



**COAL BED METHANE ANALYSIS FINAL REPORT**  
**of**  
***FINGAL-82***  
**for**  
***PURE ENERGY RESOURCES LIMITED***  
**by**  
**ACS LABORATORIES PTY LTD**

16<sup>th</sup> June, 2009

Pure Energy Resources Limited  
Level 17,  
80 Albert Street,  
East Brisbane Qld 4000

Attention: Steve Beardsall

**COAL BED METHANE ANALYSIS - FINAL REPORT 1180-06**

**FINGAL-82**

Please find enclosed final results of the coal bed methane study for the samples taken from the above well.

If ACS can assist you in any way, or if you require any further information, please do not hesitate to contact the undersigned.

**GREGORY COCHRANE**

Supervisor – Field & Coal Bed Methane Services

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## SUMMARY

This report outlines the methods and results of gas desorption testing and associated coal property analyses performed on coal seams located within the Fingal Coal Fields intersected during exploration drilling by Pure Energy Resources Limited in SEL 32 / 2003, Tasmania undertaken in August, 2008.

ACS Laboratories Pty Ltd was contracted by Pure Energy Resources Limited to provide a mobile field laboratory and field personnel to recover HQ3 core samples, provide core handling and conduct reservoir temperature desorption testing as per the Australian Standard, AS 3980. Further analysis was to take place at the ACS Brisbane based laboratory. The methodology adopted for all sampling and testing is detailed in Chapter 1. The modified gas content data and results of all associated gas and core analyses are presented in a series of tables and graphs in the Chapter 2.

The Fingal-82 well was part of an appraisal program for coal bed methane and was cored from a depth of 102.20m to a total depth of 400.54m. All of the recovered coal was placed into desorption canisters and monitored for the determination of gas content. Subsequent to the desorption program, the coal material was slabbled. Sub-samples were then removed from one half of the core for residual gas, proximate, maceral and adsorption isotherm analyses.

The recovery of the core was generally good with the core being relatively consolidated over most of the coal intervals. The samples consisted mainly of dull coal with minor bright bands. The bright bands were cleated with calcite infill. Occasional tuffaceous and clay bands were also present.

As received, total gas contents of the seams averaged;

Unknown 1	-0.85 scc/g (m <sup>3</sup> /t)
Unknown 2	-0.86 scc/g (m <sup>3</sup> /t)
Unknown 3	-2.02 scc/g (m <sup>3</sup> /t)

Dry and ash free gas contents of the seams averaged;

Unknown 1	-0.85 scc/g (m <sup>3</sup> /t)
Unknown 2	-0.86 scc/g (m <sup>3</sup> /t)
Unknown 3	-2.02 scc/g (m <sup>3</sup> /t)

The results were of good quality with no sign of canister leakage during the desorption testing.

The coals have moderate ash contents though the results are slightly skewed by the presence of non-coal material. Given that it is generally accepted that non-coal material does not contribute significantly to the overall gas content of a given coal seam, it was necessary for comparative purposes to normalise the gas content data to a dry, ash-free (DAF) basis.

There was insufficient desorbed gas to obtain a compositional analysis.

The sorption time, or desorption coefficient, of the coal samples corresponds to the time taken to desorb 63% of the total desorbable gas volume. This measure is used as an independent estimate of the gas diffusion constants for coals. A number of factors can affect the rate of diffusion such as maceral type and the recovery / level of consolidation of the core. In this instance the latter was consistent across the three seams. The main influence on the coefficients of diffusion is from permeability in a distressed state i.e. a direct reflection of cleat development and fracturing (permeability). Taking into account lost gas and desorbed gas ( $Q_1 + Q_2$ ), the sorption time of the coals is considered to be relatively low but with such low gas contents it is difficult to make any meaningful interpretation of these numbers.

The slabbed core is being stored in Weatherford Laboratories' Brisbane core facility pending delivery of the core to Pure Energy Resources Limited.

## ***GAS CONTENT RESULTS SUMMARY***

**Client:** Pure Energy Resources Limited

**Well:** Fingal-82

Sample #	Seam	Top Depth (m)	As Received Q1		As Received Q2		As Received Q3		As Received Q1 + Q2	As Received Total	DAF Q1		DAF Q2		DAF Q3		DAF Q1 + Q2	DAF Total	Sorption Time, Days (63%)	
																			Q2	(Q1+Q2)
1	Unknown 1	148.50	0.34	24	0.92	66	0.13	9	1.26	1.39	0.57	24	1.56	66	0.22	9	2.13	2.35	1.6	0.9
5	Unknown 2	188.68	0.03	4	0.63	77	0.16	20	0.66	0.82	0.07	4	1.46	77	0.37	19	1.53	1.90	7.5	7.0
10	Unknown 3	247.13	0.02	5	0.39	91	0.02	5	0.41	0.43	0.03	5	0.57	90	0.03	5	0.60	0.63	3.5	3.4

### ***PROXIMATE ANALYSIS RESULTS SUMMARY***

**Client:** Pure Energy Resources Limited

**Well:** Fingal-82

Sample #	Seam	Top Depth (m)	Ash	Moisture	Volatile Matter	Fixed Carbon
1	Unknown 1	148.50	36.0	4.9	25.2	33.9
5	Unknown 2	188.68	52.6	4.4	14.7	28.3
10	Unknown 3	247.13	25.9	4.7	27.8	41.6

