MAGELLAN PETROLEUM (N.T.) PTY. LTD.

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August 20, 1965

The Director,
Bureau of Mineral Resources,
Geology and Geophysics
P. O. Box 378
Canberra City, A. C. T.
Australia

Dear Sir:

Re: Well Completion Report, Palm Valley No. 1, Northern Territory

Herewith is presented the well completion report for Palm Valley No. 1, Northern Territory, as required in the agreement under the Petroleum Search Subsidy Act 1959 - 1964, dated March 25, 1965, between The Commonwealth of Australia and Magellan Petroleum (N. T.) Pty. Ltd.

The report was compiled in accordance with Section 14 and Appendix 4, Department of National Development, Petroleum Search Subsidy Act 1959 - 1964, Memorandum of Administrative Procedures (Revised May, 1965).

Originals of all illustrations for the report will be held in our files until requested by the Director.

Very truly yours,

MAGELLAN PETROLEUM (N. T.) PTY. LTD.

R. M. Hopkins

R. M. Hopkins
Assistant to Chairman (Technical)

RMH:geh

PALM VALLEY NO. 1 WELL, NORTHERN TERRITORY

OF

MAGELLAN PETROLEUM (N. T.) PTY. LTD.

WELL COMPLETION REPORT

by
Magellan Petroleum (N. T.) Pty. Ltd.
August, 1965

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SUMMARY

A. DRILLING

The Palm Valley No. 1 well, located about 75 miles southwest of Alice Springs, Northern Territory, is the discovery well of the Palm Valley gas field. Drilling commenced on January 7, 1965 and the well was completed as a shut-in gas well on May 20, 1965 after reaching a total depth of 6,658 feet. Air drilling equipment was used to drill the hole to a depth of 5,573 feet. Below that depth mud was used as the circulating fluid. Twentyfour conventional cores, totaling 319 feet-8 inches were cut of which 96 percent was recovered. Measurements of gas flows were made on four occasions while drilling with air, and eight drill stem tests were taken while drilling with mud. Electrical, radioactivity, acoustical, and temperature logs of the hole were run and a velocity survey of the well was made. Three strings of casing were set and cemented in the hole as follows: 13-3/8 inch at 403 feet, 9-5/8 inch at 3,192 feet, and 7 inch at 6,134 feet. The hole was plugged back to 6,169 feet, casing was perforated at selected intervals in the lower Stairway and upper Pacoota, between the depths of 5,178 and 5,916 feet. The well was completed in these perforations and in open hole from 6,134 to 6,169 feet in the upper Pacoota.

Completion tests were conducted of two selected intervals in the upper Pacoota, and of the lower Stairway. Each completion test consisted of a pressure build-up test and a modified isochronal flow test. Bottom-hole pressures were recorded during all tests and are shown as Enclosure 5 (b). Analyses of these tests indicate extensive formation damage in all zones and additional flowing and testing are planned for the near future.

B. GEOLOGICAL

Regional and detailed surface mapping indicates the Palm Valley anticline to be a large gentle structure located in the north central part of the Amadeus basin. The Palm Valley No. 1 well was drilled on the eastern portion of the structure near the surface axis.

The section encountered by the well differed only slightly with that which was predicted from outcrop studies. The well penetrated the surface outcropping Pertnjara formation (? Devonian), the Mereenie formation (? Ordovician), the Stokes, Stairway and Horn Valley formations, (Ordovician), and was terminated in the Pacoota formation (Ordovician).

Reservoir rocks containing gas were encountered in the lower Stairway and upper Pacoota formations. The gross thickness of the gas accumulation suggests a subsurface closure of the Palm Valley anticline in excess of 1,000 feet.

INTRODUCTION

Magellan Petroleum (N. T.) Pty. Ltd. drilled Palm Valley No. 1 as a stratigraphic test of the Palm Valley anticline. The well, located in the north-central part of the Amadeus basin about 75 miles southwest of the city of Alice Springs and about 70 miles east of the Mereenie field, was a gas discovery. It was drilled to establish subsurface stratigraphic control and to determine the fluid content of any reservoir rocks penetrated. These objectives were accomplished.

Personnel responsible for conduct of field operations at Palm Valley No. 1 were Mr. R. E. Hay, Wellsite Geologist, and Mr. J. O. Telfer, Drilling Superintendent. Operations were first supervised by Mr. M. K. Taylor and later by Mr. M. A. Brown, Petroleum Engineers and by Mr. R. M. Hopkins, Chief Geologist.

