Operational Petrophysics
ZeroGen 5

Prepared for:

Stanwell Corporation (Stanwell)

CONFIDENTIAL

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INTRODUCTION

ZeroGen 5 was drilled as the fifth CO_2 sequestration test wells in the ATP 722P Permit of the Northern Denison Trough. The objectives of this well was to collect high quality data in order to test the CO_2 injectivity potential and storage potential of the Permian sandstones; and the capacity of the intra-formational and regional seals.

Main zones of interest within this well are the Catherine, Ingelara, Freitag and Aldebaran Sandstones.

DATA AVAILABILITY AND QUALITY

Drilling Data

ZeroGen 5 was spudded on the 19th March 2008 at 14:30 hrs. A 12 ¼" section was drilled from surface to a depth of 12m, followed by the 8 ½" hole section which was drilled to 200m and then finally the 5 ½" section was drilled to 600m.

The well was then continuously cored, first with the 2.5" HQ core from 600 to 872.6m, followed by the 2" NQ cored section from 872.6 to TD (1313.9m).

Petrophysics evaluation was conducted over the two cored sections.

Wireline Log Data

Wireline logging of ZeroGen 5 was performed by Coal Seam Wireline Services and Weatherford (Precision logging Services). Table 1 summarises the logs acquired.

Suite/Run	Tool String	Interval (mMDRT)	BHT (degC)
1 / 1	GR-CAL-DEN-RES	598.3 – 0	-
1 / 2	GR-SP-CAL-PEF-DT-MDL-MSS-MPD-MDN	1247.85 - 590 (GR to surface)	64

Table 1. Log Data Acquired

Core Data

No sidewall cores were acquired in this well.

ZeroGen 5 was designed as a continuously cored hole with HQ (2.5") core from 600m to 872.6 and NQ (2") core from 872.6 to TD, (Table-2). The total cored interval was 713.9m. Extensive core analysis was conducted with the following aims –

- To provide depth correlation through the provision of 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 5m format white light core photography.

Core	Interval (mMDRT Drillers)	Formation	Core Size (")
HQ	600 – 872.6	Black Alley Shale to Peawaddy Formation	2.5
C1	872.6 – 1313.9	Peawaddy Formation to Upper Aldebaran	2

Table 2. Core acquired in ZeroGen 5.

RCA

Routine Core Analysis (RCA) was also conducted on core data for the purpose of calibrating porosity, grain density and permeability with log data. 70 horizontal plugs and 4 vertical plugs were drilled for RCA where ambient measurements were taken on all plugs and overburden measurements taken on plugs having permeability greater than 0.5 mD.

It is evident that the core data, particularly within the Catherine sandstone is of much higher resolution and thus defines the permeability and porosity much more precisely than the wireline logs due to the laminated variability of the zone. However permeability accuracy may be an issue due to drying methods possibly destroying clay structures. Resistivity and GR curves do show evidence of thin beds but not to the extent of the core data.

Before RCA analysis, core plugs were oven humidity dried to a temperature of 60℃ and then cleaned in a modified soxhelet system to remove fluids and salt. Oven drying at 100℃ and 0% relative humidity was th en conducted until the sample reached constant weight.

This method of drying has the potential to destroy clay structure and hence can overestimate the permeability, particularly pore-bridging clays which SEM scans show evidence of.

SEM

A Scanning Electron Microscopy (SEM) analysis was carried out by Reservoir Solutions Pty Ltd. The core sample was from the Aldebaran Formation at approximately 1298.5 m and the Catherine Sandstone from approximately 915.35m. Both samples were analysed in order to provide information on mineralogy and porosity, as well as diagenetic effects. A freshly broken surface which had been thoroughly washed in shellite to remove any volatile hyrdrocarbons, was used for the analysis. Clay composition was confirmed using an attached energy dispersive spectrometer (EDS).

In summary, the Aldebaran results show that the sample is a massive, clean, medium grained sandstone which has had its permeability severely affected by diagenetic processes with inter-granular porosity largely reduced by quartz overgrowth cementation (QO), grain contact dissolution and authigenic clay formation. Clay is illite, probably with a mixture of illite/smectite (I/S) which fills and bridges the primary inter-granular pores (PP) with authigenic kaolin being the dominant clay. In summary, the permeability would be low. Core analysis as well as log analysis supports this with permeabilities generally less than 1mD.

