

Pacific Oil & Gas Pty Limited

GOLDEN GROVE-1

EP 4

McARTHUR BASIN, NORTHERN TERRITORY

WELL COMPLETION REPORT

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DATE: October 1988

SUBMITTED BY: *I. Ledlie*

ACCEPTED BY: *I. Ledlie*

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: CIS, Canberra
: Pacific Oil & Gas Pty Limited, Box Hill

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LIST OF PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
Pet NTcw 4040	Location Diagram	1:1,000,000
Pet NTcw 4034	Time-Depth Curve Golden Grove-1	
Pet NTcw 909	Magnetic Susceptibility	1:500
Pet NTcw 4027	Composite Log	1:1,000
Pet NTcw 148	Stratigraphy	

20 February 1990

MEMORANDUMTO: C. Gumley
I. Clementson

FROM: Kevin Lanigan

RE: McARTHUR BASIN WELL LOCATIONS**ONSHORE**

The following list of well locations is an update of John Torkington's February 1989 memo, revised to include Pacific's first three wells.

WELL	LATITUDE (S)	LONGITUDE (E)	A G M		HEIGHT (AMSL)
			EAST	NORTH	
Alexander-1	15°10'13.6"	134°51'17.5"	484408.00	8322810.0	62.0
Scarborough-1	15°10'59"	134°47'54"	478332.0	8321396	56.0
Supply-1	15°12'41.6"	134°45'59.0"	474910.39	8318254.48	78.0
Lady Penrhyn-1	15°04'45.4"	133°59'33.4"	391731.48	8332652.66	102.90
Broughton-1	14°21'41.0"	133°37'29.5"	351721.05	8411858.15	107.54
Borrowdale-2	15°07'23.5"	133°48'56.5"	372741.99	8327698.31	124.34
Friendship-1	14°52'33"	133°54'36.0"	382750	8355100	59.04
Prince of Wales-1	14°45'38.8"	133°56'40.7"	386409.22	8367861.72	60.41
Lawrence-1	14°58'28.79"	133°55'36.25"	384596.3	8344191.4	60.5
Golden Grove-1	14°50'35.80"	134°21'49.50"	431547.45	8358905.1	80.4
Altree-1	15°55'28.70"	133°47'07.98"	370006.7	8239016.6	212.8
Altree-2	15°55'30.31"	133°47'07.36"	369988.55	8238966.9	212.8

n.b. Alexander-1, Scarborough-1 and Supply-1 locations were interpreted from juxtaposition to shotpoints on the AMOCO 1983 St. Vidgeon Seismic Survey. Lady Penrhyn-1, Broughton-1, Borrowdale-2, Friendship-1 and Prince of Wales-1, were traversed during the Roper Valley seismic survey. Lawrence-1, Golden Grove-1, and Altree-1 & -2, were surveyed using GPS satellite fixing.

All heights are for ground level.

Kevin Lanigan
KEVIN LANIGAN

12 JUN 1990

**BPB SLIMLINE SERVICES**

29 MOONBI STREET BRENDALÉ QUEENSLAND AUSTRALIA
P.O. BOX 465 STRATHPINE QUEENSLAND 4500
Telephone: (61) 07 881 1969 Facsimile: (61) 07 881 0005 Telex: (71) 42555 (BPB AA)

PD:MC

7th June, 1990.

Pacific Oil & Gas Pty. Limited,
Private Box 509,
BOX HILL Vic 3128.

ATTENTION: Mr. Kevin Lanigan

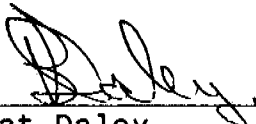
Dear Kevin,

Recently you requested official confirmation of BHT readings for two of your wells in the N.T.

Following is the information you requested.

Golden Grove 1 BHT 43 deg C at 440 m
Broughton 1 BHT 68 deg C at 1000 m

Yours sincerely,
BPB INSTRUMENTS (AUSTRALIA) PTY. LIMITED



Pat Daley
Operations Manager - Slimline Services

12 JUN 1990



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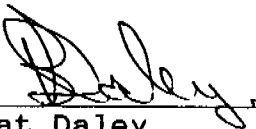
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BPB INSTRUMENTS (AUSTRALIA) PTY. LIMITED


Pat Daley
Operations Manager - Slimline Services



Status: Plugged and Abandoned Hole Size: 7-7/8" to 10m, 101mm to 83.5m, reamed out to 5-5/8", 101mm to 493.3m. Casing & Tubing Details: 7" set at 9.95m 5" set at 83.50m Perforations: Nil Plugs: 99 - 69m 30 - Surface	Operator: Pacific Oil & Gas Pty Ltd. Participants: Pacific Oil & Gas - 100% Tenement: EP 4 Location: Lat. 14°50'35.799" South Long: 134°21'49.504" East Basin: AMG:McArthur Basin Elevation: GL 80.4m AMSL Spudded: 1700 Hrs 31/07/88 Rig Released: 0000 Hrs 13/08/88 Rig: Modified Mindrill 55 (Longyear 550) Drilling Contractor: Rockdril Contractors P/L (Rig18)
--	--

Stratigraphy:				
Age	Unit and Subunit	KB (m)	MSL (m)	Thickness (m)
PROTEROZOIC	Lower Velkerri Formation	Surface		133.2
	Bessie Creek Sandstone	133.2		32.5
	Corcoran Formation	165.2		231.4
	Abner Sandstone - Munyi Member - Hodgson Sst Member	396.6		23.3
		Total Depth (Driller) (m)	439.30	
		Total Depth (Logger) (m)		

Formation Tests: NIL					Choke:								
TEST	TIMES (min)				PRESSURES (psi)								RESULT
	PF	FSI	F	SSI	IHH	IPP	FPP	BP	IFP	FFP	FBP	FHH	

PF : Prewell Period	IHH : Initial Hydrostatic Head	IFP : Initial Flow Pressure
FSI : First Sheet In	IPP : Initial Prewell Pressure	FFP : Final Flow Pressure
F : Flow Period	FPP : Final Prewell Pressure	FBP : Final Build Up Pressure
SSI : Second Sheet In	BP : Build Up Pressure	FHH : Hydrostatic Head

Type Log	Run No	Interval (m)	Date	No	Interval (m)	Recovery	No	Interval (m)	Recovery
Self Potential, Dual focussed Resistivity	1/2								
Gamma Ray, Cali- per, Density, Neutron Porosity	3/4								
Gamma Ray, Caliper Sonic	3/5								

Chemical Analysis (water, oil, gas)

Summary & Conclusions:

Golden Grove 1, was drilled in the Northern Territory Licence EP 4, approximately 150km due east of Mataranka. The hole was drilled to test the hydrocarbon prospectivity of the Roper Group of the McArthur Basin. The Bessie Creek Sandstone being the primary reservoir target.

