ZEROGEN PTY LTD

ZEROGEN-5

WELL COMPLETION REPORT

ATP 722P – QUEENSLAND

ZeroGen Pty Ltd
Level 3,
23a Graham St,
Milton Qld 4064
Australia

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1.0 WELL CARD

1. General Data

<table>
<tr><td>Well:</td><td colspan="8">ZeroGen-5</td></tr>
<tr><td rowspan="4">Location:</td><td>Permit:</td><td colspan="7">ATP 722P</td></tr>
<tr><td>Latitude:</td><td colspan="2">23°52’ 01.025013” GDA</td><td>Easting:</td><td colspan="4">641 691.94 E MGA Z55</td></tr>
<tr><td>Longitude:</td><td colspan="2">148°23’ 29.626246” GDA</td><td>Northing:</td><td colspan="4">7 359 807.41 N MGA Z55</td></tr>
<tr><td>Seismic:</td><td colspan="7">Line: AD92-5 SP: 933</td></tr>
<tr><td rowspan="2">Elevation:</td><td>GL:</td><td>184.28 m AMSL</td><td>Hole Size:</td><td>12 ¼””</td><td>8 ½”</td><td>5 ½”</td><td>HQ 3.78” (2.5” core)</td><td>NQ 2.98” (2” core)</td></tr>
<tr><td>KB:</td><td>Datum GL</td><td>Drilled Interval:</td><td>0 to 12m</td><td>11 to 200 m</td><td>200 to 600 m</td><td>600 to 872.6 m</td><td>872.6 to 1313.9 m</td></tr>
<tr><td rowspan="2">Well Classification:</td><td rowspan="2">Exploration R&D</td><td rowspan="2"></td><td>Casing Size:</td><td>9-5/8” mm Polypipe</td><td>6- 5/8” 19 lb/ft</td><td>4 ½ “ liner 11lb/ft</td><td>4 ½ “ liner 8lb/ft</td><td></td></tr>
<tr><td>Shoe Depth:</td><td>11 m</td><td>197.9 m</td><td>554.7 m</td><td>821.1 m</td><td></td></tr>
<tr><td>Well Status:</td><td colspan="8">Suspended, pending P&A.</td></tr>
<tr><td>Operator:</td><td colspan="8">AGR Asia Pacific Pty Ltd by delegation of Stanwell Corporation Limited</td></tr>
<tr><td>Permit Operator:</td><td colspan="8">Sunshine Gas Limited</td></tr>
<tr><td>Permit Interest Holders:</td><td colspan="8">Sunshine Gas Limited (100%)</td></tr>
<tr><td>Drilling Contractor:</td><td colspan="3">Wallis Drilling</td><td colspan="5">Rig: Wallis Delta 14</td></tr>
<tr><td>Spud Date:</td><td colspan="8">19 March 2008 (14:30 hrs)</td></tr>
<tr><td>Rig Release Date:</td><td colspan="8">27 April 2008 (18:00 hrs) & 16 June 2008 (10:00 hrs) after XLOT workover</td></tr>
<tr><td>Total Depth:</td><td colspan="3">Driller:</td><td colspan="2">1313.9 m</td><td>Logger:</td><td colspan="2">1250.5m</td></tr>
</table>

2. Stratigraphy

Formation Tops (* seismic markers)	**Measured Depth (mGL)**	**Subsea Depth (mSS)**	**Prognosed Depths (Pre-survey)**		**Diff Prog. H/L**
			(mGL)	**(m/SS)**	
Recent	0	184.28	0	182	0
Tertiary (Incl Basalts)	24	160.28	20	162	4H
Rewan	106.0	78.28	106	76	0
Bandanna Fm	435.6	-251.32	436	-254	0.4H
Black Alley Shale	590.2	-405.92	624	-442	33.8H
Mantuan Fm*	629.1	-444.82	656	-474	26.9H
Peawaddy Fm	807.1	-622.82	826	-644	18.9H
Catherine Sst	892.0	-707.72	917	-735	25L
Ingelara Fm	923.0	-707.72	934	-752	11H
Freitag Fm	1109.7	-925.42	1127	-945	17.3H
Upper Aldebaran Sst*	1233.6	-1049.32	1248	-1066	14.4H
Total Depth	1313.9	-1135.62	1300	-1118	16.4H

3. Wireline logging

Contractor	Log	Suite	Run	Date	Interval
CSW	GR-CAL-DEN-RES	1	1	28/03/08	598.3 – 0 m (Density 598.3 – 200m) (Resistivity 598.3 – 200m)
Weatherford	GR-SP-CAL-PEF-DT-MDL-MSS-MPD-MDN	2	1	20/04/08	1247.85-590 m (GR: 1247.85 to surface) (Density 1247.85 – 850m)

Note: Final logs were run at 1248 mGL before final drilled TD was reached at 1313.9 mGL

4. Formation tests (DST, FRT)

Test No	Packers Set Test Interval (mKB)	Fm	Build Up No	LRBU (psia)	P* (psia)	kgas (mD)	Skin	Results / Comments
N/A								

5. Formation integrity tests (FIT, LOT, XLOT)

Test Type	Test depth/ interval	Fm	Equiv Mud wt ppg	FBP Gradient Psi/ft	Comments
FIT	203	Rewan	16		
XLOT	604-614	BAS		1.25	3 cycle test

6. Cores

Whole Cores:	Interval (mGL)	Metres Cut
	HQ: 600 – 872.6	272.6
	NQ: 872.6 – 1313.9	441.3
	Total 713.9 m	
Sidewall Cores:	None	

7. Petrophysical Summary

Formation	TOP (m)	BASE (m)	GROSS (m)	NET (m)	NTG (V/V)M	PHITH MDM	KINTH Nov08 V/V	PHIT AV V/V	SWT AV V/V	PHIE AM V/V	VOL WETCLAY AM	KINT Nov08 AM MD
TGLD	875	892	17	0	0	0	0	-	-	-	-	-
Catherine	892	923.4	31.4	24.3	0.772	2.16	1670	0.089	1	0.083	0.050	69
Ingelara	923.4	1109.7	186.3	16.8	0.090	1.267	1.3	0.076	1	0.061	0.112	0.1
Freitag	1109.7	1233.6	123.9	18.4	0.149	1.53	0.5	0.083	1	0.072	0.099	0.02
Upper Aldebaran	1233.6	1238.2	4.6	4.0	0.859	0.27	2	0.069	1	0.063	0.052	0.4
Well	**875**	**1238.2**	**363.2**	**63.4**	**0.174**	**5.23**	**1673**	**0.082**	**1**	**0.073**	**0.081**	**26**

TGLD: Top of Good Log Data (no triple combo above this zone)
PHITH: Total porosity * net thickness
KINTH Nov 08: Intrinsic Permeability* net thickness (Nov 08 permeability algorithm)
PHIE AM: Effective porosity arithmetic average
SWT: Total water saturation
KINTNov08 AM: Intrinsic permeability arithmetic average (Nov 08 permeability algorithm)

Petrophysical Cut-offs:

Parameter	Log	Value
Net Sand	VShale	<=40%
Net Reservoir	Porosity	>=4%
Net HIP	Swt	<=80%

8. Reservoir Pressure and Temperatures

Formation	Depth (mGL)	Reservoir pressure (psi)	Reservoir Temp (degC)	Source
Catherine Sandstone	892	N/A	56	Weatherford
Ingelara Formation	923	N/A	57	Weatherford
Freitag Formation	1109	N/A	62	Weatherford
Aldebaran Sandstone	1233	N/A	64	Weatherford

2.0 EXECUTIVE SUMMARY

ZeroGen-5 (ZG-5) is the fifth research and development (R&D) exploratory well drilled by ZeroGen Pty Ltd, a subsidiary of Stanwell Corporation Limited (SCL) within the proposed Northern Denison Trough CO_2 storage site. It is located approximately 45km north east of Springsure (Figure 1).

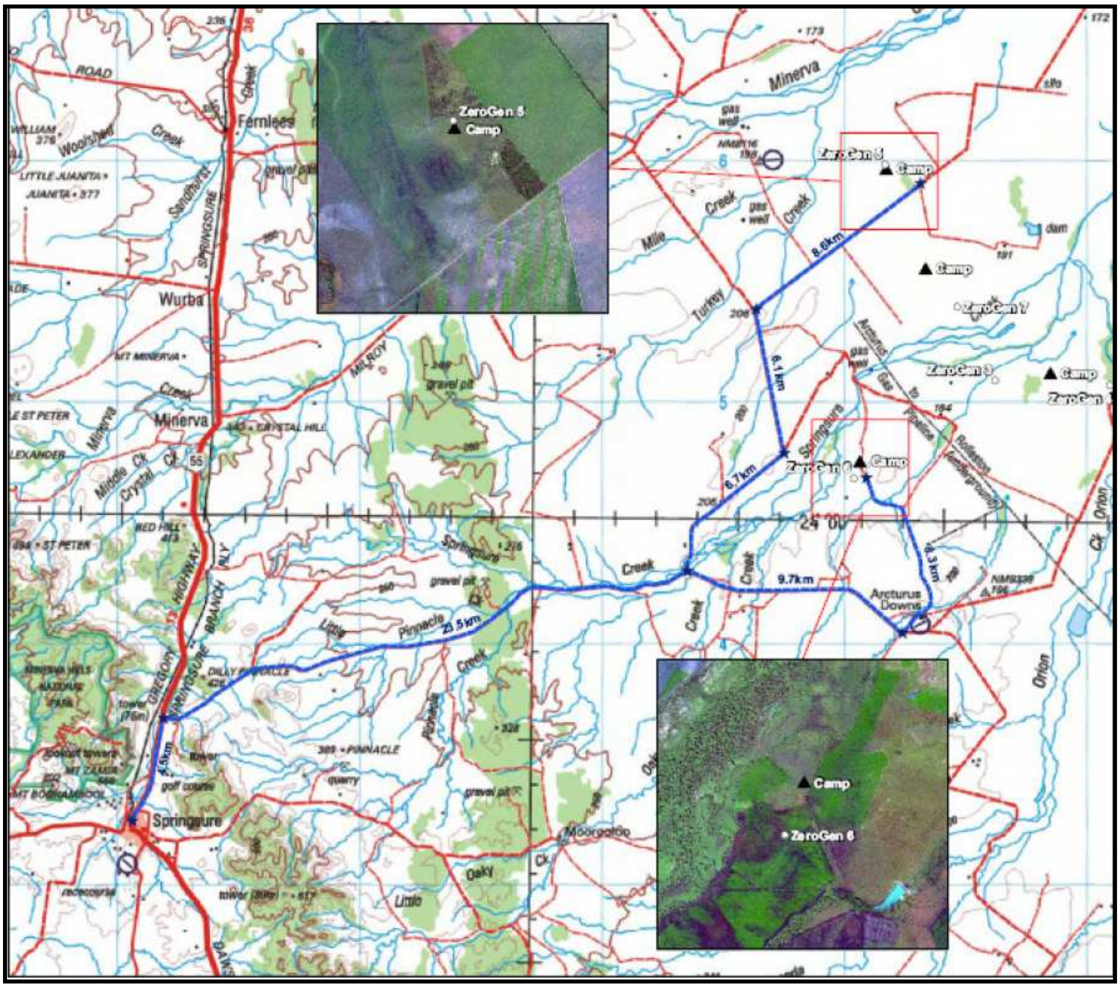


Figure 1: Road access map

ZG-5 was the third well in a four well stratigraphic exploration campaign termed “Drilling Program 2” (DP2) and was drilled in ATP 722P, (Figure 2) which is currently held and operated by Sunshine Gas Limited (SHG).

Field operations were delegated by SCL to AGR Pacific Pty Ltd (AGR).

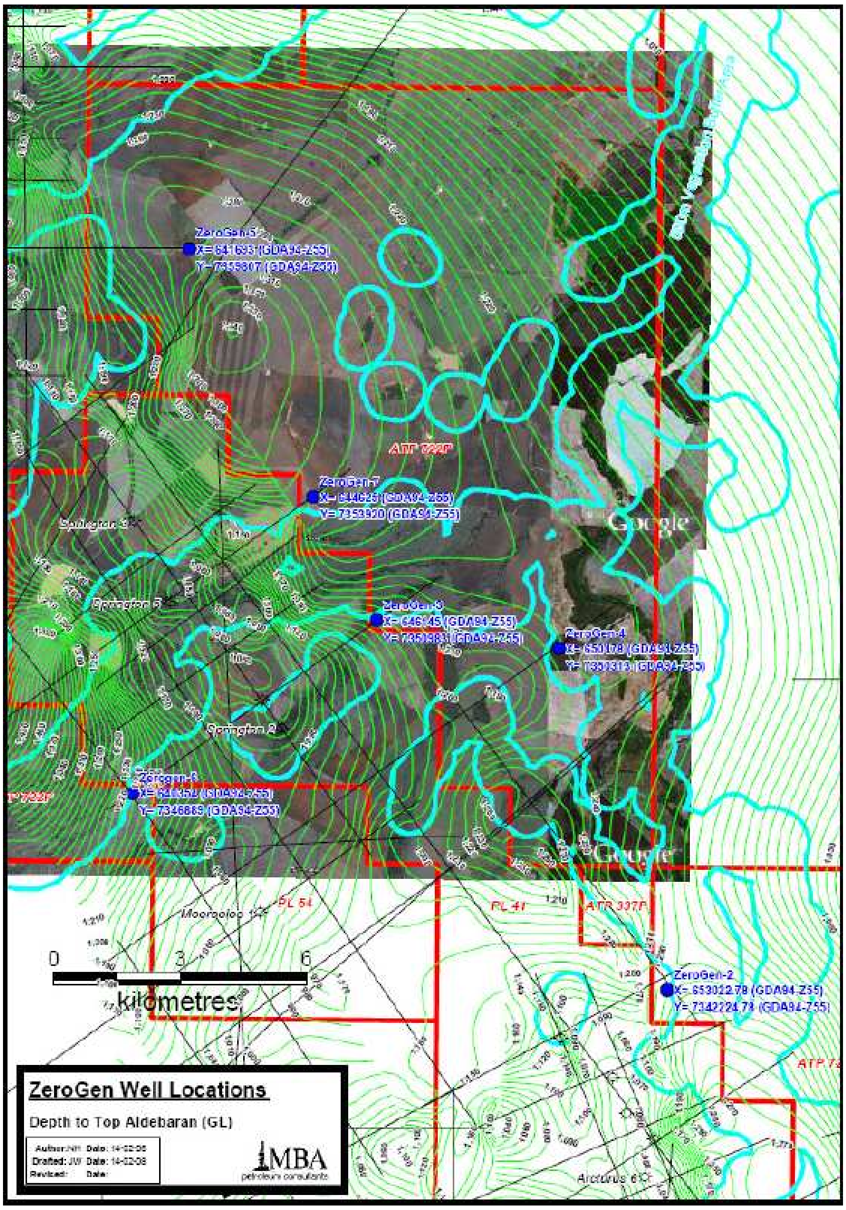


Figure 2: Location ATP 722P

The primary objective of the well was to investigate the storage capacity and flow capacity of the Permian sandstones and the sealing capacity of the intra-formational and regional seals, (Figure 3). Continuous coring operations were conducted from the Black Alley Shale (BAS) to TD, approximately 80 m within the Aldebaran Sandstone.

