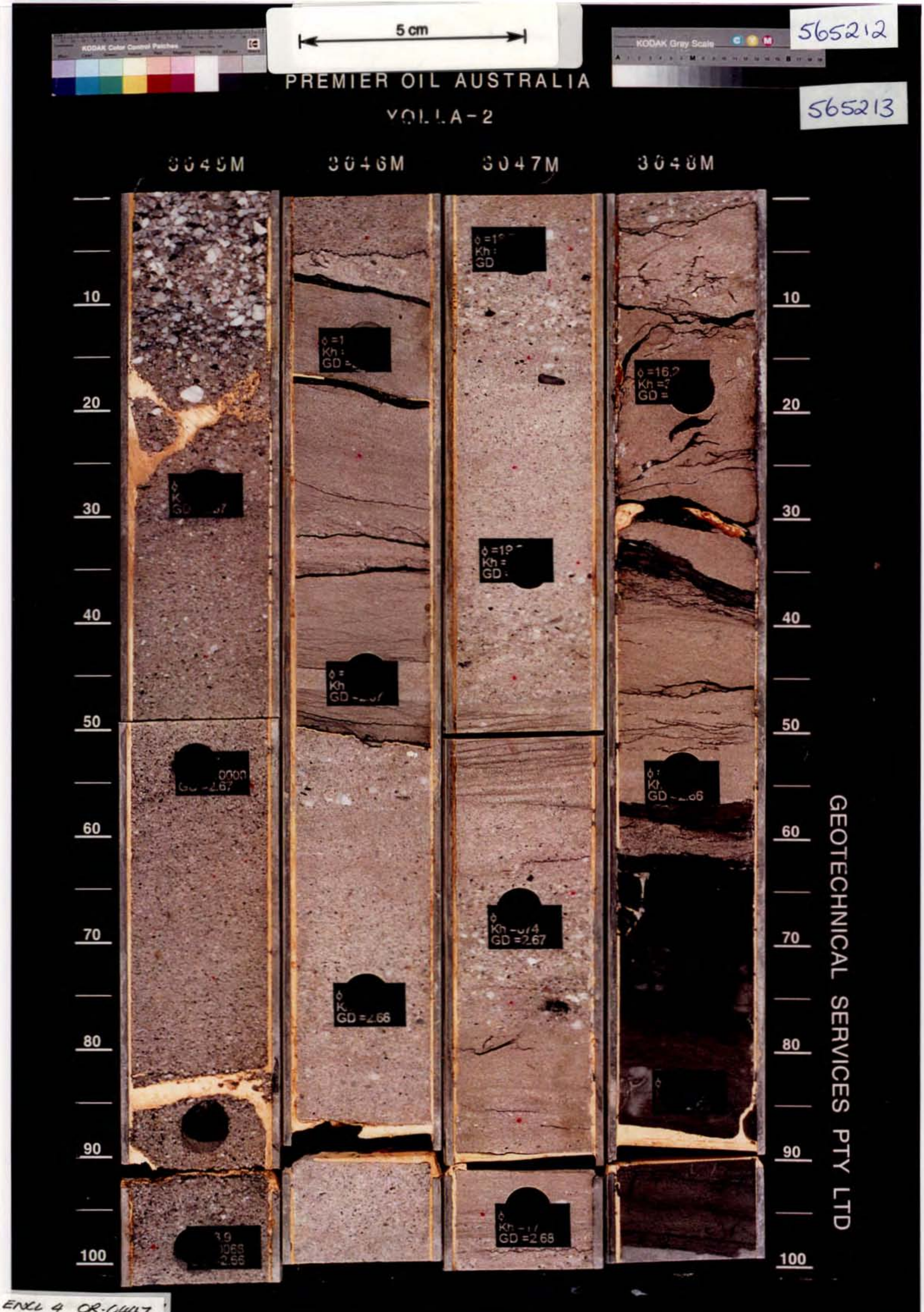
565213



ENCL. 43 OR-0447
APPX 5

565212

565213



ENCL 4 OR-0447
APPX 5

565214

PREMIER OIL AUSTRALIA
YOLLA - 2

3049M

3050M

ϕ =11.2
Kh =<0.1
GD =2.69

ϕ =13.0
Kh =0.36
GD =2.75

GD=Grain density g cm-3

Unsuit=Unsuitable

ϕ =4.3
Kh =<0.1
GD =2.70

ϕ =3.9
Kh =<0.1
GD =2.70

ϕ =13.0
Kh =0.24
GD =2.68

ϕ=Helium Porosity % Ambient

Kh = Air Permeability (md)

ϕ =12.3
Kh =0.16
GD =2.69

5 cm

ENCL 5 OR-0447
APPX 5

565215

PREMIER OIL AUSTRALIA

YOLLA-2

3049M 3050M

10 20 30 40 50 60 70 80 90 100

GEOTECHNICAL SERVICES PTY LTD

5 cm

ENCL 52 OR.0447
APPX 5.

565214

565215

PREMIER OIL AUSTRALIA

YOLLA-2

3049M 3050M

GEOTECHNICAL SERVICES PTY LTD

5 cm

ENCL 5 OR-0447
APPX 5

APPENDIX 6

SURVEY/DEVIATION DATA

YOLLA 2

565217

YOLLA-2

Survey Data

The following is a list of surveys obtained at regular intervals while drilling, using the Anadrill Slim1 tool.

Slim 1 is a retrievable and resettable MWD tool for use in 2 7/8" to 9 5/8" OD drill collars. It can be run in MWD or time-based electronic multishot (EMS) mode. In this case the latter mode was used to verify the inclination only MWD surveys using the Anderdrift tool and single shot Totco Surveys (see Appendix 1- Drilling Report).

Directional measurements using this tool in EMS mode include both inclination and azimuth. Magnetic dip angle is measured for survey quality control purposes. Gamma ray and resistivity measurements are also available, but were not used in this survey. Directional measurements can be taken at any time by varying the standpipe pressure or by time sequence autosurvey.

Measured depth is obtained from driller's depth. The inclination measurement is measured using three orthogonally placed inclinometers. The inclination has an accuracy of +/- 0.2 degrees and a resolution of 0.1 degree. The azimuth is measured using three orthogonally placed magnetometers. The azimuth has an accuracy of 1.0 degree and a resolution of 0.1 degree.

565219

Measured Depth (m)	Drift (degs)	Azimuth (degs)
183.2	0.1	57.0
211.7	0.1	58.0
240.0	0.1	16.2
268.9	0.1	61.5
297.3	0.1	19.1
325.7	0.1	11.3
354.6	0.1	62.8
383.5	0.1	25.9
412.0	0.2	326.1
440.6	0.1	318.7
468.8	0.2	319.7
497.8	0.2	312.1
526.2	0.2	297.5
555.1	0.2	302.9
583.6	0.2	280.3
612.4	0.2	288.9
641.1	0.3	286.3
669.7	0.3	301.7
698.1	0.2	305.9
726.9	0.3	305.7
755.7	0.2	8.9
784.7	0.2	309.1
813.5	0.2	19.3
837.6	0.1	3.7
841.9	0.2	166.0
870.6	0.2	23.5
899.3	0.2	82.6
928.0	0.2	86.1
956.7	0.2	106.4
985.4	0.3	103.4
1014.0	0.2	127.7
1042.7	0.2	137.4
1071.4	0.2	138.1
1100.1	0.2	164.7
1128.8	0.2	181.3
1157.5	0.4	191.5
1186.2	0.2	298.7
1214.9	0.2	252.4
1243.6	0.3	222.8
1272.3	0.2	221.2
1300.9	0.3	182.0
1329.6	0.3	194.6
1358.3	0.3	198.9
1387.0	0.3	214.0
1415.7	0.3	214.2
1444.4	0.4	203.4
1473.1	0.4	205.3
1501.8	0.4	205.6
1530.5	0.4	210.0
1559.2	0.4	212.8
1587.8	0.3	223.8
1616.5	0.2	224.9
1645.2	0.5	197.0
1673.9	0.7	201.3
1702.6	0.8	199.6
1731.3	0.7	195.1

1760.0	0.6	212.3
1788.7	0.6	223.5
1817.4	0.6	216.8
1846.1	0.6	210.1
1874.7	0.5	197.6
1903.4	0.5	202.6
1932.1	0.5	206.6
1960.8	0.5	207.9
1989.5	0.5	211.0
2018.2	0.6	220.1
2046.9	0.6	220.9
2075.6	0.4	239.5
2104.3	0.4	238.8
2133.0	0.3	189.4
2161.6	0.3	196.9
2190.3	0.4	187.3
2219.0	0.4	180.5
2247.7	0.5	182.4
2276.4	0.4	156.0
2305.1	0.5	159.9
2333.8	0.4	191.8
2362.5	0.2	155.2
2391.2	0.1	144.9
2419.9	0.3	85.4
2448.5	0.4	71.7
2477.2	0.5	56.0
2505.9	0.6	45.3
2534.6	0.8	39.2
2563.3	0.9	34.4
2592.0	1.0	38.9
2619.7	1.0	30.6
2648.4	1.1	28.9
2677.1	1.2	36.0
2705.8	1.4	44.3
2734.4	1.6	44.2
2763.1	1.6	44.8
2791.8	1.8	43.4
2820.5	1.7	45.1
2849.2	1.7	42.9
2877.9	1.7	44.4
2906.6	1.8	44.8
2935.3	2.0	45.2
2964.0	2.1	48.5
2992.7	2.2	48.5
3021.3	2.1	47.5
3050.0	2.1	49.5
3078.7	2.1	54.8
3107.4	2.4	56.8
3136.1	2.2	55.1
3146.8	2.2	54.5

565221

YOLLA-2

MD-TVD Survey Data Listing

Depth mMDRT	Depth mTVDRT
110.00	110.00
120.00	120.00
130.00	130.00
140.00	140.00
150.00	150.00
160.00	160.00
170.00	170.00
180.00	180.00
190.00	190.00
200.00	200.00
210.00	210.00
220.00	220.00
230.00	230.00
240.00	240.00
250.00	250.00
260.00	260.00
270.00	270.00
280.00	280.00
290.00	290.00
300.00	300.00
310.00	310.00
320.00	320.00
330.00	330.00
340.00	340.00
350.00	350.00
360.00	360.00
370.00	370.00
380.00	380.00
390.00	390.00
400.00	400.00
410.00	410.00
420.00	420.00
430.00	430.00
440.00	440.00
450.00	450.00
460.00	460.00
470.00	470.00
480.00	480.00
490.00	490.00
500.00	500.00
510.00	510.00
520.00	520.00
530.00	530.00
540.00	540.00
550.00	550.00
560.00	560.00
570.00	570.00
580.00	580.00
590.00	590.00
600.00	600.00
610.00	610.00
620.00	620.00
630.00	630.00
640.00	640.00

Depth MMDRT	Depth mTVDRT
650.00	650.00
660.00	660.00
670.00	670.00
680.00	680.00
690.00	690.00
700.00	700.00
710.00	710.00
720.00	720.00
730.00	730.00
740.00	740.00
750.00	750.00
760.00	760.00
770.00	770.00
780.00	780.00
790.00	790.00
800.00	800.00
810.00	810.00
820.00	820.00
830.00	830.00
840.00	840.00
850.00	850.00
860.00	860.00
870.00	870.00
880.00	880.00
890.00	890.00
900.00	900.00
910.00	910.00
920.00	920.00
930.00	930.00
940.00	940.00
950.00	950.00
960.00	960.00
970.00	970.00
980.00	980.00
990.00	990.00
1000.00	1000.00
1010.00	1010.00
1020.00	1020.00
1030.00	1030.00
1040.00	1040.00
1050.00	1050.00
1060.00	1060.00
1070.00	1069.99
1080.00	1079.99
1090.00	1089.99
1100.00	1099.99
1110.00	1109.99
1120.00	1119.99
1130.00	1129.99
1140.00	1139.99
1150.00	1149.99
1160.00	1159.99
1170.00	1169.99
1180.00	1179.99

Depth mMDRT	Depth mTVDRT
1190.00	1189.99
1200.00	1199.99
1210.00	1209.99
1220.00	1219.99
1230.00	1229.99
1240.00	1239.99
1250.00	1249.99
1260.00	1259.99
1270.00	1269.99
1280.00	1279.99
1290.00	1289.99
1300.00	1299.99
1310.00	1309.99
1320.00	1319.99
1330.00	1329.99
1340.00	1339.99
1350.00	1349.99
1360.00	1359.99
1370.00	1369.99
1380.00	1379.99
1390.00	1389.99
1400.00	1399.99
1410.00	1409.99
1420.00	1419.99
1430.00	1429.99
1440.00	1439.99
1450.00	1449.99
1460.00	1459.99
1470.00	1469.99
1480.00	1479.99
1490.00	1489.99
1500.00	1499.99
1510.00	1509.99
1520.00	1519.99
1530.00	1529.99
1540.00	1539.99
1550.00	1549.99
1560.00	1559.99
1570.00	1569.99
1580.00	1579.99
1590.00	1589.99
1600.00	1599.99
1610.00	1609.99
1620.00	1619.99
1630.00	1629.99
1640.00	1639.99
1650.00	1649.99
1660.00	1659.99
1670.00	1669.99
1680.00	1679.98
1690.00	1689.98
1700.00	1699.98
1710.00	1709.98
1720.00	1719.98

Depth mMDRT	Depth mTVDRT
1730.00	1729.98
1740.00	1739.98
1750.00	1749.98
1760.00	1759.98
1770.00	1769.98
1780.00	1779.98
1790.00	1789.98
1800.00	1799.98
1810.00	1809.98
1820.00	1819.98
1830.00	1829.97
1840.00	1839.97
1850.00	1849.97
1860.00	1859.97
1870.00	1869.97
1880.00	1879.97
1890.00	1889.97
1900.00	1899.97
1910.00	1909.97
1920.00	1919.97
1930.00	1929.97
1940.00	1939.97
1950.00	1949.97
1960.00	1959.97
1970.00	1969.97
1980.00	1979.97
1990.00	1989.97
2000.00	1999.97
2010.00	2009.97
2020.00	2019.97
2030.00	2029.97
2040.00	2039.97
2050.00	2049.97
2060.00	2059.96
2070.00	2069.96
2080.00	2079.96
2090.00	2089.96
2100.00	2099.96
2110.00	2109.96
2120.00	2119.96
2130.00	2129.96
2140.00	2139.96
2150.00	2149.96
2160.00	2159.96
2170.00	2169.96
2180.00	2179.96
2190.00	2189.96
2200.00	2199.96
2210.00	2209.96

Depth MMDRT	Depth mTVDRT
2220.00	2219.96
2230.00	2229.96
2240.00	2239.96
2250.00	2249.96
2260.00	2259.96
2270.00	2269.96
2280.00	2279.96
2290.00	2289.96
2300.00	2299.96
2310.00	2309.96
2320.00	2319.96
2330.00	2329.96
2340.00	2339.96
2350.00	2349.96
2360.00	2359.96
2370.00	2369.96
2380.00	2379.96
2390.00	2389.96
2400.00	2399.96
2410.00	2409.96
2420.00	2419.96
2430.00	2429.96
2440.00	2439.96
2450.00	2449.96
2460.00	2459.96
2470.00	2469.96
2480.00	2479.96
2490.00	2489.96
2500.00	2499.95
2510.00	2509.95
2520.00	2519.95
2530.00	2529.95
2540.00	2539.95
2550.00	2549.95
2560.00	2559.95
2570.00	2569.95
2580.00	2579.95
2590.00	2589.95
2600.00	2599.94
2610.00	2609.94
2620.00	2619.94
2630.00	2629.94
2640.00	2639.94
2650.00	2649.94
2660.00	2659.93
2670.00	2669.93
2680.00	2679.93
2690.00	2689.93
2700.00	2699.92

Depth mMDRT	Depth mTVDRT
2710.00	2709.92
2720.00	2719.92
2730.00	2729.91
2740.00	2739.91
2750.00	2749.91
2760.00	2759.90
2770.00	2769.90
2780.00	2779.89
2790.00	2789.89
2800.00	2799.89
2810.00	2809.88
2820.00	2819.88
2830.00	2829.87
2840.00	2839.87
2850.00	2849.86
2860.00	2859.86
2870.00	2869.85
2880.00	2879.85
2890.00	2889.84
2900.00	2899.84
2910.00	2909.83
2920.00	2919.83
2930.00	2929.82
2940.00	2939.82
2950.00	2949.81
2960.00	2959.81
2970.00	2969.80
2980.00	2979.79
2990.00	2989.78
3000.00	2999.78
3010.00	3009.77
3020.00	3019.76
3030.00	3029.76
3040.00	3039.75
3050.00	3049.74
3060.00	3059.74
3070.00	3069.73
3080.00	3079.72
3090.00	3089.72
3100.00	3099.71
3110.00	3109.70
3120.00	3119.69
3130.00	3129.68
3140.00	3139.68
3150.00	3149.67
3160.00	3159.67

APPENDIX 7

LOG ANALYSIS (PETROPHYSICS REPORT)

By

IKODA PTY LTD

YOLLA 2

565225

Petrophysics of Yolla 2

Submitted to
Premier Oil Australasia

June 1998

Prepared by
IKODA Pty Ltd.
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IKODA PTY LTD

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FIGURES

ENCLOSURE

YOLLA 2: PETROPHYSICAL STUDY

1.0 Executive Summary

A petrophysical study of core and log data of well Yolla No.2 has been carried out. Core and log porosity have been matched over the interval 3035.5 m – 3053.0 m (log depths), in order to predict porosity and water saturation values over the gross interval 2795 m – 2814 m, in the Eastern View Coal Measures. This interval is the only one in the well which contains substantial amounts of hydrocarbons. The estimated 'net effective pay' over this interval is 15.08 metres and the hydrocarbon column is 2.20 metres. These results are very close to those yielded by the Crocker Data Processing Package (complex lithology model), which are 14.63 and 2.11 metres, respectively.

2.0 Integration of Core and Log Data

Well Yolla 2 was cored over the interval 3033 m – 3051 m (core depth). Core and well log data had to be depth matched. Well log data was 2.44 metres lower than the core data. Figure 1 shows the depth match between the bulk density from well logs and the bulk density calculated from well core data ($\rho_{b(core)} = \rho_{ma(core)}(1 - \phi_{core}) + \phi_{core}$). Core data were interpolated to carry out the depth matching because the points were not equally spaced. Figure 4 shows a depth match between core and well log gamma ray. Well log data is again 2.44 m lower than the core data.

Once a depth match was achieved, a mineralogical model was developed such that the average porosity calculated from the model is as close as possible to the average core porosity and also, the average matrix density, derived from the model, is as close as possible to the average matrix density observed in the cores. A mineralogical model which satisfies these conditions relatively well, consists of quartz, kaolinite, pyrite and biotite. Of course, this is a great simplification of reality and other mineralogical models could have fitted the data equally well, particularly using other accessory minerals.

3.0 Estimation of Water Resistivity

The water resistivity below 2750 metres has been estimated using different procedures:

a) From Resistivity vs. Porosity crossplots over intervals assumed to be 100% water saturated.

b) From the comparison of Rt and Rxo in zones assumed to be 100% water saturated.

c) From the SP log (qualitatively).

d) From water samples.(because the formation water may be mixed with mud filtrate, these results are only indicative).

The SP log (despite being somewhat noisy), suggests that a reverse deflection exists over the interval 3025 m – 3055 m and also, over the interval 2855 m – 2880 m. The reverse SP suggests that the formation water is less saline than the mud filtrate. The mud filtrate resistivity is 0.045 ohmm at 112 C at (3045 m), so, the water resitivity has to be greater than this figure.

The quotient Rt/Rxo substantiates this trend. Over the interval 3025 m – 3055 m, for values of Rxo less than 2 ohmm, the average values of the quotient Rt/Rxo (which is equal to the quotient Rw/Rmf) is 3.17, implying that the formation water is 3.17 times more resistive than the mud filtrate. From this quotient, the water resistivity is calculated to be 0.1425 ohmm at 112 C (at 3045 m).

It should be pointed out that a water sample recovered at 3044 m had a resitivity of 0.40 ohmm at 25 C . This is equivalent to 0.139 ohmm at 112 C and this is the minimum possible value of the water resistivity. If the water sample has some mud filtrate contamination (which is less resistive than the formation water), the 'true' value of the formation water resistivity has to be more than 0.139 ohmm at 112 C. So, the figure of 0.1425 ohmm at 112 C derived from the quotient Rt/Rxo, seems a reasonable value for the formation water resistivity.

However, the interval 2860 m – 2870 m, which appears to be 100 % water saturated, has a formation water with a different salinity. A water sample recovered at 2860.4 m had an Rw of 0.32 ohmm at 25 C. Furthermore, the quotient Rt/Rxo over the interval is 2.73, suggesting that the formation water is more saline than in the deeper zone. As a result, the hydrocarbon bearing zone between 2795 m and 2815 m was evaluated using an Rw of 0.122 ohmm at 106 C, which is the average of the water sample value and the value derived from the quotient of resistivities.

The zones with different water salinity are separated by a shale about 70 metres thick, which can be correlated to Yolla 1 which from pressure information, forms a field – wide seal.

Figure 2 is a crossplot of Resistivity vs Porosity over the interval 2860 m – 2880 m. Applying the least squares method, an Rw of 0.203 ohmm and a cementation factor (m) of 1.635, are calculated. This value of Rw seems to be too high when compared with the value of 0.122 ohmm derived from the other two sources. The least squares method was applied again, but now assuming that Rw is a known value (0.122 ohmm). The calculated value of m is now 1.94 and this value was used to evaluate all the sands between 2763 m and 2936 m, including the gas bearing interval at 2795 m – 2814 m.

4.0 Well Log Evaluation below 2700 m

The well log evaluation was carried out using two different methods:

1) Probabilistic Method: This method has already been described in the document submitted to Premier by IKODA in March 1998 (entitled 'Evaluation of Yolla 1'). It uses the Neutron and Density logs and is based upon the mineralogical model described in Section 2.0 of the present document. The Waxman and Smits formula is used to calculate Sw. The clay, according to the model, is Kaolinite, to which a Cation Exchange Capacity of 0.1 meq/g has been assigned.

2) Complex Lithology Analysis (Crocker). The mineralogical model is slightly different for this method. Instead of Kaolinite, a 'shale' defined by crossplots is used. The Indonesia equation is used to calculate Sw. The method also includes the PEF log in the calculation of mineralogy and porosity. Figure 3 compares core and Crocker calculated porosity as a function of depth.

Both methods use the same values of m and Rw. According to both methods, there is just one 'pay' zone, the gross interval between 2795 and 2815 metres. A synthesis of the results of both methods is shown in the table below:

	PROBABILISTIC METHOD	COMPLEX LITHOLOGY (CROCKER)
NET EFFECTIVE PAY	15.08 m	14.63 m
AVERAGE POROSITY	0.194	0.199
AVERAGE Sw	0.246	0.286
HYDROCARBON COLUMN *	2.20 m	2.11 m

* Note: The 'hydrocarbon column' is given by $\Delta h \Sigma \phi (1-Sw)$, where Δh is the vertical distance between two consecutive data points (generally 0.1524 m or half a foot) and ϕ and Sw are the porosity and water saturation, respectively, of each point. The 'hydrocarbon column' represents volume of hydrocarbon (at reservoir conditions) per unit area and has therefore the dimension of length.

A graphic display of the Crocker Evaluation is enclosed.

5.0 Evaluation of the Upper Part of the Eastern View Coal Measures

The Eastern View Coal Measures has been evaluated over the interval 1860 m – 1903 m. A correlative interval in Yolla 1 did produce hydrocarbons on DST. A comparison of the resistivity values of the two wells over the correlative interval, shows that Yolla 2 does not contain hydrocarbons.

The evaluation of the well over the upper part of Eastern View Coal Measures has been done using the Crocker Complex Lithology Model.

The character of the SP log suggests that resistivity of the mud filtrate and the resistivity of the formation water are almost the same. The mud filtrate resistivity is 0.062 ohmm at 75 C (at 1920 m), and one would expect the formation water resistivity to be in that order of magnitude. This trend is confirmed by the quotient Rt/Rxo at certain points assumed to be 100% water saturated. Note that this formation water is much more saline than the formation water encountered deeper in the well. A value of 0.061 ohmm and a cementation factor of 2 were used in the Sw calculations.

It is concluded that the upper part of the Eastern View Coal Measures is not hydrocarbon bearing in Yolla 2 and the formation water existing in this zone has a relatively high salinity of about 50,000 ppm. MDT pressure gradient information also shows a water gradient through this interval. A graphic display of the Crocker evaluation for this interval is also enclosed.

6.0 Tabulation of Results

The tables in the next pages show the net sand, and average porosity and water saturation for the net sand, over a series of gross intervals, indicated by PREMIER. These results have been obtained with the Crocker package using the Complex Lithology model.

Points having an effective porosity greater than 5% and a clay volume fraction less than 30 % are considered to be 'sand'. A sand is considered to be 'pay' if Sw is less than 50 %. The column labeled 'Average Phi' contains two values if the sand contains hydrocarbons. The upper value refers to the average porosity of the sand and the lower to the average porosity of those points within the sand whose Sw is less than 50 %.

Tabulation of Results

Gross Interval	Sand Interval	Sand Thick.(m)	Net Pay (m)	Average Phi (%)	Average Sw (%)
2763.5 to 2792.5 m	2763.77 to 2764.69 m	0.91	0.0	19.84	
	2781.60 to 2782.06 m	0.46	0.0	11.29	
2792.5 to 2815.5 m	2795.02 to 2796.39 m	1.37	1.07	19.88 21.42	32.09
	2796.69 to 2797.61 m	0.91	0.76	14.96 15.69	40.84
	2798.22 to 2804.31 m	6.10	6.10	18.27 18.27	30.55
	2806.60 to 2808.12 m	1.52	1.52	23.11 23.11	20.99
	2808.88 to 2813.00 m	4.11	4.11	20.68 20.68	22.21
	2813.91 to 2815.44 m	1.52	0.91	19.22 22.06	42.05
2859.5 to 2895.0 m	2859.63 to 2863.90 m	4.27	0.0	22.71	
	2864.66 to 2870.15 m	5.49	0.0	19.31	
	2872.59 to 2873.65 m	1.07	0.0	18.99	
	2876.70 to 2880.06 m	3.35		17.26	
2895.0 to 2932.0 m	2899.71 to 2903.22 m	3.51	0.0	15.30	
	2904.29 to 2905.05 m	0.76	0.0	8.86	
3008.0 to 3030.0 m	3008.53 to 3010.20 m	1.68	0.0	12.55	
3030.0 to 3085.0 m	3030.17 to 3040.08 m	9.91	0.0	15.99	
	3042.21 to 3050.90 m	8.69	0.0	19.39	
Totals		55.63		18.24	
Net Pay			14.48	19.80	28.56

Tabulation or Results

(Upper Part of the Eastern View Coal Measures)

Gross Interval	Sand Interval	Sand Thick.(m)	Net Pay (m)	Average Phi (%)	Average Sw
1854.0 to 1875.5 m	0	0	0		
1875.5 to 1903.0 m	1876.04 to 1877.42 m	1.37	0	30.42	
	1878.03 to 1878.63 m	0.61	0	30.35	
	1879.09 to 1880.77 m	1.68	0	30.33	
	1880.92 to 1881.38 m	0.46	0	27.91	
	1892.35 to 1893.11 m	0.76	0	28.49	
	1893.42 to 1894.03 m	0.61	0	30.68	
	1894.79 to 1895.70 m	0.91	0	28.06	
	1899.06 to 1899.67	0.61	0	28.04	
Total Net Pay		**7.01 m**	0	**29.28**	

565233

YOLLA 2: Depth Match Between Core and Log Data

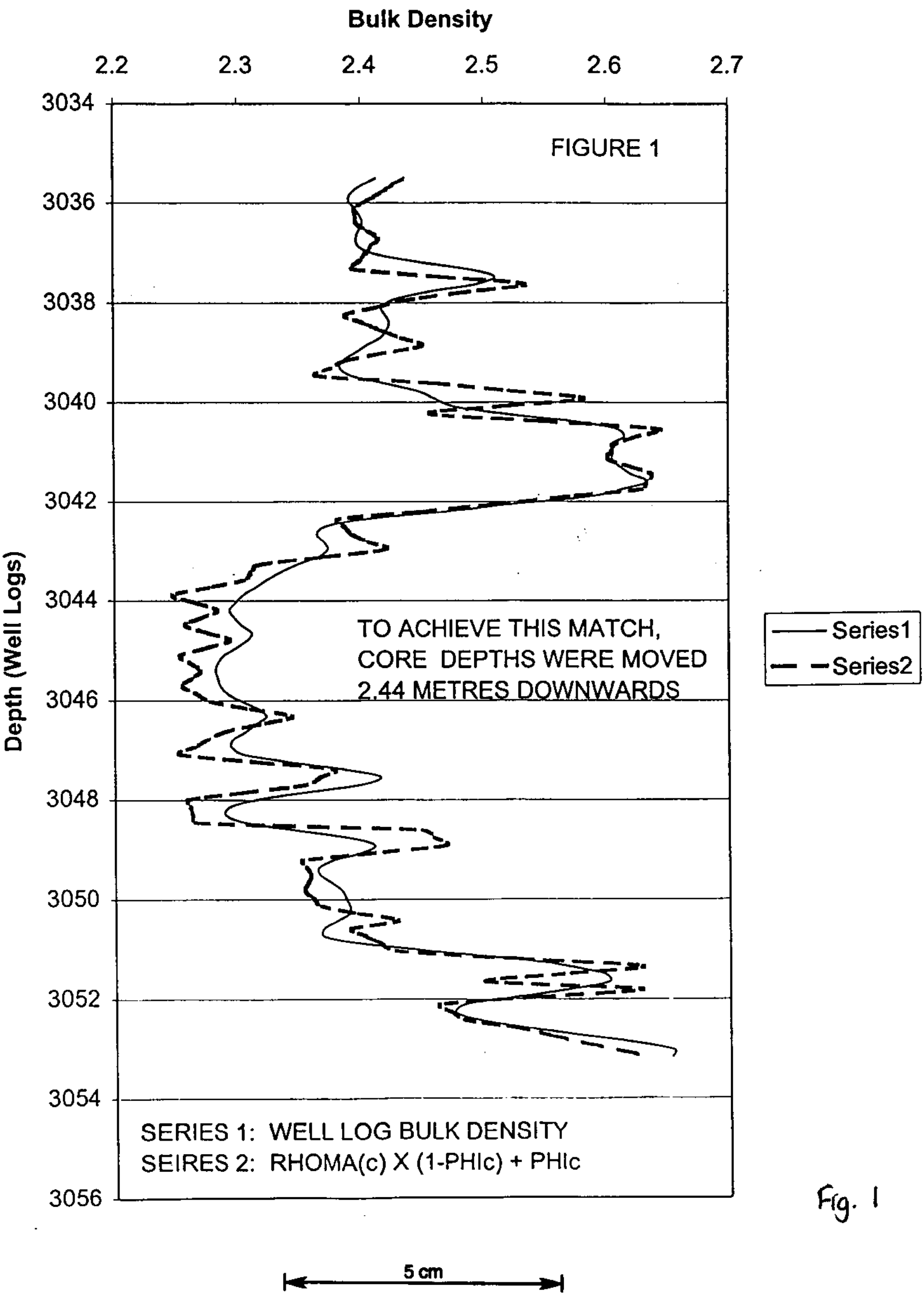

Fig. 1

YOLLA 2: Estimation of Rw (Interval 2860-2880 m)

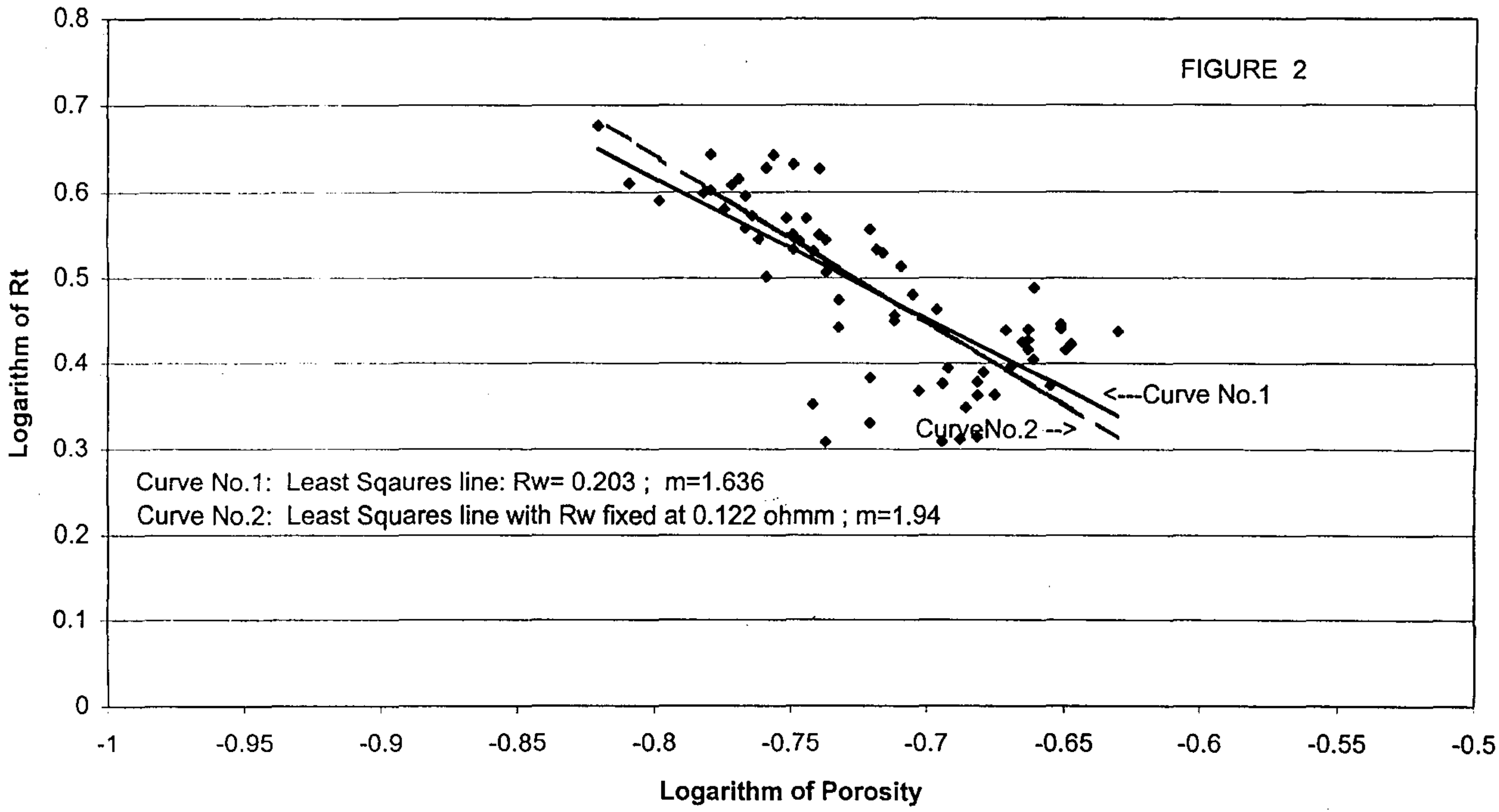

Fig. 2.

5 cm

YOLLA 2: Comparison of Core and Calculated (Crocker) Porosity

FIGURE 3

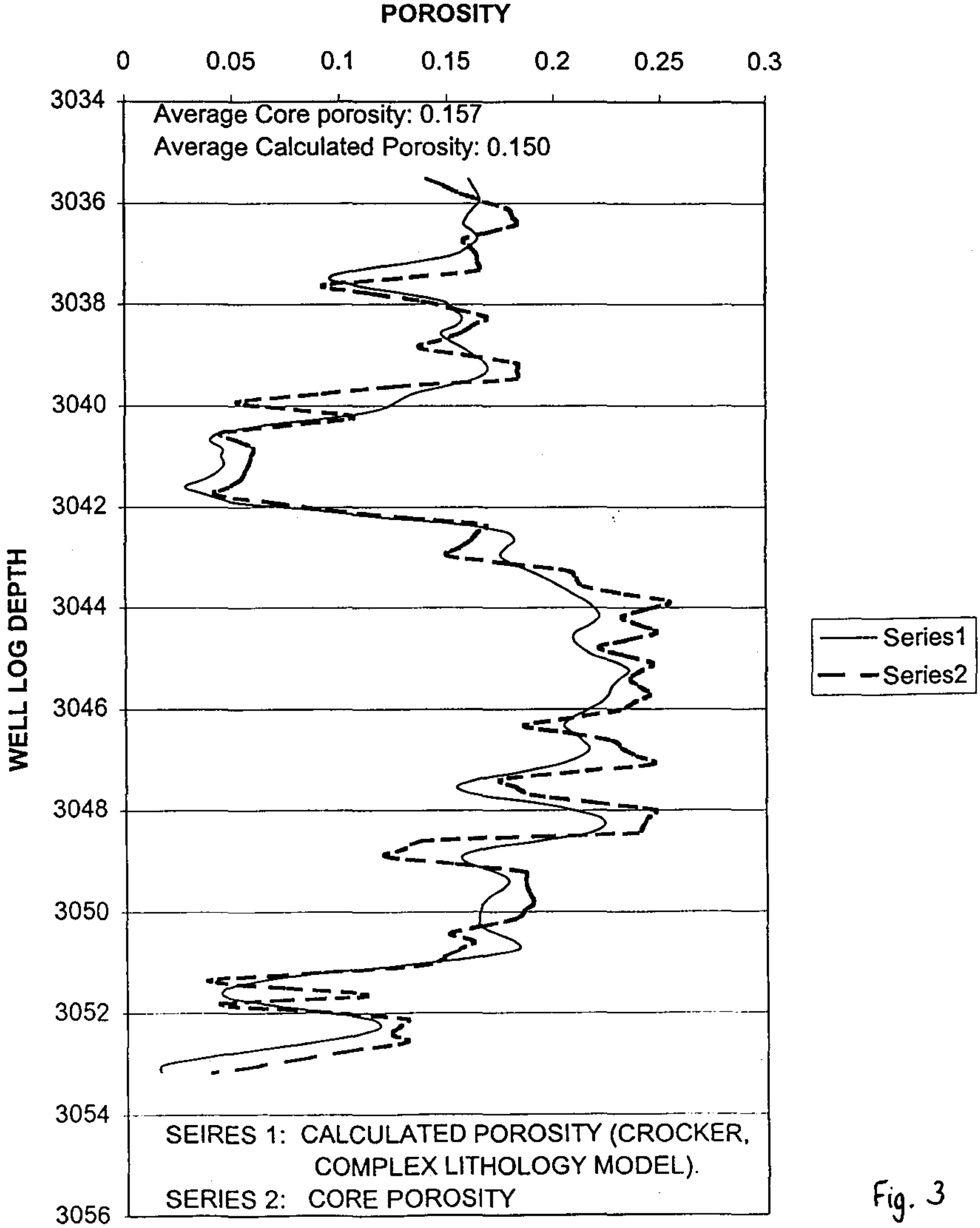

Fig. 3

5 cm

YOLLA 2: COMPARISON OF CORE AND WELL LOG GAMMA RAY

FIGURE 4

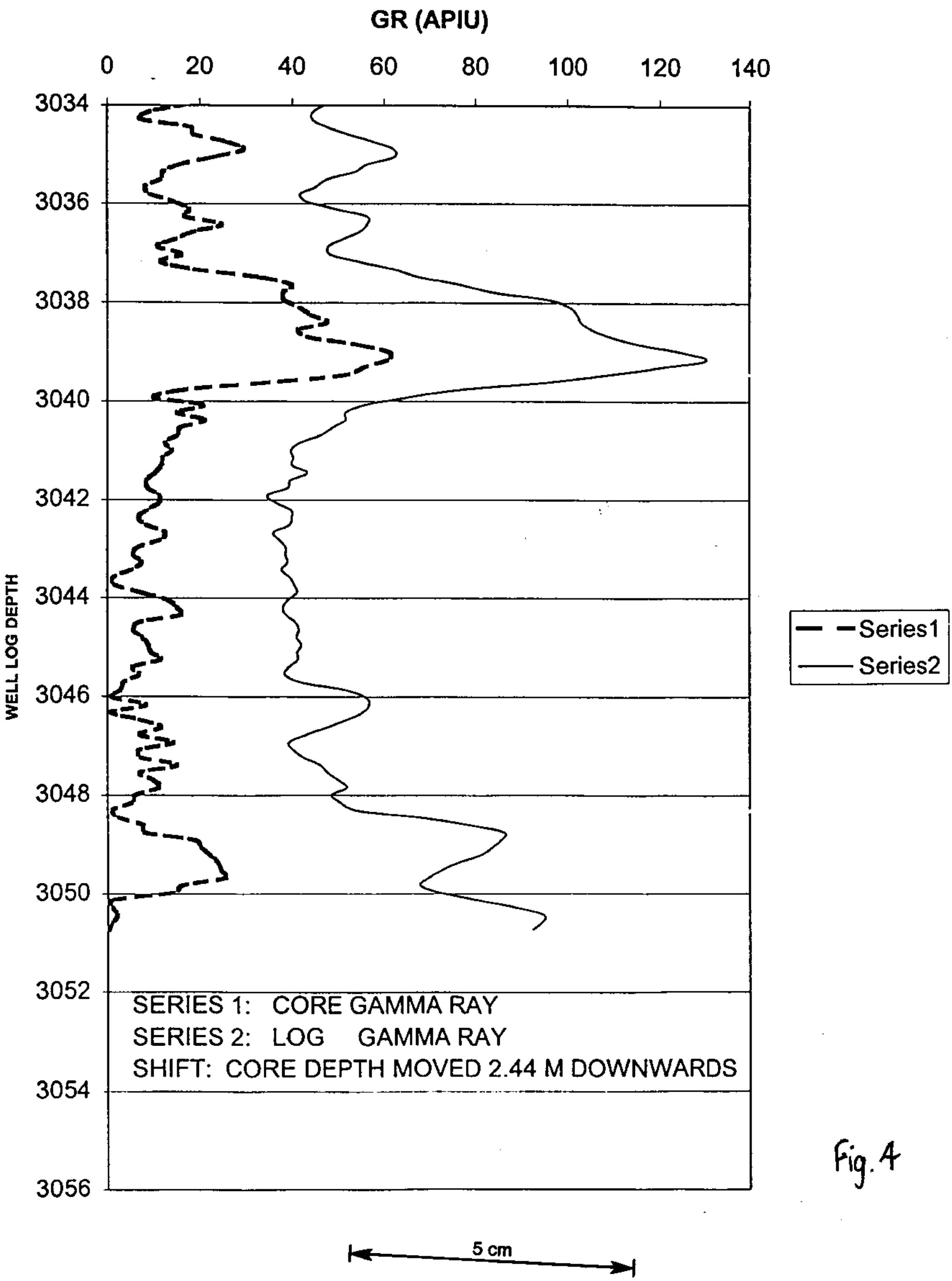

Fig. 4

ENCLOSURE 1 565237

OR-0447 Appendix 7

IKODA

COMPUTER PROCESSED LOGS

5 cm

COMPLEX LITHOLOGY MODEL

Company	
Well Name	YOLLA2
Field	
Country	
State	
Province	
Field Location	
Latitude	
Longitude	
Permanent Datum	MSL
Elevation of PD	
Elevation of KB	12.50 M
Elevation of DF	
Elevation of RT	
Elevation Ground lv	
Log measured from	
Drill measured from	
Services	
Other Services Ln 1	
Service company	
Log date	
Date computed	11-06-98
Date plotted	23-06-98
Time plotted	13:27:56

PETROLOG SOFTWARE Revision 6.20

CROCKER DATA PROCESSING

Run number	1

COMPUTATION PARAMETERS

DEPTH INTERVAL	RW	TEMP	GR MIN	GR MAX	R CLAY	RHOB CLAY	PHIN CLAY	t CLAY	RHOH	a	m	n
2750.1 - 2960.1	.122	106.4	35	120	100	2.70	.350	100	.30	1.00	1.94	2.00
2960.2 - 3060.0	.143	111.2	35	120	100	2.70	.350	100	.30	1.00	2.10	2.00

LITHOLOGIES

OIL
GAS
MOVED OIL
MOVED GAS
Shales
Rock Structure
Water
Porosity

LOG DESCRIPTION

ROMA-CPX	Apparent Matrix Density (Complex Litho Model)
SW -CPX	Formation Water Saturation <=1.0 (Complex Litho Model)
PHXO-CPX	Product (PHIE * SXO) (Complex Litho Model)
PHIE-CPX	Effective Porosity (Complex Litho Model)
DD	Caliper-bit size
PHSW-CPX	Product (PHIE * SW) (Complex Litho Model)
VCL	Volume of clay
PHIE-CPX	Effective Porosity (Complex Litho Model)
MINERAL	Special Mineral Table output flag (Salt, Trona, Anhydrite, Gypsum, Coal)
SPI -CPX	Secondary Porosity Index = PHIT-PHIS >=0 (Complex Litho Model)
PAY -CPX	Flag to indicate is level is part of pay zone (Complex Litho Model)

SPECIAL MINERALS

Coal

ENCLOSURE 2

OR-0447 Appendix 7.

IKODA 565238

5 cm

COMPUTER PROCESSED LOGS

COMPLEX LITHOLOGY MODEL

Company	PremierOil Australas
Well Name	Yolla-2
Field	Yolla
Country	
State	Tasmania
Province	
Field Location	Permit T / RL1
Latitude	
Longitude	
Permanent Datum	MSL
Elevation of PD	
Elevation of KB	12.50 M
Elevation of DF	
Elevation of RT	
Elevation Ground lv	
Log measured from	
Drill measured from	
Services	
Other Services Ln 1	
Service company	
Log date	16-MAY-1998
Date computed	23-06-98
Date plotted	23-06-98
Time plotted	17: 31: 14

PETROLOG SOFTWARE Revision 6.20

CROCKER DATA PROCESSING

Run number	
Max recorded temp 1	114.00 degC

COMPUTATION PARAMETERS

DEPTH INTERVAL	RW	TEMP	GR MIN	GR MAX	R CLAY	RHOB CLAY	PHIN CLAY	t CLAY	RHOH	a	m	n
1800.0 - 1810.1	.062	77.8	20	91	4.0	2.35	.405	100	.80	1.00	2.15	2.00
1810.2 - 1950.0	.061	79.9	50	91	4.0	2.35	.405	100	.80	1.00	2.00	2.00

LITHOLOGIES

- OIL
- GAS
- MOVED OIL
- MOVED GAS
- Shales
- Rock Structure
- Water
- Porosity

LOG DESCRIPTION

ROMA-CPX	Apparent Matrix Density (Complex Litho Model)
SW -CPX	Formation Water Saturation <=1.0 (Complex Litho Model)
PHXO-CPX	Product (PHIE * SXO) (Complex Litho Model)
PHIE-CPX	Effective Porosity (Complex Litho Model)
DD	Caliper-bit size
PHSW-CPX	Product (PHIE * SW) (Complex Litho Model)
VCL	Volume of clay
PHIE-CPX	Effective Porosity (Complex Litho Model)
MINERAL	Special Mineral Table output flag (Salt, Trona, Anhydrite, Gypsum, Coal)
SPI -CPX	Secondary Porosity Index = PHIT-PHIS >=0 (Complex Litho Model)
PAY -CPX	Flag to indicate is level is part of pay zone (Complex Litho Model)

SPECIAL MINERALS

- Coal

APPENDIX 8

MDT ANALYSIS

By

FEKETE AUSTRALIA PTY LTD

YOLLA 2

565240

YOLLA-2 MDT RESULTS

Prepared For: Premier Oil
Prepared By: Fekete Australia Pty Ltd

August 1998

Fekete
Australia Pty Ltd

CONTENTS

FIGURES

Yolla-2 MDT Results

Introduction

The MDT was run from 16/5/98 13:40 to 17/5/98 20:00. The MDT program involved both formation pressure testing and reservoir fluid sampling. The primary goals of the MDT program were:

a) Gain sufficient formation pressure data to differentiate between any distinct pressure zones.

b) If water-bearing sands are encountered, sufficient formation pressure data are collected to define the water leg gradient and therefore any gas-water contacts.

c) Collect sufficient quantity and quality of reservoir fluids from distinct reservoir zones to provide a complete reservoir fluid compositional picture throughout the reservoir.

d) Collect a water sample to determine water properties for petrophysical analysis.

e) Collect reservoir fluid samples to remove the need for production testing some of the reservoir zones and flowing hydrocarbons to surface.

The program accomplished goals a, b and e. It failed to accomplish goals c and d due to a malfunction of the pumpout module of Schlumberger's MDT tool.

Pressure Pre-tests

Forty-four pre-tests were completed, and five of them were unsuccessful. The five unsuccessful tests were on rock that was tight and would have taken too long to build up.

Of the remaining thirty-nine pre-tests, six were in the Upper EVCM, twenty-two were in the Intra-EVCM Zone 1 and eleven were in the Intra-EVCM zone 3. A plot of the Yolla-1 and Yolla-2 pre-tests is shown in Figure 1. Following are the conclusions from the MDT pre-tests.

1. The water gradient for the Upper EVCM is 1.45 psi/m which corresponds to a water with 37,000-ppm NaCl and 1.02 specific gravity. This is based on six pre-test points from 1876.0 to 2008.0 mKB. The gradient is shown in Figure 2. The pre-tests from Yolla-1 are also plotted for comparison.

2. The gas gradient for the Intra-EVCM Zone 1 is 0.323 psi/m, which corresponds to a gas with specific gravity of 0.227. This is based on twelve pre-test points from 2796.0 to 2815.0 m KB. Figure 3 shows the Intra-EVCM Zones 1 and 3 with Yolla-1 results plotted for comparison. Figure 4 is a close-up of the Zone 1 gas leg.

3. The water gradient for the Intra-EVCM Zone 1 is 1.44, which corresponds to water with 26,000 ppm NaCl and a specific gravity of 1.015. This is based on six pre-test points from 2860.4 to 2877.7 m KB. Figure 5 is a close-up of the water leg for Zone 1.

4. The gas-water contact for the Intra-EVCM Zone 1 is 2846.5 m KB (2834 mSS). Within the Yolla-2 well there is a 45-meter thick shale zone, so the contact is based on extrapolation of the gas and water gradients. Figure 6 shows the extrapolated gas water contact. Since the lines are projected for tens of meters, there is a one or two meter uncertainty in their intersection point.

5. Zone 3 was wet. The estimated water gradient is 1.43 psi/m (13,000 ppm NaCl, 1.007 SG). The gradient is based on seven points from 3031.0 to 3048.4 m KB. Figure 7 shows a close-up of the Zone 3 water gradient. There is some ambiguity on the pressure vs depth profile which will affect the extrapolated gas-water contact.

6. The gas water contact for the Intra-EVCM Zone 3 is based on the water zone pre-tests from Yolla-2 and the gas zone pre-tests from Yolla-1. There is some uncertainty in these pressure profiles, so there is a range of possible gas-contacts. The shallowest estimated contact is 3003.5 m KB (2991 mSS). The deepest estimated contact is 3014.5 m KB (3002 m SS). This is illustrated in Figure 8.

   The pre-tests in the 3031.0 to 3039.5 m KB range are probably slightly supercharged. It is unlikely that their slightly higher pressure is due to the two meter shale at 3042.5 being continuous across the entire field. Supercharging is reasonably probable since the sand is fining upward, and the mini-probe ambient permeability measurements from the core at these depths are fairly low (5.5 to 43 mD).

Sampling

Eight samples were obtained from the MDT program. All of the samples were contaminated with drilling fluids, due to the failure of the MDT pumpout module. None of the water samples can be used directly to give representative resistivity values for petrophysical work. There is one gas sample (from 2802 m KB) which is probably representative of the Intra-EVCM Zone 1 gas.

The first sample was a 450cc water sample from the Intra-EVCM Zone 3 water at 3044.0 m KB. The pumpout module failed during sampling. The fluid resistivity hadn't stabilized so the validity of the sample was suspect. Subsequent lab analysis confirmed that the sample was contaminated with drilling fluid.

One 450cc and one 2 ¾ gallon sample were taken from the Intra-EVCM Zone 1 gas leg at 2815.0 m KB. The samples were taken without the pumpout module, as it was not working. These samples were analysed on the rig. They were contaminated with drilling fluid.

The tool was pulled to attempt to repair the pumpout module. The first sample for the second run was another 450 cc sample in the Intra-EVCM Zone 1 gas leg, at 2810 m KB. The pumpout module failed after 22.5 minutes. The optical fluid analyser indicated that the fluid sample was slightly contaminated. When this sample reached the lab, there were only 10 cc of fluid available for analysis. The fluid either leaked out during transport or the sample chamber didn't work properly during sampling.

The next sample attempt was a 450 cc sample also in the Intra-EVCM Zone 1 gas, at 2802 m KB. The pumpout module failed five times. The optical fluid analyser showed that the fluid was contaminated with water just three minutes before the pumpout stopped and the sample was taken. Some water was observed when the sample was being transferred into the storage chamber at the lab. Despite the small amount of water, this sample is the most reliable sample obtained.

A one-gallon sample was obtained at 2811.8 m KB in the Intra-EVCM gas leg. The pumpout failed after 17 minutes, but the sample looked clean on the optical fluid analyser. This sample was drained on the rig to obtain a preliminary estimate of fluid composition.

The next sample was a 450 cc water sample from the Intra-EVCM at 2860.5 m KB. The pumpout failed three times. The optical fluid analyser indicated some contamination. The lab results confirmed that this sample was contaminated with drilling fluid.

Another attempt was made to obtain a representative sample from the lower part of the Intra-EVCM gas zone 1 at 2815 m KB. Over an hour was spent, during which the pumpout module failed 31 times. The pumpout chamber would run for an average of just over one minute at a time, with the longest run being just over four minutes. The fluid sample still looked contaminated with the optical fluid analyser. The lab confirmed that a lot of water was present in the sample.

Tom Fontaine
Manager Reservoir Engineering

565245

Premier Oil Australasia

WIRELINE LOGGING – RFT (PRESSURE) REPORT

WELL NO:
DATE:
PAGE OF

CONTRACTOR: Schluberger
ENGINEER: Y. Frans
WITNESS: Frankiewicz / Clota

WELL NO: Yolla 2 LOG NO: One
DEEPEST SURVEY DATA
DEPTH: MD: TVD: ANGLE: DEG:

LOG TYPE: MDT
REFERENCE LOG: PEX/AS
REFERENCE LOG NO: One

TEST NO.	DEPTH		HYDROSTATIC PRESSURE BEFORE TEST		SET TOOL	FORMATION PRESSURE		RETRACT TOOL	HYDROSTATIC PRESSURE AFTER TEST		DRAW DOWN	MOBILITY mD	TEMP ^{0}C
	MEASURED	TRUE VERTICAL	STRAIN	HP		STRAIN	HP		STRAIN	HP			
			PSIG	PSIA	TIME	PSIG	PSIA	TIME	PSIG	PSIA	PSI		
1	1913.3		3110.2	3121.7		2811.0	2821. 1		3109.6	3121.2	2600	27.6	87.37
2	1931.0		3137.0	3149.3		2835.5	2845.6		3136.9	3148.1	2790	127.4	88.5
3	1948.5		3164.3	3176.7		-	-		3163.4	3176.5	14	Tight	87.6
4	1951.0		3167.4	3180.3		2863.4	2874.1		3167.2	3180.0	2861	5163.7	88.01
5	1969.3		3198.2	3211.4		2889.8	2900.7		3197.1	3210.0	2594	22.3	88.4
6	2008.0		3259.6	3273.1		2945.5	2956.6		3258.1	3271.3	2723	25.6	88.49
7	2764.5		4450.1	4469.3		4150.2	4167.5		4449.8	4468.9	4073	113.6	114.1
8	2765.5		4450.4	4469.7		4151.7	4169.45		4447.4	4466.5	3653	11.3	114.3
9	2796.0		4493.7	4512.7		4144.9	4162.35		4492.3	4511.6	4051	65.9	115.0
10	2798.8		4496.1	4515.6		4145.6	4163.1		4497.3	4516.8	4365	216.4	115.1
11	2801.3		4500.7	4520.3		4146.5	4164.15		4500.0	4519.4	3513	12.4	115.8
12	2802.2		4501.9	4521.5		4146.4	4164.07		4500.8	4520.3	4114	181.5	116.0
13	2804.0		4503.0	4522.6	18:30	4147.1	4164.86	18:20	4501.6	4521.2	3801	17.7	116.2
14	2807.5		4505.5	4525.13	19:00	4148.3	4165.96	19:05	4504.2	4523.79	4104	96.7	116.3
15	2809.5		4506.6	4526.26	19:15	4149.0	4166.71	19:20	4506.1	4525.71	4127	197.5	116.5
16	2811.8		4511.5	4531.40	19:25	-	-	19:30	-	-	-	Tight	116.8
17	2811.5		4521.3	4541.59	19:35	4149.3	4167.33	19:40	4521.2	4541.31	4053	53.0	117.1
18	2812.5		4522.8	4542.89	19:45	4149.6	4167.60	19:50	4522.7	4542.70	4084	70.0	117.2
19	2814.5		4526.0	4546.06	19:55	4150.8	4168.75	20:00	4525.9	4546.00	4128	142.5	117.7

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WIRELINE LOGGING – RFT (PRESSURE) REPORT

WELL NO:
DATE:
PAGE OF

CONTRACTOR: Schluberger
ENGINEER: Y. Frans
WITNESS: Frankiewicz / Clota

WELL NO: Yolla 2 LOG NO: One
DEEPEST SURVEY DATA
DEPTH: MD: TVD: ANGLE: DEG:

LOG TYPE: MDT
REFERENCE LOG: PEX/AS
REFERENCE LOG NO: One

TEST NO.	DEPTH		HYDROSTATIC PRESSURE BEFORE TEST		SET TOOL	FORMATION PRESSURE		RETRACT TOOL	HYDROSTATIC PRESSURE AFTER TEST		DRAW DOWN	MOBILITY mD	TEMP ^{0}C
	MEASURED	TRUE VERTICAL	STRAIN	HP		STRAIN	HP		STRAIN	HP			
			PSIG	PSIA	TIME	PSIG	PSIA	TIME	PSIG	PSIA	PSI		
20	2815.2		45526.7	4546.83	20:05	-	-	20:10	-	-	1474	Tight	118.2
21	2815.0		4526.4	4546.67	20:15	4150.8	4168.82	20:20	4526.3	4546.43	3920	19.6	118.2
22	2860.4		4596.1	4616.62	20:30	4181.7	4199.73	20:35	4596.4	4616.75	4156	122.6	119.0
23	2862.5		4599.7	4620.08	20:43	-	-	20:46	-	-	1267	Tight	119.7
24	2862.3		4599.3	4619.64	20:55	4184.4	4202.30	21:00	4599.1	4618.99	3947	25.0	119.8
25	2866.0		4604.9	4624.68	21:05	4189.2	4207.20	21:10	4604.7	4624.75	4285	45.9	119.9
26	2870.9		4612.3	4632.59	21:18	4195.1	4213.79	21:25	4612.0	2632.17	1946	2.6	120
27	2872.8		4614.9	4635.16	21:30	4198.5	4216.45	21:35	4615.0	4635.2	4025	56.3	120.6
28	2877.7		4622.8	4643.08	21:45	4207.0	4225.32	21:50	4622.6	4643.04	3326	6,0	120.8
29	2900.8		4658.3	4678.91	21:55	4243.2	4262.36	22:20	4658.4	4678.91	1104	0.4	121.1
30	2902.3		4660.7	4681.25	22:30	4257+	4277+	22:40	4660.1	4681.2	1084	Building SC- 0.2	122.5
31	2902.0		4660.2	4680.61	22:50	4246.1	4265.38	23:00	4660.3	4680.8	2145	2.5	122.7
32	3009.3		4824.5	4845.25	23:40	4455+	4473+	22:50	4824.3	4845.1	964	Building SC – 0.2	125.4
33	3009.7		4824.7	4845.88	23:55	-	-	00:00	4824.5	4845.61	862	Tight	125.9
34	3009.0		4823.9	4844.58	00:05	4456.1	4475.84	00:25	4823.9	4844.73	1219	0.9	126.1
35	3031.0		4858.0	4879.20	00:35	4415.0	4434.40	00:45	4858.2	4879.33	3281	5.4	126.9
36	3036.3		4866.4	4887.56	00:50	4420.1	4439.35	01:00	4866.4	4887.54	3332	5.4	127
37	3039.5		4871.4	4892.51	01:10	4424.1	4443.22	01:15	4871.3	4892.38	4021	13.7	127.3
38	3044.0		4878.2	4899.28	01:20	4423.9	4442.9	01:25	4878.2	4899.17	4345	55.5	127.7

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Premier Oil Australasia

WIRELINE LOGGING – RFT (PRESSURE) REPORT

WELL NO:
DATE:
PAGE OF

CONTRACTOR
ENGINEER:
WITNESS:

WELL NO: LOG NO:

DEEPEST SURVEY DATA

DEPTH: MD: TVD: ANGLE: DEG:

LOG TYPE:
REFERENCE LOG:
REFERENCE LOG NO:

TEST NO.	DEPTH		HYDROSTATIC PRESSURE BEFORE TEST		SET TOOL	FORMATION PRESSURE		RETRACT TOOL	HYDROSTATIC PRESSURE AFTER TEST		DRAW DOWN	MOBILITY mD	TEMP ^{0}C
	MEASURED	TRUE VERTICAL	STRAIN	HP		STRAIN	HP		STRAIN	HP			
			PSIG	PSIA	TIME	PSIG	PSIA	TIME	PSIG	PSIA	PSI		
40	3048.4		4884.9	4905.54	02:35	4429.8	4448.63	02:37	4884.4	4905.9	4448	93.4	130.2
41	3063.7		4908.4	4929.41	02:45	4485.0	4504+	02:58	4908.5	4929.59	1882	Building SC – 1.9	130.3
42	3064.0		4909.2	4930.2	03:05	4479.0	4498.56	03:15	4909.0	4930.1	2693	3.1	129.4
43	2809.5		4515	4534.2	11:25	4150.6	4167.2	11:28	4544.2	4533.78	4100	13.8	
50	3046.5		4875.2	4896.1	15:58	4428.3	4447.10	16:03	4879.9	4900.2	4290	44.3	131.3
51	3033.0		4859.3	4879.7	16:14	4415.4	4434.27	16:17	4858.9	4879.3	3399	6.5	133.2
53	1876.0		3051.1	3060.43	18:30	2763.2	2772.6	18:25	3050.3	3060.79	1879	4.6	94.7

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WIRELINE LOGGING – MDT (SAMPLES) REPORT

CONTRACTOR: Schlumberger

ENGINEER: Y. Frans / S. Hookway

WITNESS: Frankiewicz / Clota

WELL NO: Yolla 2 LOG NO: One

SURVEY DATA

DEPTH: MD: 3164m TVD: 3163.7m ANGLE: 2.2° at 3146.8m °DEG:

LOG TYPE: MDT

REFERENCE LOG: PEX

REFERENCE LOG NO: One

TEST NO.	DEPTH		MDT PRESSURE DATA						MDT SAMPLE DATA						CHAMBER RECOVERY		
			HYDRO		FORMATION			HYDRO	LOWER CHAMBER		Chamber		TOTAL TIME		PRESSURE	GAS	FLUID
	MEASURED	TRUE VERTICAL	BEFORE TEST	SET TOOL	BEFORE SAMPLE	AFTER SAMPLE	RETRACT TOOL	AFTER TEST	Pump on	Volume Lts	OPEN	CLOSE	450cc	X GALL CHAMBER			
			QC PSIA	TIME	QC PSIA		TIME	PSIA	TIME		TIME	TIME	MINS	MINS	PSI	FT^3	LTS
39	3044		4899.5	01:30	4443.01	4442.68	02:20	4898.8	01:35	45	02:15	02:15	0.1		N/A	N/A	400cc
43	3031		48728.73	03:29	4434				03:30	- Pumpout failed							
44	2814.5		2541.5	04:20	low perm abort												
45	2815.0		4542.39	04:35	4168.7	4168.5	04:45		03:40	03:43	03:44	03:44	1	3 2.75gal.	1800-2.75g N/A	61 RTSTM	8000 cc-23/4gal 390 cc-450cc
46	2810.0		4534.1	11:46	4167.1	4167.0	12:30	4521.75	11:47	30	12:14	12:25	9 min		Sealed for PVT	S/N 0185	
47	2802.0		4521.4	12:42	4164.4	4164.6	13:52	4521.3	13:44	30	13:44	13:50	6 min		Sealed for PVT	S/N 0160	
48	2811.8		4535.3	14:20	4167.1	4167.7	14:50	4534.0	14:40	33	14:40	14:48		8 min /1 gal	2060	18.8	70 cc cond 50 cc mud
49	2860.4		4609.8	15:00	4199.9	4199.15	15:40	4607.3	15:35	28	15:35	15:38	3 min		Sealed for PVT	S/N 0122	
52	2815.0		4534.9	16:33	4167.9	4168.5	17:35	4529.7	16:35	24	17:28	17:32	4 min		Sealed for PVT	S/N 0156	