The Well was spudded at 0900 HRS on July 31st, 1988. A 7-7/8" hole was rotary drilled to 10m where a 7" conductor was set. The hole was then cored with CHD 101mm to 83.5m, and subsequently opened up to 5-5/8" with a rotary bit. 5" casing was set at 83.5m. Cement was drilled out and a further 2.9m of new formation drilled prior to the running of a Formation Integrity test. The hole was then drilled to a TD of 439.3m using a CHD 101 coring assembly.

The well spudded in the lower Velkerri Formation and was deepened to intersect the top of the Hodgson Sandstone Member. No shows were recorded.

The rig was released at 0000 HRS August 8, 1988.

SECTION 1 - ENGINEERING DATA

1.1 Engineering Summary

Golden Grove-1 is located in Northern Territory Exploration Permit 4 (EP 4), approximately 150km east of Mataranka (Figure 1). The hole was drilled to test the hydrocarbon prospectivity of the Proterozoic Roper Group of the McArthur Basin. The hole was drilled by Pacific Oil & Gas Pty Limited, as the sole permit holder and operator, using Rockdril Contractors Pty. Limited's Rig 18, a modified Mindrill 55 (Longyear 550).

Access to the location was via the Roper Valley highway, existing pastoral roads and an 8.5 km access track. Drill site preparation involved clearing a drilling pad over an area of approximately 50m x 50m. Potable and drilling water was obtained from a water hole approximately 11km from the well site. Well site supervision was provided by Griff Weste.

Golden Grove-1 was spudded at 1700 hrs on July 31st 1988 with the rotary drilling of a 7-7/8" hole to 10 metres below ground level. A 7" conductor was then set and cemented at 9.95 metres. A CHD 101 core barrel (103mm reamer shell) was made up and cement drilled from 7.0 - 10.0m. The 103mm hole was then fully cored to 83.5m. A rotary bottom hole assembly was made up and the hole reamed out to 5-5/8". A 5" casing string was run in the hole, which was found to be narrow over the lower 2.5 metres. The casing was pulled and the 5-5/8" bit rerun to ream the remaining 2.5 metres to 83.5 metres. The 5" casing was again run in the hole and set at 83.5m. Good cement returns were observed at the surface. The blow out prevention system was installed and pressure tested to 1000 psi for 15 minutes. A 4¼ inch roller bit was run in the hole and the cement drilled out from 74.5 metres and new formation to 86.5 metres where a formation integrity test was conducted. The formation was found to leak off at 500 psi (hole filled with 8.5 ppg mud). The CHD 101 core barrel was made up and the hole continuously cored from 86.5 to a total depth of 439.3 metres, which was reached at 0600 hrs on August 12, 1988. A bit change was made at 199.4 metres. The hole was conditioned and the following electric logs were run:- Spontaneous Potential, Dual Focussed Resistivity, Gamma Ray, Density, Neutron Porosity and Sonic.

Following the evaluation of electric logs the well was plugged and abandoned with a cement plug at the casing shoe (99-69m) and at surface (30m - surface). The rig was released at 0000 hrs, August 13 1988 after a total time of 13 days at the site.

