



ROUTINE CORE ANALYSIS FINAL REPORT
of
LONGTOM-4
for
NEXUS ENERGY LIMITED
by
ACS LABORATORIES PTY LTD



10th February 2009

Nexus Energy Limited
134 Little Lonsdale St
MELBOURNE, VIC 3000

Attention: Carrie Trembath

FINAL REPORT: 0219-02-40
LONGTOM-4

CLIENT REFERENCE: Purchase Order: N540000004

MATERIAL: 4" Diameter Core

LOCALITY: VIC/P54

WORK REQUIRED: Routine Core Analysis

Please direct technical inquiries regarding this work to the signatory below under whose supervision the work was conducted.

A handwritten signature in black ink, appearing to read 'Jared Olsen'.

JARED OLSEN
Laboratory Supervisor

A handwritten signature in black ink, appearing to read 'Ian Mangelsdorf'.

IAN MANGELSDORF
Manger West Region

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CHAPTER 1

INTRODUCTION

1. INTRODUCTION

One, 4 inch diameter, core was cut in the Longtom-4 well, as per the depth interval below.

Core No.	Cored Interval (m)	
1	2841.00 – 2895.70m	(Rec 54.65m)
	<u>Total:</u>	(54.65m)

One ACS technician was dispatched to the rig to handle, stabilise and package the cores for transport to the laboratory, on arrival at surface. The core was marked up with depth and orientation lines, prior to the annulus between the core and the inner barrel, being injected with foam to stabilise the core in the inner barrel.

The core was received at ACS Laboratories Pty Ltd, Perth on the 13th of August 2008.

A routine core analysis study was undertaken as per instructions received from Nexus Energy Limited. The study included the following analyses:

- Continuous core gamma
- Ambient porosity, ambient permeability and grain density
- Overburden porosity and permeability
- Core photography

On completion of the analysis, the core was packed into slabbed core trays for distribution to the relevant Government authorities and client storage.

The following report details the methods and procedures utilised in providing these results. Results are presented in both tabular and graphical formats.