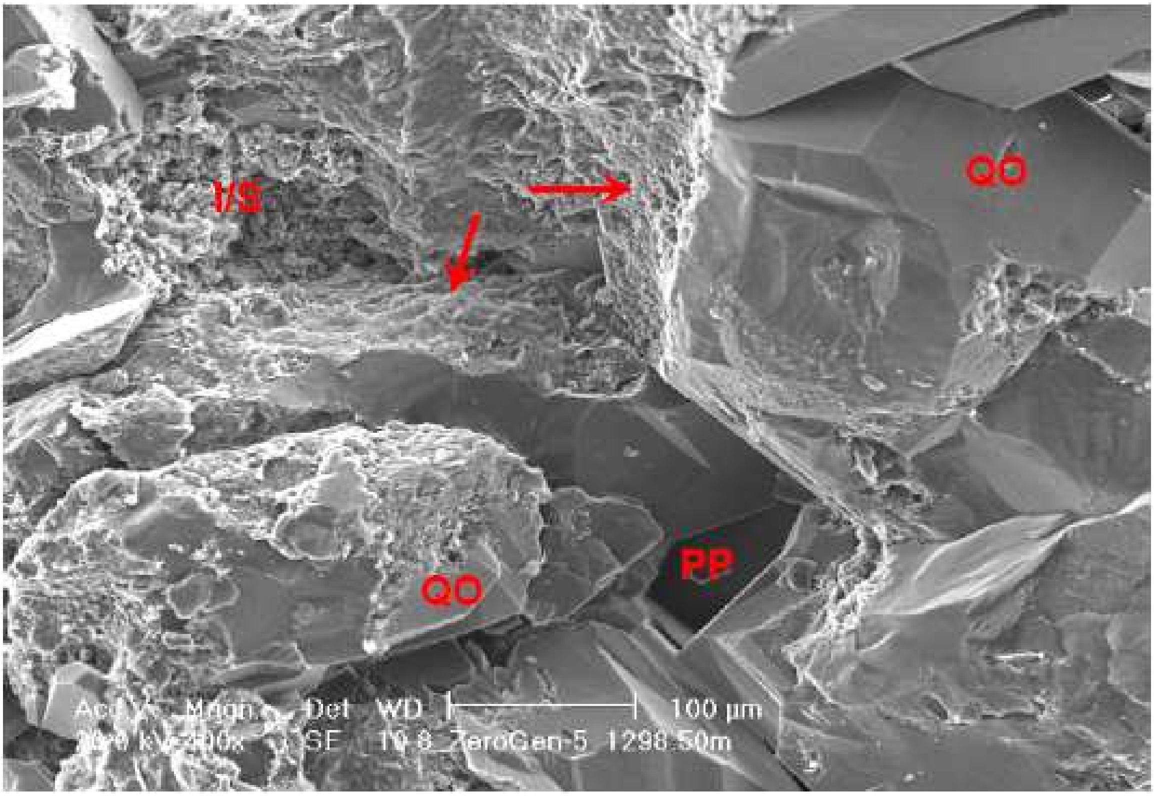

Figure 1: SEM of Aldebaran Sandstone showing low porosity due to quartz over growth and clay-bridging infill.

The Catherine Sandstone however exhibits moderate to high permeability due to the presence of authigenic grain-coating clay, coarse grain size and where the section is very coarse grained, relatively high feldspar (K) content, which diminishes the ability of quartz overgrowth cementing the pore space. Grain contact dissolution/microstylolitisation locally reduced the permeability. RCA and log analysis supports these findings.

