

# **BLAMORE - 1**

# WELL COMPLETION REPORT: BASIC DATA

EP 93

Pedirka Basin Northern Territory

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## **1.0 Introduction and Summary**

The Blamore-1 well was drilled by Central Petroleum Ltd in July and August 2008 in Exploration Permit 93 in the Pedirka Basin, Northern Territory. The well was spudded at 0400hrs on 5 July 2008 reached Total Depth of 2128m on 0700hrs 22 July 2008 when the drill pipe became stuck on pulling out of the hole to change the drill bit. The pipe probably became stuck as a result of packing-off of cavings around the bit and drill collars. Several attempts were made to jar the drill pipe free without success. The drill pipe was backed off leaving the bit, five drill collars and two stabilizers in the hole. Due to continuing hole problems, no further attempts were made to retrieve the lost pipe. The top of the fish is located at 2064 m.

Blamore -1 was drilled to test the Algebuckina Sandstone, Poolowanna, Purni, Tirrawarra Sandstone (Equivalent), Crown Point and Warburton formations. All geological horizons were intersected except the Crown Point and the Warburton formations which were secondary target horizons. The geologic prognosis for this well was based on seismic data and the Colson-1 well located 88 kilometres from Blamore-1. Prognosed depths were quite different to the actual depths of the target zones.

No live oil was found in Blamore-1 but a positive indication of prior oil entrapment was seen with the intersection of a 15m plus residual oil column from 998m – 1023m (up to 60% staining) at the top of the Algebuckina Sandstone. This is the fourth well in the Pedirka Basin and overlying Jurassic to intersect residual oil columns; the others being Colson-1, Simpson-1 and Poolowanna-1 (flowed live oil).

Coal seams which liberated gas comprising C1 to C5 were encountered in the upper part of the Purni Formation over the interval 1533.7m to 1983m with a net 160m of coal in seams greater than 0.2m.

Wireline logs were run successfully although tools hung up several times around 1300-1320mRT.

Three open hole drill stem tests were attempted using dual inflatable packers. These tests were proposed to assess the permeability of Purni Formation coal seams, however all three were unsuccessful due to mechanical failure.

The well was plugged and abandoned and the rig was released 1000hrs 22 August 2008.



## TABLE 1: WELL INDEX SHEET

							+					
WELL NAME					CLASS	CLASSIFICATION : Wildcat						
OPERATOR :			Imited									
	P 250, L 87Si		Die N	<b>.</b>		Details						
Latitude: 2	25° 20' 10.082	24''	Rig N		Hunt Rig	2 rgy Limited		S	pud Date: 5 <sup>th</sup> July 2008 D Date: 22 <sup>rd</sup> July 2008 (stuck pipe)			
Longitude: 13	36° 08' 46.485	6 ″	Rig T			del-400 (50		R	ig Released: 22 <sup>nd</sup> August 2008			
E												
	615200m											
Northing: 7 MGA 94 Zone	7197775m											
Basin: Pedirk						Depths		<u> </u>	Status			
Desert	a ompoor		Surfa	ce Ele	vation (AF		142	2.0m	Otatus			
Sub-Basin:						Kelly Bushi		5.3m	Plugged & Abandoned			
Field: Wildca	at Well			Depth		- <b>,</b>		28m				
Permit: EP 93	, Northern											
Territory												
	iner Details				M	ud Details			Trajectory:			
Size	Dep											
(inches)	(n	-			section - G		1		Vertical			
16" Conductor		5m Free	8 1⁄2"	nole s	ection - KC	I-PHPA Po	lymer					
9 5/8" 7" Tomporany (		5m 5m										
7" Temporary		וווכ	1		Cidor	all Cores		C11441-	as Samples			
	oring Details rval	Recov	erv	Shot		vered		Inter	gs Samples val Sample Rate			
inte inte	1 401	1.6001	, er y	25	2			15m –				
				20	2	0		-	- 2127m 3m (6m fast			
								drilling)				
FOR			ĸ	В	Isopac	SubSea	SubSea TWT*		COMMENTS			
					h	(MD)	(msec)					
				oths n)	(m)	. ,						
	Namba Formation			.3	25.7	+142.0	-	Quater				
Eyre Formatio			30		115	+116.3	-	Tertiar	-			
Winton Forma			145		370	+1.3	362.2	Cretac	eous			
MacKunda Fo				15	120	-368.7	-					
Oodnadatta F			635		200	-488.7	-					
Bulldog Shale Cadna-Owie F			835 960		125 8	-688.7 -813.7	- 790.2					
Murta Membe					o 27.3	-821.7	-	Farly (	Cretaceous			
Algebuckina			968 995.3		282.7	-849.0	-		ic 15m+ residual oil shows at top			
Poolowanna F		1)	1278		8.3	-1131.7	-		lurassic			
Walkandi Fori		,		36.3	247.4	-1140.0	981.8	Triassi				
Purni Formati	on			3.7	564.3	-1387.4	1140.4	Permia	an Massive Coal Measures			
Tirrawarra Fo	rmation			98	30+	-1951.7						
Total Depth			21	28		-1981.7			rom Blamore-1_computations-txt,			
								Append	dix#8			
	_			LOG	GING perf	ormed by						
Date		th (m)						Descripti	on			
00/7/00	From		To		un/Trip		Logs Red					
28/7/08	1302.6		950	1/		LL-XMAC-						
28/7/08	1301.1		15.9	1/					nung up, GR-XMAC through. casing			
4/8/08	1324		1200	1/		LL-XMAC-						
6/8/08	1980.7		238.7 1/4 MLL-DLL-XMAC-ZDL-CN-G						orary / casing at 1495m			
6/8/08	1965		510 2/1 VSP-2									
6/8/08 7/8/08	1981.2 1974		1498.5 3/1 STAR-GR 1507 4/1 MREX-GR									
7/8/08												
1/0/Uð	1977.5		504.5	5/	1 SWC							
					14	ell Track						
D/	epth	1		Latit			Longitud		Vertical Well			
		l Ne D9				three coal			Purni Formation at total depth.			
									er in each instance the packers			
failed to inflate								,				
	sine the progr											