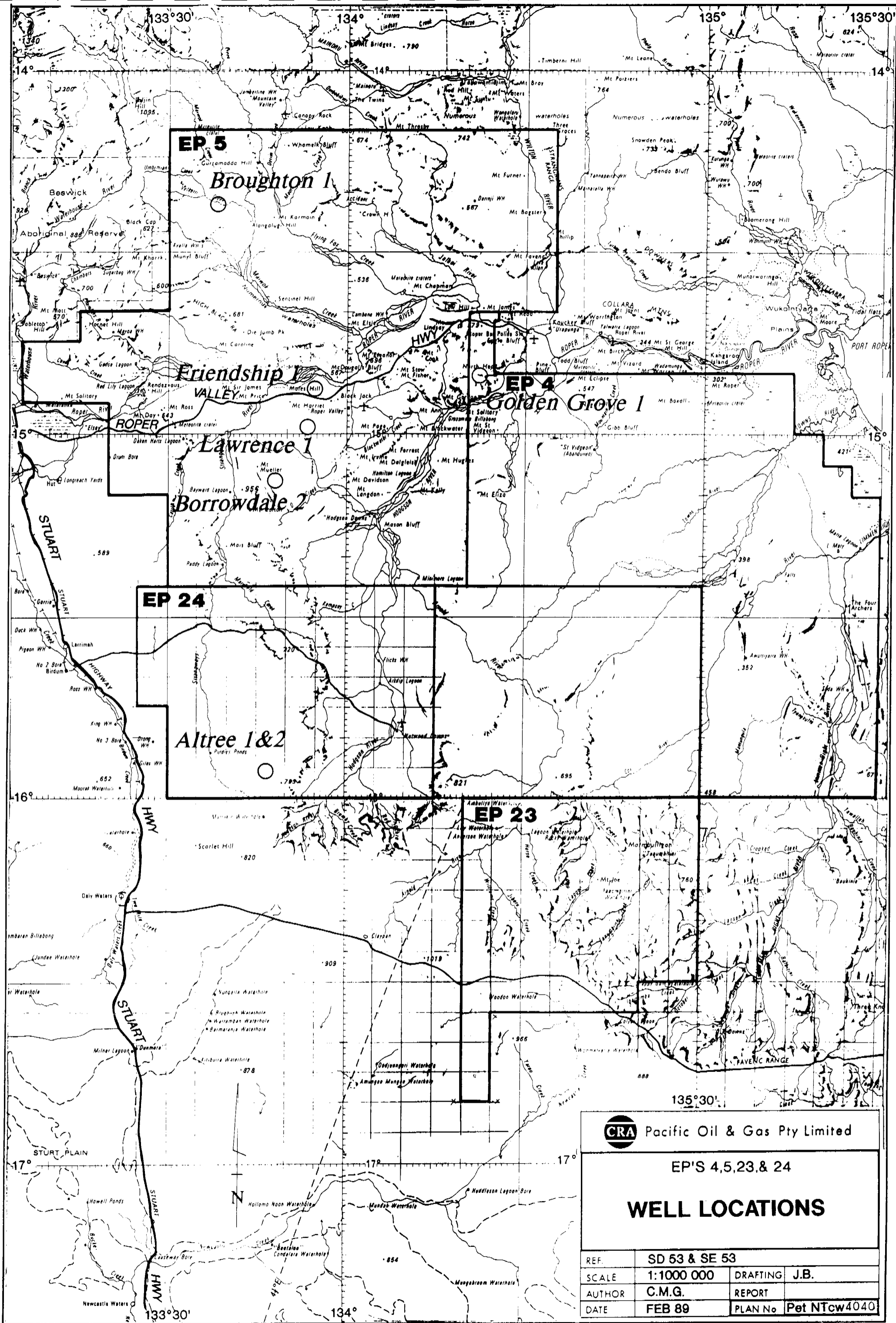


Figure 1

1.2 General Data

Well Name: Golden Grove-1

Well Type: Exploration

Operator: Pacific Oil & Gas Pty Limited

Licence Holders: Pacific Oil & Gas Pty Limited 100%

Petroleum Title: EP4, Northern Territory

Location: Latitude: 14°50'35.799" South
Longitude: ~~134°~~21'49.504" East
AMG Zone: 53 134?
431547.45 East
8358905.1 North

Elevation: Ground Level: 89.4m AHD
Rotary Table: 81.9m AHD 80.4
X 81.9

Total Depth: 439.30m (bgl) driller
439.70m (bgl) logger

Commencement Date: July 31, 1988

Total Depth Reached: August 12, 1988

Rig Released: August 13, 1988

Drilled by: Rockdril Contractors Pty Ltd

Drilling Rig: Rig 18, Modified Mindrill 55
(Longyear 550)

Hole Size: 103mm

Wireline Logs: Spontaneous Potential
Dual Focussed Resistivity
Gamma Ray, Caliper
Density
Neutron Porosity
Multichannel Sonic

Abandonment: Cement plugs over the following
intervals. 99-69m, 30m - surface

1.3 Drilling Rig

ROCKDRIL RIG 18 - RIG AND EQUIPMENT DESCRIPTION

DRILLING RIG: Longyear - Model 550 (Modified Mindrill 55)

1. Drawworks: Longyear single drum operation 3/4" line up to 4 parts with lockhead disc breaking system.
2. Power: One Caterpillar type 3304T diesel engine, mechanically driving rotation and drawworks (5 speeds) and hydraulically driving holdback rams, breakout and spinning tools and chuck.

One Perkins 4.354 diesel engine hydraulically driving two (2) triplex pumps and wireline winch assembly.
3. Mast: Box section angle type mast

Working height above sub structure - 50 feet

Static hook load capacity (4 lines) 85,000 lbs.

Racking Capacity - 9,000 ft of CHD 76 drill pipe.
4. Substructure: Allison low loader with box type drill floor and support racking capacity up to 40 tons.
5. Rig Machinery: Longyear pipe breakout and spinning tool to handle drill pipe and casing up to 3.7".
6. Rig Pumps: Two (2) Bean 435 triplex pumps hydraulically driven. Capacity 37 gallons/minute Rating 1200 psi.
7. Mud Systems: Two (2) steel tanks with a capacity of 40 barrels each operating on a settling basis.

One (1) CD62 mono pump for mixing and desilting.

Two (2) only Honda centrifugal pumps for transfer, recirculating and mixing.

10.

8. Kill mud/cement mixing: One (1) 40 barrel tank utilizing mono pump and hoppers for mixing kill mud and cement as required. Doubles as mud mixing tank.
9. B.O.P. Equipment: One (1) Regan Torus annular type blow out preventor with a 7-1/16 bore and having a working pressure of 3,000 psi.
- One A.P.I. threaded wellhead and drilling spool to suite 5" A.P.I. casing.
- One (1) twin choke manifold with adjustable Cameron chokes and three (3) outlets rated at 3000 psi and two inch (2") 3000 psi valves.
- One (1) Hydril K80 accumulator with a storage capacity of eighty (80) gallons at 1500 psi pressure.
- One (1) Oilwell D 323 triplex pump with a rating of 3000 psi for use as a kill pump.
- One (1) Guiberson type H wireline B.O.P. and oilsaver rated at 3000 psi with a type C releasing attachment.
- One (1) lower kelly cock (2.75") with a rating of 3000 psi.
10. Tubular Equipment: CHD 101 drill pipe (800 metres) and barrels 4-3/4" Collars and Stabilizers.
11. Utility and Auxilary Equipment: Two (2) Caterpillar power generating units (output 75 k.v.a. each).
- One (1) fully equipped workshop container carrying tools and spare parts.
- Two (2) Toyota Landcruiser utilities.

1.4 Hole Sizes and Depths

7-7/8" hole to 10 metres

CHD101 core to 83.5m reamed out to 5-5/8"

CHD101 core to 439.3m (All depths are drillers')

N.B. The CHD101 bottom hole assembly includes a 103mm reaming shell.

1.5 Casing and Cementing

7" Conductor: Grade: K55
 Depth: 9.95m

5" Surface Casing: Weight: 13 ppf
 Depth: 83.5m
 Grade: K55
 Thread: FL4S
 No. of Joints: 8
 Shoedepth: 83.5m
 Cement Used: 16 sacks Class "A"
 Additives: 1 sack calcium chloride
 Accessories: 1 casing shoe
 Remarks: Cemented to surface

1.6 Drilling Mud

A NewDrill polymer mud system was used throughout the well. Details of drilling fluid properties and mud consumed are given in Table 1.

1.7 Water Supply

Both drill water and potable water for use in the camp were obtained from a water hole approximately 11km from the well site.