WELL HISTORY

A. GENERAL DATA

Well Name and Number:
Palm Valley No. 1

Operator:
Magellan Petroleum (N. T.) Pty. Ltd.
Fourth Floor Bowman House
Edward at Adelaide Streets
Brisbane, Queensland, Australia

Tenement Holder:
Magellan Petroleum (N. T.) Pty. Ltd.
Fourth Floor Bowman House
Edward at Adelaide Street
Brisbane, Queensland, Australia

Petroleum Tenement:
Oil Permit No. 43; Petroleum (Prospecting and Mining) Ordinance of Northern Territory

District:
Hermansburg and Henbury, Northern Territory

Location:
24°00' South Latitude,
136°46'20" East Longitude

Elevation:
Ground - 1907 Feet Above Sea Level
Rotary Table - 1921 Feet Above Sea Level
Depth Datum - Rotary Table = 0 Feet

Total Depth:
6658 Feet
Plugged Back Depth:
6169 Feet

Drilling Commenced:
January 7, 1965

Drilling Completed:
May 1, 1965

Well Completed:
May 21, 1965

Rig Was Released:
May 21, 1965

Drilling Time in Days to Total Depth:
114 Days

Status:
Completed as a gas well through selective casing perforations between 5, 178 feet and 5, 916 feet and through an open hole interval from 6, 132 feet to 6, 169 feet (P. B. T. D.). A Halliburton R3 packer (2-7/8" x 7") is set at 5, 109 feet with 2-3/8" E. U. tail pipe open ended at 5, 202 feet, and 2-3/8" E. U. tubing to surface, landed in a National type H-1 hanger with 7, 000 pounds weight setting on the packer. A National type B wellhead (2" ser 1500) with two master gates was installed. Mud weighing 10. 2 pounds per gallon is in the annulus above the packer.

Cost:
Not available since certain invoices are still outstanding at this date.

B. DRILLING DATA

Drilling Contractor:
Richter Bawden Drilling Pty. Ltd.
Third Floor, Perry House
Elizabeth and Albert Streets
Brisbane, Queensland, Australia

Drilling Plant:
Make: National
Type: 55
Rated Capacity with 4-1/2" Drill Pipe: 10, 000 Feet
Motors (3): GMC, 12107 Series 6-71 Twin Diesel,
Rated 312 BHP each at 1840 RPM
(936 HP Total Rig)

Mast:

Make:	Lee C. Moore
Type:	Cantilever-131'
Rated Capacity:	510,000 pounds

Pumps and Compressors:

Two Pumps:

Make:	National Ideal
Type:	C-350
Size:	7-3/4" x 18"
Motors:	Compound driven from draw-works engines

Four Compressors:

Make:	Gardner Denver
Type:	WEK
Size:	7-3/4" x 5" x 6" stroke (450 CFM ea.)
Motors:	GM series 4-71 diesel, 131 BHP ea.

Two Boosters:

Make:	Gardner Denver
Type:	RXD (1500 psi max.)
Size:	6" x 11" (132 CFM displacement)
Motors:	Waukesha 148 DKU, 100 BHP each

Blowout Preventer Equipment:

Make:	Hydril	Shaffer
Size:	GK12"	12" Double Gate
Series (API)	900	900

Hole Sizes and Depths:

Diameter	Depth
17-1/2"	408 feet
12-1/4"	3192 feet
8-3/4"	6168 feet
6-1/8"	6658 feet

Casing, Liner, and Cementing Details:

	Conducter	Surface	Intermediate	Production	Liner
Size: (in. dia.)	20"	13-3/8"	9-5/8"	7"	None
Weight (lbs/ft):	40	48	36	26	
Grade:	Mild	J-55	J-55	N80 & J55	
Range:	---	2-ST&C	2-ST&C	2-LT&C	
Setting Depth:	20'	403'	3192'	6134'	
No. Joints:	1	13	103	200	
Float Collar (depth):	---	338	3159	6102	
Float Shoe (depth):	---	403	3192	6134	
Plugs:	None	None	None	None	
Centralizers (depth):	---	393-338	---	6102-5217	
Scratchers (depth):	---	---	---	6102-5155	
Cement (sacks):	5	310	600	360	
Cemented To:	Surface	Surface	2225 (log)	4400 (log)	
Method Used:	Hand Mix	2 Plug Pumped	2 Plug Pumped	2 Plug Pumped	

Drilling Fluid:

Air was used for drilling fluid from surface to 5,573 feet during which treatment consisted of additions of foaming agent and lime to the air stream. At the depth of 5,573 feet the well was mudded up with a fresh water clay mud to control the flow of gas. Drilling was continued using the water base mud treated periodically with Unical, Milcon, Bentonite, and Caustic. Frequent additions of barites were required to maintain the required mud weight. Mica and cellophane flakes were used occasionally to control lost circulation. Prior to setting production casing, a mud weight of 11.2 pounds per gallon was required to control gas pressure in the Stairway formation at 5,178 feet. After casing off the Stairway formation, a mud weight of 10.0 pounds per gallon was sufficient to control gas pressure in the Pacoota formation.