## ***CHAPTER 1***

### **DESCRIPTION OF EXPERIMENTS**



## **1. DESCRIPTION OF EXPERIMENTS**

### **1.1 Gas Content by Seam Temperature Desorption**

The gas desorption canisters that were used throughout the program were constructed of stainless steel or powder coated aluminium and designed to accommodate fully recovered HQ3 sized cores in a range of half or full metre lengths. The dead space above the sample, in the case of a partial recovery, was taken up by non porous rubber billets. The canisters were sealed by an 'O'-ring gasket and 'Camlock' lid, and came complete with an outlet valve, safety release valve, and pressure gauge rated to 1000 KPa..

Before transferral of canisters to the well site, each was accurately weighed and correctly labelled. The canisters were individually pressurised with compressed air to 400 KPa and monitored for any leakage prior to use. Following the pressure test, a vacuum was pulled on each canister and the canisters monitored for any air intake prior to use.

The principal field desorption apparatus was comprised of inverted measuring cylinders, associated fittings, and displacement baths containing an acidified solution incorporating 1% NaCl (by weight), 0.5% HCl (by volume) and a colouring additive (methyl red). Measuring cylinders for use in the mobile on-site laboratory were constructed of clear plastic with a maximum capacity of 2000 cubic centimetres. Each cylinder was supplied with two tap valves and associated clear plastic tubing that connected to the gas canisters and an electric vacuum pump respectively.

The water baths were constructed of standard 240 mm diameter PVC piping and end caps, and attached to an aluminium frame that supported the measuring cylinders. The measuring cylinders were arranged so that when the bath was filled with fluid, the open base was submerged approximately 2-4 cm below the height of water in the bath.

Digital thermometers (0.5°C accuracy) and calibrated barometers (0.5 KPa accuracy) were used throughout to monitor ambient atmospheric conditions at each recording point. Electronic 'stop watches' were utilised for the accurate timing of volume readings, and all weights were measured to an accuracy of 0.01 g using digital balances.

On recovery at surface, the cores were quickly washed, marked for orientation and depth and classified to enable desorption monitoring as detailed below. In order to assess the desorbable gas content of the coal seams encountered during drilling, all coal material was analysed. The sampling depths of the cores were derived from the continuous core depth record. This was maintained by means of the 'CBM Core Sampling Timesheet' which consisted of core numbers, driller's depths, core depths, and times that the core was penetrated, left bottom and reached surface (Chapter 3).

The procedure used throughout for gas desorption monitoring followed that outlined in the Australian Standard for the determination of desorbable gas content of coal seams - Direct method (AS 3980-1999). In summary, this procedure incorporated the following systematic steps.

Coring pre-determined depth intervals was carried out by means of a wire line retrievable, HQ3 (61.1mm), triple tube core barrels. The start time at which each core was penetrated, the time at which the core left bottom ( $t_b$  - time core retrieved), and the time at which the core arrived at surface ( $t_s$  - time at surface) were recorded. Time zero, or commencement of desorption for lost gas calculations, was taken as  $t_b - t_s/2$  where coals were under-saturated with respect to gas. Once the inner tube reached the surface, the drilling crew laid it out on the core table and pumped the slips (containing the core) out. The core was then quickly cleaned, orientated and any potential coal or carbonaceous shale identified. The samples were immediately placed in desorption canisters and weighed prior to being placed in seam temperature baths for gas content testing. The temperature used for the testing was taken from the mud returns. Upon connection of the canister to the desorption apparatus 'time on test' was recorded, and desorbed gas volumes read at the following intervals (subject to ongoing operations):

Every 1 minute for 30 minutes  
Every 5 minutes for 1 hour  
Every 15 minutes for 1 hour  
Every 30 minutes for 4 hours  
Every 1 hour for 4 hours

After this schedule the readings were extended to a wider frequency, generally in the range of 6-24 hours, dependent on the volumes produced. At each reading, the following information was recorded on specifically designed data sheets, and subsequently entered into the computer:

- 1) Progressive volume of gas in the measuring cylinder
- 2) Water column height
- 3) Bath water height
- 4) Ambient temperature
- 5) Ambient atmospheric pressure
- 6) Reset value (where appropriate)

Data acquisition continued until desorption had reached equilibrium or flat lined i.e. no additional desorbed gas for five days. The coal was then carefully removed and slabbed with one half of the core used for the determination of residual gas content and proximate analysis.

The procedure adopted for residual gas analysis involved the weighing of a sub-sample to an accuracy of 0.01 g, with the optimal weight being in the range 15-300 g. The sample was initially broken in a hermetically sealed blender and subsequently crushed in a hermetically sealed ball mill to less than 212  $\mu\text{m}$  particle size. The gas volume released by this process was measured by the direct water displacement method and a volume, per unit mass of coal, calculated at standard temperature and pressure conditions.