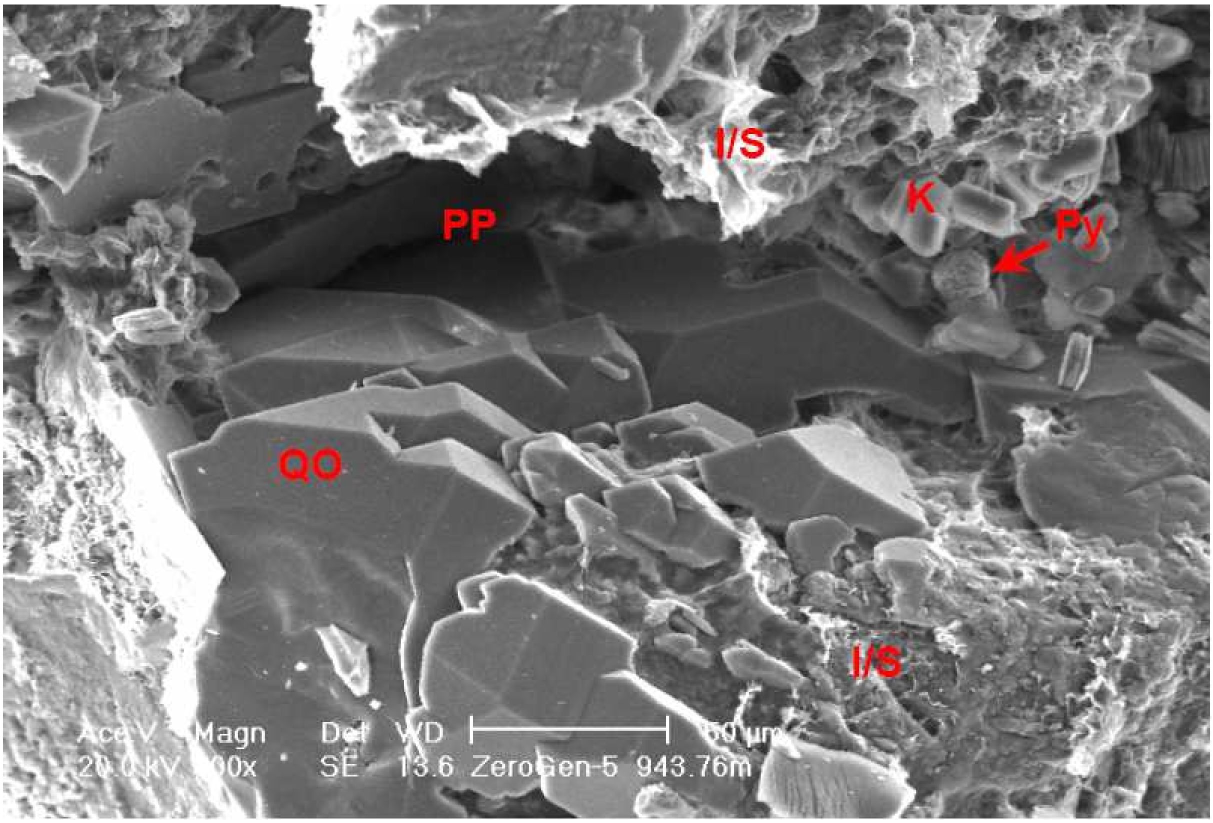

Figure 2: SEM of Catherine Sandstone showing high porosity due to clay structure, coarse grains and feldspar prohibiting quartz over growth.

Reservoir Micro Analysis©

Reservoir Micro Analysis© was carried out by Reservoir Consultants International on the Catherine and Ingelara Formations. The technique consists of a quantitative method which assesses reservoir quality in terms of their reservoir properties from cuttings and core samples. The idea is taken from the fact that petrophysical properties are controlled by the rock's textural attributes. Table 3 presents the Rock Type category based on permeability.

Ingelara was classified as a very low permeability rock with Rock Type of predominantly 1D but still capable of gas production without natural or artificial fracturing. The Catherine sandstone appears more variable from Rock Type 1A to 1C, with a high quality rock type being quite dominant.

Rock Type	Permeability Range (mD)	Geometric mean (mD)
1A	> 100	316
Low 1A (1A-)		150.8
High 1B (1B+)		78.57
1B	10-100	31.6
High 1C (1C+)		7.9
1C	1-10	3.16
Low 1C (1C-)		2.6
1D	0.5-1	0.707
2	0.07-0.5	0.187
3	< 0.07	<0.07

Table 3 Rock Type Definitions

CT Scans

CT scans were taken after core analysis was conducted to ensure cores plus were intact and had not been altered to affect core measurements.

Formation Test Data

No formation testers were run within ZeroGen-5

Drill Stem Tests

No DST's were attempted in ZeroGen-5.

Formation Pressure Data

No formation pressure sampling was conducted in ZeroGen-5.

BOREHOLE DATA

Hole Conditions

The borehole was in excellent condition over the reservoir section and resulted in excellent quality logs.

Mud Properties

The well was drilled using a KCL mud through the target formations with mud weight of approximately 1.08 gm/cc.

LOG ANALYSIS METHODOLOGY

Preparation

Wireline data were loaded from LAS files into Geolog6 software. The logs were checked for depth-matching and general acquisition quality.

Log QC and Environmental Corrections

Environmental corrections were applied as required using the *Geolog* software.

Interpretation Technique

The ZeroGen 5 well was analysed using procedures developed during the "Northern Denison Trough – CO_2 Storage Site – Results of Reservoir Modeling" study conducted by MBA Petroleum Consultants (2005).

Data from ZeroGen 5 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. For example we can define the response of the density tool to the formation if we know the response (or endpoint parameters) of each of the components that make up the formation e.g. the following would be the density response of a formation containing oil and water in the pore space, and having a matrix of quartz and albite.

$$\hat{\rho}_b = \rho_{oil} v_{oil} + \rho_{fw} v_{fw} + \rho_{qtz} v_{qtz} + \rho_{alb} v_{alb}$$

Such equations can be written for each of the wireline measurements. These equations are then solved simultaneously to define the best combination of various volumes, such that the original log measurements are as closely matched as possible. The following logs were incorporated into the model:

DEN, NPRL, DT35, U, GRGC, CT and CXO

Lithology

MULTIMIN relies on the knowledge of the logging response of the various known minerals and fluids that may occur within the formation under investigation. These responses are generally constant from basin to basin (with some exceptions) and are fairly well identified through the publication of research into the topic. Based on the lithology described in the mudlog from ZeroGen 5, the following is a list of the volume components that were integrated into the models used in this study.