The following tabulation presents the average weekly analysis and treatments.

Date	Weight (bbls/gal)	Viscosity (Marsh) (Seconds)	Water Loss (cc)	pH.	Treatment During Week
1-14	--	--	--	--	Air drilling
1-21	--	--	--	--	157 bbls. H_2O, 108 gals. soap
1-28	--	--	--	--	438 bbls. H_2O, 235 gals. soap
2- 4	--	--	--	--	79 bbls. H_2O, 79 gals. soap, 74 sx lime
2-11	--	--	--	--	Air & H_2O, 279 sx lime
2-18	--	--	--	--	Fishing
2-25	--	--	--	--	24 bbls. H_2O, 6 gals. soap
3- 4	--	--	--	--	448 bbls. H_2O, 112 gals. soap
3-11	--	--	--	--	444 bbls. H_2O, 111 gals. soap
3-18	11.5	47	14.0	9	56 bbls. H_2O, 14 gals. soap 4,054 sx barites, 24 sx lime, 496 sx gel, 84 sx Unical - 100# caustic, 12 sx Milcon
3-25	11.4	53	8.3	9.5	1,255 sx barites - 107 sx gel 12 sx Jel Flake - 450# caustic - 42 sx Milcon - 21 sx Unical
4- 1	11.5	53	7.8	9.75	246 sx barites - 42 sx gel - 5 sx Unical - 5 sx Milcon - 150# caustic
4- 8	11.3	47	8.4	10.0	3,355 sx barites - 246 sx gel - 450# caustic - 5 sx Unical - 46 sx mica - 35 sx Jel Flake
4-15	H_2O				Water
4-22	H_2O				10 gal. soap - 180 gal. diesel
4-29	10.2	37	--	10.25	100 sx barites - 157 sx gel - 625# caustic - 17 sx Unical
5- 1	10.1	38	12.0	9.1	5 sx gel - 18 sx Milcon - 7 sx barites

Water Supply:

A bore hole was drilled to 1,040 feet at the well site without encountering water. Water supply for drilling was pumped from a pit dug in the Fink river bed. Camp water was hauled from the Hermannsburg Mission.

Perforations and Shooting Record:

Open Hole Shooting:

6,146 to 6,156 feet; Shot two holes per foot using 19 Welex Torpedo-Jets, each having 177.0 gms. explosive, shot from Welex wireline; API tests report these jets result in a hole size of 1.5 inches and a penetration of 22-1/2 inches.

Casing Perforations (7" 26 lb/ft casing):

Depth Interval (Feet)
5910 to 5916
5865 to 5870
5765 to 5771
5706 to 5718
5644 to 5654
5632 to 5642
5550 to 5575
5296 to 5300
5270 to 5280
5246 to 5250
5228 to 5240
5195 to 5224
5178 to 5184

The above casing intervals were perforated with four jets per foot using Welex 4" Super Dyna-Jets each having 19.0 grams explosive charge; API test reports these jets result in a hole size of 0.56 of an inch in diameter and a penetration of 8.58 inches.

Plugging Back and Squeeze Cementation Jobs:

No.	Interval	Amount, Type, Method and Remarks
1	6168' to 6108'	25 sx cement plus 1 percent CaCl plus 10 pounds Jel Flake, through drill pipe; waited 8 hours, tagged plug at 6165'
2	6165' to 6110'	20 sx cement plus 4 percent gel plus 10 pounds Jel Flake, through drill pipe; waited 8 hours, tagged plug at 6165'
	6165' to 6160'	1 bbl. coarse gravel dropped through open ended drill pipe; tagged top of gravel plug at 6160'
3	6160' to 6105'	25 sx cement plus 2 percent CaCl plus 10 pounds Jel Flake; waited 8 hours, tagged top of plug at 6130'; cleaned out with bit to 6148'; ran 7 inch casing to 6134'
4	6658' to 6165' Plug back to above gas-water contact 6200'	85 sx cement, washed off at 6165' by reverse circulation. Tagged top of hard cement at 6169' after fishing job.