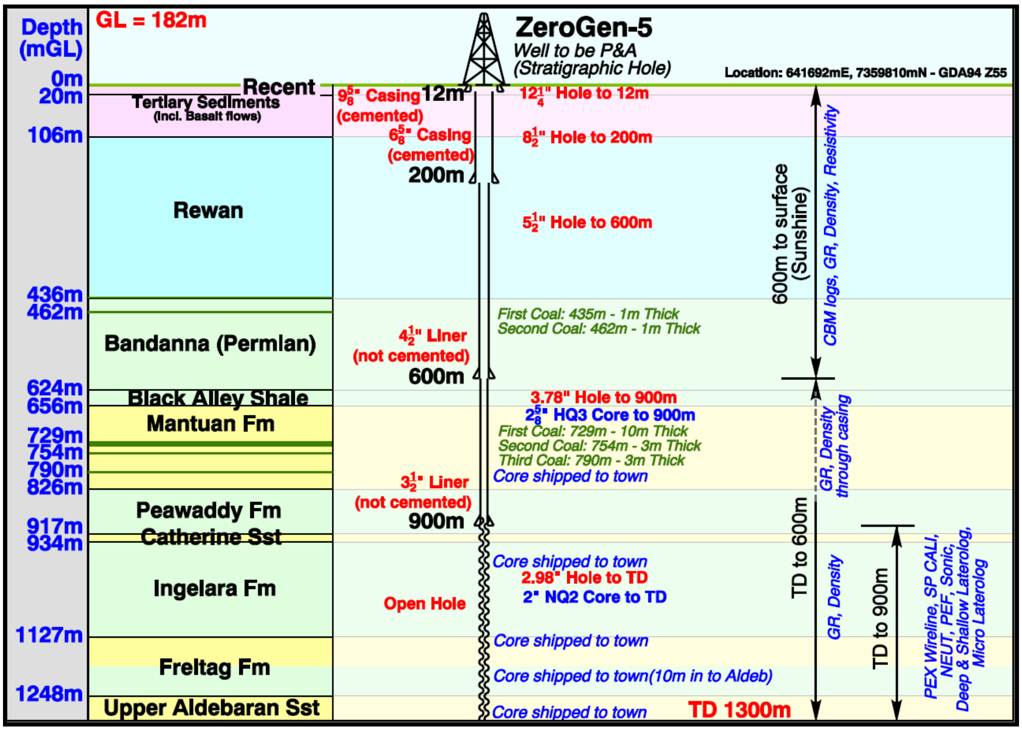


Figure 3: Prognosis

ZeroGen-5 was successfully drilled and cored to 1313.9 mGL using the Wallis Rig 14 Mantis 1000, multi-purpose exploration rig. Works commenced on the 19th March and were completed with rig release on the 26th of April 2008.

The well was revisited on the 12th of June in order to carry out an X-LOT, the hole was re-entered and the plugs drilled out at the surface and the casing shoe. A tricone bit was run in hole and used to tag the top of the liner which was cut and left in hole.

The rig was then released 10:00 hrs on the 16th of June 2008.

Again the use of the Wallis rig and associated mineral coring technology was proven to be a low cost exploration tool for the ZeroGen Project. The rig achieved a hole TD in excess of the recommended rig limitations.

ZeroGen-5 encountered a typical Northern Denison Trough sequence of transgressive marine shales and regressive shallow marine and deltaic sandstones. The sediments are hard, largely due to quartz overgrowth cementation, resulting from deep burial, post deposition. Excellent quality sandstones were encountered in arkosic, fluvial distributary facies in the Catherine Sandstone at depths that are suitable for supercritical CO_2 sequestration.

Petrophysical evaluation conducted over the fully logged section (875 mGL to 1248 mGL calculates the total permeability thickness (Kh), at depths suitable for supercritical CO_2 sequestration, to be approximately 1672 mD m. This is an order of magnitude higher than the Kh estimated at the ZeroGen-3 and 4 site. A 20 m interval within the Catherine Sandstone accounts for over 99% of the total Kh calculated from the logs.

Many of the reservoir quality zones are thin and “invisible” to logs, therefore core is very important to reservoir characterisation and rock quality evaluation.

The well has been temporally suspended pending future permanent abandonment.

3.0 WELL OBJECTIVES

ZG-5 was the fifth exploration well drilled within Sunshine Gas' ATP 722P to gather data to assess the suitability of the Northern Denison Trough for carbon dioxide sequestration.

The Denison Trough is a significant petroleum province, containing a number of natural gas fields. These natural gas fields are producing from the same Permian reservoirs that are being assessed as a potential CO_2 storage site. The well was planned to core the storage "reservoirs" in the Mantuan Formation, Catherine Sandstone, Freitag Formation, and Upper Aldebaran Sandstone and intra-formational seals within the BAS, Peawaddy Formation, Ingelara Formation and Freitag Formation.

The well is located within the saline aquifers, down dip of the eastern flank of the Turkey Creek Gas Field. Reservoir simulation indicates that the predominantly low permeability of the rocks within the Northern Denison Trough will restrict the migration of injected CO_2.

ZG-5 was designed as a continuously cored stratigraphic hole. HQ (2.5", 63.5mm diameter) core was cut from 600m in the Black Alley Shale to 872.6m in the Catherine Sandstone and NQ (1.875", 47.6mm diameter) core was cut from the Catherine Sandstone to TD at 1313.9 within the Upper Aldebaran Sandstone. The total cored interval was approximately 714 m.

The primary objective of the well is the collection of high quality data that are to be used to model the containment, injectivity and storage characteristics of the potential subsurface geosequestration site.

The location of the ZG-5 well was selected for the following reasons:

- It is within a synclinal area in the proposed Northern Denison CO_2 Storage site.
- It is located on a seismic line where faulting is interpreted to be absent (Figure 4).
- It is adjacent to the Turkey Creek Gas Field, an area of proven reservoir quality.
- It is within ATP 722P. Permission to drill within this permit had been granted by the Operator Sunshine Gas before selecting the location.

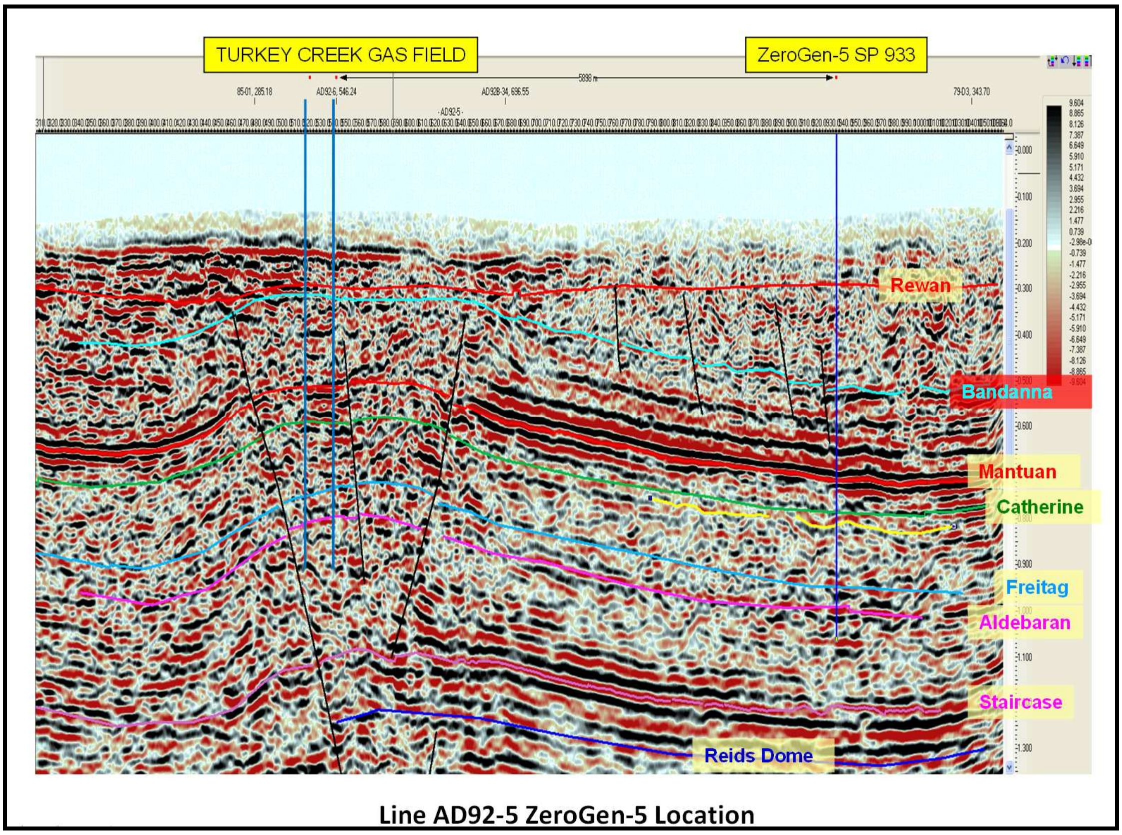


Figure 4: ZeroGen-5 location seismic line AD92-5 sp 933

4.0 DRILLING SUMMARY

ZG-5 is a vertical well drilled to a depth of 1313.9 mGL. Hole and casing parameters are provided below:

	Hole Size	Section TD	Casing Size	Casing Seat	Comment
Conductor	12-1/4″	12m	9-5/8″	11m	Cemented
Surface	8-1/2″	200m	6-5/8″	197.9m	Cemented
Intermediate	5-1/2″	600m			
HQ Core	3.78″	872.6m			
NQ Core	2.98″	1313.9m			

Table 4.1: Hole size and casing parameters

The well was spudded at 14:30 hrs on the 19th of March 2008. An 8-7/8" PVC conductor was installed to 12 mGL. The 8.5" surface hole was drilled to depth of 200 mGL at 06:00 hrs on the 21st of March 2008. 6-5/8" surface casing was set and cemented. Once the surface casing was landed it was realized that the casing was standing proud of the designed height due to an error with the casing tally. A welder was sourced and the casing cut and welded allowing the well head to be situated properly. X-Rays were taken to allow certification of the weld and check the quality standard. A BOP was installed and pressure tested on this casing string. A formation integrity test was conducted to 16 ppg at 203 mGL.

The 5.5" hole section was drilled to 600 mGL on the 27th of March 2008 at 15:00 hrs. Wireline operations were carried out in the open hole. 4.5" HWT liner was run in hole and the well displaced to a liner pack fluid before landing the casing at 600 mGL. This liner was not cemented.

HQ core was cut to 872.6 mGL with section TD reached at 21:30 hrs on the 6th of April 2008. A HQ liner was run and a liner pack fluid was used. The liner was then landed.

NQ core was cut to 1247.9 mGL when on the 19th of April whilst running wireline to retrieve core barrel, the string dropped from the clamp. The string fell 6 metres and landed on bottom, with approximately 3" compression of string.

The drill string was then attached to winch to secure. Clamps were inspected and cleaned. The hydraulic hose was inspected for leaks. The clamps were then tested to ensure that they were holding. All rods were inspected and two rods were damaged and unsuitable for future use. Weatherford logs were run to decide if additional coring was required.

The well reached designed TD at 12:00 hrs on the 23rd of April 2008 at a depth of 1300.5 mGL. The decision was made to core deeper. Advice of the crew was to be used when the rig had reached its safe operating limit. The final TD reached at 12:30 hrs on the 24th of April 2008 at a depth of 1313.9 mGL. No additional logs were run at TD, therefore the bottom 66 m from 1313.9 mGL to 1247.9 mGL was unlogged.

The well was suspended with cement plugs in the NQ section, a plug over the casing shoe and a plug at surface. The rig was released at 18:00 hrs on the 27th of April 2008.

The well was revisited on the 12th of June in order to carry out an X-LOT, the hole was re-entered and the plugs drilled out at the surface and the casing shoe. A tricone bit was run in hole and used to tag the top of the liner which was cut and left in hole. It was left as the rig was unable to remove the complete liner string, the liner was cut and a large section removed but a small section was left in the hole it was tagged at 568.9 mGL. The hole was then swept with a high viscosity pill and the 5.5” string removed from hole.

An NQ String was run in hole on the 13th of June and passed through the HWT Liner before being run to bottom and tagging the NQ plugs at 854.7 mGL. The hole was swept again with a high viscosity pill and the well slowly circulated until the Aussie DST crew were on site. The NQ String was then removed from the hole and the DST string made up and RIH to carry out the X-LOT. The test was carried out and the string pulled from the hole.

On the 15th of June the cement string was RIH to cement the shoe and spot a surface plug. A plug was pumped over the shoe and the string pulled back and the well circulated to flush all lines. The cement was allowed to cure. The string was then RIH to tag the cement. The plug was tagged at 180 m. The string was pulled and a second plug pumped near the surface. The BOP was nippled down. A casing pup joint with the box protector was then screwed onto the casing and tightened in situation.

The rig was then released 10:00 on the 16th of June 2008. Daily drilling reports are included as Appendix A3.4.

This well proved again that the Wallis Delta 14 rig could effectively cut NQ core to these depths and that mineral style wells are a valid and cost effective method of evaluating potential CO2 geosequestration. ZeroGen-5 was the quickest well thus far and had the least delays. It also exceeded the planned TD.