CHAPTER 2

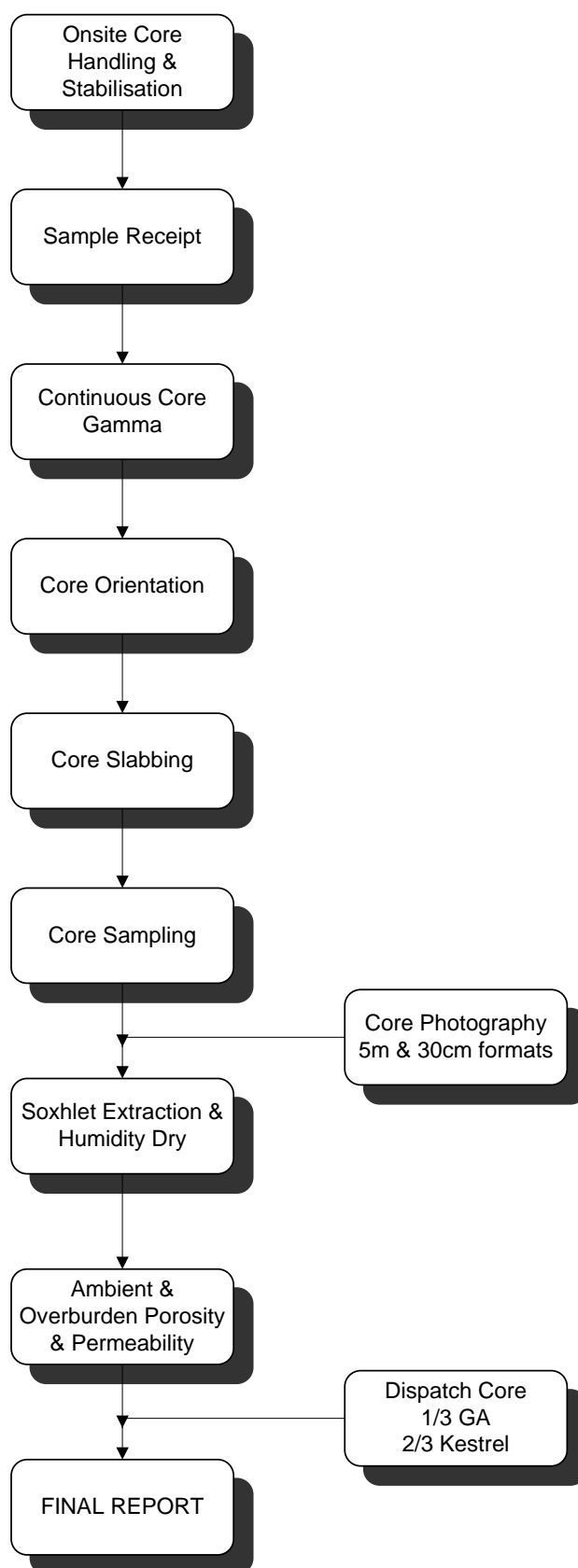
STUDY AIMS

2. STUDY AIMS

The analyses were performed with the following aims:

1. To provide core stabilisation services.
2. To provide depth correlation through the provision of a continuous core gamma log over the cored interval.
3. To provide air permeability, helium injection porosity and density data.
4. To investigate the effect on porosity and permeability due to overburden stress.
5. To provide core photography as a permanent record of the core.

STUDY OUTLINE



CHAPTER 3

CORE HANDLING, SCREENING AND SAMPLING

3. CORE HANDLING, SCREENING AND SAMPLING

3.1 Onsite H S & E

The proposed worksite was assessed by ACS and company representatives prior to a JHA being submitted. The JHA was thoroughly reviewed in conjunction with the Company HS&E representative before being signed off. A copy of the JHA and work procedure was attached to each hot work permit acquired prior to each work period. A number of toolbox meetings were held with the relevant third party operators and Nexus representatives prior to each task being performed (ie. core lay down, stabilisation and packaging).

No accidents or incidents were reported by ACS employees.

3.2 Onsite Core Handling

Once the core was laid down on the catwalk, it was marked with depths (0.5 metre intervals) and red and black orientation lines (red on the right as you look up the barrel). Pilot holes were drilled at one metre intervals along the core prior to the annulus being injected with stabilising foam. Once the stabilisation foam had set, the core barrels were loaded into core barrel baskets for transportation to the laboratory.

3.3 Core Layout

On receipt of the shipment of core at the laboratory, the 9m core barrel lengths were unloaded from the transport crates individually by crane using a spreader beam to minimise flexing of the core barrel. The core was laid out in order from top to bottom and checked off against the shipping manifest. The core was then cut into 1m lengths and removed from the aluminium inner barrel for processing. Representatives from Nexus Energy Limited undertook the core orientation so as to obtain true dip on the slabbed surface prior to slabbing

3.4 1/3 : 2/3 Core Slab

Upon completion of the core gamma, layout and orientation, the core was slabbed longitudinally into 1/3:2/3 sections. All sampling and photography was performed on the 2/3 section. The final slabs were packed into core trays and distributed to the relevant parties as described in section 7.1.

3.5 Sampling

A suite of 1½” diameter, horizontal, RCA plugs were drilled at intervals determined by representatives of Nexus Energy Limited throughout the reservoir quality sections of the core using 10% KCl brine as the bit coolant. The samples were immediately trimmed to 2” long, right cylinders for analysis, wrapped in saran, packed in air tight vials pending analysis. All plug off-cuts were retained for possible future analysis.

A complete sample listing can be found in section 7.2 of this report..

CHAPTER 4

SAMPLE PREPARATION

4. SAMPLE PREPARATION

4.1 Warm Solvent Extraction

The samples were placed in a soxhlet extractor to remove any oil and salt from the samples. The solvent used was 3:1 chloroform methanol. Cleaning continued until a sample of solvent from the soxhlet chamber tested negative to silver nitrate induced salt precipitation, and no fluorescence was observed in the sample under ultra-violet light.

4.2 Humidity Drying

After extraction, the samples were dried under humid conditions of 60°C and 40% Relative Humidity to a constant weight. Once dried, they were stored in individual air tight containers and allowed to cool to room temperature before analysis.

CHAPTER 5

TEST PROCEDURES

5. TEST PROCEDURES

5.1 Continuous Core Gamma

The core was laid out according to depth markings, and a continuous core gamma trace produced by passing the core beneath a gamma radiation detector. The detector is protected from extraneous radiation by a lead tunnel. The detector signal is amplified and digitised to produce a gamma trace for comparison with the down hole log.