Fishing Operations:

Depth	Date	Summary of Operations
2060'	2- 2-65	Twisted off 6-1/4" drill collar tool joint while reaming 8-3/4" hole with 12-1/4" bit. Left 6 - 8" drill collars in hole. Went in with overshot and recovered fish. (6 hours fishing)
2105'	2- 2-65	Twisted off drill collar tool joint while reaming 8-3/4" hole with 12-1/4" bit. Went in hole with tapered tap and recovered fish. (10-1/2 hours fishing)

Fishing Operations

Depth	Date	Summary of Operations
2368'	2- 4-65	Twisted off pin on 6-1/4" drill collar while drilling 12-1/4" hole. Went in with overshot and recovered fish. (5-3/4 hours fishing)
3189'	2-12-65	Joint parted (unscrewed) while running in hole with bit No. 35. Dropped 24 6-1/4" collars and 54 joints 4-1/2" drill pipe. Ran in open ended, recovered 53-1/2 joints drill pipe. Fished with overshots, mills, baskets, washover shoes, wall hooks and magnets. Recovered fish on February 19, 1965. (163-1/2 hours fishing plus 13 hours cleaning out)

Side-tracked Hole:
None

C. LOGGING AND TESTING

Ditch Cuttings:

Cuttings from Palm Valley No. 1 were collected and examined every ten feet down to 5,640 feet and every five feet thereafter. While air drilling, cuttings were collected in a container hung under a short extension off the discharge line. While drilling with mud, the cuttings were collected from the shale shaker. Two representative samples of each interval were placed in bags. One set of samples were sent to the Director of the Bureau of Mineral Resources, Geology and Geophysics, of the Commonwealth; the other set is stored by the operator.

Coring:

The original programme provided for conventional cores to be taken:

1. at each major change of formation;

2. at depths selected to provide adequate information on the section being drilled;

3. when an indication of porosity, permeability, oil or significant gas is detected.

4. where not provided for above, at intervals of approximately 300 feet, except in uniform lithology when by prior agreement the interval may be extended to 500 feet; and

5. at total depth.

The minimum acceptable core diameter for conventional cores was specified 2-3/8 inches, and the minimum length of core cut was specified 10 feet.

Most of the objectives of the original core programme were accomplished. Cores were cut at the first bit change after each major change of formation. Cores were cut at approximate intervals of 500 feet to a depth of 2, 789 feet, and at approximate intervals of 300 feet or less, below 2, 789 feet. Some of the core runs were held to less than 10 feet because of bit wear, jamming of the core barrel, or the desire of the operator to test strong flows of gas that were encountered.

Three attempts were made to core 10 feet at total depth. A total of only 8 feet was cut and 7 feet recovered because the vertically fractured formation jammed the core barrel. Acknowledgement of satisfaction for terminal core requirements was obtained from the Director prior to plugging the well back for completion.

Twenty-four (24) cores were cut for a total footage of 319 feet 8 inches. Total core recovery was 307 feet, or 96 percent. A record of the coring is shown on page 13.

Hughes HFC/J 8-3/4 inch bits were used to cut five cores. The remaining cores were cut with Christensen diamond bits ranging in size from 6-3/4 inch to 6-1/16 inch. Conventional core barrels were used for all cores.

Side-wall Sampling:

No side-wall samples were taken.

Electrical and Other Logging:

Welex wireline logs were run on five different occasions. The total intervals covered by the various type logs are as follows on page 14.

MAGELLAN PETROLEUM (N. T.) PTY. LTD.

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PALM VALLEY NO. 1

RECORD OF CORING

Core No.	Core Depth (Feet)	Cored (Feet)	Amount Recovered (Feet)	Recovery (Percent)
1	693- 702	9	8' 2"	90
2	1162-1167	5	5	100
3	1621-1624	3	2' 9"	91
4	2219-2234	15	15	100
5	2789-2799	10	9' 2"	92
6	3181-3181'8"	0'8"	No rec.	0
7	3293-3298	5	4' 7"	92
8	3622-3632	10	8	80
9	3899-3909	10	8' 4"	83
10	4265-4275	10	9	90
11	4611-4621	10	10	100
12	4942-4952	10	10	100
13	5197-5200	3	1' 9"	58
14	5565-5573	8	7	88
15	5580-5638	58	58	100
16	5724-5784	60	60	100
17	5894-5924	30	30	100
18	6166-6168	2	1' 9"	88
19	6346-6393	47	47	100
20	6470-6474	4	3'10"	96
21	6474-6476	2	1'10"	92
22	6646-6650	4	3' 3"	81
23	6650-6651	1	No rec.	0
24	6655-6658	3	3	100

Representative portions of each core were forwarded to the Director of the Bureau of Mineral Resources, Geology and Geophysics, of the Commonwealth. The remaining portions are stored by the operator.