Stage	Activity
1	Spud well, drill conductor hole to 12m and isolate
2	Drill 8.5” hole to 200m. Wiper trip and POOH
3	6-5/8” casing set at 196.6m, cement to surface
4	Cut proud casing and weld at appropriate height. X-Ray Inspect
5	Nipple up and pressure test BOP
6	RIH and drill 3m of new formation and perform FIT to 16ppg EMW
7	Drill 5.5” hole with tricone to 600m.
7	Run Borehole Services Wireline Logs
8	RIH with HWT Liner and casing shoe
9	Land liner at 600m
10	RIH with HQ core assembly and cut HQ core to 872.6mGL. Section TD called due to Rig limitation
11	POOH HQ Coring Assembly, run in hole HRQ Liner
12	RIH with NQ String
13	Core from 842.6m to 1229.85m
14	Stop Coring operations and pull back. Replace Damaged Bolts on Mast Jack Plates
15	Run in hole fault causes removal of string for inspection after rod clamp hydraulic failure causing string to be dropped.
16	Run Weatherford Wireline Logs
17	Rig inspection by mechanic, hydraulic system fully checked.
18	RIH and Cut Core from 1229.85m to 1313.85m.
19	POOH NQ Core Assembly
20	Rig Up to Pull HRQ Liner – Attempt to Pull HRQ Liner
21	Rig Up Cutting Tool and RIH and cut to provide circulation to aid liner removal
22	POOH with Cutting Tool and rig up to Pull HRQ liner.
23	Pull HRQ Liner from well
24	Rig up to Pull HWT Liner – Attempt to Pull HWT Liner
25	Rig Up Cutting Tool and RIH and cut leaving ~ 31m of HWT liner in the well.
26	Pull remaining HWT Liner from well
27	Run NQ Cement String and place Halliburton Cement plugs across regional seal)
28	Nipple down BOP, Clean and dump tanks
29	Release Rig

Table 4.2: Activity summary

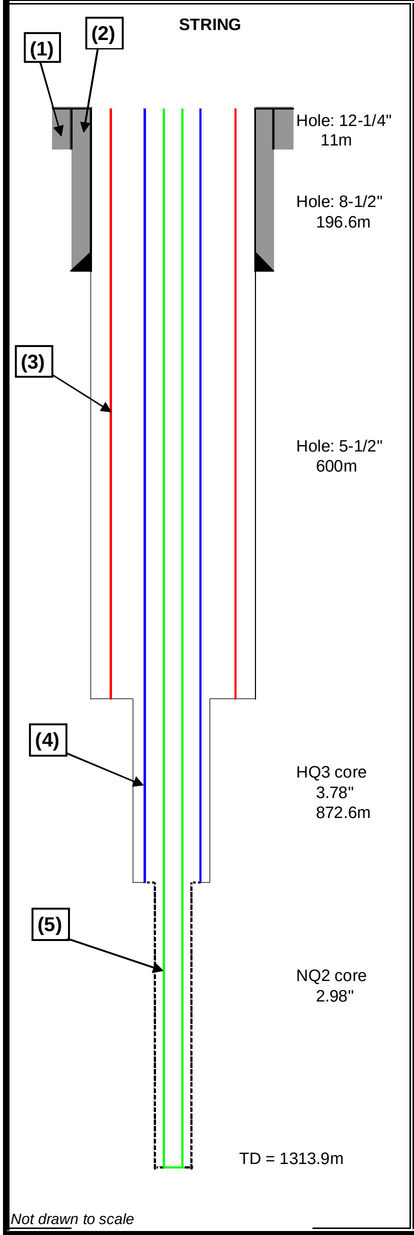
Stage	Activity
1	Nipple up and Pressure Test BOP
2	RIH and drill out cement plug from 184m to 217m
3	RIH to tag HWT Liner at 568.9m and circulate until system balanced
4	POOH and Rig up to Run NQ String
5	RIH and Tag top of Cement Plug at 854.7m
6	Swept hole with High Vis
7	Wait on DST Crew – POOH
7	RIH with DST String
8	Perform X-LOT
9	POOH and Rig up For Cement Job
10	Place Halliburton plug over the casing shoe
11	Pull back and Wait on Cement
12	RIH and Tag Cement plug at 180m
13	Pull back and Pump Surface Plug
14	Nipple Down BOP
15	Rig Down and Release Rig

Table 4.3: XLOT and abandonment activity summary

DOWNHOLE SCHEMATIC ZEROGEN 5

Well:	ZeroGen 5	**Completion Type:**	P & A
Field:	ATP 722P	**Completion Date:**	TBA
Location:	Dension Trough	**Activity Type:**	Coring NQ Section
Depth reference:	Ground Level	**Activity Date:**	TBA

Rev: BMc
Date: Jul-08



EQUIPMENT	OD (in)	ID (in)	LENGTH (m)	Depth Bottom (m)
1 - Surface Conductor 9-5/8" LP	9.625		11	
Cemented to Surface				
2 - Surface Casing 6-5/8"	6.625	6	196.6	
Cmented to Surface				
6m lengths only				
3 - First Intermediate Liner 4.5" HWT	4.5	4	600	
600m in depth				
Not Cemented				
403.4m of Exposed Liner				
4 - Second Intermediate Liner HRQ rods	3.69	3.06	872.6	
847.8m in depth				
Not Cemented				
272.6 m of Exposed Liner				
5 - NQ2 Core String	2.98		1313.9	
Cut in 6m lengths and retrieved on Wireline				
Core Drilled NQ2 to 1313.9m				

Figure 5: Downhole diagram for NQ coring operations

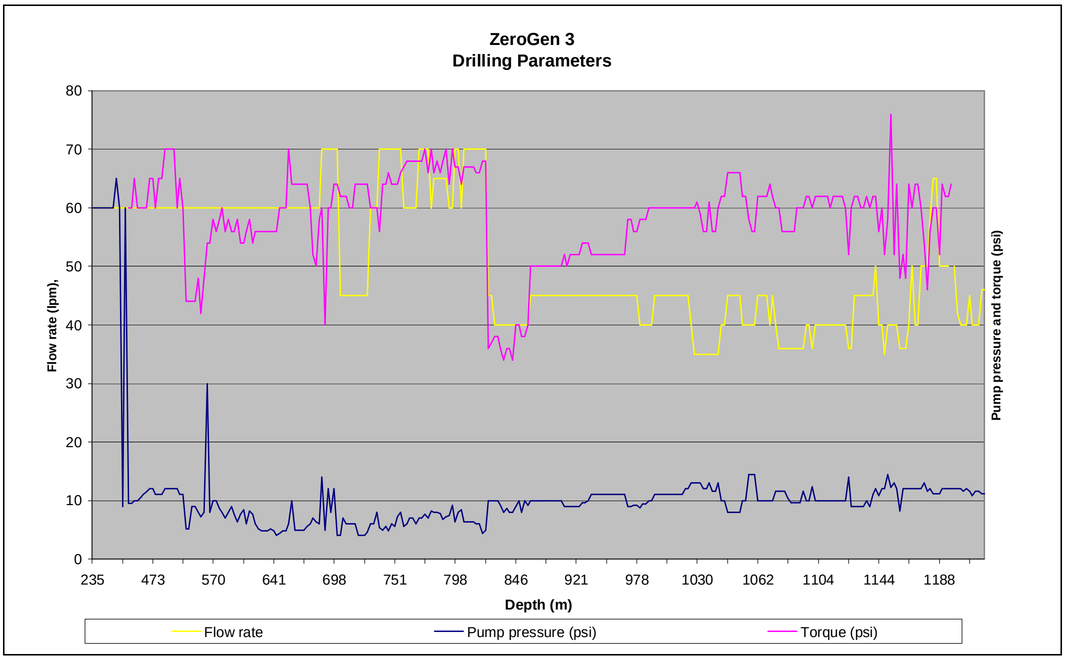


Figure 6: Drilling parameters

4.1 Rig Data

ZG-5 was drilled using the Delta 14 rig owned by Wallis Drilling Pty Ltd. The specifications of the drilling equipment are provided as Appendix A1**.**

4.2 Location Survey

The ZG-5 surface location was surveyed by Bryant Edmonston and Associates P/L. The survey plan is included as Appendix A2. The surface location coordinates are as follows***:***

Well	Easting (m)	Northing (m)	GL Elevation (m)	Projection
ZeroGen-5	641691.94	7359807.41	184.28	M.G.A. Coordinates Zone 55

Table 4.4: Surveyed location data

4.3 Wellbore Deviation

The well was designed as a vertical well however no deviation surveys were run in the well. It was deemed unnecessary to carry out a verticality survey as was done in ZG-4. The survey results from ZG-4 indicated that a near vertical well had been achieved and because identical BHAs were used in ZG-4 and ZG-5 it is likely that ZG-5 is also near vertical.

4.4 Leak-off Test Data

A formation integrity test was conducted to 16 ppg at 203 mGL in the Rewan Formation.

The well was revisited on the 12th of June in order to carry out an X-LOT, the hole was re-entered and the plugs drilled out at the surface and the casing shoe. The hole was then swept with a high viscosity pill and the 5.5” string removed from hole. An NQ String was run in hole on the 13th of June and passed through the HWT Liner before being run to bottom and tagging the NQ plugs at 854.7m. The hole was swept again with a high viscosity pill and the well slowly circulated until the Aussie DST crew were on site. The NQ String was then removed from the hole and the DST string made up and RIH to carry out the X-LOT.

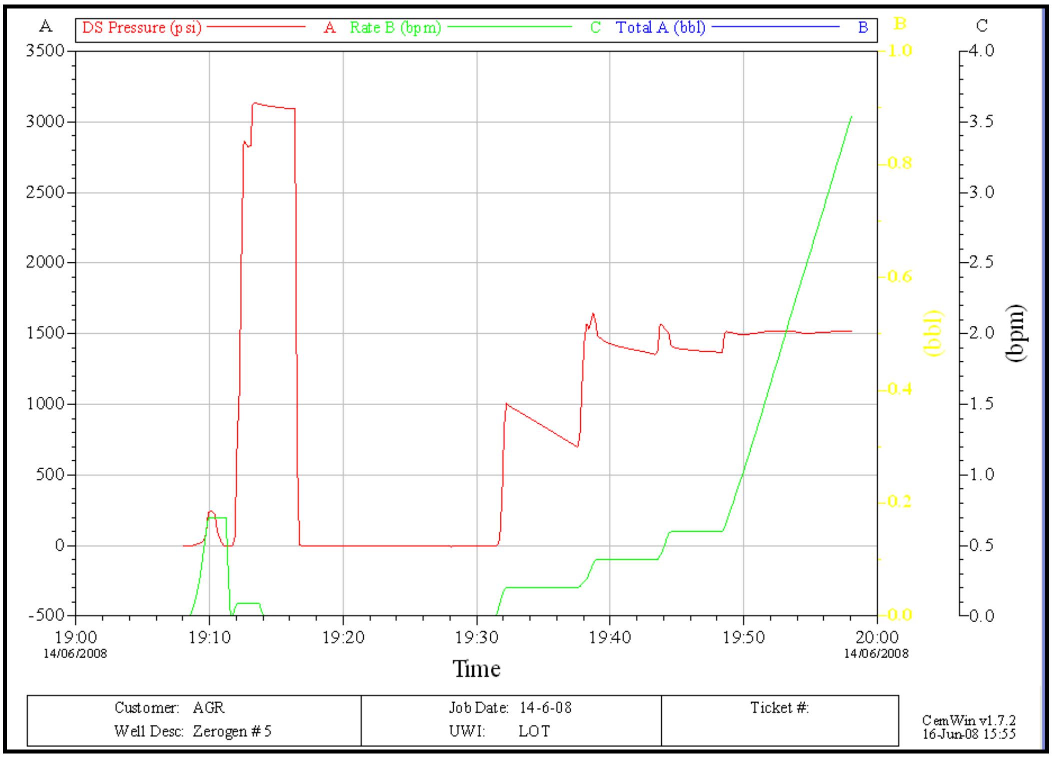


Figure 7: Extended leak-off test pressure plot

Figure 7 shows the extended leak-off test pressure plot. The test was conducted in the lower Black Alley Shale zone over the interval 604 m to 614 m. The equipment was initially tested followed by three fracture closure and reopening cycles to ensure redundancy in pressure results.

A fracture break down pressure (FBP) gradient of 1.25 psi/ft was measured.

4.5 Formation Temperature and Pressure

A continuous temperature log was acquired by Weatherford and representative temperatures are shown in Table 4.5. No pressure surveys or DSTs were conducted.

Formation	Depth (mGL)	Reservoir pressure (psi)	Reservoir Temp (degC)	Source
Catherine Sandstone	892	N/A	56	Weatherford
Ingelara Formation	923	N/A	57	Weatherford
Freitag Formation	1109	N/A	62	Weatherford
Aldebaran Sandstone	1233	N/A	64	Weatherford

Table 4.5: Formation pressure and temperature

4.6 Drilling Fluid Summary

The quality of the drilling fluid and effective hole cleaning were again major concerns prior to drilling ZeroGen-5. Average mud properties are shown in Table 4.6. While drilling, hourly reads of mud properties and drilling parameters were manually recorded as a replacement to mud logging services. These are provided as Appendix A3.1 and the mud properties are plotted in Figure 8.

The similarity in the plotted values for mud weight in and out indicates good wellbore cleaning. Equality in the mud weights in and out was used as the overriding criteria for a clean and even mud system during all hole conditioning. If these parameters had varied significantly while drilling directions had been given to halt drilling activities and commence hole cleaning (circulation or wiper trip as appropriate).

A liner pack fluid was built on site and displaced into the well bore prior to running liners. This was done to help prevent the well flowing and support the formation as was seen on ZeroGen-4.

Lessons learned in ZG-5:

- increasing mud weight before intersecting zones of expected high pressure worked well and prevented flow in combination with the liner packs. It became apparent that the liner pack make up was important, this could be optimised for long term stability to ensure liner removal; and
- corrosion was again a factor and monitored closely. This included the wiping of the wireline as it was removed from the hole.