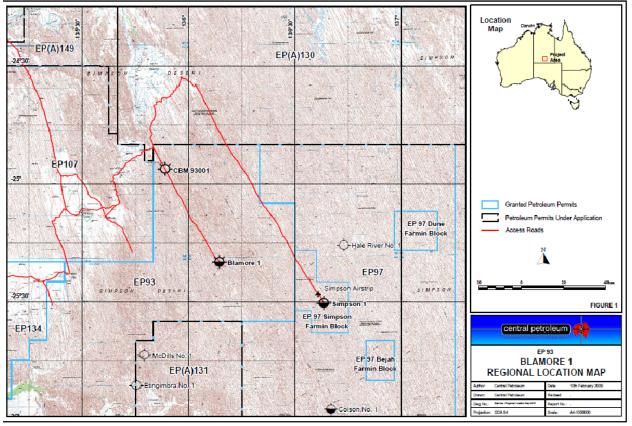


## 2.0 General Data

Well Name	Blamore-1
Well Classification	Wildcat
Interest Holders	Central Petroleum Limited80%Petroleum Exploration Australia20%
Petroleum License	EP 93, Northern Territory
Location	Latitude 25° 20' 10.0824″ S Longitude 136° 08' 46.4856 ″ E
	Easting 615200m Northing 7197775m
	Australian Map Grid Zone 53 MGA 94
Ground Level (GL)	142.0m
Kelly Bushing (KB)	146.3m
Total Depth	2128m
Drilling Contractor	Hunt Energy Limited
Drilling Rig	Hunt Rig 2, see Rig Specifications; Appendix No.11
Contractors:	
Drilling Fluids Mud Logging Wireline Logging Cementing Earth Works DST Testing	RMN Drilling Fluids Baker Inteq Baker Atlas Halliburton R&M Dehne Farley Riggs
Spud Date:	5 <sup>th</sup> July 2008
Total Depth Reached:	22 <sup>nd</sup> July 2008
Rig Released:	22 <sup>nd</sup> August 2008
Well Status:	Plugged and Abandoned



#### Figure-1: Location map

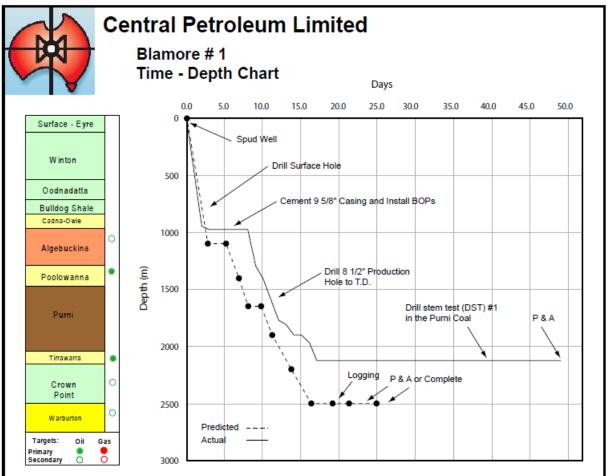


## 3.0 Drilling

## 3.1 Summary of Drilling and Related Operations

The Hunt Rig 2 mast was raised on the 4<sup>th</sup> July 2008. Drilling of the 24" conductor hole to 15m and the running and cementing of the 16" conductor pipe at 15m were carried out without incident, these considered pre spud activities. Figure 2 is a drilling time versus depth curve, the main drilling problem, which resulted in significant lost time, was hole instability over the interval1200-1600m.

#### Figure 2: Drilling TvD curve



#### 12 ¼" Hole

Blamore-1 spudded at 0400hours on the 5<sup>th</sup> July 2008 with a 12 <sup>1</sup>/<sub>4</sub>" drill bit. One metre of cement was drilled within the conductor pipe before drilling soft surficial Eyre Formation sediments to a depth of approximately 145m.

At 145m the Cretaceous Winton Formation was intersected and indicated some potential to cause problems due to hole instability. This was particularly evident while drilling from 400m to 500m when large cavings in moderate amounts, often greater than 2 cm in length, were observed coming over the shale shaker. These consisted of dark moderately hard to hard claystone cavings, irregular in shape, rarely very dark, hard and distinctly curved, spoon like cavings. The drill bit was noted to fall into the formation on occasion, but also the bit was "grabbed" resulting in temporary slow drilling spots at 442m and 483m. Cavings diminished from returns from drilling below 500m.



Drilling proceeded to a depth of 975m at which time returns were circulated after coarse sand was observed in the drill cuttings in a cuttings sample at 960m. Drilling then proceeded to 975m and the hole was prepared for 9.5% casing.

On pulling out of the hole 20Klb overpull was experienced at 952m. On returning in hole it was determined that the hole was taking 18 bbl/hr mud, with the loss presumed to be into the Cadna-Owie Formation. Fill was tagged at 905m, thence ream and wash 70m to bottom. A moderately large volume of cavings was circulated to surface, principally Winton Formation cavings with some Oodnadatta Formation cavings, these of variable size, some larger than 2cm in length.

#### 9 %" Casing

Running of the 9 %" casing started slowly. The casing had to be worked and washed from 48m to 144m, through the soft clays and sands of the Eyre Formation. Towards casing point at 950m the casing hung up. An attempt to break circulation was unsuccessful. Casing was pulled back to 938m laying out 2 joints. The SWAGE was installed and circulation was established at the depth. Casing was then run to 965m at which point one joint casing was laid down and the landing joint was picked up. On running back to casing depth the casing became stuck with the shoe at 960m. Circulation was attained, a high viscosity pill was run but working pipe 105 Klb up, 75 Klb down was unsuccessful (clutch slipping at 180 Klb Indicated weight). A diesel /Rodfree pill was pumped and spotted on bottom, the pipe was pulled free after 15 minutes with 180 Klb indicated weight.

After circulating and dumping returns of the diesel/Rodfree pill to the sump, working the casing down to 965m depth proved to be slow, due to the likely presence of cavings up hole or perhaps also relating to ongoing loss of mud to the top Cadna-Owie sand with associated mudcake buildup. A Halliburton a mixing pump failure occurred and a further delay occurred when the casing head was tested and found to be leaking.

Cementing of the 9 <sup>5</sup>/<sub>8</sub>" casing proceeded successfully. An 11.9 ppg lead slurry of 254 bbl (548sx) and a 15.8 PPG tail slurry of 20 bbl (96sx) were pumped, these displaced with water. An estimated 3 bbl of cement reached the surface.