Induction - Electrical - Self Potential	404' - 6651'
Guard - Self Potential	3189' - 6651'
FoRxo - Caliper	3189' - 6654'
Caliper	404' - 3190'
Gamma Ray - Neutron	200' - 6653'
Acoustic Velocity - Gamma Ray	10' - 6650'
Temperature	500' - 6072'

Penetration Rate Log:

Penetration rates were recorded by Geolograph and are presented graphically herein on enclosure three.

Gas Log:

While drilling with air to the depth of 5, 573 feet, significant gas shows were detected by means of a pilot flare located at the end of the discharge line. Periodic measurements of gas flow were made as described in the section of this report on formation testing. Logging of gas shows while drilling with mud was not attempted because of lost circulation and contamination of the mud by up-hole gas.

Formation Testing:

The following tabulation summarizes the tests that are described in detail in the appendix:

Empty Hole Flow Tests (while drilling with air)

Test Number	Test Interval (Feet)	Gas Flow Rate (MCF/Day)	Remarks
--	3192(1)-5193	2,470	40 minute test
--	3192(1)-5290	1,630	One hour test
--	3192(1)-5565	5,860	90 minute test
--	3192(1)-5573	11,700	16 hour test

Open Hole Drill-stem Tests (while drilling with mud)

Test Number	Test Interval (Feet)	Gas Flow Rate (MCF/Day)	Remarks
1	5500 - 5640	4,000 - 5,000 (est.)	Rec. 450' gassy mud
2	5170 - 5310	728	Rec. 1200' gas cut mud.
3	5630 - 5784	1,550	Rec. 420' mud.

(1) Bottom of casing - top of open hole. First gas show was at 5, 193 feet.

Test Number	Test Interval (Feet)	Gas Flow Rate (MCF/Day)	Remarks
4	5784 - 5924	10 (est.)	Rec. 1251 gassy mud.
5	5924 - 6110	-	No flow. Rec. 100' mud.
6	6134 - 6318	250 (est.)	Rec. 90' water.
7	6318 - 6476	-	No gas. Rec. 1080' salt water.
8	6530 - 6658	-	No gas. Rec. 270' gassy mud.

Deviation Surveys:

Surveys were made at intervals of less than 500 feet. Where change in deviation was in excess of the maximum allowable, the interval between runs was held to less than 100 feet except at 5,530 feet where the interval was 130 feet, and at 5,660 feet where the interval was 151 feet. The following tabulation lists the deviation surveys of the well:

Depth (feet)	Deviation (degrees)	Depth (feet)	Deviation (degrees)	Depth (feet)	Deviation (degrees)	Depth (feet)	Deviation (degrees)
35	1/4	2158	1/2	3670	3-3/4	4512	4
77	1/2	2310	1/2	3680	2-3/4	4611	2-3/4
133	3/4	2390	2	3705	4-3/4	4690	3-1/2
200	1/2	2459	3/4	3735	4	4810	4-3/4
260	1/4	2548	3/4	3765	3-1/2	4881	4-1/2
335	1/4	2610	1-1/8	3795	4	4911	4-1/4
410	1/2	2675	1/4	3825	2-3/4	4971	4-1/2
510	3/4	2765	3/4	3855	2-3/4	5031	3
726	1-1/8	2820	7/8	3891	3-1/2	5111	2
846	1	2883	2-3/4	3910	2-1/4	5170	4
1000	1-1/8	2916	1-1/8	3940	4-1/4	5230	3
1175	3/4	2970	1-1/4	3970	2-1/4	5330	2-1/2
1440	2	3066	1-3/4	4000	2-3/4	5530	5
1500	1-1/8	3120	1	4039	3-1/4	5660	6-1/2
1569	3/4	3181	1-1/2	4130	2-3/4	5811	6
1620	1-1/2	3260	1-3/4	4180	3-1/2	5894	5-1/2
1687	3/4	3385	2	4240	2-1/4	5976	4-1/2
1770	1/2	3470	2-3/4	4305	4-1/4	6110	5
1890	1-1/8	3560	3-3/4	4340	4-1/8	6240	5-1/2
1970	1-1/2	3610	4-3/4	4360	3	6470	5
2030	3/4	3620	2-1/4	4420	3-3/4	6561	4-1/2
2090	1	3640	4-1/2				

Temperature Surveys:

Recorded open-hole temperatures are shown in the following tabulation:

Source	Depth (feet)	Temperature (degrees F)
Log Run 1	3,193	126
DST 2	5,209	154
DST 1	5,634	154
Log Run 1	5,640	152
DST 3	5,780	150
DST 4	5,920	152
Log Run 3	6,100	158
DST 6	6,312	152
DST 7	6,471	153
Log Run 4	6,651	153

Temperature logs were run after casing was cemented at 3,192 feet and at 6,134 feet.