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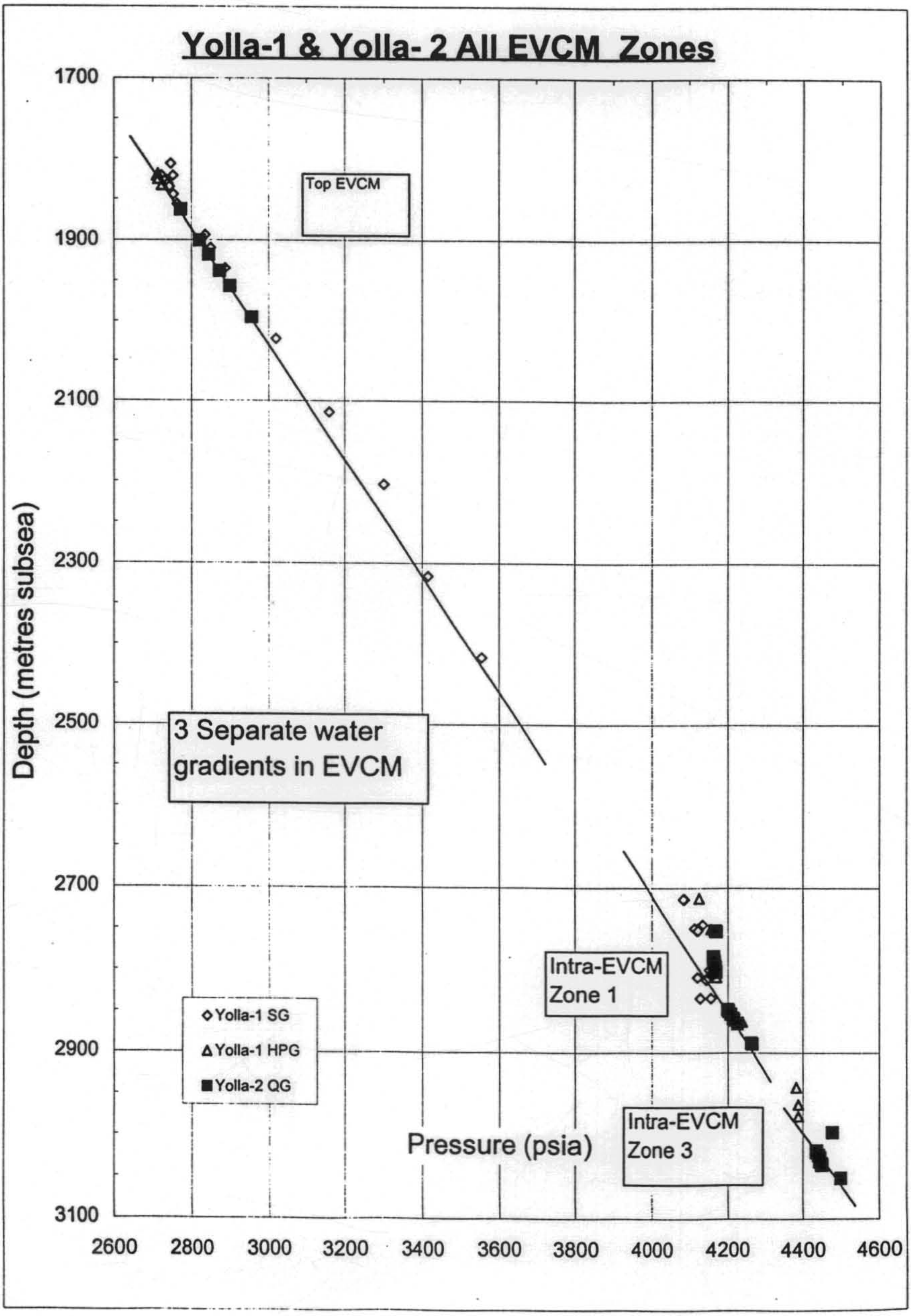
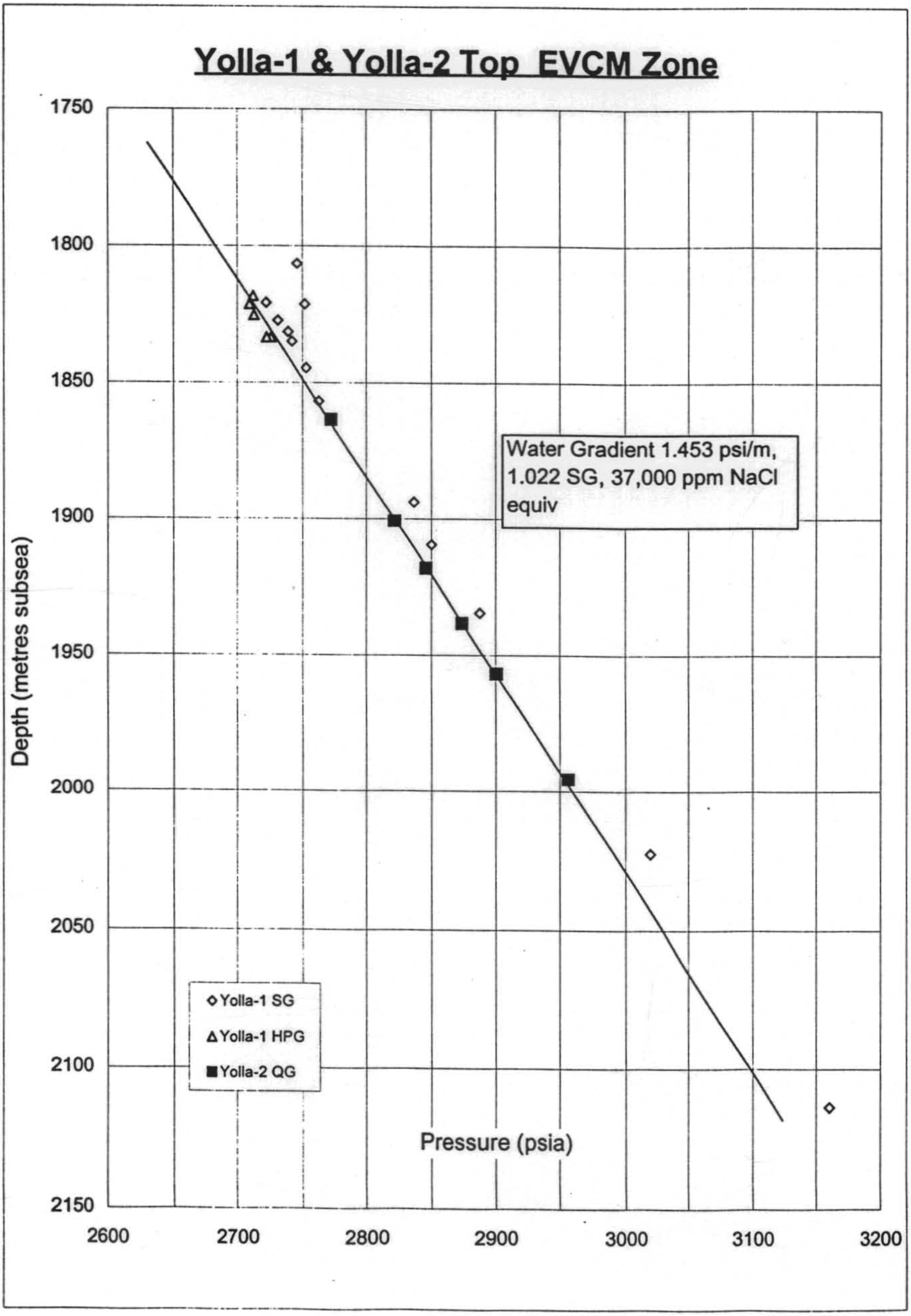
FIGURE 1



565250
FIGURE 2



565251

FIGURE 3

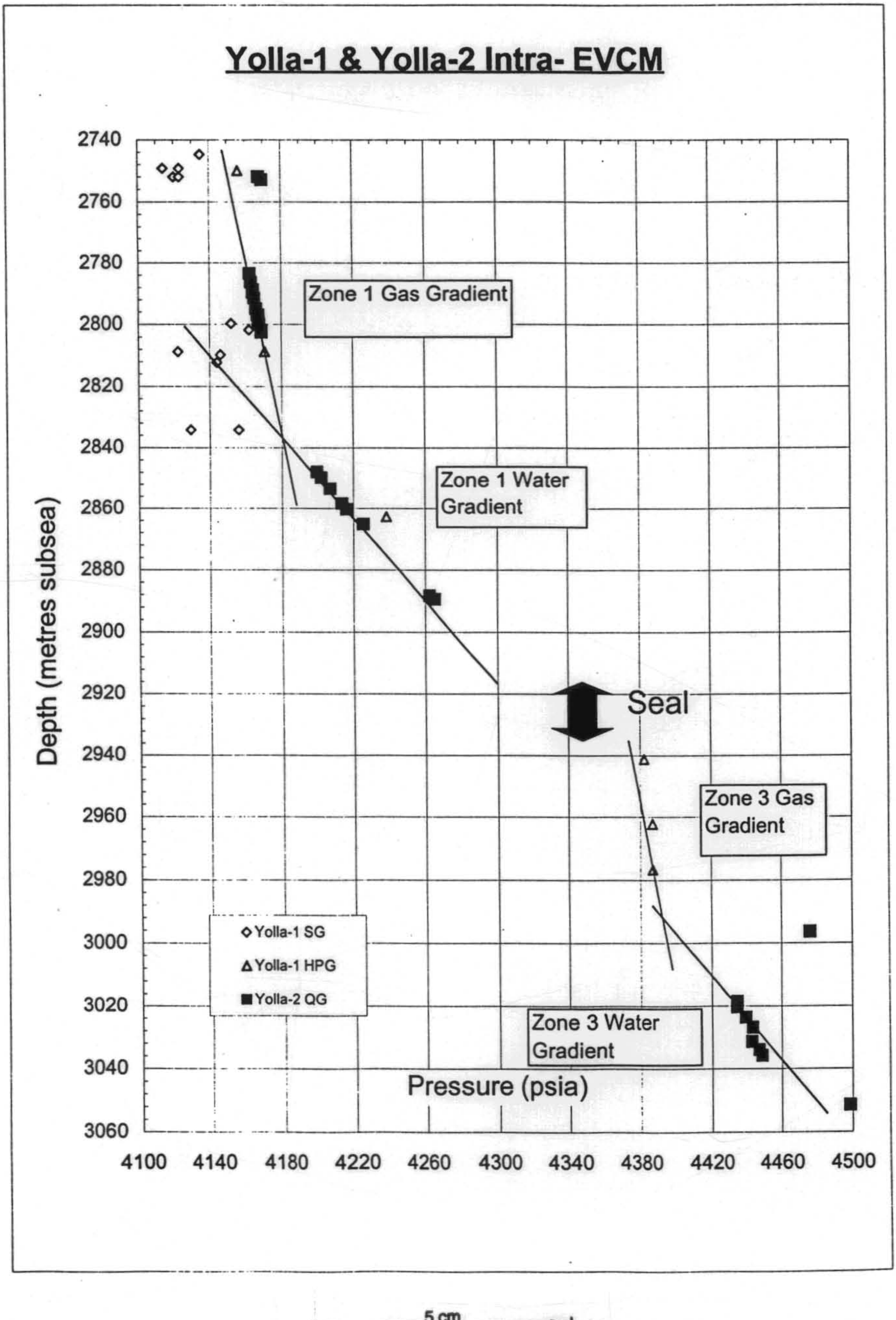
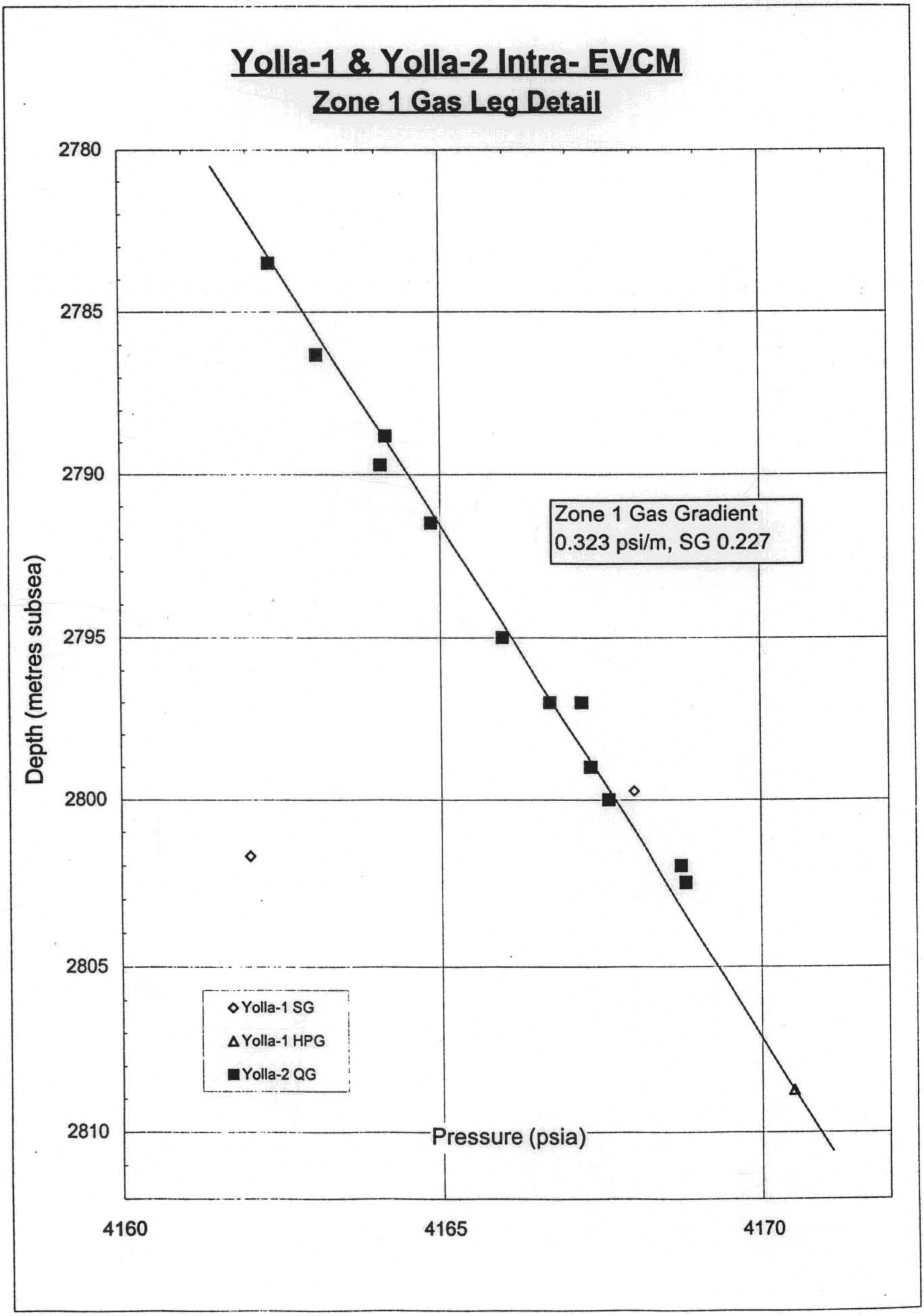


FIGURE 4

565252



5 cm

FIGURE 5

565253

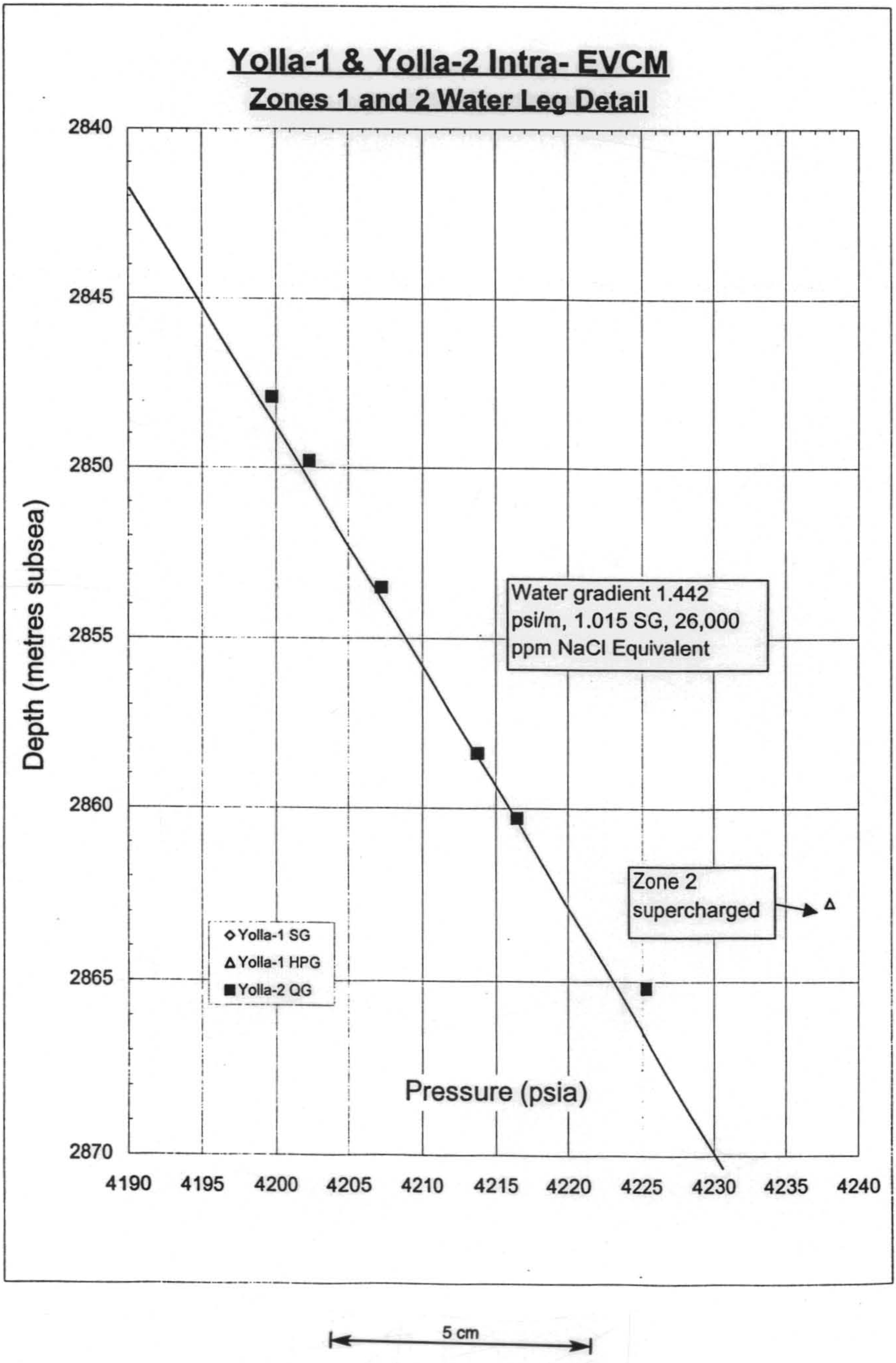


FIGURE 6

565254

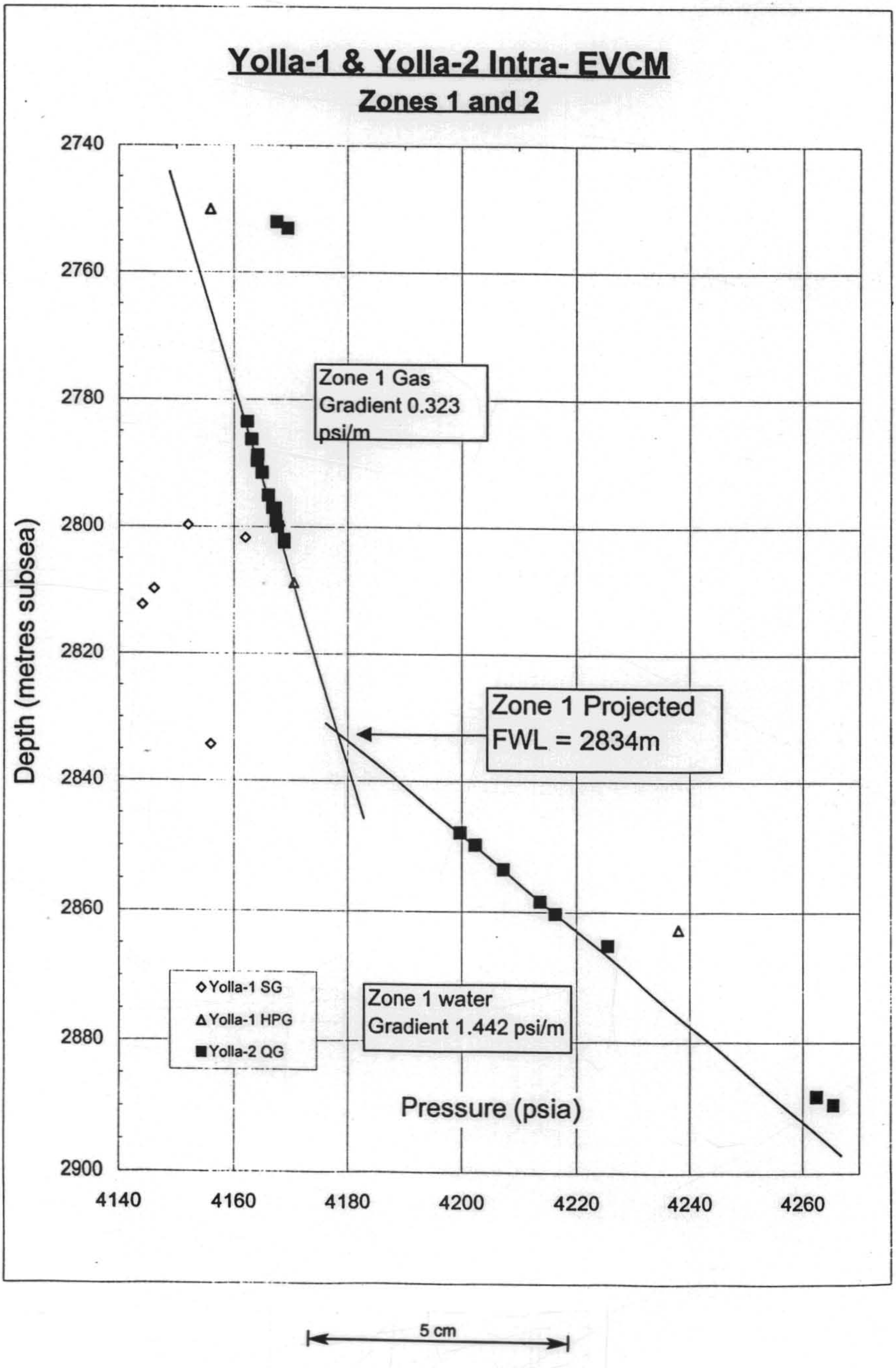
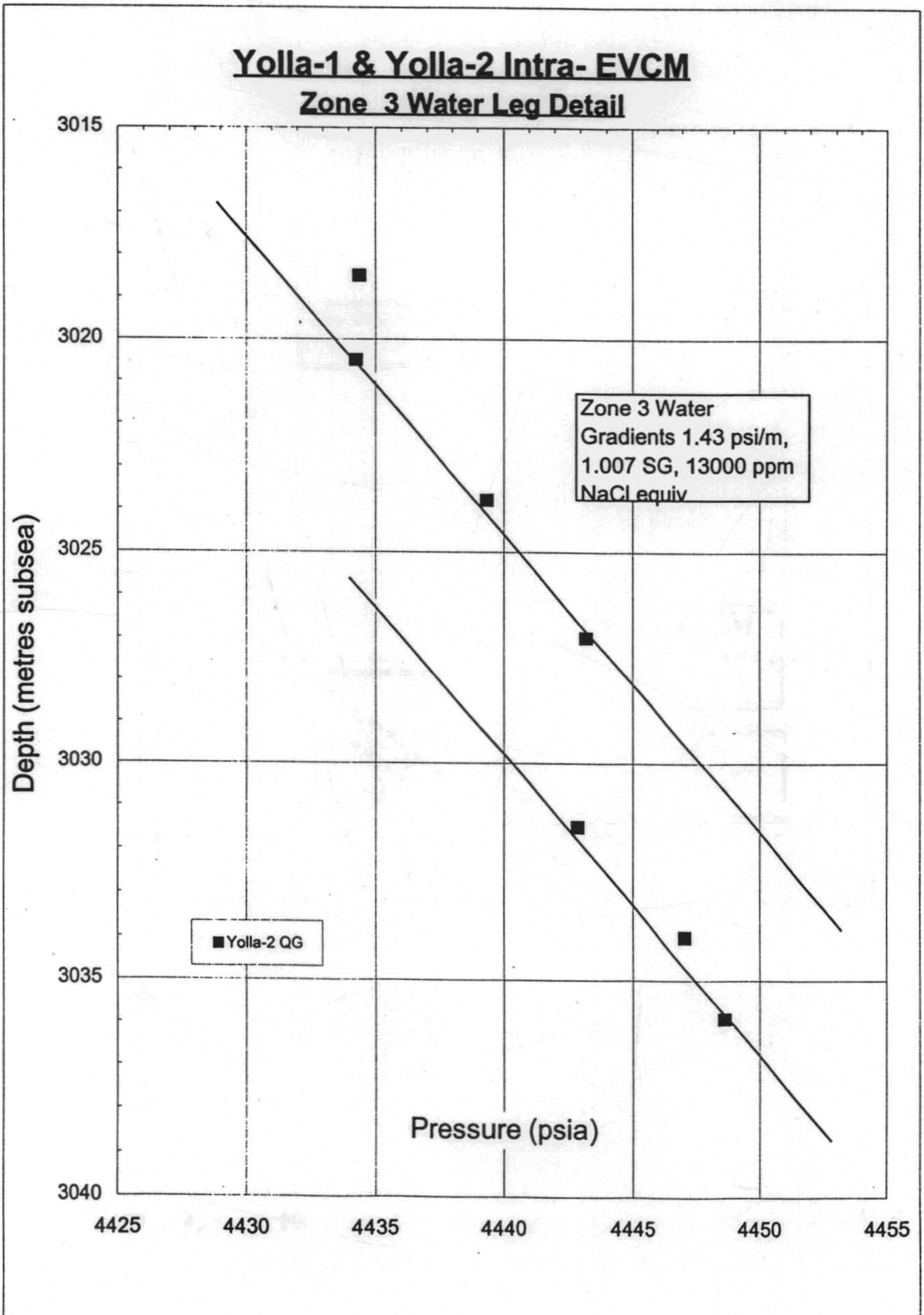


FIGURE 7

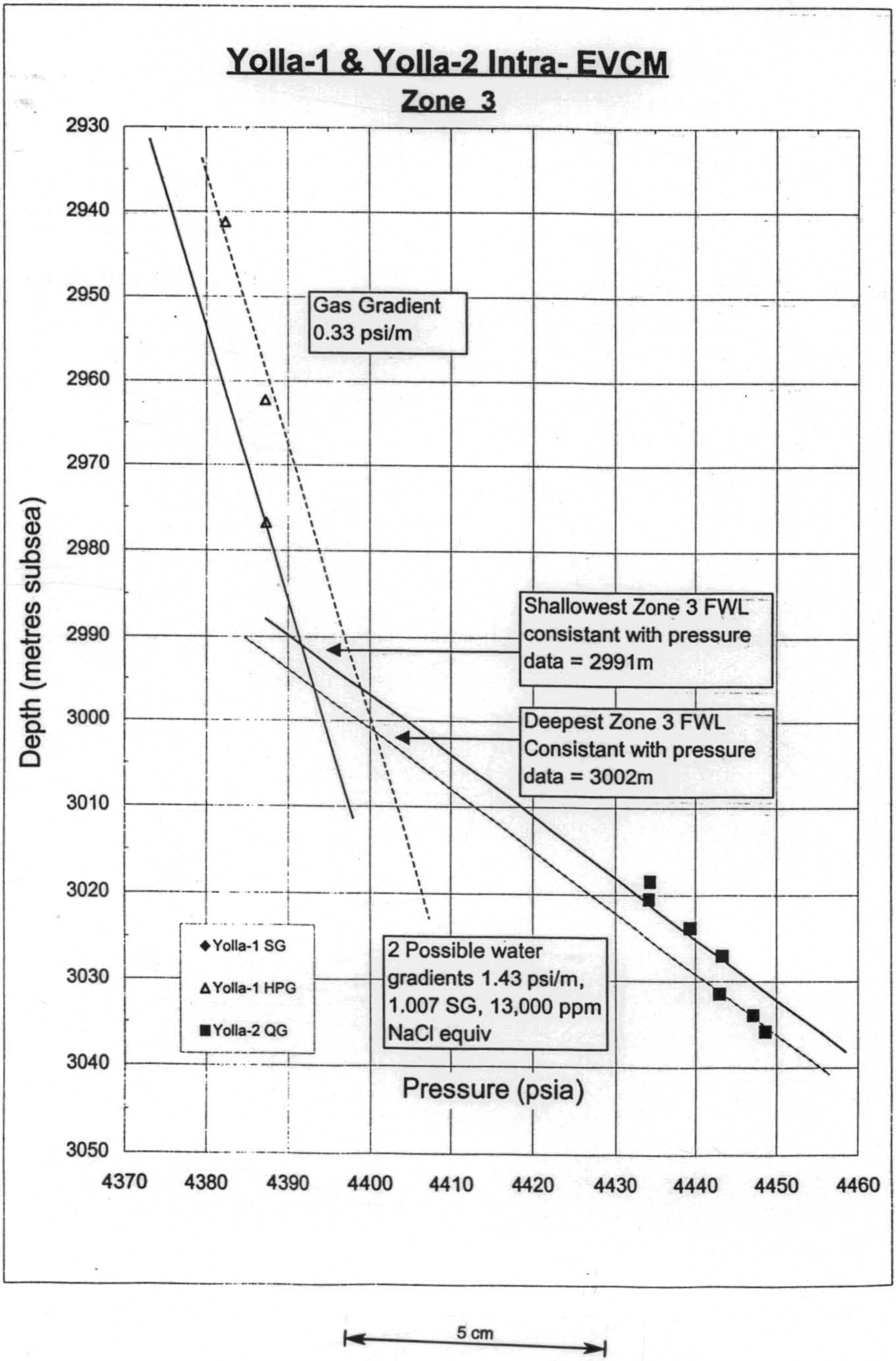
565255



5 cm

FIGURE 8

565256



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T/RL1

YOLLA-2
WELL COMPLETION REPORT
VOLUME 2 of 2

SEPTEMBER 1998

APPENDIX 9

VSP RESULTS

By

SCHLUMBERGER GEOQUEST

YOLLA 2

565259

Schlumberger GeoQuest

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PREMIER OIL AUSTRALASIA

WELL SEISMIC PROCESSING REPORT

VSP/GEOGRAM

YOLLA-2

FIELD: YOLLA

COUNTRY: AUSTRALIA

COORDINATES: 039 51' 33.820" S
: 145 48' 38.530" E

DATE OF VSP SURVEY: 17 May 1998

REFERENCE NO: AMF-561266/561267

INTERVAL: 3085 - 1325 M

Prepared by:
Serg Tcherkashnev (Schlumberger Geoquest)

CONTENTS

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1. Introduction

One vertical seismic profile was recorded with a Combinable Seismic Imager tool (CSI) at the *YOLLA-2* well. The survey was run on 17 May 1998.

The VSP data were edited and processed using the conventional VSP processing chain in vertical well.

2. Data Acquisition

The data were acquired in one logging run using the three components Dual Combinable Seismic Imager tool (CSI). An array of three Air-Guns was used as the source. The guns were positioned 5 meters below mean sea level. Recording was made on the Schlumberger Maxis 500 Unit using DLIS format.

Table 1. Survey Parameters

Elevation of KB	12.5 M
Elevation of DF	12.5 M
Elevation of GL	- 81.5 M
Energy Source	3 X 150 cu in. Air-guns
Source Offset	46.0 M
Source Depth	5 M below MSL
Reference Sensor	Hydrophone
Hydrophone Offset	46.0 M
Hydrophone Depth	10 M below MSL
Source & Hyd. Azimuth	135.0 Degrees
Tool Type	CSI
Tool Combination	Stand Alone
De-coupled Geophones	Yes
Shaker Fitted	Yes
Number of Axis	3
Geophone Type	SM-4
Frequency Response	10-150 Hz
Sampling Rate	0.5 ms.
Recording Time	3.0 sec.
Acquisition Unit	MAXIS
Recording Format	DLIS

3. Well Seismic Edit

Each shot of the raw geophone data was evaluated and edited as necessary. The hydrophone data were also evaluated for signature changes and timing shifts.

The good shots at each level were stacked, using a median stacking technique, to increase the signal to noise ratio of the data. The transit time of each trace was re-computed after stacking.

3.1 Data Quality

The overall quality of the data is very good. Note the following:

- Vertical component (Z) shows a consistent signature and a high signal to noise ratio, as seen in Figure 1.
- There is some amount of downgoing shear energy in the horizontal components . The downgoing shear is likely to come from mode conversion of direct compresional energy.

3.2 Transit Time Measurement

The transit time measured, Delta t , corresponds to a difference between arrivals recorded by surface and downhole sensors. The reference time (zero time) is the physical recording of the source signal by accelerometers on the gun or sensors positioned near the source. In this case, a hydrophone positioned 5 m below the gun was used as the reference. First break picking algorithms were used on both the hydrophone and the geophone.

3.3 Correction to Datum

Seismic Reference Datum (SRD) is at Mean Sea Level (MSL).

The source was suspended 5 meters below the sea surface. A hydrophone was attached to the source 5 meters below the outlet ports and was used as the time reference. A static correction of 6.7 msec (OWT) was thus applied to all data to correct it to SRD.

3.4 Geophysical Airgun Report

The Geophysical Airgun Report listing contains all downhole seismic measurements obtained by analyzing stacked shots.

The level number, corresponding KB and SRD depth, observed (non-vertical) transit times and corrected (vertical) transit times from the source and from SRD are listed. Also included are average velocities between SRD and geophone together with level separation and corresponding transit times and finally interval velocities between levels.

Vertical transit times have been corrected for the effects of geometry. The interval velocities listed are those computed from corrected (i.e. vertical) transit times.

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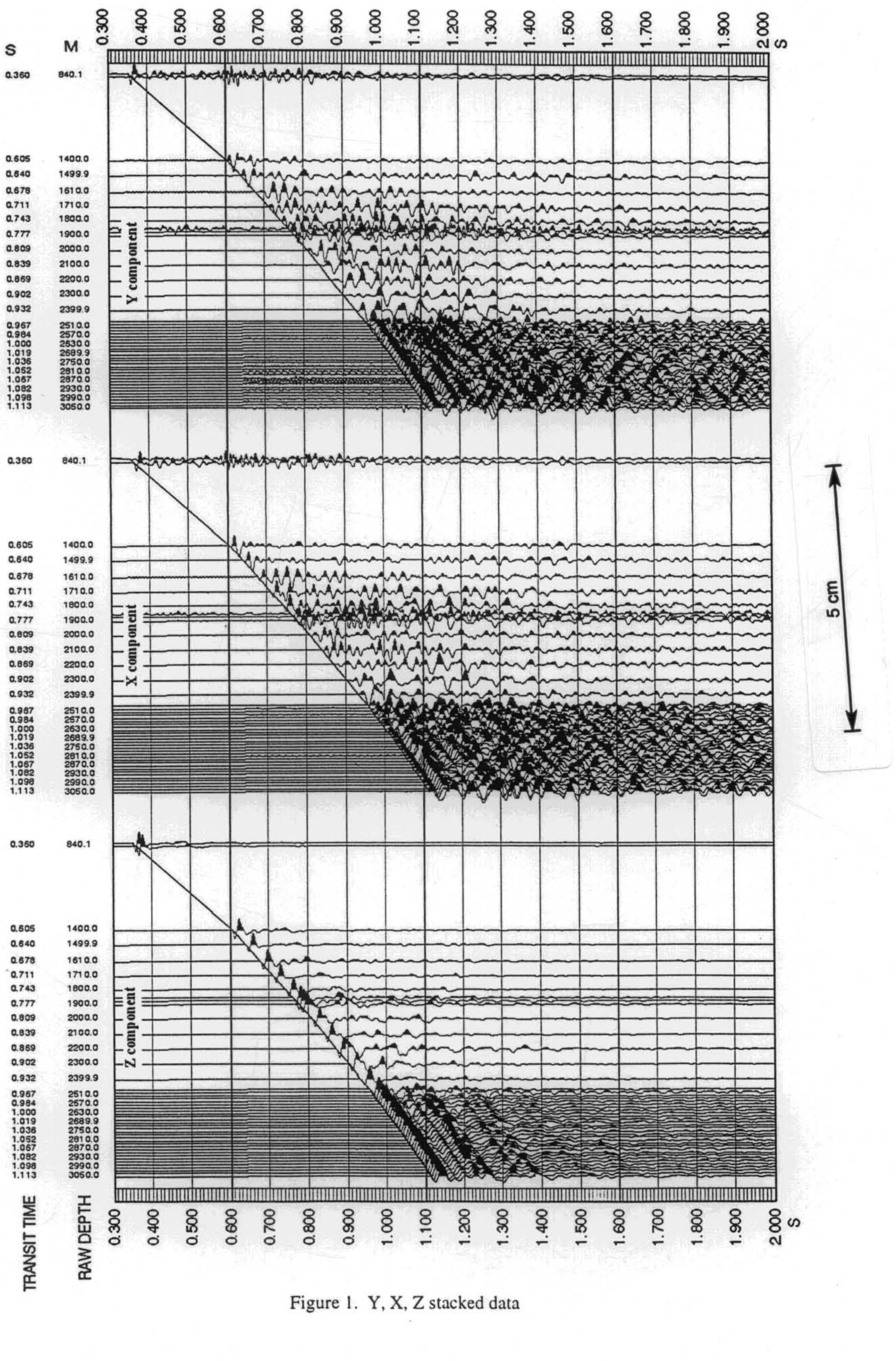


Figure 1. Y, X, Z stacked data

4. Sonic Calibration Processing

4.1 Sonic Calibration

A 'drift' curve is obtained using the sonic log and the vertical check level times. The term 'drift' is defined as the seismic time (from check shots) minus the sonic time (from integration of edited sonic). Commonly the word 'drift' is used to identify the above difference, or to identify the gradient of drift versus increasing depth, or to identify a difference of drift between two levels.

The gradient of drift, that is the slope of the drift curve, can be negative or positive.

For a negative drift ($\Delta drift/\Delta depth < 0$) the sonic time is greater than the seismic time over a certain section of the log.

For a positive drift ($\Delta drift/\Delta depth > 0$), the sonic time is less than the seismic time over a certain section of the log.

The drift curve, between two levels, is then an indication of the error on the integrated sonic or an indication of the amount of correction required on the sonic to have the TTI of the corrected sonic match the check shot times.

Two methods of correction to the sonic log are used.

1. Uniform or block shift. This method applies a uniform correction to all the sonic values over the interval. This uniform correction is applied in the case of positive drift and is the average correction represented by the drift curve gradient expressed in µsec/ft .

2. ΔT Minimum. In the case of negative drift a second method is used, called Δ minimum. This applies a differential correction to the sonic log, where it is assumed that the greatest amount of transit time error is caused by the lower velocity sections of the log. Over a given interval the method will correct only Δt values which are higher than a threshold, the Δt_{min} . Values of Δwhich are lower than the threshold are not corrected. The correction is a reduction of the excess of Δt over Δt_{min}, $\Delta t - \Delta t_{min}$.

$\Delta t - \Delta t_{min}$ is reduced through multiplication by a reduction coefficient which remains constant over the interval. This reduction coefficient, named G, can be defined as:

$$G = 1 + \frac{drift}{(\Delta t - \Delta t_{min})dZ}$$

Where drift is the drift over the interval to be corrected and the value $(\Delta t - \Delta t_{min})dZ$ is the time difference between the integrals of the two curves Δt and Δt_{min}. only over the intervals where $\Delta t > \Delta t_{min}$.

Hence the corrected sonic: $\Delta t = G(\Delta t - \Delta t_{min}) + \Delta t_{min}$.

4.2 Open Hole Logs

The sonic log has been recorded from 3085 to 1325 m below KB. This sonic log has been edited to alleviate cycle skipping and spiky data.

The density log has been edited to take into account bad hole condition.

The gamma ray, deep resitivity and caliper logs are included as correlation curves.

4.3 Correction to Datum and Velocity Modeling

The sonic calibration processing has been referenced to mean sea level which the seismic reference datum . Static corrections are applied to correct for source offset and source depth. A correction for the source depth involves using a water velocity of 1524 m/sec.

4.4 Sonic Calibration Output

Drift Computation Report

The Drift Computation Report contains the basic comparison of raw seismic and edited sonic integrated times at checkshot levels.

The level number, measured depth and vertical depth for all levels, vertical checkshot times adjusted to SRD and corresponding integrated sonic times are compiled in the listing. The drift between two adjacent checkshot levels is listed in milliseconds and the corrections to be applied to the sonic log in µsec/ ft are also listed for all intervals between two adjacent levels .

Sonic adjustment parameter report

This listing shows the depth of selected knees from KB and SRD together with the measured drift. The amount of sonic adjustment and the type of correction (block shift or Delta T Minimum) plus the corresponding reduction factor G if applicable are all printed out.

Drift Computation Report

The Drift Computation Report and Sonic Adjustment Report are graphically summarised on the Drift Curve Plot. The raw and selected (smoothed) drift curves, position of knees, and corresponding drift at all checkshots and knees are all indicated on the Drift Curve Plot.

Raw and Drift Corrected Report Sonic Plot

The effect of the shifts listed in the Sonic Adjustment Parameter Report on the edited sonic log and the results of sonic adjustment for drift are graphically displayed on the Raw and Corrected Sonic Plot.

Drift Computation Report

The interval velocities between two adjacent checkshot levels computed from corrected (adjusted) sonic log are listed in the Velocity Report. The residual errors between checkshots and integrated sonic times after calibration (adjustment) are also listed in the Velocity Report for every checkshot level.

Time and Velocity vs. Depth Plot

Four velocities - Average, Interval, Continuous and Root Mean Square together with Time vs. Depth curve are computed for all checkshot levels. The results are plotted as a function of depth on the Time and Velocity vs. Depth Plot.

Interval velocities (v_{int}) are those computed between two adjacent checkshot levels from corrected sonic logs and listed in the Velocity Report. Interval velocity is defined as

$$v_{int} = z_n - z_{n-1} \text{ over } t_n - t_{n-1}$$

where z_n is the depth of nth layer and t_n its corresponding integrated sonic time.

Average velocities (v_{ave}) are computed by dividing SRD depth of checkshots and their corresponding integrated sonic times from corrected sonic log.

$$v_{ave} = \frac{\sum v_n t_n}{\sum t_n}$$

The continuous velocity curve is an inverse of sonic log displayed not as slowness in µsec/ ft but as velocity in meters/second.

Root Mean Square Velocity (v_{rms}) is computed from calibrated sonic logs by

$$v_{rms} = \sqrt{\frac{\sum v_n^2 t_n}{\sum t_n}}$$

where v_n is an interval velocity over some specific time increment Delta t_n of calibrated sonic log.

The Time vs. Depth Curve is the result of integration of the calibrated sonic log and is plotted as one way time (OWT) against depth.

Time Converted Velocity Report

This listing is obtained from the calibrated sonic log. Average, RMS and Interval velocities are computed at one millisecond intervals one way time (OWT). The results are listed against two way time (TWT) together with corresponding measured (KB) and seismic datum (SRD) depths.

Interval velocities are between two adjacent computations (two milliseconds TWT apart) whereas average and RMS are from SRD.

4.5 Sonic Calibration Results

The top of the sonic log (1325 metres below KB) is chosen as the origin for the calibration drift curve.

The drift curve is the correction imposed upon the sonic log. The adjusted sonic curve is considered to be the best result using the available data. A list of shifts used on the sonic data is given below.

Table 2. Sonic Drift

Depth Interval (metres below KB)	Block Shift µsec/m	Δt_{min} µsec/m	Equiv Block shift µsec/m
1325.0 - 1875.0	12.73		12.73
1875.0 - 2212.0	5.93		5.93
2212.5 - 2465.5	24.00		24.00
2465.6 - 2812.5	17.14		17.14
2812.5 - 3085.0	3.67		3.67

A depth of bottom VSP level is 3050 m below KB. A dummy checkshot was introduced at 3085 m in attempt to generate a synthetic from the bottom of log interval. A transit time at 3085 m was estimated using of gradient of the drift curve above this depth.

Seismic Calibration Log shows the sonic calibration output in 22" format at a 1:5000 scale.

Drift Corrected Sonic displays the raw and calibrated sonic curves on an 8.5" plot at a 1:200 scale.

The drift exhibits a positive gradient for entire interval, obtaining a cumulative value of 22 ms at TD.

Knees are selected from the raw drift curve and lithological boundaries marked by the well logs. The depths of the knees define the zones for the adjustment.

5. Synthetic Seismogram Processing

GEOGRAM plots were generated using 25, 35 and 45 Hz zero phase zero phase Ricker wavelets.

The presentations include both normal and reverse polarity on a time scale of 20 cm/sec.

GEOGRAM processing produces synthetic seismic traces based on reflection coefficients generated form sonic and density measurements in the well-bore. The steps in the processing chain are the following:

- Depth to time conversion
- Reflection coefficient generation
- Attenuation coefficient calculation
- Convolution
- Output

5.1 Depth to Time Conversion

Open hole logs are recorded from the bottom to top with a depth index. This data is converted to a two-way time index and flipped to read form the top to bottom in order to match the seismic section.

5.2 Primary Reflection Coefficients

Sonic and density data are averaged over chosen time intervals (normally 1 or 2 millisecs). Reflection coefficients are then computed using:

$$R = \frac{r_2.v_2 - r_1.v_1}{r_2.v_2 + r_1.v_1}$$

where:

r_1 = density of the layer above the reflection interface
r_2 = density of the layer below the reflection interface
v_1 = compressional wave velocity of the layer above the reflection interface
v_2 = compressional wave velocity of the layer below the reflection interface

This computation is done for 0.5 msec time interval to generate a set of primary reflection coefficients without transmission losses.

5.3 Primaries with Transmission Loss

Transmission loss on two-way attenuation coefficients is computed using:

$$A_n = (1 - R_1^2).(1 - R_2^2).(1 - R_3^2)...(1 - R_n^2)$$

A set of primary reflection coefficients with transmission loss is generated using:

$$\mathit{Primary}_n = R_n.A_{n-1}$$

5.4 Primaries plus Multiples

Multiples are computed from these input reflection coefficients using the transform technique from the top of the well to obtain the impulse response of the earth. The transform outputs primaries plus multiples.

5.5 Multiples Only

By subtracting previously calculated primaries form the above result we obtain multiples only.

5.6 Wavelet

A theoretical wavelet is chosen to use for convolution with the reflection coefficients previously generated. Choices available include:

Klauder wavelet
Ricker zero phase wavelet
Ricker minimum phase wavelet
Butterworth wavelet
User defined wavelet

5.7 Polarity Convention

An increase in acoustic impedance gives a positive reflection coefficient, is written to tape as a negative number and is displayed as a white trough under normal polarity. Polarity conventions are displayed in Figure 5.

5.8 Convolution

The standard procedure of convolving the wavelet with reflection coefficients; the output is the synthetic seismogram.

6. VSP Processing

The vertical component of the VSP data was processed using the conventional zero offset vertical incidence processing chain. The following subsections describe the main aspects of the processing chain the final VSP data set.

- edit and sort raw VSP traces
- stack X, Y and Z component
- gain correction and bandpass filter
- up & downgoing wavefield separation
- deconvolution

6.1 Stacking

After splicing, reordering and selecting the raw shots for a median stack was performed on the vertical and horizontal component data. In this method of stacking, at each sample time, the amplitudes of the input traces are read and sorted in ascending order. The output is the median amplitude value from this ordering. If an even number of traces are input, the first is dropped and a median calculated. Then the last is dropped and another median found. The final output is the average of these two median values. The surface sensor (hydrophone) breaks are used as the zero time for stacking. The break time of each trace is recomputed after stacking.

Power spectrum (squared amplitude) of vertical component for entire interval is presented in Figure 2. It shows the trend of the VSP wavelet's frequency content with depth. The axis towards is the frequency axis from 0 to 125 Hz. Axis towards back right is the depth of geophone. The amplitude scale is in decibels.

Alternative view of power spectrum across the whole VSP survey as a 2D map is shown in Figure 3. The contours are the power ratio in decibel units (dB). Iso-energy lines are every 10 dB.

6.2 Spherical Divergence Correction and Bandpass Filter

A bandpass filter of 5-100 hertz bandwidth was applied and time varying gain function of the exponential form :

$$Gain(T) = \left(\frac{T}{T_0} \right)^{\alpha}$$

where T is the recorded time, T_O is the first break time and a = 1.2

Trace equalization was applied by normalizing the RMS amplitude of the first break to correct for transmission losses of the direct wave. A normalization window of 60 millisecs was used (Plot 2).

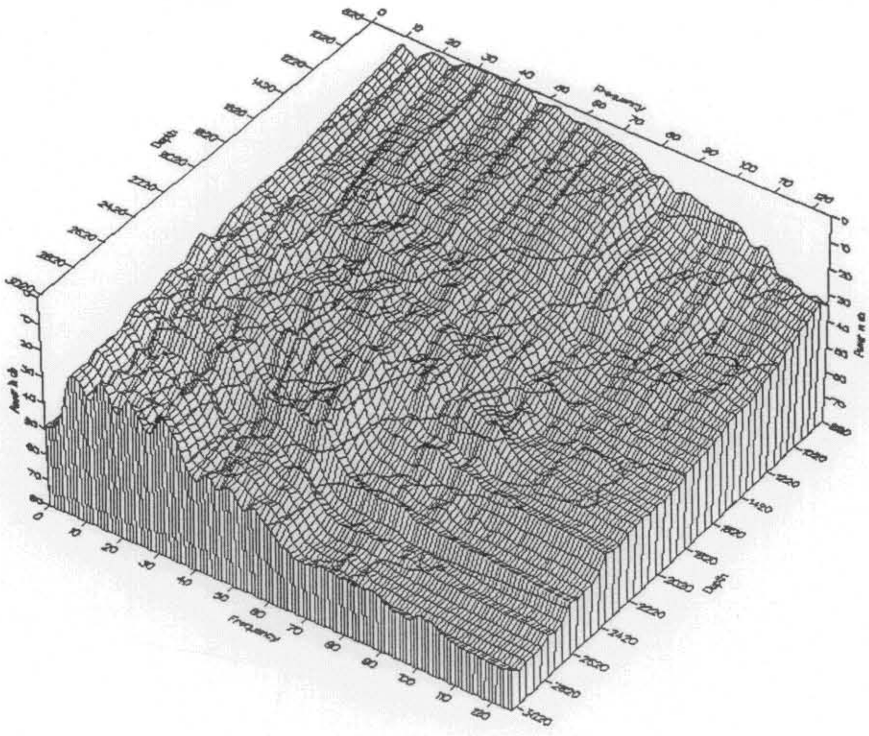


Figure 2. 3D power spectrum on Z component indexed in TVD (m).

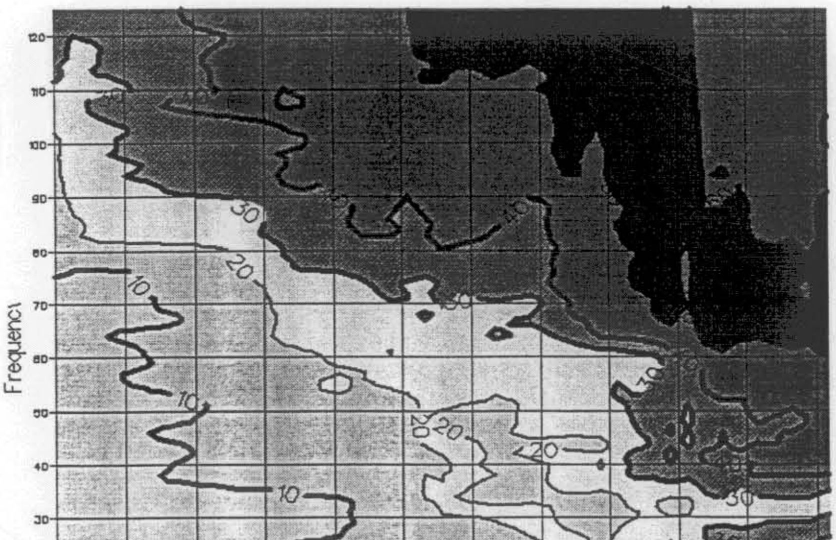
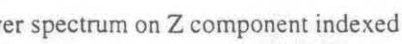


Figure 3. 2D power spectrum on Z component indexed in TVD (m)
Iso-energy lines are every 10 dB



6.3 Velocity filter

A median velocity filter is applied to extract downgoing waves, remove them from wavefields, and to enhance upgoing events.

The downgoing coherent energy is estimated using seven levels median velocity filter. The filter array is moved down one level after each computation and the process is repeated level by level over the entire dataset. As a result, the deepest and shallowest levels are lost because of edge effects.

The residual wavefield is obtained by subtracting the downgoing coherent energy from the total wavefield. The residual wavefield is dominated by reflected compressional events (Plot 3).

The upgoing wavefield is enhanced by making a median stack of the upgoing aligned traces using a 5 levels filter. The data is now displayed in two way time (Plot 3).

6.4 Waveshaping Deconvolution

The waveshaping deconvolution is applied to remove miltiples, source signature effects, and to improve resolution. Downgoing wave is considered to be the wavetrain which is reflected by reflection coefficients, producing the upgoing waves.

The waveshaping deconvolution operator is a double sided operator and is designed trace by trace opening 20 ms before the first break with a window length of 1000 ms. The desired outputs were chosen to be zero phase with a band width of 5-60 Hz. Once the design is made upon the downgoing wavefield, it is applied to the downgoing and subtracted wavefield at the same level. The upgoing compressional wavefield is enhanced in an exactly analogous manner as before. A Butterworth bandpass filter 5-80 Hz was applied after enhancement.

The trace by trace deconvolution is applied in order to collapse the multiple sequence of compressional arrivals, diffractions or out of plane reflections. The result of waveshaping deconvolution on the upgoing wavefield is shown in Plot 4.

6.5 VSP Corrodor Stack

A corridor stack was computed on the data after zero phase waveshaping deconvolution by defining a constant 100 ms timing window along the time depth curve and stacking the data onto a single trace. This trace under normal circumstances should satisfy the assumption of one dimensionality and provide the best seismic representation of the borehole.

Automatic Gain Control (AGC) using a window length of 200 msec was applied to the cooridor stack.

The final upgoing wavefield and the corridor stacks are displayed in both polarities Plot 5.

6.6 VSP/Geogram composite presentation

Plots 6, 7 are composite displays of the VSP data, logged impedance and synthetic seismograms. These displays are a guide to the tie between the Geograms and corridor stack.

There is a fairly good tie between the synthetic seismogram and VSP (Figure 5). There are some subtle variations on the amplitude of the events. The VSP provides a measure of the earth filter effect whilst the synthetic makes some very basic assumptions to approximate the earth filter effect.

SCHLUMBERGER (SEG-1976) WAVELET POLARITY CONVENTION

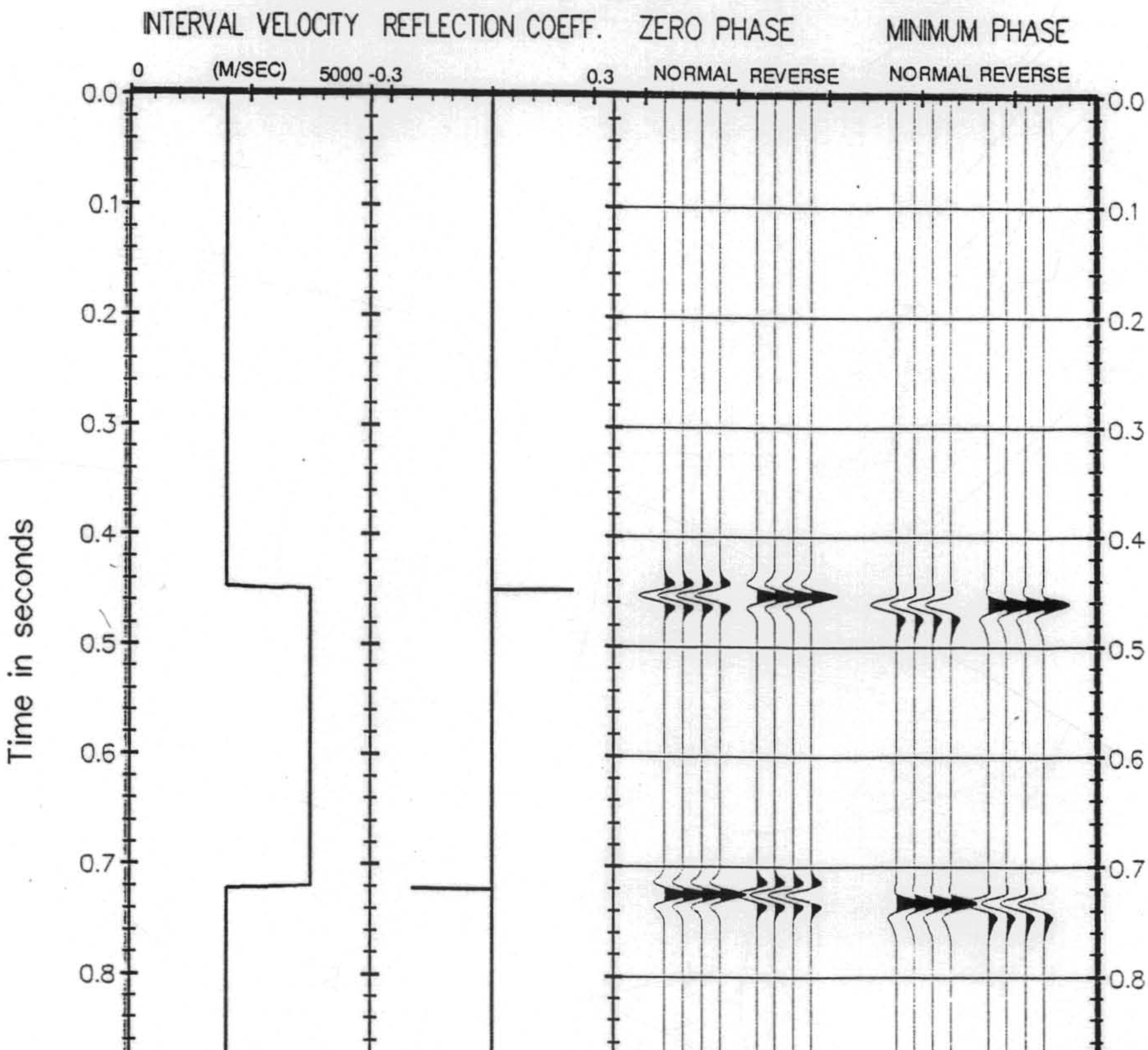


FIGURE 4

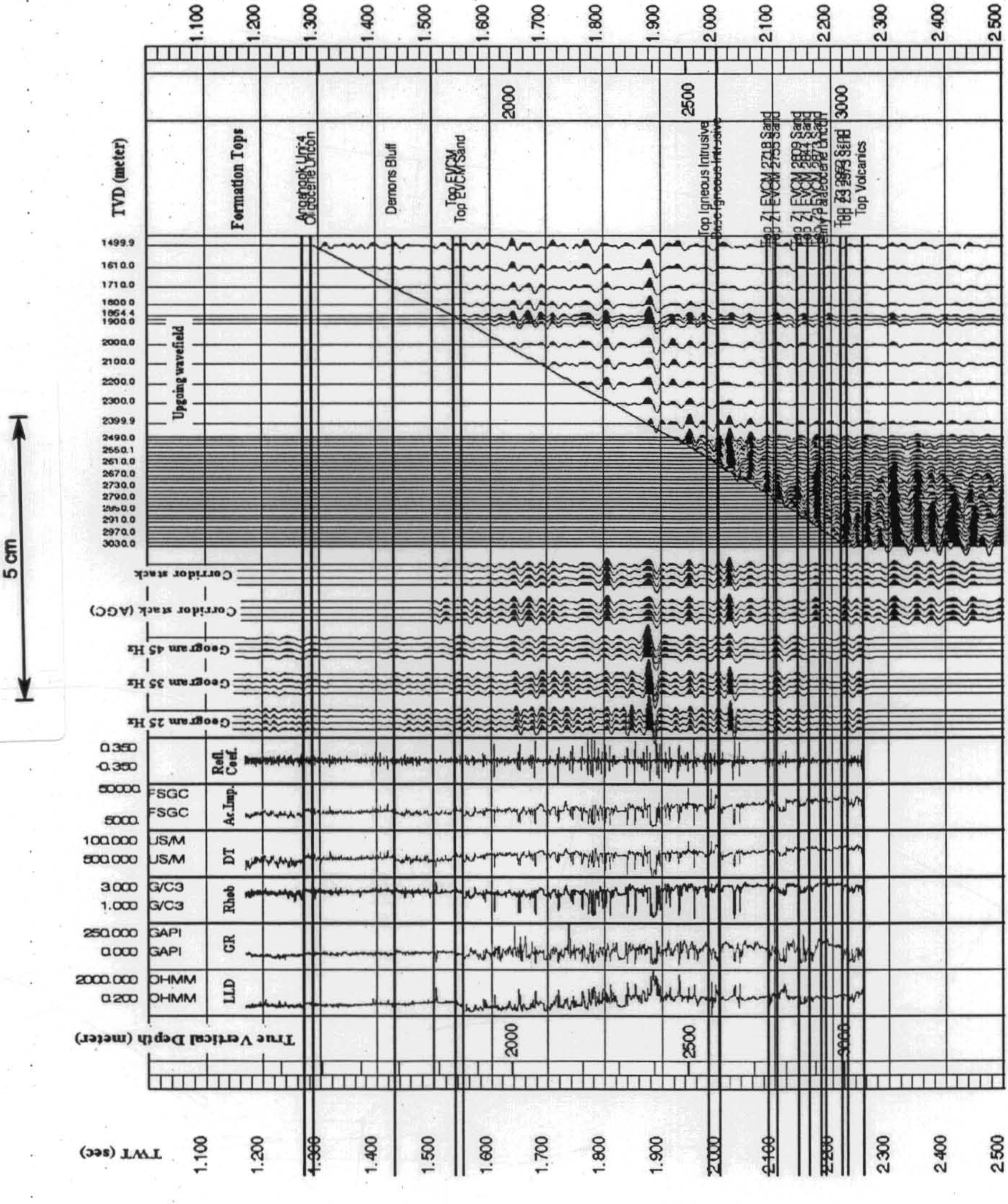


Figure 5. VSP/Geogram composite display (normal polarity) indexed in time (SRD)

A Summary of Geophysical Listings

Five geophysical data listings are appended to this report. Following is a brief description of the format of each listing.

A1 Geophysical Airgun Report

1. Level number: the level number starting from the top level (includes any imposed shots).

2. Measured depth from KB: *dkb*, the depth in metres from kelly bushing.

3. Vertical depth form SRD: *dsrd*, the depth in metres from seismic reference datum.

4. Observed travel time HYD to GEO: *tim*0, the transit time picked form the stacked data by subtracting the surface sensor first break time from the downhole sensor first break time.

5. Vertical travel time SRC to GEO: *timv*, is corrected for source to hydrophone distance and for source offset.

6. Vertical travel time SRD to GEO: *shtm*, is *timv* corrected for the vertical distance between source and datum.

7. Average velocity SRD to GEO: the average seismic velocity from datum to the corresponding checkshot level, $\frac{\text{dsrd}}{\text{shtm}}$.

8. Delta depth between shots: Δ*depth*, the vertical distance between each level.

9. Delta time between shots: Δ*time*, the difference in vertical travel time (*shtm*),between each level.

10. Interval velocity between shots: the average seismic velocity between each level, Δ*depth*/Δ*time*

A2 Drift Computation Report

1. Level number: the level number starting from the top level (includes any imposed shots).

2. Vertical depth from KB: the depth in metres from kelly bushing

3. Vertical depth from SRD: the depth in metres from seismic reference datum.

4. Vertical travel time SRD to GEO: the calculated vertical travel time from datum to downhole geophone (see column 7, Geophysical Airgun Report).

5. Integrated raw sonic time: the raw sonic log is integrated from top to bottom and listed at each level. An initial value at the top of the sonic log is set equal to the checkshot time at that level. This may be an imposed shot if a shot was not taken at the top of the sonic.

6. Computed drift at level: the checkshot time minus the integrated raw sonic time.

7. Computed blk-shft correction: the drift gradient between any two checkshot levels

$\left(\frac{\Delta\, drift}{\Delta\, depth}\right)$.

A3 Sonic Adjustment Parameter Report

1. Knee number: the knee number starting from the highest knee. (The first knees listed will generally be at SRD and the top of sonic. The drift imposed at these knees will normally be zero.)

2. Vertical depth from KB: the depth in metres from kelly bushing

3. Vertical depth from SRD: the depth in metres from seismic reference datum.

4. Drift at knee: the value of drift imposed at each knee.

5. Blockshift used: the change in drift divided by the change in depth between any two levels.

6. Delta-T minimum used: see section 4 of report for an explanation of $\Delta\, t_{min}$.

7. reduction factor: see section 4 of report.

8. Equivalent blockshift: the gradient of the imposed drift curve.

A4 Velocity Report

1. Level number: the level number starting from the top level (includes any imposed shots).

2. Vertical depth from KB: the depth in metres form kelly bushing.

3. Vertical depth from SRD: the depth in metres from seismic reference datum.

4. Vertical travel time SRD to GEOPH: the vertical travel time from SRD to downhole geophone (see column 7, Geophysical Airgun Report)

5. Integrated adjusted sonic time: the adjusted sonic log is integrated from top to bottom. An initial value at the top of the sonic is set equal the checkshot time at that level. (the adjusted sonic log is the drift corrected sonic log.)

6. Drift=shot time-raw sonic: the check shot time minus the raw integrated sonic time.

7. Residual=shot time-adj sonic: the check shot time minus the adjusted integrated sonic time. This is the difference between calculated drift and the imposed drift.

8. Adjusted interval velocity: the interval velocity calculated from the integrated adjusted sonic time at each level.

A5 Time Converted Velocity Report

the data in this listing has been resampled in time.

1. Two way travel time from SRD: this is the index for the data in this listing. The first value is at SRD (0 millisecs) and the sampling rate is 2 millisecs.

2. Measured depth from KB: the depth from KB at each corresponding value of two way time.

3. Vertical depth from SRD: the vertical depth from SRD at each corresponding value of two way time.

4. Average velocity SRD to GEO: the vertical depth from SRD divided by half the two way time.

5. RMS velocity: the root mean square velocity from datum to the corresponding value of two way time.

$$v_{rms} = \sqrt{S_1{}^n v_i{}^2 t_i / S^n{}_1 t_i}$$

where v_i is the velocity between each 2 millisecs interval.

6. First normal moveout: the correction time in millisecs to be applied to the two way travel time for a specified moveout distance (default = 1000 M).

$$\Delta t = \sqrt{t^2 + (X/Vrms)^2} - t$$

where:

Δt = normal moveout (secs)
X = moveout distance (metres)
t = two way time (secs)
v_{rms} = rms velocity (metres / sec)

7. Second normal moveout: the correction time in millisecs to be applied to the two way travel tome for a specified moveout distance (default = 1500 M).

8. Third normal moveout: the correction time in millisecs to be applied to the two way travel time for a specified moveout distance (default = 2000 M)

9. Interval velocity: the velocity between each sampled depth. Typically, the sampling rate is 2 millisecs two way time, (1 millisec one way time) therefore the interval velocity will be equal to the depth increment divided by 0.002. It is equivalent to column 9 from the Velocity Report.