Hole Section	Initial Properties			Final Properties		
	MW	pH	FV	MW	pH	FV
Surface Hole – Ausgel, KCl, Pac R + CR650	8.7ppg	8.8	48	8.7	9.1	40
Intermediate Hole – Pac R, CR650, KCl	8.7ppg	9.0	42	8.7ppg	9.0	41
Main Hole – Pac L, CR650, KCl, Soda Ash	9.0ppg	9.0	35	9.1ppg	9.0	32

Table 4.6: Mud properties

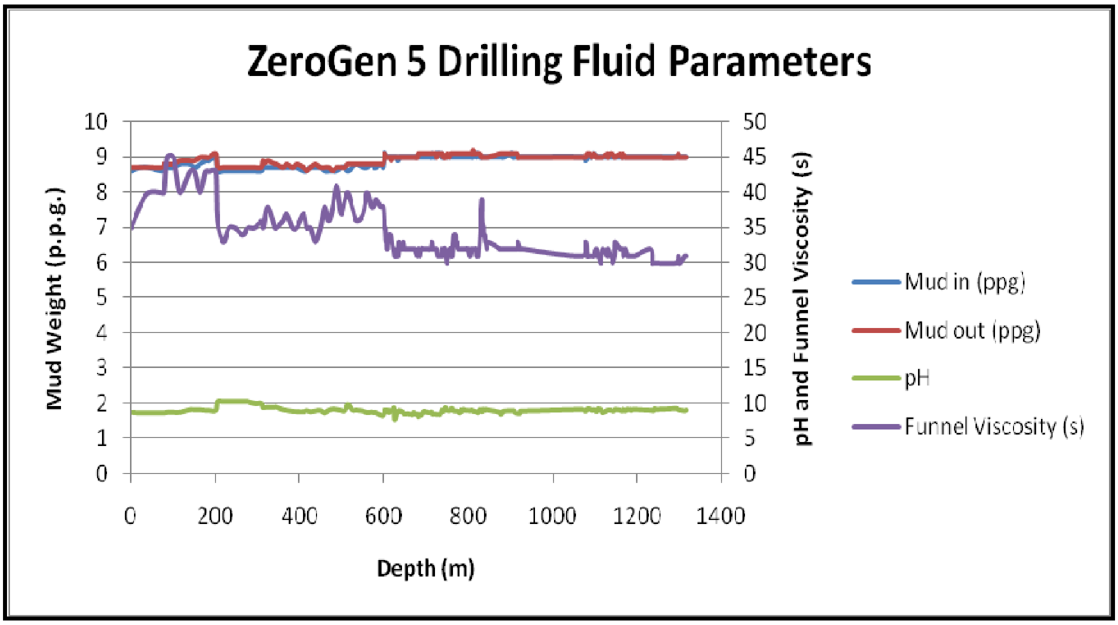


Figure 8: Mud properties

4.7 Mud-logging Services

There was no dedicated mud logging service during the Wallis drilling program. Mud samples were taken and preserved in accordance to the instructions of the ACS Wellsite Geologist. Methane and Ethane levels were monitored using the rig's alarmed sensors (MSA brand gas detectors). The alarms were set for the following levels:

- Methane – 5%
- Oxygen – 15%

Daily geological reports prepared by the onsite ACS geologist are included as Appendix 3.5. Note that no report was prepared on 22rd April (DGR 25).

4.8 Hydrocarbon Shows

ZeroGen-3 is located structurally down dip of the Turkey Creek gas field below the gas water contacts associated with the Turkey Creek accumulation. The location was specifically sited to intersect the reservoir sandstones within the saline aquifer and no hydrocarbons were anticipated to be trapped at this location. Apart from small gas shows associated with methane liberated from drilled coals and carbonaceous shales, there were no elevated gas readings or hydrocarbon fluorescence noted in ZeroGen-5.

4.9 Bit Record

A total ten bits were used to drill the well. Average drilling parameters and final bit condition of each bit are provided in Table 4.7 below. This table is also included as Appendix 3.2.

The bit selection was conducted mutually between AGR and Wallis Drilling. Bit selection in the rotary drilled sections tended to be driven by AGR, while the core heads were predominately selected by Wallis Drilling with AGR approval. The information gathered during the first two wells greatly helped in choosing the core bits. The rotary drill bits were selected based on performance in ZeroGen-1 and 2 along with data from ZeroGen-3 and 4. The surface basalt (slow drilling and lost circulation hazard) known to exist in the area was not encountered in this well. The Tungsten Insert style bit selected in the 8.5” section was designed to minimize complications if the basalt was encountered. A rerun tricone bit from ZeroGen-3 and 4 was used in the 8.5” hole section. One new tricone was required for the 5.5” section.

AGR
BIT RECORD

Well: ZeroGen 5 | Basin / Area: Bowen Basin | Permit: | Field: ZeroGen
Location: Latitude: S | G.L. 181.00 metres | Spud Date: 19-Mar-08
Longitude: E | Well Site Supervisor: D.Whitbread/R.Birkett | K.B. GL metres | T.D. Date: 24-Apr-08
Contractor: Wallis Drilling | Rig #: Delta 14 | Proposed TD: 1300 metres | Rig Released Date: 26-Apr-08

PUMPS					MUD TYPE				
No.	Type	Stroke (in)	Liner (in)	Out Put (G/Stk)	Section	Dev	Interval	Type	Wt
1	FMC Q1832	4.50	4.00	1.22	Surface		Surface	KCL/Polymer	8.60
2	Bean FMC W 1122	2.75	2.75	0.06	Main		5-1/2"	KCL/Polymer	
3	Bean FMC W 1122	2.75	2.75	0.06	HQ Core Section		Core Evaluation		

Bit No.	Run No.	Size (in)	Make	Type	IADC Code	Serial No.	# of nozzles Size- 32nds			Motor Y/N	Shock-Sub Serial No.	Depth Out	Metres	Hours	ROP (m/hr)	Accum Hours	Bit Grading I	O	D	L	B	G	O	R	WOB (psi) Mn	Mx	RPM Mn	Mx	Press (psi)	Pump (lpm)
1	OLD	8.5"	Reed	TD43AKPR	437	A45154	12	12	16	N	N	12m	12.0	2.0	6.0	2.0	1	1	WT	A	E	IN	NO	TD	100	250	60	130	50-200	950
2	OLD	12.5"	Reed	(Wallis)						N	N	12.0	12.0	1.0	12.0	3.0	2								500	600	90	110	50-200	1000
1	1RR	8.5"	Reed	TD43AKPR	437	A45154	12	12	16	N	N	200.0	188.0	22.0	8.5	25.0	3	3	BR	G	E	1/8"	WT	TD	4500	5000	90	100	50-300	950
3	1	5.5"	Reed	SL53AP		EM 2510	12	14	12	N	N	600.0	400.0	39.0	10.3	64.0	4	3	LT	NS	E	1/32"	WT	TD	4000	9000	90	120	50-500	950
4	1	3.78"	Sur Set	HQ 3.78		8900-6				N	N	614.6	14.6	13.0	1.1	77.0	1	7	RO	T	X	IN	NO	PR	1000	2000	450	650	400-600	40-65
5	1	3.78"	Longyear	HQ 3.78		16693				N	N	872.6	258.0	139.0	1.9	216.0	7	6	NO	A	X	IN	NO	CP	1000	2000	400	700	400-600	40-75
6	1	2.98"	Longyear	Alpha 6		29852-5				N	N	1073.9	201.3	90.5	2.2	306.5	6	7	NO	A	X	IN	NO	PR	1000	2000	400	650	400-600	40-75
7	1	2.98"	Sandvik	426		102161-1				N	N	1207.4	133.5	63.5	2.1	370.0	8	7	NR	G	X	1/8"	WT	PP	1000	2000	400	650	400-600	50-75
8	1	2.98"	Sandvik	426		102162-1				N	N	1241.9	34.5	26.5	1.3	396.5	3	3	BR	A	X	IN	PN	RIG	1000	2000	400	650	400-700	40-70
9	1	2.98"	Sandvik	426		102163-1				N	N	1300.5	58.6	24.5	1.4	421.0	4	2	BT	S	X	1/8"	MT	PWPR	1000	2000	400	600	550-600	45-60
10	1	2.98	Longyear	HQ 3.78		28041-6				N	N	1313.9	135.3	10.5	2.2	431.5	7	7	RO	A	X	1/16"	NR	PP	1000	2000	500	650	550-600	45-60

Table 4.7: Bit record

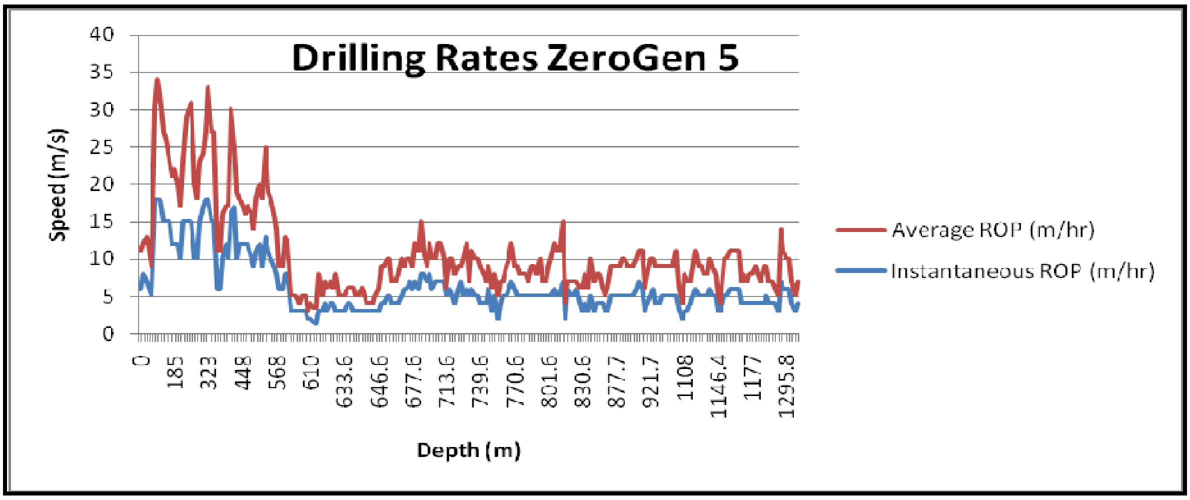


Figure 9: ROP graph

A total of 7 core heads were used - 2 HQ and 5 NQ core heads. The industry standard life for these core heads is 100 m. These bits vary greatly from the oil and gas equivalents. The experience gathered in ZeroGen-3 and 4 helped greatly in bit selection and it became apparent that over 200 m was possible from both the HQ and NQ bits. Great care had to be taken during drilling operations as the bits were very susceptible to damage caused by poor drilling conditions such as low circulation. This was demonstrated in the HQ section with one bit cutting only 14 m and the second achieving 258 m. It is clear great care is needed to ensure bit life. The drilling parameters are available for review in Appendix 3.1.

4.10 Bottom Hole Assembly (BHA)

The BHA used in ZeroGen-5 surface hole was kept as simple as possible as the Wallis Rig Delta 14 is not set up to handle complicated BHA assemblies in this size. The shock sub carried across from ZG-4 assisted in maintaining a stable weight on bit and improved bit life.

No excessive wear was seen on the string which suggests that the hole was not badly deviated. It was deemed unnecessary to carry out a verticality survey as was done in ZeroGen-4 after the survey in ZG-4 clearly showed the hole had not deviated sufficiently to cause a problem.

4.11 Well Abandonment

The well was a stratigraphic exploration hole and was suspended with cement plugs in the NQ section, a plug over the casing shoe and a plug at surface as shown in the downhole schematic, Figure 10. The rig was released at 18:00 hrs on the 27th of April 2008.

The well was revisited on the 12th of June in order to carry out an X-LOT, the hole was re-entered and the plugs drilled out at the surface and the casing shoe. A tricone bit was run in hole and used to tag the top of the liner which was cut and left in hole. It was left as the rig was unable to remove the complete liner string, the liner was cut and a large section removed but a small section was left in the hole it was tagged at 568.9 m. The hole was then swept with a high viscosity pill and the 5.5” string removed from hole. An NQ String was run in hole on the 13th of June and passed through the HWT Liner before being run to bottom and tagging the NQ plugs at 854.7 m.

On the 15th of June the cement string was RIH to cement the shoe and spot a surface plug. A plug was pumped over the shoe and the string pulled back and the well circulated to flush all lines. The cement was allowed to cure. The string was then RIH to tag the cement. The plug was tagged at 180 m. The string was pulled and a second plug pumped near the surface. The BOP was nippled down. A casing pup joint with the box protector was then screwed onto the casing and tightened in situation.

The rig was then released 10:00 hrs on the 16th of June 2008.

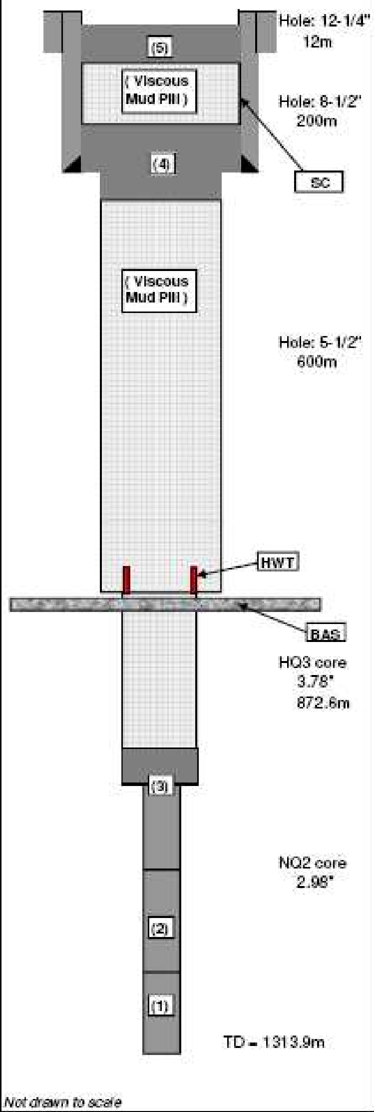
DOWNHOLE SCHEMATIC ZEROGEN 5

agr ASIA PACIFIC

Rev: BMc
Date: Dec-07

Well:	ZeroGen 5	Completion Type:	P & A
Field:	ATP 722P	Completion Date:	16-Jun-08
Location:	Dension Trough	Activity Type:	P & A
Depth reference:	Ground Level	Activity Date:	16-Jun-08

STRING



Label	EQUIPMENT	OD (in)	ID (in)	LENGTH (m)	Depth Bottom (m)
5	Plug 5: Base at 30m Top at 2m TAGGED				
	27m plug Class G + 50% pozmix				
	3.1 and 20% Excess 3.721 Bbls				
4	Plug 4: Base at 230m Top at 180m TAGGED				
	50m plug Class G + 50% pozmix				
	5.19 and 20% Excess 6.229 Bbls				
SC	Surface Casing 6-5/8"	6.625	6	196.6	
	- cemented to surface				
	- 6m lengths only				
HWT	HWT Liner - Left Behind TAGGED				
	Top Tagged at 569.3m				
BAS	Black Alley Shale at 613.7 to 629.05m				
3	Plug 3: Base at 1000 top at 854.7m TAGGED				
	14.3m plug and 0 % Excess 5.33 bbls				
	4.441				
	All Depth Calculated by Pumped Vol. for below				
	No Tagging was carried out				
2	Plug 2: Base at 1150.0m top at 1000m				
	150m plug Class G + 50% pozmix				
	4.247 and 0% Excess 4.247 Bbls				
1	Plug 1: Base at 1313.9m top at 1150m				
	163.9m plug Class G + 50% pozmix				
	4.302 and 0% Excess 5.162 Bbls				

Figure 10: Well suspension schematic

4.12 Time Analysis

The proposed and actual time-depth curve is shown in Figure 11 (and Appendix 3.3).