#### 8 1⁄2" Hole

After the blowout preventer was nippled up, drilling of the 8 ½" hole commenced on the 13<sup>th</sup> July 2008. Three metres of new hole were drilled to 978m whereupon a formation integrity test was carried out. With 8.6 ppg of mud in the hole a maximum pressure of 1310 psi (equivalent mud weight of 16.6 ppg) with no leak off.

Drilling progress was fast through the Algebuckina Sandstone. The Triassic Walkandi Fomation was intersected at 1286.3m, with slow drilling of the upper part then breaking into faster drilling sandstones. At 1405m, after intersecting a coal, it was decided to pull out of the hole to cut a core. On pulling out of the hole, tight hole was noted from 1299m to 1262m. It was decided not to cut the core as no crossover sub was on location to connect the core barrel to the Hunt Rig 2 bottom hole assembly.

On circulating bottoms up from 1405m, a light to moderate amount of hard siliceous medium to dark brown grey, cavings were circulated to the surface. The cavings were irregular in shape and up to 1cm in size. Cavings of this dimension were not seen again during drilling or in bottoms up samples after trips.

Drilling proceeded to a depth of 1775m at which point the rig air supply was found to be of insufficient volume and pressure to operate the draw works clutch and it was decided to pull out of the hole to the 9 %" casing shoe while this problem was investigated and rectified. Some tight hole was experienced at 1520m with singles pumped out to 1459m. On returning in the hole the drill string held up at 1535m. The hole was reamed and washed from 1535m to 1602m, then fill was washed 1744m to 1775m.

Drilling of new hole proceeded from 1775m to a depth of 1900m. At this depth, due to breakdown of both mud pumps, it was decided to pull out of the hole to the casing shoe to repair both pumps, each of which required new parts to be sourced off location.

After the repair of the pumps, the hole was reamed and washed from 1881m to 1900m. Only moderate returns were seen over the shakers at bottoms up, these consisting of small cuttings size cavings of



multicoloured clay from the upper part of the Triassic. The persistence of these cuttings sized cavings was disconcerting, for they were also found to comprise a persistent percentage of cuttings in the cuttings samples collected while drilling. Many of these cavings looked to be freshly drilled, perhaps indicating that larger cavings were falling down the hole and were broken up to cuttings size by the bottom hole assembly and bit.

New hole was drilled from 1900m to 2128m at which point it was planned to pull out of the hole for a bit change, after drill rate slowed.

#### Stuck Pipe

At kelly down depth of 2128m, on pulling up with the view of reaming the hole drilled by the final single, the bit reached 2115m when 25 thousand pounds overpull was encountered and the bit stuck. The drill string could not be worked downwards.

Immediately prior to reaching 2128m, a small drop in pump pressure over the preceding 30 minutes was noted by the mudlogger. The driller was informed of this, however mud was circulating freely at 1550psi at 60 SPM with no pressure loss evident on his records and the preparation to pull out of the hole proceeded and the stuck pipe occurred. While working the pipe a gradual loss of pump pressure became more evident. Surface equipment was checked out OK and a washout down hole was therefore suspected. Working of pipe was stopped, circulation reduced and a 37 bbl Diesel/Rod free pill was prepared and spotted. Subsequent working of the drill pipe was unsuccessful with the drilling jars losing effectiveness with time and further loss of circulating pressure down to 1100psi at 60 SPM evident.

The primary cause of the stuck pipe appeared to be the jamming of cavings at depth 2115m, a depth where a drilling break was evident and possibly a locus for a bridge. The presence of larger cavings was not evident from examination of bottoms up from previous trips or during drilling, however later operations and evidence from wireline logging, in particular hole size from the caliper log, indicate larger cavings were likely to have been falling down the hole from an unstable upper part of the Triassic Walkandi Formation from 1286.3m to 1348m, with the hole indicated to be in gauge through claystone below this interval, by virtue of the log response (see Section 5.2.4, a/ Walkandi Formation, paragraph 8). Small cuttings sized cavings of multicoloured claystone, in part siliceous and hard, were persistent while drilling and were the dominant component of moderate cavings returns on bottoms up after tripping, however as stated previously, had the appearance of being drill cuttings or perhaps re-drilled cavings.

The presence of a washout in the string was considered a contributory factor to the original problem of stuck pipe. It is probable the accelerating loss of circulating pressure through the bit did not help in freeing the pipe.

Two carbides were run and it was determined likely that the washout in the string was likely to be in the drill string at relatively shallow depth within the casing. The decision was made to attempt a back off at 900m. This was successful; however no washout could be detected in the recovered string.

After returning in the hole the drill string was screwed back in to the tool joint at 900m. The kelly was picked up to circulate and a carbide was again run to check the depth of the wash out in the drill string, this still tended to suggest washout should be about 866m. Pump pressure was measured at 700 psi at 60 SPM.

A freepoint indicator was then run to investigate how badly the bottom hole assembly was stuck. This determined that the bit, near bit Stabilizer, 6 ½" Drill Collar and Stabilizer were stuck. It was decided to back off at 2064m. A first attempt at back off failed due to a misfire; then a second attempt was successful. The washout in the drill pipe was detected in the drill string while pulling out of hole at depth 937m. The washout was located at box end in the slip area.

Bottom hole assembly left in the hole consisted of Bit; Near Bit Stabilizer; 6  $\frac{1}{2}$ " Drill Collar; Stabilizer; two 6  $\frac{1}{2}$ " drill Collars, a total length of 51.03m.

A new drilling jar was expected to arrive on rigsite; however the truck carrying it was delayed in Cooper Pedy. It was decided to run in the hole with a bit with the worn jars.

#### Ongoing Problems with Walkandi Formation Caving, Decision to run Wireline Logs

While returning in the hole the drill string held up at 1320m. The next 14.5 hours were spent reaming and washing from 1320m to 1663m, returning in hole with stands where possible. The main problems appeared to stem from the collapse of the upper part of the Triassic, Walkandi Formation, with most reaming/drilling effort required to get through the section directly below 1320m, with evidence that the bit was following bridged off cavings down to the 1663m depth. Returns over the shaker consisted of multi coloured claystone cavings that looked like freshly drilled cuttings.