VSP PLOTS

Plot 1 Stacked Data

Plot 2 Amplitude Recovery

Plot 3 Velocity Filter

Plot 4 Waveshaping Deconvolution Zero Phase

Plot 5 Waveshaping Deconvolution - Corridor Stack

Plot 6 VSP and GEOGRAM Composite - normal polarity 20 cm/sec

Plot 7 VSP and GEOGRAM Composite - reverse polarity 20 cm/sec

GEOGRAM PLOTS

Drift Corrected Sonic

Seismic Calibration Log

25 Hz zero phase GEOGRAM 20 cm/sec

35 Hz zero phase GEOGRAM 20 cm/sec

45 Hz zero phase GEOGRAM 20 cm/sec

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*                 *
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*                 *
*   SCHLUMBERGER  *
*                 *
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GEOPHYSICAL AIRGUN REPORT

COMPANY : PREMIER OIL AUSTRALASIA
WELL : YOLLA-2
FIELD : YOLLA
STATE : TASMANIA
COUNTRY : AUSTRALIA
REFERENCE: AMF-561266/561267
LOGGED : 17-05-1998

LONG DEFINITIONS

GLOBAL

KB - Elevation of the KELLY-BUSHING Above MSL or MWL
SRD - Elevation of the Seismic Reference Datum Above MSL or MWL
EKB - Elevation of Kelly Bushing
VELHYD - VELOCITY OF THE MEDIUM BETWEEN THE SOURCE AND THE HYDROPHONE
VELSUR - VELOCITY OF THE MEDIUM BETWEEN THE SOURCE AND THE SRD

MATRIX

GUNELZ - SOURCE ELEVATION ABOVE SRD (ONE FOR THE WHOLE JOB; OR ONE PER SHOT)
GUNEWZ - SOURCE DISTANCE FROM THE BOREHOLE AXIS IN EW DIRECTION (CF. GUNELZ)
GUNNSZ - SOURCE DISTANCE FROM THE BOREHOLE AXIS IN NS DIRECTION (CF. GUNELZ)
HYDELZ - HYDROPHONE ELEVATION ABOVE SRD (CF. GUNELZ)
HYDEWZ - HYDROPHONE DISTANCE FROM THE BOREH AXIS IN EW DIRECTION (CF GUNELZ)
HYDNSZ - HYDROPHONE DISTANCE FROM THE BOREH AXIS IN NS DIRECTION (CF GUNELZ)
TRTHYD - TRAVEL TIME FROM THE HYDROPHONE TO THE SOURCE
TRTSRD - TRAVEL TIME FROM THE SOURCE TO THE SRD
DEVWEL - DEVIATED WELL DATA PER SHOT : MEAS. DEPTH, VERT. DEPTH, EW, NS

SAMPLED

SHOT.GSH - Shot number
DKB.GSH - Measured Depth from Kelly-Bushing
DSRD.GSH - Depth from SRD
TIMO.GSH - Tie In Memorized Output
TIMV.GSH - Vertical Travel Time from the Source to the Geophone
SHTM.GSH - Shot time (WST)
AVGV.GSH - Average Seismic Velocity
DELZ.GSH - Depth Interval between Successive Shots
DELT.GSH - Travel Time Interval between Successive Shots
INTV.GSH - Internal Velocity, Average

(GLOBAL PARAMETERS)			(VALUE)	
ELEV OF KB AB. MSL (WST)	KB	:	12.5000	M
ELEV OF SRD AB. MSL(WST)	SRD	:	0	M
Elevation of Kelly Bushi	EKB	:	12.5000	M
VEL SOURCE-HYDRO(WST)	VELHYD	:	1524.00	M/S
VEL SOURCE-SRD (WST)	VELSUR	:	1524.00	M/S

(MATRIX PARAMETERS)

	SOURCE ELV M	SOURCE EW M	SOURCE NS M	HYDRO ELEV M	HYDRO EW M	HYDRO NS M
1	-5.0	32.5	-32.5	-10.0	32.5	-32.5

	TRT HYD-SC MS	TRT SC-SRD MS
1	3.28	3.28

	MD @ KB M	VD @ KB M	VD @ SRD M	E-W COORD M	N-S COORD M
1	94.0	94.0	81.5	0	0
2	819.6	819.6	807.1	0	0
3	840.1	840.1	827.6	0	0
4	1325.0	1325.0	1312.5	0	0
5	1400.0	1400.0	1387.5	0	0
6	1499.9	1499.9	1487.4	0	0
7	1610.0	1610.0	1597.5	0	0
8	1710.0	1710.0	1697.5	0	0
9	1800.0	1800.0	1787.5	0	0
10	1854.4	1854.4	1841.9	0	0
11	1875.0	1875.0	1862.5	0	0
12	1900.0	1900.0	1887.5	0	0
13	2000.0	2000.0	1987.5	0	0
14	2100.0	2100.0	2087.5	0	0
15	2200.0	2200.0	2187.5	0	0
16	2300.0	2300.0	2287.5	0	0
17	2399.9	2399.9	2387.4	0	0
18	2470.0	2470.0	2457.5	0	0
19	2490.0	2490.0	2477.5	0	0
20	2510.0	2510.0	2497.5	0	0
21	2527.9	2527.9	2515.4	0	0
22	2550.1	2550.1	2537.6	0	0
23	2570.0	2570.0	2557.5	0	0
24	2590.0	2590.0	2577.5	0	0
25	2610.0	2610.0	2597.5	0	0
26	2630.0	2630.0	2617.5	0	0
27	2649.9	2649.9	2637.4	0	0
28	2670.0	2670.0	2657.5	0	0
29	2689.9	2689.9	2677.4	0	0
30	2710.0	2710.0	2697.5	0	0
31	2730.0	2730.0	2717.5	0	0
32	2750.0	2750.0	2737.5	0	0
33	2769.9	2769.9	2757.4	0	0
34	2790.0	2790.0	2777.5	0	0
35	2810.0	2810.0	2797.5	0	0
36	2830.0	2830.0	2817.5	0	0
37	2850.0	2850.0	2837.5	0	0
38	2870.0	2870.0	2857.5	0	0
39	2890.0	2890.0	2877.5	0	0
40	2910.0	2910.0	2897.5	0	0

41	2930.0	2930.0	2917.5	0	0
42	2950.0	2950.0	2937.5	0	0
43	2970.0	2970.0	2957.5	0	0
44	2990.0	2990.0	2977.5	0	0
45	3009.9	3009.9	2997.4	0	0
46	3030.0	3030.0	3017.5	0	0
47	3050.0	3050.0	3037.5	0	0
48	3085.0	3085.0	3072.5	0	0

LEVEL NUMBER	MEASUR DEPTH FROM KB M	VERTIC DEPTH FROM SRD M	OBSERV TRAVEL TIME HYD/GEO MS	VERTIC TRAVEL TIME SRC/GEO MS	VERTIC TRAVEL TIME SRD/GEO MS	AVERAGE VELOC SRD/GEO M/S	DELTA DEPTH BETWEEN SHOTS M	DELTA TIME BETWEEN SHOTS MS	INTERV VELOC BETWEEN SHOTS M/S
1	94.0	81.5	55.29	50.20	53.48	1524	725.6	304.20	2385
2	819.6	807.1	351.70	354.40	357.68	2256	20.5	8.62	2380
3	840.1	827.6	360.30	363.01	366.29	2259	484.9	217.91	2225
4	1325.0	1312.5	578.00	580.92	584.20	2247	75.0	26.62	2817
5	1400.0	1387.5	604.60	607.54	610.83	2272	99.9	35.33	2828
6	1499.9	1487.4	639.90	642.87	646.15	2302	110.1	38.03	2895
7	1610.0	1597.5	677.90	680.90	684.18	2335	100.0	32.72	3056
8	1710.0	1697.5	710.60	713.62	716.90	2368	90.0	32.12	2802
9	1800.0	1787.5	742.70	745.73	749.01	2386	54.4	19.11	2847
10	1854.4	1841.9	761.80	764.84	768.12	2398	20.6	6.60	3120
11	1875.0	1862.5	768.40	771.44	774.73	2404	25.0	8.90	2808
12	1900.0	1887.5	777.30	780.35	783.63	2409	100.0	31.21	3204
13	2000.0	1987.5	808.50	811.56	814.84	2439	100.0	30.61	3267
14	2100.0	2087.5	839.10	842.18	845.46	2469	100.0	30.21	3310
15	2200.0	2187.5	869.30	872.39	875.67	2498	100.0	32.71	3057
16	2300.0	2287.5	902.00	905.10	908.38	2518	99.9	30.11	3318
17	2399.9	2387.4	932.10	935.21	938.49	2544	70.1	22.91	3060
18	2470.0	2457.5	955.00	958.11	961.39	2556	20.0	6.20	3225
19	2490.0	2477.5	961.20	964.31	967.59	2560	20.0	5.40	3702
20	2510.0	2497.5	966.60	969.72	973.00	2567	17.9	4.60	3890
21	2527.9	2515.4	971.20	974.32	977.60	2573	22.2	7.10	3126
22	2550.1	2537.6	978.30	981.42	984.70	2577	19.9	5.80	3430
23	2570.0	2557.5	984.10	987.22	990.50	2582	20.0	5.50	3635
24	2590.0	2577.5	989.60	992.72	996.00	2588			

LEVEL NUMBER	MEASUR DEPTH FROM KB M	VERTIC DEPTH FROM SRD M	OBSERV TRAVEL TIME HYD/GEO MS	VERTIC TRAVEL TIME SRC/GEO MS	VERTIC TRAVEL TIME SRD/GEO MS	AVERAGE VELOC SRD/GEO M/S	DELTA DEPTH BETWEEN SHOTS M	DELTA TIME BETWEEN SHOTS MS	INTERV VELOC BETWEEN SHOTS M/S
							20.0	5.10	3920
25	2610.0	2597.5	994.70	997.82	1001.10	2595			
							20.0	5.50	3635
26	2630.0	2617.5	1000.20	1003.33	1006.61	2600			
							19.9	5.70	3490
27	2649.9	2637.4	1005.90	1009.03	1012.31	2605			
							20.1	6.70	2999
28	2670.0	2657.5	1012.60	1015.73	1019.01	2608			
							19.9	6.30	3158
29	2689.9	2677.4	1018.90	1022.03	1025.31	2611			
							20.1	5.80	3465
30	2710.0	2697.5	1024.70	1027.83	1031.11	2616			
							20.0	5.60	3570
31	2730.0	2717.5	1030.30	1033.43	1036.71	2621			
							20.0	5.50	3635
32	2750.0	2737.5	1035.80	1038.93	1042.21	2627			
							19.9	5.00	3979
33	2769.9	2757.4	1040.80	1043.94	1047.22	2633			
							20.1	4.80	4187
34	2790.0	2777.5	1045.60	1048.74	1052.02	2640			
							20.0	6.10	3278
35	2810.0	2797.5	1051.70	1054.84	1058.12	2644			
							20.0	4.60	4346
36	2830.0	2817.5	1056.30	1059.44	1062.72	2651			
							20.0	5.80	3448
37	2850.0	2837.5	1062.10	1065.24	1068.52	2656			
							20.0	5.10	3920
38	2870.0	2857.5	1067.20	1070.34	1073.62	2662			
							20.0	4.80	4165
39	2890.0	2877.5	1072.00	1075.14	1078.42	2668			
							20.0	4.80	4166
40	2910.0	2897.5	1076.80	1079.94	1083.23	2675			
							20.0	5.00	3999
41	2930.0	2917.5	1081.80	1084.95	1088.23	2681			
							20.0	5.50	3636
42	2950.0	2937.5	1087.30	1090.45	1093.73	2686			
							20.0	5.40	3703
43	2970.0	2957.5	1092.70	1095.85	1099.13	2691			
							20.0	5.30	3773
44	2990.0	2977.5	1098.00	1101.15	1104.43	2696			
							19.9	4.70	4233
45	3009.9	2997.4	1102.70	1105.85	1109.13	2702			
							20.1	4.80	4187
46	3030.0	3017.5	1107.50	1110.65	1113.93	2709			
							20.0	5.10	3921
47	3050.0	3037.5	1112.60	1115.75	1119.03	2714			
							35.0	9.00	3888
48	3085.0	3072.5	1121.60	1124.75	1128.04	2724			

565286

LEVEL NUMBER	MEASUR DEPTH FROM KB M	VERTIC DEPTH FROM SRD M	OBSERV TRAVEL TIME HYD/GEO MS	VERTIC TRAVEL TIME SRC/GEO MS	VERTIC TRAVEL TIME SRD/GEO MS	AVERAGE VELOC SRD/GEO M/S	DELTA DEPTH BETWEEN SHOTS M	DELTA TIME BETWEEN SHOTS MS	INTERV VELOC BETWEEN SHOTS M/S

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DRIFT COMPUTATION REPORT

COMPANY : PREMIER OIL AUSTRALASIA

WELL : YOLLA-2

FIELD : YOLLA

STATE : TASMANIA

COUNTRY : AUSTRALIA

REFERENCE: AMF-561266/561267

LOGGED : 17-05-1998

LONG DEFINITIONS

GLOBAL

KB	-	Elevation of the KELLY-BUSHING Above MSL or MWL
SRD	-	Elevation of the Seismic Reference Datum Above MSL or MWL
EKB	-	Elevation of Kelly Bushing
XSTART	-	TOP OF ZONE PROCESSED BY WST
XSTOP	-	BOTTOM OF ZONE PROCESSED BY WST
UNFDEN	-	UNIFORM DENSITY VALUE
GAD001	-	RAW SONIC CHANNEL NAME USED FOR WST SONIC ADJUSTMENT

ZONE

LOFDEN	-	LAYER OPTION FLAG FOR DENSITY : -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYDEN	-	USER SUPPLIED DENSITY DATA

SAMPLED

SHOT	-	Shot number
DKB	-	Measured Depth from Kelly-Bushing
DSRD	-	Depth from SRD
SHTM	-	Shot time (WST)
RAWS	-	Raw Sonic (WST)
SHDR	-	Drift at Shot or Knee
BLSH	-	Block Shift between Shots or Knee

(GLOBAL PARAMETERS)			(VALUE)	
ELEV OF KB AB. MSL (WST)	KB	:	12.5000	M
ELEV OF SRD AB. MSL(WST)	SRD	:	0	M
Elevation of Kelly Bushi	EKB	:	12.5000	M
TOP OF ZONE PROCD (WST)	XSTART	:	0	M
BOT OF ZONE PROCD (WST)	XSTOP	:	0	M
UNIFORM DENSITY VALUE	UNFDEN	:	2.30000	G/C3
RAW SONIC CH NAME (WST)	GAD001	:	DT.EDI.ATT.002.FLP.*	

(ZONED PARAMETERS)			(VALUE)		(LIMITS)		
LAYER OPTION FLAG DENS	LOFDEN	:	1.000000		30479.7	-	0
USER SUPPLIED DENSITY DA	LAYDEN	:	0	G/C3	0	-	0

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL TRAVEL TIME SRD/GEO MS	INTEGRATED RAW SONIC TIME MS	COMPUTED DRIFT AT LEVEL MS	COMPUTED BLK-SHFT CORRECTION US/M
						0
1	94.0	81.5	53.48	53.48	0	
						0
2	819.6	807.1	357.68	357.68	0	
						0
3	840.1	827.6	366.29	366.29	0	
						0
4	1325.0	1312.5	584.20	584.20	0	
						5.85
5	1400.0	1387.5	610.83	610.39	.44	
						10.02
6	1499.9	1487.4	646.15	644.71	1.44	
						16.13
7	1610.0	1597.5	684.18	680.96	3.22	
						8.58
8	1710.0	1697.5	716.90	712.82	4.07	
						16.18
9	1800.0	1787.5	749.01	743.48	5.53	
						15.91
10	1854.4	1841.9	768.12	761.73	6.40	
						13.10
11	1875.0	1862.5	774.73	768.06	6.67	
						12.10
12	1900.0	1887.5	783.63	776.66	6.97	
						4.71
13	2000.0	1987.5	814.84	807.40	7.44	
						5.85
14	2100.0	2087.5	845.46	837.43	8.02	
						6.15
15	2200.0	2187.5	875.67	867.03	8.64	
						30.15
16	2300.0	2287.5	908.38	896.72	11.65	
						17.49
17	2399.9	2387.4	938.49	925.09	13.40	
						25.98
18	2470.0	2457.5	961.39	946.17	15.22	
						31.62
19	2490.0	2477.5	967.59	951.74	15.85	
						7.45
20	2510.0	2497.5	973.00	956.99	16.00	
						1.33
21	2527.9	2515.4	977.60	961.57	16.03	
						44.51
22	2550.1	2537.6	984.70	967.68	17.02	
						10.36
23	2570.0	2557.5	990.50	973.28	17.22	
						19.37
24	2590.0	2577.5	996.00	978.39	17.61	

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL TRAVEL TIME SRD/GEO MS	INTEGRATED RAW SONIC TIME MS	COMPUTED DRIFT AT LEVEL MS	COMPUTED BLK-SHFT CORRECTION US/M
						22.52
25	2610.0	2597.5	1001.10	983.05	18.06	-8.36
26	2630.0	2617.5	1006.61	988.71	17.89	7.92
27	2649.9	2637.4	1012.31	994.26	18.05	36.64
28	2670.0	2657.5	1019.01	1000.22	18.79	41.27
29	2689.9	2677.4	1025.31	1005.70	19.61	21.97
30	2710.0	2697.5	1031.11	1011.06	20.05	14.70
31	2730.0	2717.5	1036.71	1016.37	20.34	16.96
32	2750.0	2737.5	1042.21	1021.53	20.68	-.72
33	2769.9	2757.4	1047.22	1026.55	20.67	-11.26
34	2790.0	2777.5	1052.02	1031.58	20.44	22.75
35	2810.0	2797.5	1058.12	1037.22	20.90	-34.09
36	2830.0	2817.5	1062.72	1042.51	20.21	37.60
37	2850.0	2837.5	1068.52	1047.55	20.97	2.19
38	2870.0	2857.5	1073.62	1052.61	21.01	-8.79
39	2890.0	2877.5	1078.42	1057.59	20.83	-6.08
40	2910.0	2897.5	1083.23	1062.51	20.71	-1.48
41	2930.0	2917.5	1088.23	1067.54	20.68	20.97
42	2950.0	2937.5	1093.73	1072.62	21.10	7.11
43	2970.0	2957.5	1099.13	1077.88	21.25	16.56
44	2990.0	2977.5	1104.43	1082.85	21.58	-3.48
45	3009.9	2997.4	1109.13	1087.62	21.51	2.09
46	3030.0	3017.5	1113.93	1092.38	21.55	-.38
47	3050.0	3037.5	1119.03	1097.49	21.54	11.74
48	3085.0	3072.5	1128.04	1106.08	21.95	

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL TRAVEL TIME SRD/GEO MS	INTEGRATED RAW SONIC TIME MS	COMPUTED DRIFT AT LEVEL MS	COMPUTED BLK-SHFT CORRECTION US/M

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SONIC ADJUSTMENT PARAMETER REPORT

COMPANY : PREMIER OIL AUSTRALASIA
WELL : YOLLA-2
FIELD : YOLLA
STATE : TASMANIA
COUNTRY : AUSTRALIA
REFERENCE: AMF-561266/561267
LOGGED : 17-05-1998

LONG DEFINITIONS

GLOBAL

SRCDRF - ORIGIN OF ADJUSTMENT DATA
CONADJ - CONSTANT ADJUSTMENT TO AUTOMATIC DELTA-T MINIMUM = 7.5 US/F
UNERTH - UNIFORM EARTH VELOCITY (GTRFRM)

ZONE

ZDRIFT - USER DRIFT AT BOTTOM OF THE ZONE
ADJOPZ - TYPE OF ADJUSTMNENT IN THE DRIFT ZONE : 0=DELTA-T MIN, 1=BLOCKSHIFT
ADJUSZ - DELTA-T MINIMUM USED FOR ADJUSTMENT IN THE DRIFT ZONE
LOFVEL - LAYER OPTION FLAG FOR VELOCITY: -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYVEL - USER SUPPLIED VELOCITY DATA

SAMPLED

SHOT - Shot number
VDKB - Vertical Depth Relative to KB
DSRD - Depth from SRD
KNEE - Knee
BLSH - Block Shift between Shots or Knee
DTMI - Value of Delta-T Minimum used
COEF - Delta-T MIN Coefficient used in the Drift Zone
DRGR - Gradient of Drift Curve

(GLOBAL PARAMETERS)			(VALUE)	
ORIG OF ADJ DATA (WST)	SRCDRF	:	2.00000	
CONS SONIC ADJST (WST)	CONADJ	:	24.6063	US/M
UNIFORM EARTH VELOCITY	UNERTH	:	1524.00	M/S

(ZONED PARAMETERS)			(VALUE)		(LIMITS)		
USER DRIFT ZONE (WST)	ZDRIFT	:	22.00000	MS	3085.00	-	2812.50
			21.00000		2812.50		2462.50
			15.00000		2462.50		2212.50
			9.000000		2212.50		1875.00
			7.000000		1875.00		1325.00
			0		1325.00		0
ADJUSMNT MODE (WST)	ADJOPZ	:	-999.2500		30479.7	-	0
USER DELTA-T MIN (WST)	ADJUSZ	:	-999.2500	US/M	30479.7	-	0
LAYER OPTION FLAG VELOC	LOFVEL	:	0		30479.7	-	0
USER VELOC (WST)	LAYVEL	:	2225.000	M/S	1325.00	-	840.100
			2380.000		840.100		819.600
			2385.000		819.600		94.0000
			1524.000		94.0000		0

KNEE NUMBER	VERTICAL DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	DRIFT AT KNEE MS	BLOCKSHIFT USED US/M	DELTA-T MINIMUM USED US/M	REDUCTION FACTOR G	EQUIVALENT BLOCKSHIFT US/M
				0			0
2	1325.0	1312.5	0				
				12.73			12.73
3	1875.0	1862.5	7.00				
				5.93			5.93
4	2212.5	2200.0	9.00				
				24.00			24.00
5	2462.5	2450.0	15.00				
				17.14			17.14
6	2812.5	2800.0	21.00				
				3.67			3.67
7	3085.0	3072.5	22.00				

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VELOCITY REPORT

COMPANY : PREMIER OIL AUSTRALASIA

WELL : YOLLA-2

FIELD : YOLLA

STATE : TASMANIA

COUNTRY : AUSTRALIA

REFERENCE: AMF-561266/561267

LOGGED : 17-05-1998

LONG DEFINITIONS

GLOBAL

KB - Elevation of the KELLY-BUSHING Above MSL or MWL
SRD - Elevation of the Seismic Reference Datum Above MSL or MWL
EKB - Elevation of Kelly Bushing
UNERTH - UNIFORM EARTH VELOCITY (GTRFRM)

ZONE

LOFVEL - LAYER OPTION FLAG FOR VELOCITY: -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYVEL - USER SUPPLIED VELOCITY DATA

SAMPLED

SHOT - Shot number
DKB - Measured Depth from Kelly-Bushing
DSRD - Depth from SRD
SHTM - Shot time (WST)
ADJS - Adjusted Sonic Travel Time
SHDR - Drift at Shot or Knee
REST - Residual Travel Time at Knee
INTV - Internal Velocity, Average

(GLOBAL PARAMETERS)			(VALUE)	
ELEV OF KB AB. MSL (WST)	KB	:	12.5000	M
ELEV OF SRD AB. MSL(WST)	SRD	:	0	M
Elevation of Kelly Bushi	EKB	:	12.5000	M
UNIFORM EARTH VELOCITY	UNERTH	:	1524.00	M/S

(ZONED PARAMETERS)			(VALUE)		(LIMITS)		
LAYER OPTION FLAG VELOC	LOFVEL	:	0		30479.7	-	0
USER VELOC (WST)	LAYVEL	:	2225.000	M/S	1325.00	-	840.100
			2380.000		840.100		819.600
			2385.000		819.600		94.0000
			1524.000		94.0000		0

565297

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL TRAVEL TIME SRD/GEOPH MS	INTEGRATED ADJUSTED SONIC TIME MS	DRIFT = SHOT TIME - RAW SON MS	RESIDUAL = SHOT TIME - ADJ SON MS	ADJUSTED INTERVAL VELOCITY M/S
1	94.0	81.5	53.48	53.48	0	0	1524
2	819.6	807.1	357.68	357.68	0	0	2385
3	840.1	827.6	366.29	366.30	0	0	2379
4	1325.0	1312.5	584.20	584.20	0	0	2225
5	1400.0	1387.5	610.83	611.33	.44	-.51	2764
6	1499.9	1487.4	646.15	646.93	1.44	-.77	2807
7	1610.0	1597.5	684.18	684.58	3.22	-.40	2924
8	1710.0	1697.5	716.90	717.72	4.07	-.82	3018
9	1800.0	1787.5	749.01	749.52	5.53	-.51	2830
10	1854.4	1841.9	768.12	768.45	6.40	-.33	2874
11	1875.0	1862.5	774.73	775.05	6.67	-.32	3122
12	1900.0	1887.5	783.63	783.80	6.97	-.17	2857
13	2000.0	1987.5	814.84	815.13	7.44	-.29	3192
14	2100.0	2087.5	845.46	845.75	8.02	-.29	3266
15	2200.0	2187.5	875.67	875.94	8.64	-.27	3312
16	2300.0	2287.5	908.38	907.81	11.65	.57	3137
17	2399.9	2387.4	938.49	938.56	13.40	-.08	3249
18	2470.0	2457.5	961.39	961.28	15.22	.11	3086
19	2490.0	2477.5	967.59	967.19	15.85	.40	3383
20	2510.0	2497.5	973.00	972.77	16.00	.22	3583
21	2527.9	2515.4	977.60	977.68	16.03	-.08	3650
22	2550.1	2537.6	984.70	984.17	17.02	.53	3422
23	2570.0	2557.5	990.50	990.11	17.22	.39	3350
24	2590.0	2577.5	996.00	995.56	17.61	.44	3667

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL TRAVEL TIME SRD/GEOPH MS	INTEGRATED ADJUSTED SONIC TIME MS	DRIFT = SHOT TIME - RAW SON MS	RESIDUAL = SHOT TIME - ADJ SON MS	ADJUSTED INTERVAL VELOCITY M/S
25	2610.0	2597.5	1001.10	1000.55	18.06	.56	4013
26	2630.0	2617.5	1006.61	1006.57	17.89	.04	3319
27	2649.9	2637.4	1012.31	1012.45	18.05	-.14	3384
28	2670.0	2657.5	1019.01	1018.77	18.79	.24	3182
29	2689.9	2677.4	1025.31	1024.58	19.61	.73	3422
30	2710.0	2697.5	1031.11	1030.28	20.05	.83	3526
31	2730.0	2717.5	1036.71	1035.93	20.34	.78	3538
32	2750.0	2737.5	1042.21	1041.44	20.68	.78	3634
33	2769.9	2757.4	1047.22	1046.80	20.67	.42	3714
34	2790.0	2777.5	1052.02	1052.17	20.44	-.15	3742
35	2810.0	2797.5	1058.12	1058.16	20.90	-.04	3337
36	2830.0	2817.5	1062.72	1063.55	20.21	-.83	3712
37	2850.0	2837.5	1068.52	1068.67	20.97	-.15	3906
38	2870.0	2857.5	1073.62	1073.80	21.01	-.18	3897
39	2890.0	2877.5	1078.42	1078.85	20.83	-.43	3961
40	2910.0	2897.5	1083.23	1083.85	20.71	-.62	4003
41	2930.0	2917.5	1088.23	1088.95	20.68	-.72	3919
42	2950.0	2937.5	1093.73	1094.11	21.10	-.38	3876
43	2970.0	2957.5	1099.13	1099.44	21.25	-.31	3751
44	2990.0	2977.5	1104.43	1104.48	21.58	-.05	3967
45	3009.9	2997.4	1109.13	1109.33	21.51	-.19	4110
46	3030.0	3017.5	1113.93	1114.16	21.55	-.23	4159
47	3050.0	3037.5	1119.03	1119.34	21.54	-.31	3858
48	3085.0	3072.5	1128.04	1128.06	21.95	-.03	4014

565299

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL TRAVEL TIME SRD/GEOPH MS	INTEGRATED ADJUSTED SONIC TIME MS	DRIFT = SHOT TIME - RAW SON MS	RESIDUAL = SHOT TIME - ADJ SON MS	ADJUSTED INTERVAL VELOCITY M/S

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TIME CONVERTED VELOCITY REPORT

COMPANY : PREMIER OIL AUSTRALASIA
WELL : YOLLA-2
FIELD : YOLLA
STATE : TASMANIA
COUNTRY : AUSTRALIA
REFERENCE: AMF-561266/561267
LOGGED : 17-05-1998

LONG DEFINITIONS

GLOBAL

KB - Elevation of the KELLY-BUSHING Above MSL or MWL
SRD - Elevation of the Seismic Reference Datum Above MSL or MWL
GL - Elevation of Users Reference (Generally Ground Level) Above SRD
UNERTH - UNIFORM EARTH VELOCITY (GTRFRM)
UNFDEN - UNIFORM DENSITY VALUE

MATRIX

MVODIS - MOVE-OUT DISTANCE FROM BOREHOLE

ZONE

LOFVEL - LAYER OPTION FLAG FOR VELOCITY: -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYVEL - USER SUPPLIED VELOCITY DATA
LOFDEN - LAYER OPTION FLAG FOR DENSITY : -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYDEN - USER SUPPLIED DENSITY DATA

SAMPLED

TWOT - Two Way Travel Time (Relative to the Seismic Reference)
DKB - Measured Depth from Kelly-Bushing
DSRD - Depth from SRD
AVGV - Average Seismic Velocity
RMSV - Root Mean Square Velocity (Seismic)
MVOT - Normal Move-Out
MVOT - Normal Move-Out
MVOT - Normal Move-Out
INTV - Internal Velocity, Average

(GLOBAL PARAMETERS)			(VALUE)	
ELEV OF KB AB. MSL (WST)	KB	:	12.5000	M
ELEV OF SRD AB. MSL(WST)	SRD	:	0	M
ELEV OF GL AB. SRD(WST)	GL	:	0	M
UNIFORM EARTH VELOCITY	UNERTH	:	1524.00	M/S
UNIFORM DENSITY VALUE	UNFDEN	:	2.30000	G/C3

(MATRIX PARAMETERS)

	MVOUT DIST M
1	1000.0
2	1500.0
3	2000.0

(ZONED PARAMETERS)			(VALUE)		(LIMITS)		
LAYER OPTION FLAG VELOC	LOFVEL	:	0		30479.7	-	0
USER VELOC (WST)	LAYVEL	:	2225.000	M/S	1325.00	-	840.100
			2380.000		840.100		819.600
			2385.000		819.600		94.0000
			1524.000		94.0000		0
LAYER OPTION FLAG DENS	LOFDEN	:	-1.000000		30479.7	-	0
USER SUPPLIED DENSITY DA	LAYDEN	:	0	G/C3	0	-	0

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								1524
0	12.5	0						1524
2.00	14.0	1.5	1524	1524	654.17	982.25	1310.34	1524
4.00	15.5	3.0	1524	1524	652.18	980.26	1308.34	1524
6.00	17.1	4.6	1524	1524	650.20	978.27	1306.35	1524
8.00	18.6	6.1	1524	1524	648.22	976.28	1304.36	1524
10.00	20.1	7.6	1524	1524	646.24	974.30	1302.37	1524
12.00	21.6	9.1	1524	1524	644.28	972.32	1300.39	1524
14.00	23.2	10.7	1524	1524	642.32	970.35	1298.41	1524
16.00	24.7	12.2	1524	1524	640.36	968.38	1296.43	1524
18.00	26.2	13.7	1524	1524	638.41	966.42	1294.46	1524
20.00	27.7	15.2	1524	1524	636.47	964.46	1292.49	1524
22.00	29.3	16.8	1524	1524	634.54	962.50	1290.52	1524
24.00	30.8	18.3	1524	1524	632.61	960.54	1288.56	1524
26.00	32.3	19.8	1524	1524	630.68	958.60	1286.59	1524
28.00	33.8	21.3	1524	1524	628.77	956.65	1284.63	1524
30.00	35.4	22.9	1524	1524	626.85	954.71	1282.68	1524
32.00	36.9	24.4	1524	1524	624.95	952.77	1280.73	1524
34.00	38.4	25.9	1524	1524	623.05	950.84	1278.78	1524
36.00	39.9	27.4	1524	1524	621.15	948.91	1276.83	1524
38.00	41.5	29.0	1524	1524	619.27	946.99	1274.89	1524
40.00	43.0	30.5	1524	1524	617.39	945.06	1272.95	1524
42.00	44.5	32.0	1524	1524	615.51	943.15	1271.01	1524
44.00	46.0	33.5	1524	1524	613.64	941.24	1269.07	1524
46.00	47.6	35.1	1524	1524	611.78	939.33	1267.14	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
48.00	49.1	36.6	1524	1524	609.92	937.42	1265.21	1524
50.00	50.6	38.1	1524	1524	608.07	935.52	1263.29	1524
52.00	52.1	39.6	1524	1524	606.23	933.62	1261.37	1524
54.00	53.6	41.1	1524	1524	604.39	931.73	1259.45	1524
56.00	55.2	42.7	1524	1524	602.55	929.84	1257.53	1524
58.00	56.7	44.2	1524	1524	600.73	927.96	1255.62	1524
60.00	58.2	45.7	1524	1524	598.91	926.08	1253.71	1524
62.00	59.7	47.2	1524	1524	597.09	924.20	1251.80	1524
64.00	61.3	48.8	1524	1524	595.28	922.33	1249.90	1524
66.00	62.8	50.3	1524	1524	593.48	920.46	1247.99	1524
68.00	64.3	51.8	1524	1524	591.68	918.60	1246.10	1524
70.00	65.8	53.3	1524	1524	589.89	916.74	1244.20	1524
72.00	67.4	54.9	1524	1524	588.11	914.88	1242.31	1524
74.00	68.9	56.4	1524	1524	586.33	913.03	1240.42	1524
76.00	70.4	57.9	1524	1524	584.55	911.18	1238.53	1524
78.00	71.9	59.4	1524	1524	582.79	909.34	1236.65	1524
80.00	73.5	61.0	1524	1524	581.03	907.50	1234.77	1524
82.00	75.0	62.5	1524	1524	579.27	905.66	1232.90	1524
84.00	76.5	64.0	1524	1524	577.52	903.83	1231.02	1524
86.00	78.0	65.5	1524	1524	575.78	902.00	1229.15	1524
88.00	79.6	67.1	1524	1524	574.04	900.18	1227.28	1524
90.00	81.1	68.6	1524	1524	572.31	898.36	1225.42	1524
92.00	82.6	70.1	1524	1524	570.59	896.54	1223.56	1524
94.00	84.1	71.6	1524	1524	568.87	894.73	1221.70	1524

565305

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
96.00	85.7	73.2	1524	1524	567.15	892.92	1219.84	1524
98.00	87.2	74.7	1524	1524	565.45	891.12	1217.99	1524
100.00	88.7	76.2	1524	1524	563.74	889.32	1216.14	1524
102.00	90.2	77.7	1524	1524	562.05	887.52	1214.29	1524
104.00	91.7	79.2	1524	1524	560.36	885.73	1212.45	1524
106.00	93.3	80.8	1524	1524	558.67	883.94	1210.61	1524
108.00	95.3	82.8	1534	1535	552.29	875.05	1199.27	2041
110.00	97.7	85.2	1549	1555	542.52	861.03	1181.07	2385
112.00	100.1	87.6	1564	1573	533.34	847.88	1164.02	2385
114.00	102.5	90.0	1578	1591	524.69	835.52	1148.03	2385
116.00	104.9	92.4	1592	1608	516.51	823.87	1132.97	2385
118.00	107.2	94.7	1606	1625	508.77	812.85	1118.76	2385
120.00	109.6	97.1	1619	1640	501.41	802.41	1105.32	2385
122.00	112.0	99.5	1631	1655	494.41	792.50	1092.58	2385
124.00	114.4	101.9	1643	1669	487.74	783.07	1080.47	2385
126.00	116.8	104.3	1655	1683	481.36	774.08	1068.95	2385
128.00	119.2	106.7	1667	1696	475.26	765.49	1057.97	2385
130.00	121.6	109.1	1678	1709	469.40	757.28	1047.47	2385
132.00	123.9	111.4	1688	1721	463.79	749.41	1037.43	2385
134.00	126.3	113.8	1699	1733	458.38	741.86	1027.81	2385
136.00	128.7	116.2	1709	1744	453.18	734.60	1018.58	2385
138.00	131.1	118.6	1719	1755	448.17	727.61	1009.71	2385
140.00	133.5	121.0	1728	1766	443.33	720.88	1001.18	2385
142.00	135.9	123.4	1737	1776	438.65	714.38	992.96	2385

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2385
144.00	138.2	125.7	1746	1786	434.13	708.11	985.03	2385
146.00	140.6	128.1	1755	1796	429.74	702.05	977.37	2385
148.00	143.0	130.5	1764	1805	425.49	696.18	969.98	2385
150.00	145.4	132.9	1772	1814	421.37	690.49	962.82	2385
152.00	147.8	135.3	1780	1822	417.37	684.97	955.88	2385
154.00	150.2	137.7	1788	1831	413.48	679.62	949.16	2385
156.00	152.6	140.1	1796	1839	409.69	674.42	942.64	2385
158.00	154.9	142.4	1803	1847	406.01	669.36	936.31	2385
160.00	157.3	144.8	1810	1855	402.42	664.44	930.16	2385
162.00	159.7	147.2	1817	1862	398.92	659.65	924.18	2385
164.00	162.1	149.6	1824	1869	395.50	654.98	918.35	2385
166.00	164.5	152.0	1831	1876	392.17	650.43	912.68	2385
168.00	166.9	154.4	1838	1883	388.92	645.99	907.15	2385
170.00	169.3	156.8	1844	1890	385.74	641.65	901.76	2385
172.00	171.6	159.1	1850	1897	382.63	637.41	896.50	2385
174.00	174.0	161.5	1857	1903	379.59	633.27	891.36	2385
176.00	176.4	163.9	1863	1909	376.61	629.22	886.34	2385
178.00	178.8	166.3	1868	1915	373.69	625.25	881.44	2385
180.00	181.2	168.7	1874	1921	370.84	621.37	876.64	2385
182.00	183.6	171.1	1880	1927	368.04	617.57	871.94	2385
184.00	186.0	173.5	1885	1932	365.29	613.84	867.34	2385
186.00	188.3	175.8	1891	1938	362.60	610.19	862.83	2385
188.00	190.7	178.2	1896	1943	359.95	606.60	858.42	2385
190.00	193.1	180.6	1901	1948	357.36	603.08	854.09	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2385
192.00	195.5	183.0	1906	1953	354.81	599.63	849.84	
								2385
194.00	197.9	185.4	1911	1958	352.31	596.24	845.67	
								2385
196.00	200.3	187.8	1916	1963	349.85	592.91	841.58	
								2385
198.00	202.6	190.1	1921	1968	347.43	589.63	837.56	
								2385
200.00	205.0	192.5	1925	1972	345.06	586.41	833.61	
								2385
202.00	207.4	194.9	1930	1977	342.72	583.25	829.73	
								2385
204.00	209.8	197.3	1934	1981	340.42	580.13	825.91	
								2385
206.00	212.2	199.7	1939	1985	338.15	577.06	822.16	
								2385
208.00	214.6	202.1	1943	1990	335.93	574.05	818.47	
								2385
210.00	217.0	204.5	1947	1994	333.73	571.07	814.83	
								2385
212.00	219.3	206.8	1951	1998	331.57	568.15	811.25	
								2385
214.00	221.7	209.2	1955	2002	329.44	565.26	807.73	
								2385
216.00	224.1	211.6	1959	2006	327.35	562.42	804.26	
								2385
218.00	226.5	214.0	1963	2010	325.28	559.61	800.84	
								2385
220.00	228.9	216.4	1967	2013	323.24	556.85	797.47	
								2385
222.00	231.3	218.8	1971	2017	321.23	554.13	794.14	
								2385
224.00	233.7	221.2	1975	2021	319.25	551.44	790.87	
								2385
226.00	236.0	223.5	1978	2024	317.30	548.78	787.63	
								2385
228.00	238.4	225.9	1982	2027	315.37	546.16	784.44	
								2385
230.00	240.8	228.3	1985	2031	313.47	543.58	781.30	
								2385
232.00	243.2	230.7	1989	2034	311.59	541.03	778.19	
								2385
234.00	245.6	233.1	1992	2037	309.74	538.51	775.12	
								2385
236.00	248.0	235.5	1995	2041	307.91	536.02	772.09	
								2385
238.00	250.4	237.9	1999	2044	306.10	533.56	769.10	

COMPANY PREMIER OIL AUSTRALASIA WEL. : YOLLA-2

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
240.00	252.7	240.2	2002	2047	304.32	531.13	766.14	2385
242.00	255.1	242.6	2005	2050	302.56	528.72	763.22	2385
244.00	257.5	245.0	2008	2053	300.82	526.35	760.34	2385
246.00	259.9	247.4	2011	2056	299.10	524.00	757.48	2385
248.00	262.3	249.8	2014	2059	297.40	521.68	754.66	2385
250.00	264.7	252.2	2017	2061	295.72	519.38	751.87	2385
252.00	267.1	254.6	2020	2064	294.06	517.11	749.11	2385
254.00	269.4	256.9	2023	2067	292.42	514.87	746.39	2385
256.00	271.8	259.3	2026	2070	290.80	512.65	743.69	2385
258.00	274.2	261.7	2029	2072	289.20	510.45	741.01	2385
260.00	276.6	264.1	2031	2075	287.62	508.27	738.37	2385
262.00	279.0	266.5	2034	2077	286.05	506.12	735.75	2385
264.00	281.4	268.9	2037	2080	284.50	503.99	733.16	2385
266.00	283.7	271.2	2039	2082	282.97	501.88	730.60	2385
268.00	286.1	273.6	2042	2085	281.46	499.79	728.06	2385
270.00	288.5	276.0	2045	2087	279.96	497.72	725.54	2385
272.00	290.9	278.4	2047	2090	278.47	495.67	723.05	2385
274.00	293.3	280.8	2050	2092	277.01	493.64	720.59	2385
276.00	295.7	283.2	2052	2094	275.55	491.63	718.14	2385
278.00	298.1	285.6	2054	2096	274.12	489.64	715.72	2385
280.00	300.4	287.9	2057	2099	272.69	487.66	713.32	2385
282.00	302.8	290.3	2059	2101	271.29	485.71	710.94	2385
284.00	305.2	292.7	2061	2103	269.89	483.77	708.58	2385
286.00	307.6	295.1	2064	2105	268.51	481.85	706.24	2385

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2385
288.00	310.0	297.5	2066	2107	267.15	479.95	703.93	2385
290.00	312.4	299.9	2068	2109	265.79	478.06	701.63	2385
292.00	314.8	302.3	2070	2111	264.46	476.19	699.35	2385
294.00	317.1	304.6	2072	2113	263.13	474.34	697.09	2385
296.00	319.5	307.0	2074	2115	261.82	472.50	694.85	2385
298.00	321.9	309.4	2077	2117	260.52	470.67	692.63	2385
300.00	324.3	311.8	2079	2119	259.23	468.87	690.43	2385
302.00	326.7	314.2	2081	2121	257.95	467.07	688.24	2385
304.00	329.1	316.6	2083	2123	256.69	465.30	686.07	2385
306.00	331.5	319.0	2085	2124	255.44	463.53	683.92	2385
308.00	333.8	321.3	2087	2126	254.20	461.78	681.78	2385
310.00	336.2	323.7	2089	2128	252.97	460.05	679.66	2385
312.00	338.6	326.1	2090	2130	251.75	458.33	677.56	2385
314.00	341.0	328.5	2092	2131	250.54	456.62	675.47	2385
316.00	343.4	330.9	2094	2133	249.35	454.92	673.40	2385
318.00	345.8	333.3	2096	2135	248.16	453.24	671.34	2385
320.00	348.1	335.6	2098	2136	246.99	451.57	669.30	2385
322.00	350.5	338.0	2100	2138	245.83	449.92	667.27	2385
324.00	352.9	340.4	2101	2140	244.67	448.27	665.26	2385
326.00	355.3	342.8	2103	2141	243.53	446.64	663.26	2385
328.00	357.7	345.2	2105	2143	242.40	445.02	661.27	2385
330.00	360.1	347.6	2107	2144	241.27	443.41	659.30	2385
332.00	362.5	350.0	2108	2146	240.16	441.82	657.34	2385
334.00	364.8	352.3	2110	2147	239.06	440.23	655.40	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
336.00	367.2	354.7	2111	2149	237.96	438.66	653.46	2385
338.00	369.6	357.1	2113	2150	236.88	437.10	651.55	2385
340.00	372.0	359.5	2115	2152	235.80	435.55	649.64	2385
342.00	374.4	361.9	2116	2153	234.73	434.01	647.75	2385
344.00	376.8	364.3	2118	2155	233.68	432.48	645.87	2385
346.00	379.2	366.7	2119	2156	232.63	430.97	644.00	2385
348.00	381.5	369.0	2121	2158	231.59	429.46	642.14	2385
350.00	383.9	371.4	2122	2159	230.56	427.96	640.29	2385
352.00	386.3	373.8	2124	2160	229.53	426.48	638.46	2385
354.00	388.7	376.2	2125	2162	228.52	425.00	636.64	2385
356.00	391.1	378.6	2127	2163	227.51	423.54	634.83	2385
358.00	393.5	381.0	2128	2164	226.51	422.08	633.03	2385
360.00	395.9	383.4	2130	2166	225.52	420.63	631.24	2385
362.00	398.2	385.7	2131	2167	224.54	419.20	629.46	2385
364.00	400.6	388.1	2133	2168	223.57	417.77	627.69	2385
366.00	403.0	390.5	2134	2169	222.60	416.35	625.94	2385
368.00	405.4	392.9	2135	2171	221.64	414.94	624.19	2385
370.00	407.8	395.3	2137	2172	220.69	413.54	622.46	2385
372.00	410.2	397.7	2138	2173	219.75	412.15	620.73	2385
374.00	412.6	400.1	2139	2174	218.81	410.77	619.01	2385
376.00	414.9	402.4	2141	2175	217.88	409.40	617.31	2385
378.00	417.3	404.8	2142	2177	216.96	408.03	615.61	2385
380.00	419.7	407.2	2143	2178	216.05	406.68	613.93	2385
382.00	422.1	409.6	2144	2179	215.14	405.33	612.25	2385

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2385
384.00	424.5	412.0	2146	2180	214.24	403.99	610.58	
								2385
386.00	426.9	414.4	2147	2181	213.35	402.66	608.92	
								2385
388.00	429.2	416.7	2148	2182	212.46	401.34	607.28	
								2385
390.00	431.6	419.1	2149	2183	211.58	400.03	605.64	
								2385
392.00	434.0	421.5	2151	2184	210.71	398.72	604.01	
								2385
394.00	436.4	423.9	2152	2185	209.84	397.43	602.38	
								2385
396.00	438.8	426.3	2153	2186	208.98	396.14	600.77	
								2385
398.00	441.2	428.7	2154	2187	208.13	394.86	599.17	
								2385
400.00	443.6	431.1	2155	2189	207.28	393.58	597.57	
								2385
402.00	445.9	433.4	2156	2190	206.44	392.32	595.98	
								2385
404.00	448.3	435.8	2158	2191	205.60	391.06	594.41	
								2385
406.00	450.7	438.2	2159	2192	204.77	389.81	592.84	
								2385
408.00	453.1	440.6	2160	2193	203.95	388.56	591.27	
								2385
410.00	455.5	443.0	2161	2194	203.14	387.33	589.72	
								2385
412.00	457.9	445.4	2162	2194	202.32	386.10	588.17	
								2385
414.00	460.3	447.8	2163	2195	201.52	384.88	586.64	
								2385
416.00	462.6	450.1	2164	2196	200.72	383.66	585.11	
								2385
418.00	465.0	452.5	2165	2197	199.93	382.45	583.58	
								2385
420.00	467.4	454.9	2166	2198	199.14	381.25	582.07	
								2385
422.00	469.8	457.3	2167	2199	198.36	380.06	580.56	
								2385
424.00	472.2	459.7	2168	2200	197.58	378.87	579.06	
								2385
426.00	474.6	462.1	2169	2201	196.81	377.69	577.57	
								2385
428.00	477.0	464.5	2170	2202	196.05	376.52	576.09	
								2385
430.00	479.3	466.8	2171	2203	195.29	375.35	574.61	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
432.00	481.7	469.2	2172	2204	194.53	374.19	573.14	2385
434.00	484.1	471.6	2173	2205	193.79	373.04	571.68	2385
436.00	486.5	474.0	2174	2205	193.04	371.89	570.22	2385
438.00	488.9	476.4	2175	2206	192.30	370.75	568.78	2385
440.00	491.3	478.8	2176	2207	191.57	369.62	567.34	2385
442.00	493.6	481.1	2177	2208	190.84	368.49	565.90	2385
444.00	496.0	483.5	2178	2209	190.12	367.37	564.47	2385
446.00	498.4	485.9	2179	2210	189.40	366.25	563.05	2385
448.00	500.8	488.3	2180	2210	188.69	365.15	561.64	2385
450.00	503.2	490.7	2181	2211	187.98	364.04	560.23	2385
452.00	505.6	493.1	2182	2212	187.28	362.95	558.83	2385
454.00	508.0	495.5	2183	2213	186.58	361.85	557.44	2385
456.00	510.3	497.8	2184	2214	185.88	360.77	556.05	2385
458.00	512.7	500.2	2184	2214	185.19	359.69	554.67	2385
460.00	515.1	502.6	2185	2215	184.51	358.62	553.30	2385
462.00	517.5	505.0	2186	2216	183.83	357.55	551.93	2385
464.00	519.9	507.4	2187	2217	183.15	356.49	550.57	2385
466.00	522.3	509.8	2188	2217	182.48	355.43	549.21	2385
468.00	524.7	512.2	2189	2218	181.82	354.38	547.86	2385
470.00	527.0	514.5	2190	2219	181.16	353.34	546.52	2385
472.00	529.4	516.9	2190	2220	180.50	352.30	545.19	2385
474.00	531.8	519.3	2191	2220	179.85	351.26	543.85	2385
476.00	534.2	521.7	2192	2221	179.20	350.24	542.53	2385
478.00	536.6	524.1	2193	2222	178.55	349.21	541.21	2385

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2385
480.00	539.0	526.5	2194	2223	177.91	348.20	539.90	2385
482.00	541.4	528.9	2194	2223	177.28	347.18	538.59	2385
484.00	543.7	531.2	2195	2224	176.64	346.18	537.29	2385
486.00	546.1	533.6	2196	2225	176.02	345.18	535.99	2385
488.00	548.5	536.0	2197	2225	175.39	344.18	534.71	2385
490.00	550.9	538.4	2198	2226	174.77	343.19	533.42	2385
492.00	553.3	540.8	2198	2227	174.16	342.20	532.14	2385
494.00	555.7	543.2	2199	2227	173.55	341.22	530.87	2385
496.00	558.1	545.6	2200	2228	172.94	340.24	529.60	2385
498.00	560.4	547.9	2201	2229	172.33	339.27	528.34	2385
500.00	562.8	550.3	2201	2229	171.73	338.31	527.09	2385
502.00	565.2	552.7	2202	2230	171.14	337.35	525.83	2385
504.00	567.6	555.1	2203	2231	170.55	336.39	524.59	2385
506.00	570.0	557.5	2203	2231	169.96	335.44	523.35	2385
508.00	572.4	559.9	2204	2232	169.37	334.49	522.11	2385
510.00	574.7	562.2	2205	2232	168.79	333.55	520.89	2385
512.00	577.1	564.6	2206	2233	168.21	332.61	519.66	2385
514.00	579.5	567.0	2206	2234	167.64	331.68	518.44	2385
516.00	581.9	569.4	2207	2234	167.07	330.75	517.23	2385
518.00	584.3	571.8	2208	2235	166.50	329.83	516.02	2385
520.00	586.7	574.2	2208	2235	165.94	328.91	514.82	2385
522.00	589.1	576.6	2209	2236	165.38	328.00	513.62	2385
524.00	591.4	578.9	2210	2237	164.82	327.09	512.42	2385
526.00	593.8	581.3	2210	2237	164.27	326.18	511.24	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2385
528.00	596.2	583.7	2211	2238	163.72	325.28	510.05	2385
530.00	598.6	586.1	2212	2238	163.17	324.39	508.87	2385
532.00	601.0	588.5	2212	2239	162.63	323.50	507.70	2385
534.00	603.4	590.9	2213	2240	162.09	322.61	506.53	2385
536.00	605.8	593.3	2214	2240	161.56	321.73	505.37	2385
538.00	608.1	595.6	2214	2241	161.02	320.85	504.21	2385
540.00	610.5	598.0	2215	2241	160.49	319.97	503.05	2385
542.00	612.9	600.4	2216	2242	159.97	319.10	501.90	2385
544.00	615.3	602.8	2216	2242	159.44	318.24	500.76	2385
546.00	617.7	605.2	2217	2243	158.92	317.37	499.62	2385
548.00	620.1	607.6	2217	2243	158.41	316.52	498.48	2385
550.00	622.5	610.0	2218	2244	157.89	315.66	497.35	2385
552.00	624.8	612.3	2219	2244	157.38	314.81	496.22	2385
554.00	627.2	614.7	2219	2245	156.87	313.97	495.10	2385
556.00	629.6	617.1	2220	2245	156.37	313.13	493.98	2385
558.00	632.0	619.5	2220	2246	155.87	312.29	492.87	2385
560.00	634.4	621.9	2221	2246	155.37	311.46	491.76	2385
562.00	636.8	624.3	2222	2247	154.87	310.63	490.66	2385
564.00	639.1	626.6	2222	2247	154.38	309.80	489.56	2385
566.00	641.5	629.0	2223	2248	153.89	308.98	488.46	2385
568.00	643.9	631.4	2223	2248	153.40	308.16	487.37	2385
570.00	646.3	633.8	2224	2249	152.92	307.35	486.28	2385
572.00	648.7	636.2	2224	2249	152.44	306.54	485.20	2385
574.00	651.1	638.6	2225	2250	151.96	305.74	484.12	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
576.00	653.5	641.0	2226	2250	151.48	304.93	483.05	2385
578.00	655.8	643.3	2226	2251	151.01	304.13	481.98	2385
580.00	658.2	645.7	2227	2251	150.54	303.34	480.91	2385
582.00	660.6	648.1	2227	2252	150.07	302.55	479.85	2385
584.00	663.0	650.5	2228	2252	149.60	301.76	478.79	2385
586.00	665.4	652.9	2228	2253	149.14	300.98	477.74	2385
588.00	667.8	655.3	2229	2253	148.68	300.20	476.69	2385
590.00	670.2	657.7	2229	2254	148.22	299.42	475.65	2385
592.00	672.5	660.0	2230	2254	147.77	298.65	474.61	2385
594.00	674.9	662.4	2230	2255	147.32	297.88	473.57	2385
596.00	677.3	664.8	2231	2255	146.87	297.11	472.54	2385
598.00	679.7	667.2	2231	2256	146.42	296.35	471.51	2385
600.00	682.1	669.6	2232	2256	145.98	295.59	470.48	2385
602.00	684.5	672.0	2232	2256	145.54	294.84	469.46	2385
604.00	686.9	674.4	2233	2257	145.10	294.09	468.44	2385
606.00	689.2	676.7	2233	2257	144.66	293.34	467.43	2385
608.00	691.6	679.1	2234	2258	144.22	292.59	466.42	2385
610.00	694.0	681.5	2234	2258	143.79	291.85	465.41	2385
612.00	696.4	683.9	2235	2259	143.36	291.11	464.41	2385
614.00	698.8	686.3	2235	2259	142.94	290.38	463.41	2385
616.00	701.2	688.7	2236	2259	142.51	289.64	462.42	2385
618.00	703.6	691.1	2236	2260	142.09	288.92	461.43	2385
620.00	705.9	693.4	2237	2260	141.67	288.19	460.44	2385
622.00	708.3	695.8	2237	2261	141.25	287.47	459.46	2385

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
624.00	710.7	698.2	2238	2261	140.83	286.75	458.48	2385
626.00	713.1	700.6	2238	2262	140.42	286.04	457.50	2385
628.00	715.5	703.0	2239	2262	140.01	285.32	456.53	2385
630.00	717.9	705.4	2239	2262	139.60	284.61	455.56	2385
632.00	720.2	707.7	2240	2263	139.19	283.91	454.60	2385
634.00	722.6	710.1	2240	2263	138.79	283.21	453.63	2385
636.00	725.0	712.5	2241	2264	138.39	282.51	452.68	2385
638.00	727.4	714.9	2241	2264	137.99	281.81	451.72	2385
640.00	729.8	717.3	2242	2264	137.59	281.12	450.77	2385
642.00	732.2	719.7	2242	2265	137.19	280.42	449.82	2385
644.00	734.6	722.1	2242	2265	136.80	279.74	448.88	2385
646.00	736.9	724.4	2243	2265	136.41	279.05	447.94	2385
648.00	739.3	726.8	2243	2266	136.02	278.37	447.00	2385
650.00	741.7	729.2	2244	2266	135.63	277.69	446.07	2385
652.00	744.1	731.6	2244	2267	135.25	277.02	445.14	2385
654.00	746.5	734.0	2245	2267	134.86	276.34	444.21	2385
656.00	748.9	736.4	2245	2267	134.48	275.67	443.29	2385
658.00	751.3	738.8	2245	2268	134.10	275.01	442.37	2385
660.00	753.6	741.1	2246	2268	133.73	274.34	441.45	2385
662.00	756.0	743.5	2246	2268	133.35	273.68	440.54	2385
664.00	758.4	745.9	2247	2269	132.98	273.03	439.63	2385
666.00	760.8	748.3	2247	2269	132.61	272.37	438.72	2385
668.00	763.2	750.7	2248	2269	132.24	271.72	437.82	2385
670.00	765.6	753.1	2248	2270	131.87	271.07	436.92	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2385
672.00	768.0	755.5	2248	2270	131.50	270.42	436.02	2385
674.00	770.3	757.8	2249	2271	131.14	269.78	435.13	2385
676.00	772.7	760.2	2249	2271	130.78	269.13	434.24	2385
678.00	775.1	762.6	2250	2271	130.42	268.50	433.35	2385
680.00	777.5	765.0	2250	2272	130.06	267.86	432.47	2385
682.00	779.9	767.4	2250	2272	129.70	267.23	431.59	2385
684.00	782.3	769.8	2251	2272	129.35	266.60	430.71	2385
686.00	784.6	772.1	2251	2273	129.00	265.97	429.83	2385
688.00	787.0	774.5	2252	2273	128.64	265.34	428.96	2385
690.00	789.4	776.9	2252	2273	128.30	264.72	428.09	2385
692.00	791.8	779.3	2252	2274	127.95	264.10	427.23	2385
694.00	794.2	781.7	2253	2274	127.60	263.48	426.36	2385
696.00	796.6	784.1	2253	2274	127.26	262.87	425.51	2385
698.00	799.0	786.5	2253	2275	126.92	262.26	424.65	2385
700.00	801.3	788.8	2254	2275	126.58	261.65	423.80	2385
702.00	803.7	791.2	2254	2275	126.24	261.04	422.94	2385
704.00	806.1	793.6	2255	2276	125.90	260.44	422.10	2385
706.00	808.5	796.0	2255	2276	125.57	259.83	421.25	2385
708.00	810.9	798.4	2255	2276	125.23	259.23	420.41	2385
710.00	813.3	800.8	2256	2276	124.90	258.64	419.57	2385
712.00	815.7	803.2	2256	2277	124.57	258.04	418.74	2385
714.00	818.0	805.5	2256	2277	124.24	257.45	417.90	2383
716.00	820.4	807.9	2257	2277	123.92	256.86	417.08	2379
718.00	822.8	810.3	2257	2278	123.59	256.28	416.26	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
720.00	825.2	812.7	2257	2278	123.27	255.70	415.44	2380
722.00	827.6	815.1	2258	2278	122.95	255.12	414.62	2380
724.00	829.9	817.4	2258	2279	122.63	254.54	413.81	2379
726.00	832.3	819.8	2258	2279	122.31	253.97	413.00	2380
728.00	834.7	822.2	2259	2279	122.00	253.39	412.19	2379
730.00	837.1	824.6	2259	2279	121.68	252.82	411.38	2380
732.00	839.5	827.0	2259	2280	121.37	252.26	410.58	2379
734.00	841.7	829.2	2259	2280	121.09	251.75	409.88	2262
736.00	843.9	831.4	2259	2280	120.82	251.27	409.20	2225
738.00	846.2	833.7	2259	2279	120.56	250.79	408.53	2225
740.00	848.4	835.9	2259	2279	120.29	250.31	407.86	2225
742.00	850.6	838.1	2259	2279	120.02	249.84	407.20	2225
744.00	852.9	840.4	2259	2279	119.76	249.36	406.53	2225
746.00	855.1	842.6	2259	2279	119.50	248.89	405.87	2225
748.00	857.3	844.8	2259	2279	119.24	248.41	405.21	2225
750.00	859.5	847.0	2259	2279	118.98	247.94	404.54	2225
752.00	861.8	849.3	2259	2278	118.72	247.47	403.89	2225
754.00	864.0	851.5	2259	2278	118.46	247.01	403.23	2225
756.00	866.2	853.7	2258	2278	118.20	246.54	402.57	2225
758.00	868.4	855.9	2258	2278	117.94	246.07	401.92	2225
760.00	870.7	858.2	2258	2278	117.69	245.61	401.27	2225
762.00	872.9	860.4	2258	2278	117.43	245.15	400.62	2225
764.00	875.1	862.6	2258	2278	117.18	244.69	399.97	2225
766.00	877.3	864.8	2258	2277	116.93	244.23	399.32	2225

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
768.00	879.6	867.1	2258	2277	116.68	243.77	398.68	2225
770.00	881.8	869.3	2258	2277	116.43	243.32	398.03	2225
772.00	884.0	871.5	2258	2277	116.18	242.86	397.39	2225
774.00	886.2	873.7	2258	2277	115.93	242.41	396.75	2225
776.00	888.5	876.0	2258	2277	115.68	241.96	396.11	2225
778.00	890.7	878.2	2258	2277	115.43	241.51	395.47	2225
780.00	892.9	880.4	2257	2276	115.19	241.06	394.84	2225
782.00	895.1	882.6	2257	2276	114.94	240.61	394.20	2225
784.00	897.4	884.9	2257	2276	114.70	240.17	393.57	2225
786.00	899.6	887.1	2257	2276	114.46	239.72	392.94	2225
788.00	901.8	889.3	2257	2276	114.22	239.28	392.31	2225
790.00	904.0	891.5	2257	2276	113.97	238.84	391.68	2225
792.00	906.3	893.8	2257	2276	113.73	238.40	391.06	2225
794.00	908.5	896.0	2257	2276	113.50	237.96	390.44	2225
796.00	910.7	898.2	2257	2275	113.26	237.52	389.81	2225
798.00	912.9	900.4	2257	2275	113.02	237.09	389.19	2225
800.00	915.2	902.7	2257	2275	112.78	236.65	388.57	2225
802.00	917.4	904.9	2257	2275	112.55	236.22	387.95	2225
804.00	919.6	907.1	2256	2275	112.32	235.79	387.34	2225
806.00	921.8	909.3	2256	2275	112.08	235.36	386.72	2225
808.00	924.1	911.6	2256	2275	111.85	234.93	386.11	2225
810.00	926.3	913.8	2256	2275	111.62	234.50	385.50	2225
812.00	928.5	916.0	2256	2274	111.39	234.07	384.89	2225
814.00	930.7	918.2	2256	2274	111.16	233.65	384.28	2225

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2225
816.00	933.0	920.5	2256	2274	110.93	233.22	383.67	2225
818.00	935.2	922.7	2256	2274	110.70	232.80	383.07	2225
820.00	937.4	924.9	2256	2274	110.47	232.38	382.47	2225
822.00	939.6	927.1	2256	2274	110.25	231.96	381.86	2225
824.00	941.9	929.4	2256	2274	110.02	231.54	381.26	2225
826.00	944.1	931.6	2256	2274	109.80	231.13	380.66	2225
828.00	946.3	933.8	2256	2274	109.57	230.71	380.07	2225
830.00	948.5	936.0	2256	2273	109.35	230.30	379.47	2225
832.00	950.8	938.3	2255	2273	109.13	229.88	378.88	2225
834.00	953.0	940.5	2255	2273	108.91	229.47	378.28	2225
836.00	955.2	942.7	2255	2273	108.69	229.06	377.69	2225
838.00	957.4	944.9	2255	2273	108.47	228.65	377.10	2225
840.00	959.7	947.2	2255	2273	108.25	228.24	376.51	2225
842.00	961.9	949.4	2255	2273	108.03	227.84	375.93	2225
844.00	964.1	951.6	2255	2273	107.81	227.43	375.34	2225
846.00	966.3	953.8	2255	2273	107.60	227.03	374.76	2225
848.00	968.6	956.1	2255	2272	107.38	226.63	374.18	2225
850.00	970.8	958.3	2255	2272	107.17	226.22	373.59	2225
852.00	973.0	960.5	2255	2272	106.95	225.82	373.02	2225
854.00	975.2	962.7	2255	2272	106.74	225.43	372.44	2225
856.00	977.5	965.0	2255	2272	106.53	225.03	371.86	2225
858.00	979.7	967.2	2255	2272	106.32	224.63	371.29	2225
860.00	981.9	969.4	2254	2272	106.11	224.24	370.71	2225
862.00	984.1	971.6	2254	2272	105.90	223.84	370.14	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2225
864.00	986.4	973.9	2254	2272	105.69	223.45	369.57	
								2225
866.00	988.6	976.1	2254	2271	105.48	223.06	369.00	
								2225
868.00	990.8	978.3	2254	2271	105.27	222.67	368.43	
								2225
870.00	993.0	980.5	2254	2271	105.07	222.28	367.87	
								2225
872.00	995.3	982.8	2254	2271	104.86	221.89	367.30	
								2225
874.00	997.5	985.0	2254	2271	104.65	221.50	366.74	
								2225
876.00	999.7	987.2	2254	2271	104.45	221.12	366.18	
								2225
878.00	1001.9	989.4	2254	2271	104.25	220.73	365.62	
								2225
880.00	1004.2	991.7	2254	2271	104.04	220.35	365.06	
								2225
882.00	1006.4	993.9	2254	2271	103.84	219.97	364.50	
								2225
884.00	1008.6	996.1	2254	2271	103.64	219.59	363.94	
								2225
886.00	1010.8	998.3	2254	2270	103.44	219.21	363.39	
								2225
888.00	1013.1	1000.6	2254	2270	103.24	218.83	362.84	
								2225
890.00	1015.3	1002.8	2253	2270	103.04	218.45	362.28	
								2225
892.00	1017.5	1005.0	2253	2270	102.84	218.07	361.73	
								2225
894.00	1019.7	1007.2	2253	2270	102.64	217.70	361.18	
								2225
896.00	1022.0	1009.5	2253	2270	102.45	217.33	360.64	
								2225
898.00	1024.2	1011.7	2253	2270	102.25	216.95	360.09	
								2225
900.00	1026.4	1013.9	2253	2270	102.05	216.58	359.54	
								2225
902.00	1028.6	1016.1	2253	2270	101.86	216.21	359.00	
								2225
904.00	1030.9	1018.4	2253	2270	101.67	215.84	358.46	
								2225
906.00	1033.1	1020.6	2253	2269	101.47	215.47	357.92	
								2225
908.00	1035.3	1022.8	2253	2269	101.28	215.11	357.38	
								2225
910.00	1037.5	1025.0	2253	2269	101.09	214.74	356.84	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
912.00	1039.8	1027.3	2253	2269	100.89	214.38	356.30	2225
914.00	1042.0	1029.5	2253	2269	100.70	214.01	355.77	2225
916.00	1044.2	1031.7	2253	2269	100.51	213.65	355.23	2225
918.00	1046.4	1033.9	2253	2269	100.32	213.29	354.70	2225
920.00	1048.7	1036.2	2253	2269	100.14	212.93	354.17	2225
922.00	1050.9	1038.4	2252	2269	99.95	212.57	353.64	2225
924.00	1053.1	1040.6	2252	2269	99.76	212.21	353.11	2225
926.00	1055.3	1042.8	2252	2268	99.57	211.85	352.58	2225
928.00	1057.6	1045.1	2252	2268	99.39	211.50	352.06	2225
930.00	1059.8	1047.3	2252	2268	99.20	211.14	351.53	2225
932.00	1062.0	1049.5	2252	2268	99.02	210.79	351.01	2225
934.00	1064.2	1051.7	2252	2268	98.83	210.43	350.49	2225
936.00	1066.5	1054.0	2252	2268	98.65	210.08	349.97	2225
938.00	1068.7	1056.2	2252	2268	98.47	209.73	349.45	2225
940.00	1070.9	1058.4	2252	2268	98.28	209.38	348.93	2225
942.00	1073.2	1060.7	2252	2268	98.10	209.03	348.41	2225
944.00	1075.4	1062.9	2252	2268	97.92	208.68	347.90	2225
946.00	1077.6	1065.1	2252	2268	97.74	208.34	347.38	2225
948.00	1079.8	1067.3	2252	2267	97.56	207.99	346.87	2225
950.00	1082.1	1069.6	2252	2267	97.38	207.65	346.36	2225
952.00	1084.3	1071.8	2252	2267	97.20	207.30	345.85	2225
954.00	1086.5	1074.0	2252	2267	97.03	206.96	345.34	2225
956.00	1088.7	1076.2	2252	2267	96.85	206.62	344.83	2225
958.00	1091.0	1078.5	2251	2267	96.67	206.28	344.32	2225