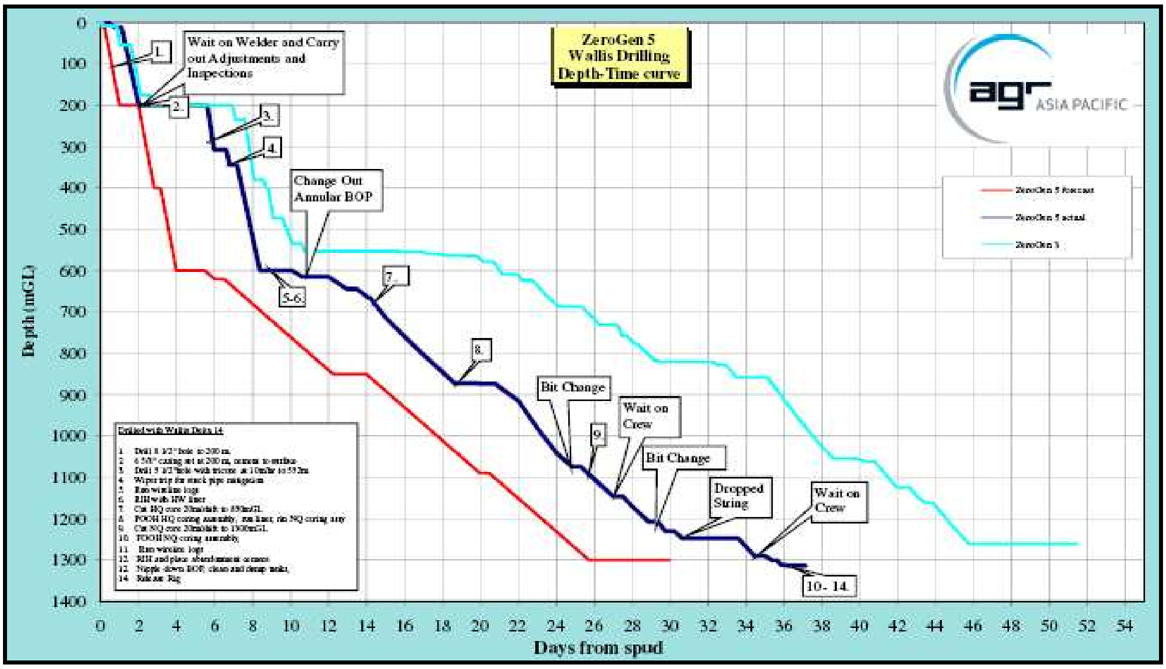


Figure 11: Drilling time-depth curve

An activity breakdown of time is shown in Figures 12 and 13.

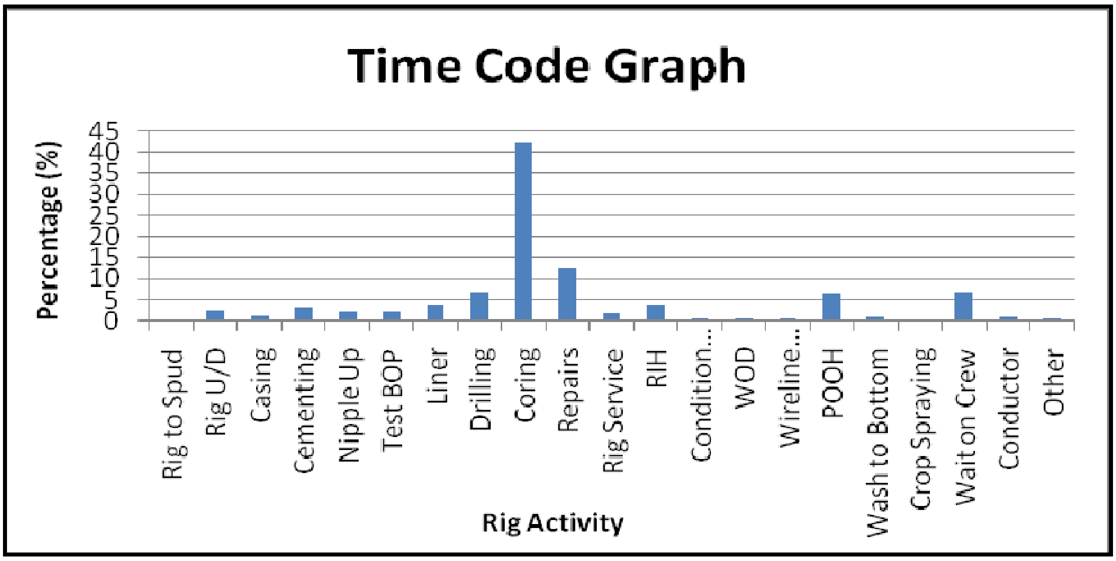


Figure 12: Time breakdown by activity

From the time analysis chart above it can be seen that 42 % of time taken at ZeroGen-5 can be attributed to coring. The coring rate estimate was 20 m per 12 hour shift to include retrieval time, core cutting time and bit trips. This was a reasonably accurate estimate throughout the coring sections.

Coring activities include time for bit changes. Drilling to 600 m, the core point, took approximately seven percent of the overall operation time.

Repairs accounted for twelve percent of the time which is high but well site operations were managed to minimise this down time. Crews were directed to proceed with works which would save time further down the line, whilst repairs were underway.

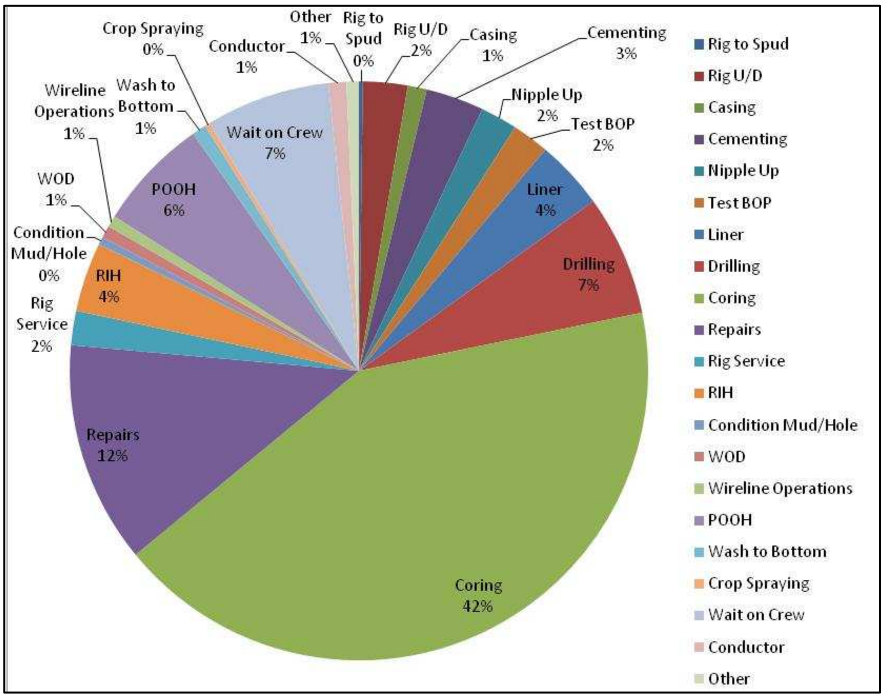


Figure 13: Pie chart with all activities

Due to the logistics of getting crew to the wellsite from the contractor's base in Perth it was deemed necessary to have a twelve hour break in operations on a weekly basis to facilitate the change out of crew members.

Equipment failure reports are included as Appendix A4.

5.0 GEOLOGICAL SUMMARY

The well is an exploratory stratigraphic core hole designed to evaluate injectivity and storage characteristics of the Permian sequence for CO_2 storage within an approximate 1200 m section from the top of the Mantuan Formation to the Upper Aldebaran Sandstone.

The well was drilled close to proposed likely future injector locations within the syncline down-dip of the producing Springton gas field.

5.1 Regional Stratigraphy

The principal reservoirs in the Northern Denison Trough occur within shallow marine/deltaic regressive Permian sandstones in the Mantuan Formation, Catherine Sandstone, Freitag Formation, Aldebaran Sandstone and Staircase Sandstone. The Staircase Sandstone is the deepest reservoir, but as it is of minor volumetric importance it was not a target in this drilling programme and the well was prognosed to reach total depth at around 1300 m in the Upper Aldebaran Sandstone. This was calculated to be close to, but within the safe drilling capability of the Wallis Delta 14 rig.

The principal seals exist in transgressive marine shales within the Black Alley Shale, Ingelara Formation and Freitag Formation. Although the regional top seal is interpreted to be the Black Alley Shale, lacustrine and flood plain shales within the Bandanna Formation, overlying the Black Alley Shale also act as potential seals.

The Aldebaran Sandstone is the most productive natural gas reservoir in the Denison Trough. Lateral and vertical reservoir quality heterogeneity in the Aldebaran Sandstone reflects the formation's complex depositional and diagenetic history. Core porosities can exceed 20 % and horizontal permeabilities of over 2000 millidarcies (mD) are recorded in tidal delta channel sandstones in the Aldebaran Sandstone. More typical Aldebaran Sandstone porosities and permeabilities in net effective gas pay zones range from 9-18 % and 0.1-25 mD respectively. Fewer cores have been cut in Early Permian reservoir zones but available data indicate that porosity rarely exceeds 15 % and permeability is typically less than 10 mD (Anthony, 2004)

Garside (1990) and Wilkinson (1991) conducted comprehensive studies on the Mantuan/Catherine/Freitag and Aldebaran reservoirs respectively.

5.2 Regional Structural History

Wilkinson's (1991) sequence stratigraphic study of the Aldebaran Sandstone is an excellent summary of the geology of the Denison Trough and the following paragraphs describing the regional structural history are taken from that report.

The Denison Trough is approximately 320 km long, up to 80 km wide and covers an area of approximately 24,000 km^2. It is underlain by continental basement consisting mainly of deformed Devonian meta-sediments, locally overlain by andesitic Early Permian volcanics in the central-eastern areas of the trough. The Denison Trough consists of several Early Permian grabens/half grabens which trend approximately N-S (varying from NE-SW to NW-SE). These are separated by hinge areas consisting of basement high blocks, onto which the graben sediments onlapped. The grabens/half grabens were bounded by major Early Permian normal faults, which were reactivated during the Permian and Triassic into high angle reverse faults. The largest of these faults is the Merivale Fault, which forms the western boundary of the Denison Trough.

A series of deep grabens/half grabens are developed to the east of the Merivale Fault, and include the Springsure, Serocold and Yellowbank/Westgrove grabens/half grabens. However, the configuration of these and the intervening hinge areas is unclear. Another series of major half grabens occurs to the east of the Consuelo, Rolleston, Warrinilla and Arcadia fault systems. The Rolleston half graben is the most easterly of the major half grabens. To the northeast, several small grabens are present in the Springton/Arcturus area; however they are much smaller and thinner than the Springsure graben.

Present day structures include large N-S (NW-SE, NW-SW) trending anticlines and synclines. They are often sinuous due to the doglegging and offset of the Early Permian normal faults. The anticlines are located primarily over the axial zones of the grabens/half grabens while others are related to basement high blocks and faulted areas. The largest structure is the Springsure-Serocold Anticline located on the western margin of the trough. It is asymmetric with its steepest limb to the west, and consists of a series of culminations approximately 120 km long. The amplitude and definition of the folds diminish to the east and in the north-eastern part of the trough the anticlines are primarily compressionally enhanced basement drape folds on the Comet Ridge.

Within the Denison Trough, Ziolkowski and Taylor (1985) identified 5 significant phases of tectonics/sedimentation:

1. Graben forming, extensional phase in which pre-Permian volcanics and sediments, and Early Permian terrestrial (alluvial-fan, fluvio-lacustrine) sediments (Reids Dome Beds) were deposited in the grabens.

2. First regional (thermal) sag phase, with normal adjustment along the graben bounding faults. Initial sediments were flood plain lacustrine sediments in the deeper areas of the grabens. Eustatic overprinting of the continuing tectonic sag resulted in a series of major marine transgressions (mudstone members of the Cattle Creek Formation) which were deposited beyond the boundaries of the grabens. Several low energy regressive pulses of deltaic to shallow marine (Riverstone and Staircase Sandstone Members) sediments occurred between the transgressions.

3. A compressive phase resulting in low amplitude folds and reversal of graben bounding faults (graben inversion). This was associated with a major regressive phase (Aldebaran Sandstone) and onlapping of high energy tectonoclastic sediments of the upper Aldebaran Sandstone.

4. Second regional sag phase with a series of transgressions and regressions consisting of low energy coastal plain-paralic-shallow marine calc-siliciclastics (uppermost Aldebaran Sandstone to Mantuan Formation).