TABLE 1

DRILLING FLUID SUMMARY

GOLDEN GROVE-1

DATE	TIME	DEPTH (m)	WT (ppg)	FV (sec)	OPERATION	FORMATION	MUD USED *
01/8/88	0700	1.5	8.4	45	Repair Rig	Lower Velkerri Formation	A, B, C
	1200	10	8.4	40	Coring		
	2300	20	8.5	35	"		
02/8/88	0400	28	8.5	35	"		A, B
	1230	43	8.6	35	"		
	2200	62	8.5	35	"		
03/8/88	0300	71	8.4	35	"		
	1430	83.5	8.5	34	Ream to 5-5/8"		
	2100	83.5	8.6	38	"		
04/8/88	0200	83.5	8.8	38	"		
05/8/88	0730	83.5	8.4	35	Drill out cement		
	1230	83.5	8.4	34	Coring		A, B
	2200	100	8.4	45	"		2xA, 2xB, 1xC
06/8/88	0500	122	8.4	42	"		
	1530	153	8.6	36	"	Bessie Creek sandstone	
	2200	170	8.5	36	"	Corcoran Fm.	
07/8/88	0400	187	8.6	36	"		
	1600	208	8.5	47	"		A, B, C
	2100	215	8.6	45	"		
08/8/88	0300	226	8.6	38	"		
	1200	243	8.6	50	"		
	2100	262	8.7	35	"		
09/8/88	0300	277	8.7	35	"		
	0930	290	8.5	37	"		C
	2200	315	8.5	34	"	Munyi Member	
10/8/88	0500	333	8.5	40	"		
	1430	355	8.5	31	"		
	2100	374	8.5	30	Pressure Test		
					Drill String		
11/8/88	0400	390	8.5	37	Coring		
	1230	407	8.5	36	"		
	2100	423	8.5	34	"		
12/8/88	0300	437	8.5	32	"		
	0630	439	8.5	32			

* A = CMCLV (25kg) B = New Vis (20kg). C = New Drill (25lt)

1.8 Bit and Deviation Record1.8.1 Drilling Bits

A total of 5 bits were used in the drilling of Golden Grove-1. Details of bit usage are given in Table 2.

TABLE 2BIT SUMMARYGOLDEN GROVE-1

BIT NO.	MAKE/TYPE	SERIAL NO.	DEPTH IN	DEPTH OUT	WOB KG.	RPM	PUMP PRESSURE psi
1	Hughes, Tricone		0	10	2000	130	
2	Ausbit, 3 step	169-1	10	83.5	1500	600	300
3	Varell V2, Tricone	17347	10	83.5	500	130	150
4	Smith & Gunner, Tricone	P52967	83.5	86.5	3000	130	150
RR2	Ausbit, 3 step	169-1	86.5	199.4	3000	450	300
5	Longyear, 3 step	L27913	199.4	493.3	3000	450	600

N.B: Bit 3 reamed 101 hole to 5-5/8inch

1.8.2 Deviation

The Golden Grove-1 well remained within allowable limits of deviation over its entire length. Deviation survey details are given in Table 3.

TABLE 3DEVIATION SURVEY RECORDSGOLDEN GROVE 1

Depth (m)	Deviation (°)
83.5	Missrun
133	1
289.7	1
439.3	1

1.9 Fishing Operations

No fishing operations were undertaken.

1.10 Formation Testing

No formation tests were conducted.

1.11 Time Distribution

Time spent on the various phases of the drilling operation are given in Appendix 2, and a time-depth curve is illustrated in Figure 2.

1.12 Well Costs

TABLE 4

WELL COSTSGOLDEN GROVE 1

ITEM	COST
Drilling General	91066.28
Diamond Drilling	0.00
Grading/Bulldozing	14051.26
Drilling Materials	2120.61
Drill Stem Testing	725.91
Geophysical Logging	9277.26
Wages and Office costs	6311.56
Supplies & Commun. Gen.	3060.38
Vehicle Operation General	3039.12
Travel & Accommodation Gen.	2913.50
Hire of Camp Accom. Facil.	1558.28
Depreciation	0.00
Insurances	465.03
Contractors/Consult. Gen.	12544.89
Aircraft Hire	0.00
Geological Consultants	0.00
Laboratory Analysis Gen.	0.00
Mineralogical Determinations	1012.69
T O T A L	148146.78