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2225
960.00	1093.2	1080.7	2251	2267	96.50	205.94	343.82	
								2225
962.00	1095.4	1082.9	2251	2267	96.32	205.60	343.31	
								2225
964.00	1097.6	1085.1	2251	2267	96.15	205.26	342.81	
								2225
966.00	1099.9	1087.4	2251	2267	95.97	204.93	342.31	
								2225
968.00	1102.1	1089.6	2251	2267	95.80	204.59	341.81	
								2225
970.00	1104.3	1091.8	2251	2267	95.63	204.26	341.31	
								2225
972.00	1106.5	1094.0	2251	2266	95.45	203.92	340.81	
								2225
974.00	1108.8	1096.3	2251	2266	95.28	203.59	340.31	
								2225
976.00	1111.0	1098.5	2251	2266	95.11	203.26	339.82	
								2225
978.00	1113.2	1100.7	2251	2266	94.94	202.93	339.33	
								2225
980.00	1115.4	1102.9	2251	2266	94.77	202.60	338.83	
								2225
982.00	1117.7	1105.2	2251	2266	94.60	202.27	338.34	
								2225
984.00	1119.9	1107.4	2251	2266	94.43	201.94	337.85	
								2225
986.00	1122.1	1109.6	2251	2266	94.26	201.62	337.36	
								2225
988.00	1124.3	1111.8	2251	2266	94.10	201.29	336.87	
								2225
990.00	1126.6	1114.1	2251	2266	93.93	200.97	336.39	
								2225
992.00	1128.8	1116.3	2251	2266	93.76	200.64	335.90	
								2225
994.00	1131.0	1118.5	2251	2266	93.60	200.32	335.42	
								2225
996.00	1133.2	1120.7	2250	2265	93.43	200.00	334.93	
								2225
998.00	1135.5	1123.0	2250	2265	93.26	199.68	334.45	
								2225
1000.00	1137.7	1125.2	2250	2265	93.10	199.36	333.97	
								2225
1002.00	1139.9	1127.4	2250	2265	92.94	199.04	333.49	
								2225
1004.00	1142.1	1129.6	2250	2265	92.77	198.72	333.01	
								2225
1006.00	1144.4	1131.9	2250	2265	92.61	198.40	332.53	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1008.00	1146.6	1134.1	2250	2265	92.45	198.09	332.06	2225
1010.00	1148.8	1136.3	2250	2265	92.29	197.77	331.58	2225
1012.00	1151.0	1138.5	2250	2265	92.13	197.46	331.11	2225
1014.00	1153.3	1140.8	2250	2265	91.97	197.14	330.64	2225
1016.00	1155.5	1143.0	2250	2265	91.81	196.83	330.17	2225
1018.00	1157.7	1145.2	2250	2265	91.65	196.52	329.70	2225
1020.00	1159.9	1147.4	2250	2265	91.49	196.21	329.23	2225
1022.00	1162.2	1149.7	2250	2264	91.33	195.90	328.76	2225
1024.00	1164.4	1151.9	2250	2264	91.17	195.59	328.29	2225
1026.00	1166.6	1154.1	2250	2264	91.01	195.28	327.83	2225
1028.00	1168.8	1156.3	2250	2264	90.86	194.97	327.36	2225
1030.00	1171.1	1158.6	2250	2264	90.70	194.66	326.90	2225
1032.00	1173.3	1160.8	2250	2264	90.54	194.36	326.44	2225
1034.00	1175.5	1163.0	2250	2264	90.39	194.05	325.97	2225
1036.00	1177.7	1165.2	2249	2264	90.23	193.75	325.51	2225
1038.00	1180.0	1167.5	2249	2264	90.08	193.45	325.06	2225
1040.00	1182.2	1169.7	2249	2264	89.93	193.15	324.60	2225
1042.00	1184.4	1171.9	2249	2264	89.77	192.84	324.14	2225
1044.00	1186.6	1174.1	2249	2264	89.62	192.54	323.69	2225
1046.00	1188.9	1176.4	2249	2264	89.47	192.24	323.23	2225
1048.00	1191.1	1178.6	2249	2263	89.32	191.95	322.78	2225
1050.00	1193.3	1180.8	2249	2263	89.16	191.65	322.33	2225
1052.00	1195.5	1183.0	2249	2263	89.01	191.35	321.88	2225
1054.00	1197.8	1185.3	2249	2263	88.86	191.05	321.43	2225

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2225
1056.00	1200.0	1187.5	2249	2263	88.71	190.76	320.98	2225
1058.00	1202.2	1189.7	2249	2263	88.56	190.46	320.53	2225
1060.00	1204.4	1191.9	2249	2263	88.41	190.17	320.08	2225
1062.00	1206.7	1194.2	2249	2263	88.27	189.88	319.64	2225
1064.00	1208.9	1196.4	2249	2263	88.12	189.59	319.19	2225
1066.00	1211.1	1198.6	2249	2263	87.97	189.29	318.75	2225
1068.00	1213.3	1200.8	2249	2263	87.82	189.00	318.31	2225
1070.00	1215.6	1203.1	2249	2263	87.68	188.71	317.86	2225
1072.00	1217.8	1205.3	2249	2263	87.53	188.43	317.42	2225
1074.00	1220.0	1207.5	2249	2263	87.39	188.14	316.99	2225
1076.00	1222.2	1209.7	2249	2263	87.24	187.85	316.55	2225
1078.00	1224.5	1212.0	2249	2262	87.10	187.56	316.11	2225
1080.00	1226.7	1214.2	2249	2262	86.95	187.28	315.67	2225
1082.00	1228.9	1216.4	2248	2262	86.81	186.99	315.24	2225
1084.00	1231.1	1218.6	2248	2262	86.66	186.71	314.81	2225
1086.00	1233.4	1220.9	2248	2262	86.52	186.43	314.37	2225
1088.00	1235.6	1223.1	2248	2262	86.38	186.15	313.94	2225
1090.00	1237.8	1225.3	2248	2262	86.24	185.86	313.51	2225
1092.00	1240.0	1227.5	2248	2262	86.10	185.58	313.08	2225
1094.00	1242.3	1229.8	2248	2262	85.96	185.30	312.65	2225
1096.00	1244.5	1232.0	2248	2262	85.81	185.02	312.22	2225
1098.00	1246.7	1234.2	2248	2262	85.67	184.75	311.80	2225
1100.00	1248.9	1236.4	2248	2262	85.53	184.47	311.37	2225
1102.00	1251.2	1238.7	2248	2262	85.40	184.19	310.95	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2225
1104.00	1253.4	1240.9	2248	2262	85.26	183.91	310.52	2225
1106.00	1255.6	1243.1	2248	2262	85.12	183.64	310.10	2225
1108.00	1257.8	1245.3	2248	2261	84.98	183.36	309.68	2225
1110.00	1260.1	1247.6	2248	2261	84.84	183.09	309.26	2225
1112.00	1262.3	1249.8	2248	2261	84.71	182.82	308.84	2225
1114.00	1264.5	1252.0	2248	2261	84.57	182.55	308.42	2225
1116.00	1266.7	1254.2	2248	2261	84.43	182.27	308.00	2225
1118.00	1269.0	1256.5	2248	2261	84.30	182.00	307.59	2225
1120.00	1271.2	1258.7	2248	2261	84.16	181.73	307.17	2225
1122.00	1273.4	1260.9	2248	2261	84.03	181.46	306.76	2225
1124.00	1275.6	1263.1	2248	2261	83.89	181.19	306.34	2225
1126.00	1277.9	1265.4	2248	2261	83.76	180.93	305.93	2225
1128.00	1280.1	1267.6	2248	2261	83.62	180.66	305.52	2225
1130.00	1282.3	1269.8	2247	2261	83.49	180.39	305.11	2225
1132.00	1284.5	1272.0	2247	2261	83.36	180.13	304.70	2225
1134.00	1286.8	1274.3	2247	2261	83.22	179.86	304.29	2225
1136.00	1289.0	1276.5	2247	2261	83.09	179.60	303.88	2225
1138.00	1291.2	1278.7	2247	2260	82.96	179.33	303.47	2225
1140.00	1293.5	1281.0	2247	2260	82.83	179.07	303.07	2225
1142.00	1295.7	1283.2	2247	2260	82.70	178.81	302.66	2225
1144.00	1297.9	1285.4	2247	2260	82.57	178.55	302.26	2225
1146.00	1300.1	1287.6	2247	2260	82.44	178.29	301.86	2225
1148.00	1302.4	1289.9	2247	2260	82.31	178.03	301.45	2225
1150.00	1304.6	1292.1	2247	2260	82.18	177.77	301.05	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2225
1152.00	1306.8	1294.3	2247	2260	82.05	177.51	300.65	
								2225
1154.00	1309.0	1296.5	2247	2260	81.92	177.25	300.25	
								2225
1156.00	1311.3	1298.8	2247	2260	81.79	176.99	299.86	
								2225
1158.00	1313.5	1301.0	2247	2260	81.67	176.74	299.46	
								2225
1160.00	1315.7	1303.2	2247	2260	81.54	176.48	299.06	
								2225
1162.00	1317.9	1305.4	2247	2260	81.41	176.23	298.67	
								2225
1164.00	1320.2	1307.7	2247	2260	81.28	175.97	298.27	
								2225
1166.00	1322.4	1309.9	2247	2260	81.16	175.72	297.88	
								2225
1168.00	1324.6	1312.1	2247	2260	81.03	175.47	297.49	
								2616
1170.00	1327.2	1314.7	2247	2260	80.86	175.11	296.93	
								2616
1172.00	1329.8	1317.3	2248	2261	80.68	174.76	296.37	
								2632
1174.00	1332.5	1320.0	2249	2262	80.51	174.40	295.80	
								2504
1176.00	1335.0	1322.5	2249	2262	80.35	174.08	295.30	
								2443
1178.00	1337.4	1324.9	2249	2262	80.20	173.77	294.82	
								2704
1180.00	1340.1	1327.6	2250	2263	80.02	173.40	294.23	
								2634
1182.00	1342.8	1330.3	2251	2264	79.84	173.05	293.67	
								2731
1184.00	1345.5	1333.0	2252	2265	79.66	172.67	293.07	
								2735
1186.00	1348.2	1335.7	2252	2266	79.47	172.29	292.47	
								2858
1188.00	1351.1	1338.6	2253	2267	79.27	171.87	291.82	
								2792
1190.00	1353.9	1341.4	2254	2268	79.08	171.48	291.19	
								2889
1192.00	1356.8	1344.3	2255	2269	78.87	171.06	290.53	
								2721
1194.00	1359.5	1347.0	2256	2270	78.69	170.69	289.94	
								2769
1196.00	1362.2	1349.7	2257	2271	78.51	170.31	289.34	
								2927
1198.00	1365.2	1352.7	2258	2272	78.30	169.89	288.66	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2828
1200.00	1368.0	1355.5	2259	2273	78.11	169.50	288.04	2961
1202.00	1371.0	1358.5	2260	2274	77.90	169.06	287.35	3105
1204.00	1374.1	1361.6	2262	2276	77.67	168.59	286.59	2977
1206.00	1377.0	1364.5	2263	2277	77.46	168.16	285.90	2745
1208.00	1379.8	1367.3	2264	2278	77.28	167.80	285.33	2630
1210.00	1382.4	1369.9	2264	2279	77.12	167.47	284.80	2627
1212.00	1385.0	1372.5	2265	2279	76.96	167.14	284.28	2901
1214.00	1387.9	1375.4	2266	2280	76.77	166.74	283.64	2771
1216.00	1390.7	1378.2	2267	2281	76.59	166.37	283.06	2941
1218.00	1393.7	1381.2	2268	2283	76.39	165.96	282.41	2776
1220.00	1396.4	1383.9	2269	2284	76.22	165.60	281.83	2738
1222.00	1399.2	1386.7	2270	2284	76.05	165.25	281.27	2599
1224.00	1401.8	1389.3	2270	2285	75.89	164.94	280.78	2648
1226.00	1404.4	1391.9	2271	2286	75.73	164.62	280.26	2525
1228.00	1406.9	1394.4	2271	2286	75.59	164.32	279.80	2837
1230.00	1409.8	1397.3	2272	2287	75.41	163.95	279.21	2954
1232.00	1412.7	1400.2	2273	2288	75.22	163.55	278.56	2724
1234.00	1415.5	1403.0	2274	2289	75.05	163.21	278.02	2782
1236.00	1418.2	1405.7	2275	2290	74.88	162.86	277.46	2700
1238.00	1420.9	1408.4	2275	2291	74.72	162.53	276.94	2906
1240.00	1423.8	1411.3	2276	2292	74.54	162.15	276.32	2737
1242.00	1426.6	1414.1	2277	2292	74.38	161.81	275.79	2576
1244.00	1429.2	1416.7	2278	2293	74.23	161.52	275.32	2647
1246.00	1431.8	1419.3	2278	2294	74.08	161.21	274.82	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1248.00	1434.4	1421.9	2279	2294	73.94	160.91	274.35	2600
1250.00	1437.2	1424.7	2280	2295	73.77	160.56	273.80	2797
1252.00	1439.9	1427.4	2280	2296	73.61	160.24	273.28	2703
1254.00	1442.5	1430.0	2281	2296	73.47	159.94	272.80	2629
1256.00	1445.0	1432.5	2281	2297	73.34	159.68	272.38	2483
1258.00	1447.6	1435.1	2282	2297	73.20	159.39	271.93	2557
1260.00	1450.3	1437.8	2282	2298	73.05	159.08	271.42	2697
1262.00	1453.1	1440.6	2283	2299	72.88	158.74	270.89	2788
1264.00	1455.8	1443.3	2284	2299	72.73	158.42	270.37	2735
1266.00	1458.5	1446.0	2284	2300	72.58	158.11	269.88	2688
1268.00	1461.3	1448.8	2285	2301	72.42	157.78	269.35	2781
1270.00	1464.1	1451.6	2286	2302	72.26	157.45	268.81	2806
1272.00	1467.0	1454.5	2287	2303	72.09	157.09	268.24	2885
1274.00	1469.9	1457.4	2288	2304	71.91	156.72	267.64	2958
1276.00	1473.0	1460.5	2289	2305	71.71	156.32	266.99	3096
1278.00	1476.0	1463.5	2290	2307	71.53	155.93	266.37	3024
1280.00	1479.2	1466.7	2292	2308	71.33	155.52	265.70	3144
1282.00	1482.2	1469.7	2293	2310	71.15	155.13	265.07	3040
1284.00	1485.2	1472.7	2294	2311	70.97	154.77	264.49	2964
1286.00	1488.2	1475.7	2295	2312	70.79	154.40	263.89	2992
1288.00	1491.3	1478.8	2296	2313	70.60	153.99	263.23	3156
1290.00	1494.4	1481.9	2298	2315	70.41	153.61	262.61	3074
1292.00	1497.4	1484.9	2299	2316	70.24	153.25	262.03	2963
1294.00	1500.2	1487.7	2299	2317	70.09	152.93	261.51	2835

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2973
1296.00	1503.2	1490.7	2300	2318	69.92	152.57	260.94	2937
1298.00	1506.1	1493.6	2301	2319	69.75	152.23	260.38	2891
1300.00	1509.0	1496.5	2302	2320	69.59	151.89	259.84	2783
1302.00	1511.8	1499.3	2303	2321	69.44	151.59	259.35	2861
1304.00	1514.6	1502.1	2304	2322	69.29	151.27	258.83	2945
1306.00	1517.6	1505.1	2305	2323	69.12	150.92	258.27	2928
1308.00	1520.5	1508.0	2306	2324	68.96	150.59	257.73	2884
1310.00	1523.4	1510.9	2307	2325	68.81	150.27	257.21	2897
1312.00	1526.3	1513.8	2308	2326	68.65	149.94	256.68	2928
1314.00	1529.2	1516.7	2309	2327	68.49	149.61	256.15	2931
1316.00	1532.2	1519.7	2310	2328	68.33	149.28	255.61	3185
1318.00	1535.3	1522.8	2311	2329	68.15	148.89	254.98	2990
1320.00	1538.3	1525.8	2312	2331	67.98	148.55	254.42	2790
1322.00	1541.1	1528.6	2313	2331	67.84	148.25	253.95	3009
1324.00	1544.1	1531.6	2314	2333	67.68	147.91	253.39	2939
1326.00	1547.1	1534.6	2315	2334	67.52	147.58	252.86	2896
1328.00	1550.0	1537.5	2315	2335	67.37	147.27	252.36	2960
1330.00	1552.9	1540.4	2316	2336	67.22	146.94	251.82	2988
1332.00	1555.9	1543.4	2317	2337	67.06	146.61	251.29	2894
1334.00	1558.8	1546.3	2318	2338	66.91	146.30	250.78	3043
1336.00	1561.9	1549.4	2319	2339	66.75	145.96	250.23	2860
1338.00	1564.7	1552.2	2320	2340	66.60	145.66	249.74	2898
1340.00	1567.6	1555.1	2321	2341	66.46	145.36	249.25	2934
1342.00	1570.5	1558.0	2322	2342	66.31	145.04	248.74	

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TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2922
1344.00	1573.5	1561.0	2323	2343	66.16	144.73	248.23	
								2934
1346.00	1576.4	1563.9	2324	2344	66.01	144.42	247.73	
								2930
1348.00	1579.3	1566.8	2325	2345	65.87	144.12	247.23	
								2906
1350.00	1582.2	1569.7	2326	2346	65.72	143.81	246.74	
								2883
1352.00	1585.1	1572.6	2326	2346	65.58	143.52	246.26	
								2976
1354.00	1588.1	1575.6	2327	2347	65.43	143.20	245.75	
								2882
1356.00	1591.0	1578.5	2328	2348	65.29	142.91	245.27	
								2899
1358.00	1593.9	1581.4	2329	2349	65.15	142.62	244.79	
								2903
1360.00	1596.8	1584.3	2330	2350	65.01	142.32	244.31	
								2834
1362.00	1599.6	1587.1	2331	2351	64.88	142.04	243.86	
								2901
1364.00	1602.5	1590.0	2331	2352	64.74	141.75	243.38	
								2927
1366.00	1605.4	1592.9	2332	2353	64.60	141.45	242.90	
								2917
1368.00	1608.4	1595.9	2333	2354	64.46	141.16	242.42	
								2994
1370.00	1611.4	1598.9	2334	2355	64.31	140.85	241.92	
								2875
1372.00	1614.2	1601.7	2335	2356	64.18	140.57	241.46	
								3023
1374.00	1617.2	1604.7	2336	2357	64.03	140.26	240.95	
								2952
1376.00	1620.2	1607.7	2337	2358	63.89	139.96	240.47	
								2992
1378.00	1623.2	1610.7	2338	2359	63.74	139.66	239.97	
								2987
1380.00	1626.2	1613.7	2339	2360	63.60	139.36	239.48	
								3042
1382.00	1629.2	1616.7	2340	2361	63.45	139.05	238.97	
								3048
1384.00	1632.3	1619.8	2341	2362	63.30	138.74	238.47	
								2940
1386.00	1635.2	1622.7	2342	2363	63.17	138.45	238.00	
								2999
1388.00	1638.2	1625.7	2343	2364	63.03	138.16	237.51	
								2919
1390.00	1641.1	1628.6	2343	2365	62.89	137.87	237.05	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								3021
1392.00	1644.2	1631.7	2344	2366	62.75	137.58	236.56	
								3135
1394.00	1647.3	1634.8	2345	2367	62.60	137.25	236.04	
								2977
1396.00	1650.3	1637.8	2346	2368	62.46	136.97	235.56	
								2911
1398.00	1653.2	1640.7	2347	2369	62.33	136.69	235.12	
								3097
1400.00	1656.3	1643.8	2348	2370	62.19	136.38	234.61	
								3029
1402.00	1659.3	1646.8	2349	2371	62.05	136.09	234.13	
								2964
1404.00	1662.3	1649.8	2350	2372	61.91	135.81	233.67	
								3127
1406.00	1665.4	1652.9	2351	2374	61.76	135.49	233.15	
								2984
1408.00	1668.4	1655.9	2352	2375	61.63	135.21	232.69	
								2928
1410.00	1671.3	1658.8	2353	2375	61.50	134.94	232.25	
								2965
1412.00	1674.3	1661.8	2354	2376	61.37	134.67	231.80	
								3165
1414.00	1677.4	1664.9	2355	2378	61.22	134.35	231.28	
								3021
1416.00	1680.5	1668.0	2356	2379	61.09	134.07	230.81	
								2999
1418.00	1683.5	1671.0	2357	2380	60.96	133.79	230.35	
								3314
1420.00	1686.8	1674.3	2358	2381	60.79	133.45	229.79	
								3034
1422.00	1689.8	1677.3	2359	2382	60.66	133.16	229.33	
								3054
1424.00	1692.9	1680.4	2360	2383	60.53	132.88	228.86	
								3058
1426.00	1695.9	1683.4	2361	2384	60.39	132.59	228.39	
								3093
1428.00	1699.0	1686.5	2362	2386	60.25	132.30	227.91	
								3041
1430.00	1702.0	1689.5	2363	2387	60.12	132.02	227.45	
								3103
1432.00	1705.2	1692.7	2364	2388	59.98	131.73	226.97	
								2930
1434.00	1708.1	1695.6	2365	2389	59.86	131.47	226.55	
								2786
1436.00	1710.9	1698.4	2365	2389	59.75	131.24	226.17	
								2821
1438.00	1713.7	1701.2	2366	2390	59.64	131.01	225.78	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1440.00	1716.5	1704.0	2367	2391	59.53	130.77	225.40	2800
1442.00	1719.2	1706.7	2367	2391	59.43	130.56	225.06	2687
1444.00	1721.9	1709.4	2368	2391	59.32	130.34	224.69	2751
1446.00	1724.7	1712.2	2368	2392	59.22	130.12	224.33	2758
1448.00	1727.4	1714.9	2369	2393	59.12	129.90	223.97	2731
1450.00	1730.2	1717.7	2369	2393	59.01	129.68	223.60	2775
1452.00	1733.2	1720.7	2370	2394	58.89	129.42	223.18	2989
1454.00	1736.1	1723.6	2371	2395	58.77	129.16	222.76	2955
1456.00	1739.0	1726.5	2372	2396	58.66	128.93	222.37	2880
1458.00	1742.0	1729.5	2372	2396	58.54	128.68	221.96	2950
1460.00	1744.6	1732.1	2373	2397	58.44	128.48	221.63	2639
1462.00	1747.3	1734.8	2373	2397	58.34	128.27	221.29	2723
1464.00	1750.2	1737.7	2374	2398	58.24	128.04	220.91	2853
1466.00	1752.9	1740.4	2374	2398	58.13	127.82	220.56	2747
1468.00	1755.9	1743.4	2375	2399	58.02	127.58	220.15	2945
1470.00	1758.8	1746.3	2376	2400	57.91	127.35	219.77	2882
1472.00	1761.6	1749.1	2377	2401	57.80	127.11	219.38	2891
1474.00	1764.5	1752.0	2377	2401	57.69	126.89	219.02	2820
1476.00	1767.2	1754.7	2378	2402	57.59	126.68	218.67	2752
1478.00	1770.0	1757.5	2378	2403	57.49	126.46	218.31	2821
1480.00	1772.9	1760.4	2379	2403	57.39	126.24	217.95	2816
1482.00	1775.7	1763.2	2379	2404	57.29	126.02	217.60	2802
1484.00	1778.6	1766.1	2380	2405	57.17	125.78	217.20	2963
1486.00	1781.5	1769.0	2381	2405	57.06	125.56	216.82	2889

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								3072
1488.00	1784.6	1772.1	2382	2406	56.94	125.30	216.39	2967
1490.00	1787.5	1775.0	2383	2407	56.83	125.06	216.00	2724
1492.00	1790.3	1777.8	2383	2408	56.74	124.86	215.67	2760
1494.00	1793.0	1780.5	2384	2408	56.64	124.65	215.33	2747
1496.00	1795.8	1783.3	2384	2409	56.54	124.45	215.00	2823
1498.00	1798.6	1786.1	2385	2409	56.44	124.24	214.65	2840
1500.00	1801.4	1788.9	2385	2410	56.34	124.02	214.29	2774
1502.00	1804.2	1791.7	2386	2410	56.25	123.82	213.96	2697
1504.00	1806.9	1794.4	2386	2411	56.16	123.63	213.64	2926
1506.00	1809.8	1797.3	2387	2411	56.05	123.40	213.27	2766
1508.00	1812.6	1800.1	2387	2412	55.95	123.20	212.94	2806
1510.00	1815.4	1802.9	2388	2413	55.86	122.99	212.60	2811
1512.00	1818.2	1805.7	2389	2413	55.76	122.79	212.25	2919
1514.00	1821.1	1808.6	2389	2414	55.66	122.57	211.89	2782
1516.00	1823.9	1811.4	2390	2414	55.56	122.36	211.56	2824
1518.00	1826.7	1814.2	2390	2415	55.46	122.16	211.21	2990
1520.00	1829.7	1817.2	2391	2416	55.36	121.93	210.83	2844
1522.00	1832.6	1820.1	2392	2416	55.26	121.72	210.49	2834
1524.00	1835.4	1822.9	2392	2417	55.16	121.51	210.15	2828
1526.00	1838.2	1825.7	2393	2418	55.07	121.31	209.81	2853
1528.00	1841.1	1828.6	2393	2418	54.97	121.10	209.47	2801
1530.00	1843.9	1831.4	2394	2419	54.87	120.90	209.14	3034
1532.00	1846.9	1834.4	2395	2420	54.76	120.67	208.75	3083
1534.00	1850.0	1837.5	2396	2421	54.65	120.43	208.35	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1536.00	1853.1	1840.6	2397	2422	54.54	120.20	207.97	3041
1538.00	1856.3	1843.8	2398	2423	54.42	119.94	207.53	3225
1540.00	1859.5	1847.0	2399	2424	54.30	119.68	207.11	3180
1542.00	1862.6	1850.1	2400	2425	54.19	119.44	206.71	3136
1544.00	1865.7	1853.2	2400	2426	54.08	119.21	206.32	3063
1546.00	1868.8	1856.3	2401	2427	53.97	118.96	205.92	3133
1548.00	1871.9	1859.4	2402	2428	53.85	118.73	205.52	3103
1550.00	1874.9	1862.4	2403	2429	53.75	118.50	205.15	3040
1552.00	1877.8	1865.3	2404	2429	53.65	118.30	204.81	2882
1554.00	1880.6	1868.1	2404	2430	53.57	118.12	204.51	2742
1556.00	1883.5	1871.0	2405	2431	53.47	117.91	204.17	2919
1558.00	1886.6	1874.1	2406	2432	53.37	117.68	203.79	3073
1560.00	1889.5	1877.0	2406	2432	53.27	117.47	203.44	2979
1562.00	1892.3	1879.8	2407	2433	53.18	117.29	203.13	2797
1564.00	1895.1	1882.6	2407	2433	53.09	117.11	202.83	2743
1566.00	1897.8	1885.3	2408	2434	53.01	116.93	202.53	2766
1568.00	1900.7	1888.2	2408	2434	52.92	116.73	202.21	2867
1570.00	1903.6	1891.1	2409	2435	52.82	116.53	201.88	2910
1572.00	1906.8	1894.3	2410	2436	52.71	116.29	201.47	3216
1574.00	1909.9	1897.4	2411	2437	52.61	116.06	201.09	3095
1576.00	1912.9	1900.4	2412	2438	52.51	115.85	200.74	2993
1578.00	1915.9	1903.4	2412	2439	52.41	115.64	200.39	3018
1580.00	1919.0	1906.5	2413	2440	52.31	115.42	200.03	3059
1582.00	1922.1	1909.6	2414	2440	52.20	115.20	199.66	3088

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1584.00	1925.2	1912.7	2415	2441	52.10	114.98	199.29	3105
1586.00	1928.3	1915.8	2416	2442	52.00	114.75	198.92	3125
1588.00	1931.5	1919.0	2417	2443	51.89	114.53	198.54	3140
1590.00	1934.6	1922.1	2418	2444	51.79	114.31	198.17	3101
1592.00	1937.9	1925.4	2419	2446	51.67	114.06	197.76	3302
1594.00	1941.1	1928.6	2420	2447	51.56	113.82	197.35	3273
1596.00	1944.4	1931.9	2421	2448	51.44	113.58	196.94	3286
1598.00	1947.7	1935.2	2422	2449	51.33	113.33	196.54	3270
1600.00	1950.9	1938.4	2423	2450	51.22	113.10	196.14	3259
1602.00	1954.3	1941.8	2424	2452	51.11	112.85	195.73	3341
1604.00	1957.5	1945.0	2425	2453	51.00	112.61	195.34	3251
1606.00	1960.7	1948.2	2426	2454	50.89	112.39	194.96	3193
1608.00	1963.6	1951.1	2427	2455	50.80	112.20	194.65	2922
1610.00	1966.9	1954.4	2428	2456	50.70	111.97	194.26	3237
1612.00	1970.2	1957.7	2429	2457	50.59	111.74	193.87	3283
1614.00	1973.4	1960.9	2430	2458	50.48	111.51	193.49	3219
1616.00	1976.8	1964.3	2431	2459	50.37	111.26	193.07	3392
1618.00	1980.1	1967.6	2432	2461	50.26	111.03	192.68	3297
1620.00	1983.3	1970.8	2433	2462	50.15	110.80	192.30	3259
1622.00	1986.6	1974.1	2434	2463	50.05	110.57	191.92	3247
1624.00	1989.8	1977.3	2435	2464	49.94	110.35	191.54	3246
1626.00	1993.0	1980.5	2436	2465	49.84	110.13	191.18	3208
1628.00	1996.4	1983.9	2437	2466	49.73	109.90	190.79	3317
1630.00	1999.7	1987.2	2438	2467	49.63	109.67	190.40	3298

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1632.00	2003.0	1990.5	2439	2469	49.51	109.43	190.00	3390
1634.00	2006.4	1993.9	2441	2470	49.40	109.19	189.59	3398
1636.00	2009.6	1997.1	2441	2471	49.30	108.98	189.24	3185
1638.00	2012.8	2000.3	2442	2472	49.21	108.77	188.90	3157
1640.00	2016.0	2003.5	2443	2473	49.11	108.55	188.53	3266
1642.00	2019.4	2006.9	2444	2475	49.00	108.32	188.14	3366
1644.00	2022.7	2010.2	2446	2476	48.89	108.09	187.76	3300
1646.00	2026.0	2013.5	2447	2477	48.79	107.87	187.39	3302
1648.00	2029.1	2016.6	2447	2478	48.70	107.68	187.07	3046
1650.00	2031.8	2019.3	2448	2478	48.63	107.53	186.82	2762
1652.00	2034.7	2022.2	2448	2479	48.56	107.37	186.54	2855
1654.00	2037.6	2025.1	2449	2479	48.47	107.19	186.25	2963
1656.00	2040.9	2028.4	2450	2480	48.38	106.98	185.90	3236
1658.00	2044.3	2031.8	2451	2482	48.26	106.74	185.49	3467
1660.00	2047.7	2035.2	2452	2483	48.16	106.52	185.13	3321
1662.00	2050.9	2038.4	2453	2484	48.07	106.32	184.78	3207
1664.00	2053.9	2041.4	2454	2485	47.98	106.13	184.48	3057
1666.00	2057.1	2044.6	2455	2486	47.89	105.93	184.13	3213
1668.00	2060.6	2048.1	2456	2487	47.78	105.69	183.73	3492
1670.00	2063.8	2051.3	2457	2488	47.69	105.49	183.40	3203
1672.00	2067.1	2054.6	2458	2489	47.59	105.29	183.05	3263
1674.00	2070.2	2057.7	2458	2490	47.50	105.10	182.73	3141
1676.00	2073.5	2061.0	2459	2491	47.40	104.89	182.38	3292
1678.00	2076.6	2064.1	2460	2492	47.32	104.71	182.07	3079

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TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1680.00	2079.6	2067.1	2461	2493	47.24	104.53	181.78	3006
1682.00	2083.0	2070.5	2462	2494	47.14	104.31	181.40	3429
1684.00	2086.5	2074.0	2463	2495	47.03	104.08	181.02	3475
1686.00	2090.1	2077.6	2465	2497	46.92	103.83	180.60	3599
1688.00	2093.8	2081.3	2466	2499	46.80	103.58	180.18	3631
1690.00	2097.4	2084.9	2467	2500	46.68	103.33	179.76	3661
1692.00	2101.0	2088.5	2469	2502	46.57	103.09	179.35	3596
1694.00	2104.3	2091.8	2470	2503	46.48	102.89	179.01	3282
1696.00	2107.6	2095.1	2471	2504	46.39	102.69	178.67	3335
1698.00	2110.8	2098.3	2471	2505	46.30	102.50	178.36	3157
1700.00	2114.0	2101.5	2472	2506	46.21	102.32	178.04	3193
1702.00	2117.2	2104.7	2473	2507	46.12	102.12	177.72	3260
1704.00	2120.4	2107.9	2474	2508	46.04	101.94	177.41	3158
1706.00	2123.6	2111.1	2475	2509	45.95	101.76	177.10	3188
1708.00	2127.0	2114.5	2476	2510	45.86	101.55	176.75	3397
1710.00	2130.5	2118.0	2477	2511	45.76	101.33	176.38	3475
1712.00	2133.9	2121.4	2478	2512	45.66	101.11	176.02	3466
1714.00	2137.0	2124.5	2479	2513	45.58	100.95	175.74	3039
1716.00	2139.8	2127.3	2479	2514	45.51	100.81	175.50	2849
1718.00	2143.2	2130.7	2480	2515	45.42	100.60	175.16	3380
1720.00	2146.2	2133.7	2481	2515	45.35	100.44	174.89	3027
1722.00	2149.5	2137.0	2482	2516	45.26	100.26	174.57	3244
1724.00	2152.7	2140.2	2483	2517	45.18	100.07	174.26	3233
1726.00	2155.9	2143.4	2484	2518	45.09	99.89	173.96	3215

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1728.00	2159.3	2146.8	2485	2519	45.00	99.69	173.62	3392
1730.00	2162.9	2150.4	2486	2521	44.90	99.47	173.24	3583
1732.00	2166.6	2154.1	2487	2523	44.79	99.23	172.84	3697
1734.00	2170.0	2157.5	2488	2524	44.69	99.03	172.50	3418
1736.00	2173.4	2160.9	2489	2525	44.60	98.84	172.17	3361
1738.00	2176.7	2164.2	2490	2526	44.52	98.64	171.85	3350
1740.00	2179.7	2167.2	2491	2527	44.44	98.49	171.58	3041
1742.00	2183.2	2170.7	2492	2528	44.35	98.29	171.24	3455
1744.00	2186.3	2173.8	2493	2529	44.28	98.13	170.97	3072
1746.00	2189.7	2177.2	2494	2530	44.19	97.93	170.65	3395
1748.00	2193.2	2180.7	2495	2531	44.09	97.72	170.29	3517
1750.00	2196.8	2184.3	2496	2533	43.99	97.51	169.93	3598
1752.00	2200.3	2187.8	2497	2534	43.90	97.30	169.58	3517
1754.00	2203.8	2191.3	2499	2535	43.81	97.11	169.24	3450
1756.00	2207.0	2194.5	2499	2536	43.73	96.93	168.95	3228
1758.00	2210.4	2197.9	2500	2537	43.64	96.74	168.63	3398
1760.00	2213.1	2200.6	2501	2537	43.58	96.62	168.43	2738
1762.00	2216.2	2203.7	2501	2538	43.51	96.47	168.17	3058
1764.00	2219.5	2207.0	2502	2539	43.43	96.29	167.87	3311
1766.00	2222.6	2210.1	2503	2540	43.36	96.13	167.60	3147
1768.00	2225.7	2213.2	2504	2541	43.28	95.98	167.34	3109
1770.00	2228.8	2216.3	2504	2541	43.22	95.83	167.09	3024
1772.00	2231.6	2219.1	2505	2542	43.16	95.70	166.87	2838
1774.00	2234.9	2222.4	2506	2543	43.08	95.53	166.58	3296

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								2862
1776.00	2237.8	2225.3	2506	2543	43.02	95.40	166.36	
								3433
1778.00	2241.2	2228.7	2507	2544	42.93	95.21	166.04	
								2762
1780.00	2244.0	2231.5	2507	2544	42.87	95.09	165.84	
								2994
1782.00	2247.0	2234.5	2508	2545	42.81	94.95	165.60	
								3879
1784.00	2250.8	2238.3	2509	2547	42.70	94.71	165.19	
								3264
1786.00	2254.1	2241.6	2510	2548	42.62	94.54	164.91	
								2976
1788.00	2257.1	2244.6	2511	2548	42.56	94.40	164.68	
								2728
1790.00	2259.8	2247.3	2511	2548	42.51	94.29	164.48	
								3305
1792.00	2263.1	2250.6	2512	2549	42.43	94.12	164.19	
								3246
1794.00	2266.4	2253.9	2513	2550	42.35	93.96	163.92	
								2966
1796.00	2269.3	2256.8	2513	2551	42.29	93.82	163.69	
								3399
1798.00	2272.7	2260.2	2514	2552	42.21	93.64	163.39	
								3314
1800.00	2276.0	2263.5	2515	2553	42.13	93.47	163.10	
								2859
1802.00	2278.9	2266.4	2515	2553	42.07	93.35	162.89	
								3361
1804.00	2282.2	2269.7	2516	2554	41.99	93.18	162.60	
								3368
1806.00	2285.6	2273.1	2517	2555	41.91	93.00	162.31	
								3069
1808.00	2288.7	2276.2	2518	2556	41.85	92.86	162.07	
								2470
1810.00	2291.2	2278.7	2518	2556	41.81	92.77	161.91	
								3371
1812.00	2294.5	2282.0	2519	2557	41.73	92.60	161.62	
								3224
1814.00	2297.8	2285.3	2520	2558	41.66	92.44	161.36	
								2924
1816.00	2300.7	2288.2	2520	2558	41.60	92.32	161.14	
								3238
1818.00	2303.9	2291.4	2521	2559	41.52	92.16	160.88	
								3540
1820.00	2307.5	2295.0	2522	2560	41.44	91.97	160.56	
								3264
1822.00	2310.7	2298.2	2523	2561	41.37	91.82	160.29	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								3122
1824.00	2313.8	2301.3	2523	2562	41.30	91.67	160.05	
								3167
1826.00	2317.0	2304.5	2524	2563	41.23	91.53	159.80	
								3221
1828.00	2320.2	2307.7	2525	2563	41.16	91.37	159.54	
								3217
1830.00	2323.4	2310.9	2526	2564	41.09	91.22	159.28	
								3228
1832.00	2326.7	2314.2	2526	2565	41.02	91.07	159.03	
								3239
1834.00	2329.9	2317.4	2527	2566	40.95	90.92	158.77	
								3180
1836.00	2333.1	2320.6	2528	2567	40.89	90.77	158.52	
								3210
1838.00	2336.3	2323.8	2529	2567	40.82	90.62	158.27	
								2484
1840.00	2338.8	2326.3	2529	2567	40.78	90.54	158.12	
								3205
1842.00	2342.0	2329.5	2529	2568	40.71	90.39	157.87	
								3542
1844.00	2345.5	2333.0	2530	2569	40.63	90.21	157.56	
								3424
1846.00	2349.0	2336.5	2531	2570	40.55	90.04	157.28	
								3478
1848.00	2352.4	2339.9	2532	2572	40.47	89.87	156.99	
								3508
1850.00	2355.9	2343.4	2533	2573	40.39	89.70	156.69	
								3366
1852.00	2359.3	2346.8	2534	2574	40.32	89.54	156.42	
								2679
1854.00	2362.0	2349.5	2535	2574	40.27	89.44	156.25	
								3264
1856.00	2365.3	2352.8	2535	2575	40.20	89.29	156.00	
								3450
1858.00	2368.7	2356.2	2536	2576	40.13	89.12	155.71	
								3236
1860.00	2371.9	2359.4	2537	2577	40.06	88.98	155.47	
								3354
1862.00	2375.3	2362.8	2538	2578	39.99	88.82	155.20	
								3251
1864.00	2378.5	2366.0	2539	2578	39.92	88.67	154.95	
								3442
1866.00	2382.0	2369.5	2540	2579	39.85	88.51	154.67	
								2606
1868.00	2384.6	2372.1	2540	2580	39.80	88.42	154.52	
								3430
1870.00	2388.0	2375.5	2541	2581	39.73	88.26	154.24	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1872.00	2391.7	2379.2	2542	2582	39.64	88.07	153.93	3669
1874.00	2394.9	2382.4	2543	2583	39.58	87.93	153.69	3224
1876.00	2398.0	2385.5	2543	2583	39.52	87.80	153.47	3124
1878.00	2401.5	2389.0	2544	2584	39.44	87.64	153.19	3465
1880.00	2404.9	2392.4	2545	2585	39.37	87.48	152.92	3397
1882.00	2407.2	2394.7	2545	2585	39.34	87.41	152.80	2330
1884.00	2409.3	2396.8	2544	2585	39.32	87.36	152.71	2044
1886.00	2411.4	2398.9	2544	2584	39.29	87.30	152.61	2102
1888.00	2413.6	2401.1	2544	2584	39.26	87.23	152.50	2258
1890.00	2415.9	2403.4	2543	2584	39.22	87.16	152.38	2311
1892.00	2419.2	2406.7	2544	2584	39.16	87.02	152.15	3235
1894.00	2422.2	2409.7	2545	2585	39.11	86.90	151.95	2985
1896.00	2425.8	2413.3	2546	2586	39.03	86.73	151.65	3595
1898.00	2428.7	2416.2	2546	2587	38.98	86.62	151.46	2930
1900.00	2432.1	2419.6	2547	2588	38.91	86.47	151.20	3428
1902.00	2435.5	2423.0	2548	2589	38.84	86.31	150.94	3396
1904.00	2438.9	2426.4	2549	2590	38.77	86.16	150.68	3433
1906.00	2442.3	2429.8	2550	2591	38.70	86.01	150.42	3396
1908.00	2445.4	2432.9	2550	2591	38.64	85.89	150.22	3032
1910.00	2448.9	2436.4	2551	2592	38.57	85.73	149.94	3536
1912.00	2452.3	2439.8	2552	2593	38.50	85.58	149.70	3364
1914.00	2455.3	2442.8	2553	2594	38.45	85.47	149.49	3040
1916.00	2458.7	2446.2	2553	2595	38.38	85.32	149.25	3363
1918.00	2462.2	2449.7	2554	2596	38.31	85.16	148.98	3522

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								3438
1920.00	2465.6	2453.1	2555	2597	38.24	85.01	148.72	
								3474
1922.00	2469.1	2456.6	2556	2598	38.17	84.86	148.46	
								3496
1924.00	2472.6	2460.1	2557	2599	38.10	84.71	148.19	
								3564
1926.00	2476.2	2463.7	2558	2600	38.03	84.55	147.92	
								3532
1928.00	2479.7	2467.2	2559	2601	37.95	84.39	147.65	
								3039
1930.00	2482.7	2470.2	2560	2602	37.90	84.27	147.46	
								3499
1932.00	2486.2	2473.7	2561	2603	37.83	84.12	147.20	
								3188
1934.00	2489.4	2476.9	2561	2603	37.77	84.00	146.98	
								3634
1936.00	2493.1	2480.6	2563	2605	37.70	83.83	146.70	
								3618
1938.00	2496.7	2484.2	2564	2606	37.62	83.67	146.43	
								3410
1940.00	2500.1	2487.6	2565	2607	37.56	83.53	146.18	
								3456
1942.00	2503.5	2491.0	2565	2608	37.49	83.38	145.93	
								3540
1944.00	2507.1	2494.6	2566	2609	37.42	83.23	145.67	
								4170
1946.00	2511.3	2498.8	2568	2611	37.33	83.02	145.31	
								3747
1948.00	2515.0	2502.5	2569	2613	37.25	82.85	145.02	
								3581
1950.00	2518.6	2506.1	2570	2614	37.18	82.69	144.75	
								3469
1952.00	2522.1	2509.6	2571	2615	37.11	82.55	144.51	
								3544
1954.00	2525.6	2513.1	2572	2616	37.04	82.40	144.25	
								3184
1956.00	2528.8	2516.3	2573	2617	36.99	82.28	144.04	
								3317
1958.00	2532.1	2519.6	2574	2617	36.93	82.15	143.82	
								3584
1960.00	2535.7	2523.2	2575	2619	36.86	81.99	143.56	
								3439
1962.00	2539.1	2526.6	2576	2620	36.79	81.85	143.32	
								3318
1964.00	2542.4	2529.9	2576	2620	36.73	81.73	143.10	
								3591
1966.00	2546.0	2533.5	2577	2622	36.67	81.57	142.84	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								3567
1968.00	2549.6	2537.1	2578	2623	36.60	81.43	142.59	
								3563
1970.00	2553.2	2540.7	2579	2624	36.53	81.28	142.33	
								3561
1972.00	2556.7	2544.2	2580	2625	36.46	81.13	142.08	
								3450
1974.00	2560.2	2547.7	2581	2626	36.40	80.99	141.85	
								3165
1976.00	2563.3	2550.8	2582	2626	36.35	80.88	141.65	
								3205
1978.00	2566.5	2554.0	2582	2627	36.29	80.76	141.45	
								3196
1980.00	2569.7	2557.2	2583	2628	36.24	80.64	141.25	
								3549
1982.00	2573.3	2560.8	2584	2629	36.17	80.50	141.00	
								3276
1984.00	2576.6	2564.1	2585	2630	36.12	80.38	140.79	
								3680
1986.00	2580.2	2567.7	2586	2631	36.05	80.22	140.53	
								4274
1988.00	2584.5	2572.0	2588	2633	35.95	80.02	140.17	
								3516
1990.00	2588.0	2575.5	2588	2634	35.89	79.88	139.94	
								3571
1992.00	2591.6	2579.1	2589	2635	35.82	79.74	139.69	
								3930
1994.00	2595.5	2583.0	2591	2637	35.75	79.56	139.39	
								4372
1996.00	2599.9	2587.4	2593	2639	35.65	79.35	139.03	
								4344
1998.00	2604.3	2591.8	2594	2641	35.55	79.14	138.67	
								3722
2000.00	2608.0	2595.5	2595	2643	35.48	78.99	138.41	
								4284
2002.00	2612.3	2599.8	2597	2645	35.39	78.79	138.06	
								3412
2004.00	2615.7	2603.2	2598	2646	35.33	78.66	137.84	
								3029
2006.00	2618.7	2606.2	2598	2646	35.29	78.56	137.67	
								3210
2008.00	2621.9	2609.4	2599	2647	35.24	78.45	137.48	
								3168
2010.00	2625.1	2612.6	2600	2647	35.19	78.34	137.30	
								3211
2012.00	2628.3	2615.8	2600	2648	35.14	78.23	137.11	
								3165
2014.00	2631.5	2619.0	2601	2648	35.09	78.12	136.92	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								3306
2016.00	2634.8	2622.3	2601	2649	35.04	78.00	136.72	
								3288
2018.00	2638.0	2625.5	2602	2650	34.98	77.89	136.52	
								3354
2020.00	2641.4	2628.9	2603	2651	34.93	77.77	136.32	
								3471
2022.00	2644.9	2632.4	2604	2652	34.87	77.64	136.10	
								3517
2024.00	2648.4	2635.9	2605	2653	34.81	77.51	135.87	
								3194
2026.00	2651.6	2639.1	2605	2653	34.76	77.40	135.69	
								2454
2028.00	2654.0	2641.5	2605	2653	34.73	77.34	135.58	
								2766
2030.00	2656.8	2644.3	2605	2653	34.69	77.26	135.45	
								3599
2032.00	2660.4	2647.9	2606	2654	34.63	77.12	135.21	
								3481
2034.00	2663.9	2651.4	2607	2655	34.58	77.00	135.00	
								3601
2036.00	2667.5	2655.0	2608	2656	34.51	76.86	134.76	
								3211
2038.00	2670.7	2658.2	2609	2657	34.46	76.76	134.58	
								3360
2040.00	2674.1	2661.6	2609	2658	34.41	76.64	134.38	
								3630
2042.00	2677.7	2665.2	2610	2659	34.35	76.50	134.15	
								3558
2044.00	2681.2	2668.7	2611	2660	34.29	76.37	133.92	
								3370
2046.00	2684.6	2672.1	2612	2661	34.24	76.26	133.72	
								3420
2048.00	2688.0	2675.5	2613	2661	34.18	76.14	133.52	
								3412
2050.00	2691.4	2678.9	2614	2662	34.13	76.02	133.32	
								3513
2052.00	2695.0	2682.5	2614	2663	34.07	75.89	133.10	
								3504
2054.00	2698.5	2686.0	2615	2664	34.01	75.77	132.89	
								3464
2056.00	2701.9	2689.4	2616	2665	33.96	75.65	132.68	
								3496
2058.00	2705.4	2692.9	2617	2666	33.90	75.53	132.47	
								3620
2060.00	2709.0	2696.5	2618	2667	33.84	75.39	132.24	
								3664
2062.00	2712.7	2700.2	2619	2668	33.78	75.26	132.01	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								3642
2064.00	2716.4	2703.9	2620	2669	33.72	75.13	131.78	
								3553
2066.00	2719.9	2707.4	2621	2670	33.67	75.00	131.57	
								3453
2068.00	2723.4	2710.9	2622	2671	33.61	74.88	131.37	
								3412
2070.00	2726.8	2714.3	2622	2672	33.56	74.77	131.17	
								3570
2072.00	2730.3	2717.8	2623	2673	33.50	74.65	130.95	
								3640
2074.00	2734.0	2721.5	2624	2674	33.44	74.52	130.73	
								3558
2076.00	2737.5	2725.0	2625	2675	33.39	74.39	130.52	
								3603
2078.00	2741.1	2728.6	2626	2676	33.33	74.27	130.30	
								3607
2080.00	2744.7	2732.2	2627	2677	33.27	74.14	130.08	
								3696
2082.00	2748.4	2735.9	2628	2678	33.21	74.01	129.86	
								3795
2084.00	2752.2	2739.7	2629	2680	33.15	73.87	129.62	
								3824
2086.00	2756.1	2743.6	2630	2681	33.08	73.73	129.38	
								3756
2088.00	2759.8	2747.3	2632	2682	33.02	73.59	129.14	
								3692
2090.00	2763.5	2751.0	2633	2683	32.96	73.46	128.92	
								3533
2092.00	2767.0	2754.5	2633	2684	32.91	73.34	128.72	
								3725
2094.00	2770.8	2758.3	2634	2686	32.85	73.21	128.49	
								3675
2096.00	2774.4	2761.9	2635	2687	32.79	73.09	128.27	
								3745
2098.00	2778.2	2765.7	2637	2688	32.73	72.95	128.04	
								3692
2100.00	2781.9	2769.4	2638	2689	32.67	72.83	127.82	
								3857
2102.00	2785.7	2773.2	2639	2690	32.61	72.69	127.58	
								3734
2104.00	2789.5	2777.0	2640	2692	32.55	72.56	127.36	
								3687
2106.00	2793.2	2780.7	2641	2693	32.50	72.43	127.14	
								3275
2108.00	2796.4	2783.9	2641	2693	32.45	72.33	126.97	
								3304
2110.00	2799.7	2787.2	2642	2694	32.40	72.23	126.80	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								3181
2112.00	2802.9	2790.4	2642	2694	32.36	72.14	126.64	3255
2114.00	2806.2	2793.7	2643	2695	32.32	72.04	126.48	3358
2116.00	2809.5	2797.0	2644	2696	32.27	71.94	126.30	3411
2118.00	2812.9	2800.4	2644	2696	32.22	71.84	126.12	3651
2120.00	2816.6	2804.1	2645	2698	32.17	71.71	125.91	3812
2122.00	2820.4	2807.9	2646	2699	32.11	71.58	125.68	3886
2124.00	2824.3	2811.8	2648	2700	32.05	71.45	125.45	3724
2126.00	2828.0	2815.5	2649	2701	31.99	71.32	125.23	3835
2128.00	2831.9	2819.4	2650	2703	31.93	71.19	125.01	3776
2130.00	2835.6	2823.1	2651	2704	31.87	71.06	124.79	3645
2132.00	2839.3	2826.8	2652	2705	31.82	70.94	124.58	4004
2134.00	2843.3	2830.8	2653	2706	31.75	70.80	124.34	4108
2136.00	2847.4	2834.9	2654	2708	31.69	70.65	124.08	4034
2138.00	2851.4	2838.9	2656	2710	31.62	70.51	123.83	3969
2140.00	2855.4	2842.9	2657	2711	31.56	70.37	123.59	4050
2142.00	2859.4	2846.9	2658	2713	31.49	70.23	123.35	3679
2144.00	2863.1	2850.6	2659	2714	31.44	70.11	123.14	3903
2146.00	2867.0	2854.5	2660	2715	31.38	69.98	122.92	3856
2148.00	2870.9	2858.4	2661	2716	31.32	69.85	122.70	3892
2150.00	2874.8	2862.3	2663	2718	31.26	69.72	122.47	3794
2152.00	2878.6	2866.1	2664	2719	31.21	69.60	122.26	4011
2154.00	2882.6	2870.1	2665	2720	31.14	69.46	122.02	4045
2156.00	2886.6	2874.1	2666	2722	31.08	69.32	121.78	4093
2158.00	2890.7	2878.2	2667	2723	31.02	69.18	121.54	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
2160.00	2894.6	2882.1	2669	2725	30.96	69.05	121.31	3931
2162.00	2898.6	2886.1	2670	2726	30.90	68.92	121.08	4005
2164.00	2902.6	2890.1	2671	2728	30.84	68.78	120.85	3996
2166.00	2906.7	2894.2	2672	2729	30.77	68.64	120.61	4052
2168.00	2910.7	2898.2	2674	2731	30.71	68.51	120.38	4025
2170.00	2914.7	2902.2	2675	2732	30.65	68.38	120.15	3957
2172.00	2918.8	2906.3	2676	2734	30.59	68.24	119.91	4139
2174.00	2922.7	2910.2	2677	2735	30.53	68.12	119.70	3844
2176.00	2926.4	2913.9	2678	2736	30.48	68.00	119.50	3776
2178.00	2930.3	2917.8	2679	2737	30.43	67.88	119.29	3873
2180.00	2934.2	2921.7	2680	2739	30.37	67.76	119.08	3860
2182.00	2938.3	2925.8	2682	2740	30.31	67.62	118.84	4128
2184.00	2942.1	2929.6	2683	2741	30.26	67.50	118.64	3828
2186.00	2946.0	2933.5	2684	2743	30.20	67.39	118.43	3829
2188.00	2949.7	2937.2	2685	2744	30.15	67.27	118.24	3737
2190.00	2953.4	2940.9	2686	2745	30.10	67.16	118.05	3715
2192.00	2957.2	2944.7	2687	2746	30.05	67.05	117.86	3764
2194.00	2961.0	2948.5	2688	2747	30.00	66.94	117.66	3785
2196.00	2964.7	2952.2	2689	2748	29.95	66.83	117.47	3753
2198.00	2968.4	2955.9	2690	2749	29.90	66.72	117.28	3728
2200.00	2972.3	2959.8	2691	2750	29.85	66.60	117.08	3846
2202.00	2976.2	2963.7	2692	2752	29.79	66.48	116.87	3945
2204.00	2980.3	2967.8	2693	2753	29.73	66.35	116.65	4067
2206.00	2984.3	2971.8	2694	2754	29.68	66.23	116.43	3982

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								3938
2208.00	2988.2	2975.7	2695	2756	29.62	66.11	116.23	
								3924
2210.00	2992.1	2979.6	2697	2757	29.57	65.99	116.02	
								4159
2212.00	2996.3	2983.8	2698	2759	29.51	65.86	115.79	
								4145
2214.00	3000.4	2987.9	2699	2760	29.45	65.73	115.56	
								4124
2216.00	3004.6	2992.1	2700	2762	29.39	65.60	115.34	
								4153
2218.00	3008.7	2996.2	2702	2763	29.33	65.46	115.11	
								4116
2220.00	3012.8	3000.3	2703	2765	29.27	65.34	114.89	
								4251
2222.00	3017.1	3004.6	2704	2766	29.21	65.20	114.65	
								4211
2224.00	3021.3	3008.8	2706	2768	29.15	65.07	114.42	
								4143
2226.00	3025.4	3012.9	2707	2770	29.09	64.94	114.20	
								4020
2228.00	3029.5	3017.0	2708	2771	29.04	64.82	113.99	
								3836
2230.00	3033.3	3020.8	2709	2772	28.99	64.71	113.81	
								3942
2232.00	3037.2	3024.7	2710	2773	28.94	64.60	113.61	
								3990
2234.00	3041.2	3028.7	2711	2775	28.88	64.48	113.40	
								3755
2236.00	3045.0	3032.5	2712	2776	28.84	64.38	113.23	
								3787
2238.00	3048.8	3036.3	2713	2777	28.79	64.27	113.04	
								3969
2240.00	3052.7	3040.2	2714	2778	28.74	64.16	112.85	
								4293
2242.00	3057.0	3044.5	2716	2780	28.68	64.02	112.61	
								4281
2244.00	3061.3	3048.8	2717	2782	28.62	63.89	112.38	
								4005
2246.00	3065.3	3052.8	2718	2783	28.56	63.77	112.18	
								4156
2248.00	3069.5	3057.0	2720	2784	28.51	63.65	111.97	
								4026
2250.00	3073.5	3061.0	2721	2786	28.46	63.53	111.77	
								3868
2252.00	3077.4	3064.9	2722	2787	28.41	63.43	111.58	
								3621
2254.00	3081.0	3068.5	2723	2788	28.37	63.34	111.42	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
								3759
2256.00	3084.7	3072.2	2724	2789	28.32	63.24	111.25	

APPENDIX 10

POSITIONING REPORT

By

RACAL

YOLLA 2

565352

POSITIONING REPORT

OF THE DRILLING RIG

NORTHERN EXPLORER III

FOR

PREMIER OIL AUSTRALIA PTY LIMITED

LOCATION	:	YOLLA-2
DATED	:	1 APRIL TO 11 APRIL 1998
REPORT REF.	:	2753A3

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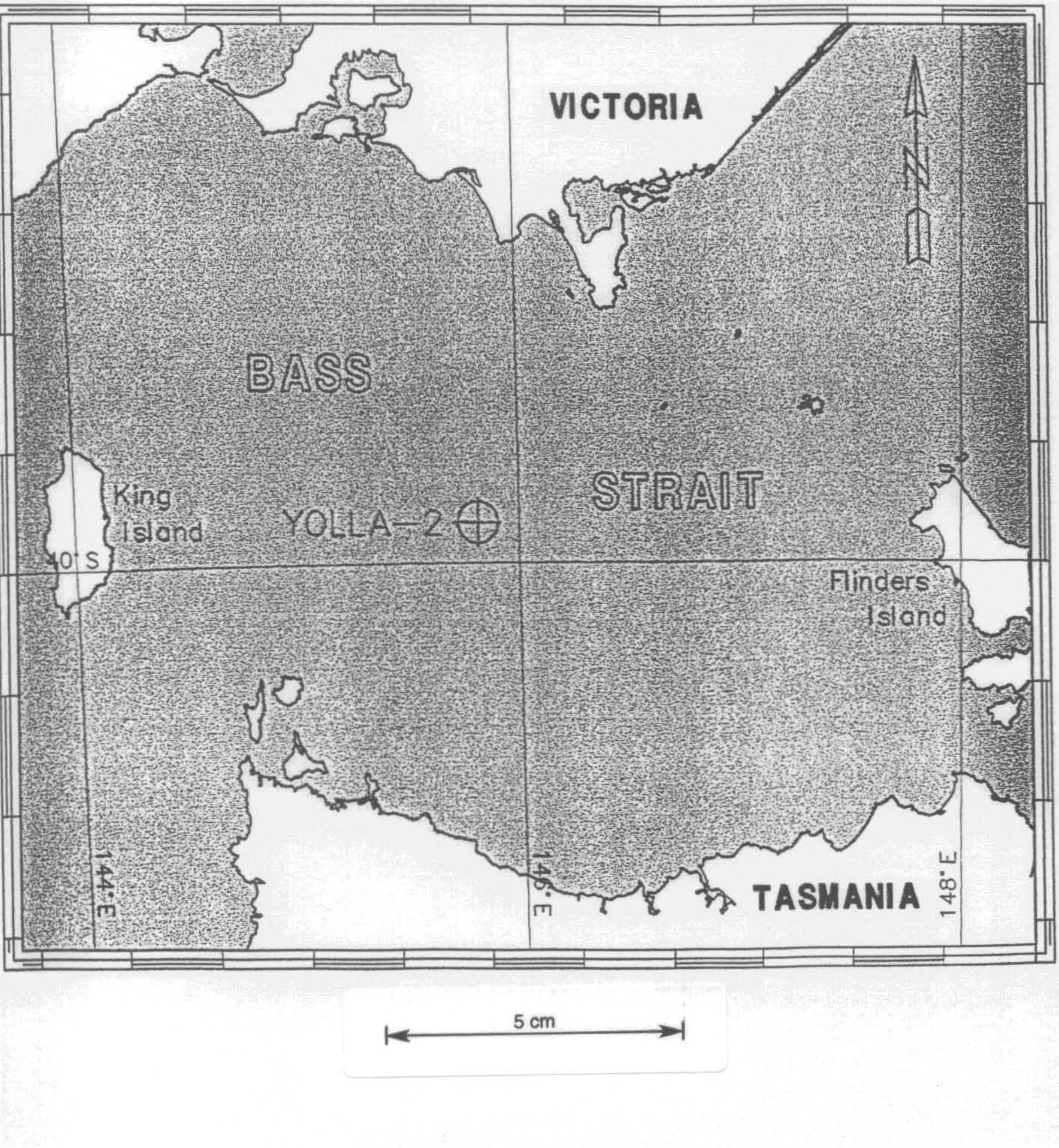
APPENDICES

565355

LOCATION DIAGRAM



1. INTRODUCTION

This report details the survey services provided by Racal Survey Australia Limited (Racal), prior to and during the positioning of the drillship Northern Explorer III at the Yolla-2 location, in the Bass Strait, for Premier Oil Australia Pty Limited (Premier Oil).

Positioning of the Northern Explorer III during the approach to and over the location was provided by Racal's SkyFix Spot Differential GPS (DGPS), interfaced via Racal's multiple reference station software, MultiFix 2, to Racal's General Navigation System (GNS) software, version 416A. Racal's SkyFix Differential GPS was utilised as the secondary differential system for onboard positioning of the Northern Explorer III.

The drillship Northern Explorer III was positioned over the Yolla-2 wellhead on 5 April 1998.

Yolla-2 Proposed Location

The proposed co-ordinates of the Yolla-2 location were provided by Premier Oil and are as follows:

Datum AGD 84

Latitude	:	39° 51' 33.820" South
Longitude	:	145° 48' 38.530" East

AMG Zone 55 C.M. 147° East

Easting	:	398 272.343 m
Northing	:	5 587 156.370 m
Intended Rig Heading	:	270.0° (T)

Yolla-2 Differential GPS Final Fix Position

The final surface position of Yolla-2, as observed by Differential GPS on 9 April 1998 was:

Datum AGD 84

Latitude	:	39° 51' 33.889" South
Longitude	:	145° 48' 38.493" East

AMG Zone 55 C.M. 147° East

Easting	:	398 271.48 m
Northing	:	5 587 154.23 m
Final Rig Heading	:	271.2° (T)

The final Differential GPS position is 2.30m on a bearing of 202.69° (T) from the Yolla-2 intended location.

2. SUMMARY OF EVENTS

2.1 REQUIREMENTS

Racal Survey Australia Limited (Racal) were contacted by Premier Oil Pty Limited (Premier Oil) to provide personnel and positioning equipment consisting of Racal's SkyFix/SkyFix Spot Differential GPS for the rig move of the Northern Explorer III to the Yolla-2 location. Racal's GNS software was used with the SkyFix/Skyfix Spot Differential GPS to provide online navigation of the drill ship and final drill ship position.

The requirements were as follows:

(a) To provide real-time positioning for the drill ship Northern Explorer III during the final approach and positioning at the Yolla-2 location.

(b) To provide real-time bearing and distances from the drill ship to the proposed anchor drop locations to help the vessels master during anchoring operations.

(c) To provide a preliminary position of the drill ship prior to pre-tensioning and final positioning.

(d) To complete a Differential GPS drillstem position after the Northern Explorer III had completed pre-tensioning and the preliminary position was accepted by the Client Representative.

2.2 SUMMARY OF EVENTS

On 1 April 1998 Racal Personnel K. Perry and B. O'Brien and Client Representative I. Scorgie departed Perth for Melbourne, arriving at 1730 (EST). All personnel transferred to the Travelodge Hotel for the night.

At 0800 on 2 April 1998 all personnel transferred from the Travelodge to Essendon Airport. All personnel departed Essendon Airport to meet the drillship Northern Explorer III in Geelong by bus at 1100. The bus arrived at Geelong/drillship at 1400. Survey equipment was loaded aboard the drillship at 1800 on 1 April 1998.

Personnel commenced mobilisation of equipment at 0800 on 3 April 1998 and it was completed by 1100. At 1200 all antenna offsets from the drillstem and sea level were measured. Completed system data configuration and completed tie down of equipment by 1300.

K. Perry performed a gyro calibration at 1730 on 3 April 1998, using a sextant, while the drillship was alongside the wharf in Geelong. The resulting C-O of +0.1° was entered into GNS.

The drillship Northern Explorer III departed Geelong for Yolla-2 at 1200 on 4 April 1998. The drillship arrived at the Yolla-2 location at 0240 on 5 April 1998 and commenced running anchors at 0946. Anchor handling continued until 1415 on 7 April 1998. All anchors were pre-tensioned at 1600 on 7 April 1998. It was decided to install piggy-backs on all the primary anchors as the pre-tension test failed.

The drillship commenced deploying piggy-backs at 1800 on 7 April 1998. All piggy-backs were installed on the primaries at 0800 on 8 April 1998 and the pre-tension test commenced. The anchors failed the required pre-tension values. The drillship went on weather standby at 0900 on 8 April 1998.

Anchor # 5 was re-run at 1225 on 9 April 1998. The drillship re-positioned over the Yolla-2 location and commenced pre-tensioning using reviewed tension values. All anchor tensions, except # 5 and # 8, were accepted. The final positioning of the drillship was completed at 1553 on 9 April 1998.

The final fix commenced at 1602 on 9 April 1998 and was completed at 1740 on 9 April 1998. A final fix analysis was performed and the final position of Yolla-2 calculated.

The survey personnel went on standby waiting for extra anchors at 1800 on 9 April 1998. Anchor # 5 was re-run with the anchor arrangement modified at 2002 on 10 April 1998.

Personnel commenced the demobilisation of all equipment at 2140 on 10 April 1998 and completed the demobilisation by 2330.

Racal Personnel K. Perry and B. O'Brien and Client Representative I. Scorgie departed the drillship at 1100 on 11 April 1998 for Melbourne.

3. GEODETIC PARAMETERS

Co-ordinates shown in this report are referred to the Australian Geodetic Datum 1984 (AGD 84).

The Global Positioning System (GPS) is referenced to the World Geodetic System 1984 (WGS 84).

3.1 DATUMS

Datum	:	**Australian Geodetic Datum 1984**
Spheroid	:	Australian National Spheroid
Semi-major Axis (a)	:	6 378 160.000m
Semi-minor Axis (b)	:	6 356 774.719m
Eccentricity Squared (e^2)	:	0.006 694 542
Flattening ($^1/_f$)	:	298.25

Datum	:	**World Geodetic System 1984**
Spheroid	:	WGS 84
Semi-major Axis (a)	:	6 378 137.000m
Semi-minor Axis (b)	:	6 356 752.314m
Eccentricity Squared (e^2)	:	0.006 694 380
Flattening ($^1/_f$)	:	298.257 223 563

3.2 PROJECTION

Projection	:	**Universal Transverse Mercator**
AMG Zone	:	55
Central Meridian (C.M.)	:	147° East
Scale factor on the C.M.	:	0.9996
False Easting	:	500 000m
False Northing	:	10 000 000m
Latitude of Origin	:	0° (Equator)
Unit of Measure	:	International Metre

3.3 DATUM TRANSFORMATION

The following 7-parameter datum transformation was used to convert WGS 84 co-ordinates to AGD 84 co-ordinates:

Dx	=	+ 116.00m
Dy	=	+ 50.47m
Dz	=	– 141.69m
Rx	=	+ 0.230"
Ry	=	+ 0.390"
Rz	=	+ 0.344"
Scale	=	– 0.0983 p.p.m.

Note: The sign conventions used in Racal software in the datum transformations were derived as follows:

<u>GNS Survey Software</u>:
The convention used is that used by the US Department of Defense and by Higgins (Transformation from WGS 84 to AGD 84 - An Interim Solution), where a positive rotation about the Z axis is an anti-clockwise movement of the X and Y axes (when viewed from the North Pole looking towards the centre of the Earth).

These values were adopted by the Inter-Governmental Advisory committee on Surveying and Mapping Standards for Control Surveys in May 1990.

3.4 GEOID/SPHEROID SEPARATION

The Geoid/Spheroid (WGS-84) separation (N), as computed from the OSU91A Geoid/Spheroid Model at the Yolla-2 location is -0.394m.

4. GLOBAL POSITIONING SYSTEM (GPS)

4.1 SYSTEM DESCRIPTION

The NAVSTAR GPS (Navigational Satellite Timing and Ranging Global Positioning System) is an USA Military all weather, space-based positioning system that transmits signals from a constellation of satellites orbiting the Earth. It is capable of providing suitably equipped users world-wide with accurate three dimensional positions on, or near, the Earth's surface. The accuracy of these determined positions can vary from a few millimetres to 100 metres depending on the method of data acquisition and processing. System design consists of three integrated parts: the Ground Control Segment, the Space Segment and the User Segment.

The operational space segment consists of 24 production satellites and 3 active spares; the term Space Vehicle (SV) is used as a synonym for satellite. The satellites are in high orbits, at approximately 20,200km, having an orbit period of 12 hours. They are arranged in 6 orbital planes, inclined at 55 degrees with near circular orbits. The configuration provides complete 4 satellite (3D) coverage world-wide.