Velocity Surveys:

A velocity survey of the well and calibration of the Acoustic Velocity log was conducted by Compagnie Generale de Geophysique. A copy of the report on this survey is included as Enclosure No. 4-b.

Other Well Surveys:

None

Production Testing:

Productive formations were grouped into three major zones for completion testing. A pressure build up and a four point modified isochronal flow test was conducted on each zone after acidizing. An Amerada pressure bomb recorded bottom hole pressures throughout the tests. A brief summary of the completion test results is shown in the following table:

Completion Test	No. 1	No. 2	No. 3
Date	10-11, May	14-15, May	19-20, May
Interval (gross feet)	6134-6169	5550-5916	5178-5916
Formation (zone)	lower P1	upper P1	lower Stairway & U. P1
Acid (gallons)	1,350	1,350	1,350
Depth of recorder (feet)	6000	5470	5300
Stabilized BHP (psig)	2917	2889	2874
Calc. open flow (MCF/D)	1,380	5,200	5,400

GEOLOGY

A. SUMMARY OF PREVIOUS WORK

Geological:

The surface geology of the Palm Valley anticline was mapped in 1961 by R. M. Hopkins, Jr. of Magellan Petroleum Corporation. The results of this work is presented in a report prepared for the Corporation (McNaughton, 1962). Reports on the Hermannsburg and Henbury sheet areas by The Bureau of Mineral Resources, Geology and Geophysics (Prichard and Quinlan, 1962; Ranford and Cook, 1964) describe the geology of the region surrounding the Palm Valley structure.

Geophysical:

In 1961 the Geophysical Branch of the Bureau of Mineral Resources carried out a helicopter gravity survey of the Hermannsburg and Henbury areas and made three short seismic traverses near the east end of the Palm Valley structure.

Drilling:

No drilling other than shallow water wells had been done on or near the anticline prior to Palm Valley No. 1.

B. SUMMARY OF THE REGIONAL GEOLOGY

The Palm Valley anticline is situated in the north-central part of the Amadeus basin. This basin is an east-west trending structural depression covering about 80, 000 square miles and containing up to 30, 000 feet of late Proterozoic and Paleozoic marine and continental sediments.

Marine sedimentation in the Amadeus basin started in late Proterozoic time and terminated in late Ordovician time. The deposits consist chiefly of clastics and carbonates. Thick salt deposits in the Proterozoic Bitter Springs and Cambrian Jay Creek formations, together with Proterozoic and Ordovician black pyritic shales, indicate that silled basins with restricted circulation of marine waters existed from time to time.

The marine cycle of deposition was terminated by the Pertnjara orogeny. This orogenic episode created a welt located north of the Amadeus basin and a bordering foredeep - whose depoaxis is located along the present northern margin of the basin - into which a thick apron of poorly sorted coarse clastic detritus was dumped.

South of the foredeep, the sedimentary strata were regionally folded into large anticlines and synclines.

The structural evolution of the Amadeus basin has been greatly influenced by salt tectonics. Sedimentary loading on the semi-plastic Bitter Springs salt layer produced flowage and initiated salt anticlines and salt domes, which grew periodically as is shown by crestal stratigraphic convergence and local unconformities. Also, the Bitter Springs and Jay Creek salt layers probably served as "lubricated zones" along which slippage was localized during the Pertnjara orogeny.

C. STRATIGRAPHIC TABLE

The following table shows the depth, thickness, and age of units penetrated by Palm Valley No. 1:

Age	Formation	Depth (Feet)	Subsea Depth (Feet)	Thickness (Feet)
? Devonian	Pertnjara	Surface	+1921	1016+
? Ordovician	Mereenie	1016	+ 905	2192
Ordovician	Stokes	3208	-1287	1112
Ordovician	Stairway	4320	-2399	976
Ordovician	Horn Valley	5296	-3375	338
Ordovician	Pacoota	5634	-3713	1024+
	Total Depth	6658	-4737	

D. STRATIGRAPHY

Pertnjara Formation - Surface to 1, 016 feet

Age: Palaeozoic (? Devonian)

Sandstone to 470 feet. Light orange to light red and reddish brown, mainly very fine to fine grained and medium grained, occasional coarse sand stringers, mainly siliceous (bonded with silica), angular to subrounded, dolomitic to calcareous in part, abundant green feldspar? grains. Two minor dark reddish brown shale stringers at 125 to 130 feet and 226 to 230 feet.