5.2 Porosity

The ambient porosity is determined by placing the individual plugs in a sealed matrix cup and a known volume of helium at 100 psi reference pressure introduced to the cup. From the resultant pressure the unknown volume, i.e. the grain volume, was calculated using Boyles Law.

Each individual sample is then placed into a thick walled rubber sleeve and loaded into a hydrostatic cell. With an 'ambient' confining stress of 400 psi applied to the sample, helium held at 100 psi reference pressure is released into the samples pore space and the pore volume is determined.

The bulk volume of each plug was determined by addition of the grain and pore volumes. The porosity was calculated as the volume percentage of pore space with respect to the bulk volume.

$$P_1 V_1 = P_2 V_2$$

$$\Rightarrow P_1 V_r = P_2 (V_r + V_c - V_g)$$

$$V_b = V_p + V_g$$

$$\text{Ambient Porosity \%} = \frac{V_p}{V_b} \times 100$$

The porosity was then measured at a simulated overburden stress of 2450psi, as supplied by Nexus Energy Limited. The desired confining stress is then applied to the sample, and the pore volume measured at equilibrium. This pore volume, together with the previously determined parameters in the ambient analyses, allow the calculation of porosity at overburden conditions, as follows:

$$\text{Overburden Porosity \%} = \frac{V_p - \Delta V_p}{V_b - \Delta V_b} \times 100\%$$

where	P_1	=	initial pressure (psig)
	P_2	=	final pressure (psig)
	V_r	=	reference cell volume (cm ³)
	V_c	=	matrix cup volume (cm ³)
	V_g	=	grain volume (cm ³)
	V_p	=	pore volume (cm ³)
	V_b	=	bulk volume (cm ³)

5.3 Permeability

The ambient permeability of each clean and dry sample was measured by placing it in a rubber sleeve and loaded into a hydrostatic cell. An 'ambient' confining pressure of 400 psi was applied to prevent bypassing of air around the sample when the measurement is made.

The overburden permeability is determined by placing a plug sample in a hydrostatic cell at the required confining pressure, 2450psi, as supplied by Nexus Energy Limited.

During the measurement, a known air pressure is applied to the upstream face of the sample, creating a flow of air through the sample. Permeability for each sample is then calculated using Darcy's Law, through knowledge of the upstream pressure and flow rate during the test, the viscosity of air and the plug dimensions.

$$K_a = \frac{2000 \cdot BP \cdot \mu \cdot q \cdot L}{(P_1^2 - P_2^2) \cdot A}$$

where	K_a	=	air permeability (milliDarcy's)
	BP	=	barometric pressure (atmospheres)
	μ	=	gas viscosity (cP)
	q	=	flow rate (cm ³ /s) at barometric pressure
	L	=	sample length (cm)
	P_1	=	upstream pressure (atmospheres)
	P_2	=	downstream pressure (atmospheres)
	A	=	sample cross sectional area (cm ²)

5.4 Apparent Grain Density

The apparent grain density is calculated by dividing the weight of the plug by the grain volume determined from the helium injection porosity measurement.

$$\text{Grain Density} = \frac{Wt}{Vg}$$

$$\begin{array}{lll} \text{where} & Wt & = \text{weight of sample (g)} \\ & Vg & = \text{grain volume (cm}^3\text{)} \end{array}$$

5.5 Core Photography

The digital core photography was carried out on the 2/3 slab of core.

Photographs were taken of the entire core under both white light and ultra violet light in a 5m format and white light only in a high definition 30cm format.

During examination of the preliminary set of photography, it was discovered that one metre section had been misplaced on the photographic template (see changes made below). Subsequently three metre sections were out of place in the overall core orientation as the core was packed into the coreflute boxes. Because of the cores fragile nature it was decided to relabel the core sections within the coreflute trays rather than attempt to rearrange the core into the correct continuous order.

Interval 2855-2856m was incorrectly labelled as 2857-2858m

Interval 2856-2857m was incorrectly labelled as 2855-2856m

Interval 2857-2858m was incorrectly labelled as 2856-2857m

All photographs and core orientation within the coreflute trays are now correct..

One set of the 5m format white light and ultra violet light photos were supplied in hardcopy prints and electronic form, along with the 30cm high definition format in electronic format only.