4.2 GPS OBSERVATIONS

There are two important types of GPS observations (observables):

Pseudo-range and Carrier phase.

Carrier phase is sometimes also referred to as carrier beat phase. Pseudo-range techniques are generally used for navigation e.g. Racal's MultiFix. In high-precision baseline surveying the carrier phase is used. Although the (undifferenced) phase can be used directly, it has become common practice, at least in surveying applications, to process certain linear combinations of the original carrier phase observations (double differences and triple differences).

Pseudo-ranges

The pseudo-range is a measure of the distance between the satellite and the receiver at the epochs of transmission and reception of the signals. The transit time of the signals is measured by comparing (correlating) identical pseudo-random noise (PRN) codes generated by the satellite and by the receiver. A code-tracking loop within the receiver shifts the internal replica of the PRN code in time until maximum correlation occurs. The codes generated at the receiver are derived from the receiver's own clock, and the codes of the satellite transmissions are generated by the satellite system of clocks. It follows that unavoidable timing errors in both the satellite and the receiver clock will cause the measured quantity (pseudo-range) to differ from the geometric distance.

In offshore applications, where instantaneous positions are required, Pseudo-range is the preferred observable. Given the satellite ephemeris (i.e. the position of the satellite at the epoch of transmission), there are seven unknowns: two clock errors, three receiver co-ordinates and the ionospheric and tropospheric delays. The effect of the satellite clock error is negligible for the typical navigation solution, particularly considering that the time errors are indistinguishable from the ionospheric and tropospheric delays. The satellite clocks are constantly monitored and synchronised with GPS time as maintained by the control centre. Actual offsets of the satellite clocks are approximated by polynomials in time and transmitted as part of the navigation message to the user for the correction of the measured pseudo-ranges. The ionospheric and tropospheric delays can be computed on the basis of ionospheric and tropospheric models, thus there are four unknowns left X, Y, Z and receiver clock error. These can be determined from four pseudo-ranges measured simultaneously to four GPS satellites.

Carrier Phase

The phase observable is the difference between the phase of the carrier signal of the satellite, measured at the receiver, and the phase of the local oscillator within the receiver at the epoch of measurement. This can be regarded as a biased range measurement of the satellite-receiver distance with the integer number of carrier waves being unknown. The wavelength of the L1 carrier is about 19cm. Because of the fraction of the carrier phase is measured, the term "interferometry" is often used to describe carrier phase techniques.

4.3 DIFFERENTIAL GPS (DGPS)

As the GPS is primarily a USA Defence system, the navigation accuracy to the civil user is degraded to about 100 metres standard deviation (Standard Position Service -SPS), as specified in the USA 1990 Federal Radio Navigation Plan. The means by which the USA Military degrade GPS is with the use of Selective Availability (SA) to control the accuracy of Pseudo-range measurements. Essentially, the user is given a false Pseudo-range for each satellite so that the resulting measurement is in error by a controlled amount.

Differential GPS is a means by which the civil user can overcome Selective Availability. It requires a receiver be located at a precisely known point from which Pseudo-range corrections for each satellite can be determined and monitored. These Pseudo-range corrections are then communicated by means of a telecommunications link to users at unknown locations. The Differential GPS technique has proven to be particularly effective and can improve the accuracy figure to 3 metres or better with or without Selective Availability activated. In the relative mode, most of the important systematic errors common to the known station and at the unknown location cancel out to improve the accuracy of the computed position.

4.4 SKYFIX/SKYFIX SPOT DIFFERENTIAL LINK

Racal Survey Australia Limited introduced its SkyFix Differential GPS System in Australia in February 1991, using the Inmarsat Pacific and Indian Ocean marine communications satellites as the differential data broadcast link. Extensive performance trials and projects undertaken to date have shown SkyFix to meet the best industry expectations in terms of quality of service and accuracy.

Satellite communications systems, particularly at the Inmarsat L-band frequencies of 1.5 GHz are reliable and free of the interference associated with the crowded MF/HF bands. This high data integrity gives users confidence that the corrections will be continuously received without interference.

The SkyFix Australian network comprises of reference stations at Dampier, Broome, Perth, Adelaide, Melbourne, Sydney, Cairns and Darwin.

The SkyFix Spot Differential GPS System was launched in Australia in October 1994, using the OPTUS high powered focused communications satellite as the differential data broadcast link. Extensive performance trials and projects undertaken to date have shown SkyFix Spot to meet the industry expectations in terms of quality of service and accuracy.

The SkyFix Spot system has a link capacity of 1200 bits per second, similar to the SkyFix system but because it is only transmitting corrections from the Australian network an update rate of better than two seconds is achieved.

The OPTUS satellite uses the L-band frequencies of 1.5586 GHz and are very reliable and free of interference avoiding data loss associated with the crowded HF/MF bands.

The SkyFix Spot network comprises of reference stations at Dampier, Broome, Perth, Adelaide, Melbourne, Cairns, Darwin and also Ujung Pandang and Jakarta in Indonesia, and Auckland, New Zealand.

The differential corrections generated at each reference station are brought via landline links, to the data hub and control centre in Singapore; where the system is monitored for performance and quality. From there, a composite message containing full RTCM 104 version 2 formatted data from all reference stations is sent via dual redundant links to Satellite Earth Stations at Sentosa Island, Singapore, O.T.C. Perth, and the earth station at Lockridge, Perth, Western Australia, for uplink and broadcast over the Inmarsat Pacific and Indian Ocean Region satellites and OPTUS satellite.

The SkyFix/SkyFix Spot system includes a 24 hour monitoring facility to ensure the validity of data received at the control centre from the DGPS reference stations, and that the same data are received over the SkyFix/SkyFix Spot satellite data links.

4.5 TRIMBLE 4000DS GPS RECEIVER

The Trimble 4000DS GPS receiver is designed for moderate precision static and dynamic positioning applications. The GPS receiver provides time and three-dimensional station co-ordinates at a once-per-second update rate.

The receiver receives the civilian coded signal (C/A) from the GPS NAVSTAR satellites. The receiver automatically acquires and simultaneously tracks GPS satellites and precisely measures carrier and code phase and computes position and velocity.

Latitude, longitude and height values are output on the World Geodetic System (WGS 84) Earth-centred, Earth-fixed co-ordinate system.

The receiver is designed to measure the following observables:

- Coarse/Acquisition (C/A) code Pseudo-ranges
- Rate of change of Pseudo-range
- Integrated Carrier

C/A code correlation techniques measure the propagation time of the signal from the satellite to the antenna. Latitude, longitude, height and time can be determined from measurements made from at least 4 satellites, by a process similar to triangulation.

To determine speed and heading, the receiver calculates the rate of change of Range (the range-rate) by measuring the Doppler shift of the carrier.

It is capable of receiving and processing differential corrections from other reference sources using the standard format of the Radio Technical Commission for Maritime Services, Special Committee 104 (RTCM sc.-104), Version 1.0 or 2.0 protocols.

The 4000DS has several options available, including internal data logging memory, event marker logging etc. and therefore may be used alone or as part of a more extensive navigation system.

5. GYRO CALIBRATION

At 1730 on 3 April 1998, with the Northern Explorer III alongside the Geelong wharf, observations from the centreline of the vessel to the sun were taken. The Calculated (C) heading of the vessel was compared to the Observed (O) heading of the vessel, recorded by GNS. The resulting C-O of +0.1° (T) was entered into GNS.

The gyro was installed against the bulkhead. This was to limit any possible movement of the gyro during the transit to the Yolla-2 location. If any movement did occur the gyro could be placed back in its original position.

See Appendix C for observations.

6. FINAL RIG POSITION

6.1 FINAL DIFFERENTIAL GPS POSITION

The Northern Explorer III was positioned over the Yolla-2 location on 9 April 1998.

A Differential GPS final fix of the Northern Explorer III was computed using the SkyFix Spot Differential GPS. Between 1603 and 1740 on 9 April 1998, 444 sample positions were observed from 17 constellations. The computation of the final fix gave equal weights to the positions computed for each constellation.

Constellation	Samples	Satellites
A	120	14, 18, 16, 22, 04, 19
B	74	14, 18, 16, 27, 22, 04, 19
C	15	14, 18, 16, 27, 04, 19
D	1	14, 18, 16, 27, 19, 13
E	25	14, 18, 16, 27, 03, 19, 13
F	7	14, 18, 16, 27, 19, 13
G	14	14, 18, 16, 27, 03, 19, 13
H	3	14, 18, 16, 27, 22, 19, 13
I	2	14, 18, 16, 27, 19, 13
J	5	14, 18, 16, 27, 22, 19, 13
K	14	14, 18, 16, 27, 19, 13
L	74	14, 18, 16, 27, 31, 19, 13
M	46	18, 16, 27, 31, 19, 13
N	17	18, 16, 27, 03, 31, 19, 13
O	15	18, 16, 27, 10, 03, 31, 19, 13
P	1	18, 16, 27, 03, 31, 19, 13
Q	11	18, 16, 27, 10, 03, 31, 19, 13

Total number of samples used = 444.

The computed antenna position was as follows:

Datum WGS 84

Latitude	:	39° 51' 28.236" South	(S.D. 0.09m)
Longitude	:	145° 48' 41.076" East	(S.D. 0.10m)
Spheroidal Height	:	20.08m	(S.D. 0.11m)

Transforming the above WGS 84 co-ordinates to AGD 84 using the parameters in section 3, gives the following co-ordinates:

Datum AGD 84

Latitude	:	39° 51' 33.639" South
Longitude	:	145° 48' 36.209" East
Spheroidal Height	:	35.66m

Applying the antenna to drillstem offsets of (6.60, 54.40) with a rig heading of 271.2° (True) the following co-ordinates were computed:

Datum AGD 84

Latitude	:	39° 51' 33.889" South
Longitude	:	145° 48' 38.493" East

AMG Zone 55 C.M. 147° East

Easting	:	398 271.48m
Northing	:	5 587 154.23m

This position is 2.30 metres on a bearing of 202.69° (True) from the intended Yolla-2 location.

7. PERSONNEL AND EQUIPMENT

7.1 PERSONNEL

The following personnel were employed on this project:

For : Racal Survey Australia Limited

K. Perry	:	Surveyor
B. O'Brien	:	Engineer

For : Premier Oil Australia Pty Limited

I. Scorgie	:	Client Representative

7.2 EQUIPMENT

The following equipment was provided for this project:

2 x Trimble 4000DS GPS Receivers, Cables and Antennae

1 x SkyFix Demodulator/Decoder

1 x Racal Mini Rig Portable Dish

1 x 686 Laptop (for GRREP)

1 x 686 Desktop (for MultiFix)

1 x 686 Desktop (for GNS)

1 x S.G. Brown 1000 Gyro

2 x HP Thinkjet Printers

2 x SkyFix Spot Receivers

2 x SkyFix Spot Antennae

1 x Marine Sextant

plus all associated software:

GNS PC software version GNS416A
MultiFix 2 Multiple Reference Station GPS Software Version 2.09
GRREP software version 416

c/w cables, consumables etc.

8. DISTRIBUTION

Copies of this report have been distributed as follows:

Premier Oil Australia Pty Limited Attn: Stuart Harrison	: 2 copies : 1 disk
Racal Survey - Perth	: 1 copy

pp Peter Williams
Karl Perry
Surveyor

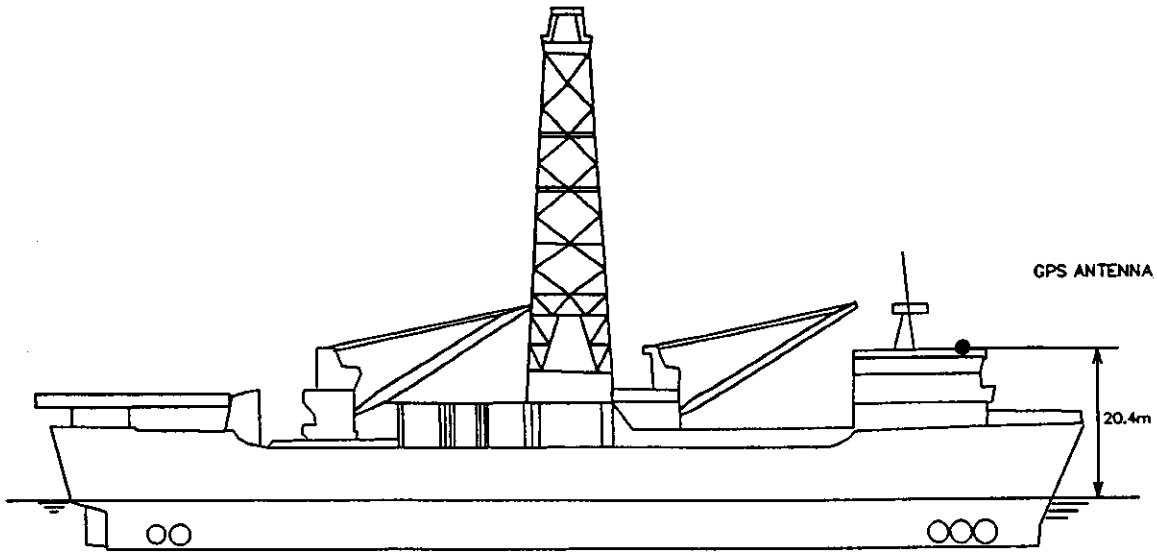
Anthony K
Anthony Kerr
Area Surveyor

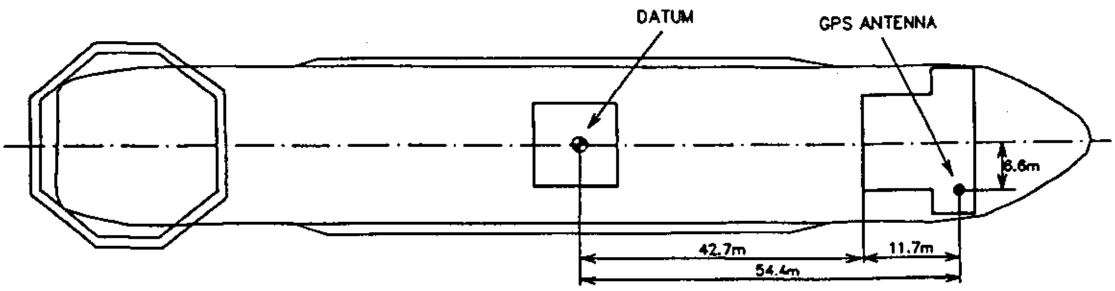
APPENDIX A

OFFSET DIAGRAM – NORTHERN EXPLORER III

565373

VESSEL DIAGRAM





NORTHERN EXPLORER III

(NOT TO SCALE)

APPENDIX B

GNS SYSTEM SET-UP PARAMETERS

565375

GNS416 System Data 3 Apr 1998 11:29:17

System Data Printout Check. 3-4-1998

Karl Perry

Job Number : 2753A3
Description : Yolla-2 Well
Client : Premier Oil Australia
Surveyor : Karl Perry & Brad O'Brien

Spheroid : ANS

Eccentricity ^2 = 0.006694542
Semi-major axis = 6378160.000 Metres

Projection : UTM/TM

Grid Scale Const = 0.9996000
Unit Conv. Factor = 1.0000000
False Easting = 500000.00 Metres
False Northing = 10000000.00 Metres
Central Meridian = 147 DEG 00 MIN 00.000 SEC E
Lat of Origin = 00 DEG 00 MIN 00.000 SEC

System Type Definition

A DNAVN
B Trimble
C Not Defined
D Not Defined

Station Data for System Type A : DNAVN
GPS Spheroid : WGS 84

Eccentricity ^2 = .00669438
Semi-major axis = 6378137.00 metres

Transformation Parameters to : ANS Spheroid

DX = +116.000 Metres
DY = +50.470 Metres
DZ = -141.690 Metres
Rotation (X) = +.2300 seconds
Rotation (Y) = +.3900 seconds
Rotation (Z) = +.3440 seconds
Scaling (ppm) = -.0983

Station Data for System Type B : Trimble
GPS Spheroid : WGS 84

Eccentricity ^2 = .00669438
Semi-major axis = 6378137.00 metres

Transformation Parameters to : ANS Spheroid

DX = +116.000 Metres
DY = +50.470 Metres
DZ = -141.690 Metres
Rotation (X) = +.2300 seconds
Rotation (Y) = +.3900 seconds
Rotation (Z) = +.3440 seconds
Scaling (ppm) = -.0983

Station Data for System Type C : Not Defined
No Station Data

Station Data for System Type D : Not Defined
No Station Data

Pattern Corrections and Standard Deviations

System A DNAVN
C-O Corrections :-
Latit. +0.000 Secs
Long. +0.000 Secs
Height +0.000 M

System B Trimble
C-O Corrections :-
Latit. +0.000 Secs
Long. +0.000 Secs
Height +0.000 M

System C Not Defined
No Data

Pattern Corrections and Standard Deviations

System D Not Defined
No Data

565376

Mobile System Assignments

Sys	Mobile	System Type	Status
1	N. Explorer	DNAVN	ON
2	N. Explorer	Trimble	OFF

Receiver Pattern Codes

Sys 1 N. Explorer	Sys 2 N. Explorer
DNAVN	Trimble
Receiver1	Receiver1
ON	ON
Geogs 1	Geogs 1

Computation Pattern Codes

Comp 1 N. Explorer
(ON)[TRACKING]

LOP	Patt Code	SRC	HRB
1	Geogs	111	1

Comp 2 N. Explorer
(OFF)

LOP	Patt Code	SRC	HRB
1	Geogs	211	1

S=System R=Receiver C=Channel *=Pattern temporarily not used in computation

Antennae/Transducer/Beacon/Target Offsets

System 1 DNAVN
for N. Explorer

	X	Y	Height
Receiver 1	+6.60	+54.40	+0.00
Receiver 2	+0.00	+0.00	+0.00

System 2 Trimble
for N. Explorer

	X	Y	Height
Receiver 1	+6.60	+54.40	+0.00
Receiver 2	+0.00	+0.00	+0.00

```
,,,,,,,,,,,,,,,,,,      ,,,,,,,,,,,,,,,,,,
.     Heading    .      .     Heading    .
.        ^       .      .        ^       .
.       +Y       .      .       +Y       .
.        .   \   .      .        .   \   .
.        .       .      .        .       .
. -X,,,,,/,,,,,+X .     . -X,,,,,/,,,,,+X .
.        .       .      .        .       .
.        .       .      .        .       .
.        .       .      .        .       .
.       -Y       .      .       -Y       .
,,,,,,,,,,,,,,,,,,      ,,,,,,,,,,,,,,,,,,
```

Offset 1=\ Offset 2=/

Winch Offsets (X,Y)

X	Y
-3.9	+71.0
-1.4	+73.0
+0.0	+0.0
+0.0	+0.0
+0.0	+0.0
+0.0	+0.0
-2.2	-76.0
-5.3	-76.0
+0.0	+0.0
+0.0	+0.0
+0.0	+0.0
+0.0	+0.0
+0.0	+0.0
+0.0	+0.0
+1.4	+73.0
+3.9	+71.0
+5.3	-76.0
+2.2	-76.0
+0.0	+0.0
+0.0	+0.0
+0.0	+0.0
+0.0	+0.0
+0.0	+0.0
+0.0	+0.0

Tow Points (X,Y) Tow Vessel

X	Y	Tow Vessel
+0.0	+0.0	OFF
+0.0	+0.0	OFF
+0.0	+0.0	OFF
+0.0	+0.0	OFF
+0.0	+0.0	OFF
+0.0	+0.0	OFF

Laser System

Laser 1 : Not Selected   Laser 2 : Not Selected

Receiver Interface Addresses

N. Explorer:-	N. Explorer:-
Sys 1 DNAVN	Sys 2 Trimble
Rx 1 : 3201	Rx 1 : 3202

P = Prioritised Receiver : Not Set.

Peripheral Interface Addresses

Inputs	Outputs	
GOLF 1	Link to TUGNAV	
GOLF 2	Link to GRREP	3208
Time Sync	Shell QC Output	
	C-O Output	
	Nav. Echo	
	Grid Position	
	Mobile Position	
	UIS System	
	KP Output	
	Ulvertech Scanner	
	Pseudo Nav String	
	PEP-CTD Output	
	Shot Controller	
	Skyfix Gyro $ECHDT	
	KP to NeSA PROC	
	Norcom Telegrams	
	Pirelli Kp Out	

Comms Configuration

Digiboard 1: Addresses 3201 - 3208

Addr	Baud	Data Bits	Parity	Stop Bits	Term Char	Term Count
3201	9600	8	NONE	1	10	0
3202	9600	8	NONE	1	10	0
3203	9600	8	NONE	1	10	0
3204	9600	8	NONE	1	10	0
3205	9600	8	NONE	1	10	0
3206	9600	8	NONE	1	10	0
3207	9600	8	NONE	1	10	0
3208	9600	8	NONE	1	10	0

Digiboard 2: Addresses 3301 - 3308

Not Interfaced

Digiboard 3: Addresses 3401 - 3408

Not Interfaced

Digiboard 4: Addresses 3501 - 3508

Not Interfaced

Comms Ports 1 and 2 : Addresses 9 and 11

Addr	Baud	Data Bits	Parity	Stop Bits	Term Char	Term Count
9	9600	8	NONE	1	10	0
11	9600	8	NONE	1	10	0

565378

CURRENT OFFSET Posn : DATUM
+0.00 X, +0.00 Y

Waypoint Co-ordinates:

1	YOLLA-2	E	398272.34 N	5587156.37

Anchor Co-ordinates (Intended):

Main Anchors:-				First Backup:-				Second Backup:-			
Anc#	Description	Easting	Northing	Anc#	Description	Easting	Northing	Anc#	Description	Easting	Northing
P1	Anc#P1	397862	5586221	P1A		Undefined		P1B		Undefined	
P2	Anc#P2	397387	5586586	P2A		Undefined		P2B		Undefined	
P3		Undefined		P3A		Undefined		P3B		Undefined	
P4		Undefined		P4A		Undefined		P4B		Undefined	
P5		Undefined		P5A		Undefined		P5B		Undefined	
P6		Undefined		P6A		Undefined		P6B		Undefined	
P7	Anc#P7	399160	5586595	P7A		Undefined		P7B		Undefined	
P8	Anc#P8	398687	5586219	P8A		Undefined		P8B		Undefined	
P9		Undefined		P9A		Undefined		P9B		Undefined	
P10		Undefined		P10A		Undefined		P10B		Undefined	
P11		Undefined		P11A		Undefined		P11B		Undefined	
P12		Undefined		P12A		Undefined		P12B		Undefined	
S1		Undefined		S1A		Undefined		S1B		Undefined	
S2		Undefined		S2A		Undefined		S2B		Undefined	
S3	Anc#S3	397387	5587726	S3A		Undefined		S3B		Undefined	
S4	Anc#S4	397862	5588092	S4A		Undefined		S4B		Undefined	
S5	Anc#S5	398687	5588093	S5A		Undefined		S5B		Undefined	
S6	Anc#S6	399160	5587727	S6A		Undefined		S6B		Undefined	
S7		Undefined		S7A		Undefined		S7B		Undefined	
S8		Undefined		S8A		Undefined		S8B		Undefined	
S9		Undefined		S9A		Undefined		S9B		Undefined	
S10		Undefined		S10A		Undefined		S10B		Undefined	
S11		Undefined		S11A		Undefined		S11B		Undefined	
S12		Undefined		S12A		Undefined		S12B		Undefined	

Chart Parameters :-

Nmr	Title	Centre East,North	Skew	Scale	Width	Height
1	Testing	9530250.00E 4453000.00N	0.00	25000	32.00	27.50

Verified by: ______ (sign) IAN SCORGIE. (print) 3 Apr 1998 11:31:42

APPENDIX C

GYRO CALIBRATION

CALCULATION SHEET

.54 /1

NATURE Kan Peng

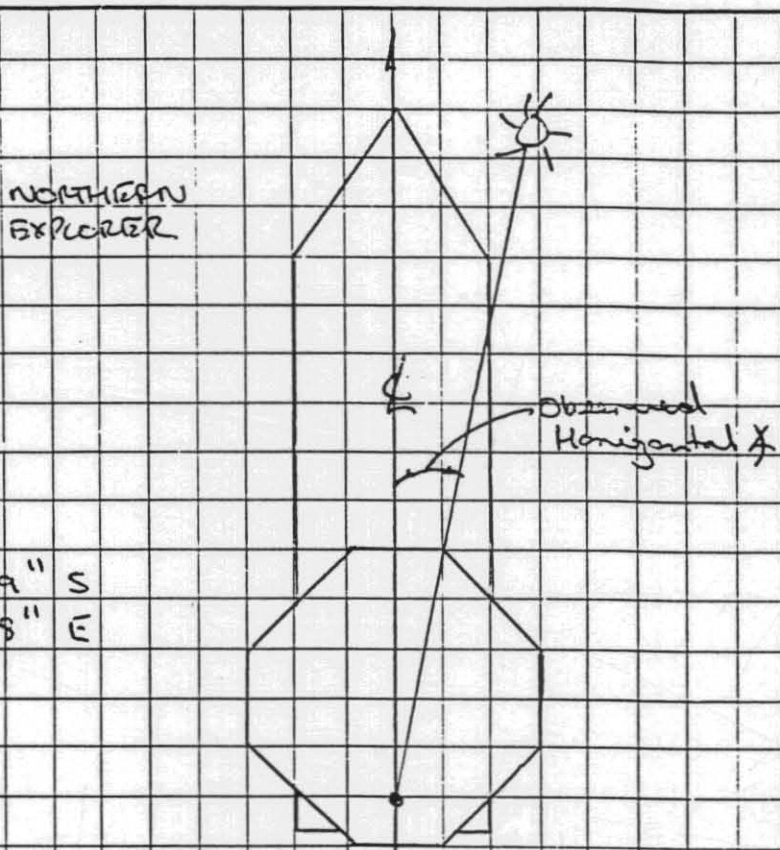
DATE 3-4-1998

TITLE PREMIER OIL AUSTRALIA – YOLLA-2 RIG MOVE

JOB No. 275343

SUBJECT GYRO CALIBRATION BY SUN OBSERVATIONS

SHEET No.



ϕ 38° 06' 29" S

λ 144° 21' 38" E

Set	Time UTC	Hor. ∡	Azimuth RO	Calculated.	Observed	C–O
1	7:38:30	2° 58' 00"	278° 38' 13"	278°.6	277°.8	0.8°
2	7:40:45	2° 55' 12"	278° 14' 41"	278°.3	278°.0	0.3°
3	7:41:55	2° 47' 00"	278° 11' 51"	278°.2	278°.3	-0.1°
4	7:43:00	2° 39' 24"	278° 09' 13"	278°.2	278°.4	-0.2°
5	7:44:55	2° 23' 36"	278° 06' 56"	278°.1	278°.4	-0.3°
6	7:45:00	2° 20' 24"	278° 09' 21"	278°.2	278°.4	-0.2°
					mean C–O	0.1°

5 cm

GYRO CALIBRATION – YOLLA-2
By observations to the sun

Date		:	3 Apr 1998
Method		:	Solar Hour Angle
Latitude	(D.MMSSs)	:	-38.0629
Longitude West	(D.MMSSs)	:	-144.2138
Watch Corr: UT-Watch	(H.MMSSs)	:	0.00000
Error in Latitude	(arcsec)	:	5.0
Error in Timing	(sec of time)	:	0.5
Output Filename		:	YOLLA-2

Set No.	Average Watch Time (HH.MMSSs)	Average Horz.Ang (DD.MMSSs)	Azimuth Star (DD.MMSSs)	Azimuth RO (HH.MMSSs)	Error in Azimuth (HH.MMSSs)
1	7.3830	2.5800	281.3113	278.3313	0.0005
2	7.4045	2.5512	281.0953	278.1441	0.0005
3	7.4155	2.4700	280.5851	278.1151	0.0005
4	7.4300	2.3924	280.4837	278.0913	0.0005
5	7.4455	2.2336	280.3032	278.0656	0.0005
6	7.4500	2.2024	280.2945	278.0921	0.0005

Average Azimuth

Set No.	Azimuth RO (DD.MMSSs)	Error (DD.MMSSs)
1	278.3313	0.0005
2	278.1441	0.0005
3	278.1151	0.0005
4	278.0913	0.0005
5	278.0656	0.0005
6	278.0921	0.0005

Average Azimuth RO : 278.1413

3-4-1998 565382

Gyro Calibration

ϕ 38° 06' 29" S

λ 144° 21' 38"

N. Explorer (Last position update 17:37:00) Logging File : OFF
CURRENT OFFSET FROM DATUM : +0.00 X +0.00 Y (DATUM)
DATUM : E 268587.06 N 5778871.68 Ht +37.95 Lat 38 6 29.687S Long 144 21 38.114E

Offset	1 DATUM		: E	268587.06	N	5778871.68
Offset	2 FAIRLEAD 1	(Hdg)	: E	268514.62	N	5778880.54
Offset	3 FAIRLEAD 2	(Hdg)	: E	268516.78	N	5778882.83
Offset	4 FAIRLEAD 3	(Hdg)	: E	268663.22	N	5778869.18
Offset	5 FAIRLEAD 4	(Hdg)	: E	268662.91	N	5778866.10
Offset	6 FAIRLEAD 5	(Hdg)	: E	268662.46	N	5778861.72
Offset	7 FAIRLEAD 6	(Hdg)	: E	268662.14	N	5778858.64
Offset	8 FAIRLEAD 7	(Hdg)	: E	268515.98	N	5778875.07
Offset	9 FAIRLEAD 8	(Hdg)	: E	268514.33	N	5778877.75

Speed MG(K): 0.0 Corrected Gyro(T) : 277.5 Corrn. : +0.0 Cmg(T) : 294.4
Waypoint: YOLLA-2 Dist(M): 231468.0 Brg(T): 147.6
COMP 1 DNAUN (Tracking) DATUM : E 268587.06 N 5778871.68 Ht +37.95
C-Os applied : dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84
3 Apr 1998 UTC Time :07 37 51.4 CMG :333.9 SMG :000.1
ANTENNA (WGS 84) Lat : 38 6 23.780 S Long :144 21 40.770 E (PR Corr.) Ht : 24.90 M
PRNs:[18 SN:23 RE:000 STAT:0][14 SN:05 RE:001 STAT:0][16 SN:14 RE:000 STAT:0][27 SN:14 RE:001 STAT:0]
[22 SN:03 RE:000 STAT:0][03 SN:05 RE:001 STAT:0][31 SN:06 RE:000 STAT:0][19 SN:17 RE:000 STAT:0][13 SN:08 RE:000 STAT:0]
PDOP :01.6 HDOP :00.9 3D-Err :001 2D-Err :001 Mode :ALL IN VIEW

FixNmr	Time	Log	Datum E	N	Hdg(T)	DOP	Wpt DTOG	Wpt BTOG
31	17:37:30.5	OFF	268587.53	5778871.30	277.6	1.6	231467.4	147.6
32	17:38:00.5	OFF	268587.76	5778871.21	277.7	1.6	231467.2	147.6
33	17:38:30.5	OFF	268587.24	5778871.41	277.8	1.6	231467.7	147.6
34	17:39:00.5	OFF	268587.23	5778871.01	[illegible]	1.8	231467.4	147.6
35	17:39:30.4	OFF	268587.23	5778871.01	277.9	1.8	231467.4	147.6
36	17:39:59.9	OFF	268587.73	5778870.41	277.9	2.1	231466.6	147.6
37	17:40:30.5	OFF	268587.72	5778870.01	278.0	2.1	231466.2	147.6
38	17:41:00.0	OFF	268587.24	5778869.68	278.0	2.5	231466.2	147.6
39	17:41:30.0	OFF	268586.74	5778869.98	278.0	2.1	231466.8	147.6

FIX # 40 17:41:59 3 Apr 1998 Time Zone +0
N. Explorer (Last position update 17:41:59) Logging File : OFF
CURRENT OFFSET FROM DATUM : +0.00 X +0.00 Y (DATUM)
DATUM : E 268585.93 N 5778870.29 Ht +36.85 Lat 38 6 29.651S Long 144 21 38.066E

Offset	1 DATUM		: E	268585.93	N	5778870.29
Offset	2 FAIRLEAD 1	(Hdg)	: E	268513.61	N	5778880.16
Offset	3 FAIRLEAD 2	(Hdg)	: E	268515.81	N	5778882.42
Offset	4 FAIRLEAD 3	(Hdg)	: E	268662.05	N	5778866.73
Offset	5 FAIRLEAD 4	(Hdg)	: E	268661.69	N	5778863.65
Offset	6 FAIRLEAD 5	(Hdg)	: E	268661.18	N	5778859.28
Offset	7 FAIRLEAD 6	(Hdg)	: E	268660.82	N	5778856.20
Offset	8 FAIRLEAD 7	(Hdg)	: E	268514.91	N	5778874.67
Offset	9 FAIRLEAD 8	(Hdg)	: E	268513.29	N	5778877.38

Speed MG(K): 0.0 Corrected Gyro(T) : 278.3 Corrn. : +0.0 Cmg(T) : 294.4
Waypoint: YOLLA-2 Dist(M): 231467.3 Brg(T): 147.6
COMP 1 DNAUN (Tracking) DATUM : E 268585.93 N 5778870.29 Ht +36.85
C-Os applied : dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84
3 Apr 1998 UTC Time :07 42 53.6 CMG :321.3 SMG :000.1
ANTENNA (WGS 84) Lat : 38 6 23.800 S Long :144 21 40.730 E (PR Corr.) Ht : 23.80 M
PRNs:[18 SN:24 RE:000 STAT:0][14 SN:03 RE:001 STAT:0][16 SN:15 RE:000 STAT:0][27 SN:08 RE:000 STAT:0]
[31 SN:11 RE:001 STAT:0][19 SN:21 RE:000 STAT:0][13 SN:08 RE:000 STAT:0]
PDOP :02.1 HDOP :01.4 3D-Err :002 2D-Err :001 Mode :ALL IN VIEW

FixNmr	Time	Log	Datum E	N	Hdg(T)	DOP	Wpt DTOG	Wpt BTOG
41	17:42:29.9	OFF	268586.14	5778870.52	278.4	1.7	231467.6	147.6
42	17:42:59.9	OFF	268586.64	5778869.91	278.4	1.7	231466.8	147.6
43	17:43:30.0	OFF	268586.64	5778869.91	278.4	1.7	231466.8	147.6
44	17:44:00.0	OFF	268587.13	5778869.93	278.4	1.7	231466.5	147.6
45	17:44:29.9	OFF	268587.38	5778869.63	278.4	1.7	231466.1	147.6
46	17:44:59.9	OFF	268587.38	5778869.63	278.4	1.7	231466.1	147.6
47	17:45:29.9	OFF	268587.67	5778869.11	278.3	1.7	231465.5	147.6
48	17:46:00.0	OFF	268587.69	5778869.20	278.2	1.8	231465.6	147.6
49	17:46:30.0	OFF	268587.45	5778869.20	278.2	1.8	231465.7	147.6

FIX # 50 17:47:00 3 Apr 1998 Time Zone +0
N. Explorer (Last position update 17:47:00) Logging File : OFF
CURRENT OFFSET FROM DATUM : +0.00 X +0.00 Y (DATUM)
DATUM : E 268587.36 N 5778869.53 Ht +36.65 Lat 38 6 29.677S Long 144 21 38.124E

Offset	1 DATUM		: E	268587.36	N	5778869.53
Offset	2 FAIRLEAD 1	(Hdg)	: E	268515.08	N	5778879.65
Offset	3 FAIRLEAD 2	(Hdg)	: E	268517.29	N	5778881.91
Offset	4 FAIRLEAD 3	(Hdg)	: E	268663.47	N	5778865.70
Offset	5 FAIRLEAD 4	(Hdg)	: E	268663.10	N	5778862.62
Offset	6 FAIRLEAD 5	(Hdg)	: E	268662.57	N	5778858.26
Offset	7 FAIRLEAD 6	(Hdg)	: E	268662.20	N	5778855.18
Offset	8 FAIRLEAD 7	(Hdg)	: E	268516.36	N	5778874.16
Offset	9 FAIRLEAD 8	(Hdg)	: E	268514.75	N	5778876.87

Speed MG(K): 0.0 Corrected Gyro(T) : 278.5 Corrn. : +0.0 Cmg(T) : 294.4
Waypoint: YOLLA-2 Dist(M): 231466.1 Brg(T): 147.6

COMP 1 GNAVN (Tracking)   DATUM : E 268587.36 N 5778869.53 Ht +36.65
C-Os applied : dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84
3 Apr 1998 UTC Time :07 47 53.6 CMG :324.2 SMG :000.1
ANTENNA (WGS 84) Lat : 38 6 23.820 S Long :144 21 40.790 E (PR Corr.) Ht : 23.60 M
PRNs:[18 SN:22 RE:000 STAT:0][14 SN:07 RE:001 STAT:0][16 SN:12 RE:000 STAT:0][27 SN:13 RE:000 STAT:0]
[10 SN:05 RE:002 STAT:0][03 SN:02 RE:000 STAT:0][31 SN:04 RE:000 STAT:0][19 SN:19 RE:000 STAT:0][13 SN:11 RE:000 STAT:0]
PDOP :01.5 HDOP :00.9 3D-Err :001 2D-Err :001 Mode :ALL IN VIEW

FixNmr	Time	Log	Datum E	Datum N	Hdg(T)	DOP	Wpt DTOG	Wpt BTOG
51	17:47:29.9	OFF	268587.35	5778869.84	278.5	1.5	231466.3	147.6
52	17:47:59.9	OFF	268587.61	5778869.54	278.5	1.8	231465.9	147.6
53	17:48:30.0	OFF	268587.36	5778869.53	278.5	1.8	231466.1	147.6
54	17:49:00.0	OFF	268587.10	5778869.13	278.6	1.8	231465.9	147.6
55	17:49:30.0	OFF	268586.61	5778869.42	278.6	1.8	231466.4	147.6
56	17:49:59.9	OFF	268586.86	5778869.12	278.6	1.8	231466.0	147.6
57	17:50:29.9	OFF	268586.59	5778869.02	278.7	1.8	231466.1	147.6
58	17:50:59.9	OFF	268586.58	5778869.33	278.7	2.0	231466.3	147.6
59	17:51:30.0	OFF	268586.59	5778869.02	278.7	2.0	231466.1	147.6

APPENDIX D

DGPS DRILLSTEM POSITION PRINTOUT – YOLLA-2

System final fix printout
Yolla-2.
[signature] 9-4-1998.

565385

FINAL POSITION ANALYSIS: Yolla-2 Well
WGS 84 Spheroid
GNS v R 416

COMPUTATION 1 CONSTELLATION SUB FINAL POSITION - ONAVN
Sub-Final Position A Constellation:(14,18,16,22,04,19)
16:02:48 9 Apr 1998 to 16:23:57 9 Apr 1998
No samples: 120 1 to 120
No samples used: Lat/Long 120 Height 120
P.D.O.P Minimum 2.3 Maximum 2.7
H.D.O.P Minimum 1.2 Maximum 1.4
3D error Minimum 4.0m Maximum 4.0m
2D error Minimum 2.0m Maximum 2.0m
Latitude 39 DEG 51 MIN 28.237 SEC S (S.D. .36m)
Longitude 145 DEG 48 MIN 41.090 SEC E (S.D. .36m)
Height 19.96 m (S.D. .84m)

COMPUTATION 1 CONSTELLATION SUB FINAL POSITION - ONAVN
Sub-Final Position B Constellation:(14,18,16,27,22,04,19)
16:24:38 9 Apr 1998 to 16:39:07 9 Apr 1998
No samples: 74 121 to 194
No samples used: Lat/Long 74 Height 74
P.D.O.P Minimum 1.9 Maximum 2.0
H.D.O.P Minimum 1.1 Maximum 1.2
3D error Minimum 3.0m Maximum 5.0m
2D error Minimum 2.0m Maximum 3.0m
Latitude 39 DEG 51 MIN 28.234 SEC S (S.D. .50m)
Longitude 145 DEG 48 MIN 41.081 SEC E (S.D. .67m)
Height 20.40 m (S.D. .58m)

COMPUTATION 1 CONSTELLATION SUB FINAL POSITION - ONAVN
Sub-Final Position C Constellation:(14,18,16,27,04,19)
16:40:41 9 Apr 1998 to 16:43:19 9 Apr 1998
No samples: 15 195 to 209
No samples used: Lat/Long 15 Height 15
P.D.O.P Minimum 3.7 Maximum 3.7
H.D.O.P Minimum 2.6 Maximum 2.6
3D error Minimum 5.0m Maximum 7.0m
2D error Minimum 3.0m Maximum 5.0m
Latitude 39 DEG 51 MIN 28.236 SEC S (S.D. .62m)
Longitude 145 DEG 48 MIN 41.049 SEC E (S.D. .50m)
Height 20.74 m (S.D. .51m)

COMPUTATION 1 CONSTELLATION SUB FINAL POSITION - ONAVN
Sub-Final Position D Constellation:(14,18,16,27,19,13)
16:44:55 9 Apr 1998 to 16:44:55 9 Apr 1998
No samples: 1 210 to 210
No samples used: Lat/Long 1 Height 1
P.D.O.P Minimum 2.7 Maximum 2.7
H.D.O.P Minimum 2.0 Maximum 2.0
3D error Minimum 5.0m Maximum 5.0m
2D error Minimum 3.0m Maximum 3.0m
Latitude 39 DEG 51 MIN 28.220 SEC S (S.D. 0.00m)
Longitude 145 DEG 48 MIN 41.090 SEC E (S.D. 0.00m)
Height 20.30 m (S.D. 0.00m)

COMPUTATION 1 CONSTELLATION SUB FINAL POSITION - ONAVN
Sub-Final Position E Constellation:(14,18,16,27,03,19,13)
16:45:36 9 Apr 1998 to 16:50:45 9 Apr 1998
No samples: 25 211 to 235
No samples used: Lat/Long 25 Height 25
P.D.O.P Minimum 1.7 Maximum 1.8
H.D.O.P Minimum 1.1 Maximum 1.1
3D error Minimum 4.0m Maximum 5.0m
2D error Minimum 2.0m Maximum 4.0m
Latitude 39 DEG 51 MIN 28.242 SEC S (S.D. .58m)
Longitude 145 DEG 48 MIN 41.065 SEC E (S.D. .48m)
Height 19.71 m (S.D. .58m)

COMPUTATION 1 CONSTELLATION SUB FINAL POSITION - ONAVN
Sub-Final Position F Constellation:(14,18,16,27,19,13)
16:51:25 9 Apr 1998 to 16:52:38 9 Apr 1998
No samples: 7 236 to 242
No samples used: Lat/Long 7 Height 7
P.D.O.P Minimum 2.7 Maximum 2.7
H.D.O.P Minimum 2.0 Maximum 2.0
3D error Minimum 4.0m Maximum 5.0m
2D error Minimum 3.0m Maximum 3.0m

Latitude   39 DEG 51 MIN 28.254 SEC S   (S.D.   .24m)
Longitude 145 DEG 48 MIN 41.099 SEC E   (S.D.   .44m)
Height   19.43 m   (S.D.   .37m)

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COMPUTATION 1   CONSTELLATION SUB FINAL POSITION - DNAUN
Sub-Final Position G   Constellation:(14,18,16,27,03,19,13)
16:53:19   9 Apr 1998   to   16:55:38   9 Apr 1998
No samples: 14   243 to 256
No samples used: Lat/Long 14   Height 14
P.D.O.P   Minimum   1.8   Maximum   1.8
H.D.O.P   Minimum   1.1   Maximum   1.1
3D error   Minimum   3.0m   Maximum   4.0m
2D error   Minimum   2.0m   Maximum   3.0m
Latitude   39 DEG 51 MIN 28.258 SEC S   (S.D.   .13m)
Longitude 145 DEG 48 MIN 41.070 SEC E   (S.D.   .25m)
Height   20.25 m   (S.D.   .25m)

COMPUTATION 1   CONSTELLATION SUB FINAL POSITION - DNAUN
Sub-Final Position H   Constellation:(14,18,16,27,22,19,13)
16:56:42   9 Apr 1998   to   16:57:03   9 Apr 1998
No samples: 3   257 to 259
No samples used: Lat/Long 3   Height 3
P.D.O.P   Minimum   1.8   Maximum   1.8
H.D.O.P   Minimum   1.0   Maximum   1.0
3D error   Minimum   3.0m   Maximum   3.0m
2D error   Minimum   2.0m   Maximum   2.0m
Latitude   39 DEG 51 MIN 28.253 SEC S   (S.D.   .18m)
Longitude 145 DEG 48 MIN 41.057 SEC E   (S.D.   .14m)
Height   20.80 m   (S.D.   .26m)

COMPUTATION 1   CONSTELLATION SUB FINAL POSITION - DNAUN
Sub-Final Position I   Constellation:(14,18,16,27,19,13)
16:57:44   9 Apr 1998   to   16:57:55   9 Apr 1998
No samples: 2   260 to 261
No samples used: Lat/Long 2   Height 2
P.D.O.P   Minimum   2.7   Maximum   2.7
H.D.O.P   Minimum   2.0   Maximum   2.0
3D error   Minimum   4.0m   Maximum   4.0m
2D error   Minimum   3.0m   Maximum   3.0m
Latitude   39 DEG 51 MIN 28.245 SEC S   (S.D.   .22m)
Longitude 145 DEG 48 MIN 41.115 SEC E   (S.D.   .50m)
Height   19.85 m   (S.D.   .07m)

COMPUTATION 1   CONSTELLATION SUB FINAL POSITION - DNAUN
Sub-Final Position J   Constellation:(14,18,16,27,22,19,13)
16:59:19   9 Apr 1998   to   17:00:06   9 Apr 1998
No samples: 5   262 to 266
No samples used: Lat/Long 5   Height 5
P.D.O.P   Minimum   1.8   Maximum   1.8
H.D.O.P   Minimum   1.0   Maximum   1.0
3D error   Minimum   3.0m   Maximum   3.0m
2D error   Minimum   2.0m   Maximum   2.0m
Latitude   39 DEG 51 MIN 28.202 SEC S   (S.D.   .26m)
Longitude 145 DEG 48 MIN 41.084 SEC E   (S.D.   .13m)
Height   20.14 m   (S.D.   .38m)

COMPUTATION 1   CONSTELLATION SUB FINAL POSITION - DNAUN
Sub-Final Position K   Constellation:(14,18,16,27,19,13)
17:00:47   9 Apr 1998   to   17:03:12   9 Apr 1998
No samples: 14   267 to 280
No samples used: Lat/Long 14   Height 14
P.D.O.P   Minimum   2.7   Maximum   2.7
H.D.O.P   Minimum   2.0   Maximum   2.0
3D error   Minimum   4.0m   Maximum   5.0m
2D error   Minimum   3.0m   Maximum   3.0m
Latitude   39 DEG 51 MIN 28.236 SEC S   (S.D.   .31m)
Longitude 145 DEG 48 MIN 41.102 SEC E   (S.D.   .72m)
Height   19.89 m   (S.D.   .85m)

COMPUTATION 1   CONSTELLATION SUB FINAL POSITION - DNAUN
Sub-Final Position L   Constellation:(14,18,16,27,31,19,13)
17:03:53   9 Apr 1998   to   17:17:54   9 Apr 1998
No samples: 74   281 to 354
No samples used: Lat/Long 74   Height 74
P.D.O.P   Minimum   2.0   Maximum   2.1
H.D.O.P   Minimum   1.4   Maximum   1.4
3D error   Minimum   3.0m   Maximum   5.0m
2D error   Minimum   2.0m   Maximum   4.0m

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```
Latitude    39 DEG 51 MIN 28.237 SEC S      (S.D.      .52m)
Longitude 145 DEG 48 MIN 41.056 SEC E      (S.D.      .54m)
Height             20.31 m                 (S.D.      .41m)
-----------------------------------------------------------------------------

COMPUTATION 1    CONSTELLATION SUB FINAL POSITION - DNAUN
Sub-Final Position M          Constellation:(18,16,27,31,19,13)
17:18:45   9 Apr 1998    to     17:29:33   9 Apr 1998
No samples:   46                 355 to  400
No samples used:    Lat/Long 46  Height 46
P.D.O.P    Minimum   2.2          Maximum   2.3
H.D.O.P    Minimum   1.5          Maximum   1.5
3D error   Minimum   3.0m         Maximum   5.0m
2D error   Minimum   2.0m         Maximum   3.0m
Latitude    39 DEG 51 MIN 28.237 SEC S      (S.D.      .49m)
Longitude 145 DEG 48 MIN 41.071 SEC E      (S.D.      .32m)
Height             20.09 m                 (S.D.      .53m)
-----------------------------------------------------------------------------

COMPUTATION 1    CONSTELLATION SUB FINAL POSITION - DNAUN
Sub-Final Position N          Constellation:(18,16,27,03,31,19,13)
17:30:14   9 Apr 1998    to     17:33:46   9 Apr 1998
No samples:   17                 401 to  417
No samples used:    Lat/Long 17  Height 17
P.D.O.P    Minimum   2.0          Maximum   2.0
H.D.O.P    Minimum   1.1          Maximum   1.1
3D error   Minimum   3.0m         Maximum   3.0m
2D error   Minimum   2.0m         Maximum   2.0m
Latitude    39 DEG 51 MIN 28.221 SEC S      (S.D.      .23m)
Longitude 145 DEG 48 MIN 41.069 SEC E      (S.D.      .25m)
Height             20.11 m                 (S.D.      .37m)
-----------------------------------------------------------------------------

COMPUTATION 1    CONSTELLATION SUB FINAL POSITION - DNAUN
Sub-Final Position O          Constellation:(18,16,27,10,03,31,19,13)
17:34:28   9 Apr 1998    to     17:37:20   9 Apr 1998
No samples:   15                 418 to  432
No samples used:    Lat/Long 15  Height 15
P.D.O.P    Minimum   1.8          Maximum   1.8
H.D.O.P    Minimum   1.0          Maximum   1.0
3D error   Minimum   2.0m         Maximum   3.0m
2D error   Minimum   2.0m         Maximum   2.0m
Latitude    39 DEG 51 MIN 28.224 SEC S      (S.D.      .23m)
Longitude 145 DEG 48 MIN 41.065 SEC E      (S.D.      .12m)
Height             19.85 m                 (S.D.      .37m)
-----------------------------------------------------------------------------

COMPUTATION 1    CONSTELLATION SUB FINAL POSITION - DNAUN
Sub-Final Position P          Constellation:(18,16,27,03,31,19,13)
17:38:01   9 Apr 1998    to     17:38:01   9 Apr 1998
No samples:    1                 433 to  433
No samples used:    Lat/Long 1  Height 1
P.D.O.P    Minimum   2.1          Maximum   2.1
H.D.O.P    Minimum   1.1          Maximum   1.1
3D error   Minimum   3.0m         Maximum   3.0m
2D error   Minimum   2.0m         Maximum   2.0m
Latitude    39 DEG 51 MIN 28.240 SEC S      (S.D.      0.00m)
Longitude 145 DEG 48 MIN 41.060 SEC E      (S.D.      0.00m)
Height             20.00 m                 (S.D.      0.00m)
-----------------------------------------------------------------------------

COMPUTATION 1    CONSTELLATION SUB FINAL POSITION - DNAUN
Sub-Final Position Q          Constellation:(18,16,27,10,03,31,19,13)
17:38:43   9 Apr 1998    to     17:40:29   9 Apr 1998
No samples:   11                 434 to  444
No samples used:    Lat/Long 11  Height 11
P.D.O.P    Minimum   1.8          Maximum   1.8
H.D.O.P    Minimum   1.0          Maximum   1.0
3D error   Minimum   2.0m         Maximum   3.0m
2D error   Minimum   2.0m         Maximum   2.0m
Latitude    39 DEG 51 MIN 28.236 SEC S      (S.D.      .21m)
Longitude 145 DEG 48 MIN 41.081 SEC E      (S.D.      .22m)
Height             19.51 m                 (S.D.      .24m)
-----------------------------------------------------------------------------
```

565388

FINAL/STATIC POSITION ANALYSIS: Yolla-2 Well
GMS v R4.5 16:02:48 9 Apr 1998 to 17:40:29 9 Apr 1998
GPS Weighting Option - Constellations given equal weights
Mean Corrected Gyro : 271.2   Gyro Correction :   +.1
Mean Grid Heading   : 270.4   Convergence   : +0.763

Antennae/Transducer/Beacon/Target Offsets

```
System 1 DNAVN                 System 2 Trimble
for N. Explorer                for N. Explorer
Receiver 1                     Receiver 1
  X       Y     Height           X       Y     Height
 +6.60  +54.40  +0.00           +6.60  +54.40  +0.00
Receiver 2                     Receiver 2
  X       Y     Height           X       Y     Height
 +0.00   +0.00  +0.00           +0.00   +0.00  +0.00

