



technology and enterprise

10th August 1989

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Attention: Mr B Eyre

REPORT F 5259/89

CLIENT REFERENCE:	DPO No 37337
TITLE:	Core Analysis
SAMPLE IDENTIFICATION:	Samples 2557492 - 2557515
MATERIAL:	HQ Core Samples
WORK REQUIRED:	Porosity and Air Permeability Thin Section Preparation

Investigation and Report by: Russell Martin

Dr Brian G Steveson  
Manager, Petroleum Services Section

**ONSHORE**

PR92/051A

PR92/031

DEPT OF MINES & ENERGY  
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## 1. INTRODUCTION

Twenty-four (24) samples were received by the Petroleum Services Section of Amdel Limited from Pacific Oil and Gas, Alice Springs. The following analyses were requested:

- Permeability to air - ambient
- Helium injection Porosity - ambient
- Calculated Grain Density
- Thin Section Preparation

One-inch diameter samples were taken from the sections of core parallel to the bedding plane using tap water as the bit lubricant. Samples were then trimmed and faced square before drying in a conventional dry oven at 80°C.

## 2. PERMEABILITY TO AIR

Permeability is determined on the plug by placing the sample into a Hassler type cell and applying a confining pressure of 250 psig (1725 kPa). The confining pressure is applied to prevent air bypassing around the sides of the samples. A known pressure is then applied to the upstream sample face and the differential pressure is monitored at the downstream sample face using a calibrated orifice and graduated straight tube manometer.

## 3. HELIUM INJECTION POROSITY

To determine ambient porosity the dry core plug is first placed into a matrix cup and grain volume determined by helium injection. Using this method a known volume of helium at a given reference pressure is expanded into an unknown volume. The resultant pressure is read and the unknown volume determined using Boyle's Law. Sample bulk volume is determined by mercury immersion. The difference between sample grain volume and sample bulk volume is the pore volume from which porosity is calculated as a percentage.

## 4. THIN SECTION PREPARATION

Before plug samples were taken, two slices, approximately 5 mm thick were taken from the sections of core for thin section preparation. Two thin sections were to be prepared for each piece of core with one half stained with Alizarin red for carbonate identification.

The thin sections are enclosed with this report.

## 5. DISCUSSION OF RESULTS

Results of porosity and air permeability are tabulated on pages one and two of this report.

Samples 492, 496, 497, 505, 508 and 513 all failed while attempting to take plugs and no analysis has been performed on these samples.

Samples 509 and 510 are conglomeritic with poor matrix and exhibit good porosity and permeability. Sample 514 is a medium grained well sorted sandstone with very little matrix and exhibits the best porosity and permeability for this sample suite.

Should you have any questions concerning the data contained in this report, please do not hesitate to contact me.

ROUTINE CORE ANALYSIS RESULTS

Company: Pacific Oil and Gas

Location: Alice Springs

File: F 5259/89  
Page: 2 of 2

Sample Number	Depth metres	Permeability to air, md Ambient	Porosity percent Ambient	Grain Density gms/cc Calculated	Residual Fluids Sw% So%	Bulk Dry Density Ambient	Remarks
506	350.50-350.70	1.60	9.6	2.75		2.49	
507	354.81-354.90	0.010	6.4	2.78		2.60	
508	357.60-357.67						
509	373.50-373.60	3.89	23.9	2.75		2.09	Sample Failed
510	365.02-365.72	930	18.6	2.72		2.21	
511	204.20-204.30	0.006	3.4	2.66		2.57	
512	223.91-223.98	0.170	8.1	2.68		2.46	
513	232.73-232.79						
514	233.53-233.61	5897	21.5	2.68		2.11	Sample Failed
515	879.92-880.02	5.07	7.8	2.69		2.48	

M 506  
N 507  
N 508

511  
512  
513

514  
515

ROUTINE CORE ANALYSIS RESULTS

Company: Pacific Oil and Gas

Location: Alice Springs

File: F 5259/89  
Page: 1 of 2

Sample Number	Depth metres	Permeability to air, md Ambient	Porosity percent Ambient	Grain Density gms/cc Calculated	Residual Fluids Sw% So%	Bulk Dry Density Ambient	Remarks
492	372.70-372.80						
493	373.43-373.58	0.122	10.6	2.66		2.38	
494	378.25-378.40	0.056	6.3	2.65		2.48	
495	380.90-381.00	0.012	5.5	2.66		2.51	
496	17.59- 17.70						
497	25.27- 25.33						
498	26.22- 26.37	0.236	8.4	2.72		2.49	Sample Failed
499	32.75- 32.88	0.001	1.4	2.57		2.54	
500	37.75 -37.85	0.114	6.9	2.65		2.47	
501	46.28 -46.40	0.001	1.8	2.63		2.58	
502	149.18-149.30	<0.001	0.4	2.83		2.82	
503	149.93-150.00	<0.001	0.2	2.83		2.82	
504	339.85-339.95	0.132	5.5	2.71		2.56	
505	341.95-342.00						Sample Failed

1 HUC 1  
 NGs  
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