## **1.2 Compositional Analysis of Gas**

To aid in the overall assessment of coal bed methane resources, samples of evolved gas were collected from each gas desorption canister. Inert gas was purged through the measuring cylinders and rubber hoses to minimise air contamination in desorption samples. A sub-sample of each desorbed gas was transferred into an evacuated stainless steel cylinder. The sampling procedure involved connecting the evacuated cylinder via a rubber hose to the measuring cylinder. The valve from the measuring cylinder was opened, filling the sample cylinder with the gas. The gases were analysed on a portable 'Varian Micro Gas Chromatograph' instrument.

## **1.3 Proximate Analysis**

A representative sub-sample of coal was removed from each desorption canister for proximate analysis. This sampling strategy was designed to:

- a) Calculate gas contents on a DAF basis for comparison purposes
- b) Determine the factors controlling variations in in-situ gas contents within a given seam

Every attempt was made to exclude all non-coal material from proximate analysis sampling, on the basis that these rocks did not contribute to the overall gas content of the coal seam in question.

The testing procedure adopted throughout for proximate analysis conformed to the appropriate Australian Standard for coal analysis and testing (AS 1038.3-1989). In summary, this procedure involved the drying of a known mass of coal in an oxygen-free (nitrogen flush) oven at 105-110°C for a period of between 1.5 to 3 hours. After removal from the oven, and subsequent to the sample being placed in a desiccator, the coal was weighed, and the loss of mass ascribed to inherent moisture.

The sample was then heated in a cylindrical silica crucible in a muffle furnace at 900°C for seven minutes. The loss of mass recorded during this process equated to the proportion of volatile matter present in the sample. Determination of ash content was achieved by combusting the coal until a constant mass was attained. This was achieved by heating the sample to 500°C for 30 minutes before increasing the temperature to 815°C, until combustion was complete. The percentage of ash was calculated from the mass of the residue remaining after incineration. The amount of fixed carbon was not determined directly, but represented the difference between the sum of all other components.

## 1.4 Dry and Ash Free Normalisation of Gas Content

As it is generally accepted that non-coal material does not contribute significantly to the overall gas content of a given coal seam, it was necessary for comparative purposes to normalise the gas content data to a dry, ash-free (DAF) basis. This was achieved by using the following equation:

$$DAF \text{ Gas Content} = \frac{\text{gas volume ( scc / g )}}{\text{core wt ( g )} - \left( \text{core wt} \times \left( \frac{\text{ash (\%)} + \text{moisture (\%)}}{100} \right) \right)}$$

This equation was applied to the lost gas, desorbed gas, and residual gas components so that comparisons could be made between all the data gathered during the exploration program.

Whilst every attempt was made to remove non-coal partings from samples prior to weighing and preparation for proximate analysis, it was not always possible to isolate fine material. Consequently, the corresponding DAF gas content results may be artificially high.

## 1.5 Calculation of Desorption Coefficient

The sorption time, or desorption coefficient, of a coal sample corresponds to the time taken to desorb 63% of the total desorbable gas volume (Q2). This measure is used as an independent estimate of the gas diffusion constant for a given coal (see Close & Erwin 1989). Two methods for calculating sorption time are widely used in the literature, namely the sorption time method outlined by Close & Erwin (1989) and the more recently adopted GRI or modified sorption time method.

The sorption time method, as outlined by Close & Erwin (1989), was calculated using the following formulae:

$$V_{63\%} = Q2 \times 0.63$$

$$\text{Sorption time} = TCS_{lbl} + (TCS_{ubl} - TCS_{lbl}) \times \frac{V_{63\%} - CDV_{lbl}}{CDV_{ubl} - CDV_{lbl}}$$

where:

$$\begin{aligned} TCS_{lbl} &= \text{time core sealed (lower bounding limit)} \\ TCS_{ubl} &= \text{time core sealed (upper bounding limit)} \\ CDV_{lbl} &= \text{cumulative desorbed volume (lower bounding limit)} \\ CDV_{ubl} &= \text{cumulative desorbed volume (upper bounding limit)} \end{aligned}$$

The modified sorption time method is identical in approach to that outlined above, with the only difference being that this method incorporates the estimated lost gas volume into the cumulative desorbed volume and uses time zero (i.e. the commencement of desorption for lost gas calculations) as the starting point for elapsed time.

$$V_{63\%} = (Q1 + Q2) \times 0.63$$

By incorporating the lost gas into the equation, this method is considered to be a more reliable indicator of the desorption behaviour of a given coal.

## ***CHAPTER 2***

### **GAS DESORPTION RESULTS**

# ACS Laboratories Pty Ltd

## GAS DESORPTION DATA SUMMARY

# Fingal-82

# 1

# Unknown 1

**WELL NAME: Fingal-82**

### SAMPLE DETAILS

SAMPLE NO 1  
SEAM NAME Unknown 1  
DEPTH FROM (m) 148.50  
DEPTH TO (m) 149.02  
THICKNESS (m) 0.5  
COAL LENGTH (m) 0.5  
COAL WEIGHT (kg) 2.182  
CORE DIAM (mm) 63  
SAMPLE TYPE Core