Interbedded sandstone, siltstone and shale from 470 feet to 860 feet. The sandstone is orange and reddish brown, very fine to fine and medium grained, occasional coarse grained, angular to subrounded, well to medium sorted, occasionally poorly sorted,

mainly siliceous, dolomitic to calcareous in part, abundant green feldspar? grains. The siltstone is mainly dark reddish brown, occasionally greyish green in part, micaceous, sandy in part. The shale interbeds are dark reddish brown, blocky to platy, micaceous and silty in part. Traces of gypsum were noted throughout the section, distributed as flecks and small spots in the shale and siltstones and also occurring in small veins and fractures.

Interbedded shale, siltstone and sandstone from 860 to 1,016 feet. The shale is dark reddish brown, blocky to platy, micaceous silty in part and gypsiferous in part, also slightly dolomitic in part. The siltstone is orange-red to dark reddish brown dolomitic, sandy and micaceous in part. The sandstone is light orange to reddish brown, mainly very fine to fine grained, occasionally medium grained, medium to well sorted, angular to subrounded, siliceous, slightly dolomitic in part, silty, some green feldspar? grains.

Mereenie Formation - 1,016 to 3,208 feet.

Age: Palaeozoic (? Ordovician)

Sandstone from 1,016 to 1,320 feet. Light orange to orange-red, well consolidated, hard, tight, very fine to medium grained, medium to well sorted, angular to subrounded, siliceous cement with some minor white clay (kaolin?) in places, slightly dolomitic in part, green mineral grains (feldspar?), minor scattered thin lenses and pockets of dark reddish brown shale and minor scattered thin stringers of greyish green silty sand.

Sandstone from 1,320 to 1,600 feet. White, light orange and orange-red, siliceous cement, minor white clay, slightly dolomitic in part, very fine to medium grained, angular to subrounded, medium to well sorted, some green mineral grains (feldspar?), scattered dark reddish brown shaly partings, occasional scattered thin stringers of white to green silty sand.

Sandstone from 1,600 to 2,660 feet. White to bright orange and orange-red, siliceous cement in part, minor white clay, fine to medium grained with some stringers and patches of coarse grained sandstone, subangular to round quartz grains, medium to well sorted, occasionally poorly sorted, very slightly dolomitic in part, some dark mineral grains, occasionally silty in part, scattered thin interbeds of dark reddish brown shale.

Sandstone from 2,660 to 2,760 feet. Bright orange-red and rusty red, siliceous cement in part, minor white clay, fine to

medium grained with some coarse sand stringers, subangular to rounded quartz grains, medium to well sorted, occasionally poorly sorted, some dark mineral grains.

Sandstone from 2, 760 to 2, 910 feet. Bright orange-red (2760-2800 feet) and white, whitish pink, light reddish pink and occasional orange and light purple siliceous cement, fine to medium grained, occasionally coarse grained, angular to subrounded, occasional well rounded quartz grains, medium to well sorted, occasionally poorly sorted, minor scattered dark red and reddish brown shaly and silty partings.

Sandstone from 2, 910 to 2, 984 feet. White to rusty red, light pink and orange pink, siliceous in part, argillaceous to silty in part, mainly fine grained with minor thin lenses of medium to coarse grained sand, some white clay, some green silty sand and occasional dark red shaly to silty partings. The sandstone in this interval does not appear to be as clean as the sand above, probably due to the argillaceous and silty content.

Interbedded shale and sandstone from 2, 984 to 3, 015 feet. Shale - reddish brown, blocky, micaceous, silty in part, some inclusions and flecks of green silty shale. Sandstone - white, orange and red, fine grained, occasionally medium to coarse grained, poorly to well sorted, silty, minor white clay.

Sandstone from 3, 015 to 3, 050 feet. White and rusty red, siliceous in part, silty in part, mainly fine grained, occasional medium to coarse grained sand, angular to subrounded, poorly to well sorted, some dark red silty and shaly partings.

Interbedded shale and siltstone from 3, 050 to 3, 175 feet. Shale - red to dark red with minor flecks, spots and inclusions of green shale (typical Stokes type shale), blocky to platy, micaceous, silty in part, some medium to coarse, subangular to rounded floating quartz grains, gypsiferous in part. Siltstone - red green, micaceous in part grading to very fine silty sand in places.

Sandstone from 3, 175 to 3, 208 feet. Minor interbeds shale and siltstone. Sandstone - white, light pink, cream and rusty red, siliceous in part, argillaceous to silty in part, very fine to fine grained, angular to subrounded, well sorted, minor green silty sand and white clay.

Stokes Formation - 3, 208 to 4, 320 feet.