From 1663m stands were run freely into the hole to 2031m at which point the kelly was picked up to wash and ream to the top of the fish at 2064m. On pulling out of the hole stands had to be worked through tight hole from 1530m to 1340m, thence pulling free to 1300m.

Due to deteriorating hole conditions a decision was made to run wireline logs rather than continuing the fishing operation.

The drill string was run in again from its 1300m position to 2031m when the kelly was picked up to wash and ream to the top of the fish at 2064m and then circulate a high viscosity sweep. The drill string was pulled out of the hole without incident.

Baker-Atlas GSlam combination logging tools were then run in the hole. The tool held up at 1304m. Attempts to work past the obstruction at this depth met with no success. The logging tools were pulled out recording with the caliper log showing substantially enlarged hole between 1286.3m; and 1301m (first reading). On pulling the tools to surface the tool combination was reconfigured, the neutron density tools were removed and the bottom of the tool was configured as a hole finder. This configuration was run in the hole however this time hung up at depth 1302m, again attempts to work past the obstruction again unsuccessful and the tools were pulled out of the hole.

Mud weight up to this point was 9.1 ppg. The decision was made to increase weight to 9.5 ppg in an attempt to stabilize hole conditions.

Pulling out of the hole was not a problem, however drilling through the bridges required serious drilling effort. The upper part of the Triassic, Walkandi Formation, top 1286.3m (wireline depth) had originally been drilled some 16 days previously was demonstrating that large, likely hard parts of the formation were continuing to fall into the hole to bridge across in gauge parts of the sequence, in particular at depth 1302m. Note, while drilling there was very slow drilling for half a metre from 1302.5m to 1303m.

The bottom hole assembly was remade to incorporate the new drilling jar that had arrived on location, a mill toothed bit and an additional stabilizer. This was run in the hole to a depth of 1302m at which depth the drill string held up. The kelly was picked up and the section from 1293m down to 1560m was reamed and washed with some care to maximize the chance of cleaning out the hole, this taking a little more than a day. From 1560m the drill string was run in the hole freely to a depth of 2041m at which depth the kelly was picked up to ream and wash to the top of the fish at 2064m.

A high viscosity sweep was circulated prior to pulling out of the hole to 1250m without trouble. The drill string was then run in the hole to determine the effectiveness of the preceding effort to clean the hole. Unfortunately on running in, the drill string once again hung up at depth 1302m. The kelly was picked up again and the section from 1302m to 1314m was then repeatedly washed and reamed. After this part of the hole stayed clear the hole was progressively reamed and washed to a depth of 1353m.

At this point it was decided to set a cement plug over the problematic interval. The drill string was pulled out of the hole and then open ended drill pipe was run to a depth of 1332m where it held up. The kelly was picked up and the pipe washed and worked to a depth of 1353m when no further progress could be made. A 46 bbl cement plug was then run.

On returning to bottom it was initially thought top of the cement plug was tagged at 1293m, when 5 thousand pounds of weight on bit was observed, however later reaming and washing from 1293m to 1324m indicated no cement to be present. Once again the bit hung up at 1324m and after repeated reaming at this depth the hole failed to stay clear. It was decided to pull out of the hole, remove the stabilizer, and run in with a slick assembly. On returning in the hole the drill string hung up at 1301m, the

kelly was picked up and the hole was reamed and washed from 1301m to 1323m, repeatedly hanging up at 1316m.

After further reaming and washing the top of the cement plug was finally tagged at 1333m. Cement was drilled to 1353m, then drilling and reaming below this cement plug setting depth through obstructions in the hole to a depth of 1360m. The hole was reamed and washed from 1360m to 1408m, thence returning in the hole freely, except for a minor hang up at 1660m, to a depth of 2002m. The kelly was picked up and the hole reamed and washed from 2002m to the top of the fish at 2064m, with minor tight spots and 6m of fill.

After pulling out of the hole a further attempt was made to run wireline logs. The GSIam assembly was run in the hole but hung up at 1319m. The tools were the worked down to 1324m but could not be run past this point. Logs were recorded from 1324m to 1200m incorporating the section of hole not logged previously.

# Running Temporary 7" Casing through unstable Walkandi Formation zone and successful running of Wireline Logs

An alternative plan was then implemented. 7" casing was to be run in the hole uncemented to act as a conduit through which logs could be run. This operation proved successful, however not without difficulty; from 1324m to 1342m the 7" casing had to be washed and worked downwards. The casing was run to 1812m and then pulled back to 1495m (wireline log depth 1496.8m).

The GSIam logs, MLL-DLL-XMAC-ZDL-CN-GR, were then run in the hole. The logging tools reached a depth of 1891m before hanging up. The GSIam were successfully logged up from 1980.7m to 1238.7m.

The Vertical Seismic Profile was then run, with guns rigged up in the flare pit. The flare pit had been deepened and despite the loose sandstone surface, held fluid effectively.

The next log run was the Star-Orientation-Gamma Ray tool, recorded from 1981.7m to 1498.5m.

The MRex tool was then recorded from 1974m to 1507m.

The final logging run was the sidewall core gun. Cores shot 25, recovered 23 and lost 2.

#### **Drill Stem Testing**

No mechanically successful drill stem tests were conducted.

The operation was time consuming, requiring the mobilization of 3  $\frac{1}{2}$  " drill string and associated 4  $\frac{3}{4}$  " bottom hole assembly as well as drill stem test tools, all at short notice.

The programme called for three zones to be tested in open hole using dual inflatable packers. The drill stem test tools were provided by Farley Riggs with the three zones to be tested consisting of Purni Formation coals with the objective being to determine the permeability of these coals. All attempts to drill stem test were mechanically unsuccessful as in all instances the packers failed to inflate.

#### Abandonment

The testing programme was aborted and the decision was made to plug and abandon Blamore-1, see Section 3.2 below for details.

Hunt Rig No, 2 was released 1000hrs 22 August 2008, to be mobilized to drill CBM 93-01.

#### 3.2 Particulars of Drilling



#### 3.2.1 Particulars of the equipment installed in or on the well

The well has been plugged and abandoned. Casing and abandonment details are included below.