### CAN DETAILS

CAN NO A  
CAN LENGTH (m) 0.5  
CAN WEIGHT (kg) 7.583  
CAN + SAMPLE WT (kg) 9.765  
SAMPLE WEIGHT (kg) 2.182  
CAN VOLUME (cc) 2200  
SAMPLE VOLUME(cc) 1621  
CAN VOID SPACE (cc) 579  
ESTIMATED VOID (cc) 0

### DESORBED GAS

USBM LOST GAS (scc)	735.7	RESIDUAL GAS (scc/g)	0.13
USBM LOST GAS (scc/g)	0.34	TOTAL RAW GAS (scc/g)	1.39
DESORPTION TEMP (°C)	43.7	DAF LOST GAS (scc/g)	0.57
RAW DESORBED GAS (scc)	2017	DAF DESORBED GAS (scc/g)	1.56
RAW DESORBED GAS (scc/g)	0.92	DAF Q1 + Q2 (scc/g)	2.13
RAW TOTAL DESORBED (scc/g)	1.26	DAF RESIDUAL GAS Q3 (scc/g)	0.22
		DAF TOTAL GAS Q1+2+3 (scc/g)	2.35

### CORE DETAILS

	Date	Time
CORE PENETRATED	8/14/2008	14:55:00
CORE LEFT BOTTOM	8/14/2008	15:54:00
CORE AT SURFACE	8/14/2008	15:56:00
COAL IN CANISTER	8/14/2008	16:08:00
CORE ON TEST	8/14/2008	16:11:00
TIME ZERO	8/14/2008	15:55:00

### COAL ANALYSIS DATA

ASH %	36.0
VOLATILE MATTER %	25.2
INHERENT MOISTURE %	4.9
FIXED CARBON %	33.9

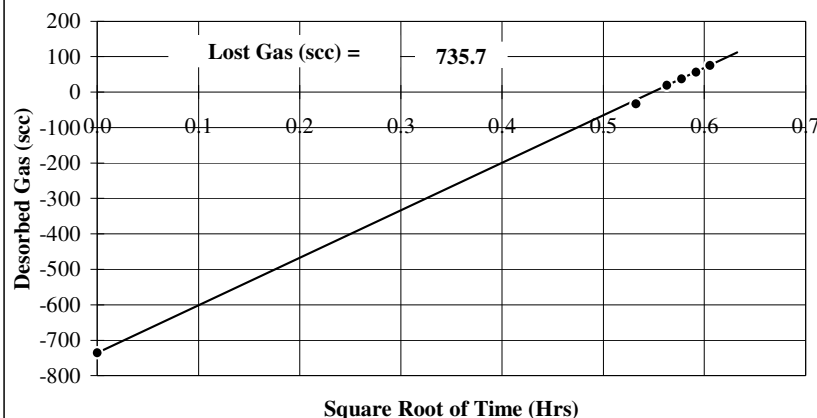
### DESORPTION TIME

	Days
ON TEST	82.7
63% Q2	1.6
63% Q1+Q2	0.9

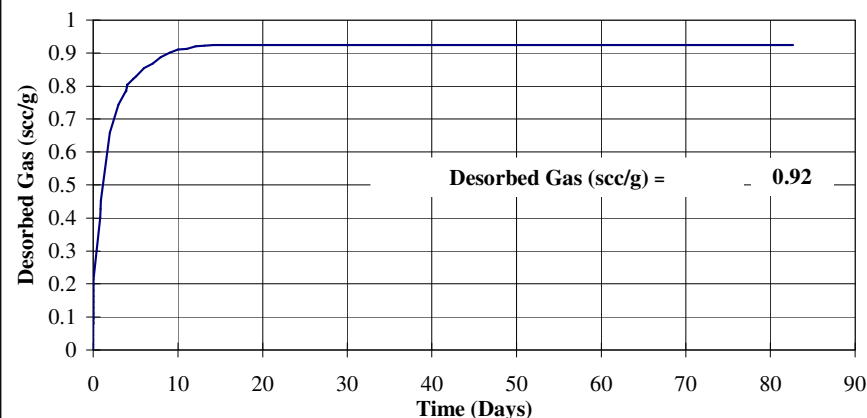
### GAS ANALYSIS (Air-Free)

	Mid
CH4 (%)	Insufficient Gas
C2H6 (%)	Insufficient Gas
CO2 (%)	Insufficient Gas
N2 (%)	Insufficient Gas

**LOST GAS PLOT**



**DESORBED GAS PLOT**



# **ACS Laboratories Pty Ltd** **GAS DESORPTION DATA SUMMARY**

**Fingal-82**

**5**

**Unknown 2**

**WELL NAME: Fingal-82**

## **SAMPLE DETAILS**

SAMPLE NO 5  
 SEAM NAME Unknown 2  
 DEPTH FROM (m) 188.68  
 DEPTH TO (m) 189.20  
 THICKNESS (m) 0.5  
 COAL LENGTH (m) 0.5  
 COAL WEIGHT (kg) 2.704  
 CORE DIAM (mm) 63  
 SAMPLE TYPE Core