5. Final compressive phase, initiated by a change in basin geometry, with deposition of fluvio-deltaic sediments (Black Alley Shale and Bandanna Formation) from the evolving foreland to the east. There was a significant increase in the volume of volcanogenic detritus, due to the prominence of a newly evolved volcanic upland in the east as a sediment source. A minor compressive phase is present in some areas at the end of the Permian.

Continental sedimentation then occurred with deposition of the Rewan Group, Clematis Sandstone and the Moolayember Formation. Sediment accumulation was terminated during the Middle to Late Triassic by an intense compressive phase directed from the east. This resulted in graben inversion with major movement along the major graben bounding faults, as well as the initiation of pure high angle reverse faults.

5.3 Formation Tops

The geological prognosis was based on depth converted seismic picks for the Mantuan and Upper Aldebaran Sandstone. Formation isopachs in offset wells were used to predict the tops of the remaining formations.

A comparison of actual to prognosed formation tops in ZeroGen-5 is provided in the table below. Reference datum is ground level which is 184.28 m above seal level.

Formation Tops	Measured Depth (mGL)	Subsea Depth (mSS)	Prognosed Depths (Pre-survey)		Diff Prog. H/L
			(mGL)	(m/SS)	
Recent	0	184.28	0	182	0
Tertiary (Incl Basalts)	24	160.28	20	162	4H
Rewan	106.0	78.28	106	76	0
Bandanna Fm	435.6	-251.32	436	-254	0.4H
Black Alley Shale	590.2	-405.92	624	-442	33.8H
Mantuan Fm*	629.1	-444.82	656	-474	26.9H
Peawaddy Fm	807.1	-622.82	826	-644	18.9H
Catherine Sst	892.0	-707.72	917	-735	25L
Ingelara Fm	923.0	-707.72	934	-752	11H
Freitag Fm	1109.7	-925.42	1127	-945	17.3H
Upper Aldebaran Sst*	1233.6	-1049.32	1248	-1066	14.4H
Total Depth**	1313.9	-1135.62	1300	-1118	16.4H

*Seismic Picks
Note: Final logs were run at 1248 mGL before final drilled TD was reached at 1313.9 mGL

Table 5.1: Formation tops

The tops tabulated in Table 5.1 and Table 5.2 are based upon a sequence stratigraphic set of markers that allow regional correlation across the entire Northern Denison Trough, whereas the tops in Table 5.3 are based on the lithostratigraphic nomenclature that has traditionally been used in the Denison Trough. TD shown in the tables below is the total depth logged by wireline logs. Note that the drilled total depth is 1313.9 mGL.

Surface	Depth mTVD SS	Depth mGL
Rewan	76.0	106.0
Bandanna Fm	-253.6	435.6
Black Alley Shale	-408.2	590.2
Mantuan Formation	-447.1	629.1
AM 2.2	-535.4	717.4
AM 1.3	-559.0	741.0
Mantuan Coal 3	-597.3	779.3
Peawaddy Formation	-625.1	807.1
Peawaddy Sand	-662.8	844.8
Catherine Sandstone	-710.0	892.0
Ingelara Formation	-741.0	923.0
Ingelara Sand	-761.2	943.2
Freitag Formation	-927.7	1109.7
Aldebaran Sandstone	-1051.6	1233.6
TD	-1101.6	1283.6

Table 5.2: Sequence stratigraphic markers

Surface	Depth mTVD SS	Depth mGL
Rewan	76.0	106.0
Bandanna Fm	-253.6	435.6
Black Alley Shale	-408.2	590.2
Mantuan Formation	-447.1	629.1
Peawaddy Formation	-616.4	798.4
Catherine Lithostrat	-662.0	844.0
Ingelara Lithostrat	-815.3	997.3
Freitag Formation	-927.7	1109.7
Aldebaran Sandstone	-1051.6	1233.6
TD	-1101.6	1283.6

Table 5.3: Litho-stratigraphic markers

The main difference between the two marker sets is in the section between the base Mantuan Formation to the top Freitag Formation. In the lithostratigraphic correlation this interval comprises the Peawaddy Formation (shale), Catherine Sandstone (sand) and Ingelara Formation (shale). In the sequence stratigraphic correlation the Catherine interval is subdivided into 3 sand prone cycles. The youngest is named “Peawaddy Sand”, the middle is the “Catherine Sandstone” and basal is the “Ingelara Sand”.

A major uncertainty prior to drilling was the thickness of near surface basalts that would be present. This is largely unpredictable as the basalts are principally lava flows with varying thickness that disrupt the seismic signal.

The pre-drill top Aldebaran Sandstone structural map is shown in Figure 14. Depths are datumed on ground level. ZeroGen-5 is approximately 5 km east of the Turkey Creek gas field

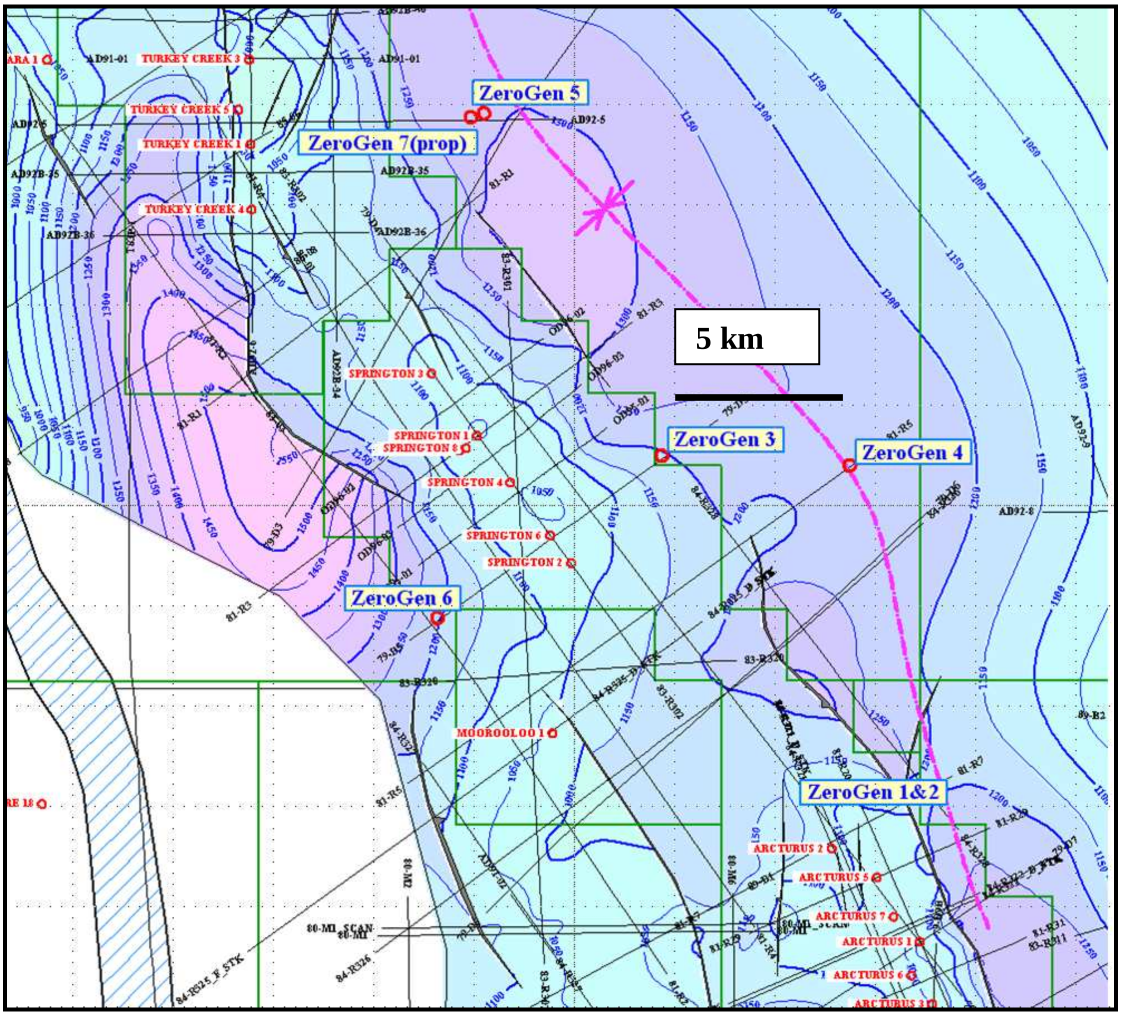


Figure 14: Pre-drill structural depth map on Top Aldebaran Sandstone. Depths shown are datumed on ground level.

6.0 EVALUATION

The following high quality data were acquired in ZG-5:

- Cuttings samples collected every 6 m in surface hole
- Mud samples 3 times a day in core sections
- Mud weights, funnel viscosity, torque, pump pressure and flow rate were recorded hourly in the core sections. Refer to Appendix A3 for summary.
- HQ core acquired 600 m to 872.6 m,
- NQ core from 872.6 m to 1313.9 m

Mud logging services were not conducted on this well.

Hole Section	Suite	Contractor	Log	Depth
Intermediate Hole	1	Coal Seam Wireline	GR	600m - Surface
			Density	600 - 200m
			Resistivity	
Main Hole	2	Weatherford	SP CALI.	1247.85 - 850m
			Neutron	
			PEF	
			Sonic	
			Deep and Shallow laterlog	
			Micro Laterlog	
			GR	1247.85 - Surface
			Density	1247.85 – 850m

Table 6.1: Wireline logs summary

Note: Final logs were run at 1248 mGL before final drilled TD was reached at 1313.9 mGL

7.0 CORING

An extensive coring programme was conducted in ZeroGen-5. 272.6 m of HQ core was cut from 600 to 872.6 m and 441.3 m of NQ core was cut from 872.6 to 1313.9m (driller's depths).

ACS personnel travelled to the ZeroGen-5 well site on 27th March 2008 to receive the core. Cores were cut continuously from 600.2 to 1314 mGL with a change from HQ to NQ sized core at 872.54 m. Once the core reached the surface it was marked with orientation lines, depths and all fractures marked. The core was then broken on the metre marks, placed into metal core trays and photographed. A brief description was then performed noting possible areas of permeability. Core trays were stored in sealed plastic crates with dry ice to keep core cool, prior to transporting by ACS Personnel (at pre selected depth intervals) to ACS Laboratories Brisbane facility for analysis.

A comprehensive routine core analysis programme was conducted on this core. The analyses were performed with the following aims:

- To provide depth correlation through the provision of a continuous spectral core gamma log over the cored interval.
- To provide air permeability, helium injection porosity and density data.
- To provide a detailed permeability profile across selected depths of the core.
- To investigate the porosity and permeability reductions due to overburden stress.
- To provide a permanent record of the core through provision of 5 metre format white light core photography (Appendix A7.2)

74 horizontal and 4 vertical plugs were drilled for routine core analysis using brine as the bit lubricant. Core plugs were visually inspected and fractured plugs were discarded. Ambient base parameters were measured on all plugs. Overburden measurements were made on plugs having permeability greater than 0.5 mD. Several plugs from the Catherine Sandstone have excellent permeability.

The plugs were CT scanned as a final QC step.

As no wire line logs were acquired over the lower part of the Aldebaran Sandstone, probe permeameter data were acquired from the Aldebaran Sandstone section over the interval from 1235.1 to 1295.5 mGL to supplement the permeability characterisation of this interval. The measured flow rate (at a fixed injection pressure) was converted to permeability by comparison against measurements on the core plugs with know permeabilities.

Single phase permeability measurements were conducted on three representative permeability plugs to calibrate between ambient air permeability measurements, brine permeability and CO_2 permeability. These results are shown in Figure 15 below. Permeability loss from air to brine ranges between 74-83 % and from air to CO_2 the loss is between 70 to 93%.

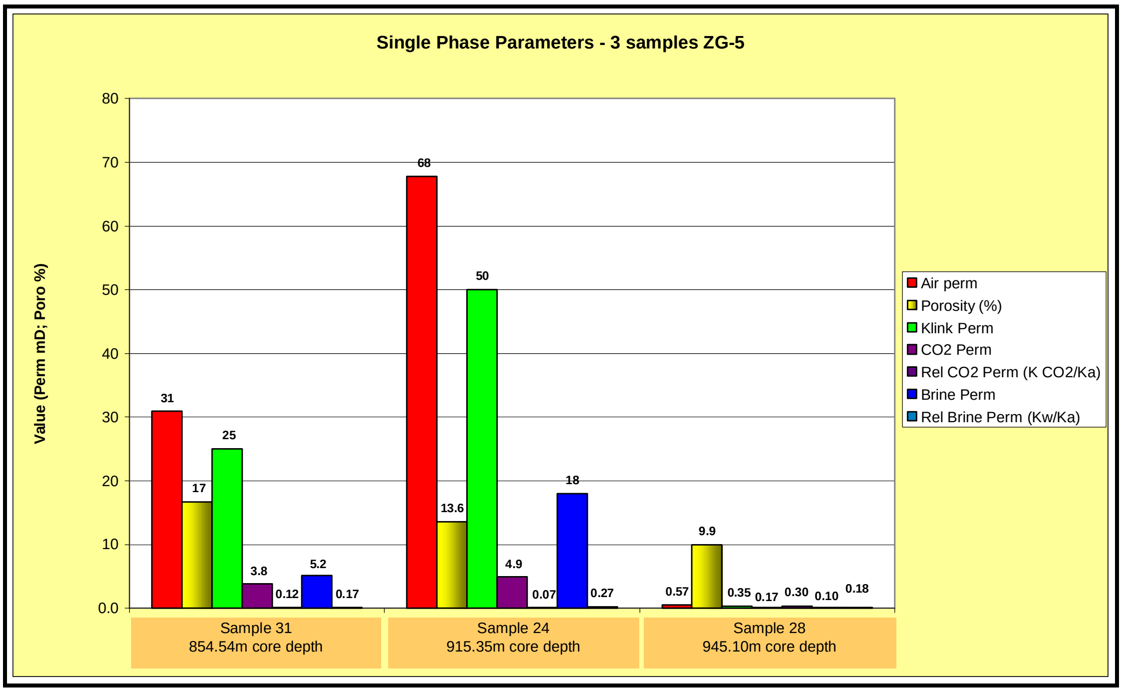


Figure 15: Comparison of single phase poro-perm data measured on 3 core plugs from ZeroGen-5.

