Electric Wireline Operations
End of Well Report

Triclops - 1
Queenlands/Australia

Prepared by:

Mohd Rothi Hamzah
afriQA Ltd
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1. Introduction

This EOW report is intended to serve as a permanent and accurate record of the Wireline Formation Evaluation program performed on exploration well Triclops-1. Triclops - 1 is located in Queensland Block- ATP 539 and operated by Drillsearch Energy Limited.

An operational audit was performed by afriQA Ltd, a specialist Wireline Operations Quality Assurance consultancy group. An audit was performed for Run 1 (8.5" whole section)

The main purpose of the audit was to ensure:

- The safety culture espoused by the Contractor was consistent with industry norms and compliant with both the Contractor's and the Clients own policies
- That the Formation Evaluation objectives were met
- The Formation Evaluation program was completed in an efficient manner possible
- To assist with continuous improvement

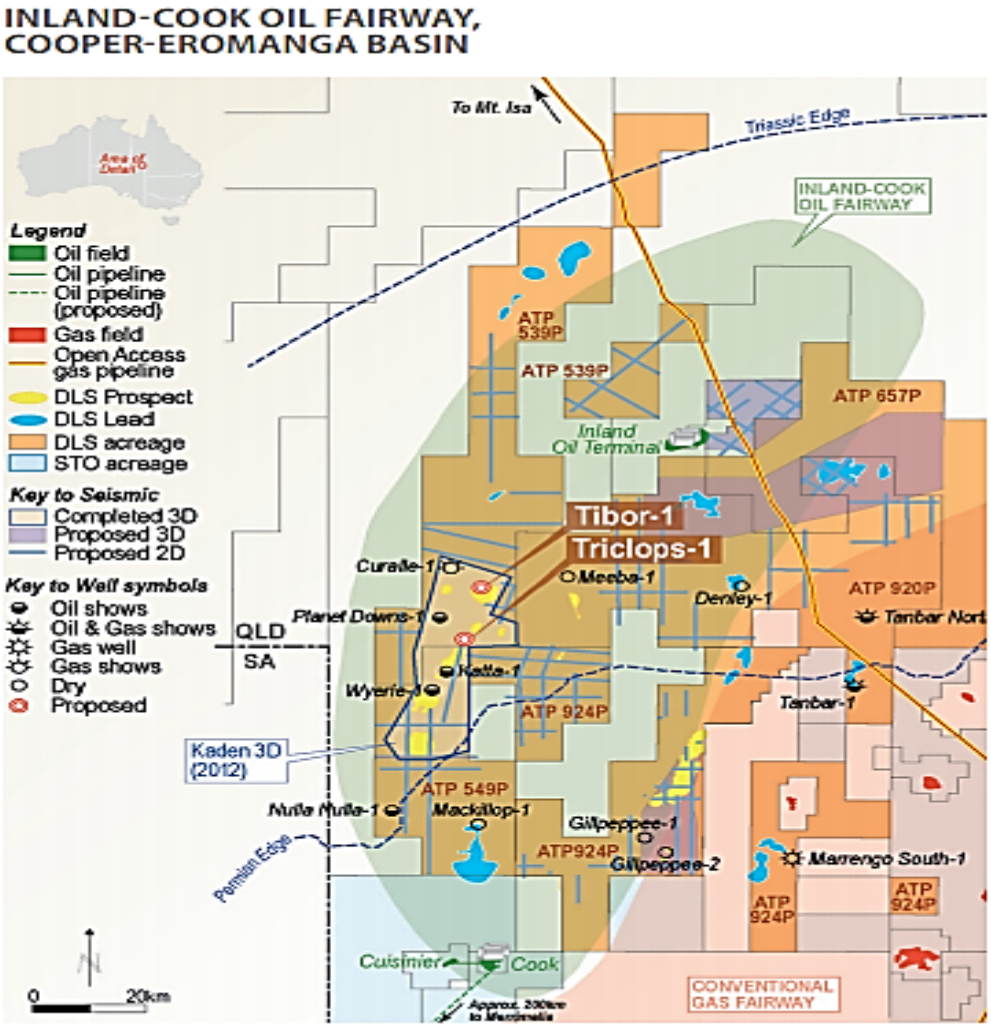
In addition to the EOW report, a technical report for each logging operation performed on Triclops-1 was completed and delivered by afriQA Ltd.

The Formation Evaluation program was performed by Schlumberger. The afriQA audit was performed by Mohd Rothi Hamzah.

2. Critical Formation Evaluation Objectives

The wireline logging programme was a fundamental part of the data acquisition required to achieve the FE objectives, namely the acquisition of appropriate wireline logs to fully evaluate the drilled section as per the detailed logging program.

The main objective of Triclops-1 exploration well is to test the hydrocarbon propectivity of the Inland-Cook Oil Fairway by demonstrating oil migration from the Yamma Yamma Depression into the Western Flank of the SWQ Eromanga Basin. Triclops-1 in ATP 539P, is located approximately 25km east of the South Australian and Queensland border and 250km northeast of Fairway. Triclops-1 is an exploration commitment well in ATP 539P area.



Source: Drillsearch Energy Limited

The two closest offset well that can be used to correlate Triclops-1 are Planet Down -1 and Katta-1 well, as shown in the figure above.

Triclops-1 Exploration well is a vertical well. The primary hydrocarbon formation targets are Hutton Sandstone and Birkhead Sandstone formations. The secondary target will be Westbourne Sandstone and Namur Sandstone formations.

To summarize, the main objectives drilling Triclop-1 well are;

- Drill a safe and environmentally sound, low cost well
- Establish presence of oil in place and associated liquids in the primary target: Hutton and Birkhead sandstone formations and secondary target: Westbourne and Namur formations. To also establish the following over these targets
    - Determine net pay
    - Evaluate reservoir properties including porosity and hydrocarbon saturation
- TD the well in the Poolowanna Formation to a depth sufficient to meet the well objectives of establishing properties and identifying the presence of hydrocarbons. The planned total depth for Triclops-1 will be +/- 2021 m.
- Run wireline logs including a minimum of GR, Density/Neutron, Sonic and resistivity logs (Laterolog and Dielectric tool)
    - Run appropriate cement bond logs if required

Having identified the presence of oil and/or associated liquids through mud logs and wireline logging in any one of the 2 primary targets, the next step is to establish the following key reservoir parameters to characterise the reservoir and enable reservoir development planning including estimates of the following for each oil bearing zone. This information is likely to be determined through a combination of wireline results and well testing:

- Reservoir Fluid properties including gas composition and condensate yield for PVT modelling.
- Zone pressure and temperature
- Reservoir kh
- Skin and non-darcy skin parameters
- AOF and inflow potential of each zone

3. Safety

There were no **LTI's** during Schlumberger operations on Triclops -1.

The planning and execution of the well objectives in a safe and environmentally sound manner was a fundamental requirement of all aspects of the drilling programme. All operations were executed in accordance with the HSE management systems and the Schlumberger SOP.

In accordance with these overall objectives, specifically to the wireline logging activities, prior to individual operations, a toolbox talk was held at the worksite where the immediate operation was outlined and any safety issues were discussed between the crews. The Wireline QA Supervisor was present at every Toolbox talk, and reviewed and approved the JSA in agreement with the worksite supervisors.

SAFETY	**PRE-JOB SAFETY MEETING HELD ADEQUATE FOR THE OPERATION**	✓
	CORRECT PPE WORN AT ALL TIMES	✓
	RA SOURCE HANDLING PROCEDURES CORRECTLY EXECUTED	✓
	BEFORE AND AFTER LOG SURVEYS COMPLETED	✓
	RA STORED IN A SAFE AREA CORRECTLY BARRIERED OFF	✓
	LIFTING PLAN IN PLACE FOR EQUIPMENT TRANSFER TO AND FROM CATWALK	✓
	SP GROUND CABLES FOR LOGGING IN GOOD CONDITION	✓
	SAFETY SWITCH OPERATIONAL	✓
	GENERAL SAFETY PROCEDURES FOLLOWED AT ALL TIMES	✓

4. General Well Information

Background

The 12.25" open hole section on Triclops-1 was drilled from 24.0 m to 766.0 m. No basic formation evaluation wireline log was performed for this section. The hole was cased with 9 5/8" casing before commencing to drill the Triclops-1, 8.5" hole section. The 8.5" section was drilled from 766.0 m to a total depth (TD) of 1962.5 m at which point wireline log Run 1 and 2 were completed.