# 3.2.2 Casing and equipment installed in or on the well including details of abandonment.

The following casing was run in the hole:

16" Conductor Pipe cemented at 15m

9 <sup>5</sup>⁄<sub>4</sub>" Casing Set at 965m.

7" Temporary Casing run to 1495m (Wireline log depth 1496.8m). This casing was cemented at well abandonment.

Details of Abandonment:

Blamore-1 was plugged and abandoned on 22 August, 2008. The Purni coals were left open with 9.5ppg mud across them. 7" casing was cemented into place from 1465m to at least 30m above the 9 5/8" shoe – conservative estimate puts the cement top at 935m. However, the top is probably much higher since excess cement was used to account for the known washouts. A 15m surface plug was also set. A wellbore schematic of the wellbore in its current state is included as Figure No.4.

#### 3.2.3 Cementing operations carried out

The following cementing operations were performed:

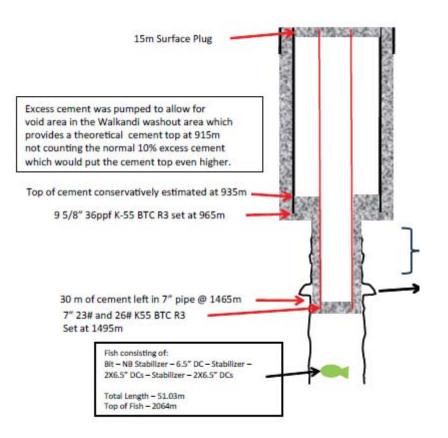
Conductor Casing – A 24" hole was augered to 15m. Then 11m of 16" conductor pipe was cemented in place with 2000kg (47X94# sxs) of Class A cement and 3 sxs of calcium chloride on 5 July, 2008.

Surface Casing – On 11 July, 2008, 9  $\frac{5}{6}$ " 36ppf BTC K-55 R3 casing was cemented in a 12  $\frac{1}{4}$ " hole at a depth of 965m. An 11.8 ppg lead slurry consisting of 254bbls (548 sxs) Class G with 1.15 gal/sx Econolite was pumped. This was followed by a 15.8 ppg tail slurry consisting of 20bbls (96 sxs). Displacement was with water. Three barrels of cement were returned to surface when the plug bumped. Casing was pressure tested to 2300psig. No operations occurred over the next 7.5 hrs while cement cured to an adequate hardness.

Intermediate Casing – 7" 23/26ppf K55 BTC R3 was cemented in an 8  $\frac{1}{2}$ " hole below the 9  $\frac{5}{8}$ " casing at a depth of 1495m. This casing string became stuck in the hole but maintained circulation. It was decided to cement it in place rather than taking the time to fish it out. It was cemented with 115 bbls of lead cement pumped at 5 bpm followed by 10 bbls of tail cement pumped at 4 bpm. A displacement of 183.9bbls of water pumped at 6bpm left 30m of cement in the 7" casing and took the cement top to 30 meters above the 9  $\frac{5}{8}$ " shoe. This operation took place 20 August, 2008.



#### Figure-3: Blamore-1 well schematic



#### 3.2.4 Bit Records

Two bits were used during the drilling of the Blamore-1 well, the details of which are summarised in Table 2 below:

#### **TABLE 2: Bit Records**

Bi	it # Size	Manufacturer	Туре	IADC	Jets	Hrs	In	out	drilled
1	12 ¼"	Stealth	JST 11XC	117	3X16,14	37.5	15m	975m	960m
2	8 1⁄2 "	Stealth	JTC 44D	447X	3X12	106.5	975m Bi	2128m t stuck in	1153m hole

### 3.2.5 Deviation Surveys

Deviation surveys were taken using a TOTCO survey tool with a 0-8° range with a single shot survey barrel. Survey results are summarised in Table 3 below:



#### TABLE 3: Deviation Surveys

Depth (m)	Dev (degrees)
40	1/4
77	1/2
302	1
451	3/4
613	1/4
764	1
913	2
1065	1
1218	1 1/2
1365	1 1/2

## 3.2.6 Drilling Fluids

Mud engineering services were provided by RMS Drilling Fluids. Aus Gel-KCl Spud Mud was used for the surface hole to casing point of 975m. In the 81/2" hole KCl/PHPA mud was used 975m to 1200m and KCl/PHPA/ Pac-R from 1200m to Total Depth of 2128m. Daily summary details a summarised in Table 4 on the next page. A full report on the drilling fluids used in Blamore-1 is included Appendix No.9.

#### **TABLE 4: Drilling Fluid Record**

Date	Wt	Vis	PV /	Gels	%	%	MBC	рН	Chlorides	Hardness	KCl %wt
			YP		Solids	Sand	ppb				
6-Jul-08	9.1	34	10/24	6/10	4	0.2	15	9.5	19000	480	3.5
7-Jul-08	9.1	38	12/24	8/14	5	0.2	15	9.0	18000	480	3.2
8-Jul-08	9.0	37	12/22	6/10	5	0.2	12.5	9.0	16000	400	3.0
9-Jul-08	9.0	36	11/23	5/8	4	tr	10	10.0	15000	400	2.8
10-Jul-08	8.7	35	11/22	5/8	3	tr	5	8.0	12000	400	2.0
11-Jul-08	NC										
12-Jul-08	8.6	42	12/16	4/8	1	0			23000	440	3.5
13-Jul-08	8.6	42	12/16	4/7	1	0		9.0	23000	400	3.5
14-Jul-08	8.8	38	12/20	6/9	2.5	0		9.0	20000	400	3.0
15-Jul-08	8.9	37	11/20	5/8	4	0		9.0	17000	400	2.5
16-Jul-08	8.9	38	11/22	6/9	4.5	0.25	5	9.2	19500	400	3.0
17-Jul-08	9.1	38	10/23	6/11	4.4	0.2	5	8.7	19300	360	2.6
18-Jul-08	9.1	42	9/27	6/12	4.6	0.25	7.5	8.8	20000	400	2.5
19-Jul-08	9.1	40	9/25	6/14	4.5	0.25	7.5	8.8	19000	360	2.6
20-Jul-08	9.1	38	9/25	6/9	4.5	0.2	5	8.7	19000	369	2.6
21-Jul-08	9.0	36	11/14	4/8	3.9	0.2	5	8.7	19000	360	2.6
22-Jul-08	9.1	39	10/23	6/10	4.5	0.2	5	9.0	17000	360	2.4
23-Jul-08	9.1	40	10/24	6/12	5.1	0.2	5	8.8	19000	360	2.6
24-Jul-08	9.1	38	9/24	6/10	4.8	0.2	5	8.8	19000	360	2.6
25-Jul-08	9.1	37	8/24	5/9	4.8	0.2	5	8.7	19000	360	2.6
26-Jul-08	9.0	37	11/19	5/9	4	tr	5	8.9	20000	400	2.7
27-Jul-08	9.0	39	11/22	6/10	4	tr	5	8.9	20000	400	2.7
28-Jul-08	9.1	41	13/19	6/12	4.7	0.25	5	9.0	18000	360	2.5
29-Jul-08	9.2	43	12/22	7/14	5.4	0.3	5	8.8	18500	360	2.5
30-Jul-08	9.5	41	11/21	6/12	6.9	0.33	5	8.8	31000	440	5.0