,,,,,,,,,,,,,,,,,,,            ,,,,,,,,,,,,,,,,,,,
.     Heading     .            .     Heading     .
.        ^        .            .        ^        .
.        +Y       .            .        +Y       .
.        .        .            .        .        .
.        .  \     .            .        .  \     .
.        .        .            .        .        .
. -X,,,,,/,,,,,+X .            . -X,,,,,/,,,,,+X .
.        .        .            .        .        .
.        .        .            .        .        .
.        -Y       .            .        -Y       .
,,,,,,,,,,,,,,,,,,,            ,,,,,,,,,,,,,,,,,,,
```

Offset 1=\   Offset 2=/

N. EXPLORER Computation 1 (DNAVN)

Constellations Used

Const.	# Samples	S.V.s
A	120	14,18,16,22,04,19
B	74	14,18,16,27,22,04,19
C	15	14,18,16,27,04,19
D	1	14,18,16,27,19,13
E	25	14,18,16,27,03,19,13
F	7	14,18,16,27,19,13
G	14	14,18,16,27,03,19,13
H	3	14,18,16,27,22,19,13
I	2	14,18,16,27,19,13
J	5	14,18,16,27,22,19,13
K	14	14,18,16,27,19,13
L	74	14,18,16,27,31,19,13
M	46	18,16,27,31,19,13
N	17	18,16,27,03,31,19,13
O	15	18,16,27,10,03,31,19,13
P	1	18,16,27,03,31,19,13
Q	11	18,16,27,10,03,31,19,13

Total number of samples used : 444

Intended Final Datum Location
ANS Spheroid
Latitude : 39 DEG 51 MIN 33.820 SEC S
Longitude : 145 DEG 48 MIN 38.530 SEC E
UTM/TM
Easting : 398272.34 Metres
Northing : 5587156.37 Metres

Computed Final Antenna Position
WGS 84 Spheroid

Latitude :	39 DEG 51 MIN 28.236 SEC S	Sd :	.09 Metres
Longitude :	145 DEG 48 MIN 41.076 SEC E	Sd :	.10 Metres
Height :	20.08 Metres	Sd :	.11 Metres

ANS Spheroid
Latitude : 39 DEG 51 MIN 33.639 SEC S
Longitude : 145 DEG 48 MIN 36.209 SEC E
Height : 35.66 Metres
UTM/TM
Easting : 398217.13 Metres
Northing : 5587161.23 Metres

<u>Computed Final Datum Position</u>
ANS Spheroid
Latitude : 39 DEG 51 MIN 33.889 SEC S
Longitude : 145 DEG 48 MIN 38.493 SEC E
UTM/TM
Easting : 398271.48 Metres
Northing : 5587154.23 Metres

Final Datum Position is 2.30 Metres (spheroidal distance) bearing 202.69 T from the Intended Loc.

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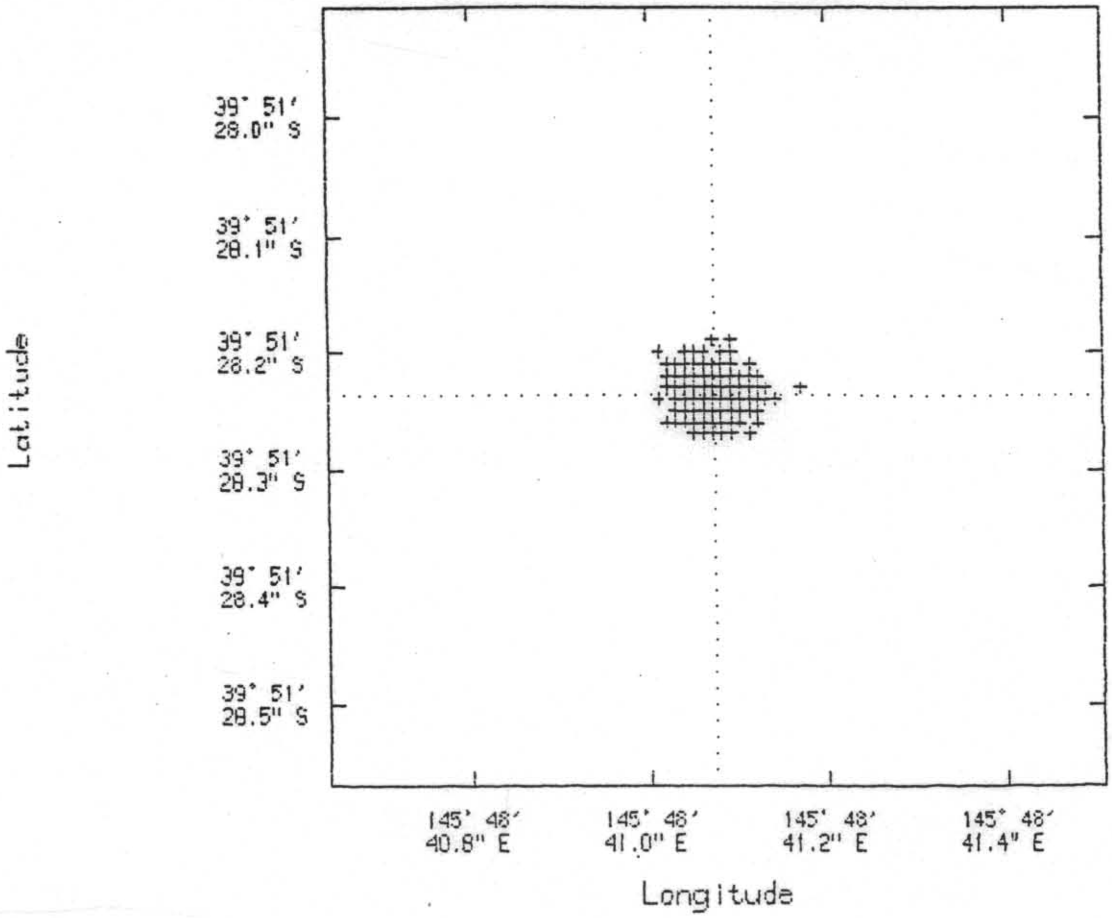
APPENDIX E

GNS GRAPHICS DUMP OF RIG ON YOLLA-2

Computation 1 GPS Scatter Plot (DNAUN)

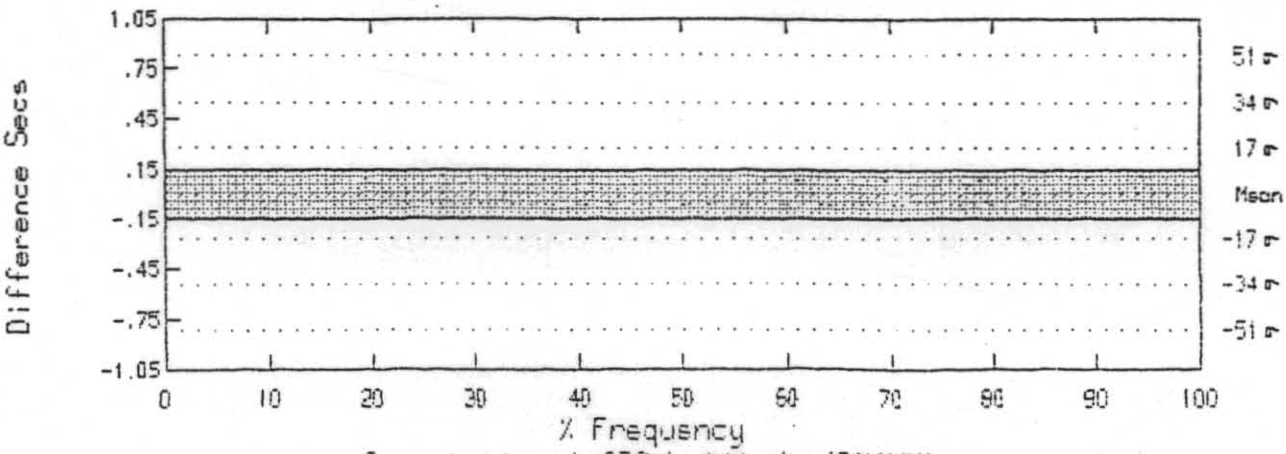


Centred on mean antenna position (passes 1 to 444).
WGS 84 Spheroid
Latitude 39 DEG 51 MIN 28.237 SEC S
Longitude 145 DEG 48 MIN 41.073 SEC E

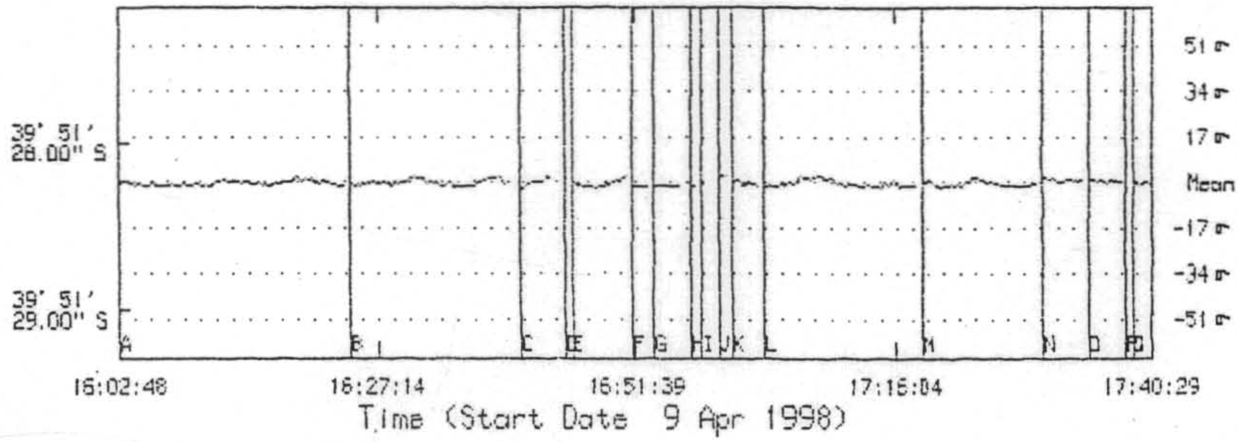
5 cm

565392

Computation 1 GPS Latitude (DNAVN)



Computation 1 GPS Latitude (DNAVN)

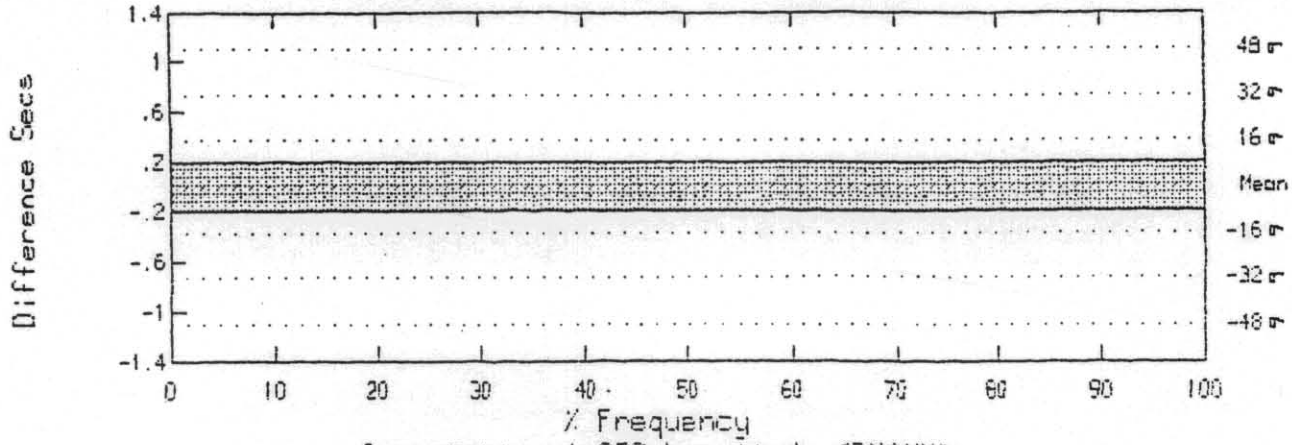


Computation 1 (WGS 84 - DNAVN)
Centred on mean of antenna position (passes 1 to 444).
Latitude 39 DEG 51 MIN 28.237 SEC S Sd .497 Metres

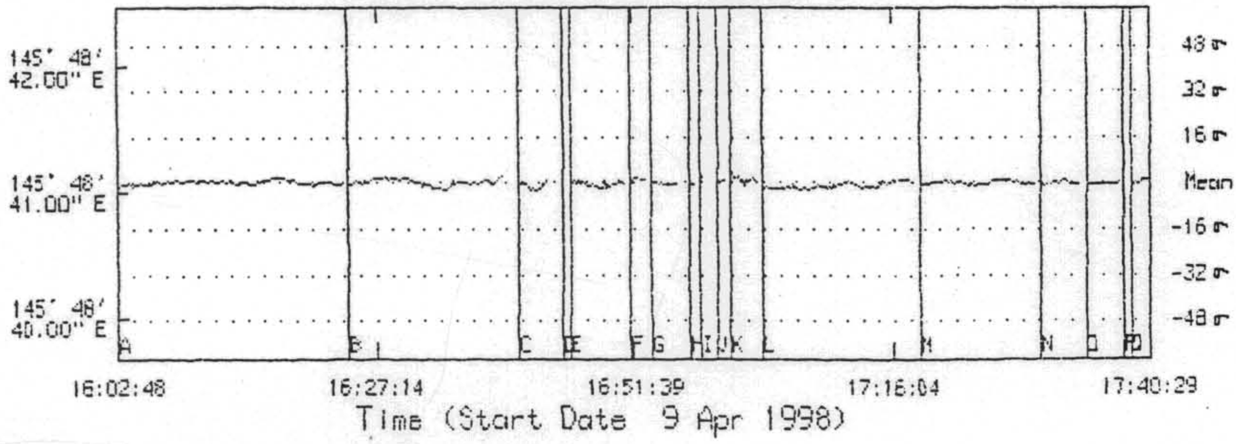
5 cm

565393

Computation 1 GPS Longitude (DNAVN)



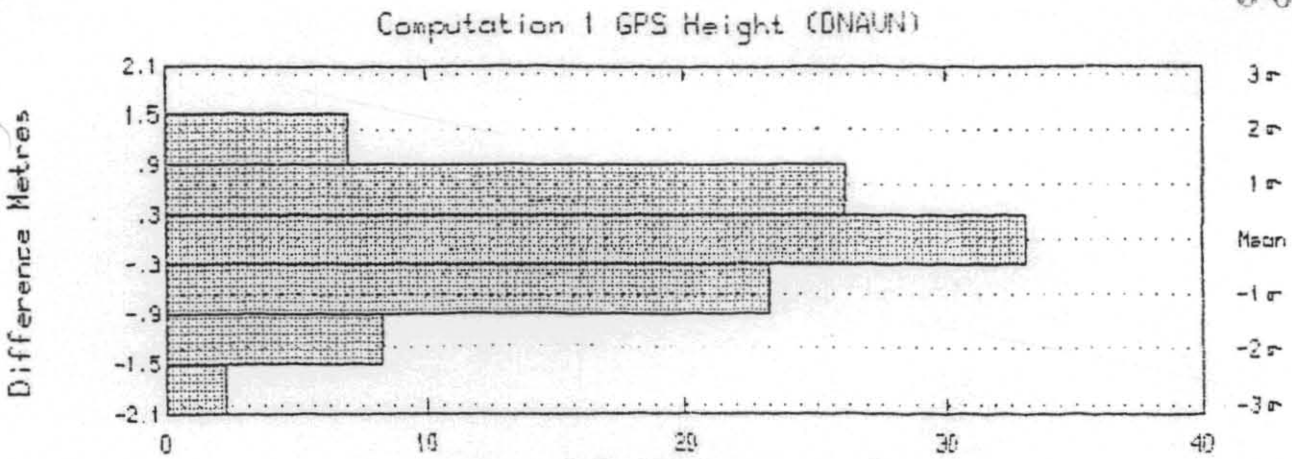
Computation 1 GPS Longitude (DNAVN)

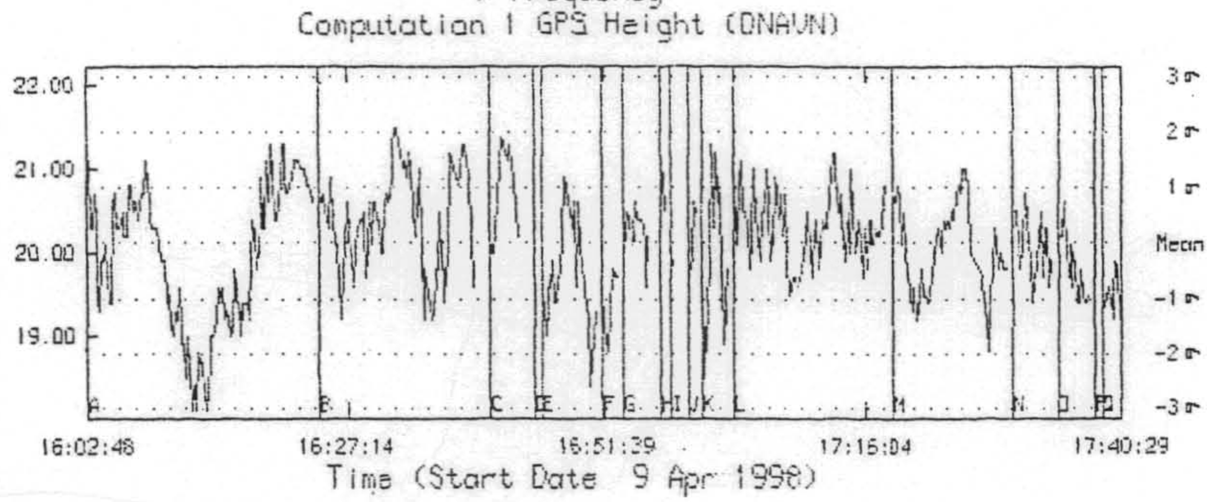


Computation 1 (WGS 84 - DNAVN)
Centred on mean of antenna position (passes 1 to 444).
Longitude 145 DEG 48 MIN 41.073 SEC E Sd .543 Metres

5 cm

565394

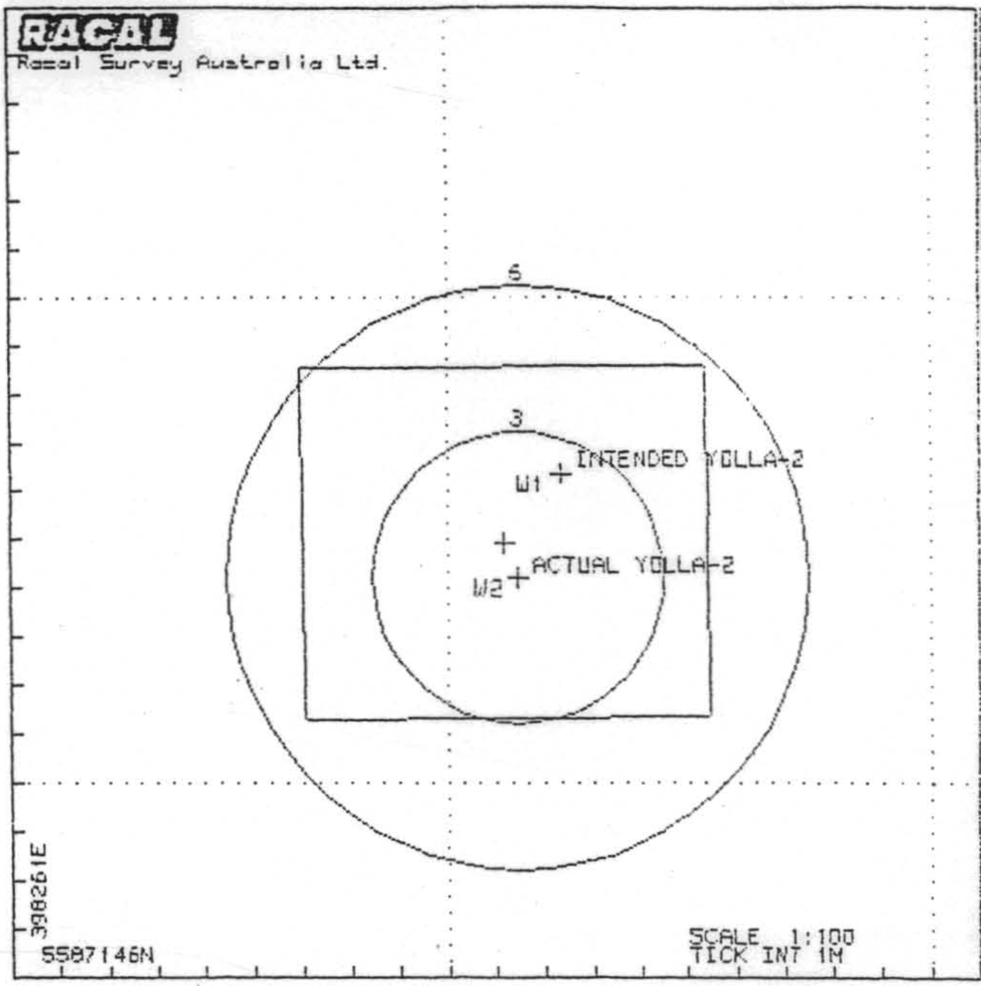




Computation 1 (WGS 84 - DNAVN)
Centred on mean of antenna position (passes 1 to 444).
Height +20.11 Sd .662 Metres

5 cm

565395



20:30:29 9 Apr 98
N. Explorer
DATUM
E 398271.20
N 5587154.94

Ø 039 51 33.87S
λ 145 48 38.48E

Hdg 270.3 T
CMG 180.0 T
Speed 0.0 Kt

Wp:ACTUAL YOLLA-2 #2
Wp R .8 M
Wp B 159.5 T

#	R(M)	B(T)
FP1 -P1	995	196.6
FP2 -P2	994	230.5
FS3 -S3	988	300.6
FS4 -S4	987	335.7
FS5 -S5	998	015.6
FS6 -S6	996	050.5
FP7 -P7	988	120.4
FP8 -P8	985	155.5

5 cm

APPENDIX F

ANCHOR PATTERN DETAILS – YOLLA-2

565397

CALCULATION SHEET

[redacted]

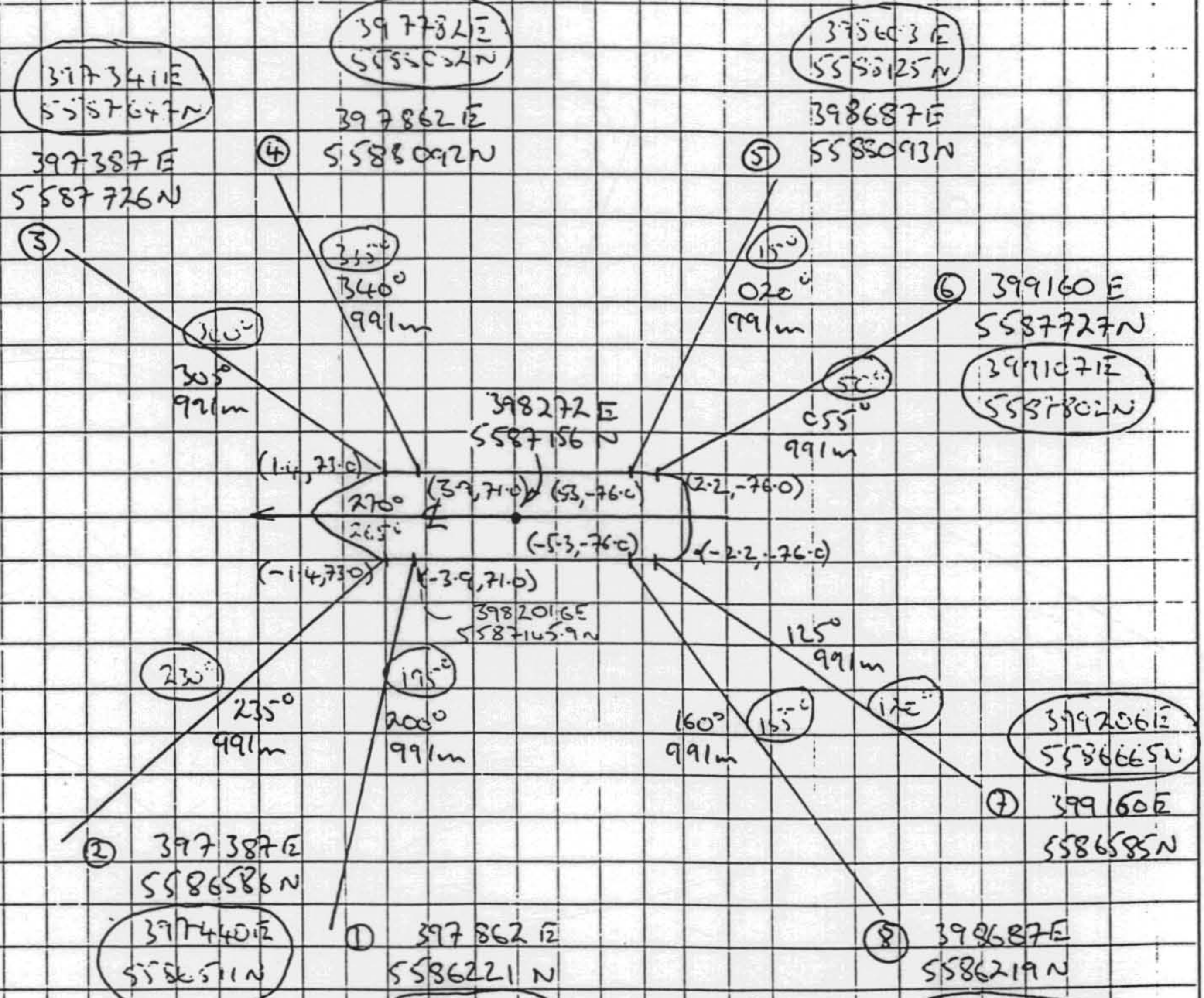
541/1

SIGNATURE Kant Pong DATE 27-3-98

TITLE Premier Oil Australasia → Yolla-2 Rig move JOB No. 275313

SUBJECT Anchor Plan Calculations. SHEET No.

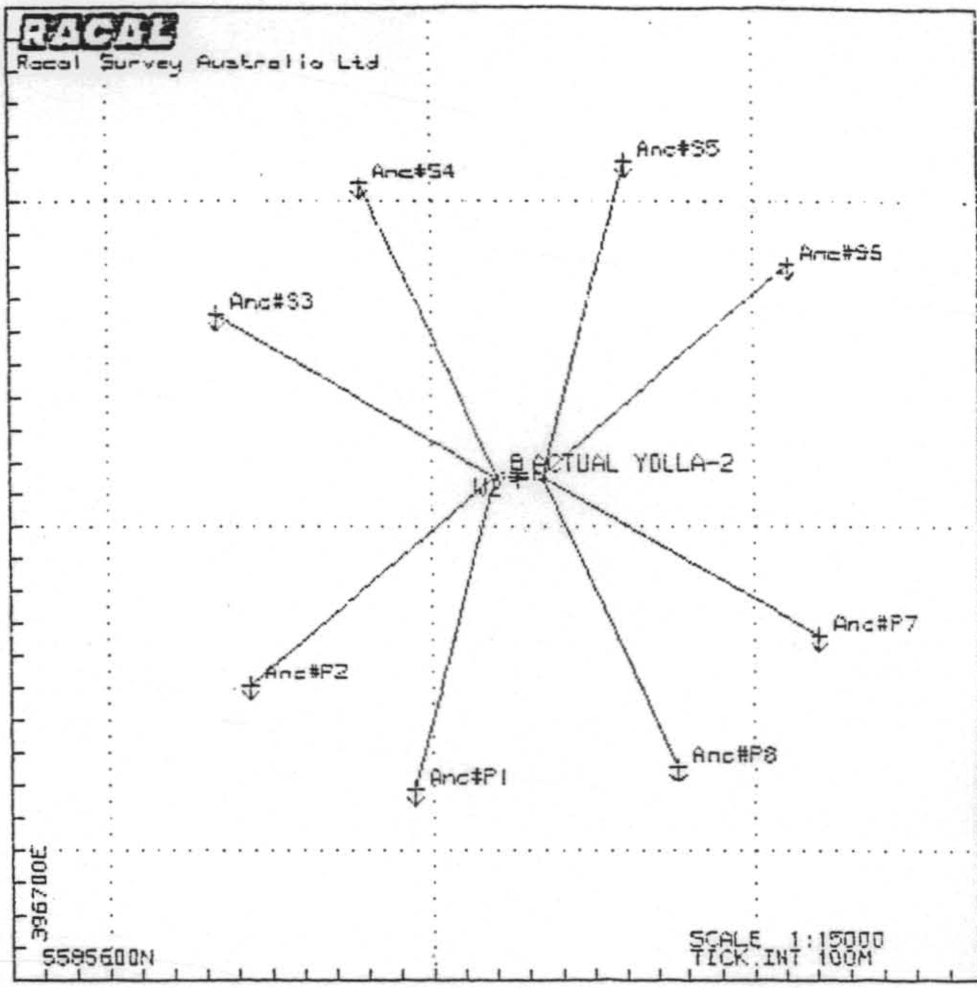
Anchor Spread 35/35.



1" = 2.54cm
1 foot = 0.3048m
30" = 0.762m

5 cm

565398



20:32:36 9 Apr 98
N. Explorer
DATUM
E 398271.68
N 5587155.66

Ø 039 51 33.84S
λ 145 48 38.50E

Hdg 270.2 T
CMG 180.0 T
Speed 0.0 Kt

Wp:ACTUAL YOLLA-2 #2
Wp R 1.4 M
Wp B 188.7 T

#	R(M)	B(T)
FP1 -P1	996	195.6
FP2 -P2	994	230.5
FS3 -S3	988	300.5
FS4 -S4	987	335.6
FS5 -S5	997	015.6
FS6 -S6	996	050.5
FP7 -P7	988	120.4
FP8 -P8	986	155.6

5 cm

APPENDIX G

DAILY LOG SHEETS

565400

RACAL SURVEY AUSTRALIA LIMITED
DAILY RECORD SHEET

Date: 1/4/98 Client: PREMIER Job No.: 275343 Vessel: N EXPLORER Location: YOLLA-2.

PAGE OF

Equipment	Op	
SkyFix	✓	
LandStar	✓	
Gyro	✓	
PCGNS	✓	
MultiFix II	✓	
GRREP	✓	
SkyTrac		

Equipment	Op	
Deso Echo Sounder		
Sidescan		
Boomer		
Heave Co.		
STD-12		
ENSIN		

Racal Personnel
K. PERRY
B. O'BRIEN
Client Personnel
I. SCORGIE

WX	Sea State	Swell	Wind Dir.
0000			
0600			
1200			
1800			

DIARY OF OPERATIONS

TIME	Time Zone = UTC+ 10
(WST) 1130	Racal Personnel & Client Rep. depart Perth -> Melbourne
(EST) 1730	all Personnel arrive Melbourne and transit to travelodge.
	2/4/98
0800	all Personnel transfer to Essendon A/Port.
1100	all Personell travel via bus to Geelong to meet Vessel/rig.
1400	On Vessel and all Personnel complete induction.
	waiting for equipment to be loaded onto the rig.
1800	Equipment loaded onto rig.
	3/4/98.
0800	Commence mobilization of equipment.
1100	Equipment mobilization completed & operational.
1200	measure GPS antenna offsets (x, y, z) -> (6.6, 54.4, 20.4).
1300	Complete system data configuration and tie down equipment
1730	On Standby, Perform Gyro calibration. C-O of +0.1° entered into GNS.
	4/4/98
0600	On Standby, waiting for crew to join vessel @ Geelong wharf.
1200	Rig departs Geelong wharf for location - Yolla 2.
1700	Depart Port Phillip Bay for location -

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Signature [signature] SURVEYOR/ENGINEER

WHITE : Accounts Department
BLUE : Operations Department
YELLOW : Clients Representative

Signature [signature] CLIENT REPRESENTATIVE

565401

RACAL SURVEY AUSTRALIA LIMITED
DAILY RECORD SHEET

Date: 5/4/96	Client: PREMIER OIL	Job No.: 2753A3	Vessel: N EXPLORER	Location: YOLLA-2

PAGE OF

Equipment	Op	
SkyFix	✓	
LandStar	✓	
Gyro	✓	
PCGNS	✓	
MultiFix II	✓	
GRREP	✓	
SkyTrac		

Equipment	Op	
Deso Echo Sounder		
Sidescan		
Boomer		
Heave Co.		
STD-12		
ENSIN		

Racal Personnel
K. PERRY
B. O'BRIEN
Client Personnel
I. SCORGIE

WX	Sea State	Swell	Wind Dir.
0000			
0600			
1200			
1800			

DIARY OF OPERATIONS

TIME	Time Zone = UTC+ 10 ⇒ 5/4/96.
0240	arrive @ location - waiting on daylight
0630	Positioning rig @ location. - preparing to run ⚓'s
0946	Commence running ⚓ N#2.
1118	Drop ⚓ N#2.
1200	Commence Running ⚓ N# 6
1245	PC LOSES #6 ⚓ WIRE.
1515	#6 WIRE BACK ON PC DECK.
1820	Drop ⚓ N#6
1920	Commence running ⚓ N#3
2102	Drop ⚓ N#3. Vessel on standby till first light
	6/4/96.
0740	Commence running ⚓ N#7
0801	Drop ⚓ N#7, PC alongside rig loading remaining ⚓'s, buoys & chain.
1322	winching rig to location on 4 primary ⚓'s, backload PC with ⚓'s
1417	Primary ⚓'s sinking in; vessel on standby till first light
	7/4/96
0600	Commence running ⚓ N#1
0736	Drop ⚓ N# 1
0816	Commence running ⚓ N# 4.
0918	Drop ⚓ N#4
1000	Commence running ⚓ N#5.
1210	Drop ⚓ N#5
1307	Commence running ⚓ N#8

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Signature [signature] SURVEYOR/ENGINEER

WHITE	: Accounts Department
BLUE	: Operations Department
YELLOW	: Clients Representative

Signature [signature] CLIENT REPRESENTATIVE

RACAL

RACAL SURVEY AUSTRALIA LIMITED
DAILY RECORD SHEET

Date: 7/4/98 Client: PREMIER OIL Job No.: 2753A3 Vessel: N EXPLORER Location: YOLLA-2.

PAGE OF

Equipment	Op	
SkyFix	✓	
LandStar	✓	
Gyro	✓	
PCGNS	✓	
MultiFix II	✓	
GRREP	✓	
SkyTrac		

Equipment	Op	
Deso Echo Sounder		
Sidescan		
Boomer		
Heave Co.		
STD-12		
ENSIN		

Racal Personnel
K. PERRY
B. O'BRIEN
Client Personnel
I. SCORGIE

WX	Sea State	Swell	Wind Dir.
0000			
0600			
1200			
1800			

DIARY OF OPERATIONS

TIME	Time Zone = UTC+ 10 ⇒ 7/4/98
1415	Drop J N# 8.
1600	Test primary J's holding - Failed, prepare to put piggy-backs on primary.
	8/4/98
0300	Piggy backs fail to hold pre-tension weights. Vessel on standby for weather.
	9/4/98
0300	On Standby for weather.
1225	Stretch out J N#5
1231	Drop J N#5
1311	Positioning rig over location/Pre-tensioning J's
1553	Tensioning complete, final Positioning Complete
1602	Commence final fix
1740	Completed final fix; final Position of Yolla-2 is:
	ϕ 39° 51' 33".889 S 398 271.48 E
	λ 145° 48' 38".493 E 5 587 154.23 N
	The final position is 2.30 m (epir) bearing 202.69T from the intended location.
	On Standby for replacement J's
	10/4/98
0600	On standby for anchoring
2002	Commence modifications to J#5
2053	Drop J#5

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Signature [signature] SURVEYOR/ENGINEER

WHITE : Accounts Department
BLUE : Operations Department
YELLOW : Clients Representative

Signature [signature] CLIENT REPRESENTATIVE

565403

RACAL

RACAL SURVEY AUSTRALIA LIMITED
DAILY RECORD SHEET

Date: 10/4/98 Client: PREMIER OIL Job No.: 275343 Vessel: N. EXPLORER Location: YOLLA-2

PAGE OF

Equipment	Op	
SkyFix	✓	
LandStar	✓	
Gyro	✓	
PCGNS	✓	
MultiFix II	✓	
GRREP	✓	
SkyTrac		

Equipment	Op	
Deso Echo Sounder		
Sidescan		
Boomer		
Heave Co.		
STD-12		
ENSIN		

Racal Personnel
K. PERRY
B. O'BRIEN
Client Personnel
I. GORGIE.

WX	Sea State	Swell	Wind Dir.
0000			
0600			
1200			
1800			

DIARY OF OPERATIONS

TIME	Time Zone = UTC+10 ⇒ 10/4/98
2140	Commence demobilisation of equipment.
2330	demobilisation completed.
	11/4/98.
0600	Helicopter video
1100	all personnel depart N. Explorer-III for Melbourne

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Signature [signature] SURVEYOR/ENGINEER

WHITE	:	Accounts Department
BLUE	:	Operations Department
YELLOW	:	Clients Representative

Signature CLIENT REPRESENTATIVE

APPENDIX 11

FINAL WELL REPORT

By

GEOSERVICES OVERSEAS S.A.

YOLLA 2

565405

PREMIER OIL
AUSTRALASIA

YOLLA-2

FINAL WELL REPORT

Geoservices

Prepared By
Geoservices Overseas S.A.

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Premier Oil Australasia
45 Ord Street
West Perth
W.A. 6872
Tel : (08) 94804100
Fax : (08) 93241851

REVIEWED BY	DATE	FINAL COPY #
[illegible]	9/99	1

CONTENTS

Appendices

1.	Bit Record				
2.	Formation Evaluation Log	(A4)	94-3164 m	Scale	1:500 - MISSING
3.	Pressure Evaluation Log	(A4)	94-3164 m	Scale	1:1000 - MISSING

Well Summary

The Bass Basin is a late Mesozoic - Cainozoic intra-cratonic basin, trending northwest-southeast between Victoria and northern Tasmania. It is separated from the Torquay Sub-basin to the west and northwest by the King Island - Mornington Rise, which began to form in the Miocene, and from the Gippsland Basin to the east by the Palaeozoic rocks of the Bassian Rise.

The Yolla-2 appraisal well was designed to further evaluate the hydrocarbons present in the sands of the Eastern View Coal Measures (ECVM) in the Yolla-1 discovery. The well is located 2350 m SSE of the Yolla-1 surface location and approximately 50 m structurally lower at reservoir level.

Yolla-2 was spudded on the 9th of April 1998 by the "Drill ship" MODU "Northern Explorer III". The well was drilled in 3 hole sizes: 914 mm, 445 mm, and 311 mm with 762 mm casing being set at 151.5 m and 340 mm casing at 853.0 m. The well was drilled to a final depth of 3164.0 m (3163.7 m TVD) on the 14 th May 1998.

The 914 mm and 444 mm hole sections were drilled with seawater and high viscosity guar gum sweeps, with returns to the sea floor. The 311 mm hole section was drilled with a KCL/PHPA mud. There were no major problems encountered whilst drilling Yolla-2, there were no problematic downhole losses or lost returns.

Geoservices performed full mudlogging analysis and pressure detection using standard equipment throughout the drilling of Yolla-2. Gas was constantly monitored using both a Geoservices FCP chromatograph and FGP total gas detector. H_2S and CO_2 were also monitored with only minor CO2 being recorded.

All depths given are measured depths from rotary table unless specified otherwise.

Well Data

Operator	: Premier Oil Australasia
Well name	: Yolla-2
Country	: Australia
Basin	: Bass basin
Permit	: T/RL 1
Field	: Yolla
Profile	: Vertical Appraisal
Depth Reference	: LAT
Rotary Table (LAT)	: 12.5 m
Water depth	: 81.5 m
Rotary Table - Seabed	: 94 m

Latitude	: 39°51' 33.889" S
Longitude	: 145° 48' 38.493" E
Easting	: 398 271.48 m E
Northing	: 5 587 154.23 m N

Total Depth	: 3164.0 m MD, 3163.7 m TVD
Date spudded	: 21:00 hours, 9th April 1998
Date TD reached	: 01:00 hours, 14 th May 1998
Final status	: Plug & Abandon

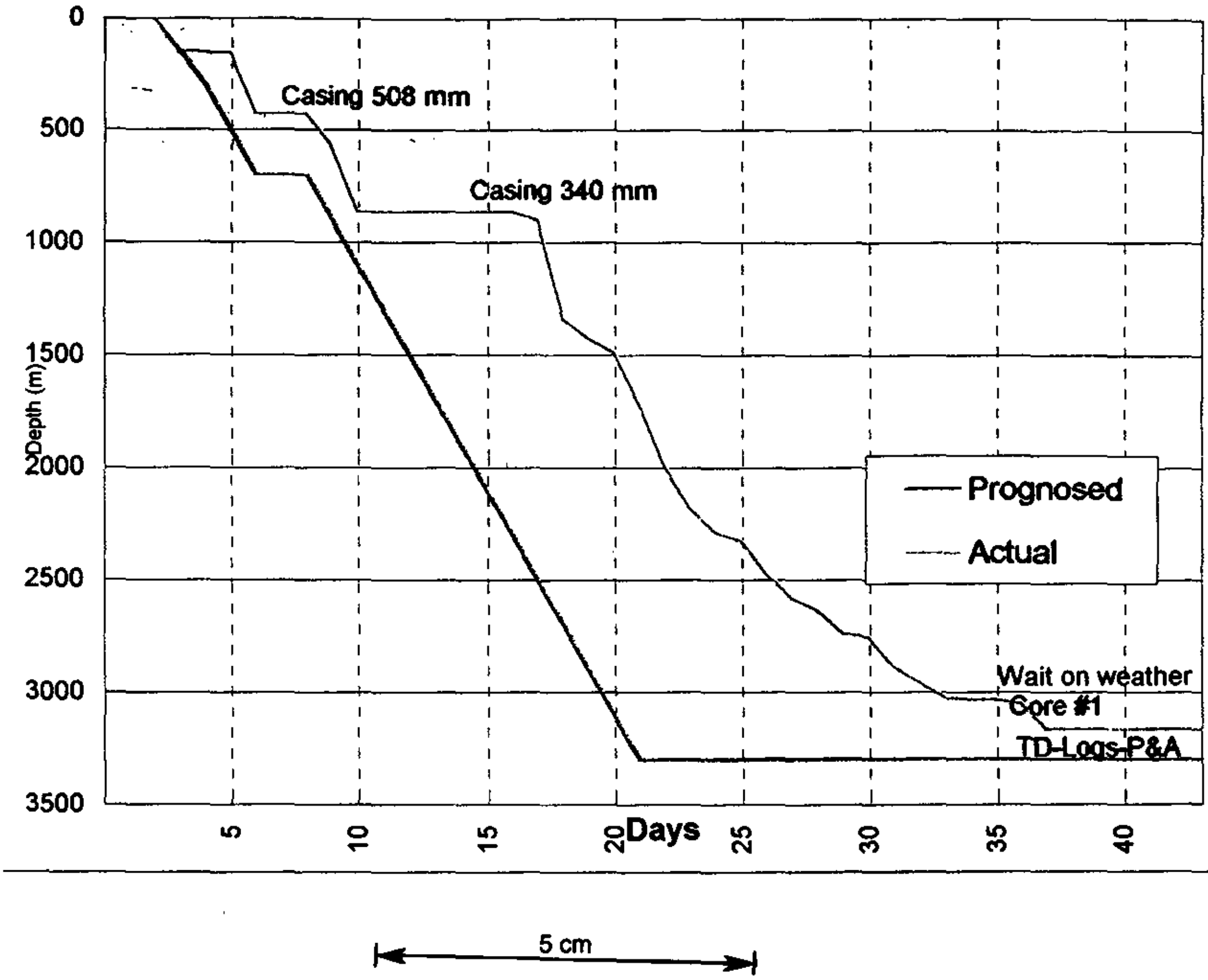
Contractor Information

Drilling	: Northern Offshore Ltd
Rig name	: Northern Explorer III
Rig type	: Drill ship
Mud logging	: Geoservices Overseas S.A.
Mud engineering	: Dowel Schlumberger
MWD	: Anderdrift
Wireline logging	: Schlumberger
Production testing	: Schlumberger
Cementing	: Dowell Schlumberger
Casing	: Premium Services
Work boat	: Pacific Commander
Helicopter	: Lloyds Helicopters

Geoservice Personnel

ALS Engineers	: Blowes, Chris
	: Jones, Steve
	: McGilveray, Paul
	: Mohan, Kuttikat
Mudloggers	: Fernandes, Fred
	: Nair, Vinod
	: T.V. Tu
	: N.Hien

Day vs depth chart



Sample Collection Summary

2 sets of Unwashed Samples (300 grams):
- 5 m intervals from 862-1750 m
- 3 m intervals from 1750 - 3164 m (TD)

4 sets of Washed and Dried Samples (100 grams):
- 5 m intervals from 862-1750 m
- 3 m intervals from 1750 - 3164 m (TD)

1 set of Samplex Trays:
- 5 m intervals from 862-1750 m
- 3 m intervals from 1750 - 3164 m (TD)

Sample Distribution:

Sample Distribution	Unwashed	Washed and Dried	Samplex Trays
Premier :	1	1	1
Boral Energy :	1	1	
BRS :		1	
Mineral & Resouces Tasmania :	1		

Lithological & Show Summary - Yolla-2

Formation		Prognosed	Actual	Thickness
Torquay Group		94 - 1094.5 mRt(m)		
Angahook	Unit 1	1094.5 mRt	1075 mRt	175
	Unit 2	1292.9 mRt	1265.5 mRt	50
	Unit 3	1336.5 mRt	1316 mRt	135
	Unit 4	1482.5 mRt	1468 mRt	255
Demons Bluff		1732.5 mRt	1705.5 mRt	148
Eastern View Coal Measures (EVCM)		1886.5 mRt	1854 mRt	

LITHOLOGICAL DESCRIPTIONS

94 - 862 m **Returns to sea floor**

862-1094.5 m **Claystone with minor Limestone grading to Calcilutite in part.**

Claystone: Medium dark grey to light grey, nil to slightly silty, slightly to moderately becoming calcareous with depth, common becoming trace to slightly silt-sized to very fine glauconite, slightly micro micaceous, rare pyrite nodules, trace carbonaceous specks, rare forams & bryzoa, amorphous in part to sub blocky, soft to firm, occasionally moderately hard.

Limestone: Dark yellow to orange, pale yellow to white, occasionally moderate to dark red-brown to red-orange oxidized Fe, cryptocrystalline to very finely crystalline, predominantly microcrystalline, trace very fine to medium quartz grains, trace corals, rare gastropods, rare forams, rare echinoderms, rare pyrite nodules, rare silt-sized to very fine glauconite grains, friable to moderately hard, no visual porosity, no shows.

1094.5-1265.5 m **Claystone with minor Limestone stringers, with trace Siltstone, Sandstone & Coal.**

Claystone: Light grey to occasional light brown grey, slightly calcareous, arenaceous in part grading to Siltstone, common black carbonaceous specks, trace micro micaceous, trace disseminated and nodule pyrite, trace fossil fragments, soft to sticky, occasionally firm, blocky to sub blocky, slightly fissile in part.

Limestone: Off white, yellow grey, moderate to very calcareous, slightly dolomitic in part, microcrystalline, trace forams, trace fossil fragments, soft to sticky, moderately hard in part, no visual porosity.

Siltstone (Tr): Pale grey, arenaceous, common very fine quartz grains with light brown dolomitic matrix, grading to very fine Sandstone.

LITHOLOGICAL DESCRIPTIONS (cont)

1094.5-1265.5 m	**Claystone with minor Limestone stringers, with trace Siltstone, Sandstone & Coal.**
Sandstone (Tr)	Clear to light grey, very fine grained, rounded to sub rounded, grades to Calcisiltite in part, poor visual porosity, no fluorescence.
Coal (Tr)	Dark brown to black, silty, common disseminated pyrite, firm to hard.
1265.5-1316 m	**Claystone with minor Volcanics, Siltstone & Limestone, trace Sandstone.**
Claystone	Dark grey to medium grey, nil to slightly calcareous, common disseminated pyrite, trace carbonaceous specks, trace quartz grains, trace micro micaceous, firm, blocky to sub blocky.
Volcanics	White to pale blue green, slightly calcareous, trace calcareous grains, trace quartz grains, trace micro micaceous, firm, sub blocky.
Siltstone	Yellow white to brown white, very fine quartz grains, trace glauconite and carbonaceous specks, common strong calcareous cement, trace siliceous matrix, firm to hard, sub blocky.
Limestone	Yellow grey to white, microcrystalline, very calcareous, slightly dolomitic, trace forams and fossil fragments, soft-moderately hard, no visual porosity.
Sandstone (Tr)	Clear, transparent, translucent, very fine grain, grading to Siltstone, occasional fine grain, well sorted, sub rounded to rounded, trace calcareous cement, predominantly loose, no visual porosity, no fluorescence.
1316-1468 m	**Interbedded Siltstone & Claystone with minor Sandstone & Limestone.**
Siltstone	Yellow white to brown white, very fine silt size quartz grains, round to sub angular, moderately well sorted, trace glauconite and carbonaceous specks, common strong calcareous cement, trace siliceous matrix, firm to hard aggregates, moderate to poor visual porosity, no fluorescence.
Claystone	Medium dark grey to light grey, olive brown in part, nil to slightly silty, slightly calcareous, common disseminated and nodule pyrite, trace carbonaceous specks, trace very fine quartz grains in part, trace mica, rare forams and fossil fragments, sub blocky to sub fissile, soft to firm.

LITHOLOGICAL DESCRIPTIONS (cont)

1316-1468 m	**Interbedded Siltstone & Claystone with minor Sandstone & Limestone.**
Sandstone	Light grey-light brown, transparent-translucent, very fine grain, very well sorted, sub rounded to rounded, minor glauconite, trace carbonaceous specks, strong calcareous cement, moderately hard to hard, nil visual porosity, no fluorescence.
Limestone	Off white-yellow grey, moderate to very calcareous, slightly dolomitic, microcrystalline, trace foram and fossil fragments, soft to sticky, occasional moderately hard, no visual porosity.
1468-1705.5 m	**Interbedded Siltstone, Sandstone & Claystone with minor Dolomite stringers.**
Siltstone	Light grey, off white to pale brown, very argillaceous, common very fine quartz grains, grading to Sandstone in part, micro micaceous in part, trace to common glauconite, trace disseminated pyrite, good calcareous cement, firm to moderately hard, sub blocky to blocky.
Sandstone	Light to medium brown, transparent-translucent, very fine to fine grain, moderately well sorted, sub angular to sub rounded, trace glauconite, trace carbonaceous specks, strong calcareous to dolomitic cement, moderately hard to hard, nil to poor visual porosity, trace mineral fluorescence.
Claystone	Light grey, olive brown in part, nil to slightly silty, slightly calcareous, common disseminated and nodule pyrite, trace carbonaceous specks, trace glauconite, rare forams and fossil fragments, sub blocky to sub fissile, soft to firm.
Dolomite	Light brown-medium yellow brown. crypto crystalline, occasional microcrystalline, sucrosic-waxy texture in part, trace very fine quartz grains, trace glauconite, argillaceous in part, very hard to hard, blocky.
1705.5-1854 m	**Interbedded Siltstone & Claystone with minor Sandstone interbeds & trace Dolomite.**
Siltstone	Grey brown-medium brown, argillaceous in part, moderate dolomitic cement, common very fine quartz grains, trace micro micaceous in part, trace glauconite, trace disseminated and nodule pyrite, trace fossil fragments, firm to moderately hard, sub blocky to blocky, occasional sub fissile.

LITHOLOGICAL DESCRIPTIONS (cont)

1705.5-1854 m	**Interbedded Siltstone & Claystone with minor Sandstone interbeds & trace Dolomite.**
Claystone	Light grey-brown, light blue grey in part, nil to slightly calcareous, trace disseminated pyrite, trace very fine quartz grains in part, trace micro micaceous, rare forams and fossil fragments, sub blocky to sub fissile, occasional amorphous to washable, soft to firm.
Sandstone	Light brown grey, pale green grey, very fine to fine grain, moderately sorted, rounded to sub rounded, trace disseminated pyrite, trace micro micaceous, trace carbonaceous specks, trace fossil fragments, common dolomite cement, trace siliceous cement, common clay matrix, common moderately hard to firm aggregates, poor inferred porosity, no fluorescence.
Dolomite (Tr)	Light to medium brown, microcrystalline, silty, trace very fine quartz grains, firm to hard, occasionally soft, blocky, dull yellow mineral fluorescence, no cut.
1854- 2580 m	**Interbedded Sandstone, Siltstone & Claystone with minor Coal seams.**
Sandstone	Light brown grey, pale green grey, translucent, very fine to coarse grain, moderately sorted, moderately good sphericity, rounded to sub angular, common disseminated pyrite, trace to common glauconite, trace carbonaceous specks, trace siderite, moderately calcareous cement, trace quartz overgrowths, mainly siliceous cement, dominantly coarse, trace kaolin intrusion, chlorite, mica & feldspar with depth, common moderately hard, firm aggregates, moderate visible porosity, no to trace mineral fluorescence with depth.
Siltstone	Medium brown, grey brown, locally very argillaceous grading to Claystone, slightly arenaceous in part, micro micaceous, trace fossil fragments, common carbonaceous specks and laminae with depth, trace lithic fragments, soft to firm, occasional moderately hard, massive to blocky.
Claystone	Medium dark grey to light grey, grey brown, slightly silty, micro micaceous, slightly calcareous, trace disseminated and nodule pyrite, trace carbonaceous specks, trace very fine quartz grains in part, trace glauconite/chlorite in part, rare forams and fossil fragments, waxy, blocky to sub fissile in part, soft to firm, grading to Siltstone.

LITHOLOGICAL DESCRIPTIONS (cont)

Coal	Black, dark brown black, metallic to sub vitreous lustre with depth, slightly silty, common disseminated and nodule pyrite interbedded in part, sub conchoidal fracture, bituminous, sub blocky to sub fissile, brittle to hard.
2580- 2616 m	**Volcanics-Igneous Intrusion.**
Dolerite	light grey, translucent, opaque, light green, fine to coarse crystalline quartz/plagioclase/olivine with black glassy ground mass microvesicular in part, trace pyrite, locally vein calcite infill in fractures, predominantly disaggregated crystals, hard.
2616- 2792 m	**Siltstone with interbedded and minor Shale, Claystone, Sandstone and Coal.**
Siltstone	Medium brown-grey, brown black, very argillaceous grading to Claystone, micro micaceous, trace to locally common carbonaceous specks and laminae, trace lithic fragments, soft to firm, hard in part, massive to blocky, locally altered to Shale within igneous intrusive metamorphic areole.
Claystone	Light grey to pale yellow brown, pale brown, brown-green, non calcareous, micro micaceous, abundant silt to very fine quartz, grade to argillaceous Siltstone in part, tr carbonaceous specks, trace fossil fragments, soft to sticky, moderately hard to firm in part.
Shale	Olive-black to brown-black, micro micaceous, very carbonaceous, trace lithic fragments, common disseminated pyrite, moderately hard, subfissile in part.
Sandstone	Clear, off white, pale yellow brown, translucent, frosted, fine to predominantly medium, good sorting, sub rounded to sub angular, rare kaolin intrusions, trace nodular pyrite, disaggregated, occasional hard aggregates, poor to good visible porosity, nil to trace fluorescence. **Fluorescence**: 2766m-2772m Trace bright yellow white pinpoint-spotted fluorescence, slow streaming cut, milky white to yellow crush cut, thin chalky white residual ring.
Coal	Black bituminous, vitreous lustre, grade to carbonaceous Shale in part, slightly silty, sub conchoidal to conchoidal fracture, brittle, blocky to subfissile.

LITHOLOGICAL DESCRIPTIONS (cont)

2792- 2884 m **Sandstone with interbedded Siltstone and trace Coal.**

Sandstone

Clear to light grey brown, translucent, pale orange-brown and frosted with depth, fine to medium, occasional coarse grain, occasional very coarse with depth, moderate to poorly sorted, sub rounded to sub angular, angular with depth, trace siderite cement, trace kaolin matrix, trace carbonaceous specks, trace biotite, trace quartz over growths, trace nodular pyrite, trace fractured grains with depth, loose to occasionally friable, good inferred porosity, trace fluorescence.

2792- 2884 m **Sandstone with interbedded Siltstone and trace Coal.**

Fluorescence: 2792m-2816m Trace dull yellow orange pinpoint mineral fluorescence. 2874m-2880m Trace dull pale yellow patchy fluorescence, very weak diffuse cut, thin residue ring.

Siltstone

Light grey to brown grey, occasional brown black, locally very argillaceous grading to Claystone, arenaceous in part, micro micaceous, trace lithic fragments, common carbonaceous specks and laminae, firm to moderately hard, blocky.

Coal

Black, bituminous, vitreous lustre, sub conchoidal to conchoidal fracture, brittle, blocky.

2884- 3033 m **Siltstone with interbedded Sandstone and minor Claystone.**

Siltstone

Grey black to yellow brown, very argillaceous grading to Claystone, slightly arenaceous in part, micro micaceous in part, trace disseminated pyrite, trace fossil fragments, locally common carbonaceous specks and laminae, trace lithic fragments, soft to firm, occasional moderately hard, massive to blocky.

Sandstone

Light brown grey, translucent-transparent, very fine to coarse grain, dominantly medium grain, moderately sorted, sub rounded to sub angular, trace disseminated-nodular pyrite, trace carbonaceous specks, trace siderite/siliceous cement, trace quartz overgrowths & fractured grains, trace kaolin intrusion, mica, occasional aggregates, generally loose, disaggregates, common moderately hard, firm aggregates, moderate to good inferred porosity, no fluorescence.

Claystone

Medium grey to dark grey, olive grey to brown grey in part, slightly silty, trace micro micaceous, slightly calcareous, trace carbonaceous specks, firm to moderately hard, smooth-waxy texture in part, blocky to sub fissile, grading to Siltstone.

LITHOLOGICAL DESCRIPTIONS(cont)

3033- 3050.5 m	**Core #1 : Massive Sandstone with occasional Siltstone/Clay interbeds.**
Sandstone	Light grey, translucent-transparent, medium to very coarse grain, moderately sorted, sub angular to angular, trace carbonaceous specks, trace mica, fine grained aggregates with moderately strong siliceous cement, trace white argillaceous matrix, predominantly loose, friable to moderately hard aggregates, fair inferred porosity, nil fluorescence.
Siltstone	Grey black to yellow brown, very argillaceous grading to Claystone, slightly arenaceous in part, micro micaceous in part, trace disseminated pyrite, trace fossil fragments, locally common carbonaceous specks and laminae, trace lithic fragments, soft to firm, occasional moderately hard, massive to blocky
3050.5- 3088 m	**Interbedded Sandstone and Siltstone with minor Clay interbeds.**
Sandstone	Off white-light grey, translucent, coarse to very coarse grained, moderately sorted, angular to sub angular, trace carbonaceous specks, predominantly loose, friable-moderately hard aggregates, poor inferred porosity, nil to trace fluorescence. **Fluorescence**: 3069m-3075m Trace dull yellow white pinpoint mineral fluorescence. 3081m-3090m Trace dull yellow gold patchy direct fluorescence, very weak diffuse cut, thin residue ring.
Siltstone	Brown grey, medium grey brown, very argillaceous grading to Claystone, micro micaceous in part, trace carbonaceous specks, trace lithic fragments, slightly siliceous, firm to moderately hard, massive to blocky.
Claystone	Medium grey to dark grey, slightly siliceous, trace carbonaceous specks, trace disseminated pyrite, waxy texture, homogeneous, firm, blocky to sub fissile. (possibly hole cavings).
3088 - 3164 m	**Massive Igneous horizon.**
Volcanics	Off White to brown grey, grey red, light to dark green, olivine basalt, trace to locally common dark green fine crystalline orthoclase/olivine/K feldspar/mafic mineral assemblage, cherty in part, locally sparry dolomitic/calcite infill, firm to hard, massive to blocky. Occasionally orange brown weathered (?) tuffaceous horizons.

Overpressure Summary

OVERPRESSURE

Introduction

There are several techniques available which when used in the appropriate overpressured environment, can effectively predict an approaching overpressured zone while drilling. Each technique may give slightly different results according to geological and drilling conditions. By combining both the qualitative and quantitative techniques discussed below, with correct interpretation the best results are achieved. The constant monitoring and quick response to gas, flow and pit levels is however still the most accurate means of determining borehole state.

Geoservices currently makes use of the following parameters to indicate overpressured regions whilst drilling:

D-Exponent: This is a normalized rate of penetration which takes into account mud weight, bit wear and hydraulics. It can be reliably used in shales and clean claystones and as an indicator in siltstones, silty shales and calcareous claystones. It is not valid when PDC bits are used.

A normal trend line is established through normally pressured shale points, representing a normal compaction trend, and any leftward deviation of subsequent shale points from this trend, representing relative undercompaction, indicates overpressure (plotted relative to depth) or increased porosity due to lithology changes.

Sigmalog: The Sigmalog is the variation with depth of the sigma factor, also called "total rock strength". The sigma factor takes into account the same factors as the D-Exponent. It also takes into account a value n, which is a function of permeability and porosity. In this way the sigmalog is expected to overcome D-Exponent problems in carbonate, marl and silty shale sequences. The sigmalog is however extremely difficult to use. A large amount of data is required, and it relies heavily on operator judgement. It is ill-suited for use in exploration wells.

Shale density: Generally sediments undergo compaction concurrent with depth of burial. The compaction results in the expulsion of water. As the matrix density of clay is greater than the one of water, the density of the clay increases as its water content decreases. In the case of overpressured shales where the water has not been able to escape normally the shale density is unnaturally light. Various methods are available to measure shale density. A liquid density column is most commonly used by Geoservices. Clean shales with consistent mineral make up, devoid of contaminants such as mica and silica, are necessary. This method is also very susceptible to errors induced by cavings.

Temperature: By plotting mud flow line temperature against depth a normal temperature gradient can be established. An overpressured zone which is under compacted, and thus hydrated, has a higher temperature gradient as water is a poor conductor of heat relative to rock. Zones of overpressure will hence tend to cause a zone of heat starvation in overlying sediments. This results in a decreased temperature gradient in this zone, creating a "thermal shadow" effect.

The use of temperature as a method of determining overpressure has many limitations. Additions to the mud system at surface, circulation breaks, mud type, length of conductor pipe/riser, hole size, downhole mechanical and hydraulic factors can all adversely effect observed gradients.

Cuttings: Small, splintery cuttings can be used as an indicator of overpressured regions. Long, propeller shaped cuttings are usually an indicator of overpressure. Tabular, flattened cavings are usually more indicative of hydration of reactive or swelling clays. A large increase in caving volume is often a good indication of abnormal pressure. Excessive sloughing resulting in fill is also another valid indicator of abnormal pressure.

Overpull and Drag: Excessive overpull and drag during pipe movement can be attributed to abnormal pressure. Increases in overpull and drag are good indications of borehole instability. In highly deviated wells dog-legs can develop causing excessive overpull.

Resistivity/Conductivity: In normally compacted sediments salinity will increase with depth. Clays during the course of sediment compaction retain ions raising the salinity. A reduction in salinity can be attributed to undercompaction. For this method to work successfully a significant contrast must occur in drilling fluid/formation water salinities. The addition of mud chemicals can also cause variables to be induced.

Torque: While an increase in torque may have a number of causes, one of these can be a change of differential pressure while entering an overpressured zone. Negative differential pressure can cause shales to increase torque in two ways. a) Swelling can occur to reduce hole size. b) Cuttings can accumulate around the bit and stabiliser. Also it has been noted that the plastic state of clays can cause a bit to ball-up (reduced steady torque). Bit balling can often be used to indicate that a Transition zone is being penetrated. With the many additional factors that effect torque, hole geometry, deviation and BHA make-up, care must be taken in assessing torque data. It is however a useful secondary indicator.

Gas: Increases in background, connection and trip gas readings indicate increasing pore pressures and can be used as an indicator of overpressure. However, changes in porosity as a result of changes in formation type can give rise to increases in background, connection and trip gas which are not related to overpressure. Variable flow rates, hole size and penetration rate can also cause considerable changes in background gas levels.
Gas composition is also used as a method of detecting overpressure. In normal compaction there is generally less propane (C3) than ethane (C2). In abnormal sediments often the opposite is true. A C2/C3 ratio of less than 1 is usually an indication of overpressure. All gas data is susceptible to variables resulting from measurement type, degasser position and type, mud properties. Often gas may be recycled and this can induce further errors. Care must be taken in interpretation of gas data in respect to prediction of abnormal pressure.

Yolla 2

Yolla #2 appeared to be drilled as a normally pressured well with no hole problems to TD at 3164 mRT. The overpressure trend plot takes into account the hole conditions and provides the most readable form to determine overpressure. The trend shows increasing trends in compaction and decreases or steady trends show changes in the formations drillability that may relate to undercompaction, depending on other pressure indicators. Monitoring of the well and plots calculating overburden gradient and formation fluid pressure were used drilling Yolla #2 (plot takes into account mud weight and bit wear) and no major overpressure signs or hole problems were encountered. The data is plotted and saved for future interpretation and well planning.

Mudlogging started at 862 mRT with previous returns to the sea floor. There were two PDC bit runs from 862 m-1485 m and 2306 m-2580 m used in this well. Drilling of the EVCM (1858 mRT) produced a lot of coarse coal cavings at times but no splintery cuttings were observed during drilling. The mud weight was reduced from 9.4 ppg to 9.2 ppg (2580 mRT) in order to improve the background gas readings and hole condition. By reducing the mud weight, there was an increase in the background gas trend. There were no indications of any connection/swab gas. The rate of drilling improved and downhole losses were reduced. No hole problems occurred until after tripping or after pulling out at TD, 3164 mRT. Minor reaming was required when running in hole with a new bit run and there were signs of hole deterioration, mud weight was kept at 9.2 ppg (1.12 sg).

At TD 3164 mRT the string was pulled out of the hole with no hole problems, mud weight of 1.12 sg heavy. Schlumberger logging tools were run but could not pass 1240 m. A wiper trip was done, with the string picking up weight at 1240 m. The hole was reamed and circulated clean with cuttings coming up of mainly claystone with a trace of splintery cuttings . Overall the cuttings were well rounded and had been circulated around the hole. The riser was flushed of cuttings while running in hole again. After cleaning the hole further reaming was required to progress down the hole, at 1890 mRT above a large sand section the hole packed off with no returns and mud losses down hole. The string was rotated at high rpm until full circulation could be established. A hi-vis pill was pumped and the hole circulated to bottoms up before running in the hole again. The stands continued to be reamed in due to the poor condition and instability of the hole, mud weight needs conditioning for the whole hole section.

Pulling out of the hole there were no hole problems and logging operations started with no trouble running down hole. Temperature out reached a maximum of 64 degrees Celsius at 2710 m and 67 degrees at 3141 m but is affected by many variables while drilling and can indicate hole condition changes while drilling by sudden increases. No large Shale sections were encountered to give a good picture of compaction changes in Yolla #2. Future mud monitoring and conditioning needs to be looked at for future wells to keep the hole in good condition.

Trip gas summary

MD (mRT)	MWT (sg)	Trip Gas (%)	Background Gas (%)	Peak A.B.G %	Remarks
1404.0	1.10	0.19	0.11	0.08	Wiper trip
1485.0	1.12	0.09	0.06	0.03	Bit trip
2234.0	1.13	0.60	0.15	0.45	Wiper trip
2306.0	1.14	2.55	0.50	2.05	Bit trip
2580.0	1.10	3.20	0.50	2.70	Bit trip
2738.0	1.11	21.8	0.80	21.0	Bit trip
2907.0	1.11	28.0	1.00	27.0	Wash Trip
2954.0	1.13	2.10	0.64	1.46	Wash Pipe
3033.0	1.13	18.2	1.00	17.2	Bit Trip
3050.5	1.13	4.50	0.60	3.90	Core Run
3164.0	1.12	16.20	1.00	15.2	Wiper to TD

Deviation Summary

Yolla-2 was drilled as a vertical appraisal well. Surveys while drilling were from an Anderdrift tool with Anadrill EMS survey phase TD. For detailed deviation data please refer to the Anadrill deviation report.

MD (mRT)	Inclination (deg)	Azimuth (deg)	Tool Type
1475.0	0.00	n/a	Anderdrift
1631.0	0.00	n/a	Anderdrift
1710.0	0.00	n/a	Anderdrift
1829.0	0.50	n/a	Anderdrift
1994.0	0.00	n/a	Anderdrift
2202.0	0.00	n/a	Anderdrift
2348.0	0.00	n/a	Anderdrift
2489.0	0.00	n/a	Anderdrift
2575.0	1.00	n/a	Anderdrift
2660.0	2.00	n/a	Anderdrift
2691.0	2.00	n/a	Anderdrift
2738.0	1.50	n/a	Anderdrift
2892.0	2.00	n/a	Anderdrift
3061.0	2.50	n/a	Anderdrift
3150.0	2.00	n/a	Anderdrift
Multishot Survey Tool run at TD			

Drilling Phase Summary - 914 mm hole section

Dates	: 9 - 10 April 1998
Measured depth	: 94 m to 152.0 m
Vertical TD	: 94 m to 152.0 m
Number of bits used	: 1
Mud type	: Seawater with high viscosity sweeps

A conventional 660 mm bottom hole assembly, including 660 mm bit #1 with a 914 mm hole opener, was made up and lowered to the seabed in 81.5 m of water plus 12.5 metres of rig air gap relative to LAT. The 914 mm surface hole was then drilled from 94 m to the 762 mm casing point at 152.0 m using seawater and pumping high viscosity sweeps as needed. A 16 m^3 sweep of guar gum was pumped, an Anderdrift survey taken (0°), followed by 46 m^3 of high viscosity gel mud. The drill string was then pulled out to five metres below seabed (99 m), then ran in to 142 m, where weight was taken, so washed to bottom at 151.9 m. Displaced the hole with 46 m3 of gel mud again, dropped a Totco survey (0°), then pulled out of hole to run and cement the 762 mm casing as per Premier's programme with the shoe at 151.9 m.

Bit Record

BIT #	SIZE mm	MAKE	TYPE	JETS	IN m	OUT m	RUN m	HRS	GRADING
1RR + HO	660 914	HTC	CR 1	3 x 22 1 x 20 3x18	94	152.0	58	0.73	1-1-NO-A-1-I-NO-TD

Drilling Phase Summary - 445 mm

Dates	: 11 - 16 April 1998
Measured depth	: 151.9 m to 862.0 m
Vertical TD	: 151.9 m to 862.0 m
Number of bits used	: 2 (3 bit runs)
Mud type	: Seawater and Guargum sweeps