The well was planned to be a vertical well. After drilling to 1138 m the well started to build up angle to 2.75 degrees. While waiting for the directional assembly and mud motor to arrive at the well site, drilling was continued using pendulum BHA to 1208 m. The well was then steered and drilled from

1208 m to 1962.5 m to target path when the drill bit failed. The decision was taken to stop drilling and getting ready for wireline operations. The maximum deviation recorded was 3.43 degrees at 1216.8 m.

General

Well	Triclops-1
Block	**ATP 539P**
Type	**Exploration**
Operator	**Drillsearch Energy Limited**
EWL Contractor	**Schlumberger**
Area	**Roma**
Latitude	**25° 59' 43.4298" S**
Longitude	**141° 14' 40.3804" E**
Drilling Supervisor	**Guy Holmes**
Logging Engineer	**Astrid Mon Panieda/ Jamie Fraser**
Logging Witness	**Mohd Rothi Hamzah**

Rig data

Rig	**ENSIGN 918**	
KB-RT	**NA**	**m**
RT-GL	**5.2**	**m**
GL-MSL	**141.0**	**m**

Sub-surface well information

	Run 1: Triclops - 1
Bit Size	**8.5 in**
TD Driller	**1926.5 m**
TD Logger	**1926.5 m**
Casing Shoe Driller	**762.5 m**
Casing Shoe Logger	**762.7 m**
Circulation Stopped at TD	**28-Jan-2013 23:40 dd/mm/yy**
Circulation Time	**70 min**
Max Well Deviation	**3.43 deg @ 1216.8 mDRT**
Casing size	**9 5/8 in**

Mud system

	Run 1:
Mud Type	KCL-PHB-Polymer
Mud Weight	9.1 ppg
Mud Viscosity	11.0 sec
HPHT Fluid Loss	9.0 cc
PH	9.0
Corr Solids	4.0 %vol
Oil/Water Ratio	NA
CL (whole mud)	33,500 mg/l
Rmf @Temp	0.1649 @ 34.7°C
Rm @ Temp	0.1970 @ 34.2°C
Rmc @ Temp	0.2040 @ 33.7°C

5. Schlumberger tool mnemonics

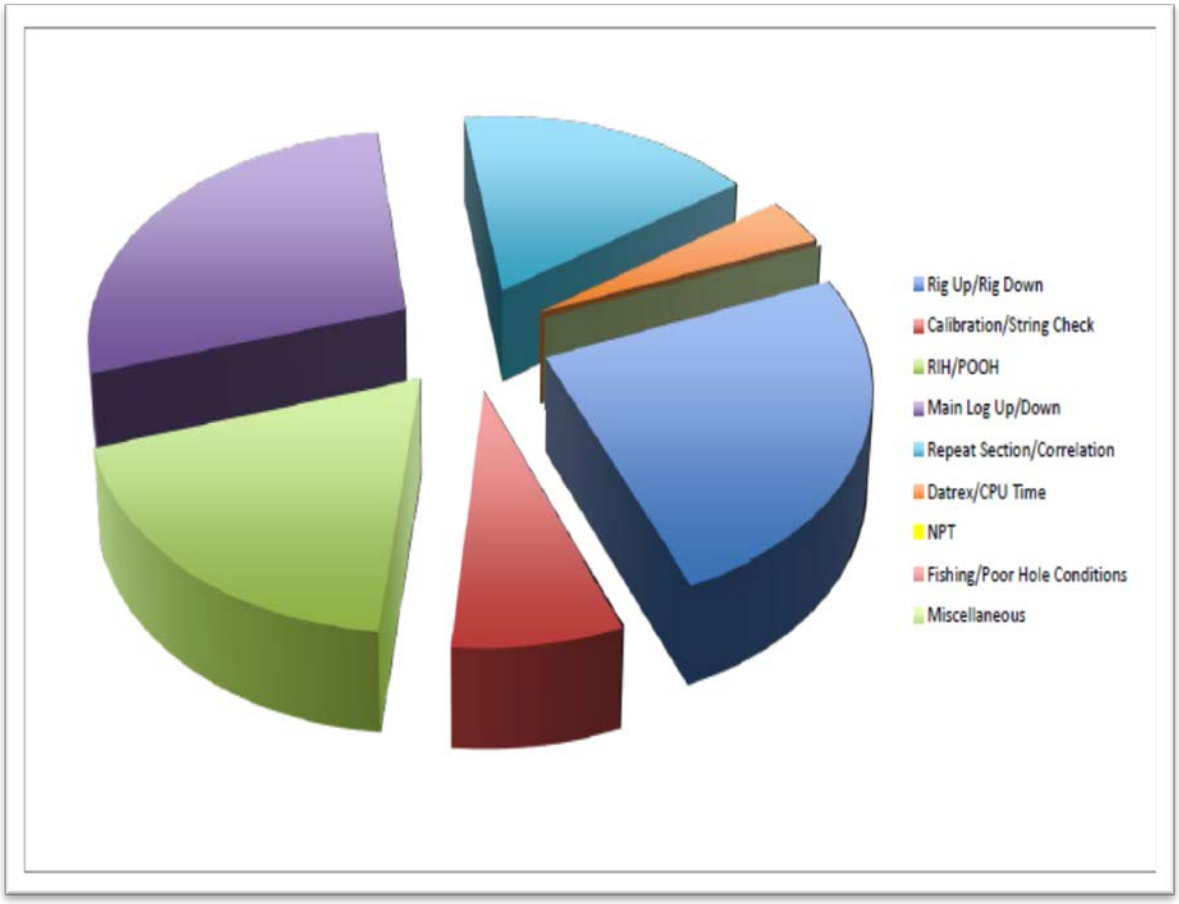
EDTC	Gamma Telemetry tool
HNGS	Natural Gamma Ray Spectrometry tool
HGNS	Highly Integrated Gamma Ray Neutron Sonde
PEX(TLD)	Platform Express (Three-Detector Lithology Density)
HRLA	High-Resolution Laterolog Array
MAST	Sonic Scanner
ADT	Array Dielectric Tool
SP	Spontaneous Potential
PPC	Powered Caliper
GPIT	General Purpose Inclinometry Tool

6. Triclops -1 Run 1 Activity summary and Operating Efficiency

For a detailed account of the Activity Summary, please refer to the afriQA Operational Reports for each logging suite.

RUN	SERVICES	RIG UP	RIG DOWN	TOTAL	LOST TIME	BHT
		dd/mm hh:mm	dd/mm hh:mm	TIME	(Contractor)	°C
1	EDTC/SP/HGNS/PEX/HRLA/ADT	29/01 10:15	29/01 20:30	10:15	00:00	130
2	EDTC/PPC/MAST/GPIT	29/01 20:30	30/01 04:10	07:40	00:00	130
	TOTAL TIME FOR WIRELINE OPERATIONS			17:55	00:00	
	OPERATING EFFICIENCY (1-LT/OT)x 100			100.0%		

Triclops-1 Operating Efficiency Run 1 and 2



6.1 Summary Run-1A: EDTC/HGNS/TLD/HRLA/DSLT/SP

Run 1 was completed in 10 hours and 15 min without NPT recorded.

Narrative

Upon arrival at the Triclops-1 wellsite, a complete operational and mobilisation audit was conducted by afriQA representative on the Contractors equipment. Refer to the operational audit report submitted for operational detail of Run 1 logging operations.