Permian Formations

Framework:	***Clays:***	***Fluids:***
Quartz	Illite	Formation Brine
Feldspar	Kaolinite	Gas
Calcite		

It is important to note that Multimin estimates the volume of mineral components (clays and framework grains) which means that a Vsh is not actually calculated as defined by typical deterministic analyses. If you look at typical shales across the world, they contain on average around 40% quartz, and 60% clay minerals, which surprises many people.

Formation Tops

Zones of interest were from the Catherine through to the Aldebaran Formation. ZeroGen-5 triple combo data was run from the Aldebaran to half way up the Peawaddy Formation, denoted by TGLD in table below. Table 4 shows the formation tops as provided by the client.

Formation	Depth (m MD)
Peawaddy Formation	807.1
TGLD (top good log data)	875.0
Catherine Sandstone	892.0
Ingelara Formation	923.4
Freitag Formation	1109.73
Upper Aldebaran Sandstone	1233.6

Table 4. Formation tops used within the analysis

The following litho-stratigraphic formation tops were also used for pay summary analysis as per client request. These are based on the traditional nomenclature used within the Denison Trough.

Formation	Depth (m MD)
Peawaddy Formation	798.4
Catherine Lithostrat	844.0
TGLD (top good log data)	875.0
Ingelara Lithostrat	997.3
Freitag Formation	1109.7
Aldebaran Sandstone	1233.6

Table 5. Litho-stratigraphic Formation tops used for pay summaries only

Fluid parameters

Formation Brine

Some uncertainty exists in the concentration of formation water salinity, due to regional variations in water salinity. Formation water resistivity values used in this analysis are based on the Pickett plot method as opposed to data from offset wells as with ZeroGen-1 to 3. Figure 3 shows a Pickett plot within the Aldebaran formation where the Rw has been determined based on an average Rwa within the water wet zone. Estimating Rw using this method gives a good estimate of Sw of approximately 100%. Using an Rw of 6.5kppm as used within the previous ZeroGen wells as obtained from offset data, gives an Sw which is overestimated (above 100%) and is therefore not as representative as 16kppm, as used in this analysis. It was attempted to obtain a water sample within the Catherine sandstone within ZeroGen-6 but unfortunately the sample was contaminated with mud filtrate. An attempt was made to back out the effects of the mud filtrate and a water sample of 8.5kppm was determined. This value seems plausible based on Pickett plot and offset data. However, an attempt to retrieve a water sample from ZeroGen-7 will reduce this uncertainty. Water resistivity is one of the uncertainties in this study and as such every effort should be made to obtain representative water analysis from and future in-wellbore activities. Table 6 summarises formation water resistivities used in this analysis.

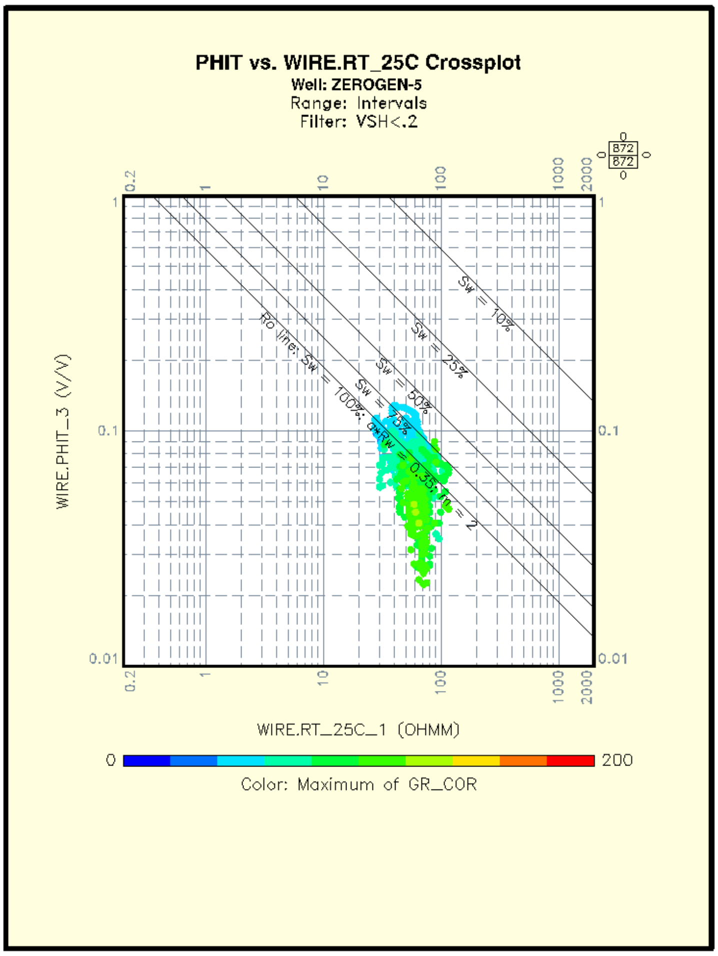

Figure 3. Pickett Plot within the zones analysed.