## Blamore-1 Well Completion Report: Basic Data

Date	Wt	Vis	PV /	Gels	%	%	MBC	рΗ	Chlorides	Hardness	KCl %wt
			YP		Solids	Sand	ppb	-			
31-Jul-08	9.6	42	9/24	7/14	7.2	0.25	5	8.9	32000	440	5.3
1-Aug-08	9.6	44	11/23	7/14	6.9	0.25	5	9.0	31000	400	5.2
2-Aug-08	9.5	41	11/20	6/11	6.6	0.2	5	8.5	30000	440	5.1
3-Aug-08	9.7	38	10/20	7/14	7.4	0.25	5	9.0	37000	900	6.3
4-Aug-08	9.7	41	11/21	7/12	7.5	0.2	5	9.0	38000	800	6.4
5-Aug-08	9.7	40	10/22	7/11	7.3	0.2	5	8.8	37000	800	6.3
6-Aug-08	9.5	41	12/20	7/13	6	0.2	5	8.6	33000	720	5.5
7-Aug-08	9.5	40	11/20	6/11	6.1	0.2	5	8.5	32000	720	5.5
8-Aug-08	9.5	40	11/20	6/11	6.1	0.2	5	8.5	32000	720	5.5
9-Aug-08	9.5	40	11/20	6/11	6.1	0.2	5	8.5	32000	720	5.5
10-Aug-08	9.5	38						9.0			
11-Aug-08	9.5	40						9.0			
12-Aug-08	9.5	40						9.0			
13-Aug-08	9.4	41						9.0			
14-Aug-08	9.6	40						9.0			
15-Aug-08	9.6	40						9.0			
16-Aug-08	9.6	40						9.0			
17-Aug-08	9.4	41						9.0			
18-Aug-08	9.4	41						9.0			
19-Aug-08	9.4	41						9.0			
20-Aug-08	9.4	41						9.0			
21-Aug-08	9.4	41						9.0			
22-Aug-08	9.4	41						9.0			

#### Note: Mud Engineer not on site from10 Aug 08

#### 3.2.7 Lost Time

A total of 499 hrs were tallied as lost time. Nineteen percent of this was associated with rig mechanical problems, twenty-nine percent was due to stuck pipe, forty-seven was attributed to hole problems and five percent was assigned to waiting on cement to arrive. A detailed breakdown is located in the Appendix No.1, this analysis excludes the attempt to conduct open hole drill stem tests funded by a third party (QGS).

## 3.2.8 Water Supply

Water for drilling purposes was taken from a water bore drilled close to the location. This well, Blamore Bore, was drilled to 374m. A 6  $\frac{3}{4}$ " steel casing was cemented from 258m to surface and a 6  $\frac{3}{4}$ " slotted steel casing was set from 258m to 300m. The remainder of the well was left open hole. The well produced water at a rate of 2.5 l/hr. The water was not potable for human consumption. Water was produced to a turkey's nest then pumped to the rig. No problems were encountered with the bore. A schematic of the bore is included in Appendix No.12.



## 4.0 Logging, Sampling and Testing

Descriptions of samples and data collected pertinent to formation evaluation of the Blamore-1 well are included in this section.

## 4.1 Cuttings Samples Collected

10m interval washed and dried cuttings samples were collected from 15m to 975m. 3m interval washed and dried cuttings samples were collected from 975m to 2127m. Within this interval where fast drill rates prevailed, sample interval was spaced at 6m intervals.

Selected samples were collected for Palynology, Geochemistry and Coal Petrology evaluation with the results detailed within the appendices forming parts of this report.

#### 4.2 Sidewall Cores

25 sidewall cores were shot with 23 successfully recovered, between depths 1977.5m and 1504.5m. Specific depths and descriptions of these sidewall cores are included in Appendix No.3

## 4.3 Mudlogging

Standard mudlogging services were provided by Baker Inteq for the duration of the well. The mudlog for the well is included as Enclosure No.1 of this report. A final well report is provided by Baker Inteq and is included in this document as Appendix No.10.

#### 4.4 Wireline Logging

Three attempts were made to record wireline logs between 28/7/08 and 4/8/08 however on each occasion the logging tools hung up in the upper part of the Triassic Walkandi Formation. Maximum depth reached was 1324.2m. Final logs were run on 6/8/08 and 7/8/08 after temporary 7" casing had been run to a depth of 1495m, to resolve the problem of poor Walkandi Formation hole condition. Open hole logs were recorded between 1981m, the maximum depth reached and 1495m (wireline depth 1496.8m), with logs run through casing between this depth and the earlier attempts to run logs. The following table details all wireline logging conducted in the Blamore-1 well.