## **CAN DETAILS**

CAN NO 0  
 CAN LENGTH (m) 0.5  
 CAN WEIGHT (kg) 7.516  
 CAN + SAMPLE WT (kg) 10.220  
 SAMPLE WEIGHT (kg) 2.704  
 CAN VOLUME (cc) 2200  
 SAMPLE VOLUME(cc) 1621  
 CAN VOID SPACE (cc) 579  
 ESTIMATED VOID (cc) 0

## **DESORBED GAS**

USBM LOST GAS (scc)	85.8	RESIDUAL GAS (scc/g)	0.16
USBM LOST GAS (scc/g)	0.03	<b>TOTAL RAW GAS (scc/g)</b>	<b>0.82</b>
DESORPTION TEMP (°C)	43.7	DAF LOST GAS (scc/g)	0.07
RAW DESORBED GAS (scc)	1696	DAF DESORBED GAS (scc/g)	1.46
RAW DESORBED GAS (scc/g)	0.63	DAF Q1 + Q2 (scc/g)	1.53
RAW TOTAL DESORBED (scc/g)	0.66	DAF RESIDUAL GAS Q3 (scc/g)	0.37
		DAF TOTAL GAS Q1+2+3 (scc/g)	1.90

## **CORE DETAILS**

	Date	Time
CORE PENETRATED	8/18/2008	12:29:00
CORE LEFT BOTTOM	8/18/2008	13:34:00
CORE AT SURFACE	8/18/2008	13:36:00
COAL IN CANISTER	8/18/2008	13:53:00
CORE ON TEST	8/18/2008	12:58:00
TIME ZERO	8/18/2008	13:35:00

## **COAL ANALYSIS DATA**

ASH %	52.6
VOLATILE MATTER %	14.7
INHERENT MOISTURE %	4.4
FIXED CARBON %	28.3

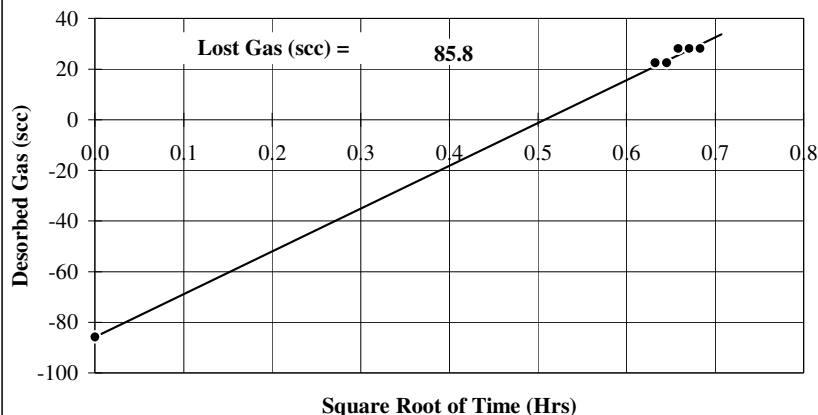
## **DESORPTION TIME**

	Days
ON TEST	78.8
63% Q2	7.5
63% Q1+Q2	7.0

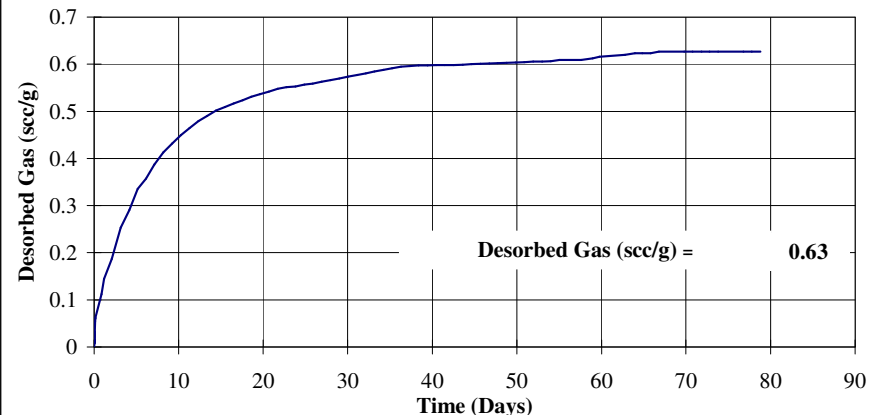
## **GAS ANALYSIS (Air-Free)**

	Mid
CH4 (%)	Insufficient Gas
C2H6 (%)	Insufficient Gas
CO2 (%)	Insufficient Gas
N2 (%)	Insufficient Gas

## **LOST GAS PLOT**



## **DESORBED GAS PLOT**





# **ACS Laboratories Pty Ltd** **GAS DESORPTION DATA SUMMARY**

**Fingal-82**

**10**

**Unknown 3**

**WELL NAME: Fingal-82**

## **SAMPLE DETAILS**

SAMPLE NO 10  
 SEAM NAME Unknown 3  
 DEPTH FROM (m) 247.13  
 DEPTH TO (m) 248.13  
 THICKNESS (m) 1.0  
 COAL LENGTH (m) 1.0  
 COAL WEIGHT (kg) 4.398  
 CORE DIAM (mm) 63  
 SAMPLE TYPE Core