Pacific Oil & Gas Pty Limited
GOLDEN GROVE 1 - TIME DEPTH CURVE

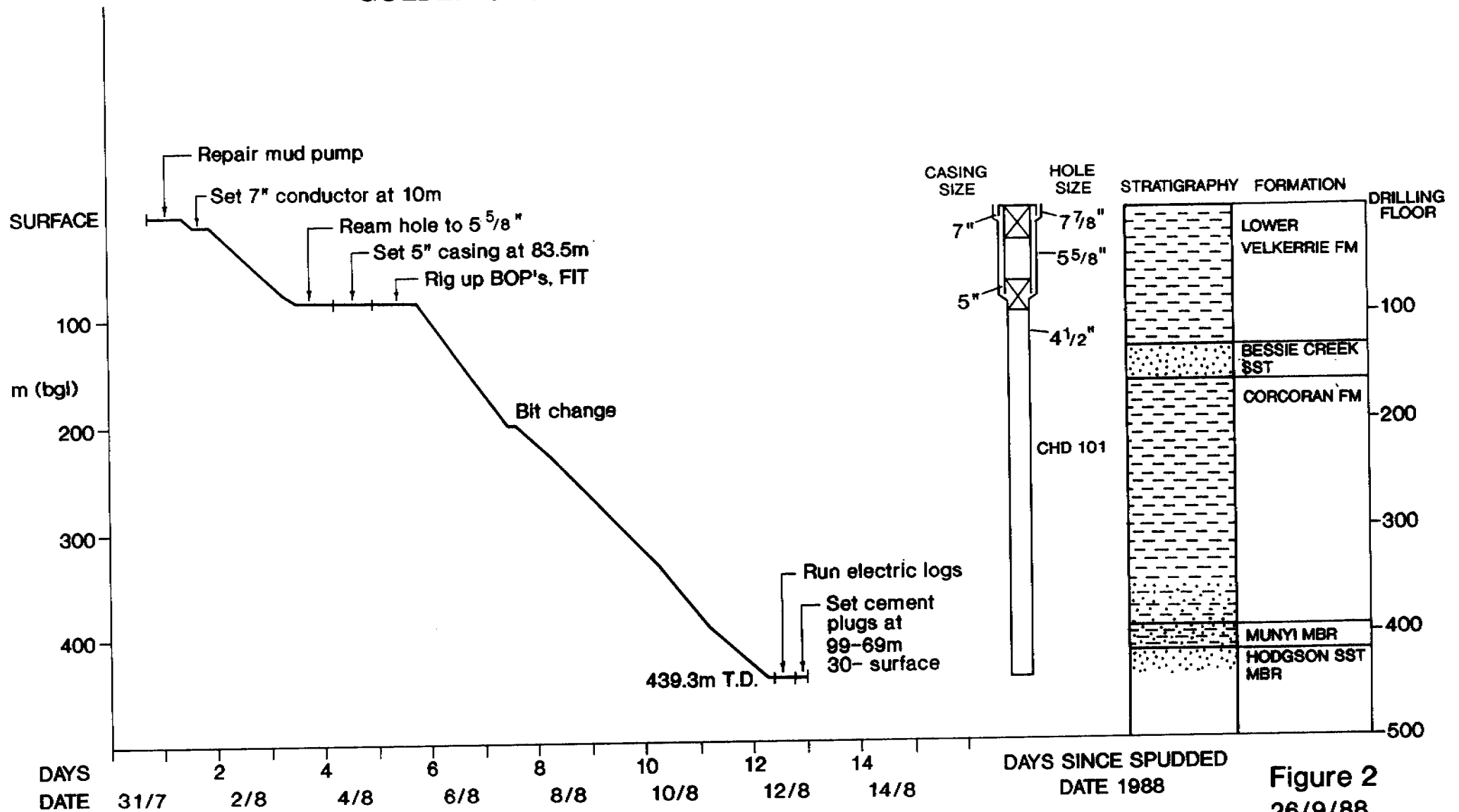


Figure 2
 26/9/88
 J. Torkington

SECTION 2 - GEOLOGICAL DATA

2.1 Geological Summary

Golden Grove-1 was spudded in the Velkerri Formation of the late Proterozoic upper Roper Group of the McArthur Basin. The hole was fully cored from 10 metres to a total depth of 439.3 metres using a CHD 101 core assembly. Cuttings samples were collected at 2 metre intervals from the surface to 10 metres.

The Golden Grove-1 well encountered a typical Roper Group section approximately 215 metres high to prognosis. The well spudded in sediments of the uppermost lower Velkerri Formation and intersected the primary reservoir target, the Bessie Creek Sandstone, at 133.2 metres. The sand was seen to have very little porosity and no shows were observed. Given that the well was approximately 215 metres high to prognosis, a decision was made to drill to the Hodgson Sandstone member of the Abner Sandstone. The Corcoran Formation was intersected at 165.2 metres and the Munyi member of the Abner Sandstone at 396.6 metres. The Hodgson Sandstone member was intersected at 419.9 metres and like the Bessie Creek Sandstone was found to have very little porosity and no shows. The Hodgson Sandstone Member was drilled for 19.4 metres prior to the well reaching total depth at 439.3 metres. Table 5 lists the actual versus prognosed formation tops.

TABLE 5

ACTUAL Vs. PROGNOSED FORMATION TOPSGOLDEN GROVE-1

AGE	FORMATION	ACTUAL DEPTH (M)	PROG. DEPTH (M)	DIFF. (M)
Proter- ozoic	Moroak Sandstone		Surface	
	Upper Velkerri Fm		20	
	Midd Velkerri Fm		110	
	Lower Velkerri Fm	Surface	210	
	Bessie Creek Sst	133.2	350	216.8 high
	Corcoran Fm	165.2	380	214.8 high
	Abner Sst	396.6		
	-Munyi Mbr -Hodgson Sst	419.9		

KPL
30/3/90

see
core
description

Wireline logs were run but failed to indicate any potential hydrocarbon-bearing zones. The well was subsequently plugged and abandoned with the setting of two, 30 metre cement plugs, one over the casing shoe and one at the surface.

2.2 Well Objectives & Performance

The Golden Grove-1 well was drilled to test the hydrocarbon potential of the Proterozoic Bessie Creek Sandstone at the culmination of a north-north east trending anticlinal structure. In addition the well was to provide subsurface data on the stratigraphy of the Roper Group in the Northeast of EP4.

The well intersected both the Bessie Creek Sandstone and the Hodgson Sandstone Member of the Abner Sandstone, at depths significantly higher than prognosed. Both sandstones were void of any shows and lacked appreciable amounts of porosity. The 20-25° structural dip present throughout the well suggests that the Golden Grove-1 well was not a valid structural test. Closer inspection of the surface mapping indicates a number of steeply dipping beds (25-30°) within the core of the broad anticlinal trend. These dipping beds appear to be associated with a number of small north-north east trending faults between two larger east west trending faults. This surface information and the dips from the well indicate that the structure is more complex than presently mapped and that the well was not ideally located to test the structure.

In terms of gaining stratigraphic control, the well fulfilled its objectives. Although Golden Grove-1 was spudded in the Lower Velkerri Formation as opposed to the overlying Moroak Sandstone, its extension to intersect the Corcoran Formation, the Munyi Member and the uppermost portion of the Hodgson Sandstone Member; gave valuable information on the stratigraphy of the Lower Roper Group.

2.3 Stratigraphy

The Stratigraphic nomenclature used in the following discussion is that used by Pacific Oil & Gas.

Proterozoic

lower Velkerri Formation

Surface to 133.2 metres (thickness 133.2 metres)

Medium dark grey claystone with rare wisps and fine intraclasts of grey-black claystone slowly increasing in abundance with depth. Strongly disturbed faint laminae. Abundant fine fractures, often closed but with occasional 1-2mm calcite veins above 33 metres. Unit contains proportionally more siltstone below 90 metres and grades to a sandy siltstone over the last 3 metres. The sandy siltstone is dark grey to greyish black, poorly bedded to faintly laminated, with scattered well rounded fine quartz grains. No visible porosity in sandier units.