Bit #1RR2 was run into the hole with a conventional vertical assembly to drill out the 762 mm shoe at 151.9 m. and one metre of formation, before being pulled out of the hole and replaced with 445 mm bit # 2. New hole was drilled from 153 m to 441 m, where drilling stopped due to a problem with the "Top drive" system. It was necessary to pull out of hole due to bad weather anyway, so the top drive system was repaired while waiting on weather. The rig anchors had to be repositioned after the storm before running back in hole with bit # 2RR. It was not possible to stab into the wellhead immediately until a malfunction of the Remote Operated Vessel was fixed. Once the ROV was on bottom, with camera functioning, the bit was manoeuvred into the wellhead. Washed and reamed to bottom, then drilled from 441 m to the 340 mm casing point at 862 m, taking Anderdrift surveys every connection. A 32 m^3 high viscosity sweep was pumped, then the hole was displaced with 102 m^3 of 1.14 SG gel mud while pulling out of hole and strapping the pipe. The well head was jetted clean (observed with ROV), then continued pulling out of hole and recovered an Electronic Multi-Shot survey at surface. 340 mm casing was the run as per Premier's programme with the shoe set at 852.89 m.

Bit Record

BIT #	SIZE mm	MAKE	TYPE	JETS	IN m	OUT m	RUN m	HRS	GRADING
1RR2	660	HTC	CR 1	3 x 22 1 x 20	152.0	153.0	1.0	1.0	1-1-NO-A-1-I-NO-BHA
2	444	HTC	GTX-C1	3x18 1x16	153.0	441.0	288.0	5.62	0-0-NO-A-E-I-NO-RIG
2RR	444	HTC	GTX-C1	3x18 1x16	441.0	862.0	421.0	11.14	2-4-WT-G1/3-E-I-NO-TD

Drilling Phase Summary - 311 mm

Dates	: 23 rd April - 14 th May 1998
Measured depth	: 862.0 m to 3164.0 mRT
Vertical TD	: 862.0 m to 3163.7 mTVD
Number of bits used	: 7
Mud type	: KCL IDBOND

After running and testing the BOP's, 311 mm, PDC bit #3 was run into the hole with a conventional packed assembly, then washed from 800 m to the top of the cement at 818.5 m. At this point some suspected unidentified junk that had fallen out of the derrick into the well was briefly "worked" in case it was hard enough to cause problems, then 8m3 of high viscosity mud was pumped to clear the hole. Cement was then drilled to the float collar at 826.3 m, where high torque up to 10,000 ft/lbs was noted. This tight area was worked down to the shoe at 853 m, then the rathole was cleared down to 862 m. Some time had to then be spent working, what was suspected to be, full gauge stabilisers following a slightly undergauge bit through the float and shoe, before drilling 3 m of new hole to 865 m.

An 8m3 sweep was pumped to clear the hole, then the well was displaced with a 1.1 SG KCL mud system before doing a Formation Integrity Test that resulted in an Equivalent Mud Weight of 1.75 SG. The choke and kill lines were flushed, slow circulation rates taken, then new 311 mm hole was drilled from 865 m to 1145 m where drilling stopped for a while to service the Topdrive system. It was straining to rotate the larger stabilisers through hard stringers of Limestone and Dolomite in the formation, with high torque up to 16,000 ft/lbs being noted. New hole was then drilled to 1404 m where a wiper trip back to the shoe was performed with some overpull and drag being noted at 1025 m. Anderdrift surveys were run regularly through out the drilling and resulted in 0 degrees deviation except at 994 m (½°).

Due to a Pipe tally error, a correction of -10 metres has been made for all data and samples collected up to 1404 metres RT. Drilling continued to 1485 metres RT before pulling out of the hole for a bit change due to poor penetration and high torque. Bit # 4 was run in the hole and drilled to 2232 m before tripping due to deteriorating weather, 11 stands were pulled before running top bottom and circulating bottoms up. The weather improved and drilling continued to 2306 metres RT before pulling out of the hole due to a poor rate of penetration. The EVCM sands were encountered from 1876 mRT. A carbide lag check at 2289 m showed an average hole size of 13.5" in the 12.25" hole section. A maximum gas show of 4.5 % was recorded at 2288 mRT.

Bit # 5 a PDC was run in the hole to 852 mRT (casing shoe) and the mud was circulated until the weight was decreased from 9.4 sg to 9.1 sg. Drilling continued with an average mud weight of 9.2 sg drilling Siltstone/Sandstone & Coals with higher gas readings recorded associated with the coal seams. At 2580 mRT the bit was pulled out of the hole due to poor penetration rates while drilling shales. The top drive on the rig and formation type(volcanics) appear to be not suitable for a PDC bit. Bit # 6 a Reed tooth bit with 3 x 14 jets was run in the hole, a survey at 2575 mRT recorded 1 degree inclination before drilling ahead at 3 m/hr average. Trip gas of 3.2 % was recorded. In the 2583 mRT sample there was a distinct change in lithology to a volcanic-igneous rock (Dolerite). Drilling continued at 5 m/hr average with gas peaks up to 35% at 2652m associated with coal. The inclination increased to 2 degrees, reducing to 1.5 degrees by 2738 mRT. Due to the slow penetration rate the bit was pulled out of the hole at 2738 mRT.

Tight hole was encountered at 2567 m backreaming to 2560 m, and at 2422 and 2250 mRT with 50 Klb overpull. Bit # 7, ATMP18 with 3x14 jets, was run in the hole on BHA # 9 and encountered tight hole at 2207 mRT, the hole was reamed to 2260 mRT. Trip gas of 8 % was recorded with 2% background gas. CO2 gas reached a maximum of 5% while reaming. The hole was reamed to 2738 mRT and drilling continued with gas sands being drilled at 2794 mRT with a maximum of 50% gas peak recorded, with gas dropping off at 2817 mRT. Good porosity Sands were followed by Siltstones being drilled down to the expected sands for coring at 2857 mRT. Gas levels upon circulating up the next drill break showed poor gas in the next sands with a 3.5 % maximum peak. Drilling continued, looking for drilling breaks with gas/oil shows for a coring point. At 2900 mRT samples were circulated up with a 1.3% gas peak, at 2907 mRT pump pressure dropped indicating a wash in the pipe, after pulling 14 stands the wash was found so the pipe was run in the hole and drilling continued.

Losses averaged 10 bbl/hr over this drill section with a 9.2 ppg mud weight average. With large swell-heave mud would be lost over the shakers, if there was a better way of stopping flow over the shakers due to this alot of mud would have been saved during this well. At 2954 mRT the pump pressure dropped, after pulling 22 stands the wash in the pipe was found. The single was taken out and the pipe was run in the hole again before becoming stuck at 2313 mRT, after working and reaming, the pipe was run to bottom before drilling ahead. A drill break was encountered at 3007 mRT and at 3028 mRT, the sample was circulated up each time before drilling to 3033 mRt and pulling out to do a coring run. The pipe was backreamed to 2204 mRT due to tight hole, before circulating bottoms up and pulling out of the hole.

Bha # 10 was made up with the core barrell, but due to bad weather operations were suspended. The riser was pulled out of the hole as weather detiorated and equipment was strapped down. After re-locating and landing the riser BHA # 10 was run in the hole, reaming tight spots. After reaming to bottom, 2 stands were pulled out to circulate bottoms up before coring 18 metres 3033 mRT to 3051 mRT. Maximum trip gas recorded was 18.2 %. The core was cut in 1.8 hours a total of 17.5 metres, average rate of penetration was 9.8 m/hr. Upon pulling out some overpull was encountered but 100% recovery was made.

Bha # 11 was made up with a hughes bit and run in, reaming the last stand to bottom and drilling ahead. Trip gas peaked at 4.5 % with trace H2S and up to 10 % CO2 before decreasing. Mud temperature rose at bottoms up to 58 degrees Celcius before dopping to a steady 56 degrees. The rate of penetration averaged 8 m/hr intersecting volcanics at 3088 mRT with a light grey tuff and dark grey basement basalt. Total depth was called at 3164 mRT (3163.7 mTVD) at 01:00 hours 14-5-98. A six stand wiper trip was done, the hole circulated clean and the string was pulled out with no hole problems. Schlumberger logs were run. The well was finally plugged & abandoned.

Bit Record

BIT #	SIZE mm	MAKE	TYPE	JETS	IN m	OUT m	RUN m	HRS	GRADING
3	311	HTC	AG526	2x14 3x12	862.0	1485.0	623.0	33.2	1-6-CT-G-X-3/8-PR-TRQ
4	311	HTC	GT18	3x14	1485	2306.0	821.0	73.87	3-3-WT-A-E-3/16-NO-PR
5	311	HTC	BD447	2x18 6x14	2306	2580.0	274.0	37.30	0-1-WT-NTS-X-1/16-NO-PR
6	311	REED	HP41 HLK	3x14	2580	2738.0	158.0	30.4	6-5-LT-BT-CT-A-E-3/16-JD-PR
7	311	HTC	ATM P18	3x14	2738	3033.0	295.0	45.1	3-3-WT-CT-BT-A-E-1/16-NO-CP
8	311	CORPRO	CM365F	1.15 Tfa	3033	3050.5	17.5	1.77	80 % WORN
9	311	HUGHES	GTP09	2x16 1x14	3050	3164.0	113.5	13.5	1-1-WT-A-E-1/16-NO-TD

Mud Record

Depth m	MW sg	FV sec/qt	PV cps	YP lb/100ft	Gels	WL	Solids %	Sand %	pH	Chlorides mg/l	Ca2+ mg/l	KCl %	Cake 32/"
907	1.07	56	11	22	8/10	8.2	1.7	-	9.5	32,000	100.2	-	1
1120	1.10	49	14	27	5/7	6.6	3.7	0.3	9.5	33,000	120.2	5	1
1250	1.12	60	15	39	10/12	6.2	3.8	-	9.5	34,000	120.2	4	1
1300	1.12	58	16	36	10/14	5.3	3.8	0.3	9.0	34,000	120.2	4	1
1390	1.10	54	15	38	10/14	5.6	3.9	-	9.5	38,000	200.4	5	1
1411	1.11	59	16	39	10/14	5.6	3.5	-	9.5	39,000	200.4	5	1
1425	1.12	56	17	38	10/13	5.6	3.5	-	9.5	39,000	200.4	5	1
1594	1.10	69	17	43	10/13	5.8	3.8	nil	9.7	32,000	80.2	5	1
1678	1.10	64	17	40	10/13	5.6	3.7	nil	9.9	34,000	80.2	5	1
1696	1.10	66	19	37	10/13	5.8	3.7	nil	9.9	34,000	60.1	5	1
1857	1.12	64	19	45	11/14	5.6	3.7	nil	9.8	34,000	80.2	5	1
1947	1.12	59	19	41	10/15	5.4	3.7	nil	9.7	34,000	80.2	5	1
1984	1.13	59	19	42	11/15	5.4	4.6	nil	9.7	34,000	80.2	5.5	1
2061	1.12	58	18	42	11/15	5.6	4.4	nil	9.7	38,000	80.2	5.5	1
2161	1.12	58	19	42	11/14	5.4	4.5	nil	9.7	36,000	80.2	5.5	1
2167	1.13	57	20	40	11/15	5.4	4.5	nil	9.7	36,000	60.1	5.5	1
2259	1.13	58	18	38	8/12	5.0	4.7	nil	9.1	35,000	160.3	5.0	1
2280	1.13	56	18	40	8/12	5.2	5.7	nil	9.1	36,000	160.3	5.2	1
2306	1.14	60	20	40	9/12	4.0	5.2	nil	9.0	43,000	240.5	5.2	1
2314	1.11	55	16	33	7/11	4.6	4.7	nil	9.0	42,000	200.4	4.7	1
2371	1.11	53	16	36	7/10	5.2	4.9	1.5	9.5	42,000	180.4	5.1	1
2434	1.11	51	16	33	7/10	5.0	4.4	1.0	9.1	42,000	280.5	5.0	1
2469	1.10	52	15	30	6/9	5.2	4.9	0.8	9.0	40,000	240.5	5.0	1
2522	1.10	52	17	34	7/9	4.6	4.5	0.8	9.0	41,000	440.9	4.9	1
2571	1.10	55	18	38	8/11	4.5	4.4	0.6	9.1	42,000	360.7	5.0	1
2580	1.10	54	18	37	8/11	4.8	4.3	0.4	9.2	42,000	400.8	5.1	1
2736	1.11	51	16	36	9/11	4.6	4.9	0.4	9.0	39,000	400.8	5.4	1
2738	1.13	50	16	38	9/12	4.6	6.0	0.4	8.5	40,000	480.9	5.0	1
2750	1.10	56	15	31	7/9	5.2	4.4	0.3	9.0	40,000	320.6	5.1	1
2775	1.10	49	14	32	8/12	4.6	4.4	0.2	9.1	40,000	440.9	5.7	1
2825	1.10	47	15	27	7/11	4.6	4.2	0.3	9.0	41,000	400.8	6.0	1
2866	1.13	50	16	34	8/12	4.2	5.9	0.5	9.0	40,000	480.9	5.4	1
3033	1.13	48	17	32	9/14	4.4	5.7	0.3	8.8	42,000	440.9	6.0	1
3150	1.12	44	13	29	8/12	5.2	5.3	0.4	9.0	40,000	521.0	6.0	1

Bit Record **PREMIER OIL : YOLLA # 2**

	BIT #	SIZE (mm)	MAKE	TYPE	Serial number	JETS	TFA (sq.in)	IN (m)	OUT (m)	RUN (m)	HRS w/ conns	HRS onbtm	ROP (m/hr)	Tot Revs (krev)	GRADING
1	1RR +H0	660 914	Hughes	CR1	B09CH	3x22+1x20 3x18	2.17	94.0	152.0	58.0	3.8	0.95	61.05	13.40	1-1-NO-A-1-I-NO-TD
2	1RR2	660	Hughes	CR1	B09CH	3x22+1x20	1.42	152.0	153.0	1.0	1.25	0.98	1.02	5.00	1-1-NO-A-1-I-NO-BHA
3	2	444	Hughes	GTXC1	A15KA	3x18+1x16	0.94	153.0	441.0	288.0	8.60	5.62	51.25	41.00	0-0-NO-A-E-I-NO-RIG
4	2RR	444	Hughes	GTXC1	A15KA	3x18+1x16	0.94	441.0	862.0	421.0	20.50	11.14	37.79	90.00	2-4-WT-G1/3-E-I-NO-TD
5	3	311	Hughes	AG526	1402214	2x14+3x12	0.63	862.0	1485.0	623.0	72.00	33.20 38.92	18.77	402.00 447.00	-6-CT-G-X-3/16-NR-PR/T with cement included
6	4	311	Hughes	GT-18	W15GB	3x14	0.45	1485.0	2306.0	821.0	86.50	73.87	11.11	647.00	3-3-WT-A-E-3/16-NO-PR
7	5	311	Hughes	BD447	1902101	2x18,6x14	1.40	2306.0	2580.0	274.0	43.8	37.30	7.35	388.00	0-1-WT-NTS-X-1/16-NO-PR
8	6	311	Reed	P41HL	LJ4759	3x14	0.45	2580.0	2738.0	158.0	33.8	30.40	5.10	239.00	-5-LT-BT-CT-A-E-3/16-JD-P
9	7	311	HTC	ATMP18	V05BW	3x14	0.45	2738.0	3033.0	295.0	53.7	45.10	6.50	242.00	3-3-WT-CT-BT-A-E-1/16-NO-CP
10	8	311	CORPRO	CM365F	711001		1.15	3033.0	3050.5	17.5	1.8	1.77	9.80	11.00	80 % WORN
11	9	311	Hughes	GTP09	A64KA	2x16+1x14		3050.5	3164.0	113.5	14.5	13.50	8.40	122.00	1-1-WT-A-E-1/16-NO-TD

Appendix 1 :

APPENDIX 12

FLUID RESERVOIR STUDY

By

PETROLAB

YOLLA 2

565430

PETROLAB

Company : Premier Oil Australia Pty. Ltd.
Well : Yolla # 2
File : P 98029

INDEX

PETROLAB

TRANSFER DETAILS

Chamber MPSR-BA # 0160, from 2802 m opened at 2000 psig, was compressed to 6000 psig into single phase with 210 ccs of water behind piston and transferred into Petrolab cylinder # 453

Chamber MPSR-BA # 0185, from 2810 m opened at 0 psig and was found to be empty

Chamber MPSR-BA # 0156, from 2815 m opened at 1700 psig, was compressed to 6000 psig into single phase with 100 ccs of water behind piston and transferred into Petrolab cylinder # 395

Chamber MPSR-BA # 0122, from 2860.4 m opened at 1800 psig, contained water and was transferred into bottle

SUMMARY OF RESULTS

RESERVOIR FLUID FROM 2802 m IN CYLINDER # L-453, Ex MPSR-BA # 0160

SATURATED VAPOUR:

Reservoir Temperature (°F)	:	253
Dew Point Pressure (psig)	:	4788
Gas Formation Volume Factor (Bg)	:	0.00402
Gas Expansion Factor (E)	:	248.76
Gas Deviation Factor (Z)	:	0.958
Specific Volume (CFT/LB)	:	0.05717
Density (gm/cc)	:	0.2802
Viscosity (centipoise)	:	0.0341
Molecular Weight	:	26.70
Gas Gravity (Air = 1.000)	:	0.919
Gross Heating Value (BTU/ft3)	:	1086

Total Plant Products in Dew Point Fluid (GPMM):

RESERVOIR FLUID FROM 2802 m IN CYLINDER # L-453, Ex MPSR-BA # 0160

Dew Point	:	4788 psig @ 253 ° C
Ethane	:	4.298
Propane	:	2.599
Butanes	:	1.857
Pentanes Plus	:	1.427

RESERVOIR FLUID FROM 2815 m IN CYLINDER # L-395, Ex MPSR-BA # 0156

Dew Point		3660 psig @ 253 ° C
Ethane	:	4.294
Propane	:	2.720
Butanes	:	2.185
Pentanes Plus	:	1.729

PETROLAB

Company : Premier Oil Australia Pty. Ltd.	Page : 2 of 22
Well : Yolla # 2	File : P 98029

FIELD CHARACTERISTICS :

Field Name	: Yolla # 2
Formation Name	:
Pool (or Zone)	:
Date first well completed	:
Original reservoir pressure (psig)	:
@ datum (m ss)	:

WELL CHARACTERISTICS :

Depth datum (m)	: 2815.0
Elevation above MSL (m)	:
Total depth (m PBTD)	:
Producing interval (mAHBRT)	:
Perforated intervals (m KB)	:
Tubing size (inch)	:
Tubing shoe (m)	:
Casing size (inch)	:
Reservoir temperature (°F)	:
Last reservoir pressure (psia)	: 4168.8
@ datum (m KB)	:
date	:
Status of well	:

SAMPLING CONDITIONS

MDT Details	: MPSR-BA # 0160	MPSR-BA # 0156	MPSR-BA # 0185	MPSR-BA # 0122
Size Sampler	: 450 cc	450 cc	450 cc	450 cc
Date sampled	:			
Transferred into	: L-453	L-395	Empty	Drained
Depth Sampled (m)	: 2802	2815	2810	2860.4
Tool opening pressure	: 2000 psig @ 63 ° F	1700 psig @ 66 F	0 psig @ 63 ° F	1800 psig @ 63 ° F
Reservoir Temperature (°F)	: 253			
Reservoir Pressure (psia)	:	4168.8		
Date Sample Received	: June 1 1998	June 1 1998	June 1 1998	June 1 1998

PETROLAB

Company : Premier Oil Australia Pty. Ltd.	Page : 3 of 22
Well : Yolla # 2	File : P 98029

Analysis of water flashed from sample in MPSR-BA-0156

Resistivity	:	0.123	Ohm.M @ 25 °C
Conductivity (E.C)	:	81100	micro-S/cm @ 25 °C
pH	:	5.7	
Density	:	1.0383	gm/cc @ 25 °C
Total alkalinity	:	659	Each as CaCO3

Cations

		mg/l	meq/l
Calcium	(Ca):	600.0	29.94
Magnesium	(Mg):	520.0	42.80
Sodium	(Na):	9820.0	427.14
Potassium	(K):	29160.0	745.78
Iron	(Fe)	0.00	0.00
Strontium	(Sr)	0.00	0.00

Anions

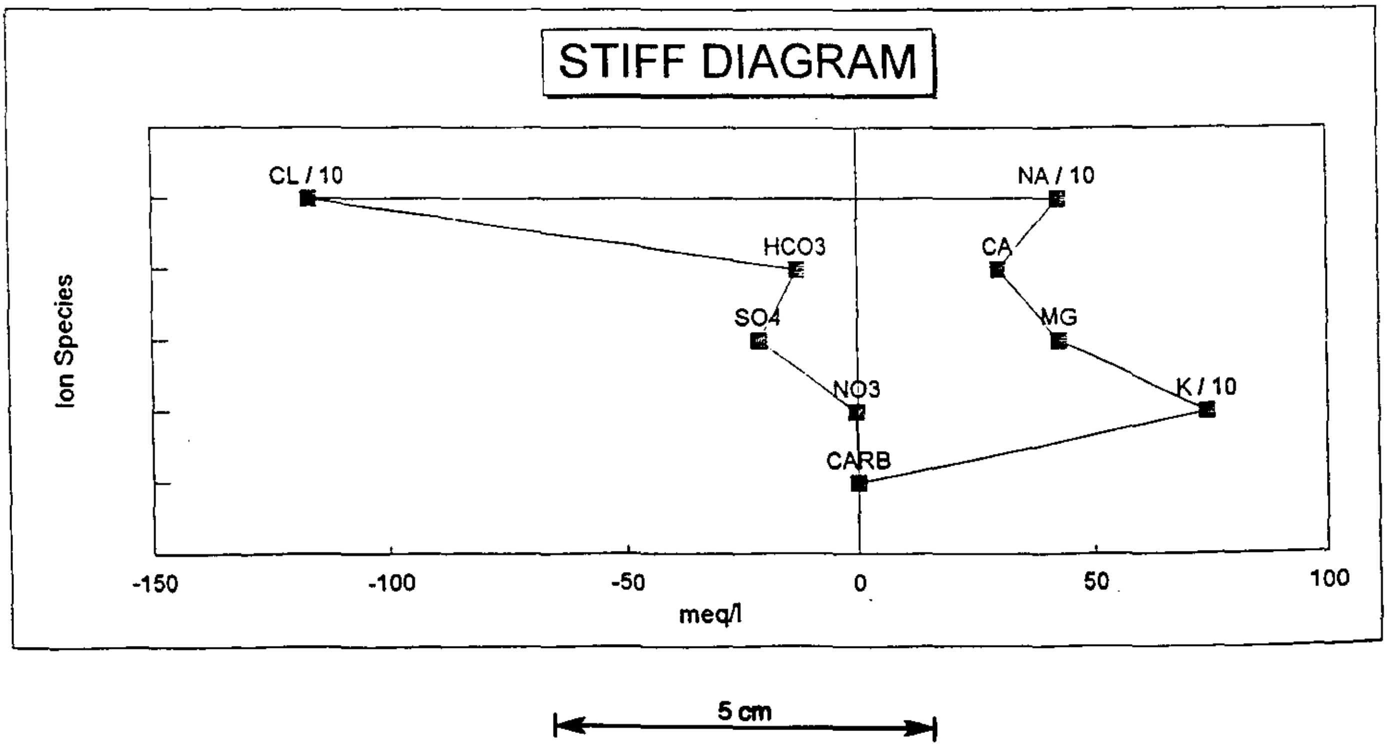
		mg/l	meq/l
Hydroxide	(OH):	0.0	0.00
Carbonate	(CO3):	0.0	0.00
Bi-Carbonate	(HCO3):	803.5	13.17
Sulphate	(SO4):	1025.0	21.34
Chloride	(Cl):	41529.0	1171.48
Nitrate	(NO3):	18.0	0.29

Total dissolved solids

		mg/l
Calculated (HCO3=CO3)	:	83067
From Conductivity	:	51336
Salinity (ppt)	:	74960

Hardness

Carbonate	:	659
Non-Carbonate	:	2981
Total	:	3640



PETROLAB

Company : Premier Oil Australia Pty. Ltd.	Page : 4 of 22
Well : Yolla # 2	File : P 98029

Analysis of water flashed from sample in MPSR-BA-0122

Resistivity	:	0.150	Ohm.M @ 25 °C
Conductivity (E.C)	:	66700	micro-S/cm @ 25 °C
pH	:	5.9	
Density	:	1.0317	gm/cc @ 25 °C
Total alkalinity	:	840	Each as CaCO3

Cations

		mg/l	meq/l
Calcium	(Ca):	660.0	32.93
Magnesium	(Mg):	460.0	37.86
Sodium	(Na):	8040.0	349.72
Potassium	(K):	27160.0	694.63
Iron	(Fe)	20.00	0.72
Strontium	(Sr)	0.00	0.00

Anions

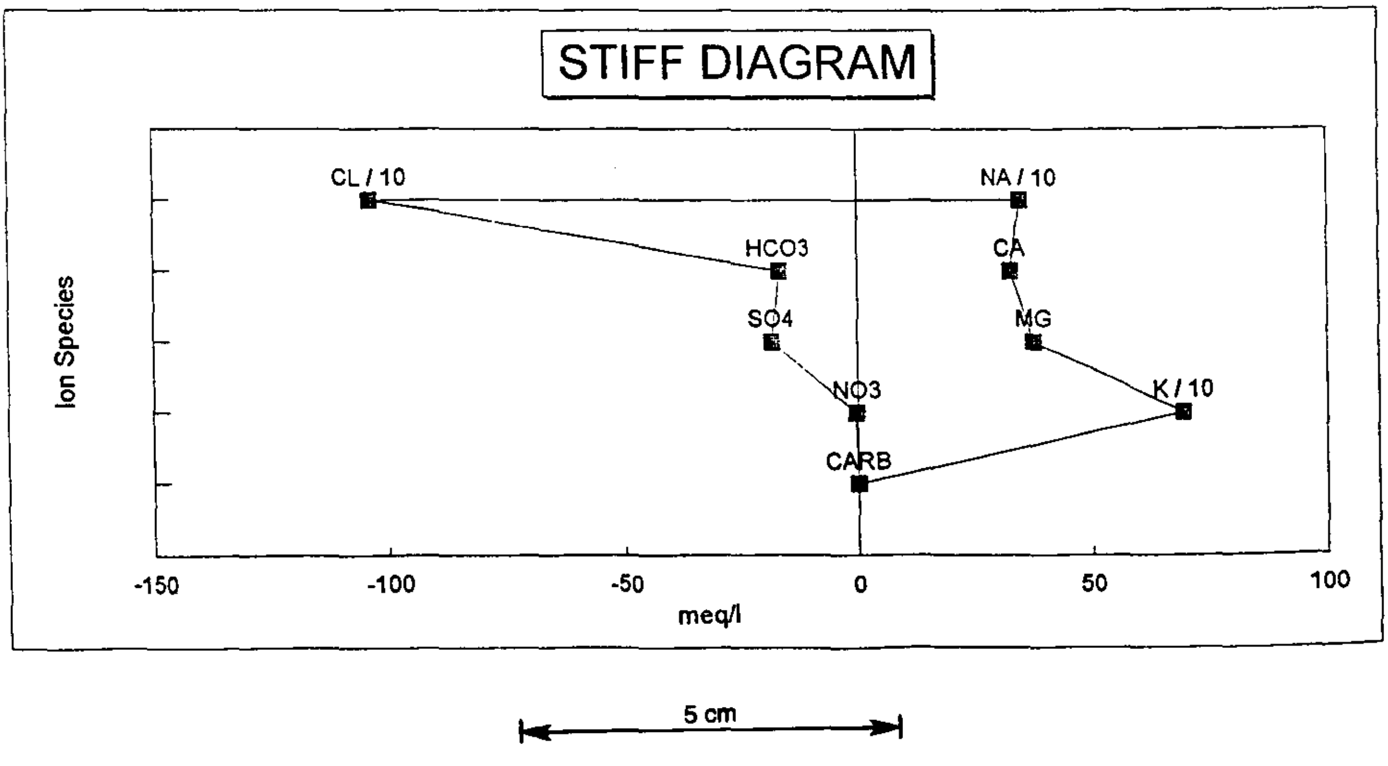
		mg/l	meq/l
Hydroxide	(OH):	0.0	0.00
Carbonate	(CO3):	0.0	0.00
Bi-Carbonate	(HCO3):	1024.2	16.78
Sulphate	(SO4):	885.0	18.43
Chloride	(Cl):	36762.0	1037.01
Nitrate	(NO3):	18.0	0.29

Total dissolved solids

		mg/l
Calculated (HCO3=CO3)	:	74509
From Conductivity	:	42221
Salinity (ppt)	:	66355

Hardness

Carbonate	:	840
Non-Carbonate	:	2703
Total	:	3543



Analysis of water sample 2815.0 m, MDT run #1, 2 ¾ gallon chamber

Resistivity	:	0.104	Ohm.M @ 25 °C
Conductivity (E.C)	:	96100	micro-S/cm @ 25 °C
pH	:	5.6	
Density	:	1.0452	gm/cc @ 25 °C
Total alkalinity	:	1135	Each as CaCO3

Cations

		mg/l	meq/l
Calcium	(Ca):	780.0	38.92
Magnesium	(Mg):	460.0	37.86
Sodium	(Na):	7040.0	306.22
Potassium	(K):	29600.0	757.03
Iron	(Fe)	0.00	0.00
Strontium	(Sr)	20.00	0.46

Anions

		mg/l	meq/l
Hydroxide	(OH):	0.0	0.00
Carbonate	(CO3):	0.0	0.00
Bi-Carbonate	(HCO3):	1383.9	22.68
Sulphate	(SO4):	906.0	18.86
Chloride	(Cl):	37300.0	1052.19
Nitrate	(NO3):	14.0	0.23

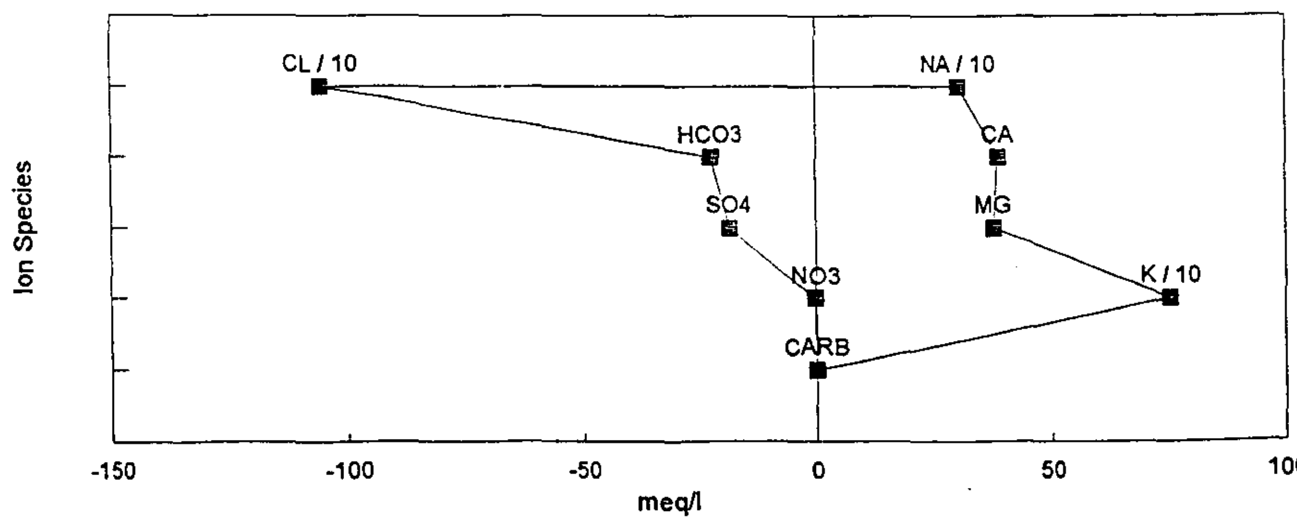
Total dissolved solids

		mg/l
Calculated (HCO3=CO3)	:	76800
From Conductivity	:	60831
Salinity (ppt)	:	67327

Hardness

Carbonate	:	1135
Non-Carbonate	:	2708
Total	:	3843

STIFF DIAGRAM



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PETROLAB

Company : Premier Oil Australia Pty. Ltd.	Page : 6 of 22
Well : Yolla # 2	File : P 98029

Analysis of water sample 2815.0 m, MDT run #1, Serial No. 2815

Resistivity	:	0.110	Ohm.M @ 25 °C
Conductivity (E.C)	:	90600	micro-S/cm @ 25 °C
pH	:	6.3	
Density	:	1.0426	gm/cc @ 25 °C
Total alkalinity	:	1078	Each as CaCO3

Cations

		mg/l	meq/l
Calcium	(Ca):	720.0	35.93
Magnesium	(Mg):	460.0	37.86
Sodium	(Na):	7200.0	313.18
Potassium	(K):	28560.0	730.43
Iron	(Fe)	0.00	0.00
Strontium	(Sr)	0.00	0.00

Anions

		mg/l	meq/l
Hydroxide	(OH):	0.0	0.00
Carbonate	(CO3):	0.0	0.00
Bi-Carbonate	(HCO3):	1314.4	21.54
Sulphate	(SO4):	922.0	19.20
Chloride	(Cl):	39500.0	1114.25
Nitrate	(NO3):	18.0	0.29

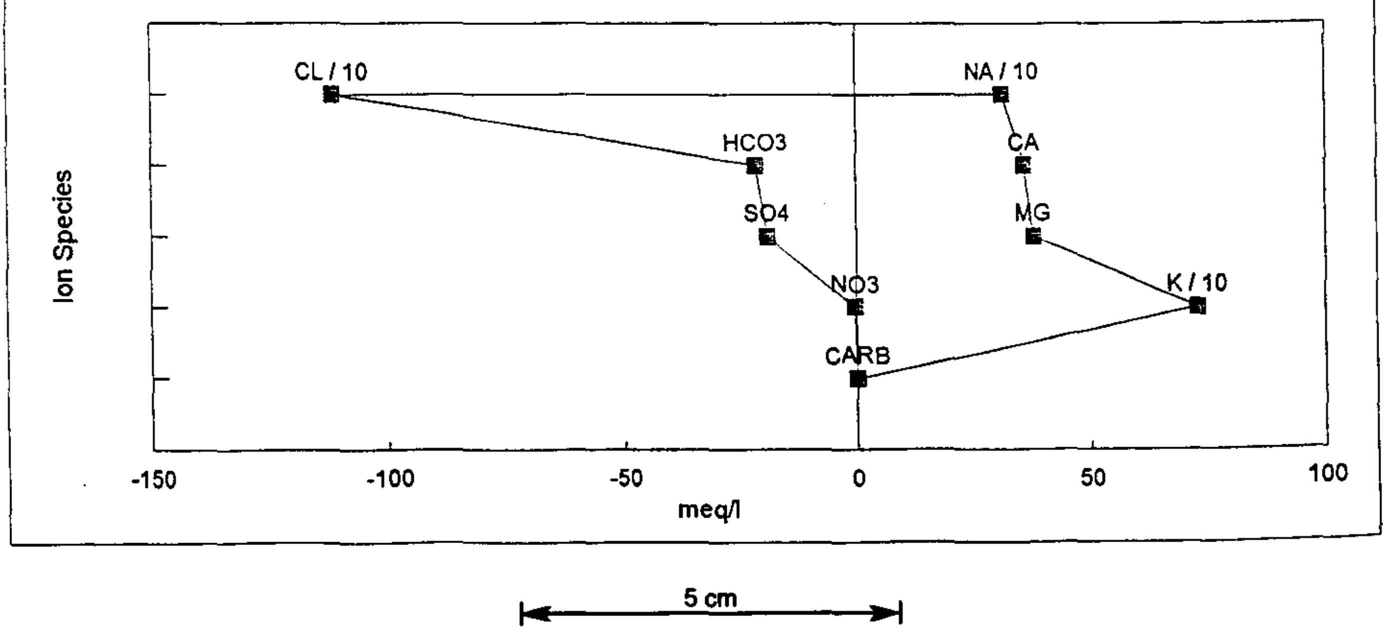
Total dissolved solids

		mg/l
Calculated (HCO3=CO3)	:	78026
From Conductivity	:	57350
Salinity (ppt)	:	71298

Hardness

Carbonate	:	1078
Non-Carbonate	:	2615
Total	:	3693

STIFF DIAGRAM



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PETROLAB

Company : Premier Oil Australia Pty. Ltd.	
Well : Yolla # 2	File : P 98029

Analysis of water sample 3044.0 m, MDT run #1, Serial No. 0193

Resistivity	:	0.400	Ohm.M @ 25 °C
Conductivity (E.C)	:	25000	micro-S/cm @ 25 °C
pH	:	6.6	
Density	:	1.0128	gm/cc @ 25 °C
Total alkalinity	:	918	Each as CaCO3

Cations

		mg/l	meq/l
Calcium	(Ca):	160.0	7.98
Magnesium	(Mg):	40.0	3.29
Sodium	(Na):	5690.0	247.50
Potassium	(K):	2030.0	51.92
Iron	(Fe)	0.00	0.00
Strontium	(Sr)	0.00	0.00

Anions

		mg/l	meq/l
Hydroxide	(OH):	0.0	0.00
Carbonate	(CO3):	0.0	0.00
Bi-Carbonate	(HCO3):	1119.3	18.34
Sulphate	(SO4):	156.0	3.25
Chloride	(Cl):	9288.0	262.00
Nitrate	(NO3):	5.0	0.08

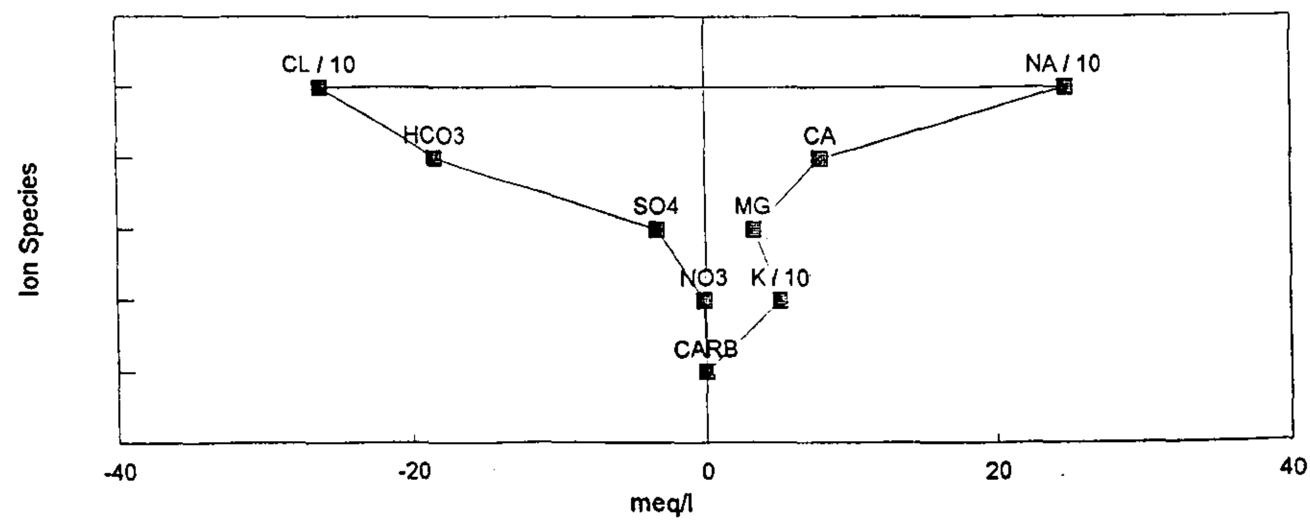
Total dissolved solids

		mg/l
Calculated (HCO3=CO3)	:	17919
From Conductivity	:	15825
Salinity (ppt)	:	16765

Hardness

Carbonate	:	564
Non-Carbonate	:	0
Total	:	564

STIFF DIAGRAM



5 cm

PETROLAB

FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
Cylinder Number L-395, Ex MPSR-BA # 0156, Depth 2815.0 m

Component		Mol %
Hexanes minus	C6-	1.63
Hexanes	C6	2.25
Heptanes	C7	8.39
Octanes	C8	9.97
Nonanes	C9	17.05
Decanes	C10	12.30
Undecanes	C11	8.28
Dodecanes	C12	6.57
Tridecanes	C13	6.39
Tetradecanes	C14	4.28
Pentadecanes	C15	5.31
Hexadecanes	C16	3.40
Heptadecanes	C17	3.82
Octadecanes	C18	1.97
Nonadecanes	C19	1.64
Eicosanes	C20	1.50
Heneicosanes	C21	1.20
Docosanes	C22	1.14
Tricosanes	C23	0.95
Tetracosanes	C24	0.70
Pentacosanes	C25	0.52
Hexacosanes	C26	0.33
Heptacosanes	C27	0.23
Octacosanes	C28	0.12
Nonacosanes	C29	0.04
Triacontanes	C30	0.01
Hentriacontanes	C31	0.01
Dotriacontanes	C32	0.00
Tritriacontanes	C33	0.00
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

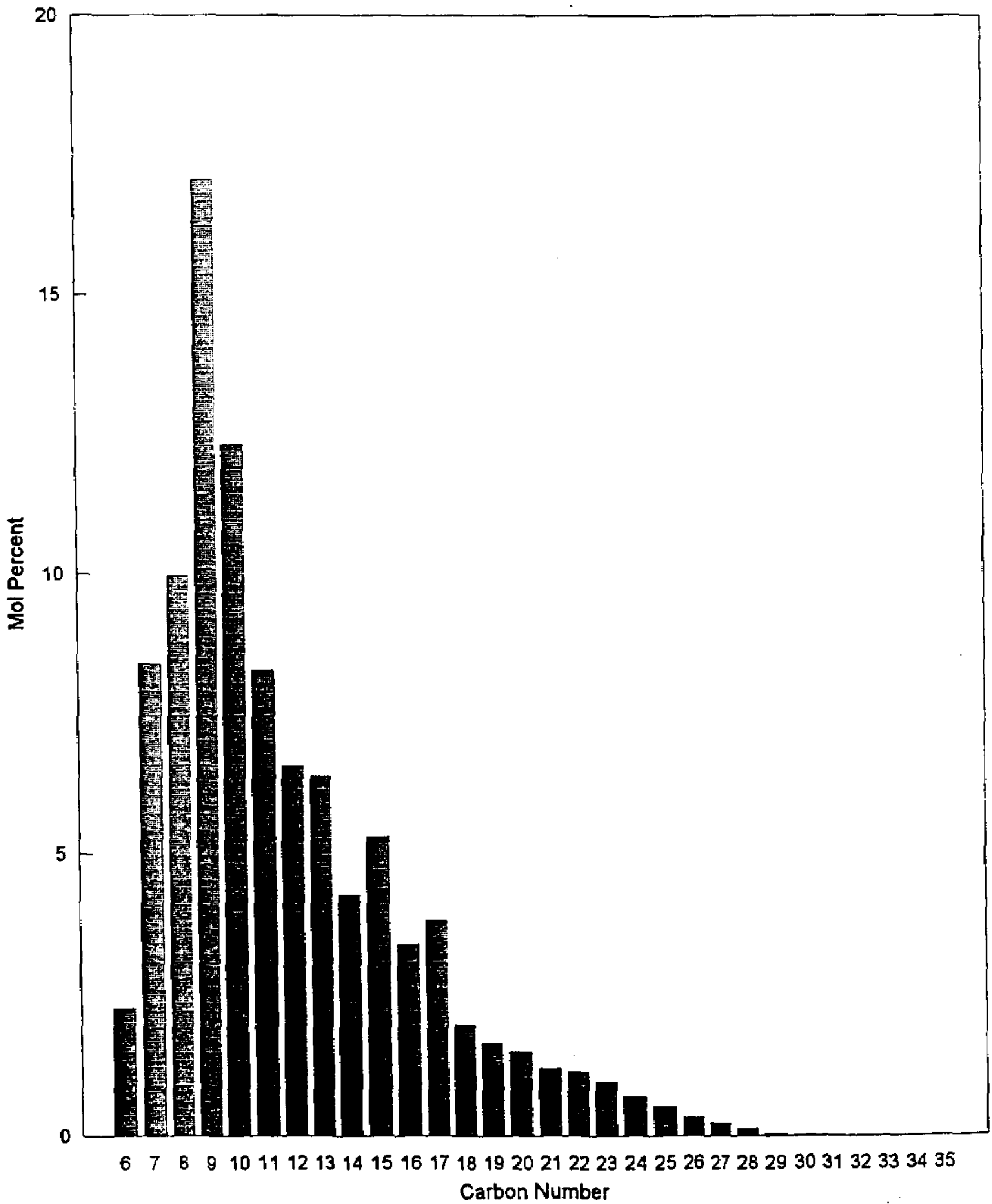
Molecular Weight Calculated *	:	159.1
Density @ 60 °F Calculated *	:	0.8001

*Calculation based on generalized properties as published by Katz and Firoozabadi

PETROLAB

Company : Premier Oil Australia Pty. Ltd.	Page : 9 of 22
Well : Yolla # 2	File : P 98029

FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
Cylinder Number L-395, Ex MPSR-BA # 0156 Depth 2815.0 m



5 cm

PETROLAB

COMPOSITIONAL ANALYSIS OF BOTTOM HOLE SAMPLE
Cylinder Number L-395, Ex MPSR-BA # 0156, Depth 2815.0 m

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.22	14.37	14.26
Nitrogen	N2	0.00	0.33	0.33
Methane	C1	0.43	72.91	72.37
Ethane	C2	0.22	5.92	5.88
Propane	C3	0.26	1.95	1.94
Iso-Butane	iC4	0.14	0.41	0.41
N-Butane	nC4	0.51	1.02	1.02
Iso-Pentane	iC5	0.48	0.36	0.36
N-Pentane	nC5	0.66	0.38	0.38
Hexanes	C6	2.22	0.55	0.56
Heptanes	C7	8.28	0.76	0.82
Octanes	C8	9.84	0.47	0.54
Nonanes	C9	16.81	0.39	0.51
Decanes	C10	12.14	0.16	0.25
Undecanes	C11	8.17	0.02	0.08
Dodecanes Plus	C12+	39.61	0.00	0.29
TOTAL		100.00	100.00	100.00
Ratios				
Molar Ratio	:	0.0074	0.9926	1.0000
Mass Ratio	:	0.0458	0.9542	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	–	–
Gas Liquid Ratio	:	1.0000 bbl @ SC	90319 SCF	–
Stream Properties				
Molecular Weight	:	157.1	24.53	25.5
Density obs. (gm/cc)	:	0.7990 @ 60 °F	–	–
Gravity (AIR = 1.000)	:	45.4 °API @ 60 °F	0.850	0.880
GHV (BTU/scf)	:	–	1105	1153
Hexanes Plus Properties				
Mol %	:	97.09	2.35	3.05
Molecular Weight	:	160.2	102.6	116.4
Density (gm/cc @ 60 °F)	:	0.8023	0.6924	0.7248
Gravity (°API @ 60 °F)	:	44.7	72.7	63.5
Heptanes Plus Properties				
Mol %	:	94.86	1.80	2.49
Molecular Weight	:	162.0	108.2	123.4
Density (gm/cc @ 60 °F)	:	0.8039	0.6996	0.7350
Gravity (°API @ 60 °F)	:	44.3	70.6	60.8
Decanes Plus Properties				
Mol %	:	59.93	0.18	0.62
Molecular Weight	:	191.6	84.0	136.8
Density (gm/cc @ 60 °F)	:	0.8240	0.6661	0.8240
Gravity (°API @ 60 °F)	:	40.1	80.7	40.1
Undecanes Plus Properties				
Mol %	:	47.78	0.02	0.37
Molecular Weight	:	206.2	147.0	195.3
Density (gm/cc @ 60 °F)	:	0.8321	0.7400	0.8321
Gravity (°API @ 60 °F)	:	38.4	59.5	38.4
Dodecanes Plus Properties				
Mol %	:	39.61	0.00	0.29
Molecular Weight	:	218.5	–	218.5
Density (gm/cc @ 60 °F)	:	0.8385	–	0.8385
Gravity (°API @ 60 °F)	:	37.1	–	37.1

* (P)ressure : 3660 psig * (T)emperature : 253 °F

PETROLAB

FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
Cylinder number L-453, Ex MPSR-BA # 0160, Depth 2802.0 m

Component		Mol %
Hexanes minus	C6-	1.83
Hexanes	C6	2.33
Heptanes	C7	9.15
Octanes	C8	10.43
Nonanes	C9	16.68
Decanes	C10	11.01
Undecanes	C11	7.12
Dodecanes	C12	6.23
Tridecanes	C13	5.71
Tetradecanes	C14	3.33
Pentadecanes	C15	4.82
Hexadecanes	C16	3.12
Heptadecanes	C17	3.79
Octadecanes	C18	2.29
Nonadecanes	C19	1.88
Eicosanes	C20	1.88
Heneicosanes	C21	1.67
Docosanes	C22	1.46
Tricosanes	C23	1.36
Tetracosanes	C24	1.06
Pentacosanes	C25	0.85
Hexacosanes	C26	0.65
Heptacosanes	C27	0.51
Octacosanes	C28	0.33
Nonacosanes	C29	0.25
Triacontanes	C30	0.15
Hentriacontanes	C31	0.07
Dotriacontanes	C32	0.03
Tritriacontanes	C33	0.01
Tetratriacontanes	C34	0.00
Pentatriacontanes Plus	C35+	0.00
TOTAL		100.00

Molecular Weight Calculated *	:	164.9
Density @ 60 °F Calculated *	:	0.8050

*Calculation based on generalized properties as published by Katz and Firoozabadi

565442

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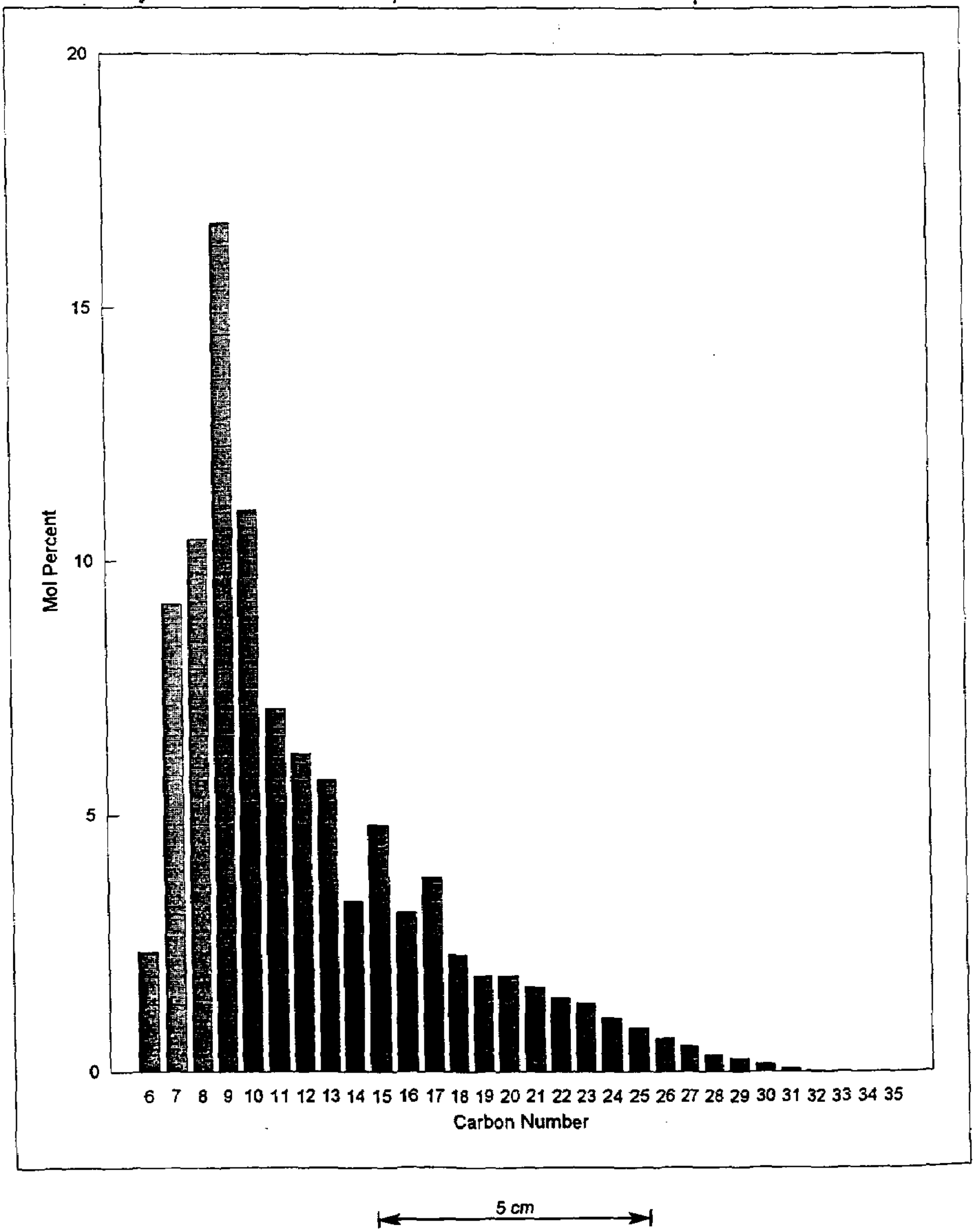
FINGERPRINT ANALYSIS
BY CAPILLARY GAS CHROMATOGRAPHY
Cylinder number L-453, Ex MPSR-BA # 0160 Depth 2802.0 m



PETROLAB

Company : Premier Oil Australia Pty. Ltd.	Page : 13 of 22
Well : Yolla # 2	File : P 98029

COMPOSITIONAL ANALYSIS OF BOTTOM HOLE SAMPLE
Cylinder number L-453, Ex MPSR-BA # 0160, Depth 2802.0 m

Component		Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	0.30	19.66	19.46
Nitrogen	N2	0.00	0.18	0.18
Methane	C1	0.40	67.66	66.96
Ethane	C2	0.23	6.41	6.35
Propane	C3	0.36	2.71	2.69
Iso-Butane	iC4	0.18	0.53	0.53
N-Butane	nC4	0.40	0.81	0.81
Iso-Pentane	iC5	0.35	0.27	0.27
N-Pentane	nC5	0.47	0.28	0.28
Hexanes	C6	2.31	0.41	0.43
Heptanes	C7	9.07	0.56	0.65
Octanes	C8	10.34	0.29	0.39
Nonanes	C9	16.53	0.19	0.36
Decanes	C10	10.91	0.04	0.15
Undecanes	C11	7.06	0.00	0.07
Dodecanes Plus	C12+	41.09	0.00	0.42
TOTAL		100.00	100.00	100.00

		Stock Tank Liquid	Stock Tank Gas	Reservoir Fluid
Ratios				
Molar Ratio	:	0.0103	0.9897	1.0000
Mass Ratio	:	0.0630	0.9370	1.0000
Liquid Ratio (bbl/bbl)	:	1.0000 @ SC	--	--
Gas Liquid Ratio	:	1.0000 bbl @ SC	62830 SCF	--
Stream Properties				
Molecular Weight	:	163.0	25.33	26.7
Density obs. (gm/cc)	:	0.8044 @ 60 °F	--	--
Gravity (AIR = 1.000)	:	44.2 °API @ 60 °F	0.878	0.919
GHV (BTU/scf)	:	--	1018	1086
Hexanes Plus Properties				
Mol %	:	97.31	1.49	2.47
Molecular Weight	:	166.1	99.0	126.79
Density (gm/cc @ 60 °F)	:	0.8073	0.6878	0.75
Gravity (°API @ 60 °F)	:	43.6	74.0	57.79
Heptanes Plus Properties				
Mol %	:	95.00	1.08	2.04
Molecular Weight	:	168.1	104.8	135.09
Density (gm/cc @ 60 °F)	:	0.8091	0.6953	0.76
Gravity (°API @ 60 °F)	:	43.2	71.8	54.79
Decanes Plus Properties				0.00
Mol %	:	59.06	0.04	0.64
Molecular Weight	:	203.1	84.0	190.69
Density (gm/cc @ 60 °F)	:	0.8311	0.6661	0.8311
Gravity (°API @ 60 °F)	:	38.6	80.7	38.6
Undecanes Plus Properties				
Mol %	:	48.15	0.00	0.49
Molecular Weight	:	218.7	--	218.7
Density (gm/cc @ 60 °F)	:	0.8390	--	0.8390
Gravity (°API @ 60 °F)	:	37.0	--	37.0
Dodecanes Plus Properties				
Mol %	:	41.09	0.00	0.42
Molecular Weight	:	231.0	--	231.0
Density (gm/cc @ 60 °F)	:	0.8449	--	0.8449
Gravity (°API @ 60 °F)	:	35.8	--	35.8

* (P)ressure : 4788 psig * (T)emperature : 253 °F

PETROLAB

CONSTANT MASS STUDY

@ 253 °F

Cylinder number L-453, Ex MPSR-BA # 0160, Depth 2802.0 m

Pressure (psig)		Relative Volume (V/Vsat) (1)	Formation Volume Factor (Bg) (2)	Gas Expansion Factor (E) (3)	Deviation Factor (Z)	Specific Volume (CFT/LB)	Gas Viscosity (Centipoise) (4)
6000		0.8785	0.00353	283.04	1.054	0.05024	0.0407
5750		0.8983	0.00361	276.79	1.033	0.05137	0.0394
5500		0.9209	0.00370	270.01	1.013	0.05266	0.0380
5400		0.9305	0.00374	267.23	1.005	0.05321	0.0375
5300		0.9405	0.00378	264.40	0.997	0.05378	0.0369
5200		0.9508	0.00382	261.52	0.989	0.05437	0.0364
5100		0.9615	0.00387	258.60	0.981	0.05499	0.0358
5000		0.9727	0.00391	255.62	0.973	0.05563	0.0353
4900		0.9854	0.00396	252.34	0.966	0.05635	0.0347
4788	**	1.0000	0.00402	248.65	0.958	0.05719	0.0341

** Dew Point Pressure

(1) Cubic feet of gas at indicated pressure and temperature per cubic foot at reservoir pressure
(2) Cubic feet of gas at indicated pressure and temperature per cubic foot at 14.696 psia and 60 °F
(3) Cubic feet of gas at 14.696 psia and 60 °F per cubic foot at indicated pressure and temperature
(4) Calculated from correlation of Lee, Gonzales and Eakin

PETROLAB

CONSTANT MASS STUDY
@ 253 °F
Cylinder number L-453, Ex MPSR-BA # 0160, Depth 2802.0 m

Pressure (psig)	Relative Volume (V/Vsat) (1)	Retrograde Liquid Deposit (Bbl/MMSCF) (2)	(Volume%) (3)
4788 *	1.0000	0.00	0.00
4450	1.0499	1.22	0.17
4154 **	1.1015	1.93	0.27
3848	1.1681	2.46	0.34
3524	1.2552	2.95	0.41
3261	1.3422	3.35	0.47
2930	1.4786	3.76	0.53
2600	1.6585	4.17	0.58
2300	1.8691	4.53	0.63
2000	2.1549	4.87	0.68
1725	2.5157	5.16	0.72
1500	2.9192	5.39	0.75

* Dew Point Pressure
** Reservoir Pressure

(1) Cubic feet of gas at indicated pressure and temperature per cubic foot at saturation pressure
(2) Barrels of liquid at indicated pressure and temperature per MMSCF of original reservoir fluid
(3) Percent of reservoir hydrocarbon pore space at dew point

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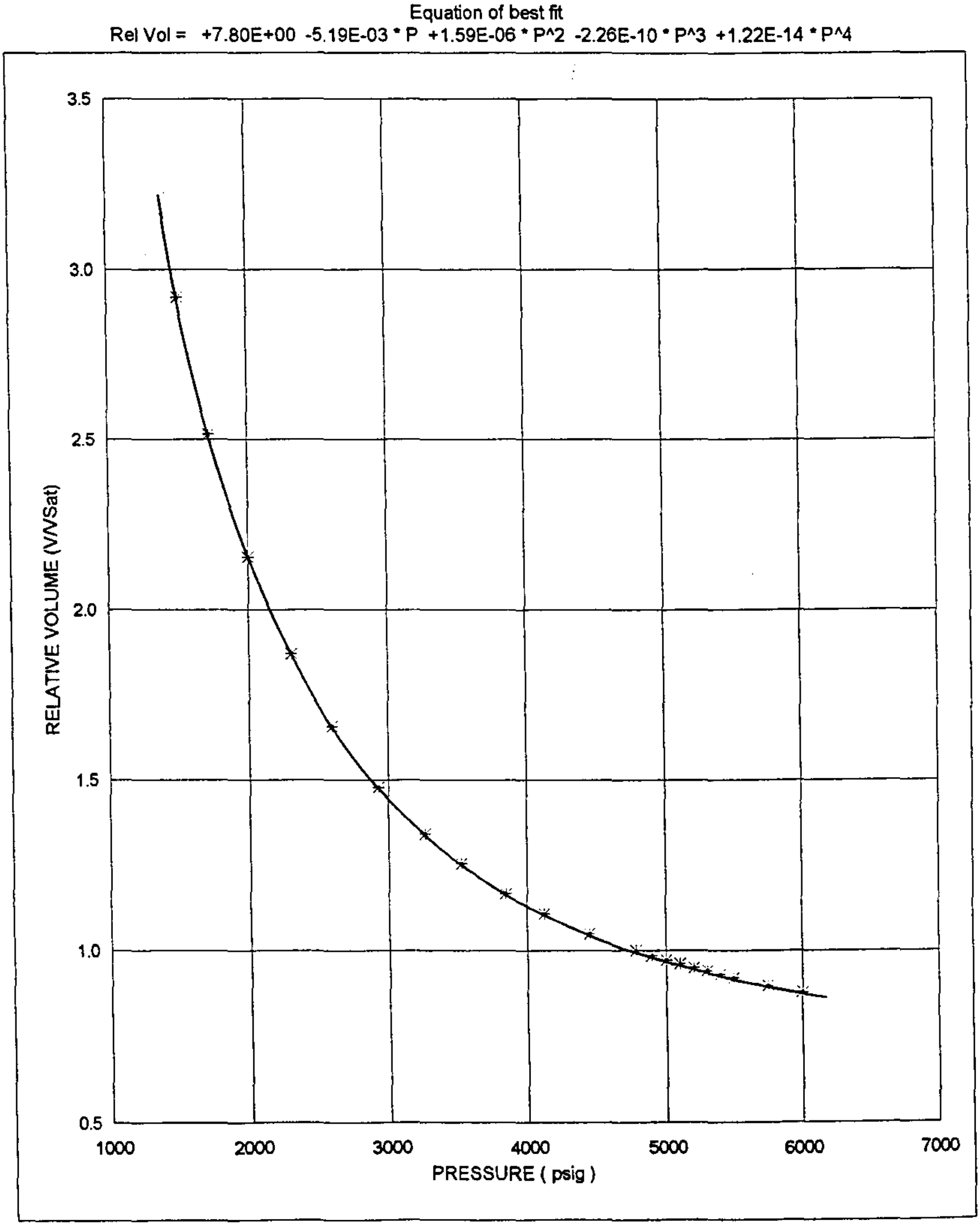
RELATIVE VOLUME



5 cm

PETROLAB

Company : Premier Oil Australia Pty. Ltd.	Page : 17 of 22
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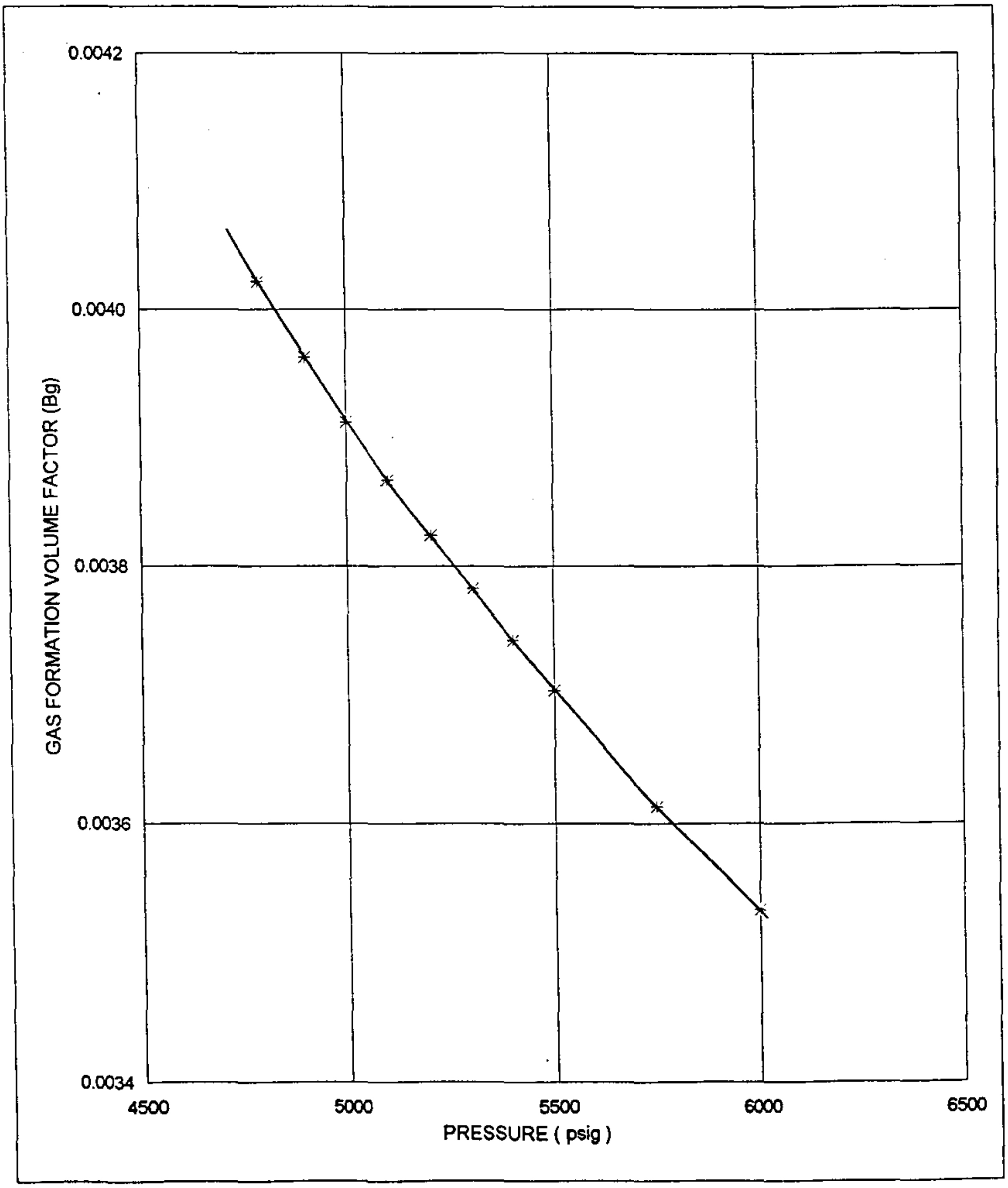
GAS FORMATION VOLUME FACTOR

Equation of best fit

$Bg = +1.34E-02 \ -4.13E-06 * P \ +6.03E-10 * P^2 \ -3.17E-14 * P^3$



5 cm

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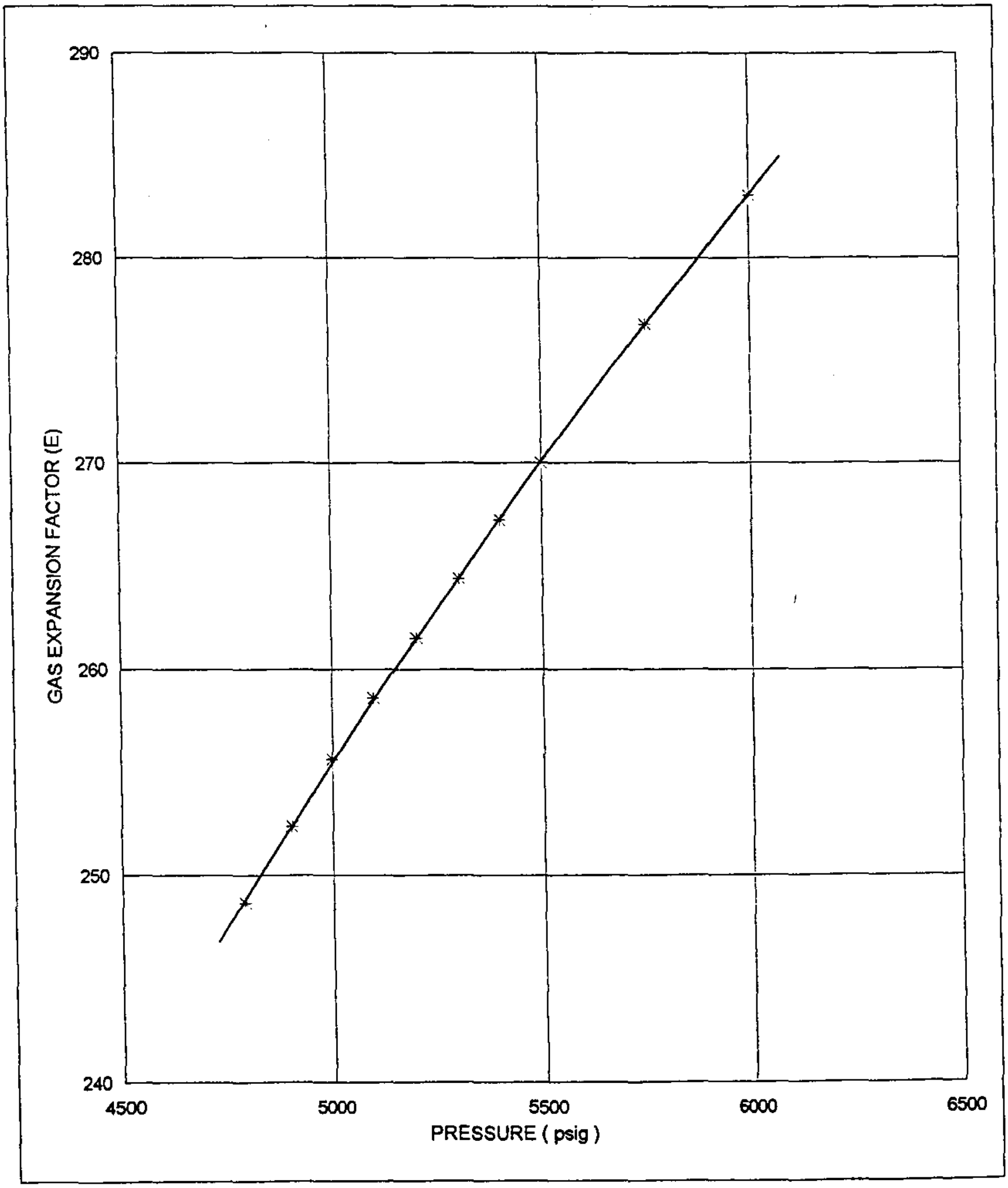
GAS EXPANSION FACTOR

Equation of best fit

E = -1.54E+02 +1.60E-01 * P -2.12E-05 * P^2 +1.11E-09 * P^3



5 cm

PETROLAB

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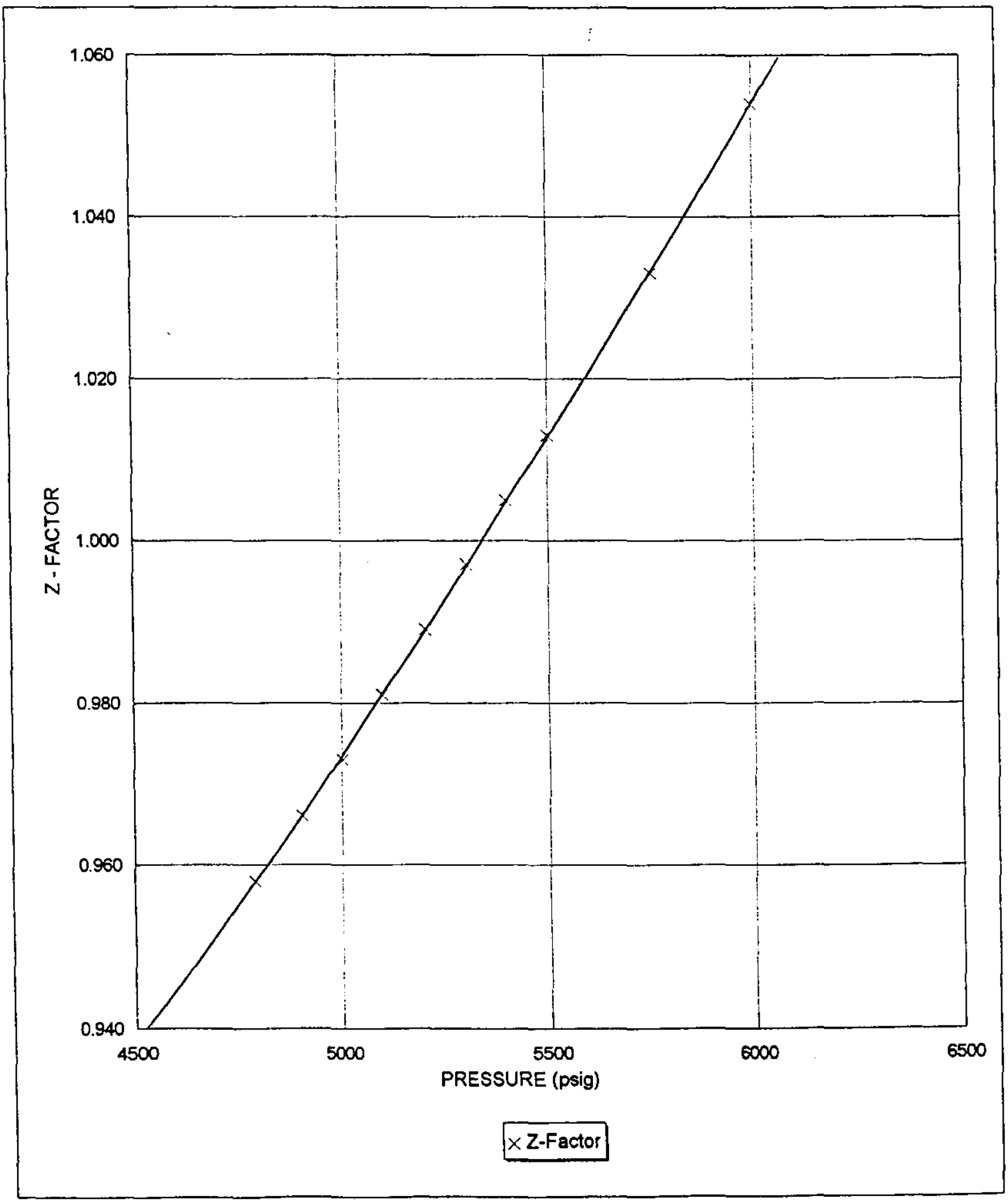
GAS DEVIATION FACTOR

Equation of best fit

Z

Z = +-6.83E-01 +1.74E-03 * P +-1.23E-06 * P^2 +3.07E-10 * P^3 +-2.38E-14 * P^4



5 cm

PETROLAB

Company : Premier Oil Australia Pty. Ltd.	Page : 20 of 22
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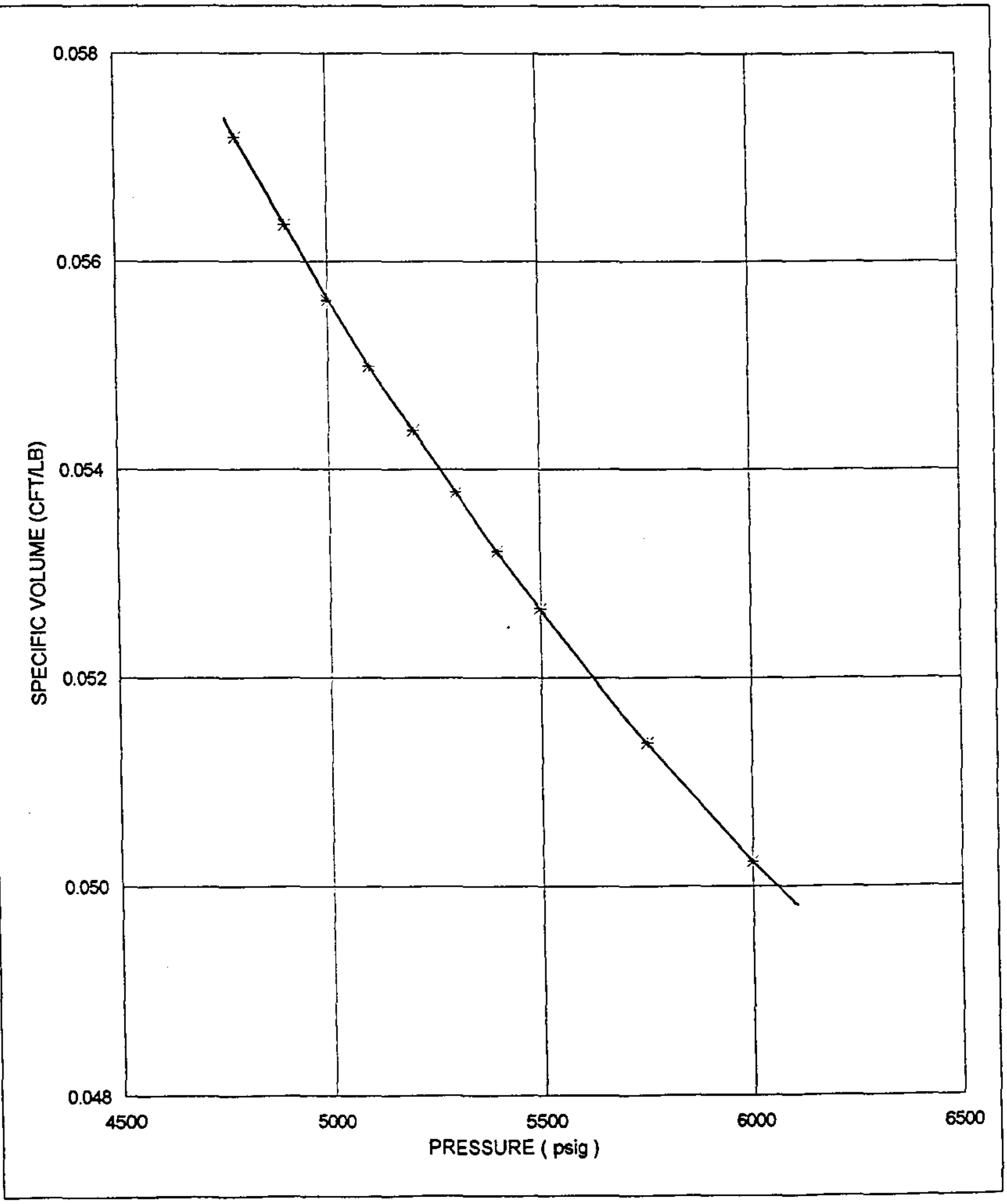
RESERVOIR FLUID SPECIFIC VOLUME

Equation of best fit
SV = +1.91E-01 -5.87E-05 * P +8.57E-09 * P^2 -4.51E-13 * P^3



5 cm

PETROLAB

Company : Premier Oil Australia Pty. Ltd.	Page : 21 of 22
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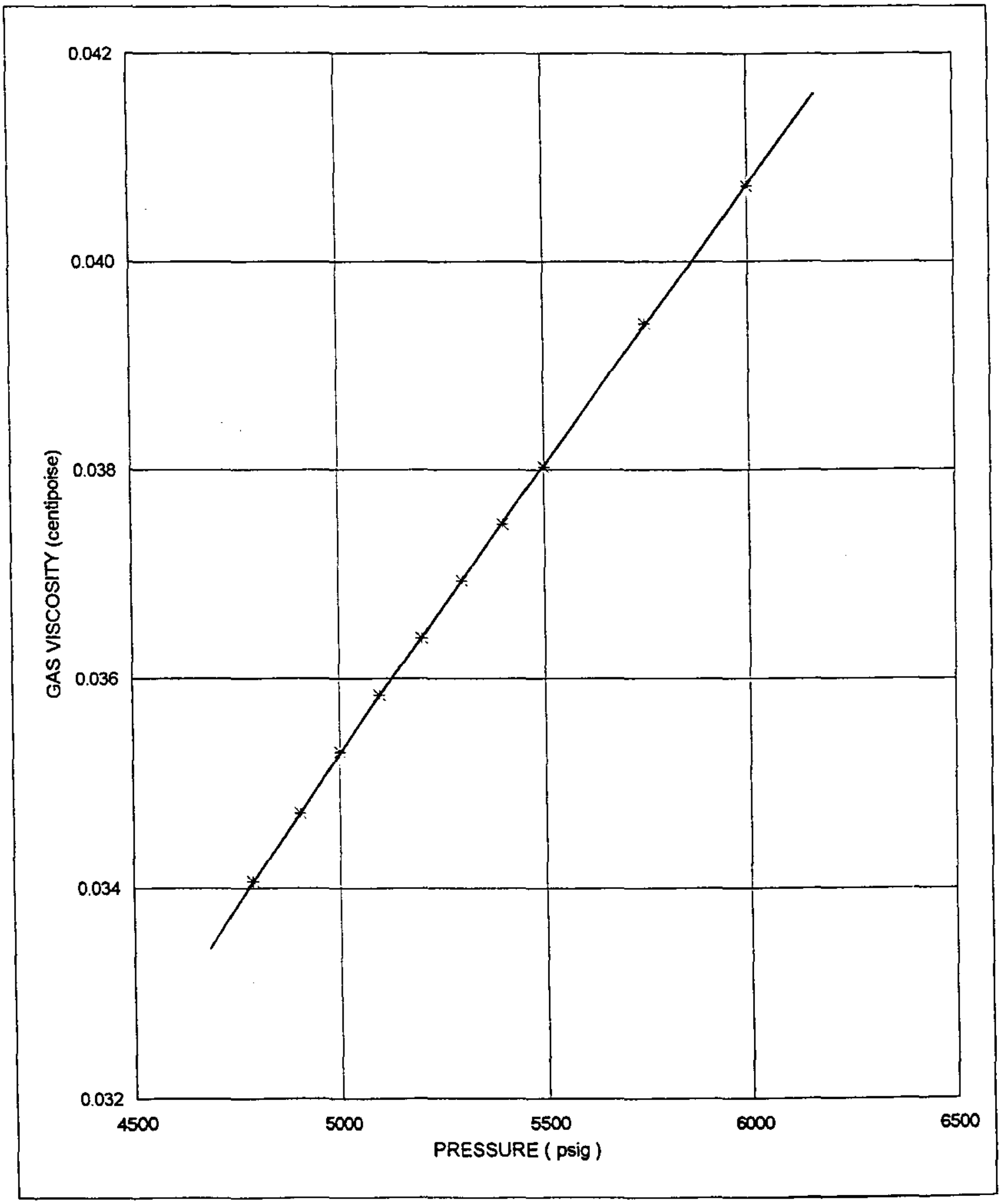
VISCOSITY OF RESERVOIR FLUID

Equation of best fit

μ = -1.43E-02 +1.70E-05 * P -2.00E-09 * P^2 +1.14E-13 * P^3



5 cm

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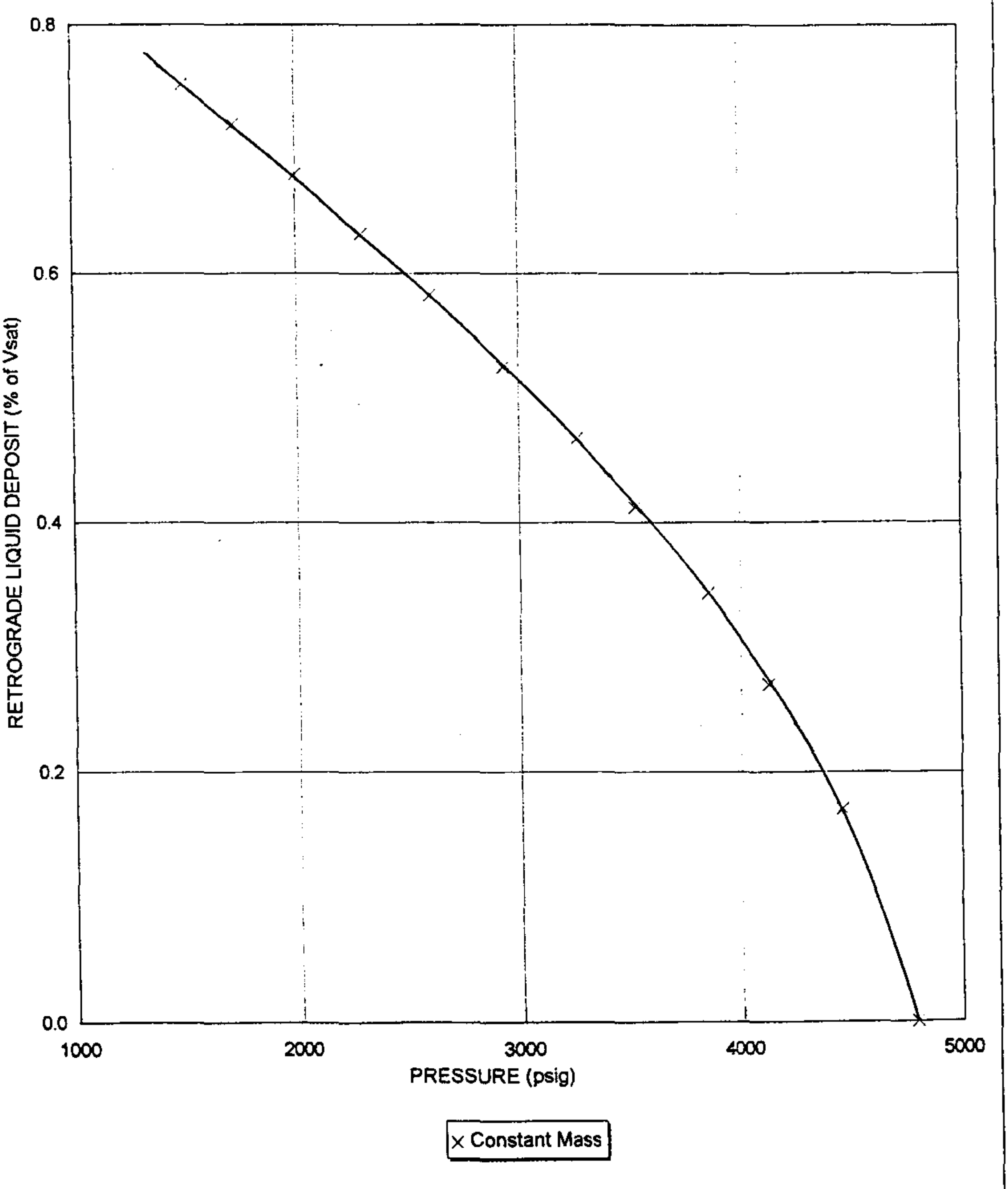
RETROGRADE CONDENSATION

Equation of best fit
RLD = +5.03E-01 +6.10E-04 * P -4.37E-07 * P^2 +1.08E-10 * P^3 -1.01E-14 * P^4



5 cm

565453

ENCLOSURE 1
OR. 0447

PremierOil
Australasia
COMPOSITE WELL LOG
Yolla 2

5 cm

Scale 1:500

LOCATION :	LAT. : 39° 51' 33.889" S LONG. : 145° 48' 38.493" E	**PERMIT :**	T / RL1
ELEVATIONS :	RKB : 12.5m G.L. : -81.5m	**TOTAL DEPTH :**	3164m
REGION :	BASS BASIN	**WELL STATUS :**	PLUGGED AND ABANDONED
RIG :	NORTHERN EXPLORER III	**PERFORATIONS :**	
DRILLING CONTRACTOR :	NORTHERN OFFSHORE	**WELLSITE GEOLOGISTS :**	CLOTA/FRANKIEWITZ
DATE SPUDDED :	21:00 hrs 9/4/98	**WIRELINE LOGGING BY :**	SCHLUMBERGER
DATE AT TOTAL DEPTH :	01:00 hrs 14/5/98	**CEMENTING :**	HALIBURTON
DATE RIG RELEASED :	13:00 hrs 30/5/98	**MUD LOGGING BY :**	GEOSERVICE
LOG COMPILATION :	SINGLETON	**DRAFTING :**	Bibra Drafting Service

ELECTRIC LOGS DATA

LOG SUITE NUMBER	1/1	1/2	1/3	1/4
LOG TYPE/COMBINATION	PEX (HALS)-BHC	MDT	MDT	VSP
DATE	16 MAY 1998	16 MAY 1998	17 MAY 1998	18 MAY 1998
INTERVAL RECORDED	1065 -3084m	3064-1876m	3064-1876m	3050-840m
MUD TYPE	KCL / PHPA	KCL / PHPA	KCL / PHPA	KCL / PHPA
MUD DENSITY	1.13sg	1.13sg	1.13sg	1.13sg
Rmf @ TEMP MEAS.	0.149 @ 19°C	0.149 @ 19°C	0.149 @ 19°C	0.149 @ 19°C
MEASURED BHT	114°C	132°C	132°C	135°C

OTHER LOGS

1/5	1/6
CMR	FMS - NGT
18 MAY 1998	19 MAY 1998
3055-2860m	3081-1800m
KCL / PHPA	KCL / PHPA
1.13sg	1.13sg
0.149 @ 19°C	0.149 @ 19°C
140°C	142°C

CASING

SIZE	WEIGHT	INTERVAL
762mm	310 lb/ft	151.9m
340mm	68 lb/ft	853m

CEMENT PLUGS

FROM	TO	CEMENT
3090	3000	
2850	2760	
1940	1850	
835	805	
175	130	

HOLE SIZE

SIZE	FROM	TO
26"/36"	94m	152m
17.50"	152m	862m
12.25"	862m	3164m

CORING

CORE No.	FROM	TO	CUT	REC	FORMATION
1	3033	3050.5	17.7	17.7	EVCM

DST

DST No.	INTERVAL	FORMATION	RESULTS
1	NO DST's CARRIED OUT ON YOLLA-2		
2			

LITHOLOGY SYMBOLS

ROCK TYPE

SANDSTONE (coarse) · SANDSTONE (fine) · SILTSTONE · CLAYSTONE · CONGLOMERATE · TILLITE · COAL · LIMESTONE · LIMESTONE (recrystallised) · CALCARENITE · CALCISILTITE · CALCILUTITE · MARL · DOLOMITE · HALITE · GYPSUM · ANHYDRITE · VOLCANICS · IGNEOUS BASEMENT · METAMORPHIC BASEMENT · SHALE

OTHER CONSTITUENTS

ARGILLACEOUS · GLAUCONITIC · FELDSPATHIC · MICACEOUS · CARBONACEOUS · PYRITE · PLANT REMAINS · CALCAREOUS · DOLOMITIC · CHERT · FORAMINFERA · SKELETAL FRAGMENTS · RADIOLARIA · FOSSILS

ENGINEERING SYMBOLS

CASING SEAT · PLUGGED INTERVAL · DRILL STEM TEST · PERFORATED INTERVAL · CORE No. AND INTERVAL (RECOVERED / NON RECOVERED) · 19.88 / 32.09 / 21.42 AV. Sw (%) AV. Phi (%) · Modular Dynamic Tester MDT · MDT SAMPLE RECOVERED

SHOW LEGEND

MODERATE TO STRONG OIL SHOW · MODERATE TO STRONG GAS SHOW · MINOR OIL SHOW · MINOR GAS SHOW

Yolla-2.dgn

GAMMA RAY 0–200 / HIGH RESOLUTION CALIPER 6–16 / BS 6–16 / SP -80–20	DEPTH M 1:500	INTERPRETED LITHOLOGY	MUD RESISTIVITY .20–2000 / DEEP LATEROLOG RESISTIVITY .20–2000 / HIGH RES SHALLOW LATEROLOG .20–2000 / MICRO RESISTIVITY FROM RXO TOOL .20–2000	NUCLEAR FORMATION DENSITY 1.95–2.95 / THERMAL NEUTRON POROSITY .45–-.15 / DELTA T 240–40	LITHOLOGICAL DESCRIPTION	STRATIGRAPHIC UNIT	SERIES / EPOCH	PERIOD

TORQUAY GROUP 81m MD

855 - 1075m

Claystone: light grey-very light grey, medium light grey, soft-firm, amorphous ip, blocky-subblocky, sticky, grades to Calcilutite ip, slightly-moderately calcareous, common mica flakes, trace black carbonaceous specks / laminae, trace forams, trace bryozoans, trace-abundant fossil fragments, trace pyrite nodules.
Limestone: off white-yellow greyvpl orangelight grey, light-medium grey, plastic, sticky, moderately-very calcareous, slightly dolomitic, trace cryptocrystalline, trace medium brown-black oxidised Fe, trace very fine grained quartz silt, trace nautilus, shell fragments, coral, trace-common fossil fragments, trace very fine grained quartz silt, trace disseminated & nodular pyrite, trace calcite.
Siltstone: light grey, very fine grained quartz, w/ light brown dolomitic matrix, poor vis porosity, no fluor.

ANGAHOOK UNIT 1 1075m MD

1075 - 1265m

Claystone: light grey-very light grey, occasionally light brown grey & light medium grey-medium dark grey, calcareous, arenaceous ip, silty, grades to Siltstone, common black carbonaceous specks, trace micromica, soft-sticky, occasionally firm, blocky-subblocky, fissile ip, trace coal, trace-common disseminated pyrite, trace pyrite nodules, trace fossil fragments, trace red lithics, tracerare siderite.
Limestone: light grey-medium grey, off white-yellow grey, gen soft-sticky, mod hard ip, plastic, moderately-very calcareous, slightly dolomitic ip, microcrystalline, grades to Calcarenite ip, trace calcite, trace shell fragments, trace forams.
Sandstone: light grey, rounded-subrounded, very fine grained, grades to Calcisiltite ip, poor vis porosity, no fluor.
Coal: dark brown-black, firm-hard, silty, common disseminated pyrite.

ANGAHOOK UNIT 2 1265.5m MD

1265 - 1278m

Volcanics (Tuff): white-light pale blue green, firm-soft, subblocky, very slightly calcareous, trace calcareous grains, trace quartz grains.

MIOCENE VOLCANICS 1278m MD

1278 - 1316m

Claystone: generally as above, dark grey-medium dark grey, non-silty calcareous, firm, blocky-subblocky, common disseminated pyrite, trace black carbonaceous specks, trace quartz grains, trace micromica.
Volcanics: as above
Sandstone: clear-transparent-translucent, very fine grained grades to Siltstone, occasionally fine grained, subrounded-rounded, well sorted, trace calcareous cement, predominantly loose, no vis porosity, no fluor.
Siltstone: yellow white-brown white, very fine-silt quartz grains, firm-hard aggregates, rounded-subangular, well sorted, trace glauconite, trace carbonaceous specks, common strong calcareous cement, trace siliceous cement, mod-poor vis porosity, no fluor.

ANGAHOOK UNIT 3 1316m MD

1316 - 1468m

Siltstone: yellow white-brown white, very fine-silt quartz grains, firm-hard aggregates, rounded-subangular, well sorted, trace glauconite, trace carbonaceous specks, common strong calcareous cement, trace siliceous cement, mod-poor vis porosity, no fluor.
Limestone: yellow white-grey white, light brown orange, soft-firm, amorphous, cryptocrystalline-microcrystalline, trace calcareous, slightly dolomitic ip, trace fossil fragments, common pelletal glauconite inclusions, trace pyrite inclusions.

Claystone: dark grey-medium dark grey-light olive grey-moderate olive brown, light blue grey ip, argillaceous, non slightly calcareous, firm, blocky-subblocky, subfissile-fissile ip, common disseminated pyrite, trace black carbonaceous specks, trace quartz grains, trace-rare micromica, trace glauconite.
Sandstone: light grey-light brown, transparent-translucent grains, very fine grained, mod hard-hard, very well sorted, rounded-subrounded, minor glauconite, trace carbonaceous specks, strong calcareous cement, nil vis porosity, nil fluor.
Siltstone: very light grey-off white-light brown white, firm-moderately hard, occasionally hard, subblocky-blocky, moderate-strong calcareous cement, mod calcareous, very argillaceous, common very fine-fine grained quartz, grades to a Sandstone ip, trace-common glauconite, trace disseminated pyrite.

ANGAHOOK UNIT 4 1468m MD

1468 - 1492.5m

Limestone: medium-dark red brown, firm-hard, blocky, microcrystalline-cryptocrystalline, dolomitic, nil vis porosity.
Siltstone: very light grey-off white-light brown white, firm-moderately hard, occasionally hard, subblocky-blocky, mod calcareous, very argillaceous, common very fine-fine grained quartz, grades to a Sandstone ip, trace-common glauconite, trace disseminated pyrite, moderate-strong calcareous cement.
Claystone: light grey-light olive grey-light brown grey-medium grey, soft-occasionally firm, subblocky-blocky, mod-strong calcareous, argillaceous/silty ip, grading to arenaceous siltstone ip, trace-common glauconite, trace pyrite, trace carbonaceous specks, trace mica, trace fossil fragments

OLIGOCENE UNCONFORMITY 1492.5m MD

1492.5 - 1705.5m

Siltstone: very light grey-off white-light brown, becoming brown grey-medium brown-gr rd ip, firm-occasionally mod hard, subblocky-blocky, occasionally subfissile, mod calcareous, very argillaceous, common very fine-fine grained quartz, trace-common glauconite, trace disseminated pyrite, trace pyrite nodules, good calcareous cement, trace limonite(?), trace fossil fragments, poor vis porosity, trace dull yellow fluor, no cut fluor, grading ip toSandstone: light grey-light brown-pale yellow brown-medium brown, silt sized-very fine-fine grained, mod hard-hard, rounded-subrounded subangular, mod well sorted, trace glauconite, tr mod strong calcareous cement, tr dolomitic cement, grading to dolomitic siltstone ip, trace siliceous cement red w/ depth, common clay matrix, trace pyrite, trace micromica, trace carbonaceous specks, trace glauconite, trace limonite(?), trace coral, nil-poor vis porosity, trace dull yellow mineral fluor, no cut fluor, no residual ring.
Claystone: light grey-light olive grey-light brown grey-medium grey becoming medium olive grey-dark grey ip, soft-occasionally firm, subblocky-blocky, non-slightly calcareous, argillaceous/silty ip, grad to arenaceous siltstone ip, trace-common glauconite, trace micromica, trace-common pyrite nodules, trace carbonaceous specks, trace fossil fragments.
Dolomite: light-medium brown-dark yellow brown, occasionally pale yellow brown, very hard-hard, predominantly cryptocrystalline, occasionally microcrystalline, occasionally sucrosic-waxy text, trace very fine quartz grains, trace glauconite, argillaceous ip, grades to dolomitic siltstone ip, no vis porosity, no fluor.

DEMONS BLUFF 1705.5m MD

1705.5 - 1844m

Siltstone: grey brown-medium brown-dusky brown-dusky yellow brown, mod hardfirm, occasionally soft, dispersive-amorphous, subblocky-blocky, occasionally subfissile, argillaceous ip, mod dolomitic cement, common very fine grained quartz, grades to very fine grained Sandstone ip, trace glauconite, trace micromica, trace-common disseminated pyrite, trace pyrite nodules, trace fossil fragments.
Sandstone: light brown to moderate yellow brown, very fine-occasionally fine grained, firm-occasionally hard aggregates, rounded to subrounded, well sorted, trace pyrite, trace micromica, trace carbonaceous specks, trace fossil fragments, common dolomitic cement, trace siliceous cement, common clay matrix, poor inferred porosity, no fluor
Claystone: Light blue grey-dusky brown, dusky brown, occasionally dark grey-brown black-black, soft-plastic, occasionally firm, subblocky-blocky, occasionally subfissile-fissile, dispersive ip, non-slightly calcareous, trace very fine grained quartz, trace micromica, common disseminated pyrite, occasionally pyrite nodules, trace black carbonaceous specks, trace fossil fragments.
Dolomite: light-medium brown, firm-hard, occasionally soft, blocky, microcrystalline, silty, trace very fine grained quartz, grades to dolomitic Sandstone ip, dull yellow mineral fluor, no cut fluor.

TOP EVCM 1844m MD

1844 - 1876m

Claystone: dark grey-medium dark grey brown, occasionally pale yellow brown, silty, trace

STRATIGRAPHIC UNIT	SERIES / EPOCH	PERIOD
TORQUAY GROUP	MIOCENE TO RECENT	TERTIARY
ANGAHOOK UNIT 1	MIOCENE TO RECENT	TERTIARY
ANGAHOOK UNIT 2		
MIOCENE VOLCANICS		
ANGAHOOK UNIT 3	MIOCENE TO RECENT	TERTIARY
ANGAHOOK UNIT 4		
UNDIFFERENTIATED OLIGOCENE	OLIGOCENE	
DEMONS BLUFF FORMATION		TERTIARY

ANGAHOOK UNIT 2 — 1265.5m MD