## **CAN DETAILS**

CAN NO J  
 CAN LENGTH (m) 1.0  
 CAN WEIGHT (kg) 6.188  
 CAN + SAMPLE WT (kg) 10.586  
 SAMPLE WEIGHT (kg) 4.398  
 CAN VOLUME (cc) 4400  
 SAMPLE VOLUME(cc) 3117  
 CAN VOID SPACE (cc) 1283  
 ESTIMATED VOID (cc) 0

## **DESORBED GAS**

USBM LOST GAS (scc)	88.1	RESIDUAL GAS (scc/g)	0.02
USBM LOST GAS (scc/g)	0.02	TOTAL RAW GAS (scc/g)	0.43
DESORPTION TEMP (°C)	43.7	DAF LOST GAS (scc/g)	0.03
RAW DESORBED GAS (scc)	1736	DAF DESORBED GAS (scc/g)	0.57
RAW DESORBED GAS (scc/g)	0.39	DAF Q1 + Q2 (scc/g)	0.60
RAW TOTAL DESORBED (scc/g)	0.41	DAF RESIDUAL GAS Q3 (scc/g)	0.03
		DAF TOTAL GAS Q1+2+3 (scc/g)	0.63

## **CORE DETAILS**

	Date	Time
CORE PENETRATED	8/20/2008	8:15:00
CORE LEFT BOTTOM	8/20/2008	9:03:00
CORE AT SURFACE	8/20/2008	9:06:00
COAL IN CANISTER	8/20/2008	9:16:00
CORE ON TEST	8/20/2008	9:19:00
TIME ZERO	8/20/2008	9:04:30

## **COAL ANALYSIS DATA**

ASH %	25.9
VOLATILE MATTER %	27.8
INHERENT MOISTURE %	4.7
FIXED CARBON %	41.6

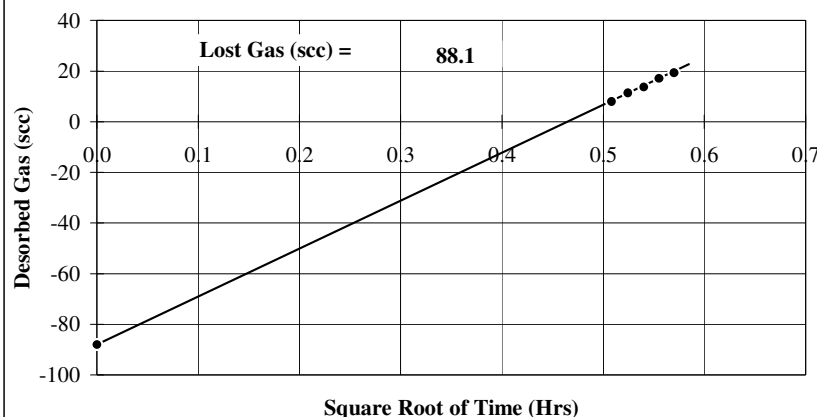
## **DESORPTION TIME**

	Days
ON TEST	77.0
63% Q2	3.5
63% Q1+Q2	3.4

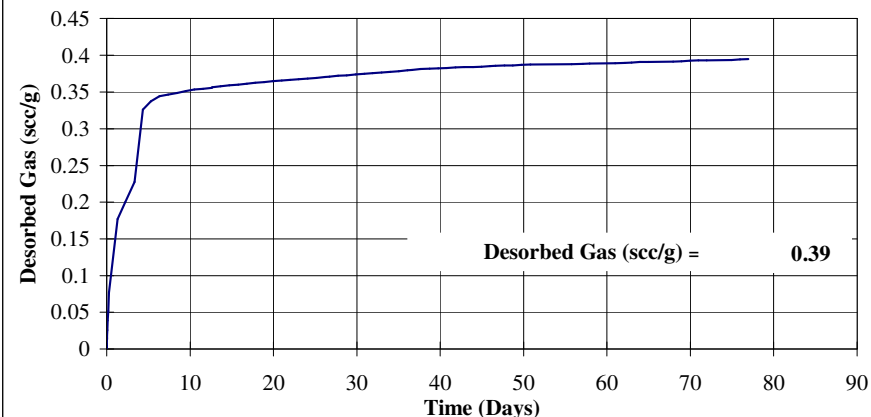
## **GAS ANALYSIS (Air-Free)**

	Mid
CH4 (%)	Insufficient Gas
C2H6 (%)	Insufficient Gas
CO2 (%)	Insufficient Gas
N2 (%)	Insufficient Gas

**LOST GAS PLOT**



**DESORBED GAS PLOT**



## ***CHAPTER 3***

### **CORE SAMPLING TIMESHEET**

## ***CBM CORE SAMPLING TIMESHEET***

Client:	Pure Energy Resources Limited	Well:	Fingal-82
Job Number:	1180-06	Start Date:	13/8/2008
		Engineer:	MA