The results of the RCA are provided as Appendix A7.

Thirty-three full diameter samples were selected for preservation under brine. A further one shale sample was preserved under mineral oil. Preserved core sections continue to be stored under brine and oil.

7.1 Core Storage

All core plugs and off-cuts are currently stored at ACS Laboratories' Brisbane facility. One section of the ½ core slab was transported to the Department of Mines and Energy core storage facility at Zillmere on 11th September 2008. The Set A ½ core slab is currently stored at ACS Laboratories Brisbane.

7.2 Core Descriptions

Detailed core logging was conducted by Vic Ziolkowski. Core descriptions are provided as Appendix A5. Formation nomenclature is based on the lithostratigraphic markers (see table 5.3).

7.2.1 Mantuan Formation

The channel facies encountered in ZG-5 are poorly developed compared to those intersected in ZeroGen-3. The channel sediments present in ZG-3 below the coal at 724 m are not present at the same stratigraphic level in ZG-5. Consequently the visual porosity not well developed. Likewise the channels observed between the coals at 680 and 724 m in ZG-3 are lower energy at ZG-5. The coal at 680 m in ZG-3 is split by a very coarse sandstone and micro conglomerate in ZG-3 but does not occur in ZG-5 at 730 m. It seems that the main distributary system for the Mantuan is to the west of ZG-5 and the well encountered lower energy secondary channels. The thicker coals support this interpretation.

At the macroscopic level porosity is poor with only one observation being assigned moderate. As with the other horizons the porosity is restricted to the labile channel bedload sediments. The transition in the upper Mantuan and into the Black Alley Shale is accompanied with a marked drop in coastal energy (lack of wave activity). The degree of subaerial vulcanism and input of organic detritus is increasing upwards. There is still infaunal activity and presence of calcium carbonate in the Black Alley Shale.

7.2.2 Catherine Sandstone

The 'Catherine Sandstone' interval in ZG-5 consists of more proximal facies that in the previous wells. Two facies types dominate:

- Shallow marine and shore face processes that produce sorted quartzose coarse clastics that have undergone extensive silicification.
- Bed load sedimentation in the form of distributary sediments that are lablile and contain abundant feldspar and classed as arkoses. These have not been affected as severely as the marine dominated coarse clastics.

From a macroscopic point of view the coarser grained arkosic sediments appear to have the best relict and secondary enhanced porosity.

The finer the grain size and the more quartz that is present lead to the most extensive silicification. This is a function of surface area to volume of the grains.

The channel facies are readily distinguishable however the associated facies are complex and appear to be dominated by reworking of the channel sediments by wave and minor tide (bars, shore face bay etc).

7.2.3 Freitag Formation

The overall thickness of the 'Freitag Formation' in ZG-3 and ZG-5 are similar. There is a major flooding surface between 1117 and 1122 m in ZG-3. This event correlates well with the one observed in ZG-5 at around 1150 m. None of the ancillary tidal-like facies such as sand flat and mixed flat are observed in the upper part of ZG-5. ZG-5 is dominated in the upper interval by amalgated channels and contains woody and coaly fragments.

It is more energetic than ZG-3, however like the Aldebaran it does not appear to contain the granite derived micro conglomerates observed in the overlying Catherine and the macroscopic porosity observed is at best poor and restricted to the coarser intervals.

It is likely that the Freitag (and the Aldebaran) may be derived from a western provenance rather than a north-western one as proposed for the Catherine.

These wells indicate the complexity of the depositional system. The amalgamated channel sets define basinward shifts which suggests that during relative highstands the paralic wave dominated sediments dominate.

The labile coarser channel sediments are the likely ones to have relict and secondary porosity (after altered feldspars)

7.2.4 Aldebaran Formation

No major differences exist between the facies in ZG-3 and ZG-5. The deeper interval is dominated by distributary channel bed load sedimentation with relatively thin bay, lagoon and swamp facies including thin coals and carbonaceous indicating a lack of aborescent material. Both locations show three flooding events culmination in the offshore facies of the Ingalara formation.

At the macroscopic level porosity (poor visual porosity) appears to be restricted to the distributary channel sediments. These appear to be more labile that the marine dominated shore face and bar facies at the top of the succession.

It may be possible that the porosity of the Aldebaran may improve, (though presumably still poor), with increased depth where thicker 'coarser' deltaics may be present.

The core chip samples from the non-wireline logged Aldebaran in ZG-5 have the best reservoir quality in the basal 15 m. Comparison of the 8 samples analysed from the basal 15 m with the core log indicates that "good reservoir" correlates to the coarse fractions of the distributary channels.

There is a reasonable correlation between the "biscuit" or disc fractured intervals and those with reasonable permeability. All the samples analysed over the basal 15 m were in biscuit fractured zones. The biscuit fracturing is mainly in the coarser grained fractions of the sequence.

There is also indication of permeability development in the 1298.4 m & 1313.6 m samples that are in the basal (coarser) part of the channel lags. The intervals marked on the core description as biscuit fractured generally coincide with the higher permeability intervals identified by rock typing.

7.3 Petrology

A petrological study was carried out on six core samples from the Catherine Sandstone in ZeroGen-5 (854.54 m to 945.10 m). Analytical techniques used were thin-section analysis, fine fraction X-ray diffraction analysis and scanning electron microscopy. A summary of the key results and conclusions follows. The detailed report is included as Appendix A6.

- Samples are clean, medium to very coarse grained subarkoses and a subarkosic granule conglomerate in which framework grains are mainly quartz, K-feldspar, plagioclase and a variety of rock fragments.

- Sandstones are derived from a nearby provenance dominated by granitic rocks and which also included metasedimentary rocks, siliciclastic sedimentary rocks and acid volcanic rocks.

- Clay is authigenic kaolin and subordinate illitic clay that result from labile grain alteration.

- The samples have been severely affected by diagenesis, with the main diagenetic processes being quartz overgrowth cementation, grain contact dissolution/microstylolitisation, authigenic clay formation and secondary porosity formation.

The sandstone at 854.54m is distinguished by its relatively high (17.6 %) visible porosity. In the deeper section (915.35m to 945.10m), visible porosity (5.3-13.9 %) tends to increase with increasing grain size. Visible porosity is mainly primary and intergranular and also includes scattered secondary pores that result from feldspar dissolution. A SEM photograph from plug depth at 915.35 m (driller's depth) is shown in Figure 16. Measured porosity is 12.3 % and air ambient permeability is 520 mD. Analysis shows that the porosity is preserved due to a combination of clay (inhibiting quartz overgrowth cementation), coarse grain size and relatively high labile grain contact.

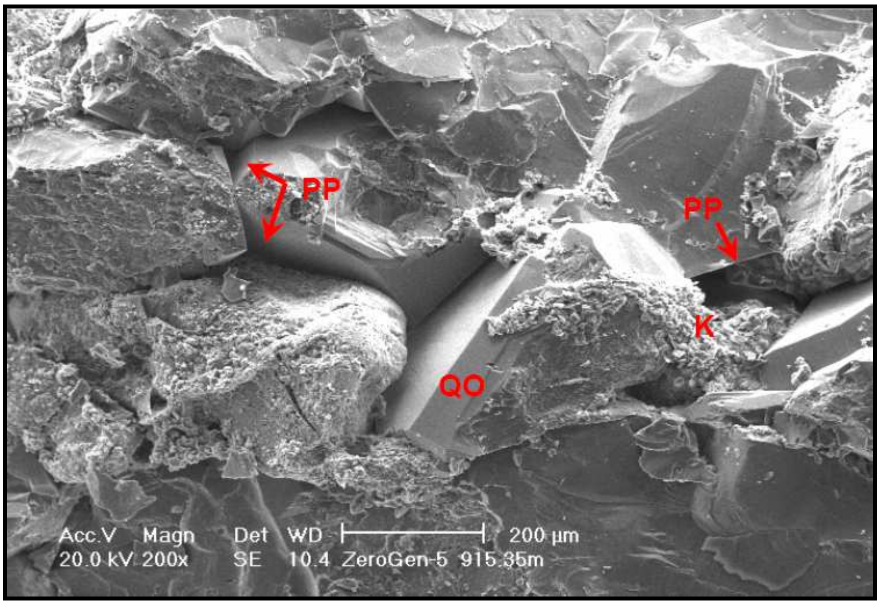


Figure 16: SEM Micrograph (Sample 24 915.35 m) ZeroGen-5 showing large primary pores.

Porosity reduction was due to quartz overgrowth cementation, grain contact dissolution/microstylolitisation, authigenic clay formation and ductile grain/authigenic clay compaction to form pseudomatrix.

Anomalous intergranular porosity at 854.54 m is the result of authigenic grain-coating illitic clay having inhibited quartz overgrowth cementation, but here permeability is limited (33.0 mD) by relatively fine grain size.

In the deeper sandstones (915.35 m to 945.10 m), permeability (0.80mD to 520 mD) is controlled mainly by grain size, reflecting not only the intrinsic grain size control on permeability, but also the decreased effectiveness of quartz overgrowth cementation in eliminating intergranular porosity in the coarser lithologies.
In addition, the two coarsest samples (915.35 m, 920.22 m) are relatively feldspathic, which further decreased the susceptibility of these samples to porosity destruction by quartz overgrowth cementation. Grain contact dissolution/microstylolitisation locally reduced permeability.

Moderate to high permeability in the Catherine Sandstone in ZG-5 can be attributed to the presence of authigenic grain-coating clay (854.54 m), coarse grain size (915.35m to 943.76 m) and, particularly where the section is very coarse grained (915.35 m, 920.22 m), relatively high feldspar content.

Thin section point count analysis is shown in Table 7.1. The main observation that distinguishes the higher permeability rock is the higher proportion of feldspar and granitic rock fragments. This suggests a granite provenance.

The Retreat Granite northwest of Springsure, (Figure 17) is the closest granite batholith to ZG-5 and this is postulated to be the source of the arkosic, labile material deposited by southerly flowing distributary channels during “Catherine times” at ZG-5.

It is likely that similar quality reservoir will be found in distributary channel facies north-west of ZG-5, possibly within ZeroGen’s ATP 835P.

Sandstones in the Freitag Formation and Aldebaran Sandstone are not as arkosic as the Catherine deltaics and porosity appears to be considerably more occluded. This may in part be due to the degree of un-roofing of the northern Retreat Granite batholith at this stage of the basin evolution.

The lack of significant increase of coarser clastics at ZG-5 suggests that unlike the Catherine Sandstone the provenance for the Aldebaran may in fact be more to the west rather than the northwest. This would be in keeping with the changing geometry of the foreland.

Sample #	31	24	25	26	27	28
Depth (m)	854.54	915.35	920.22	943.21	943.76	945.10
Quartz (monocrystalline)	60.7	47.2	51.2	56.1	58.9	58.4
Quartz (polycrystalline)	3.3	15.0	3.8	5.5	3.4	4.6
Quartz overgrowths	4.0	2.7	8.4	9.1	6.4	8.6
Chert	0.3	-	0.3	0.7	0.7	0.3
K-feldspar	5.0	14.9	13.0	7.8	10.7	8.8
Plagioclase	0.7	3.9	4.5	2.1	2.7	3.3
Granitic rock fragments	0.7	1.7	1.4	0.7	-	0.3
Volcanic rock fragments	0.7	-	2.2	0.7	0.7	1.1
Metamorphic rock fragments	1.1	0.3	-	0.3	0.3	1.7
Sedimentary rock fragments	1.1	-	-	1.1	1.1	2.1
Mica	-	0.3	-	-	-	0.3
Heavy minerals	0.3	-	-	-	-	-
Organics	-	0.3	-	0.3	-	-
Ankerite	0.7	-	0.3	0.3	-	-
Siderite	1.1	-	-	-	0.7	-
Pyrite	-	-	-	-	-	0.7
Authigenic kaolin	2.7	1.1	0.7	5.0	5.1	2.8
Authigenic illitic clay	-	0.3	0.3	-	2.1	1.7
Detrital clay	-	-	-	-	0.7	-
Primary porosity	14.5	11.2	11.1	7.8	4.1	3.2
Secondary porosity	3.1	1.1	2.8	2.5	2.4	2.1
Total visible porosity	17.6	12.3	13.9	10.3	6.5	5.3
Q (quartz + chert)	88.1	75.7	75.1	84.9	81.7	80.6
F (felds. + granitic rock frags.)	8.2	23.9	22.3	12.6	15.8	13.9
R (rock fragments)	3.7	0.4	2.6	2.5	2.5	5.5
Mean grain size (mm)	0.30	2.30	1.12	0.64	0.62	0.36
Mean grain size (class)	medium	granule	v. coarse	coarse	coarse	medium
Sorting (class)	mod-well	moderate	mod-well	mod-well	mod-well	moderate
Porosity (%)	17.7	12.3	13.4	13.1	12.6	11.7
Permeability (mD)	33.0	520	322	32.1	12.1	0.80
Grain density (g/cm^3)	2.67	2.64	2.63	2.66	2.65	2.66