CHAPTER 6

TEST RESULTS

6.1 Ambient & Overburden Test Results

CORE ANALYSIS FINAL REPORT

Company : Nexus Energy Limited
Well : Longtom-4
Field :
Core Int. : 2841.00-2895.65m

Date : 22/09/2008
File : 0219-02-40
Location : Bass Straight
Analysts : SR HJ

Overburden Pressure 1: 2450 psi

Sample Number	Depth	Dir	Ambient Porosity	OB1 Porosity	Grain Density	Ambient Permeability	OB1 Permeability	Remarks
1	2841.25	H	13.4	12.6	2.64	0.45	0.23	
2	2841.75	H	12.1	11.5	2.66	0.20	0.14	
3	2842.25	H	8.6	8.4	2.67	0.03	0.01	
4	2842.74	H	13.1	12.4	2.64	0.48	0.17	
5	2843.25	H	14.0	13.1	2.64	0.95	0.33	
6	2843.75	H	13.1	12.3	2.64	0.52	0.23	
7	2844.25	H	13.5	12.6	2.64	0.50	0.21	
8	2844.75	H	12.8	11.8	2.64	0.34	0.13	
9	2845.32	H	9.3	8.7	2.64	0.12	0.07	
10	2845.75	H	10.9	10.1	2.66	0.17	0.05	
11	2846.25	H	9.4	8.6	2.67	0.11	0.04	
12	2846.75	H	9.2	8.7	2.67	0.10	0.03	
13	2847.24	H	8.4	8.0	2.68	0.08	0.06	
14	2847.75	H	8.0	7.7	2.70	0.02	<0.01	
15	2870.67	H	11.6	10.8	2.64	0.25	0.06	

Sample Number	Depth	Dir	Ambient Porosity	OB1 Porosity	Grain Density	Ambient Permeability	OB1 Permeability	Remarks
16	2871.56	H	11.3	10.6	2.63	0.32	0.05	sample failed post ambient measurements
17	2872.36	H	11.6		2.63			
18	2873.53	H	11.6	11.4	2.75	<0.01	<0.01	
19	2874.48	H	7.7	7.3	2.65	0.01	<0.01	
20	2875.40	H	8.5	8.3	2.66	0.01	<0.01	
21	2876.45	H	9.4	8.9	2.65	0.07	0.01	
22	2877.28	H	6.3	6.2	2.67	0.02	0.01	
23	2878.36	H	8.5	8.2	2.65	0.03	0.01	
24	2878.54	H	8.5	8.0	2.64	0.04	0.02	
25	2879.48	H	10.3	9.6	2.65	0.08	0.04	
26	2880.69	H	8.3	7.8	2.63	0.08	0.02	
27	2882.86	H	7.1	6.8	2.68	0.04	<0.01	
28	2883.68	H	5.6	5.5	2.64	<0.01	<0.01	
29	2884.47	H	8.4	8.0	2.66	0.02	0.01	
30	2886.19	H	7.2	6.8	2.69	0.02	<0.01	
31	2887.16	H	7.2	6.6	2.70	0.04	<0.01	
32	2889.18	H	7.3	7.1	2.69	0.11	<0.01	
33	2890.91	H	7.5	6.9	2.68	0.04	<0.01	
34	2893.51	H	7.1	6.7	2.68	0.02	<0.01	