After an initial HSE meeting, standard open-hole logging conveyance equipment was rigged up in the derrick. An **EDTC/SP/HGNS/PEX-TLD/HRLA/ADT** combination was rigged up and run in hole. The Schlumberger primary depth control procedures were followed closely. The first point of reference was taken around 140m. The run in hole speed was set to around 3600 ft/hr to avoid undesired depth slippage for the first run. HRLA and MCFL calibration performed below the casing shoe. The TLD and ADT caliper were also verified inside casing prior to logging down.

Down log was logged from casing shoe to 1870 m and avoiding area around TD. Only HRLA, GR, Spectra GR and TNPH data were valid as all calipers were closed. Another depth control observation was done during down log. The measurements indicated that the downlog depth could be used as depth references. Tools were pulled back to log repeat pass from 1655 to 1555 m for all sensors. This specific interval would cover top of Birkhead sandstone and all Adori sandstone. Upon completion of repeat pass, data and plot were produced to be sent to town.

The main pass was recorded from TD to 50m above casing show depth (762.5 m) at 1800 ft/hr to allow for high resolution playback of the data if required. The main pass data file was depth shifted +0.38m to depth match the down log. On completion of the main pass, the tool string was pulled to surface.

The tool string was kept at 100 m in order to prepare ADT data for processing in town. Due to huge amount of ADT data recorded; the Maxwell program was very slow to process even for the depth shifting.

The tool string was pulled out of the hole, all after-log verifications were performed and the string was rigged down.

Summary

1. Run 1 was the 1st run in the hole and the down log would serve as the main depth reference log as per Schlumberger procedures.

2. Experienced over pull over the 1655 to 1555 m interval. Stick and pull observed during the main or the repeat pass, due to major washouts over this interval. The maximum overpull applied on both passes was around 1,600 lbs.
3. Neutron was corrected for whole mud salinity of 25616 ppm and logged in Limestone matrix.
4. RHOZ Density was corrected for borehole and mud density; and presented in Limestone Compatible scale.
5. RXO from the MCFL electrodes failed to function. The inversion process from the HRLA can be used as replacement.
6. The hole volume and cement volume was computed from the HCAL calliper (density tool), verified in casing (8.9" ID), tool reading 8.63". HCAL reset to Casing ID.
7. Maximum reading BHT from thermometer was 130 Deg C at 1940.5m MDRT 15hrs and 30 min after final TD circulation.
8. Bulk Density (RHOZ) and ADT data were affected badly by washout and borehole rugosity.

OBSERVATIONS AND LOG QUALITY CONTROL	
1. DEPTH CONTROL	**Run 1 down log was the main depth reference log**
2. RHOZ	**Good repeatable data recorded. Density corrections (HDRA) within expected range over gauge hole. Borehole rugosity (washout) affected density data badly.**
3. GR	**Good data recorded.**
4. TPHI	**Good repeatable data recorded. Corrected for whole mud salinity of 25616 ppm. Borehole rugosity (washout) affected porosity data badly.**
5. HNGS	**Good data recorded. NO Uranium rich formation seen.**
6. ADT	**Good data recorded. Proper QC cannot be done because of processing requirement. All the QC flags were OK.**
7. HRLA	**Good repeatable data recorded. Different invasion profile seen when comparing TD section and top section of the log.**

6.2 Summary Run-2: EDTC/PPC/MAST(Sonic Scanner)/GPIT

Run 2 was completed in 7 hours 40 Minutes with no NPT recorded.

Narrative

On completion of Run 1, the PPC/MAST (Sonic Scanner)/GPIT was rigged up. The PPC caliper and GR were calibrated before setting tool “ZERO” depth and run in hole. The crew ran the cable at 60,000 ft/hr to top of 9 5/8” casing shoe before setting the sonic scanner for down log. For down log the

sonic scanner was set for compressional slowness only – BHC mode. In this case, the down log can be logged from casing to 1870 m at 60,000 ft/hr. Run 1 was used for correlation in order to put this log on depth.

The tool was then moved up to 1655.0 m for repeat pass. The repeat pass interval was consistent with run 1. With PPC caliper set to open and sonic scanner set to standard mode (full wave and crosss dipole), the repeat pass was logged from 1655 m to 1550 m. GPIT QC flags were all showing good responses. GPIT data was required in order to orientate the anisotropy seen by the cross dipole sonic processing. The compressional slowness and shear wave slowness (compressional and dipole) were all showing good data. The compressional slowness also follow the same trend seen in the offset well, Planet Down-1. The tool was then moved to TD for main pass.

Main pass was logged using same sonic scanner standard from TD to surface at 1800 ft/hr. GR was also logged to surface as per client request. The sonic scanner data required more processing at Schlumberger data centre.

Summary

1. Run 2 was correlated to Run 1
2. Sonic scanner was logged in BHC mode for down log in order to log using faster logging speed at 6000 ft/hr.
3. Sonic scanner log in standard sonic mode for repeat pass and main pass. Fullwave monopole, inline dipole and cross dipole were recorded in this mode.
4. GPIT data and QC flags were all showing good inclinometry data: which were also recorded. GPIT also read good field intensity and field magnetometer for the well.
5. PPC caliper showing same borehole washout seen by the density tool. PPC is a 2-axis calipers. The washout only showed on one side of the well with the other orthogonal side still in gauge.

OBSERVATIONS AND LOG QUALITY CONTROL	
1. Depth Control	**Run 2 down log tied into run 1**
2. GR	Good repeatable data recorded
3. MAST(Sonic Scanner)	Reasonable data recorded. Sonic fullwave and cross dipole need further processing in Schlumberger data centre.
4. GPIT	Good data recorded
5. PPC	Good data recorded

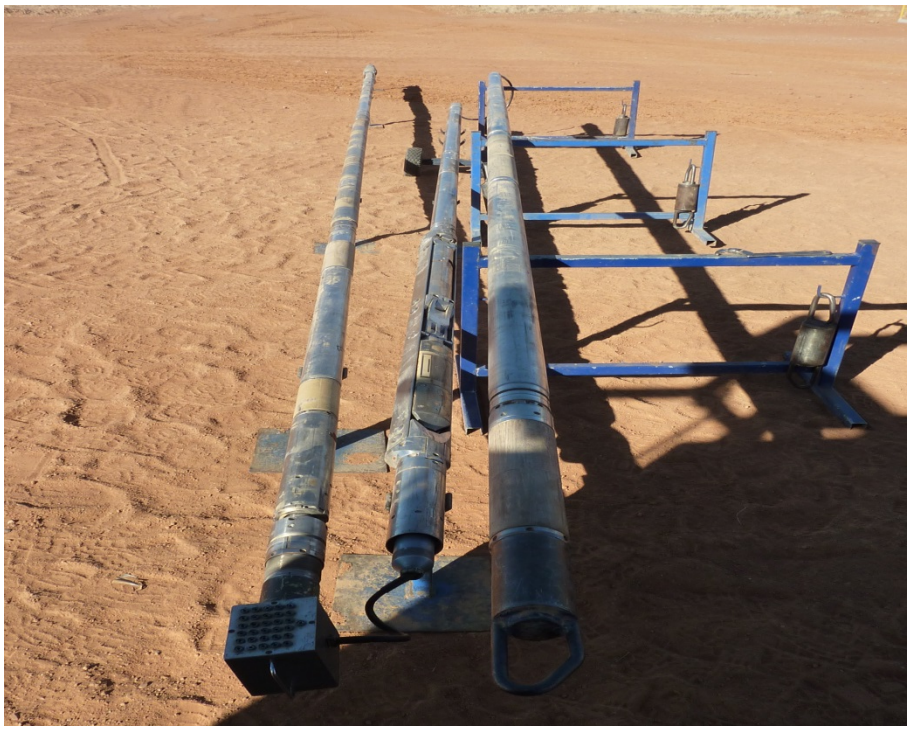


Figure-1 Schlumberger tool checkout for Run 1 EDTC/SP/HNGS/PEX-TLD/HRLA/ADT

Figure-2 Showing MCFL buttons situated in between the TLD detectors.

Figure 4- ADT top and lower Transmitters (in the middle) and 4 set-Top and Bottom receivers

Figure 4- ADT caliper and large caliper ring used to calibrate the caliper section.