Run No.	Depth	Driller's Depth	Meters Cored	Meters Recovered	Difference +/-	Time Core Penetrated	Time Core Left Bottom	Time Core Reached Surface	Date
1	102.20	102.20	0.50	0.50	0.00				13/8/08
2	102.70	102.70	2.70	2.70	0.00				13/8/08
3	105.40	105.40	3.10	3.10	0.00				13/8/08
4	108.50	108.50	3.10	3.10	0.00				13/8/08
5	111.60	111.60	3.10	3.10	0.00				13/8/08
6	114.70	114.70	2.70	2.70	0.00				13/8/08
7	117.40	117.40	3.10	3.10	0.00	640	709	710	14/8/08
8	120.50	120.50	3.00	3.00	0.00	728	821	823	14/8/08
9	123.50	123.50	3.10	3.10	0.00	829	906	908	14/8/08
10	126.60	126.60	3.10	3.10	0.00	913	1004	1006	14/8/08
11	129.70	129.70	3.00	3.00	0.00	1010	1054	1056	14/8/08
12	132.70	132.70	3.00	3.00	0.00	1101	1138	1140	14/8/08
13	135.70	135.70	3.00	3.00	0.00	1145	1207	1209	14/8/08
14	138.70	138.70	3.00	3.00	0.00	1214	1235	1237	14/8/08
15	141.70	141.70	3.00	3.00	0.00	1241	1259	1301	14/8/08
16	144.70	144.70	3.00	3.00	0.00	1420	1442	1444	14/8/08
17	147.70	147.70	3.00	2.00	-1.00	1455	1554	1556	14/8/08
18	149.70	149.70	2.00	3.00	1.00	1603	1642	1644	14/8/08
19	152.70	152.70	1.00	1.00	0.00	1650	635	637	14/8/08
20	153.70	153.70	3.00	3.00	0.00	645	711	713	15/8/08
21	156.70	156.70	3.00	2.90	-0.10	718	807	809	15/8/08
22	159.60	159.70	3.00	3.10	0.10	815	902	904	15/8/08
23	162.70	162.70	3.00	3.10	0.10	911	959	1001	15/8/08
24	165.80	165.70	3.00	3.00	0.00	1009	1110	1112	15/8/08
25	168.80	168.70	3.00	3.00	0.00	1124	1224	1226	15/8/08
26	171.80	171.70	3.00	3.00	0.00	1232	1315	1317	15/8/08
27	174.80	174.70	3.00	3.00	0.00	930	1004	1006	18/8/08
28	177.80	177.70	3.00	3.00	0.00	1014	1039	1041	18/8/08
29	180.80	180.70	3.00	3.00	0.00	1048	1110	1112	18/8/08
30	183.80	183.70	3.00	3.00	0.00	1121	1220	1222	18/8/08
31	186.80	186.70	3.00	3.00	0.00	1229	1334	1336	18/8/08
32	189.80	189.70	3.00	3.00	0.00	1343	1429	1431	18/8/08
33	192.80	192.70	3.00	3.00	0.00	1439	1518	1520	18/8/08
34	195.80	195.70	3.00	3.00	0.00	1526	1554	1556	18/8/08
35	198.80	198.70	3.00	3.00	0.00	1603	1629	1631	18/8/08
36	201.80	201.70	3.00	3.00	0.00	1639	1700	1702	18/8/08
37	204.80	204.70	3.00	3.00	0.00	630	709	711	19/8/08
38	207.80	207.70	3.00	3.00	0.00	716	744	747	19/8/08
39	210.80	210.70	3.00	3.03	0.03	754	822	825	19/8/08
40	213.83	213.70	3.00	2.88	-0.12	826	856	858	19/8/08
41	216.71	216.70	3.00	3.08	0.08	906	1021	1023	19/8/08
42	219.79	219.70	3.00	2.80	-0.20	1029	1129	1132	19/8/08
43	222.59	222.70	3.00	3.10	0.10	1139	1245	1247	19/8/08

## ***CBM CORE SAMPLING TIMESHEET***

<b>Client:</b>	Pure Energy Resources Limited	<b>Well:</b>	Fingal-82
<b>Job Number:</b>	1180-06	<b>Start Date:</b>	13/8/2008
		<b>Engineer:</b>	MA