RUN	TYPE OF LOG	Interva	al (m)	COMMENT
1/1	MLL-DLL-XMAC-ZDL-CN-GR	1302.6	950	71°C / 16HR 30MIN, RECORDED 28/7/08
1/2	MLL-DLL-XMAC-ZDL-CN-GR	1301.1	159	GR/SONIC ONLY TO SURFACE 68°C / 9HR 50MIN. RECORDED 28/7/08
1/3	MLL-DLL-XMAC-ZDL-CN-GR	1324.2	1200	RECORDED 4/8/08
1/4	MLL-DLL-XMAC-ZDL-CN-GR	1980.7	1238.7	106°C / 27HR 35MIN, RECORDED 6/8/08 TEMPORARY 7" CASING RUN TO 1495M (LOG DEPTH 1496.8M)
2/1	VSP-2	1965	510	RECORDED 6/8/08
3/1	STAR-GR	1981.2	1498.5	106°C / 45HR 20MIN, RECORDED 6/8/08
4/1	MREX-GR	1974	1507	109°C/53HR 30MIN, RECORDED 7/8/08

**TABLE 5: Wireline Log Summary** 



Blamore-1 Well Completion Report: Basic Data

RUN	TYPE OF LOG	Interva	al (m)	COMMENT
5/1	SWC	1977.5	1504.5	25 SHOT: 2 LOST: 23 BOUGHT, 7/8/08

## 4.5 Vertical Seismic Profile

A Vertical Seismic Profile (VSP) was recorded from depth 510m to 1965m. Results of the VSP are included in Appendix No.8.

## 4.6 Drill Stem Testing

The Drill Stem Testing programme called for three zones to be tested in open hole using dual inflatable packers. The drill stem test tools were provided by Farley Riggs with the three zones to be tested consisting of Coal seams in the upper part of the Purni Formation. The objective of the programme was to determine the permeability of these coals.

All attempts to drill stem test were mechanically unsuccessful as in all instances the packers failed to inflate. No pressure or fluid samples were obtained and the testing programme was aborted.

#### 4.7 Coal Desorption Sampling

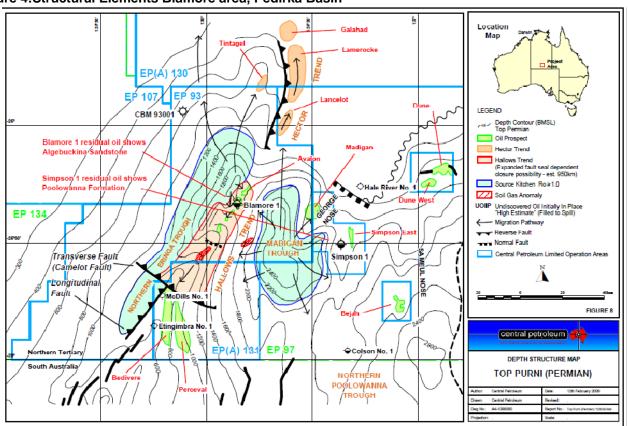
Bulk samples of Purni Formation coal cuttings were loaded into GeoGas canisters. Q1 gas desorption measurements were obtained on rigsite. Field desorption measurements were made for a 20 minute period. Q1 data sheets were prepared for each of the 11 coal cutting filled canisters collected from various Purni Formation coal seams in Blamore-1. Canisters were resealed directly after taking Q1 measurements and sent to GeoGas. Further desorption analysis was conducted under laboratory conditions by GeoGas, with data obtained included as Table 10 in Section 5.3.3 of this report. Q1 field data sheets for individual canister samples and details of the GeoGas methodology are included in Appendix No.4.

## 5.0 Geology and Formation Evaluation

#### 5.1 Regional Geological Setting and Discussion of the Blamore Prospect

The Blamore area lies in the Simpson Desert and encompasses four vertically stacked sedimentary basins, namely the Palaeozoic Warburton Basin, the Permo-Carboniferous Pedirka Basin, the Triassic Simpson Basin, and the Jurassic-Cretaceous Eromanga Basin. The basins are superimposed to some extent and over wide areas reflect a structural footprint controlled by Palaeozoic structuring and palaeo-depositional facies.





## Figure 4:Structural Elements Blamore area, Pedirka Basin

The Blamore Prospect was mapped as a multi-level 4 way dip closure on the Hallows Trend which is a linear, multi-crested structural nose plunging northwards, being bound on its eastern and western margins by the Madigan and Eringa Troughs respectively (Figure 4).

The stratigraphic section is very similar to that encountered in Colson-1, 50 km to the southeast. This is true for the Jurassic- Cretaceous section which is similar and a full section is recorded – i.e. Winton Formation, Oodnadatta Formation, Bulldog Shale, Cadna-Owie Formation, Murta Member and Algebuckina Sandstone.

The Triassic section (Walkandi Formation) is overlain by a thin Poolowanna Formation, the contact being marked by an apparent weathered claystone zone. This zone was problematical during drilling. The Walkandi Formation comprises multi coloured claystone that becomes brick red below 948m and becomes predominantly sandstone with a minor coal horizon in its lower part. The Walkandi Formation disconformably overlies the early Permian Purni Formation.

The Purni Formation sequence was much thicker than predicted (prognosed 161m, versus actual; 564m) The Upper Purni is coal bearing with 132m net coal, in several thick seams.

The Tirrawarra Formation (Equivalent) was not logged because of drilling problems. It appears to consist of 30m+ of fine to coarse sandstone with poor to very poor porosity.



## 5.2 Lithology and Formation Tops

Drill Cuttings sample lithological descriptions and SWC descriptions are included within this report as Appendix 3. Table 6 shows predicted vs actual Formaion Top depths

Formation Tops	Prognos	ed Depths	Final D	Difference		
Blamore-1	(mKB)	(mSS)	(mKB)	(mSS)	High / Low To Prognosis	
Surficial / Namba Fm	4.5	0	4.3	0		
Eyre Fm			30	+116.3		
Winton Fm	164.5	-18	145	+1.3	+19.3	
Oodnadatta Fm	664.5	-518	635	-488.5	+29.5m	
Bulldog Shale	851.5	-705	835	-688.7	+16.5m	
Cadna-owie Fm	1061.5	-915	960	-804.5	+101.5m	
Murta Member			965	-818.5		
Algebuckina Ss	1083.5	-937	995.3	-889	+88.2m	
Poolowanna Fm	1543.5	-1397	1278	-1131.7	+265.5m	
Walkandi Fm			1286.3	-1139	Not prognosed	
Purni Fm	1727.5 (1472)**	-1581	1533.7	-1387.3	+193.8m (-61.7m)	
Tirrawarra Ss (Equivalent)			2098	-1951.7	Close to top Crown Pt Prog.	
Crown Point Fm	1918	-1742	+2128 (TD)	-	Not penetrated (?) -180m (approx.)	
Warburton Basin					Not Penetrated	
Total Depth			2128	<mark>-</mark> 1918.3		

**TABLE 6: Predicted v Actual Formation Tops** 

\*\* Top Purni Formation was re-prognosed at 965m casing point using RMS velocities

## 5.3 Hydrocarbon Indications and Sample Analysis

Gas readings throughout the Top Cadna-Owie to the Top of the Permian, Purni Formation coals were very low. The main indications of hydrocarbons during drilling were apparent residual oil shows at the top of the Algebuckina Sandstone. Gas shows recorded from Purni Formation were the main interest in the well, and are dealt with in this section. Rare to trace cuttings grains showed mineral fluorescence through the Purni Formation including a minor amount of amber, a soft unidentified mineral and one fluorescing quartz grain in the 155m sample. None of these produced a fluorescent cut.