7. Summary and Recommendations for continuous improvement

During the Triclops-1 wireline logging operations, there were no NPT recorded. The seismic checkshot planned for DRY CASE logging operation was cancelled due to Schlumberger not being able to mobilize on time. The first two runs were performed successfully without any backup tools at all. The mobilizations also included the MDT, MSCT and FMI tools, which were not run. The crew failed to setup the satellite communication due to very low satellite signal received at the wellsite. This setback affected the logging crew to perform real time logs monitoring via "INTERACT".

The assigned engineers for this job were quite new. They appear knowledgeable in operating the logging system and logging tools. However they were still lacking in experiences to read log. They weren't paying attention to how all the data or curves behaving on the screen. They also showed lack of attention to QC all input spectrums, data graph and waveforms, which is the first step to getting good data.

Client faced difficulties to read in time with the logging as the process monitor was also used for display monitor. In future assigning a separate monitor will improve the operation between client and logging engineers. Running MDT without a second screen would negatively impact the process of achieving good results.

Nevertheless, the advantages of schlumberger system and logging tools are its reliability and easiness for engineers to operate with.

7.1 Highlights:

1. No accidents recorded during the logging operation.
2. No environmental incidents recorded.
3. Good commitment shown by the on-site wireline crew to perform the operation in a safe and efficient manner.
4. All formation evaluation objectives were met during Run 1 and 2 operations.
5. With the exception of RXO data from the MCFL pad of TLD tool, generally good quality data was received.

7.2 Lowlights:

1. Full back up strings were not loaded out for the job. This current well location is quite remote and not having the capability of changing tools when tool failures occur is not good practise.
2. Crew refusal to check MDT at the wellsite was not acceptable. MDT tool and operations had been in operation for a long time. Hence, the crew should find ways to overcome the problem of handling heavy tool at the wellsite.

3. Logging truck was not set up properly for this logging. Plotter wasn't connected to provide plots for QC.
4. Logging system should have two monitors; one for process and the other for display. This way log LQC can be done by the client also.
5. Data depth shifting took considerable time after logging.
6. Slow data transfer due to big data size. For critical data transfer, only required curves or data should be transferred.
7. Complete formation slowness should be provided to client for all types sonic run. Engineers should QC the data real time and try to find the best sonic setup to get the best formation slowness result.

Run 1 Wireline operations

1. Run 1 – The RXO reading from the TLD pad failed to operate. The similar RXO reading can also be derived from ADT and HRLA tool through inversion process. Both reading were checked and compared real time, and reading from HRLA appeared to be the best choice.

Run 2 Wireline operations

1. Run 2 – Sonic Scanner slowness were satisfactorily good real time. Engineers still refused to release the shear and stoneley slowness to client.

7.3 Best practices and Continuous improvement:

1. Inspect all rig-up equipment before every load out or at the wellsite to ensure operational status
2. Mobilise QA/QC supervisor to assist with tool checks in SLB base in ROMA or MOOMBA, reducing time required on site for an audit and in so, significantly reducing the direct cost due to equipment standby rates on site.
3. Perform pre-job logging plan review with SLB in ROMA or MOOMBA to ensure correct equipment is mobilised to site for upcoming operations.
4. Initiate a customer rig book in aiding efficient hand-over between engineers in charge and being consistent to client requirements.
5. Request RITE maintenance history for the specific Schlumberger equipment being mobilised to site.

HEADING INFORMATION & RUN SUMMARY

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Drillsearch

Well	Triclops-1	Rig	Ensign 918		Mud Type	KCL PHB POLYMER	
Block	ATP 539	RKB	NA	m	Mud Weight	9.10	ppg
Type	Exploration	RT Elevation	5.20	m above GL	Mud Viscosity	11	s
Operator	Drillsearch	Ground Level	141.00	m above MSL	Fluid Loss	9	cc
EWL Contractor	Schlumberger	Bit Size	8.50	in	PH	9.0	
Area	Queensland	TD Driller	1926.50	m	Corr Solids	4.0	%vol
Latitude	25degs 59' 43.42988" S	TD Logger	1926.50	m	Oil/Water Ratio	NA	
Longitude	141degs 14' 40.38024 " E	CSG Shoe Driller	762.70	m	Cl^- (whole mud)	33,500	mg/L
Drilling Supervisor	Guy Holmes	CSG Shoe Logger	762.50	m	Rmf @ temp	0.1649	34.7 °C
Logging Engineer	Astrid Mon Panieda/Jamie Fisher	Circ Stopped at TD	28-Jan-13 23:40	dd/mm/yy hh:mm	Rm @ temp	0.197	34.2 °C
Logging Witness	Rothi Hamzah/Andrew James	Circulation time	70	mins	Rmc @ temp	0.204	33.7 °C
Job start date	29-Jan-13	Max Dev @ depth	3.43	at 1216.8 m			

SERVICES	RIG UP dd/mm hh:mm	RIG DOWN dd/mm hh:mm	TOTAL TIME	LOST TIME (Due to Contractor)	LOST TIME (3rd party NPT)	TOP LOGGED INTERVAL (m)	BOTTOM LOGGED INTERVAL (m)
Run 1 : ERCD/EDTC/SP/HNGS/PEX/HRLA/ADT	29/01 10:15	29/01 20:30	10:15	00:00	00:00	725.0	1926.5
Run 2: ERCD/EDTC/PPC/MAST/GPIT	29/01 20:30	30/01 04:10	7:40	00:00	00:00	0.0	1926.5
TOTAL TIME FOR THE LOGGING JOB			17:55	0:00	0:00		
OPERATING EFFICIENCY (1-LT/OT)x 100			100.00%				

SCHLUMBERGER SERVICE QUALITY

The Schlumberger logging crew on the Ensign 918 performed well during the logging operation and showed good commitment. Unfortunately due to failures on setting the satellite communication, real time data streaming could not be done. All crew worked safely and no HS&E occurred throughout the logging operations. It could have been better if Schlumberger crew had brought backup tool for 100% coverage. One of the tool failed downhole and the crew had no choice but to log without it. The truck should be equipped with all the required test harness, in order to check the tool properly on surface and trouble shoot any existing problems. The level of experiences of the operators and specialist were good. The level of experiences of the logging engineers were satisfactory. The total operating efficiency was good with the jobs running flawlessly without any operational problems. Good quality geological and petro-physical data was recorded. The equipment failures need to be investigated and reports on error-cause-removal submitted.

EQUIPMENT QA/QC

Well	**Triclops-1**	**TD Driller**	**1926.50**	**m**	**CSG Shoe Driller**	**762.70**	**m**
Block	**ATP 539**	**TD Logger**	**1926.50**	**m**	**CSG Shoe Logger**	**762.50**	**m**
EWL Contractor	**Schlumberger**	**Bit Size**	**8.50**	**in**	**Circ Stopped at TD**	**28-Jan-13 23:40**	**dd/mm/yy hh:mm**
Job date	**29-Jan-13**	**Max Dev @ depth**	**3.43**	**at 1216.8 m**	**Circulation time**	**70**	**min**
Logging Engineer	**Astrid Mon Panieda/Jamie Fisher**	**Mud Type**	**KCL PHB POLYMER**		**Rmf @ temp**	**0.1649**	**34.7 °C**
Logging Witness	**Rothi Hamzah/Andrew James**	**Mud Weight**	**9.10**	**ppg**	**Rm @ temp**	**0.197**	**34.2 °C**
Report Date	**31-Jan-13**	**Suite**	**1**		**Rmc @ temp**	**0.204**	**33.7 °C**