Table 7.1: Thin section point count – ZeroGen-5 Catherine interval

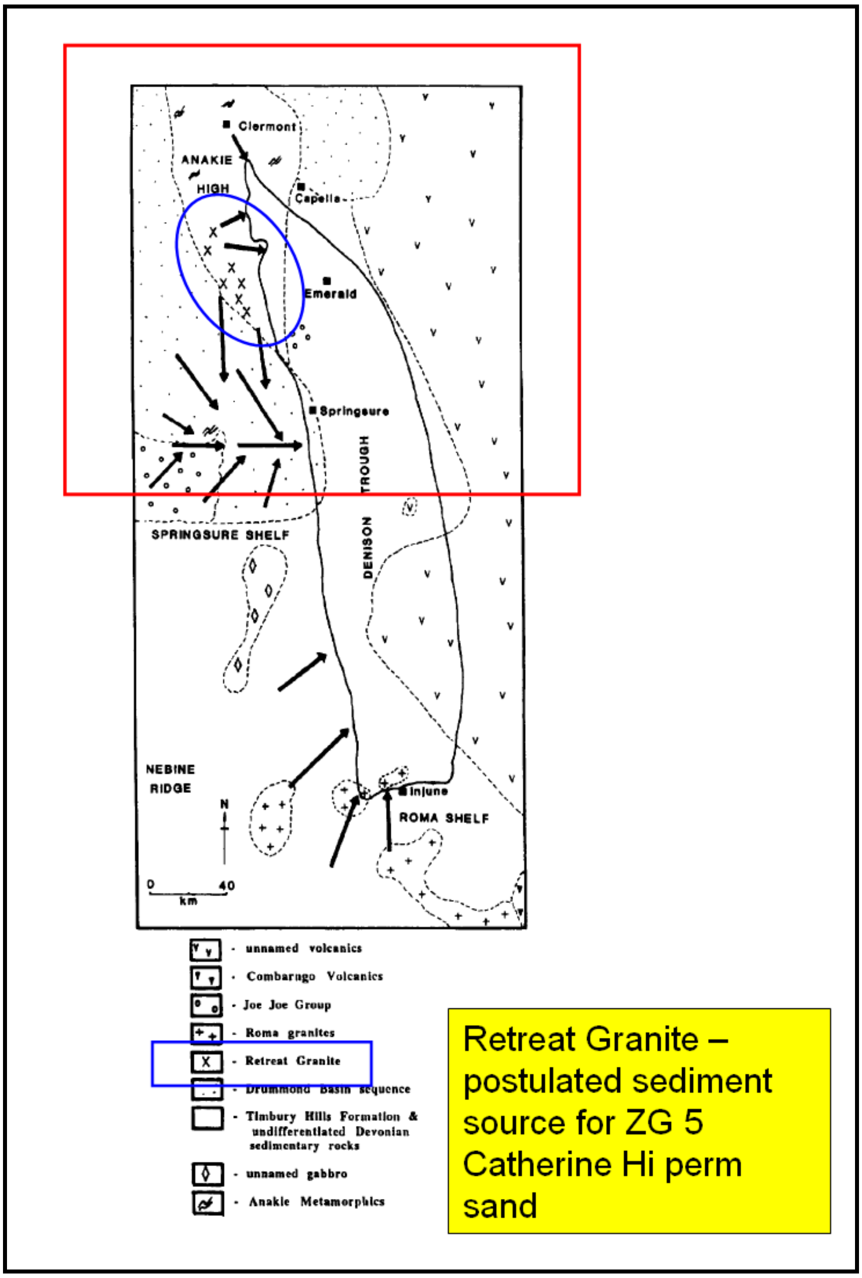


Figure 17: Location of the Retreat Granite

Rock typing was carried out over the prospective sections of the well that had limited or no wireline log coverage as well as the Catherine "high permeability" section. The objective of the rock typing was to provide an estimate of the vertical extent of poro-perm development away from RCA plug point samples.

- Type 1 rocks are capable of gas production without natural or artificial fracturing. They are sub-divided into four classes.
    - Type 1A have a permeability > 100 md. These are classed as conventional reservoir rocks.
    - Type 1B have a permeability range between 10 - 100 md. These are classed as conventional reservoir rocks
    - Type 1C have a permeability range between 1 - 10 md. These are classed as conventional reservoir rocks.
    - Type 1D have a permeability range between 0.5 - 1 md. These are classed as sub conventional reservoir rocks
- Type 2 rocks are capable of gas production when interbedded with Type 1 rocks or with natural and/or artificial fracturing. Permeability range is 0.07 - 0.5 md. These are classed as marginal non-conventional reservoir rocks.
- Type 3 rocks are too tight to produce at commercial rates even with natural or artificial fracturing. Permeabilities are generally less than 0.07 md. These are classed as non-reservoir rocks.

Figure 18 is a plot of ZeroGen-5 rock types plotted against core depth over the Catherine interval and shows that the best quality rock occurs at the top of the interval.

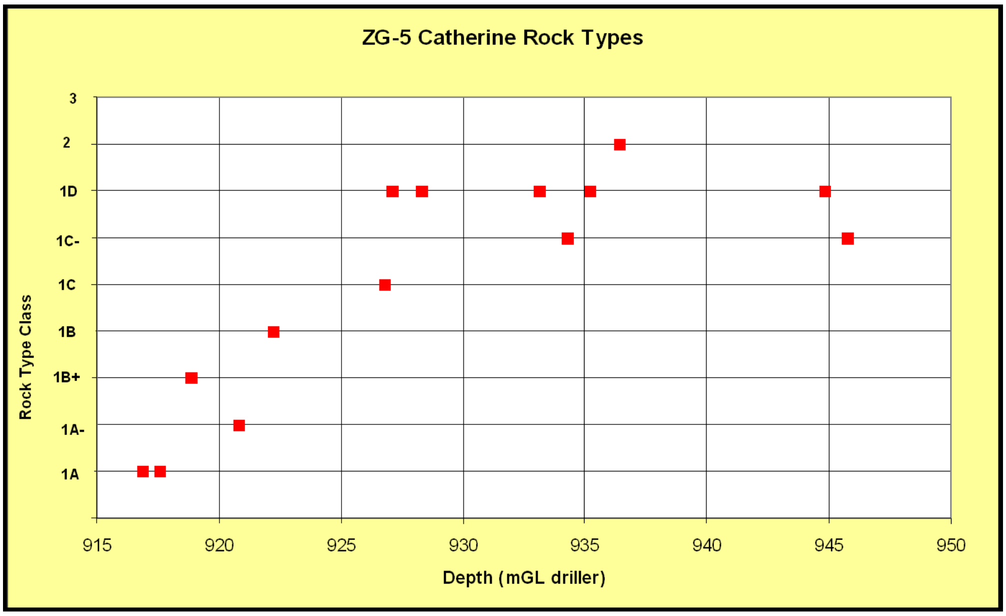


Figure 18: ZeroGen-5 Catherine rock types

A visual estimate of the permeable intervals within the Catherine section was made and these are listed in the table below. Note that depths are core depths:

Top	Base	Thickness (m)
903.00	903.74	0.74
904.10	905.60	1.50
907.30	908.75	1.45
913.80	914.00	0.20
915.20	917.15	1.95
919.44	919.80	0.36
923.34	923.41	0.07
928.10	928.30	0.20
944.44	944.90	0.46
	Total	**6.93**

Table 7.2 Visual estimates of permeable intervals

Rock types over the Aldebaran section is shown in Figure 19. The majority of rock belongs to Rock type 1D (estimated 0.5-1 mD) however 1C (1-10 mD) rock is also present particularly within the interval 1303 m to 1311 mGL core depth.

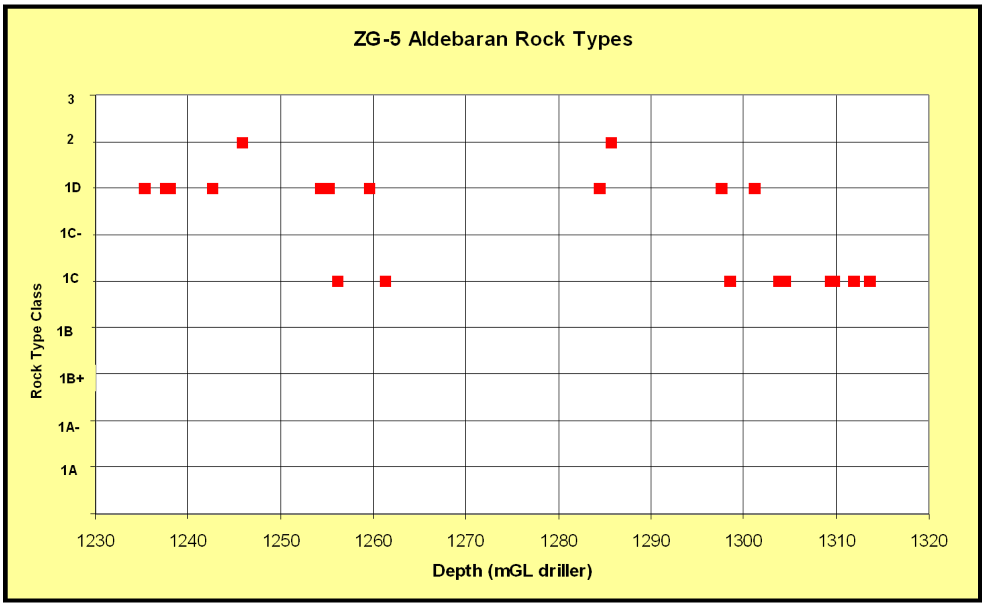


Figure 19: ZeroGen-5 Aldebaran rock types

7.4 Reservoir Characterisation

Enclosures E3 to E6 are reservoir characterisation summary montages of the Mantuan, Catherine, Freitag and Aldebaran reservoir zones showing the core description plotted with the RCA and petrology of each zone.

8.0 WATER ANALYSIS

No water samples were recovered from ZG-5.

9.0 PETROPHYSICAL ANALYSIS

A "QuickLook" petrophysical interpretation was conducted over the interval with full log coverage (875 m to 1248 mGL) and therefore did not include the Mantuan Formation.

Data was interpreted using Multimin software, which is an optimising petrophysical module within Geolog6. Optimising petrophysics relies on obtaining the best match between a model, the measured data and the predicted results. For each logging tool, response equations are used to define the influence of each of the mineral and fluid volumes. The mineral and fluid parameters and the response equations are then used to reconstruct the actual wireline measurements and predict the volumes of minerals and fluids present within the reservoir.

A report summarising the input data and results of the QuickLook petrophysical analysis is included as Appendix A8. The core to log depth shifts that have been applied are listed in Appendix 3 of the Operational Petrophysics report, which is included as Appendix A8.1.

The following cut-offs were used to calculate net reservoir:

Parameter	Log	Value
Net Sand	VShale	<=40%
Net Reservoir	Porosity	>=4%
Net HIP	Swt	<=80%

Table 9.1 Petrophysical cut-offs

- Based on the above cut-offs, the Catherine Sandstone contains 24.3 m of reservoir quality rock with an average PHIT of 8.9 %, VCL of 5.0 % and average permeability of 69 mD.

- The Ingelara Formation contains 16.8 m of reservoir quality rock with an average PHIT of 7.6 %, VCL of 11.2 % and average permeability of 0.08 mD.

- The Freitag Formation contains 18.4 m of reservoir quality rock with an average PHIT of 8.3 %, VCL of 9.9 % and average permeability of 0.02 mD.

- The Aldebaran Sandstone contains 4.0 m of reservoir quality rock with an average of PHIT of 6.9 %, VCL of 5.2 % and average permeability of 0.2 mD.

- Overall, porosities are low to medium but pass the PHIT cut-off for CO_2 storage. Total net reservoir over the zones is 63.4 m with a N/G of 0.17.

Table 9.2 summarises results from the QuickLook analysis.

Formation	TOP (m)	BASE (m)	GROSS (m)	NET (m)	NTG (V/V)M	PHITH MDM	KINTH Nov08 V/V	PHIT AV V/V	SWT AV V/V	PHIE AM V/V	VOL WETCLAY AM	KINT Nov08 AM MD
TGLD	875	892	17	0	0	0	0	-	-	-	-	-
Catherine	892	923.4	31.4	24.3	0.772	2.16	1670	0.089	1	0.083	0.050	69
Ingelara	923.4	1109.7	186.3	16.8	0.090	1.267	1.3	0.076	1	0.061	0.112	0.1
Freitag	1109.7	1233.6	123.9	18.4	0.149	1.53	0.5	0.083	1	0.072	0.099	0.02
Upper Aldebaran	1233.6	1238.2	4.6	4.0	0.859	0.27	2	0.069	1	0.063	0.052	0.4
Well	**875**	**1238.2**	**363.2**	**63.4**	**0.174**	**5.23**	**1673**	**0.082**	**1**	**0.073**	**0.081**	**26**

TGLD: Top of Good Log Data (no triple combo above this zone)
PHITH: Total porosity * net thickness
KINTH Nov 08: Intrinsic Permeability* net thickness (Nov 08 permeability algorithm)
PHIE AM: Effective porosity arithmetic average
SWT: Total water saturation
KINTNov08 AM: Intrinsic permeability arithmetic average (Nov 08 permeability algorithm)

Table 9.2: QuickLook petrophysical summary

10.0 CONCLUSIONS

ZeroGen-5 provided the valuable information about the potential storage site and achieved its objectives as a high quality data gathering well.

- It was the fifth well drilled within the structural syncline and encountered a typical Northern Denison Trough Permian sequence;
- the nearby Turkey Creek wells provided good correlation control;
- the sediments are hard, largely due to quartz overgrowth cementation, resulting from deep burial, post deposition;
- detailed core logging indicates that the distributary channel sand facies contain the best relict porosity and permeability
- excellent permeability was encountered in arkosic distributary channel facies within the Catherine Sandstone.
- the Retreat Granite northwest of Springsure is the closest granite batholith to ZG-5 and this is postulated to be the source of the arkosic, labile material deposited by southerly flowing distributary channels during “Catherine times” at ZG-5; and
- many of the reservoir quality zones are thin and “invisible” to logs, therefore core is very important to reservoir characterisation and the evaluation of rock quality.
- Petrophysical evaluation conducted over the fully logged section (875 mGL to 1248 mGL calculates the total permeability thickness (Kh), at depths suitable for supercritical CO_2 sequestration, to be approximately 1673 mD m. This is an order of magnitude higher than the Kh estimated at the ZeroGen-3 and 4 site.
- A 20 m interval within the Catherine Sandstone accounts for over 99% of the total Kh calculated from the logs.

REFERENCES

ANTHONY, D.P., 2004. A review of recent conventional petroleum exploration and in-field gas reserves growth in the Denison Trough, Queensland. *PESA EABS 2, 277-296*

GARSIDE, I. E., 1990, Facies and Potential Reservoir Study Freitag, Catherine and Mantuan Formations Northern ATP 337P Denison Trough, *For AGL Petroleum*, *Unpublished (QDEX Report 24004)*

WILKINSON, M., 1991, Sequence Stratigraphy of the Aldebaran Sandstone Group ATP 337P Denison Trough, Qld Volume 1, *For AGL Petroleum, Unpublished (QDEX Report 24005)*

APPENDICES

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A2: LOCATION SURVEY DIAGRAM
A3: DRILLING REPORTS
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ENCLOSURES