Wireline logs were run but failed to indicate any potential hydrocarbon-bearing zones. The well was subsequently plugged and abandoned with the setting of two, 30 metre cement plugs, one over the casing shoe and one at the surface.

2.2 Well Objectives & Performance

The Golden Grove-1 well was drilled to test the hydrocarbon potential of the Proterozoic Bessie Creek Sandstone at the culmination of a north-north east trending anticlinal structure. In addition the well was to provide subsurface data on the stratigraphy of the Roper Group in the Northeast of EP4.

The well intersected both the Bessie Creek Sandstone and the Hodgson Sandstone Member of the Abner Sandstone, at depths significantly higher than prognosed. Both sandstones were void of any shows and lacked appreciable amounts of porosity. The 20-25° structural dip present throughout the well suggests that the Golden Grove-1 well was not a valid structural test. Closer inspection of the surface mapping indicates a number of steeply dipping beds (25-30°) within the core of the broad anticlinal trend. These dipping beds appear to be associated with a number of small north-north east trending faults between two larger east west trending faults. This surface information and the dips from the well indicate that the structure is more complex than presently mapped and that the well was not ideally located to test the structure.

In terms of gaining stratigraphic control, the well fulfilled its objectives. Although Golden Grove-1 was spudded in the Lower Velkerri Formation as opposed to the overlying Moroak Sandstone, its extension to intersect the Corcoran Formation, the Munyi Member and the uppermost portion of the Hodgson Sandstone Member; gave valuable information on the stratigraphy of the Lower Roper Group.

2.3 Stratigraphy

The Stratigraphic nomenclature used in the following discussion is that used by Pacific Oil & Gas.

Proterozoic

lower Velkerri Formation

Surface to 133.2 metres (thickness 133.2 metres)

Medium dark grey claystone with rare wisps and fine intraclasts of grey-black claystone slowly increasing in abundance with depth. Strongly disturbed faint laminae. Abundant fine fractures, often closed but with occasional 1-2mm calcite veins above 33 metres. Unit contains proportionally more siltstone below 90 metres and grades to a sandy siltstone over the last 3 metres. The sandy siltstone is dark grey to greyish black, poorly bedded to faintly laminated, with scattered well rounded fine quartz grains. No visible porosity in sandier units.

STRATIGRAPHY – ROPER GROUP


CHAMBERS RIVER FORMATION		COBANBIRINI FORMATION
McMINN FORMATION	KYALLA MEMBER  SHERWIN IRONSTONE MOROAK SANDSTONE MEMBER	
VELKERRI FORMATION		
BESSIE CREEK SANDSTONE		LANSEN CREEK SHALE
CORCORAN FORMATION		
ABNER SANDSTONE	HODGSON/MUNYI SANDSTONE MBR.	
	JALBOI MEMBER	
	ARNOLD SANDSTONE MEMBER	
CRAWFORD FORMATION		
MAINORU FORMATION		
LIMMEN SANDSTONE		

Figure 3



Bessie Creek Sandstone

133.2 - 165.7 metres (thickness 32.5 metres)

Light grey quartz sandstone, very hard, fine to occasionally medium grained, sub-angular to sub rounded, poorly sorted. Silica cement and silt matrix. Poorly bedded siltstone laminae and cross bedding near top and base. Visual porosity less than 1%. No shows.

Corcoran Formation

165.7 - 396.6 metres (thickness 231.4 metres)

165.7 - 283.9 metres

Siltstone: medium dark grey to dark grey, finely laminated to poorly bedded, disturbed graded bedding. Minor claystone and silty sandstone, moderately abundant pyrite. Beds dipping between 25 and 30°.

283.9 - 335.9 metres

Siltstone, medium grey, becoming dark greenish grey, laminated to thinly bedded, minor graded bedding. Minor light grey laminae of clean quartz silt and very fine sand. Minor scattered siliceous ooids below 327.3 metres. Beds dipping between 25 & 30°.

335.9 - 338.7 metres

Siltstone with minor sandstone, medium dark greenish grey to dark grey, laminated to thinly bedded siltstone with minor graded bedding and slumping. 10% grey laminae of very fine quartz sand and coarse quartz silt with siliceous and dolomitic cement. Sand increases with depth and grades to underlying unit.

388.7 - 396.6 metres

Siltstone with sandstone. Medium dark grey poorly laminated to poorly bedded siltstone with scattered fine grained quartz sand grains and minor pyrite. 20% sandstone, light grey medium grained, occasionally fine or coarse grained, subangular to sub rounded, poorly sorted, fining upward. Laminated thin beds, siliceous cement and silty matrix, beds dipping at 25°. No visible porosity.

Abner Sandstone - Munyi Member

396.6 - 419.9 metres (thickness 23.30 metres)

Sandstone 80%, Silstone 20%: Light grey to greyish red, hard, fine to medium grained, coarse grained, sub angular to sub rounded, very poorly sorted, quartz sandstone. Strong iron staining at base. Silica cement and clay matrix. Siltstone laminae medium dark grey, fining upwards, dewatering features common. Less than 1° visible porosity.

Abner Sandstone - Hodgson Sandstone Member

419.9 - 439.3 metres (19.4 metres penetrated).

Sandstone: very light grey, very hard, fine grained, occasionally medium grained, subangular, moderately well sorted, massive, cross bedded, quartz overgrowths and silica cement. Less than 1% visible porosity. No shows.

2.4 Mud Logging

Mudlogging services were provided by Gearhart Geodata Pty. Ltd. Rate of penetration, total gas detection, fluorescence and H₂S detection services were provided, as well as lag monitoring and the preparation of a continuous mud log at a scale of 1:100.

A copy of the mud log is enclosed with this report (Enclosure 1). In addition the mud logging personnel assisted Pacific Oil & Gas personnel in the handling, marking and description of core.

2.5 Wireline logging and other services

At total depth, the following logs were run by BPB Instruments (Australia) Pty. Ltd.

TABLE 6

ELECTRIC LOGSGOLDEN GROVE 1

LOG	RUN	INTERVAL (m)	DATE
Spontaneous Potential	1	439-83	12/8/88
Dual Focussed Resistivity	2	439-83	"
Gamma Ray, Density	3	439-83 GR to Surface	"
Caliper Neutron Porosity	4	439-83	"
Dual Spaced Sonic	5	439-83	"

Copies of Well logs are included in this report as Enclosures Nos. 2-4.