Equipment QC

Logging Run	Tool Type	Description	Primary Equipment Asset Number	CALIBRATED	Backup Equipment Asset Number	CALIBRATED	COMMENTS
Run 1: ECRD/EDTC/SP/ HNGS/PEX/HRLA/ADT	LEH-QT	Cable head	9004	NA			
	ECRD	Electrical release cable head	-	NA			8k weak point
	SPA-A	Spontaneous Potential	9999	NA			
	AH-369	Mass Isolation sub	752	NA			
	EDTC-BB	Down hole telemetry	8378	28 January 2013			
	EDTH-B	Down hole telemetry	8379	28 January, 2013			
	HEH-K	Spectral GR HNGS housing	19	NA			
	HNGS-BA	Spectral GR Sonde	19	11 January 2013			
	HNGH-AA	Spectral GR housing	47	NA			
	HNGC-AA	Spectral GR cartridge	221	NA			
	HNGH-AA	Neutron and Gamma Ray	2954	27 November 2012			
	HNGS-BA	Neutron and Gamma Ray	3852	28 January, 2013			
	HRCC-H	Density Housing	4854	NA			
	HRMS-H	Density Sonde	4973	NA			
	HRGD-H	Density Pad	4967	10 January 2013			
	AH-184	Mass Isolation sub	5955	NA			
	HRUC-B	Laterolog Upper cartridge	939	NA			
	HRUH-B	Laterolog Upper housing	933	NA			
	HRLS-B	Laterolog Sonde	928	29 January, 2013			
	HRLC-B	Laterolog Lower cartridge	920	NA			
	HRLH-B	Laterolog Lower housing	915	NA			
	AH-270	Mass Isolation sub	845	NA			
	HECH-KDB	ADT	772	NA			
	ADC-C	ADT	759	29 January, 2013			
	ADS-C	ADT	761	NA			
	ADP-C	ADT	761	NA			
Run 2: ECRD/EDTC/PPC/MAST/GPIT	LEH-QT	Cable head	9004				8k weak point
	ECRD	Electrical release cable head	-				
	EDTC-BB	Down hole telemetry	8378	29 January 2013			
	EDTH-B	Down hole telemetry	8379	29 January, 2013			
	PPC	4-arm Caliper	8291	29 January, 2013			
	ECH-SF	Sonic Scanner	6733	NA			
	MAPC-BA	Sonic Scanner	8265	NA			
	MAMS-BA	Sonic Scanner	8262	NA			
	MASS-BA	Sonic Scanner	8218	NA			
	MAXS-BA	Sonic Scanner	8221	NA			
	GPIH-B	GPIT	2816	28 January 2013			
	DHRU-F	GPIT	1823	NA			
	GPIC-H	GPIT	1823	NA			
Surface	MSLC	Wireline logging truck	3144	NA			
	IDW	Depth measuring device	978	26/10/2012			
	7-46ZVXS	Wireline	75134	NA			

EQUIPMENT PREPARATION REMARKS

1. Only one (1) set of complete string mobilized to the wellsite

2. Only standalone system was inside the logging truck. No backup system available inside the truck or mobilized for this job.

3. The logging operations were based on DRY CASE programme. The seismic checkshot planned for third run has been cancelled due to unavailability of the vibrator unit.

4. All pre-log verifications performed during pre-job check at surface and before rig-up. Resistivity tools were checked without test harness.

5. Unable to set up satellite communication system due to poor signal.

6. All tool stand-offs calipered manually and the tool diagram handed to the company representative before rig-up.

7. The HNGS tools were cooled with CO2 before rig-up as per Schlumberger SOP.

8. MAST cross operation was tested on surface but dipole waveforms and monopole waveforms were not tested because special shuck or half-trough was not mobilized.

9. All PPC level was checked during surface test. Level 2 will be used for logging with MAST (Sonic Scanner)

10. MDT and MSCT were not tested on surface.

EQUIPMENT QA/QC

Well	**Triclops-1**	**TD Driller**	**1926.50**	**m**	**CSG Shoe Driller**	**762.70**	**m**
Block	**ATP 539**	**TD Logger**	**1926.50**	**m**	**CSG Shoe Logger**	**762.50**	**m**
EWL Contractor	**Schlumberger**	**Bit Size**	**8.50**	**in**	**Circ Stopped at TD**	**28-Jan-13 23:40**	**dd/mm/yy hh:mm**
Job date	**29-Jan-13**	**Max Dev @ depth**	**3.43**	**at 1216.8 m**	**Circulation time**	**70**	**min**
Logging Engineer	**Astrid Mon Panieda/Jamie Fisher**	**Mud Type**	**KCL PHB POLYMER**		**Rmf @ temp**	**0.1649**	**34.7 °C**
Logging Witness	**Rothi Hamzah/Andrew James**	**Mud Weight**	**9.10**	**ppg**	**Rm @ temp**	**0.197**	**34.2 °C**
Report Date	**31-Jan-13**	**Suite**	**1**		**Rmc @ temp**	**0.204**	**33.7 °C**

Equipment QC

Logging Run	Tool Type	Description	Primary Equipment Asset Number	CALIBRATED	Backup Equipment Asset Number	CALIBRATED	COMMENTS
Run 3: MDT	LEH-QT	Cable head	9004				
	ECRD	Electrical release cable head	-				
	EDTC-BB	Down hole telemetry	8611				
	EDTH-B	Down hole telemetry	8600				
	MRPC	MDT power cartridge	1083				
	MRCH	MDT power cartridge housing	1083				
	MRMS	6 Tank sample carrier	75				
	MPSR	450cc Sample chamber					
	MPSR	450cc Sample chamber					
	MPSR	450cc Sample chamber					
	MPSR	450cc Sample chamber					
	MPSR	450cc Sample chamber					
	MPSR	450cc Sample chamber					
	MRSC	Sample chamber - large volume					
	MRSC	Sample chamber - large volume					
	MRPO	MDT Pump	734				
	MRSC	Sample chamber - large volume	612				
	MRFA	MDT Fluid analyser	8263				
	MRPO	MDT Pump	734				
	MRHY	MDT hydraulics	751				
	MRPQ	MDT probe section	3290				
	MRPP	MDT Power panel					
	MRTM	MDT communications panel					
Run 4: MSCT	LEH-QT	Cable head	9004				
	SGH-K	Gamma Ray	3322				
	MCCM	Rotary coring tool	239				
	MCEC-AA	Rotary coring tool	240				
	MDMU-AA	Rotary coring tool	8090				
	MCRCM	Rotary coring tool	691				
	MCPP	Power panel	239				

EQUIPMENT PREPARATION REMARKS

1. DRY CASE operations- run 3 and run 4 were cancelled

2. Tools for these runs were not checked.

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PRE-JOB QA/QC CHECKS

Drillsearch

Well	**Triclops-1**	**TD Driller**	**1926.50**	**m**	**CSG Shoe Driller**	**762.70**	**m**
Block	**ATP 539**	**TD Logger**	**1926.50**	**m**	**CSG Shoe Logger**	**762.50**	**m**
EWL Contractor	**Schlumberger**	**Bit Size**	**8.50**	**in**	**Circ Stopped at TD**	**28-Jan-13 23:40**	**dd/mm/yy hh:mm**
Job date	**29-Jan-13**	**Max Dev @ depth**	**3.43**	**at 1216.8 m**	**Circulation time**	**70**	**min**
Logging Engineer	**Astrid Mon Panieda/Jamie Fisher**	**Mud Type**	**KCL PHB POLYMER**		**Rmf @ temp**	**0.1649**	**34.7 °C**
Logging Witness	**Rothi Hamzah/Andrew James**	**Mud Weight**	**9.10**	**ppg**	**Rm @ temp**	**0.197**	**34.2 °C**
Report Date	**31-Jan-13**	**Suite**	**1**		**Rmc @ temp**	**0.204**	**33.7 °C**