CHAPTER 6

TEST RESULTS

6.2 Porosity vs Permeability Plot

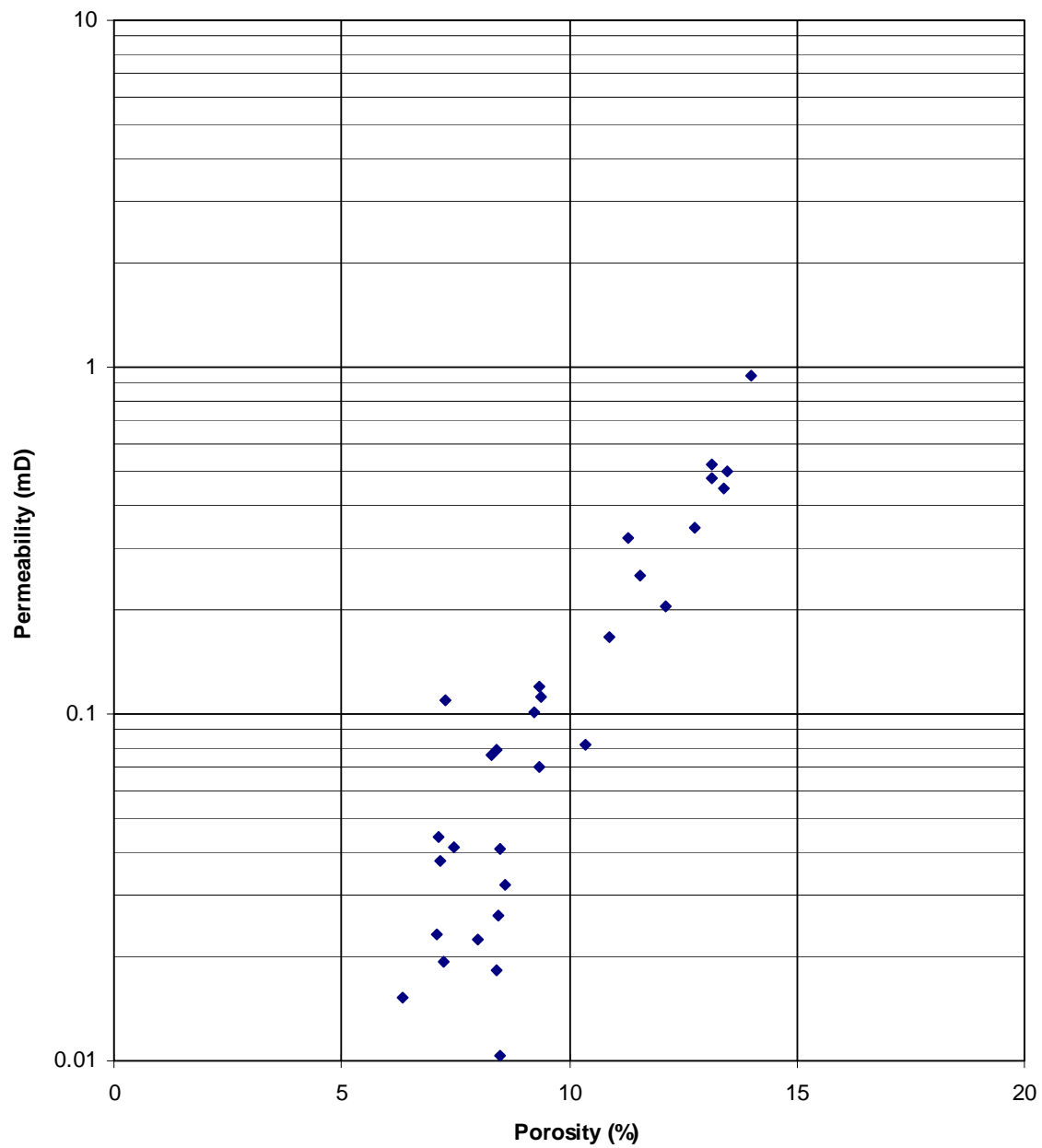
POROSITY vs PERMEABILITY



Client: Nexus Energy Limited

Well: Longtom-4