Abner Sandstone - Hodgson Sandstone Member

419.9 - 439.3 metres (19.4 metres penetrated).

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2.6 Formation Sampling

2.6.1 Ditch Cuttings

Ditch cuttings were collected at two metre intervals from the surface to the 7 inch casing depth at 10 metres. A washed sample was described and a proportion of the sample submitted to the Department of Mines & Energy.

2.6.2 Conventional Core

The Golden Grove-1 well was fully cored from 10m to its total depth of 493.3 metres (excluding the interval 83.5 - 86.4m, which was drilled with a 4½ inch rotary bit to enable the formation integrity test to be conducted). The core was logged and chip samples taken at 2m intervals for microscopic evaluation. A detailed description of the core is included in Appendix 3.

The core from Golden Grove-1 is stored at CRA Exploration Pty. Limited, Darwin.

2.7 Hydrocarbon Shows

No hydrocarbon shows were observed in Golden Grove-1.

2.8 Magnetic Susceptibility

Magnetic susceptibility measurements were made at 1 metre intervals along the entire length of core from Golden Grove-1. A magnetic Susceptibility Log is included as Enclosure 5.

2.9 Contributions to Geological Knowledge

Given the paucity of sub-surface data in the McArthur Basin, the fully cored stratigraphic section intersected in Golden Grove-1 will add greatly to understanding the stratigraphy and geological setting of the McArthur Basin.

The lack of porosity in either of the two reservoir units intersected unfortunately must downgrade the area's hydrocarbon potential.

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KEYWORDS

Drill Stratigraphic; Geophys Borehole; Hydrocarbon Potential;
Proterozoic.

LOCATION

Chapman 1:100,000 Sheet 5768, EP4: Golden Grove-1; McArthur Basin:
Northern Territory.

APPENDIX 1

DRILLING SUMMARY - GOLDEN GROVE-1

<u>DATE</u>	<u>TIME</u>	
31 July	1700	Spud well, drill to 1.5m with 7-7/8" rotary bit (Bit No. 1). Clay blocking of bit.
	1900	Continue to rig up, repair mud pumps.
1 August	0900	Drill to 10m with 7-7/8" rotary bit.
	1400	Set 7" casing at 9.95m and cement to surface with 6 sacks class "A" cement.
	1500	Wait on cement
	2000	Drill cement 7 - 10m
	2030	Core from 10m to 32.3m with CHD101 (Bit No. 2)
2 August	0600	Service Rig
	0630	Core from 32.3m with CHD101, rocks heavily fractured.
	1430	Repair lube pump - Rig head assembly.
	1500	Core with CHD101, heavily fractured formation.
	1730	Service Rig, Mud pumps
1800	Core with CHD101	
3 August	0900	Pull out of hole, Clear blocked bit, Run in hole
	1000	Core with CHD101 to 83.5m
	1045	Survey Hole - Missrun
	1130	Pull out of hole, Lay down drill rods
	1215	Rig up heavy weight drill collars, 5-5/8" rotary bit, and ream down to 83.5m
4 August	0400	Pull out of hole, Lay down drill collars
	0600	Run 5" casing, hole reamed 2.5m short, pull casing, Run drill string and ream hole to correct casing depth.
	1200	Rerun 5" casing set at 83.5m.
	1330	Repair mud pumps
	1530	Cement casing to surface with 16 sacks Class "A" cement and 1 sack calcium chloride.
	1630	Wait on cement
	2200	Nipple up BOP's
5 August	0330	Pressure test choke manifold - failed.
	0345	Repair choke manifold valve
	0500	Pressure test kill line, choke line, choke manifold, to 1000 psi for 15 mins. O.K. Test B.O.P. O.K.
	0530	Make up 4½ inch rotary bit (Bit No. 4) and Run in hole to drill plug and float shoe.
	0700	Drill out cement - float and formation to 86.5m.
	0930	Formation integrity test. Formation leaked off at 500 psi with 8.5 ppg mud in hole.
	1000	Pull out of hole. Make up CHD 101 core assembly (rerun Bit No. 2) and run in hole.

<u>DATE</u>	<u>TIME</u>	
	1100	Core with CHD 101
	1730	Service Rig
	1800	Core with CHD 101
6 August	1100	Survey 133m, 1°
	1130	Core with CHD 101
7 August	0530	Service Rig
	0600	Core with CHD 101
	0830	Repair rig engine, blocked fuel line
	0845	Core with CHD 101
	0915	Replace damaged swivel
	0945	Core with CHD 101
	1115	Pull out of hole for Bit No. 5, Run in hole
	1315	Core with CHD101
9 August	0600	Core stuck in Drill pipe - knock out with bar on wire line
	0745	Core with CHD 101
	1000	Survey 289.7m, 1°
	1030	Core with CHD 101
	1445	Dropped Core - Ream over to bottom
	1515	Core with CHD 101
10 August	0530	Service Rig
	0600	Repair chuck, Jaw retaining ring broken
	0700	Core with CHD 101
	1700	Repair damaged mud hose
	1730	Core with CHD 101
	2030	Pressure test drill string (OK)
	2130	Core with CHD101 to 439.7m
12 August	0600	Survey 439.7m, 1°
	0630	Circulate and condition hole
	0700	Pull out of hole, strapped out depth 439.3m
	0900	Run wireline logs. Spontaneous potential, Dual focussed resistivity, Gamma ray, Density, Neutron Porosity, Caliper and Sonic
	1700	Run in hole, set cement plug at 99-69m (8 sacks class "A" cement and $\frac{1}{2}$ sack calcium chloride)
	1815	Wait on cement, tag plug with 500kg
	2315	Set cement plug at 30m to surface (8 sacks Class "A" cement and $\frac{1}{2}$ sack calcium chloride)
13 August	0000	Release Rig