Pre-Job QA/QC Checks		STATUS	COMMENTS
SURFACE EQUIPMENT	WIRELINE CONTINUITY AND INSOLATION	Good	Checked at the base and was recorded on the cable sheet
	CABLEHEAD CONTINUITY AND INSOLATION	NA	inside the truck
	WIRELINE LENGTH SUFFICIENT FOR LOGGING JOB	NA	Primary 75134 = 3900m;
	WIRELINE TORTURE TEST	NA	Not checked, readily installed with ERCD and ready to go
	DEPTH ENCODER SURFACE CHECK	NA	IDW # 1933 Calibration date 26-Oct-2012.
	MULTI METER AND MEGGER IN GOOD WORKING ORDER	28/1/2013	
	GEIGER COUNTER IN GOOD WORKING ORDER	28 January, 2013	Calibration due date July 2013.
	RA SOURCE INSTALLATION TOOL IN GOOD WORKING ORDER	NA	
	SOURCE CATCHER IN GOOD WORKING ORDER	11/1/2013	Using makeup plate - Dual purposes
	LIFTING CAPS IN GOOD CONDITION AND CERTIFIED	NA	Certified in in date
	TOOL STAND-OFFS CALIPERED FOR ACCURATE OD AND DIAGRAMS WITH CO-MAN	NA	Physically measured OK
	EQUIPMENT FUNCTIONALLITY CHECK ON PRIMARY AND BACK-UP SYSTEM	27/11/2012	No BACK up tool supplied
	COPY OF MASTER CALIBRATION ON PRIMARY AND BACK-UP SYSTEM	28 January, 2013	Verified during logging
	RIG-UP EQUIPMENT CERTIFICATION	NA	
	CABLE CUTTER AVAILABILITY	NA	Not checked
	WEAK POINT SELECTION	10/1/2013	8k weak point in ECRD.
CALIBRATIONS	SHOP CALIBRATION	NA	
	BEFORE LOG SURVEY	NA	
	AFTER LOG SURVEY	NA	
	CALIBRATION EQUIPMENT CONDITION	29 January, 2013	
SAFETY	PRE-JOB SAFETY MEETING HELD ADEQUATE FOR THE OPERATION	NA	
	CORRECT PPE WORN AT ALL TIMES	NA	
	RA SOURCE HANDLING PROCEDURES CORRECTLY EXECUTED	NA	
	BEFORE AND AFTER LOG SURVEYS COMPLETED	NA	
	RA AND EXPLOSIVE BUNKERS STORED IN A SAFE AREA CORRECTLY BARRIERED OFF	29 January, 2013	Stored behind logging truck for transport. NO Bunker
	LIFTING PLAN IN PLACE FOR EQUIPMENT TRANSFER TO AND FROM CATWALK	NA	Picked up sources using wireline
	GROUND CABLES FOR EXPLOSIVE OPERATIONS IN GOOD CONDITION	NA	
	SAFETY SWITCH OPERATIONAL	NA	
	GENERAL SAFETY PROCEDURES FOLLOWED AT ALL TIMES	29 January, 2013	
FISHING	FISHING BOX INVENTORY UPDATED AND COMPLETE	29 January, 2013	Not checked-Short on time-Crew arrived late
	FISHING EQUIPMENT CERTIFIED AND IN GOOD CONDITION	29 January, 2013	
	COPY OF FISHING OPERATING PROCEDURES IN THE FISHING BOX	NA	
	FISHING HAND TOOLS IN GOOD OPERATING CONDITION	NA	
	TWO UNUSED CABLE HEAD GRAPPLES AVAILABLE	NA	
	CABLE CLAMP IN GOOD CONDITION	NA	
TLC KIT	MALE WET CONNECT CHECKED FOR CONTINUITY AND INSOLATION	NA	
	FEMALE WET CONNECT CHECKED FOR CONTINUITY AND INSOLATION	28/1/2013	
	SIDE ENTRY SUB AVAILABLE AND CERTIFIED	NA	
	ALL RELEVANT CROSS-OVERS AVAILABLE AND CERTIFIED	NA	
	WET CONNECTS FUNCTION TESTED FOR LATCHING AND SYSTEM COMMUNICATION	NA	
	CABLE GUARD AVAILABLE	NA	
	TLC HAND TOOL IN GOOD CONDITION	NA	
	COPY OF TLC PROCEDURES AVAILABLE IN UNIT	NA	
UNIT	SYSTEM AND BACK-UP OPERATING CORRECTLY	NA	No back-up. Stand alone system
	WINCH IN OPERATIONAL CONDITION	Good	Need to remedy- brake catching the drum flange when drum moving downward.
	BACK-UP WIRELINE AVAILABLE ON LOCATION AND IN GOOD CONDITION	NA	
	ALL FLUID LEVELS CHECKED AND SATISFACTORY	Good	
	AC'S OPERATIONAL	Good	Not enough, only one unit available
	LIGHTS ADQUATE	Good	
	POWER PACK AND GENERATOR OPERATIONAL	Good	
	UNIT CHECK SHEET COMPLETED BEFORE EVERY JOB	Not Done	Late arrival to location
WORKSHOP	RE-HEAD SPARE PARTS AVAILABLE	Good	
	BACK-OFF EQUIPMENT CHECKED, LABLED AND STORED READY STATE	NA	
	MECHANICAL SETTING TOOL OPERATIONAL, REDRESS KITS AVAILABLE	NA	
	BOP AVAILABLE, SERVICED AND IN READY STATE	NA	
	SQUEEZE GUNS AVAILABLE	NA	
	SPARE CABLE HEAD BUILD, CHECKED AND READY	NA	
	AC'S OPERATIONAL	NA	
	LIGHTS ADEQUATE	NA	
	GR/CCL TOOLS AVAILABLE FOR VARIOUS OPERTIONS AND HOLE ID's	NA	
	HAND TOOLS ADEQUATE	NA	

PRE-JOB QA/QC R E M A R K S

1. The Schlumberger crew arrived on site about 16hrs from rig up time. Only the first two (2) confirmed runs were surface checked.

2. All down-hole equipment was checked on site as per the Equipment QC sheet

3. All rig-up equipment was checked on site

4. Satellite communication was attempted but failed due to poor 'signal' in this remote location.

5. RA survey was done prior to moving the sources to assigned secured location.

6. Cablehead was already made up, hence cable test only limited to insulation and continuity test.

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SEQUENCE OF EVENTS RUN 1

Drillsearch

Well	Triclops-1	TD Driller	1926.50	m	CSG Shoe Driller	762.70	m
Block	ATP 539	TD Logger	1926.50	m	CSG Shoe Logger	762.50	m
EWL Contractor	Schlumberger	Bit Size	8.50	in	Circ Stopped at TD	28-Jan-13 23:40	dd/mm/yy hh:mm
Job date	29-Jan-13	Max Dev @ depth	3.43	at 1216.8 m	Circulation time	70	min
Logging Engineer	Astrid Mon Panieda/Jamie Fisher	Mud Type	KCL PHB POLYMER		Rmf @ temp	0.165	34.7 °C
Logging Witness	Rothi Hamzah/Andrew James	Mud Weight	9.1	ppg	Rm @ temp	0.197	34.2 °C
Report Date	31-Jan-13	Logging Suite	1		Rmc @ temp	0.204	33.7 °C