1265 - 1278m

Volcanics (Tuff): white-light pale blue green, firm-soft, subblocky, very slightly calcareous, trace calcareous grains, trace quartz grains.

MIOCENE VOLCANICS — 1278m MD

1278 - 1316m

Claystone: generally as above, dark grey-medium dark grey, non-silty calcareous, firm, blocky-subblocky, common disseminated pyrite, trace black carbonaceous specks, trace quartz grains, trace micromica.
Volcanics: as above
Sandstone: clear-transparent-translucent, very fine grained grades to Siltstone, occasionally fine grained, subrounded-rounded, well sorted, trace calcareous cement, predominantly loose, no vis porosity, no fluor.
Siltstone: yellow white-brown white, very fine-silt quartz grains, firm-hard aggregates, rounded-subangular, well sorted, trace glauconite, trace carbonaceous specks, common strong calcareous cement, trace siliceous cement, mod-poor vis porosity, no fluor.

ANGAHOOK UNIT 3 — 1316m MD

1316 - 1468m

Siltstone: yellow white-brown white, very fine-silt quartz grains, firm-hard aggregates, rounded-subangular, well sorted, trace glauconite, trace carbonaceous specks, common strong calcareous cement, trace siliceous cement, mod-poor vis porosity, no fluor.
Limestone: yellow white-grey white, light brown orange, soft-firm, amorphous, cryptocrystalline-microcrystalline, trace calcareous, slightly dolomitic ip, trace fossil fragments, common pelletal glauconite inclusions, trace pyrite inclusions.

Claystone: dark grey-medium dark grey-light olive grey-moderate olive brown, light blue grey ip, argillaceous, non slightly calcareous, firm, blocky-subblocky, subfissile-fissile ip, common disseminated pyrite, trace black carbonaceous specks, trace quartz grains, trace-rare micromica, trace glauconite.
Sandstone: light grey-light brown, transparent-translucent grains, very fine grained, mod hard-hard, very well sorted, rounded-subrounded, minor glauconite, trace carbonaceous specks, strong calcareous cement, nil vis porosity, nil fluor.
Siltstone: very light grey-off white-light brown white, firm-moderately hard, occasionally hard, subblocky-blocky, moderate-strong calcareous cement, mod calcareous, very argillaceous, common very fine-fine grained quartz, grades to a Sandstone ip, trace-common glauconite, trace disseminated pyrite.

ANGAHOOK UNIT 4 — 1468m MD

1468 - 1492.5m

Limestone: medium-dark red brown, firm-hard, blocky, microcrystalline-cryptocrystalline, dolomitic, nil vis porosity.
Siltstone: very light grey-off white-light brown white, firm-moderately hard, occasionally hard, subblocky-blocky, mod calcareous, very argillaceous, common very fine-fine grained quartz, grades to a Sandstone ip, trace-common glauconite, trace disseminated pyrite, moderate-strong calcareous cement.
Claystone: light grey-light olive grey-light brown grey-medium grey, soft-occasionally firm, subblocky-blocky, mod-strong calcareous, argillaceous/silty ip, grading to arenaceous siltstone ip, trace-common glauconite, trace pyrite, trace carbonaceous specks, trace mica, trace fossil fragments

OLIGOCENE UNCONFORMITY — 1492.5m MD

1492.5 - 1705.5m

Siltstone: very light grey-off white-light brown, becoming brown grey-medium brown-gr rd ip, firm-occasionally mod hard, subblocky-blocky, occasionally subfissile, mod calcareous, very argillaceous, common very fine-fine grained quartz, trace-common glauconite, trace disseminated pyrite, trace pyrite nodules, good calcareous cement, trace limonite(?), trace fossil fragments, poor vis porosity, trace dull yellow fluor, no cut fluor, grading ip toSandstone: light grey-light brown-pale yellow brown-medium brown, silt sized-very fine-fine grained, mod hard-hard, rounded-subrounded subangular, mod well sorted, trace glauconite, tr mod strong calcareous cement, tr dolomitic cement, grading to dolomitic siltstone ip, trace siliceous cement red w/ depth, common clay matrix, trace pyrite, trace micromica, trace carbonaceous specks, trace glauconite, trace limonite(?), trace coral, nil-poor vis porosity, trace dull yellow mineral fluor, no cut fluor, no residual ring.
Claystone: light grey-light olive grey-light brown grey-medium grey becoming medium olive grey-dark grey ip, soft-occasionally firm, subblocky-blocky, non-slightly calcareous, argillaceous/silty ip, grad to arenaceous siltstone ip, trace-common glauconite, trace micromica, trace-common pyrite nodules, trace carbonaceous specks, trace fossil fragments.
Dolomite: light-medium brown-dark yellow brown, occasionally pale yellow brown, very hard-hard, predominantly cryptocrystalline, occasionally microcrystalline, occasionally sucrosic-waxy text, trace very fine quartz grains, trace glauconite, argillaceous ip, grades to dolomitic siltstone ip, no vis porosity, no fluor.

DEMONS BLUFF — 1705.5m MD

1705.5 - 1844m

Siltstone: grey brown-medium brown-dusky brown-dusky yellow brown, mod hardfirm, occasionally soft, dispersive-amorphous, subblocky-blocky, occasionally subfissile, argillaceous ip, mod dolomitic cement, common very fine grained quartz, grades to very fine grained Sandstone ip, trace glauconite, trace micromica, trace-common disseminated pyrite, trace pyrite nodules, trace fossil fragments.
Sandstone: light brown to moderate yellow brown, very fine-occasionally fine grained, firm-occasionally hard aggregates, rounded to subrounded, well sorted, trace pyrite, trace micromica, trace carbonaceous specks, trace fossil fragments, common dolomitic cement, trace siliceous cement, common clay matrix, poor inferred porosity, no fluor
Claystone: Light blue grey-dusky brown, dusky brown, occasionally dark grey-brown black-black, soft-plastic, occasionally firm, subblocky-blocky, occasionally subfissile-fissile, dispersive ip, non-slightly calcareous, trace very fine grained quartz, trace micromica, common disseminated pyrite, occasionally pyrite nodules, trace black carbonaceous specks, trace fossil fragments.
Dolomite: light-medium brown, firm-hard, occasionally soft, blocky, microcrystalline, silty, trace very fine grained quartz, grades to dolomitic Sandstone ip, dull yellow mineral fluor, no cut fluor.

TOP EVCM — 1844m MD

1844 - 1876m

Claystone: dark grey-medium dark grey brown, occasionally pale yellow brown, silty, trace calcareous, trace micromica, soft-dispersive, amorphous.
Siltstone: dark grey-medium dark brown-dusky yellow brown, soft-dispersive, occasionally firm-hard, blocky-subblocky, trace calcareous, very argillaceous, good dolomitic cement, trace micromica, trace pyrite, occasional very fine grained quartz, occasionally subfissile.
Sandstone: pale green grey, very fine to fine grained quartz, moderately hard friable aggregates, occasionally loose grains, moderately good sphericity, subangular to subrounded, well sorted, common-abundant glauconite, trace carbonaceous specks, trace weak calcareous cement, common siliceous matrix, moderately-poor inferred porosity, no fluor.

1876 - 1944m

Siltstone: dark grey-medium dark brown-dusky yellow brown, soft-dispersive, occasionally firm-hard, blocky-subblocky, occasionally subfissile, trace calcareous, very argillaceous, good dolomitic cement, trace-common micromica, trace pyrite, trace glauconite, common carbonaceous laminae, occasionally very fine grained quartz.
Claystone: dark grey-medium dark grey brown, occasionally pale yellow brown, soft-dispersive, amorphous, silty, trace calcareous, trace micromica.
Coal: black-brown black-very dark brown, subfissile-blocky, brittle, dull-metallic-subvitreous lustre, silty, subconchoidal fracture common disseminated pyrite, trace quartz grains.
Sandstone: light brown grey-pale light green grey, very fine to coarse grained, predominantly coarse, commonly moderately hard aggregates, moderately good sphericity, rounded-subangular, moderately sorted, mainly siliceous cement, w/ overgrowths, moderate calcareous cement, common disseminated pyrite, trace-common glauconite, trace carbonaceous mat, trace siderite, trace carbonaceous mat, trace siderite, moderate visual porosity.
FLUORESCENCE: trace-even pale yellow-white fluor, weak diffuse yellow white cut, slow bleeding crush cut fluor, thin yellow-milky white residual ring.

FLUORESCENCE: trace solid dull yellow green-yellow fluor, very weak diffuse dull yellow cut fluor, bleeding milky white crush cut fluor, milky white residual ring.

FLUORESCENCE: moderate solid yellow green fluorescence, green yellow-white instant streaming cut fluor, yellow white crush cut fluor, trace milky white residual ring.

Sandstone: light grey, translucent, very fine to coarse grained, predominantly coarse, common moderately hard, moderately good sphericity, rounded-subangular, moderately sorted, common disseminated pyrite, trace-common glauconite, trace carbonaceous mat, trace siderite, mainly siliceous cement, overgrowths, moderate calcareous cement, moderate visual porosity, no fluor.
Sandstone: as above, w/ trace clay matrix, white-very light grey, soft-plastic, occasionally firm, non calcareous, slightly silty, occasionally carbonaceous laminae, blocky-subblocky.

1944 - 2166m

Sandstone: light grey, translucent, very fine-coarse grained, predominantly coarse, commonly moderate hard, firm aggregates, moderate good sphericity, rounded-subangular, moderately sorted, mainly siliceous cement, common disseminated pyrite, trace-common glauconite, tr carbonaceous matter, trace siderite, moderate calcareous cement, trace quartz overgrowths, moderate visual porosity, no fluorescence.
Claystone: light brown-light brown grey-light grey, soft-firm, subblocky-blocky, subfissile-fissile ip, non-slightly calcareous, trace very fine grained quartz , grades to Siltstone ips, argillaceous, trace black carbonaceous specksCoal: black-very dark brownish black, firm-moderately hard, blocky-subfissile, subconchoidal fracture, metallic-subvitreous lustre, common-abundant disseminated pyrite interbedded with the coal.
Siltstone: brown-dark brown, firm, occasionally hard, non calcareous, trace dolomitic cement, trace to common micromica, blocky-subfissile, trace very fine quartz grains, trace black carbonaceous specks/laminations, very carbonaceous ips, poor visual porosity, no fluorescence.

2166 - 2288m

Sandstone: light grey to light brown grey, very fine to fine, occasionally fine to medium, friable to moderately hard, subangular to subrounded, angular ip, moderate sorting, weak siliceous cement, locally dolomitic cement, common silty/argillaceous matrix, locally common kaolinitic matrix and inclusions, trace carbonaceous fragments, occasional muscovite flecks, trace argillaceous/carbonaceous microlaminae, poor to nil porosity.
Claystone: medium-dark grey, blue grey, grey brown ip, firm, blocky-platy ip, slightly micromicaceous, trace carbonaceous speck, trace disseminated pyrite, waxy texture.
Siltstone: medium brown, grey brown, soft to firm, massive to blocky, very argillaceous, slightly arenaceous, micromicaceous, trace carbonaceous fragments & miclaminae, trace lithic fragments, trace gastropods and coralline fragments ip.
Coal: black to brown black, subbituminous to bituminous, brittle, blocky, silty/argillaceous ip, dull-predominantly subvitreous to vitreous lustre, subconchiodal fracture.

2288 - 2328m

Sandstone: translucent, frosted, fine to predominantly medium, disaggregated to occasionally friable, subangular to subrounded, good sorting, weak dolomitic/sideritic cement ip, locally common kaolinitic matrix decreasing with depth, trace carbonaceous fragments, rare nodular pyrite, occasionally orange brown cryptocrystalline to microcrystalline hard dolomitic inclusions, fair to good porosity, occasionally dull orange mineral fluorescence only.
Siltstone: medium brown, grey brown, soft to firm, occasionally moderately hard, massive to blocky, locally very argillaceous grading to Claystone, micromicaceous, trace muscovite, occasionally fossil fragments, trace carbonaceous/coaly fragments & microlaminae, trace lithic fragments, slightly arenaceous ip.
Claystone: medium grey, medium dark grey, grey brown, firm, blocky, slightly silty ip, micromicaceous, trace carbonaceous speck, disseminated pyrite ip, trace glauconite/chlorite ip, waxy.

2328 - 2421m

Siltstone: medium brown, grey brown, soft to firm, occasionally moderately hard, massive to blocky, locally very argillaceous grading to Claystone, micromicaceous, trace muscovite, occasionally fossil fragments, trace carbonaceous/coaly fragments & microlaminae, trace lithic fragments, slightly arenaceous ip.
Sandstone: translucent-frosted grains, fine to predominantly medium, disaggregated to occasionally friable, subangular to subrounded, good sorting, weak dolomitic/sideritic cement ip, locally common kaolinitic matrix decreasing with depth, trace carbonaceous fragments, rare nodular pyrite, occasionally orange brown cryptocrystalline to microcrystalline hard dolomitic inclusions, fair to good porosity, occasionally dull orange mineral fluorescence only.
Claystone: medium grey, medium dark grey, grey brown, firm, blocky, slightly silty ip, micromicaceous, trace carbonaceous speck, disseminated pyrite ip, trace glauconite/chlorite ip, waxy.
Coal: black-dark brownish black, firm brittle, blocky-subfissile, moderately argillaceous, silty ip, waxy texture, vitreous to subvitreous lustre, conchoidal fracture.

2421 - 2473m

Sandstone: white to off white, light grey ip, very fine to occasionally fine, friable, subangular, good sorting, abundant kaolitic matrix, matrix supported grades to arenaceous siltstone ip, common sticky kaolitic aggregates, trace lithic fragments, trace altered feldspar(?) clasts, trace carbonaceous speck, nil porosity, no fluorescence.
Siltstone: brown grey, medium to dark brown, soft-firm, blocky-subfissile ip, moderately to very argillaceous locally grades to Claystone, micromicaceous, trace lithic fragments, locally common carbonaceous/coaly fragments.
Coal: (Tr) black, brown black ip, brittle, blocky, argillaceous, subbituminous to bituminous, subvitreous to locally vitreous lustre, subconchoidal fracture.

2473 - 2579m

Note: Massive Siltstone locally altered by the igneous intrusive metamorphic areole.
Siltstone: brown grey, brown black, soft-firm, hard ip, massive to blocky, very argillaceous grades to Claystone ip, micromicaceous, trace to locally common carbonaceous fragments, trace lithic fragments, slightly siliceous ip.
Shale: olive black brown black, moderately hard, micromicaceous, very carbonaceous grades to carbonaceous shale ip, common disseminated pyrite, subfissile to fissile ip.
Sandstone: light grey to off white to very light brown, very fine to fine grained, occasionally medium-coarse, predominantly fine, friable-hard, subangular-subrounded, poor to moderately sorted, common silaceous cement, trace white interstitial clay, trace carbonaceous specks, trace lithic fragments, trace pyrite, nil visable porosity, nil fluorescence.

TOP IGNEOUS INTRUSIVE — 2579m MD

2579 - 2612m

Claystone: light green grey, off white, light-medium grey, brown grey, blue grey ip, tan, soft-disseminated, occasionally firm, massive-amorphous ip, trace lithic fragments, occasionally slightly silty, trace altered mica, micromica ip, trace gastropods/coralline fragments, trace medium brown cryptocrystalline dolomitic inclusions.
Sandstone: off white, very fine, friable, angular, good sorting, abundant kaolinite matrix, matrix supported, trace carbonaceous speck, no visual porosity, no fluorescence.
Siltstone: brown grey, brown black, firm, moderately hard ip, massive-blocky, very argillaceous grades to Claystone ip, locally common carbonaceous speck, micromica, trace lithic fragments.
Dolerite: light grey green, light grey, translucent-off white, medium green ip, black ip, hard, blocky, brittle ip, massive, predominantly medium-coarse crystalline olivine/ biotite/ quartz/ pyroxene, locally common black glassy occasionally microvesicular groundmass w/ metallic lustre, predominantly basaltic, common micropyroxene, predominantly disaggregated crystals, trace tourmaline laths, becomes coarse-very coarse w/ abundant free quartz w/ mafic mineral inclusions w/ depth, moderately calcareous ip, occasionally chloritic groundmass.

BASE IGNEOUS INTRUSIVE — 2612m MD

2612 - 2763.5m

Note: Massive Siltstone locally altered by the igneous intrusive metamorphic areole.
Siltstone: brown grey, brown black, soft-firm, hard ip, massive to blocky, very argillaceous grades to Claystone ip, micromicaceous, trace to locally common carbonaceous fragments, trace lithic fragments, slightly siliceous ip.
Shale: olive black brown black, moderately hard, micromicaceous, very carbonaceous grades to carbonaceous shale ip, common disseminated pyrite, subfissile to fissile ip.
Sandstone: light grey to off white to very light brown, very fine to fine grained, occasionally medium-coarse, predominantly fine, friable-hard, subangular-subrounded, poor to moderately sorted, common silaceous cement, trace white interstitial clay, trace carbonaceous specks, trace lithic fragments, trace pyrite, nil visable porosity, nil fluorescence.
Claystone: light grey to pale yellow brown-pale brown to pale brownish green, soft to sticky, moderately hard to firm ip, non calcareous, abundant silt to very fine grained quartz, grades to argillaceous siltstone ips, trace black carbonaceous specks, trace lithic fragments, trace fossle fragments.
Coal: black, bituminous, brittle, blocky, vitreous lustre, subconchoidal to conchoidal fracture.

TOP Z1 EVCM 2718 SAND — 2763.5m MD

2763.5 - 2792.5m

Sandstone: off white-pale yellow brown, translucent, frosted, fine-predominantly medium, disaggregated, loose medium-coarse-very coarse grains, fining upwards, subangular to subrounded, good sorting, moderate cement aggregates ip, rare kaolinite inclusions, trace biotite, trace nodular pyrite, grades to Siltstone ip, poor-good porosity, occasionally bright yellow white fluorescence-trace dull yellow orange pinpoint fluorescence, slow streaming cut fluorescence reducing to nil, milky white-yellow crush cut fluorescence ip, thin chalky white residue ring.
Siltstone: light grey-brown grey-occasionally brown black, soft-firm, moderately hard-hard, massive-blocky bcm subfissile-fissile, very argillaceous grades to Claystone & Shale ip, micromica, trace-common carbonaceous fragments, trace lithic fragments, occasionally trace very fine arenaceous inclusions, moderately siliceous ip.

TOP Z1 EVCM 2755 SAND — 2792.5m MD

2792.5 - 2859.5m

Sandstone: light grey-light brown, brown ip, translucent, fine-medium grain, predominantly medium, occasional-common coarse grains, loose, rounded to subrounded, moderately well sorted, moderately cemented aggregates, trace carbonaceous specks, trace kaolinite matrix, trace lithic fragments, trace biotite, good inferred porosity, trace dull yellow orange pinpoint fluorescence, no cut fluorescence, no crush cut fluorescence.
Siltstone: light grey-brown grey-occasionally brown black, soft-firm, moderately hard-hard, blocky-platy ip, very argillaceous grades to Claystone ip, micromica, trace-common carbonaceous specks, trace lithic fragments, occasionally trace very fine arenaceous inclusions.
Sandstone: translucent-frosted grains, medium-coarse very-coarse, disaggregated, hard aggregates ip, angular-subangular, poor sorted, strong siliceous cement, trace-common quartz over growths, nil-poor porosity, no fluorescence.

Sandstone: translucent-frosted, fine-medium, disaggregated, subangular to subrounded, good sorting, trace kaolinite inclusions, trace coarse fractured milky quartz, trace quartz over growths, fair-good porosity, no fluorescence.

TOP Z1 EVCM 2809 SAND — 2859.5m MD

2859.5 - 2895.5m

Sandstone: translucent, frosted grains, medium-pred coarse, becoming fine-medium, subangular to subrounded, moderately sorted, trace siderite cement coating, trace kaolinite inclusions, trace muscovite, trace very coarse fractured quartz, trace pale aggregates, disseminated pyrite, poor-fair-good porosity, trace dull orange mineral fluorescence-trace dull pale yellow patchy fluorescence, very weak diffuse cut, thin residual ring.
Siltstone: brown grey, light-medium brown ip, off white-pale brown, firm-moderately hard, blocky, locally very argillaceous, micromica, locally common carbonaceous/coaly fragments/laminae, arenaceous ip & grading to very fine silty sandstone.
Claystone: medium-dark grey, brown grey ip, firm-moderately hard, blocky-subfissile, micromica, trace lithic fragments, smooth, waxy, homogeneous.
Coal: black, bituminous, brittle, blocky, vitreous lustre, subconchoidal-conchoidal fracture.

TOP Z1 EVCM 2844 SAND — 2895.5m MD

2895.5 - 2932m

Sandstone: light brown grey-very light grey, translucent-transparent, fine-medium grain, occasionally coarse-very coarse grain, predominantly loose, friable aggregates ip, moderately sorted, subangular to subrounded, fine grained, well rounded, trace carbonaceous/coaly matter, trace pyrite, trace siderite cement, trace siliceous cement, trace kaolinite matrix, occasionally aggregates, poor-moderate inferred porosity, trace dull yellow fluorescence, nil cut/crush cut fluorescence.
Siltstone: grey black-dark grey-brown grey, light-medium brown ip, predominantly dusky yellow brown ip, firm-moderately hard, blocky, subfissile ip locally very argillaceous, grades to Claystone ip, micromica, locally common carbonaceous/coaly fragments/laminae, grades to carbonaceous Shale ip, arenaceous ip.
Claystone: medium grey-light medium grey-blue grey, yellow grey ip, firm-moderately hard, blocky-subfissile, arenaceous, slightly calcareous, slightly siliceous ip, smooth, waxy, homogeneous, trace carbonaceous matter, trace micromica.

TOP Z2 EVCM 2873 SAND — 2932.0m MD

2932 - 2949m

Sandstone: light grey-pale brown, off white, very fine-silty, becomes fine ip, friable, subangular, good sorting, moderately siliceous cement ip, trace abundant kaolinite matrix, matrix supported ip, trace carbonaceous laminae, trace biotite, nil porosity, no fluorescence.
Siltstone: dark grey-brown grey, grey black, firm-moderately hard, blocky-platy ip, locally very argillaceous, grades to Claystone ip, micromica, locally light grey, very fine arenaceous inclusions, trace-common carbonaceous fragments, trace nodular & disseminated pyrite, trace fossil fragments.

EARLY PALAEOCENE — 2949.0m MD

2949 - 3008m

Claystone: light grey-medium grey-medium dark grey, yellow grey-orange grey ip, moderately hard, blocky-subfissile, slightly micromica, slightly siliceous ip, silty ip, smooth, waxy, homogeneous.
Siltstone: pale yellow brown-medium brown-dark brown, occasionally black brown, firm-moderately hard, soft-sticky ip, subblocky-subfissile, massive-amorphous,non calcareous, argillaceous, grades to Claystone ip, siliceous cement ip, trace lithic fragments, trace-common black carbonaceous specks, trace disseminated pyrite, trace fossil fragments, trace very fine grained quartz.

TOP Z3 2953 SAND — 3008m MD

3008 - 3030m

Siltstone: brownish grey-medium grey brown, massive-blocky, very argillaceous grading to Claystone, micromicaceous, local traces of carbonaceous specks, trace light grey arenaceous inclusions, trace biotite, trace lithic fragments, slightly silaceous.
Sandstone: clear-translucent, frosted, fine-medium grained, subangular-subrounded, good sorting, clean, trace kaolinite inclusions, trace nodular pyrite, trace muscovite, trace coal fragments, dissaggregate, good porosity, no fluorescence.

TOP Z3 2973 SAND — 3030m MD

3030 - 3085m

Sandstone: off white-very light grey, translucent, frosted, very fine-very coarse grained, predominantly loose, friablemoderately hard aggregates, angular-subangular, occasionally subrounded, moderately sorted, strong siliceous cement ip, common kaolinite matrix, trace carbonaceous specks, rare glauconite, tr lithic frags, rare nodular pyrite, poor inferred porosity, no show.
Siltstone: brown grey, medium grey brown-brown black, massive-blocky, very argillaceous grades to Claystone, micromica, locally trace carbonaceous specks, rare biotite, trace lithic fragments, tr arenaceous inclusions ip, slightly siliceous.

TOP VOLCANICS — 3083m MD

3083m - TD

Volcanics: off white to brown grey, dark grey, grey red, red brown, light to dark green, olivine basalt, trace to locally common dark green fine crystalline orthoclase/olivine/K feldspar/mafic mineral assemblage, firm to hard, massive to blocky, cherty ip, locally sparry dolomitic/calcite infill. Occasionally orange brown weathered(?) tuffaceous horizons.

DRILLERS T.D. — 3164m MD

LITHOLOGICAL DESCRIPTION

STRATIGRAPHIC UNIT	SERIES / EPOCH	PERIOD
ANGAHOOK UNIT 2	MIOCENE TO RECENT	TERTIARY
MIOCENE VOLCANICS		
ANGAHOOK UNIT 3		
ANGAHOOK UNIT 4		
UNDIFFERENTIATED OLIGOCENE	OLIGOCENE	
DEMONS BLUFF FORMATION		
EASTERN VIEW COAL MEASURES	EOCENE	
IGNEOUS INTRUSIVE		
EASTERN VIEW COAL MEASURES		
EASTERN VIEW COAL MEASURES SANDS	PALAEOCENE	
BASAL VOLCANICS	? LATE CRETACEOUS TO ?PALAEOCENE	? CRETACEOUS TO ?TERTIARY

565454

ENCLOSURE 2 OR-0447

FORMATION EVALUATION LOG
WELL : YOLLA#2

PremierOil Australasia

Geoservices logging

FROM (m): 70 TO (m): 3190 SCALE: 1/ 500

Country : AUSTRALIA Region : BASS BASIN Field : YOLLA Permit : T/RL 1 Well Type : APPRAISAL Rig Name : N.EXPLORER III	**POSITION** LAT : 39 51 33.889S LONG : 145 48 38.493E X (m) :398 271.48 Y (m) :5 587 154.23 RT-LAT (m) :12.5 RT-Seabed (m) :94.0	**CASING** 762mm Shoe at (mMDRT) :151.5 340mm Shoe at (mMDRT) :853.00 5 cm	Spud Date :09-04-1998 Total Depth Date:13-05-1998 Total Depth (mRT) :3164.0

ABBREVIATIONS

MW MUD WEIGHT	NB NEW BIT
FV FUNNEL VISCOSITY	RR RERUN BIT
PV PLASTIC VISCOSITY	CB CORE BIT
YP YIELD POINT	WOB WEIGHT ON BIT
FC FILTER CAKE	RPM REVS PER MINUTE
SOL SOLIDS	FLC FLOW CHECK
WL FILTRATE	CR CIRCULATE RETURNS
SD SAND - %	PR POOR RETURNS
S SALINITY - PPM	NR NO RETURNS
RM MUD RESISTIVITY	BG BACKGROUND GAS
RMF MUD FILTRATE	TG TRIP GAS
C CARBIDE TEST	STG SHORT TRIP GAS
LAT LOGGED AFTER TRIP	CG CONNECTION GAS
DS DEVIATION SURVEY	SG SWAB GAS
	SVG SURVEY GAS

LITHOLOGY LEGEND

Shale	Volcanics	Calcareous
Claystone	Igneous	Fossils
Siltstone	Pyrite	Shell
Sandstone	Plant fragments	Corals
Med Sandstone	Iron Stained	Radiolaria
Limestone	Mica	Wood silicified
Dolomite	Chert	Pelletoids
Coal	Foraminifera	Plant fragments

ENGINEERING LEGEND

- RFT/MDT
- Deviation surve
- Shoe
- Bit Trip
- Wiper Trip
- Sidewall Core
- SWC Unrec

CLAYSTONE: a/a, med dk gry-med gry, mod-sli dolo, tr disssem pyr, tr qtz grs, tr carb spks/ lam, tr glauc, tr foss frag, tr-r sid, r-tr yel wh mod hd-hd Sltst

1270m-1320m
CLAYSTONE WITH INTERBEDDED VOLCANICS, LIMESTONE AND MINOR SANDSTONE

VOLCANICS: wh-lt pale gn bl, prob tuff i/p, v-sli calc, tr calc grs, tr qtz grs, frm-sft, sbblky.

CLAYSTONE: dk gry-med dk gry, non-sli calc, com dissem pyr, tr blk carb spks, r qtz grs, r micmic, blky-sbfiss, frm.

LIMESTONE: gry wh-yel wh, crpxln -microxln, tr foss, tr calc, frm -amor.

1320m-1380m
INTERBEDDED CLAYSTONE AND SILTSTONE WITH MINOR SANDSTONE

SILTSTONE: lt brn gry-brn wh, mod calc cmt, com vf wl rnd qtz grs, arg i/p grad to vf Sst i/p, tr carb spks, tr glauc, r pyr, mod hd-hd, sbblky-blky

CLAYSTONE: med gry-dk gry, sli calc, slty i/p grad to Sltst, tr -com dissem pyr, tr blk carb spks, r trnsl brn sid, tr glauc, frm-sft, sbblky-frm, occ sbfiss

1380m-1445m
INTERBEDDED CLAYSTONE SILTSTONE WITH MINOR SANDSTONE

SANDSTONE: lt gry, trnsp-trnsl, vf gr qtz, md-sbrnd qtz grs, v wl srt, tr glauc, tr pyr, tr carb spks, strng, calc cmt, mod hd-hd aggs, nil vis por, no fluor

Wiper Trip @ 1394m to the 340mm Casing Shoe

Carbide Lag Check @ 1421m
Calculated Strokes=5304
Actual Strokes=6432
Difference=1128stks
Estimated Hole Size=14.85"

CLAYSTONE: lt gry-gry gn, lt olv gry, lt brn gry, strng-mod calc, slty i/p grad to Sltst i/p, tr-r glauc, r-tr dissem/mas pyr, tr carb mat, r mic, r foss, sbblky-blky, occ sbfiss, amor i/p, sft-frm
SILTSTONE: a/a

1445m-1530m
INTERBEDDED SILTSTONE AND CLAYSTONE

SILTSTONE: v lt gry-off wh, v lt brn wh, mod calc, v arg grad to a vf Sst i/p, com vf-f gr qtz, tr glauc, r-nil dissem pyr, blky -sbblky, sft-frm, occ mod hd & fri

SANDSTONE: lt gy, pl brn, trnsp-trnsl, vf grn, grad to SILST i/p rnd, occ sbrnd, wl srt, tr glauc tr dissem pyr, tr cor frags, mod -str calc cmt, mod sil cmt i/p, mod hd-hd, nil vis por
FLUOR: dull, yel mine fluor, no dir cut, no cct

CLAYSTONE: med gy, pl brn, occ blk, mod calc, tr pyr, tr foss, frm-sft, sbblky-blky

1530m-1610m
SANDSTONE WITH INTERBEDDED SILTSTONE AND MINOR DOLOMITE CLAYSTONE

SILTSTONE: dk brn, pl brn, wk calc, tr pyr, tr foss, frm-mod hd, sbblky-blky

DOLOMITE: lt-med brn, grad to dolo Sltst, cryxln, mod hd-hd, blky

SILTSTONE: dk-med gry, occ lt brn, wk calc, tr pyr, tr foss, frm-mod hd, sbblky-blky

1610m-1710m
INTERBEDDED SILTSTONE AND SANDSTONE WITH MINOR CLAYSTONE DOLOMITE

SILTSTONE: lt brn-med lt brn, mod dolo, cly i/p grad slty Clst i/p, com micmic, tr-com dissem/ mass pyr, frm-mod hd, occ v hd & fri, blky-sbblky, occ sbfiss

SANDSTONE: lt brn-mod yel brn, vf-occ f gr qtz, pred vf-slt sized grs, gd sph, wl rnd-absng grs, wl srt, tr mass pyr, tr micmic, r carb spks, r foss, com dolo cmt, com disp cl mtrx, tr sil mtrx, frm-occ hd aggs, pr inf por, no shows

DOLOMITE: mod brn-dk yel brn, pale yel brn, pred cryxln, occ microxln, suc-wxy, tr vf qtz grs, tr glauc, v hd-hd, no vis por, no fluor

1710m-1764m
CLAYSTONE WITH MINOR SILTSTONE AND SANDSTONE

CLAYSTONE: dsky brn-brn blk, sli calc, slty i/p, com dissem pyr, tr glauc, tr vf qtz grs, tr mic flks, sft-plas, occ frm, sbblky-blky, occ disp-amor

1764m-1872m
SILTSTONE WITH INTERBEDDED CLAYSTONE AND MINOR DOLOMITE

SILTSTONE:dk brn-lt brn, occ blk arg, aren i/p grd to vf SST, tr micmic, tr dissem pyr, tr foss frag, frm-sft, sbblky, occ amor

CLAYSTONE:lt brn, lt gry, wk calc, tr vf qtz grs, tr micmic, tr dissem pyr, sft, occ frm, sbblky-blky, occ amor

DOLOMITE: lt brn, grd to SLST, micrxln, mod hd-hd, blky

DOLOMITE:lt brn, grd to vf SLST, micrxln, mod hd-hd, blky

CLAYSTONE: lt gry, pl brn, wk calc, tr vf qtz grn, tr micmic, tr dissem pyr, sft, occ frm, sbblky-blky, occ amor

1872m-1923m
INTEBEDDED SILTSTONE AND CLAYSTONE WITH MINOR SANDSTONE

SANDSTONE: pale lt gn gry, vf-f gr qtz, mod gd sph, md-sbang, wl srt, com-abd glauc, tr carb spks, tr wk calc cmt, com sil mtrx, mod hd fri aggs, mod-pr inf por, no shows

SANDSTONE: lt brn gry-pale lt gn gry, vf-crs gr qtz, mod gd sph, md-sbang, mod srt, com dissem pyr, tr-com glauc, tr carb mat, tr sid, mod calc cmt, tr qtz ovgths mainly sil cmt, pred lse, com mod hd fri aggs, tl vis por, mod inf por
SHOWS: tr solid dl yel gn-yel fluor, v wk defused dl yel cut, bleeding milky wh cct, thn milky wh res rng, trnsp in wh lt

1923m-1944m
SANDSTONE WITH MINOR COAL AND SILTSTONE

COAL: blk-v dk brn, metalic lus, com dissem pyr, blky, brit
SHOWS:(1941m)tr mod brt yel even fluor, brt yel wh fair streaming cut, thck yel wh res rng

1944m-2004m
SANDSTONE WITH MINOR COAL

SANDSTONE: lt brn gry-v lt gry, vf-v crs gr qtz, pred med-crs rr gr, pr sph, ang-sbang, f gr wl rnd, mod srt, tr carb mat, r pyr, tr cl mtrx, r-nil calc cmt, pred lse, occ hd fri aggs, mod inf por, no shows
COAL: blk, metalic lus, brit, hd, blky-sbfiss

Carbide Lag Check @ 1973m
Calculated Strokes=7980
Actual Strokes=7100
Difference=880stks
Estimated Hole Size=13.4"

2004m-2166m
SANDSTONE INTERBEDDED WITH CLAYSTONE AND MINOR COAL

SANDSTONE: lt brn gry, vf-med gr qtz, com crs gr qtz, ang-sbang grs, mod srt, tr-com carb mat, tr dissem pyr, tr mic, tr sil cmt, com-abd wh-lt brn arg mtrx with carb lam, com mod hd fri aggs, pr inf por, no shows
COAL: blk-brn blk, metalic lstr, com dissem pyr vns, tr vf qtz grs, plty-sbconch fract, mod hd-brit, blky-sbfiss
CLAYSTONE: lt bl gry-wh-lt brn gry, non calc, slty, tr vf qtz grs, tr carb mat, tr dissem pyr, sft-amor, lt bl gn Cl mod hd, sbblky-blky, occ sbfiss

SANDSTONE: lt gry, trnsp-trnsl, med-crs grs, occ v crs, ang-sbang, occ sbrnd, mod srt, tr carb spks, tr mic flk, mod sil cmt, com wh-lt brn mtx, com lse, frm-mod hd aggs, gd inf por, pr vis por, no fluor

COAL: blk, brnsh blk, vit-sbvit lus, plty-conch frac, tr dissem pyr, sbblky-blky

CLAYSTONE:lt brn, brnsh gry, wh gry, non calc, arg, tr carb spks sft-frm, sbblky-sbfiss, occ amor

CLAYSTONE: lt gry, brn/gry, lt gn/gry, arg, non calc, tr carb spks, tr dissem pyr, sft-frm, sbblky-sbfiss

COAL:blk, brn/blk, grd to carb SLST, dul-sbvit, brit-frm, conch frac, sbblky-blky

SANDSTONE:lt gry, trnsp-trnsl, dom med, occ crs, dom sang, ang i/p, mod wl srt, tr carb spks, tr dissem pyr, mod sil cmt, tr wh arg mtx, dom lse, fri aggs, nil-pr vis por, fr inf por, no fluor

Sample contaminated with LCM

2166m-2232m
INTERBEDDED SANDSTONE, SILTSTONE,CLAYSTONE & COAL

SANDSTONE: v lt gry-occ lt gn gry, trnsp-trnsl, vf-med gr qtz, occ crs grs, pred f gr, sbang-sbrnd, com wl rnd grs, wl srt, tr qtz ovghts, r-tr glauc, r pyr pyr, tr cwk calc cmt, tr sil cmt, tr-r cl mtrx, com-occ mod hd fri aggs, mod inf por, no shows
SILTSTONE: lt brn-wh-lt gry, micmic, tr carb mat, tr pyr, sft -frm, sbblky-blky, amor-disp
CLAYSTONE: lt bl gry, slty i/p, tr qtz grs, tr mic, frm-mod hd, blky-occ sbfiss

COAL: blk, brn/blk, dul-sbvit, occ vit, grd to carb SLST, tr pyr, brit-frm, conch frac, sbblky-blky

SANDSTONE: lt gry, trnsp-trnsl, med-crs grs, occ v crs, sbang-ang, mod srt, tr mica flk, mod sil cmt, tr wh arg mtx, dom lse, fri aggs i/p, gd inf por, pr vis por, no fluor

2232m-2332m
INTERBEDDED CLAYSTONE, SILT SANDSTONE AND COAL

SILTSTONE: lt brn gry-mod brn, arg i/p, wk calc, com carb spks, tr dissem pyr, tr mic flks, mod hd-frm, blky-sbblky, occ sbfiss

Carbide Lag Check @ 2289m
Calculated Strokes=8149
Actual Strokes=8982
Difference=833 stks
Estimated Hole size=13.5"

SANDSTONE: v lt gry, vf-med gr qtz, pred f gr, sbang-sbrnd, wl srt, tr qtz ovgths, tr pyr, tr mic, r lits, r foss frags. tr wk calc cmt, tr sil cmt, tr koal/cl mtrx, pred lse, r-tr frm fri aggs, gd inf por, no shows
CLAYSTONE: lt bl gry-v lt gry, slty i/p, tr qtz grs, tr dissem pyr, tr carb spks, frmmod hd, blky-sbfiss

2332m-2416m
SILTSTONE WITH MINOR COAL, CLAYSTONE AND SANDSTONE

SILTSTONE: lt brn-mod brn, lt brn gry, arg i/p, tr-com carb spks/lams, tr nod pyr, tr micmic, r fluor, frm-mod hd, blky-sbblky, occ sbfiss
COAL: blk, sbvit-vit, occ dul, grd to carb SLST i/p, brit-frm, conch frac, unevn frac i/p, blky -sbblky

SANDSTONE:lt gy, trnsp-trnsl, f-med grs, dom f grs, mod wl srt, tr biot, com carb spks, mod sil cmt, tr wh arg mtx, fri-mod hd, lse i/p, nil vis por, fr inf por
FLUOR (TR): dul yel fluor, no dir ct, no cct

COAL: blk, vit-sbvit, brit, occ frm, conch frac, blky-sbblky

2421m-2558m
SILTSTONE WITH SANDSTONE & MINOR COAL SEAMS

SILTSTONE: lt-med brn, brn/gry, arg, aren i/p grad to vf SST,com carb spks, tr micmic, frm, occ mod hd, sbblky-sbfiss

SANDSTONE: wh-off wh , lt-pale brn, vf-slt sized qtz grs, pred sbang, occ sbrnd, wl srt, tr carb spks, tr micmic, tr sid cmt, r sil cmt,com-abd kaol/cl mtrx, occ frm, pred sft, grad to Sltst i/p, mod inf por, no show

COAL: blk-dk brn blk, sbvit-vit lus, r dissem pyr, sbconch fract, brit, blky

SILTSTONE: pale brn-mod brn, gry brn, i/p aren, grad to a vf Sst, wk calc(sid), com-tr carb spks/ lam, com-r dissem pyr, tr mic flks, frm-mod hd, v hd, blky-sbfiss

COAL: blk, vit-sbvit, brit-frm, conch frac, blky-sbfiss, occ grad to carb SLST

SANDSTONE: trnsl, off wh, vf agg -med grs, mod srtd, sa-sr, com wh arg mtx, fri-hd, com lse, v pr vis-pr inf por, tr min fluor

SILTSTONE: brn, lt-med gry, arg aren i/p, com micmic, com carb flk, frm-mod hd, sbblky-sbfiss

2558m-2580m
SHALE WITH SILTSTONE & MINOR CLAYSTONE BEDS

SHALE: gry blk-dk brn blk, blk, non calc, sli aren i/p, com-abd dissem pyr, tr mic flks, tr carb mat, hd-vhd, occ frm, blky-sbfiss, occ fiss

2580m-2613m
DOLORITE & MINOR CLAYSTONE

DOLORITE: lt gry-lt gn gry, off wh, med gn gry, com carb incl, com pyroxines, tr-com olivines, tr mic, v hd-hd, qtzt tex, tr-com glas ground mass which has a v metallic lus, tr calc i/p

2613m-2762m
SILTSTONE WITH MINOR SHALE, COAL, CLAYSTONE AND SAND

SHALE: blk-blk brn, blk gyr, non calc, com dissem pyr, v carb grad to a Carb Sh, tr micmic, v hd-hd, blky-sbfiss, occ fiss

SILTSTONE: med-dk brn gry, sli calc, micmic, tr dissem pyr, tr carb spks, sft-disp, blky, v arg i/p grad to a Slty Clst

COAL: blk-blk brn, sbvit-vit lus, sbconch fract, mod hd, brit, tr dissem pyr, r qtz grs blky-sbblky

SILTSTONE: med-lt brn, brn/gry, arg, grd to CLST i/p, tr carb spks, tr olivine, frm-mod hd, sbblky-sbfiss

SANDSTONE: lt gy, trnsp-trnsl, f -vf grs, md-sbrnd, mod wl srt, tr carb spks, str-mod sil cmt, tr wh arg mtx, mod hd-hd, lse i/p, pr vis por, fr inf por, no fluor

CLAYSTONE: lt gry, gn/gry, occ pl brn, arg, tr carb spks, sft, amor i/p, sbblky-blky

SILTSTONE: lt brn-lt brn gry, med brn gry-dk brn gry, aren i/p grad to vf Sst, arg i/p grad to Clst i/p, non calc, tr-com carb spks, tr micmic, r pyr, mod hd-sft, occ sft-amor, blky-mass, occ sbfiss

2762m-2919m
INTERBEDDED SILTSTONE AND SANDSTONE

SANDSTONE: v lt gry-v lt brn gry, vf-med gr qtz, pred med gr, mod sph, ang-sbrnd, pred sbang-sbrnd, wl srt, r pyr, r kaol/cl mtrx, lse, gd inf por, no shows

FLUOR(2769-2775m): tr-5%, pl-mod brt yel fluor, slw strmng ct, mod brt wh yel c/c. thn yel r/r

SANDSTONE:frstd, trnsl, clr, c-v crs, sa-ang, mod srt, lse, com rexld quartzite, gd inf por, no fluor
SANDSTONE:clr-lt gry, brn/gry, trnsl, f-med, occ crs, mod wl srt, md-sr, tr carb, tr kaol, tr lith-biot, com mod cmt agg-dom lse, gd inf por

FLUOR(2796-2817m):nil-tr dll yel-org pinpt flr, no c/c, no rr

SILTSTONE:brn/gry, gry, brn/blk, arg, tr aren, tr carb/lith, frm-mod hd, blky-sbblky, grad to CLST i/p

SANDSTONE: v lt gry-lt brn gry, f-v crs gr qtz, trnsp-trnsl, occ opq, ang-sbang, mod srt, tr nod pyr, tr mlky wh fspr, tr fract qtz grs, tr qtz ovgths, tr sil cmt, tr sid cmt, tr kaol mtrx, tl vis por, pr inf por, no shows

SANDSTONE: lt brn gry-lt gry, f-med gr qtz, becoming crs with dpth, sbang-sbrnd, f gr rnd, gd sph, wl srt, tr limonite stns, tr qtz ovgths, r carb/pyr, tr sid cmt/sil cmt, tr kaol mtx,occ v hd agg, mod inf por, tr fluor

FLUOR:(2874-2880m) tr v dll yel ptchy fluor, wk yel wh ct, thn yel wh res rng

CLAYSTONE: med gry-lt med gry, bl gry, aren i/p grad to Sltst, sli calc, tr carb spks, tr mic, frm-mod hd, blk-sbfiss

SANDSTONE: lt gry, occ pl brn, trnsp-trnsl, vf-med grs, dom med, md-sbrnd, mod srt, tr carb spks, tr mica, wk-mod sil cmt, tr wh arg mtx, dom lse, fri aggs i/p, fr inf por, nil vis por

FLUOR(2910-2919m):tr dll-pl yel fluor, no dir cut, no c/c

2919m-3006m
MASSIVE SILTSTONE WITH MINOR INTERBEDDED SANDSTONE

SANDSTONE: Lt brn-v lt gry, vf-f qtz gr, pred f, sbang-sbrnd, wl srtd, trnsl-trnsp, tr frost, r qtz ovgths, tr sil cmt, tr kao mtx, pred lse, gd inf por, no fluor

SILTSTONE: dk-med brn, occ pl brn, blk/brn, arg, aren i/p, tr carb spks, tr dissem pyr, tr foss, frm-mod hd, sbblky-sbfiss, occ blky. grad to CLST i/p

CLAYSTONE: lt gry, gry/gn, occ pl brn, arg, tr carb spks, tr dissem pyr, frm, sbblky-blky, occ sbfiss

3006m-3088m
SANDSTONE WITH SILTSTONE INTERBEDDED

SANDSTONE: lt gry-lt brn gry, vf-f gr qtz, pred f, sbang-sbrnd, wl srt, trnsp-trnsl, tr frost, r qtz ovgths, tr sil cmt, tr kaol mtrx, pred lse, gd inf por, no fluor

SANDSTONE: clr, trnsl, frstd, f-med, sbang-sbrnd, gd srtg, cln disagg, good inf por, no fluor

CORE #1 :3033m-3050.5m.Cut 17.7m 1.77 Hrs, Rec:17.7 m - 100%

SANDSTONE: lt gy, trnsp-trnsl, med-v crs grs, ang-sbang, mod srt, tr carb spks, tr mica, f gr agg w/ mod-str sil cmt, tr wh arg mtx, pred lse, fri-mod hd aggs, fr inf por, nil vis por, no fluor
SANDSTONE: lt gy, trnsl, wh, dom f grn, com sil cmt, arg mtx, fri -lse, v pr vis por, tr fluor

FLUOR 3069-3075m: tr dll yel-wh pinpt fluor, no cut, no r/r

SANDSTONE: Lt gry-brnsh gry, f, sa-sr, mod-gd srtd, mod sil cmt, tr-com kao mtx, com carb frags, tr-com frag qtz, tr biot, fri-mod hd, fr inf por, tr fluor

FLUOR 3081-3090m: tr dull yel gold ptchy dir fluor, very weak diffuse crsh cut, thin res ring

3088m-3164m
VOCANICS(TUFF)

VOLCANICS: Lt gry-lt brnsh gry, pl yel, dk grn, occ rd, com fspr alterd to kao, cherty i/p, tr-com mafic min, micxln-cpxln, tr nod pyr & biot, tr loc-com red shards(ox), tr calcite, firm-mod hd, occ v hd i/p, blky-mass

VOLCANICS: Med dk gry-dk grn, brnsh gry, redish brn, com alter ed fspr, com mic-f xln olivine & pyrocene & mafic min assemblage, tr pyr, com red shard(ox), tr-com qtz ang frags, tr calcite, frm-mod hd, ang frags, blky-mass

*TD @ 3164.0 mRT @ 01:00 Hrs 14-5-98, RUN ELECTRIC LOGS

SCHLUMBERGER LOG RUNS:
1. PEX-AS-GR-AMS
2. MDT-GR-AMS
3. VSP-GR
4. CMR-GR-AMS
5. FMS-SGR
LOGGER's TD: 3100 mRT