Depth: 2841.00 - 2895.65m



CHAPTER 6

TEST RESULTS

6.3 Ambient vs Overburden Plots

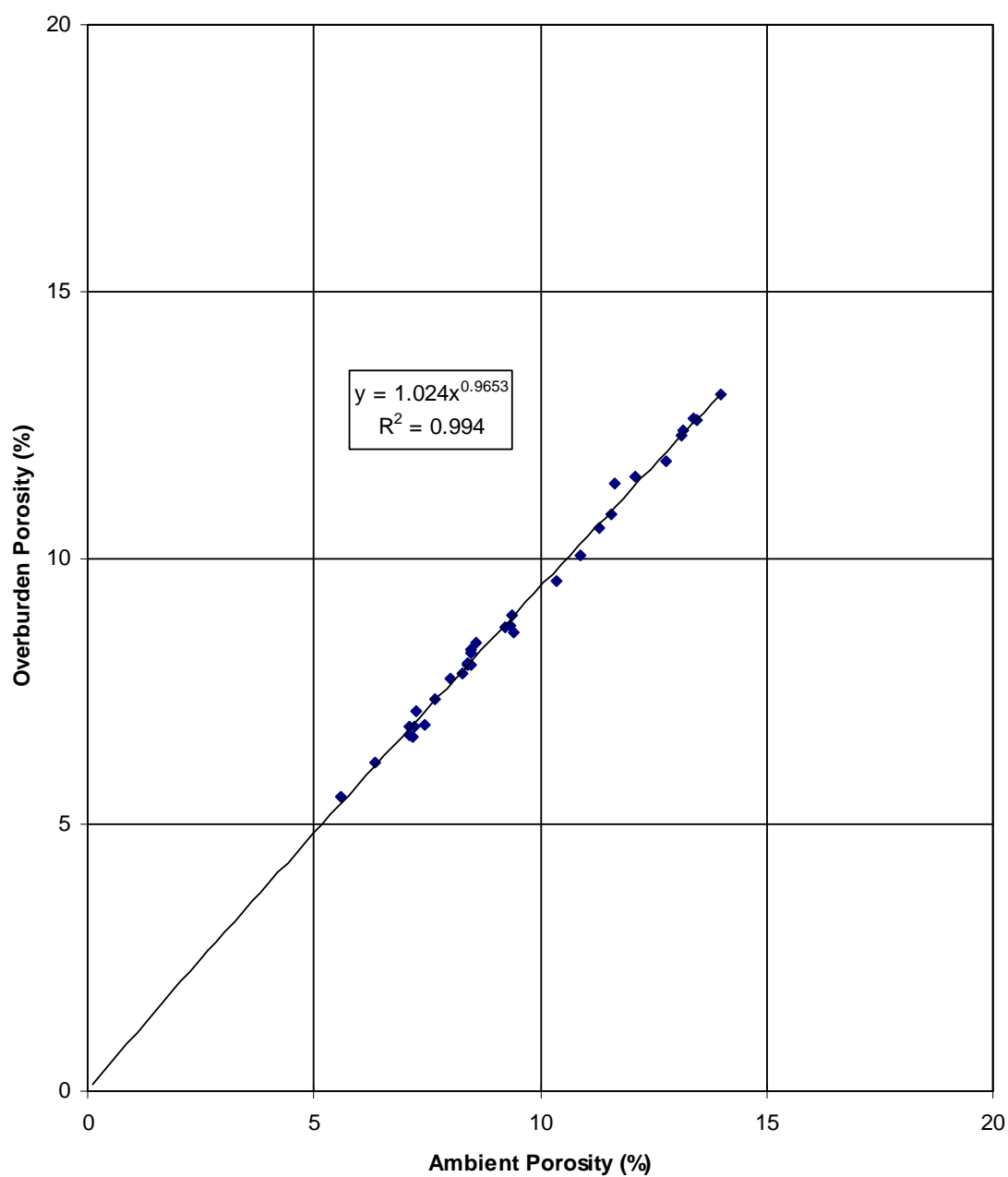
POROSITY
AMBIENT vs OVERBURDEN