Salinity (NaCl equiv)	Rw Used
16 kppm	0.35 @ 25 degC

Table 6. Summary of water resistivities used in the petrophysical analysis

Porosity Determination

From MULTIMIN Analysis

Total porosity is calculated from the MULTIMIN analysis from a combination of the individual fluid components, which in the unflushed zone corresponds to:

$$\phi_t = V_{freewat} + V_{hc} + V_{bndwat}$$

Where;

$V_{freewat}$ = *volume of free water*
V_{bndwat} = *volume of bound water*
V_{hc} = *volume of hydrocarbons.*

Saturation Evaluation

The interpretation presented in this report has utilised MULTIMIN for all results, including water saturations. The following is a description of the conductivity model used in MULTIMIN for the estimation of water saturation. It is worth noting that in the Permian section of ZeroGen 5 the intervening shales are very resistive which complicates the prediction of Sw and can result in artificially high gas saturations being predicted in shales.

Dual-Water Equation

Water saturation in this study has been determined within the MULTIMIN package using the Dual Water equation. The Dual water model uses the concept of cation exchange capacity to explain shaly sand conductivity. This model assumes that the waters in a formation can be considered to be of two kinds – a free water of normal salinity and clay bound water of altered salinity and increased conductivity. The dual-water equation is as follows:

$$C_t = \phi_t^{m_0} S_{wt}^{n_0} \left[C_{fw} + \frac{\alpha v_q^h Q_v}{S_w^t} \left(C_{bw} - C_{fw} \right) \right]$$

Where;

C_t = *total conductivity (mho/m)*
C_{bw} = *clay bound water conductivity (mho/m)*
C_{fw} = *free water conductivity (mho/m)*
m_0 = *dual-water cementation exponent*
n_0 = *dual-water saturation exponent*
Q_v = *concentration of cations (meq/cm^3)*
V_q^h = *volume of clay bound water (cm^3/meq)*
S_{wt} = *water saturation of total porosity (v/v)*
α = *expansion factor for diffuse layer*
ϕ_t = *total porosity (v/v)*

Parameters for the dual-water equation have been calculated using the following relationships;

$$\alpha = \sqrt{\frac{0.35}{<n>}} \qquad C_{wb} = \frac{\beta}{\alpha v_q^H}$$

$$\beta = 2.05\frac{(T+8.5)}{(22+8.5)} \qquad v_q^H = 0.3\frac{96}{(T+25)}$$

Where;

T = *temperature (^{0}C)*
β = *equivalent conductivity of Na counter ions @ 22^{0}C (S/m)*
<n> = *brine salt concentration (mol/dm^3)*

Saturation equation parameters
Electrical properties special core analysis data was not available at the time of this analysis, therefore a fixed cementation exponent (*m*) value of m = 2.0 was used together with a saturation exponent (*n*) of 2.0.

Cation exchange capacity (CEC) values used for each of the clay minerals modelled were 0.1 meq/g for Kaolinite and 0.25 meq/g for illite.

In zones of badhole where MLL data was not valid the assumption was made that 50% flushing of the invaded zone had occurred (e.g. SWT = 2*SXOT).

Permeability Evaluation

The basis Coates free fluid index (FFI) equation takes on the following form;

$$K_{FFI} = C\left[\phi_e^2 \frac{(\phi_t - BV_{irr})}{BV_{irr}}\right]^X$$

Where;
ϕ_e = *log analysis effective porosity*
ϕ_t = *log analysis total porosity*
BV_{irr} = *bulk volume irreducible water*
C = *constant multiplier* X = *exponent*

The Coates permeability equation was calibrated to overburden corrected RCA permeability data from ZeroGen-5. These calibrations (C and X factors in equation above) were then applied in the derivation of permeability in this well. This was done on an entire well basis as ‘well’ as an ‘interval by interval’ basis. Appendix 1 documents these parameters.

‘Interval’ basis gives a better representation of permeability within the Catherine sandstone as it is calibrated specifically to the laminated zone whereas the ‘well’ basis is slightly underestimating permeability. Having said this, the drying methods may be over-estimating permeability in the case where clay structures may be destroyed.