Start	End	Hrs	Code	Operation and Comments
dd/mm hh:mm	dd/mm hh:mm	(hh:mm)		***Run 1: ERCD/EDTC/SP/HNGS/PEX/HRLA/ADT***
29/01 10:15	29/01 10:30	0:15	1	Conducted pre-job safety meeting on drill floor
29/01 10:30	29/01 11:40	1:10	1	Rig up wireline equipment and made up Run 1 tool string
29/01 11:40	29/01 12:05	0:25	2	Performed surface Ops checks; Loaded thermometers into cable head
29/01 12:05	29/01 12:25	0:20	2	Installed R/A sources to PEX tool
29/01 12:25	29/01 12:30	0:05	2	Zero tool string at head = 26.05m. Checked head tension at surface = 1435 lb. Surface 1400 lb.
29/01 12:30	29/01 12:40	0:10	3	RIH to 150m to perform depth control for first run
29/01 12:40	29/01 13:25	0:45	3	Continue run in hole to casing shoe @ 762.7 m and performed calipers verification, HRLA and MCFL calibration
29/01 13:25	29/01 14:30	1:05	4	Recorded log file 'log down CS' at 3600ft/hr from 726.0 m to 1870m with SP/HNGS/PEX/HRLA. Stopped at 1760m to do another depth control and continue run in hole to 1870m. Tension up at 3670lbs and HTEN at 1820 lbs.
29/01 14:30	29/01 14:45	0:15	3	Picked up tool to 1665 m for repeat pass. Opened PEX and ADT calipers when approaching close to repeat depth.
29/01 14:45	29/01 15:05	0:20	4	Recorded repeat pass file 'REPEAT Pass' @ 1800ft/hr from 1655 to 1555m (Top of Birkhead and Adori formations). Depth shifted +0.5 m to tie into down pass in the interval 1655 m - 1555 m. Experienced overpull of 1,500lbs due to washout hole.
29/01 15:05	29/01 15:20	0:15	3	Run in hole back to TD and slack cable around 2 m.
29/01 15:20	29/01 17:50	2:30	4	Recorded main pass from TD to 50m above 9 5/8" casing shoe at 1800ft/he in Hi-Resolution (4spf). Experienced tight spot at 1607m and pulling 1600lbs overpull. Data over this depth can be bad due to this stick and pull problems.
29/01 17:50	29/01 18:20	0:30	3	POOH and stopped at 100m for safety with radiation sources.
29/01 18:20	29/01 19:00	0:40	6	Standby at 100m to process data for transfer to town- ADT data priority to be processed to decide next runs
29/01 19:00	29/01 19:30	0:30	3	Pull out of hole, on surface and remove R/A sources.
29/01 19:30	29/01 20:30	1:00	1	At surface and rig down Run 1 tool string
Total hours:		**10.25**	(decimal)	

Logging Codes:

1. Rigging up, rigging down
2. Calibrations, tool checks
3. Running in, pulling out of hole
4. Logging up, logging down
5. Repeat Section, depth correlation
6. Data transmission, CPU time.
7. NPT due to wireline
8. Drilling / wellbore co

REMARKS

1. Run 1 was the first run in the hole and will serve as the primary depth reference. A depth shift of +0.12m was applied to get the first repeat pass on depth with downlog. A further +0.36m adjustment required by the main pass to put on depth with down log.

2. All wireline depth was measured from RT - 5.2 m above GL.

3. Run 1 was deployed on wireline. All passes were done in high resolution (2")

4. PEX/ADT data was adversely affected by borehole conditions in sections resulting in stick and pull during Run 1. Severe stick and pull between 1605 and 1607m due to washout borehole. Maximum over pull applied was 1600lbs. Pads closed and opened to free the tool. A repeat log was completed over this interval when the stick and pull observed were improving.

5. TLD PEX was recorded in Limestone matrix and real time borehole corrections were applied.

6. The SP data was recorded for all passes. No noisy SP experienced during logging.

7. The LDT calliper read 8.6" and ADT caliper read 8.3" inside casing. True casing ID = 8.914". Caliper data was corrected to true casing ID before recording repeat and main pass.

8. The HRLA run stood off at high resolution. 2 rubber standoffs were positioned below and above the sonde.

9. The top tool string was run, decentralised using decentralizer on the Neutron Housing. The tool below PEX ran with a knuckle joint to position HRLT about 2" from the borehole wall. Another knuckle joint below the HRLA was used to make the ADT decentralized again.

10. Total hole volume = 48.31 m^3 computed from 1926.5 m - 730 m using data from HRMS (CALI)-arm calliper.

11. Total cement volume = 30.42 m^3 computed from 1926 m - 730 m using data from HRMS (CALI)-arm calliper for 5.5" casing to set.

12. The borehole temperature from the maximum reading themometers were 129 degC, 130 degC and 129 degC at 1920.0 m, 15 hrs 40 mins after bottom hole circulation at TD.

OBSERVATIONS AND LOG QUALITY CONTROL

1. DEPTH CONTROL:	**Run1 will serve as the main depth reference file. Downlog was used as the reference after doing measurement on surface and close to TD.**
2. EDTC:	**Good repeatable data recorded.**
3. HNGS:	**The spectra data real-time QC flags were all good. No anomalies seen on the log**
4. PEX:	**Density and Neutron data affected by the borehole washout and rugosity. Stick and pull over these zones also affected the data. Over the gauge hole, data was repeated well. MCFL -for rxo data failed to read correctly**
5. SP:	**Good data recorded - SP data recorded for all passes.**
6. HRLA:	**Good repeatable data recorded. FMI image data affected in wash-outs and slight amount of stick/slip.**
7. ADT:	**Tool requires good pad contact to work well. Output curves/data were not QC while logging due to requiring further processing by DCS(Schlumberger). The QC flags were found to be good while logging.**

SEQUENCE OF EVENTS RUN 2

Well	**Triclops-1**	**TD Driller**	**1926.50**	**m**	**CSG Shoe Driller**	**762.70**	**m**
Block	**ATP 539**	**TD Logger**	**1926.50**	**m**	**CSG Shoe Logger**	**762.50**	**m**
EWL Contractor	**Schlumberger**	**Bit Size**	**8.50**	**in**	**Circ Stopped at TD**	**28-Jan-13 23:40**	**dd/mm/yy hh:mm**
Job date	**29-Jan-13**	**Max Dev @ depth**	**3.43**	**at 1216.8 m**	**Circulation time**	**70**	**min**
Logging Engineer	**Astrid Mon Panieda/Jamie Fisher**	**Mud Type**	**KCL PHB POLYMER**		**Rmf @ temp**	**0.165**	**34.7 °C**
Logging Witness	**Rothi Hamzah/Andrew James**	**Mud Weight**	**9.1**	**ppg**	**Rm @ temp**	**0.197**	**34.2 °C**
Report Date	**31-Jan-13**	**Logging Suite**	**1**		**Rmc @ temp**	**0.204**	**33.7 °C**

Start	End	Hrs	Code	Operation and Comments
dd/mm hh:mm	dd/mm hh:mm	(hh:mm)		***Run 2 - ERCD/EDTC/PPC/MAST/GPIT***
29/01 20:30	29/01 21:30	1:00	1	Rig-up Run 2 tool string
29/01 21:30	29/01 21:40	0:10	1	Installed thermometers in cable head.
29/01 21:40	29/01 22:10	0:30	2	Performed tool string ops check at surface. Calibrated EDTC(GR). Zero tool string at 19.13m.
29/01 22:10	29/01 22:30	0:20	3	RIH to 9 5/8" casing shoe.
29/01 22:30	29/01 23:20	0:50	4	Recorded downlog in BHC mode from casing shoe to 1870.0 m at 6,000 ft/hr
29/01 23:20	29/01 23:40	0:20	3	Pulled up to 1655m for Repeat pass over birkheads and Adori formations
29/01 23:40	29/01 23:55	0:15	4	Recorded repeat pass with Sonic Scanner set for Standard Mode (Fullwave monopole/Inline and X-dipole)
29/01 23:55	30/01 00:10	0:15	3	RIH back to TD for Main pass and slack 2 m.
30/01 00:10	30/01 03:15	3:05	5	Recorded Main pass from TD to surface.
30/01 03:15	30/01 04:00	0:45	1	Verified EDTC(GR) and rig down run 2
30/01 04:00	30/01 04:10	0:10	1	Completed rig down Schlumberger.
Total hours:		**7.67**	(decimal)	

Logging Codes:

1. Rigging up, rigging down
2. Calibrations, tool checks
3. Running in, pulling out of hole
4. Logging up, logging down
5. Repeat Section, depth correlation
6. Data transmission, CPU time.
7. NPT due to wireline
8. Drilling / wellbore co

REMARKS

1. Run 2 was tied into Run 1 depth at 1655 m. Run 1 is the main depth reference file.

2. The GPIT real time QC flag indicated good data. All the reading seen during logging were within the tolerances of this location.
3. Sonic scanner (MAST) was logged in Standard mode to acquire inline dipole, cross dipole and monopole data sets. The DT compressional was compared with the offset well and the reading were all within ranges. The DTS from the inline dipole were also reading good with a very tight coherence confidences.