## 5.3.1 Top Algebuckina Residual Oil Shows

Residual oil shows were observed in the top of the Algebuckina Sandstone cuttings samples through the interval 996m to 1017m. The shows were not accompanied by elevated gas readings, visual fluorescence, or streaming cut fluorescence. Mudgas readings were less than 10ppm C1. (Note: trace amounts of iso and normal pentane were noted in the mud below the casing shoe however these relate to a minor amount of diesel in the mud system, with the diesel spotted to

free up stuck casing). Slow developing cut fluorescence, pale white in 999m to 1005m interval, increasing to pale to moderately bright white cut fluorescence 1005m to 1017m interval. All samples consisted of mainly loose sand.

Dead oil through the show interval was described as 3% brown stained sand grains in 996m-999m sample; 20% brown stained sand grains in the 999-1005m, light brown stain with spots of dark brown staining; 1005m to 1017m, 60% of sand grains, show predominantly light brown residual oil staining. Residual oil staining declined to less than 5% in 1023m sample.

A key observation at the wellsite was that there was a definitive increase in the intensity of fluorescent cut from the samples with a greater percentage of stained grains. This was particularly obvious with a careful comparison being done at the wellsite between the cut fluorescence obtained from sample 1005m which had 20% of sand grains showing residual oil stain and gave pale white cut fluorescence; and the cut fluorescence obtained of sample 1011m which had 60% of sand grains showing residual oil stain and gave pale white to moderately bright white cut fluorescence.

## 5.3.2 Gas Shows from Purni Formation Coals

Gas shows recorded from the Purni Formation Coals seams are summarised in Table 8 below. All coals demonstrated relatively high values of C2+ gas. A problem in assessing the gas data, particularly the upper seams, was that the lag time was incorrect and thus gas peaks from the coals intersected were recorded late. Gas peaks from drilling breaks related to coals miscorrelate with drill depths, with the peaks plotting on the mudlog deeper than they should as a result of the incorrect lag time used.

Depth Interval (m)**	Thick- ness (m)**	TG Units ***	C1	C2	C3	iC4	nC4	1C5	nC5	Background Gas Units (Tr. in ppm)
1405 -1425		Tr.								C1 4-16
1425 -1503		Tr1								C1 2-75
1537 - 1544	7	26	3441	183	33	9	3	2	1	
1569 - 1573	4	20								
1578 - 1579	1	12								
1616.5 – 1619.5	5	80								
1625.5 – 1630.5	5	71								Average
1651 - 1660	9	100								Background
1681.5 - 1690	8.5	133	19951	1377	351	44	10	7	2	Gas 4 units
1698 - 1700	2	70								
1719 - 1721	2	60								
1726 - 1732	6	126								
1750 - 1752	2	45								
1792 – 1794.5	2	31.1	5189	339	77	9	3	1	0	3
1796.5 – 1802.5	6	233	23991	1500	335	34	11	4	2	2
1834 – 1842	8	169	25789	1279	381	44	18	5	2	4
1880.5 - 1882	1.5	98	13339	763	301	41	23	7	4	3
1897.5 - 1900	2.5	67.4	12557	908	404	54	30	8	4	5
1900.5 - 1905	4.5	181.5	25489	1509	579	75	37	9	4	10
1920.5 - 1928	7.5	104	13400	877	441	66	42	10	6	5
1943 -1945.5	3.5	37.5	8660	513	286	56	35	10	6	7
** All depths and gas data are from the daily geological reports, coal seam thickness were preliminary with no reference to wireline log data: all coals not included *** Units quoted : 1 unit is approximately 200ppm C1										

#### TABLE 7: Gas Shows from the Purni Formation Coals

## 5.3.3 Gas Desorption Results from Purni Formation Coal Cuttings

Bulk samples of Purni Formation, coal cuttings were loaded into GeoGas canisters. Q1 gas desorption measurements were obtained on rigsite. Further desorption analysis was conducted in laboratory conditions by GeoGas. Q1 field data sheets for individual canister samples and details of the GeoGas methodology are included in Appendix No.4.

#### 5.3.4 Other Indications of Oil

#### Lower Walkandi:

Samples collected at 1407m and 1410m in the Lower Walkandi contained three grains in each sample, demonstrated dull to moderately bright yellow white fluorescence, however in solvent there was no fluorescent cut. Such grains persisted as very rare to poor trace in the remainder of the Lower Walkandi.

#### **Purni Formation:**

No live oil shows were detected in the Purni Formation in Blamore-1. Dead oil may have been present however grain staining associated with coal staining is common and dead oil shows were not detected.

The Purni Formation coals yielded a moderately bright white fluorescent cut throughout, with increasing cut intensity with depth.

A poor oil show was noted 1807 to 1812m. It was described as 5% extremely dim orange-brown pin-point fluorescence, rare patchy very dull yellow-white fluorescence with very slow blooming blue-white cut fluorescence and a thin film residue. Rare dull orange pinpoint fluorescence with slow pale white fluorescent cut was also recorded in the 857m sample. Cut in samples generally relates to coal fragments present in samples.

## 5.4 Source Rock analysis

Rockeval Pyrolysis and Coal Petrology work was carried out on cuttings samples of Purni Formation coals. The results of these two types of source rock analyses are discussed separately below; Raw data for Geochemistry can be found in Appendix No.5 and on Coal Petrology/Maturity in Appendix No.4.



## 6.0 References

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