2450 psi



Client: Nexus Energy Limited

Well: Longtom-4

Depth: 2841.00 - 2895.65m



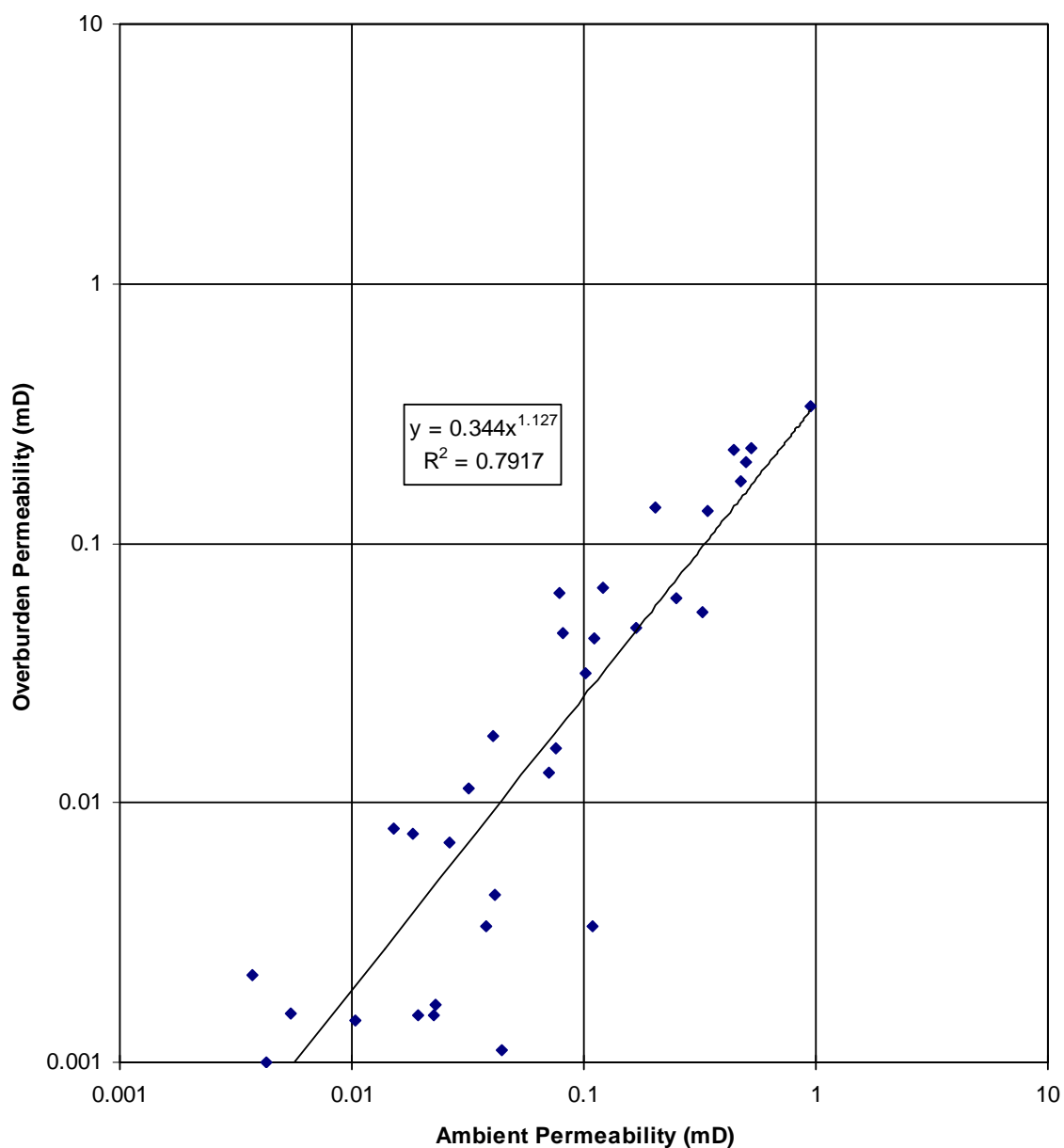
PERMEABILITY
AMBIENT vs OVERBURDEN
2450 psi