CUTOFFS

The following cutoffs were used to define net sand, net reservoir and net HIP in ZeroGen 5. These cutoffs are based on regional values from this area and are provided only to help identify the intervals within this well that have potential as CO_2 storage reservoirs. The results using these cutoffs are shown in Enclosure 1 and Appendix 2.

Cut-off Log	Value Applied
Vshale	≤ 40%
Porosity	≥ 4%
Swt	≤ 80%

Table 7. Summary of cutoffs applied in this analysis

RESULTS

Moderate to very good porosity and permeability was determined within the Catherine Sandstone. Log analysis, RCA and less conventional core studies concurred with each other. The sandstone appears highly laminated which in turn subjects a highly laminated porosity and permeability. Other zones were not so optimistic.

1. Based on the above mentioned cut-offs, the Catherine Sandstone (TGLD) contains at least 24.25m of reservoir quality rock with an average of PHIT of 8.9%, VCL of 5% and average permeability of 11.09 to 68.8mD.

2. The Ingelara Formation contains 16.75m of reservoir quality rock with an average of PHIT of 7.6%, VCL of 11.2% and average permeability of 0.08 to 0.627mD.

3. The Freitag Formation contains 18.4m of reservoir quality rock with an average of PHIT of 8.3%, VCL of 9.9% and average permeability of 0.024 to 1.7mD.

4. The Aldebaran Formation is also seen to contain 3.95m of reservoir quality rock with an average of PHIT of 6.9%, VCL of 5.2% and average permeability of 0.15 to 0.32mD.

5. Overall, porosities are low to high but pass the PHIT cut-off for CO_2 storage. The Catherine exhibits the best permeability but is variable due to laminations. Total net reservoir over the zones is 63.5m with a N/G of 0.174

APPENDIX 1: PERMEABILITY CALIBRATION

KINT_NOV08_WEL - based on Z5 calibrations				
	Entire Well			
C	98.24			
X	3.8214			
KINT_NOV08_INT - based on Z5 calibrations				
	PEAW-CATH	**INGELARA**	**FREITAG**	**ALDEBARAN**
C	88.2773	2.9713	1.127	1
X	4.41972	0.56032	0.79244	0.17661

APPENDIX 2: PAY SUMMARY REPORTS

Chronostratigraphic Formation Tops

SAND

VOL_WETCLAY <= .4 V/V
DEPTH > 800 METRES
COAL < 1
Lumping details:-
Standalone Minimum Thickness: 0.25 METRES
Include Minimum Thickness: 0.25 METRES

Well	Interval	DEPTH_TOP	DEPTH_BASE	GROSS	NET	NET_TO_GROSS	PHITH	KINT_NOV08_INTH	KINT_NOV08_WELLH	PHIT_AV	SWT_AV	SWE_AM	PHIE_AM	KINT_MAR07_AM	KINT_FEB08_WELL_AM	KINT_FEB08_INT_AM	KINT_NOV08_INT_AM	KINT_NOV08_WELL_AM	VOL_WETCLAY_AM
		METRES	METRES	METRES	METRES	M/M	(V/V)M	MDM	MDM	V/V	V/V	V/V	V/V	MD	MD	MD	MD	MD	V/V
ZEROGEN-5	TGLD	875	892	17	14.65	0.862	0.585	0	0	0.04	1	1	0	0	0	0	0	0	0.319
ZEROGEN-5	CATHERINE SANDSTONE	892	923.4	31.4	31.4	1	2.488	1669.548	268.832	0.079	1	1	0.067	4.759	3.527	2.314	53.17	8.562	0.097
ZEROGEN-5	INGELARA FORMATION	923.4	1109.7	186.3	110.35	0.592	5.02	1.641	10.506	0.045	1	1	0.014	0.139	0.135	0.457	0.015	0.095	0.249
ZEROGEN-5	FREITAG FORMATION	1109.7	1233.6	123.9	71.3	0.575	3.345	0.463	30.516	0.047	1	1	0.023	0.581	0.509	0.266	0.006	0.428	0.228
ZEROGEN-5	UPPER ALDEBARAN SST	1233.6	1238.2	4.6	4.6	1	0.307	1.654	0.598	0.067	1	1	0.057	0.72	0.815	0.686	0.36	0.13	0.08
ZEROGEN-5	-	875	1238.2	363.2	232.3	0.64	11.745	1673.307	310.453	0.051	1	1	0.024	0.902	0.713	0.625	7.203	1.336	0.223

RESERVOIR

PHIE >= .04 V/V
VOL_WETCLAY <= .4 V/V
DEPTH > 800 METRES
COAL < 1
Lumping details:-
Standalone Minimum Thickness: 0.25 METRES
Include Minimum Thickness: 0.25 METRES
Maximum Separation: 0.25 MET