4. Cross dipole data were not QC during logging but the raw waveforms look fine. More processing required to be done by geoscience centre.

5. PPC caliper showed all the breakouts over the washout zone were one sided-at minimum stress.

6. All tool ran centralized using 4 slipover centralizers and standoff on the MAST isolator section.

7. Sonic scanner and GR were logged to surface. Sonic scanner was logged using the same standard mode.

8. The borehole temperature from the maximum reading themometers were 131 degC, 131 degC and 130 degC at 1905.0 m, 24 hrs 30mins after bottom hole circulation at TD.

OBSERVATIONS AND LOG QUALITY CONTROL

1. DEPTH CONTROL:	**Log correlated to Run 1 - ECRD/EDTC/SP/HNGS/PEX/HRLA/ADT**
2. EDTC:	**Good repeatable data recorded.**
3. PPC:	**Caliper from PPC showed same washout as seen from the PEX-TLD caliper. Interesting part was the washout only happened to one of the orthogonal calipers. This indicated breakout only on the low stress side of the formation.**
4. MAST:	**The compressional arrival read almost the same as the offset well used for Triclops-1. The inline dipole, cross dipole and monopole worked well as seen on the display screen.**

Operating Efficiency Chart

Drillsearch Energy Limited

Triclops-1

Runs 1 - 2

SUMMARY AND RECOMMENDATIONS

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Drillsearch

Well	Triclops-1	TD Driller	1926.50	m	CSG Shoe Driller	762.70	m
Block	ATP 539	TD Logger	1926.50	m	CSG Shoe Logger	762.50	m
EWL Contractor	Schlumberger	Bit Size	8.50	in	Circ Stopped at TD	28-Jan-13 23:40	dd/mm/yy hh:mm
Job date	29-Jan-13	Max Dev @ depth	3.43	at 1216.8 m	Circulation time	70	min
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Logging Witness	Rothi Hamzah/Andrew James	Mud Weight	9.1	ppg	Rm @ temp	0.197	34.2 °C
Report Date	31-Jan-13	Run	1		Rmc @ temp	0.204	33.7 °C

RUN	SERVICES	RIG UP dd/mm hh:mm	RIG DOWN dd/mm hh:mm	TOTAL TIME	LOST TIME (due to Contractor)	LOST TIME (3rd Party NPT)	BHT °C	TEMP DEPTH m TVDBRT
Run 1 : ERCD/EDTC/SP/HNGS/PEX/HRLA/ADT		29/01 10:15	29/01 20:30	10:15	00:00	00:00	130.0	1926.5
Run 2: ERCD/EDTC/PPC/MAST/GPIT		29/01 20:30	30/01 04:10	07:40	00:00	00:00	131.0	1926.5
TOTAL TIME FOR WIRELINE OPERATIONS				17:55	0:00	00:00		
OPERATING EFFICIENCY (1-LT/OT)x 100				100.00%				

SUMMARY

Triclops-1: The extensive 5 runs logging operation was cut down to only 2 runs when the well status changed to DRY CASE. The logging crew arrived quite late but still in time to check the tools. The first run EDTC/SP/HNGS/PEX/HRLT/ADT ran without any big problem. The MCFL pad section of HRMS tool, which was located within the HDRS (Density)pad, wasn't working but all the density data was good. With the MCFL buttons failing, the log run failed to provide the best RXO data available. The ADT and HRLT tool could also produce RXO curve using inversion process but not as good as from the MCFL buttons. Although no backup tool was mobilized, logging was continued. The repeat pass was done first over pre-selected interval between 1655 to 1555 m (with all sensors). This interval was chosen because it covered the top of Birkhead Sandstone and all Adori Sandstone interval. Massive washout due to formation broke out over this repeated interval. ADT, density and neutron data were badly affected. A couple of stick and pulls were also experienced during recording. The maximum overpull applied to get free was around 1600lbs. The main pass was done from TD to 50m above 9 5/8 casing shoe. No additional tools problem occurred except the same stick and pull over the same zone as seen during repeat pass. On surface, all the auxiliary items were still intact on the tool body and radioactive source were retrieved safely. Run 2: EDTC/PPC/MAST/GPIT - Sonic array was ran in a full waveform mode which consisted of monopole, inline dipole and cross dipole. The GPIT was in the string, for the cross dipole process to provide the azimuthal direction of the anisotropy. The PPC was used for tool centralization and to provide an orthogonal caliper reading. The downlog was recorded from casing shoe to 1870m in compressional mode (BHC) only at 6000 ft/hr. The repeat pass was also recorded over the same interval as run 1. The main pass was done from TD to surface. The PPC data showed the same washout severity as density run but only in one direction of the PPC orthogonal caliper. This highlighted the possibility of running dual density or short-axis arrangement over the same formations on the next well. Tool reached surface without any problem and rigged down safely.

HIGHLIGHTS INCLUDED

1. Good commitment shown by the logging crew during the entire operation.
2. Good quality geological and petrophysical data recorded.
3. Good collaboration between Schlumberger office based personnel and the field to process the ADT log.
4. No HS&E issues during the entire operation.

LOWLIGHTS INCLUDED

1. The data playback to apply depth shift with Maxwell was extremely slow, delaying the final data delivery. This happened involving ADT data on the first run.
2. Standalone system with no backup wasn't desirable for a job that is far away from any wireline base. At the very least, the main CPU where the system program reside should have backup.
3. Only one (1) set of tools was mobilized to location. We weren't that lucky on this job because MCFL data failed to work.
4. Crew refused to even consider to check MDT because it is not common practise and tools are heavy and they would need special crane to lift the tool properly for connections. Schlumberger should be flexible enough to come up with ways to use the rig fork lift and couple of good slings or fixtures for this.
5. The truck did not have a special test box to check HRLT and MCFL during wellsite surface checkout. Theses boxes are very important to the success of client formation evaluations. Reasoning with not having enough boxes to supply each truck was not acceptable.
6. The small truck layout was not a problem, but without a specific display monitor for client to view the real time log was bad. Having to share the same monitor with engineer process screen was a nightmare.
7. Logging engineers were not interested in reading the log time and QC it. They were lucky because most of the tools were automatically setup by the system without much engineers' interventions.
8. Intercom between logging truck and rig floor was not available. The rig up and rig down operations only relied on hand signals. Several times during rig up, the winchman assumed the next steps prior to the operators on the rig floor giving the signal. This wasn't safe at all.
9. Printer inside the logging truck wasn't setup for logging.
10. Crew left immediately after logging ended. Engineer should check with geologist or client representative to verify all logs and data have been QC and complete.

RECOMMENDATIONS

1. A short axis contingency run for PEX and ADT should be planned during equipment preparation at the base. It is also wise to plan PPC run on the first run in the event of irregular formation breakouts are suspected.
2. Cable head maintenance records and cable book need to be kept inside the logging truck at all times.
3. Provide a second display screen for client to view and QC logs real time
4. Ability to switch-off certain tools during recording can be an advantage to increase logging speed if required.
5. Logging engineers should use all the best practise available during logging e.g. checking casing DT (57us/ft.)- sonic verification downhole.
6. Logging engineers should provide preliminary field final plots and data to be QC. The final field plot will then be generated and provided to client before leaving the wellsite. NO log QC performed for this well because this is quite common practise as crew departed the location before providing the final log. This practise should be stopped.
7. ALARA should be followed closely during any type of radioactive usages at the wellsite. Ensure new operators trained to handle radioactive.
8. Follow logging orders provided at the wellsite closely. A lot of details on how to manage the logging operation and data delivery are provided.

BEST PRACTICES

Ensure all runs are checked on primary and back-up surface system and that all calibrations are available on both systems.
Assign dedicated crew chiefs to assist engineers during rig-up and rig-down operations, thus eliminating extended working hours.
All field logs to be QC'ed by afriQA witness before final field copies are distributed.
Unspliced and marked wirelines needs to be assigned for all exploration projects.
Make use of dedicated field crews as much as practically possible to drive continuous improvement.