Client: Nexus Energy Limited

Well: Longtom-4

Depth: 2841.00 - 2895.65m



CHAPTER 6

TEST RESULTS

6.4 Core Plot

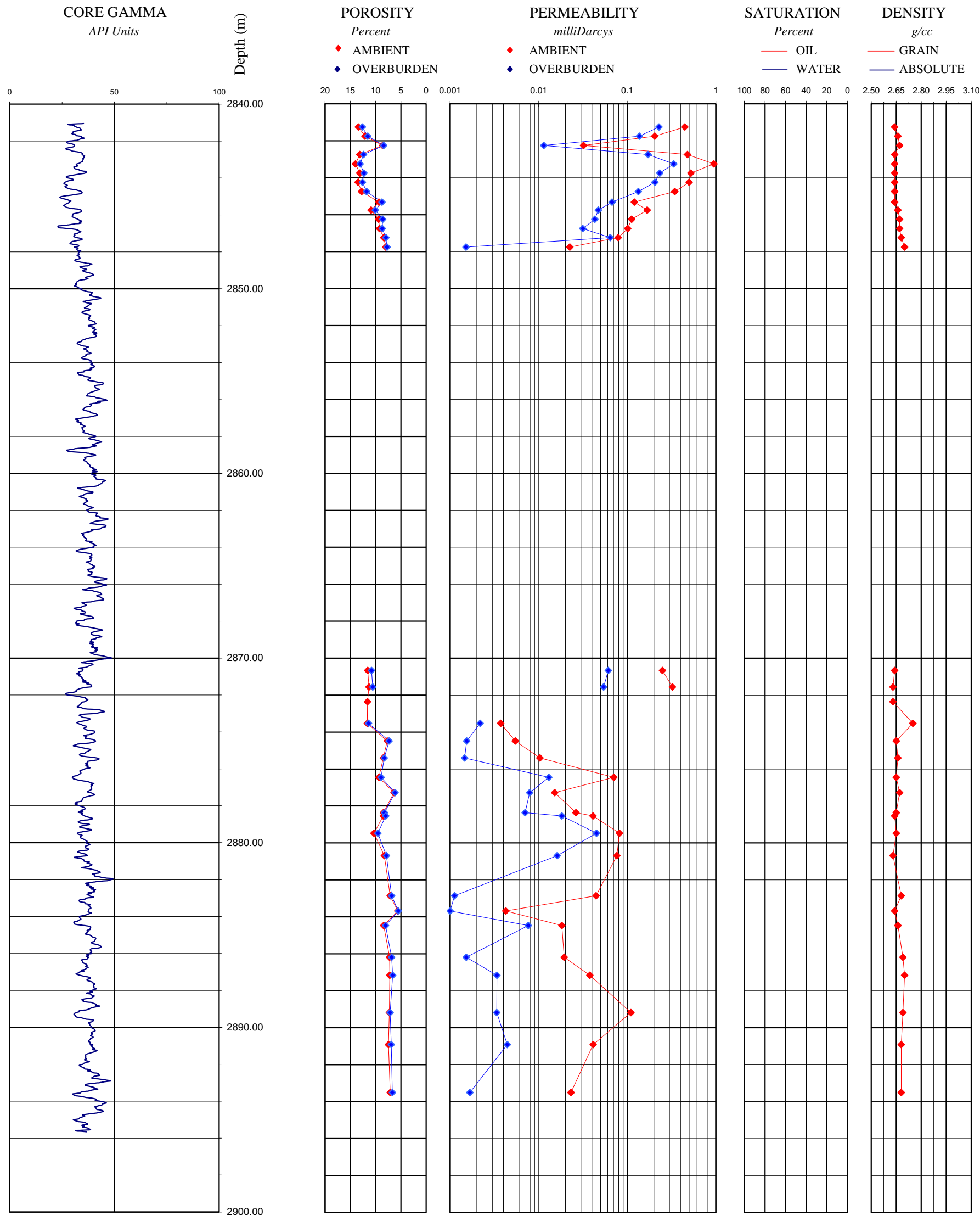
CORE PLOT

Scale 1:200



Client: Nexus Energy Limited
Well: Longtom-4
File No.: 0219-02-40

Core 1: 2841.00 - 2895.65m



ACS Laboratories Pty. Ltd.
ACN: 008 273 005

CHAPTER 7

SAMPLE DISTRIBUTION AND STORAGE

7.1 Sample Distribution and Storage

7. SAMPLE DISTRIBUTION AND STORAGE

7.1 Sample Distribution and Storage

On completion of all sampling and analysis, the two individual slabs of core were packed in corflute core boxes and distributed as follows:

The 1/3 slab of core was couriered to Geoscience Australia (GA) on the 16th of December 2008, as requested by Nexus Energy Limited (transmittal PER0252).

The clients 2/3 slab of core was couriered to Kestrel Information Management on the 16th of December 2008, for permanent storage, as requested by Nexus Energy Limited (transmittal PER0251).

All plugs and off cuts are currently being stored at ACS Laboratories Perth, pending further instructions.

CHAPTER 7

SAMPLE DISTRIBUTION AND STORAGE

7.2 Sample Listing

Client Nexus Energy Limited
Well Longtom-4

RCA plugs		SCAL plugs		Vertical plugs		Preserved Core		
Plug no.	Depth (m)	Plug No.	Depth (m)	Plug No.	Depth (m)	Sample No.	Depth (m)	Interval
1	2841.25	no samples		no samples		no samples		
2	2841.75							
3	2842.25							
4	2842.74							
5	2843.25							
6	2843.75							
7	2844.25							
8	2844.75							
9	2845.32							
10	2845.75							
11	2846.25							
12	2846.75							
13	2847.24							
14	2847.75							
15	2870.67							
16	2871.56							
17	2872.36							
18	2873.53							
19	2874.48							
20	2875.40							
21	2876.45							
22	2877.28							
23	2878.36							
24	2878.54							
25	2879.48							
26	2880.69							
27	2882.86							
28	2883.68							
29	2884.47							
30	2886.19							
31	2887.16							
32	2889.18							
33	2890.91							
34	2893.51							