<b>Run No.</b>	<b>Depth</b>	<b>Driller's Depth</b>	<b>Meters Cored</b>	<b>Meters Recovered</b>	<b>Difference +/-</b>	<b>Time Core Penetrated</b>	<b>Time Core Left Bottom</b>	<b>Time Core Reached Surface</b>	<b>Date</b>
44	225.69	225.70	3.00	2.70	-0.30	1256	1402	1405	19/8/08
45	228.39	228.70	3.00	3.16	0.16	1413	1441	1444	19/8/08
46	231.55	231.70	3.00	3.07	0.07	1453	1516	1520	19/8/08
47	234.62	234.70	3.00	3.01	0.01	1527	1602	1606	19/8/08
48	237.63	237.70	3.00	3.01	0.01	1613	1647	1650	19/8/08
49	240.64	240.70	3.00	3.06	0.06	639	713	717	20/8/08
50	243.70	243.70	3.00	3.00	0.00	723	805	809	20/8/08
51	246.70	246.70	3.00	3.06	0.06	815	903	906	20/8/08
52	249.76	249.70	3.00	2.80	-0.20	912	1023	1026	20/8/08
53	252.56	252.70	3.00	3.00	0.00	1032	1100	1103	20/8/08
54	255.56	255.70	3.00	3.00	0.00	1111	1134	1138	20/8/08
55	258.56	258.70	3.00	3.00	0.00	1147	1217	1221	20/8/08
56	261.56	261.70	3.00	3.00	0.00	1231	1303	1306	20/8/08
57	264.56	264.70	3.00	3.00	0.00	1315	1357	1401	20/8/08
58	267.56	267.70	3.00	3.02	0.02	1409	1534	1537	20/8/08
59	270.58	270.70	3.00	2.98	-0.02	1546	1607	1610	20/8/08
60	273.56	273.70	3.00	3.00	0.00	1607	1640	1643	20/8/08
61	276.56	276.70	3.00	3.06	0.06	620	652	655	21/8/08
62	279.62	279.70	3.00	2.90	-0.10	703	746	750	21/8/08
63	282.52	282.70	3.00	3.08	0.08	759	825	829	21/8/08
64	285.60	285.70	3.00	3.00	0.00	837	904	907	21/8/08
65	288.60	288.70	3.00	3.05	0.05	917	941	945	21/8/08
66	291.65	291.70	3.00	2.62	-0.38	953	1040	1044	21/8/08
67	294.27	294.70	3.00	3.10	0.10	1053	1150	1154	21/8/08
68	297.37	297.70	3.00	3.10	0.10	1248	1351	1355	21/8/08
69	300.47	300.70	3.00	3.10	0.10	1404	1457	1501	21/8/08
70	303.57	303.70	3.00	2.80	-0.20	1509	1602	1606	21/8/08
71	306.37	306.70	3.00	3.00	0.00	1616	1645	1649	21/8/08
72	309.37	309.70	3.00	3.00	0.00	614	700	703	22/8/08
73	312.37	312.70	3.00	3.00	0.00	717	743	747	22/8/08
74	315.37	315.70	3.00	2.95	-0.05	759	821	825	22/8/08
75	318.32	318.70	3.00	3.10	0.10	831	909	912	22/8/08
76	321.42	321.70	3.00	2.90	-0.10	1022	1103	1106	22/8/08
77	324.32	324.70	3.00	3.00	0.00	1114	1219	1223	22/8/08
78	327.32	327.70	3.00	3.00	0.00	1458	1559	1603	22/8/08
79	330.32	330.70	3.00	3.00	0.00	1411	1645	1648	22/8/08
80	333.32	333.70	3.00	3.00	0.00	831	928	933	23/8/08
81	336.32	336.70	3.00	3.00	0.00	942	1031	1036	23/8/08
82	339.32	339.70	3.00	3.00	0.00	1044	1131	1136	23/8/08
83	342.32	342.70	3.00	3.00	0.00	1145	1236	1241	23/8/08
84	345.32	345.70	3.00	2.70	-0.30	1248	1351	1336	23/8/08
85	348.40	348.70	3.00	3.10	0.10	1408	1450	1454	23/8/08
86	351.50	351.70	3.00	3.00	0.00	1516	1613	1617	23/8/08

## ***CBM CORE SAMPLING TIMESHEET***

<b>Client:</b>	Pure Energy Resources Limited	<b>Well:</b>	Fingal-82
<b>Job Number:</b>	1180-06	<b>Start Date:</b>	13/8/2008
		<b>Engineer:</b>	MA

<b>Run No.</b>	<b>Depth</b>	<b>Driller's Depth</b>	<b>Meters Cored</b>	<b>Meters Recovered</b>	<b>Difference +/-</b>	<b>Time Core Penetrated</b>	<b>Time Core Left Bottom</b>	<b>Time Core Reached Surface</b>	<b>Date</b>
87	354.50	354.70	3.00	3.10	0.10	700	800	805	24/8/08
88	357.60	357.70	3.00	2.60	-0.40	814	954	1000	24/8/08
89	360.20	360.70	3.00	3.10	0.10	1020	1107	1112	24/8/08
90	363.30	363.70	3.00	3.14	0.14	1118	1222	1228	24/8/08
91	366.44	366.70	3.00	3.10	0.10	1238	1324	1329	24/8/08
92	369.54	369.70	3.00	3.10	0.10	1347	1421	1426	24/8/08
93	372.64	372.70	3.00	3.10	0.10	1435	1510	1515	24/8/08
94	375.74	375.70	3.00	3.00	0.00	1540	703	708	25/8/08
95	378.74	378.70	3.00	3.00	0.00	719	801	508	25/8/08
96	381.74	381.70	3.00	3.00	0.00	834	910	915	25/8/08
97	384.74	384.70	3.00	2.90	-0.10	926	1004	1009	25/8/08
98	387.64	387.70	3.00	2.90	-0.10	1020	1115	1121	25/8/08
99	390.54	390.70	3.00	3.00	0.00	1130	1303	1308	25/8/08
100	393.54	393.70	3.00	3.00	0.00	1320	1420	1424	25/8/08
101	396.54	396.70	3.00	3.00	0.00	1435	1535	1540	25/8/08
102	399.54	399.70	0.70	1.00	0.30	1608	1619	1624	25/8/08
103	400.54	400.40							25/8/08

## ***APPENDIX 1***

### **CORE PHOTOGRAPHS**

# Fingal-82

Samples: 1, 5, 10