APPENDIX 2

TIME DISTRIBUTION

GOLDEN GROVE-2

Date	Drilling Reaming	Coring	Recover Dropped Core	Trips	Service Rig	Repair Rig	Casing & Cement	Wait On Cem.	Test Nipple up	FIT	Survey	Test Drill String	Condition Mud	Pipeline Log	Set Aband Plugs
31/7	2					5									
1/8	5½	3½				9	1	5							
2/8		22½			1	½									
3/8	11 3/4	9 3/4		1 3/4							3/4				
4/8	6			6		2	2½	5½	2						
5/8	2½	12½		2½	½				5½	½					
6/8		23½									½				
7/8		20 3/4		2	½	3/4									
8/8		24													
9/8		21 ¼	2¼								½				
10/8		21			½	1½						1			
11/8		24													
12/8		6		2				5			½		½	8	2
TOT HRS	27 3/4	188 3/4	2¼	14½	2½	18 3/4	3½	15½	7½	½	2¼	1	½	8	2
%	9.4	64.0	0.8	4.8	0.8	6.4	1.2	5.3	2.5	0.2	0.8	0.3	0.2	2.7	0.7

APPENDIX 3 - CORE DESCRIPTION

<u>Interval</u>	<u>Core Description</u>
0.0m - 4.0m	Moderate reddish orange to moderate reddish brown weathered claystone/soil.
4.0m - 10.00m	Moderate reddish brown claystone.
10.00m - 22m	Soft, medium light grey, mottled reddish brown, claystone mottling decreasing with depth.
22.00m - 83.5m	<u>Claystone</u> - medium dark grey massive, non bedded, conchoidal fracture. Minor 1-2mm thick calcite veins. Flecks or very fine intraclasts of black claystone from about 30m, associated with poor, disturbed bedding. Strong degree of fine closed fracturing, may be a result of weathering/drying out.
83.50m - 86.50m	No core.
86.50m - 98.00m	<u>Brecciated Claystone</u> medium dark grey, - <u>shearzone</u> (rock totally destroyed).
98.00m - 105.6m	<u>Siltstone/Claystone</u> medium dark grey and grey black finely laminated to thinly bedded. Grey black laminae increasing in abundance with depth. Dip 15° to 50°, abundant microfaulting and soft sediment deformation.
105.6m - 110.5m	<u>Siltstone/Claystone</u> - grey black and medium dark grey - grey-black laminae 50% of rock, strongly fractured.
110.5m - 122.3m	As above. Grey black laminae 15%.
122.3m - 124.4m	As above. Grey black laminae 50%.
124.4m - 131.7m	<u>Siltstone</u> , medium dark grey - dark grey, laminated to thinly bedded. Clayey, trace sand and pyrite.
131.7m - 133.2m	<u>Sandy Siltstone</u> - dark grey to greyish black siltstone with minor clay and scattered well rounded fine quartz sand grains, poorly bedded to faintly laminated. No visible porosity.
133.20m - 163.5m	<u>Sandstone</u> - light grey to medium light grey. Very hard, fine to occasionally medium grained, poorly sorted, subangular - moderately well rounded, silty, poorly bedded with disrupted laminae and intraclasts of sandy siltstone over top 3.5 metres. Bedding at 20° - 35°, minor pyrite, silica cement and silt matrix. Few 2-4cm beds dark grey siltstone in upper 60cm of interval - minor fracturing.

<u>Interval</u>	<u>Core Description</u>
163.5m - 165.7m	<u>Sandstone</u> - as above, siltstone laminae and silt component becoming more abundant with depth. Cross bedding.
165.7m - 301.0m	<u>Siltstone/Claystone</u> medium grey - dark grey, finely laminated to poorly bedded, disturbed graded bedding. Slumping, dewatering, bedding 25° - 30°, dark grey portions pyritic. Fine grained silty pyrite sandstone interbeds between 172.30 and 174.10m (no visible porosity). Collapse structures between 186.70 - 187.20m, dark grey siltstone increases with depth and becomes more pyritic. Abundant blebs and minor laminae of pyrite from 195.5m to 260m.
301.0m - 388.7m	<u>Siltstone/grades to minor sandstone.</u> Medium dark greenish grey to dark grey, laminated to thinly bedded siltstone, minor graded bedding, slumping. Minor light grey laminae of very fine quartz sand and coarse quartz silt, with dolomitic and siliceous cement. Rare laminae and veins of coarse dolomite.
327.3m	Minor scattered siliceous ooids (particularly at 329.70m dip 25° - 30°). 348.0m - Bright green staining, particularly along laminations in very fine sands (e.g. slumped interlaminated very fine dolomitic sandstone and siltstone @ 356.1m). Laminae of quartz sand increases in thickness and grain size with depth. No visible porosity, grades to -
388.7m - 396.6m	<u>Siltstone/Sandstone</u> - siltstone 80%, medium dark grey poorly laminated to poorly bedded with scattered very fine grained quartz sand grains and minor pyrite. Sandstone 20% light grey, medium grained, occasionally fine or coarse grained, subangular to subround, poorly sorted, fining upwards laminae and thin beds and lenses. Siliceous cement and silty matrix, ooid like silica concretions common. Slumped, intraclasts of siltstone. Dip 25°. No visible porosity, grades to -
396.60m - 414.3m	<u>Sandstone 80%/Siltstone 20%.</u> Light to medium grey, fine to coarse grained, subangular to sub rounded, poorly sorted quartz sandstone with silica cement and silty matrix. Sandstone beds and laminae - distinct bases to beds - generally fine upwards into medium dark grey to dark greenish grey siltstone. Poorly laminated, graded bedding, dewatering features common, fine to coarse quartz sand grains scattered throughout.

Interval

Core Description

Sandstone has fine grained dark grey and pale yellow sulphides including pyrite, disseminated and in pore spaces. Dark green chloritic alteration. Reddish brown, translucent, hard silicate mineral and soft bright green transparent fine grained mineral. Proportion of siltstone increases with depth, less than 1% visible porosity, grades to -

414.3m - 419.9m

Sandstone light grey and greyish red, hard; fine to medium grained, occasionally granular - coarse grained, sub angular to sub round very poorly sorted, poorly bedded, strong iron oxide staining. Silica cement and clay matrix. 10% siltstone and claystone laminae and intraclasts. Disrupted bedding.

419.9m - 439.7m
(T.D.)

Sandstone very light grey, very hard, fine grained, occasionally medium grained, subangular, moderately well sorted, massive, cross bedded, quartz overgrowths and silica cement. Very minor inclusions of silt. <1% visible porosity.