Well	Interval	DEPTH_TOP	DEPTH_BASE	GROSS	NET	NET_TO_GROSS	PHITH	KINT_NOV08_INTH	KINT_NOV08_WELLH	PHIT_AV	SWT_AV	SWE_AM	PHIE_AM	KINT_MAR07_AM	KINT_FEB08_WELL_AM	KINT_FEB08_INT_AM	KINT_NOV08_INT_AM	KINT_NOV08_WELL_AM	VOL_WETCLAY_AM
		METRES	METRES	METRES	METRES	M/M	(V/V)M	MDM	MDM	V/V	V/V	V/V	V/V	MD	MD	MD	MD	MD	V/V
		875	892	17	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-
ZEROGEN-5	TGLD	892	923.4	31.4	24.25	0.772	2.156	1669.548	268.832	0.089	1	1	0.083	6.162	4.564	2.99	68.847	11.086	0.05
ZEROGEN-5	CATHERINE SANDSTONE	923.4	1109.7	186.3	16.75	0.09	1.265	1.342	10.506	0.076	1	1	0.061	0.911	0.872	2.995	0.08	0.627	0.112
ZEROGEN-5	INGELARA FORMATION	1109.7	1233.6	123.9	18.4	0.149	1.53	0.447	30.515	0.083	1	1	0.072	2.248	1.964	1.015	0.024	1.658	0.099
ZEROGEN-5	FREITAG FORMATION	1233.6	1238.2	4.6	3.95	0.859	0.274	1.549	0.598	0.069	1	1	0.063	0.838	0.948	0.799	0.392	0.151	0.052
ZEROGEN-5	UPPER ALDEBARAN SST	875	1238.2	363.2	63.35	0.174	5.225	1672.887	310.452	0.082	1	1	0.073	3.305	2.607	2.281	26.407	4.901	0.081

Lithostratigraphic Formation Tops

SAND

VOL_WETCLAY <=.4 V/V
DEPTH > 800 METRES
COAL < 1
Lumping details:-
Standalone Minimum Thickness: 0.25 METRES
Include Minimum Thickness: 0.25 METRES
Maximum Separation: 0.25 METRES

Well	Interval	DEPTH_TOP	DEPTH_BASE	GROSS	NET	NET_TO_GROSS	PHITH	KINT_NOV08_INTH	KINT_NOV08_WELLH	PHIT_AV	SWT_AV	SWE_AM	PHIE_AM	KINT_MAR07_AM	KINT_FEB08_WELL_AM	KINT_FEB08_INT_AM	KINT_NOV08_INT_AM	KINT_NOV08_WELL_AM	VOL_WETCLAY_AM
		METRES	METRES	METRES	METRES	M/M	(V/V)M	MDM	MDM	V/V	V/V	V/V	V/V	MD	MD	MD	MD	MD	V/V
ZEROGEN-5	TGLD	875	997.3	122.3	119.45	0.977	6.708	1671.188	279.339	0.056	1	1	0.031	1.379	1.051	1.031	13.991	2.339	0.199
ZEROGEN-5	INGELARA LITHOSTRAT	997.3	1109.7	112.4	36.95	0.329	1.385	0.001	0	0.037	1	1	0	0	0	0	0	0	0.308
ZEROGEN-5	FREITAG FORMATION	1109.7	1233.6	123.9	71.3	0.575	3.345	0.463	30.516	0.047	1	1	0.023	0.581	0.509	0.266	0.006	0.428	0.228
ZEROGEN-5	ALDEBARAN SANDSTONE	1233.6	1238.2	4.6	4.6	1	0.307	1.654	0.598	0.067	1	1	0.057	0.72	0.815	0.686	0.36	0.13	0.08
ZEROGEN-5	-	875	1238.2	363.2	232.3	0.64	11.745	1673.307	310.453	0.051	1	1	0.024	0.902	0.713	0.625	7.203	1.336	0.223

RESERVOIR

PHIE >=.04 V/V
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Well	Interval	DEPTH_TOP	DEPTH_BASE	GROSS	NET	NET_TO_GROSS	PHITH	KINT_NOV08_INTH	KINT_NOV08_WELLH	PHIT_AV	SWT_AV	SWE_AM	PHIE_AM	KINT_MAR07_AM	KINT_FEB08_WELL_AM	KINT_FEB08_INT_AM	KINT_NOV08_INT_AM	KINT_NOV08_WELL_AM	VOL_WETCLAY_AM
		METRES	METRES	METRES	METRES	M/M	(V/V)M	MDM	MDM	V/V	V/V	V/V	V/V	MD	MD	MD	MD	MD	V/V
ZEROGEN-5	TGLD	875	997.3	122.3	41	0.335	3.421	1670.89	279.338	0.083	1	1	0.074	4.017	3.056	2.992	40.753	6.813	0.075
ZEROGEN-5	INGELARA LITHOSTRAT	997.3	1109.7	112.4	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-
ZEROGEN-5	FREITAG FORMATION	1109.7	1233.6	123.9	18.4	0.149	1.53	0.447	30.515	0.083	1	1	0.072	2.248	1.964	1.015	0.024	1.658	0.099
ZEROGEN-5	ALDEBARAN SANDSTONE	1233.6	1238.2	4.6	3.95	0.859	0.274	1.549	0.598	0.069	1	1	0.063	0.838	0.948	0.799	0.392	0.151	0.052
ZEROGEN-5	-	875	1238.2	363.2	63.35	0.174	5.225	1672.887	310.452	0.082	1	1	0.073	3.305	2.607	2.281	26.407	4.901	0.081

Pay summary term definitions

DEPTH_TOP	Top of sand interval (m)
DEPTH_BASE	Base of sand interval (m)
GROSS	Gross thickness of sand (m)
NET	Net reservoir within gross interval (m)
NET_TO_GROSS	Net / Gross Reservoir
PHITH	Total Porosity Height Reservoir (summation) ((v/v)/m)
PHIEH	Effective Porosity Height Reservoir (summation) ((v/v)/m)
PHIT_AV	Average Total Porosity of Reservoir Zones (v/v)
PHIE_AM	Average Effective Porosity of Reservoir Zones (v/v)
PHIE_HM	Harmonic Mean Effective Porosity of Reservoir Zones (v/v)
PHIE_AM	Geometric Mean Effective Porosity of Reservoir Zones (v/v)
VSH_AM	Average Volume of Shale of Reservoir Zones (v/v)
VOL_WETCLAY_AM	Average Wetclay Volume of Reservoir Zones (v/v)
SWE_AM	Average Effective Water Saturation of Reservoir Zones (v/v)
SWT_AV	Average Effective Total Saturation of Reservoir Zones (v/v)
KINT_AM	Average Intrinsic Permeability of Reservoir Zones (v/v)
KINT_MAR07H	Total Permability Height Reservoir (summation) (mD)/m)
KINT_MAR07_AM	Average Intrinsic Permeability of Reservoir Zones based on RCA data Zerogen Trough (except Z-2) (v/v)
KINT_FEB_08_WELL_AM	Average Intrinsic Permeability of Reservoir Zones based on cleaned RCA data from Zerogen-3 (whole well) (v/v)
KINT_FEB_08_INT_AM	Average Intrinsic Permeability of Reservoir Zones based on cleaned RCA data from Zerogen-3 (interval by interval basis) (v/v)
KINT_FEB08H	Total Permability Height Reservoir (summation) (mD)/m)
TGLD	Top Good Log Data (top of triple combo data)
KINT_NOV08_WELL_AM	Average intrinsic permeability of reservoir zones (v/v) based on Z5 OB core data (whole well)
KINT_NOV08_INT_AM	Average intrinsic permeability of reservoir zones (v/v) based on Z5 OB core data (interval by interval basis)

APPENDIX 3: CORE DEPTH SHIFT

ORIGINAL DEPTH	SHIFTED DEPTH
600.2500	600.8596
606.7797	607.7712
612.9552	613.7148
617.9853	618.5916
630.3320	630.9360
650.3001	650.9004
662.9516	663.5496
668.1216	668.8836
683.9712	684.5808
688.2384	689.0004
747.0127	747.5220
777.5448	778.1544
789.7980	790.4988
790.8440	791.7180
794.2840	795.0708
798.4719	799.4904
806.5667	807.1104
827.6844	828.1416
854.6281	855.2688
871.0173	871.8804
879.2885	879.8052
901.9032	902.6652
924.0710	924.7632
931.8146	932.6880
933.6553	934.2120
995.1749	995.7816
1005.7426	1005.9924
1044.1847	1044.2448
1055.0928	1055.8272
1136.9040	1137.5136
1139.8043	1140.7140
1152.5429	1153.2108
1196.4373	1196.9496

1209.8172	1211.4276
1216.3763	1216.9140
1221.1324	1221.1812
1224.1326	1223.9244
1225.1144	1224.5340
1227.3586	1227.4296
1228.9716	1229.4108
1237.1832	1237.4880
1240.3836	1240.6884
1313.9500	1314.2548

ENCLOSURE 1: COMPOSITE SUMMARY DEPTH PLOT – CONVENTIONAL CUTOFFS (1:500)

ENCLOSURE 2: COMPOSITE SUMMARY DEPTH PLOT – PERMEABILITY CUTOFFS (1:500)