Age: Palaeozoic (Ordovician)

Mainly interbedded shale and siltstone from 3, 208 to 4, 010 feet. Minor thin silty stringers of fine grained sand in the upper sixty feet of the interval. Shale - red to dark reddish brown with flecks, inclusions, spots and patches of green shale mottled in part, blocky to platy, micaceous, gypsiferous in part, silty and slightly dolomitic in part. Siltstone - red to reddish brown and green, micaceous, dolomitic in part, slightly sandy in places. Some of the shale is fractured and the fractures filled with white gypsum and the shale is also severely slickensided (Core No. 9) in places.

Shale as above from 4, 010 to 4, 130 feet. Minor grey, greyish green and purple shale with minor scattered thin interbeds of limestone. Limestone - white, cream whitish brown, red, greyish green and green, crypto-crystalline, silty and dolomitic in part.

Shale and minor limestone interbeds from 4, 130 to 4, 240 feet. Shale - dark grey, minor red and green shale, blocky to platy, micaceous, dolomitic to calcareous in part, fossiliferous, occasionally silty in part. Limestone - white, light and dark grey, crypto to very finely crystalline, argillaceous and dolomitic in part, fossiliferous.

Mainly shale and siltstone from 4, 240 to 4, 320 feet. Minor dolomite stringer near top of section and minor thin silty sand stringer towards base of section.

Stairway Formation - 4, 320 to 5, 296 feet.

Age - Palaeozoic (Ordovician)

Mainly sandstone with interbeds of shale from 4, 320 to 4, 400 feet. Sandstone - white, light to dark grey, siliceous, silty in part, mainly very fine to fine grained with occasional medium to coarse quartz grains in a fine sand matrix, angular to subrounded, mainly well sorted, occasionally poorly sorted, slightly dolomitic to calcareous in part, scattered dark mineral grains and black shaly partings, occasionally slightly micaceous and argillaceous in places, some minor white clay (kaolin). Shale - dark grey to black, blocky to platy, micaceous, silty in part.

Mainly shale and siltstone from 4, 400 to 4, 552 feet. Thin interbeds of very fine to fine grained silty sandstone.

Sandstone interbedded with shale and siltstone from 4, 552 to 4, 710 feet. Sandstone - mainly white to grey, some whitish green, green and dark reddish brown sand (Core No. 11), very fine to

fine grained, angular to subrounded, well sorted, siliceous in part, argillaceous to silty in part, occasionally micaceous, slightly dolomitic in places, some dark mineral grains and shaly partings. Siltstone - white to grey with minor green and dark reddish brown siltstone, micaceous, dolomitic in part, occasionally sandy. Shale - grey to black, some green and red shale, blocky to platy, micaceous and silty.

Interbedded shale, siltstone and very fine to fine silty sandstone from 4, 710 to 4, 860 feet.

Sandstone from 4, 860 to 5, 160 feet. Thin interbeds of shale terminating with a 12 to 14 foot shale and siltstone zone at the base. Sandstone - white, cream, grey and dark greyish brown, some minor whitish green and greyish green sand, siliceous, silty in part, slightly dolomitic in part, generally very fine to fine grained, with occasional medium to coarse grained sand stringers in the basal seventy feet of the section, occasional well rounded coarse quartz grains in a fine sand matrix, mainly well sorted, occasionally poorly to medium sorted, minor white clay, minor dark mineral grains, slightly pyritic and micaceous in part. No porosity or permeability was noted over this interval.

Sandstone from 5, 160 to 5, 296 feet. Some dark grey to black shale interbeds. Sandstone - clear to white, light to medium grey and light greyish brown, siliceous, orthoquartzitic, fine to coarse grained, angular to subrounded with some well rounded quartz grains, medium to well sorted, slightly silty in part, some black mineral grains and black shaly partings. The lower forty feet of the section contains two black shaly carbonaceous stringers and the basal thirty feet of the sand is very pyritic. The pyrite occurs mostly as well rounded pellets in the sandstone. The basal sand has some poor intergranular porosity and also evidence of horizontal fracturing (Core No. 13).

Horn Valley Formation - 5, 296 to 5, 634 feet.

Age: Palaeozoic (Ordovician)

Interbedded shale and dolomite from 5, 296 to 5, 480 feet and interbedded shale and limestone from 5,480 to 5,550 feet. Shale-dark grey to black, blocky to platy, micaceous, fossiliferous and silty in part interbedded with thin stringers of dolomite, light grey to dark greyish brown, crypto to finely crystalline, argillaceous and silty in part, calcareous in part. Limestone - white, light brown to dark greyish brown, crypto to finely crystalline, argillaceous, dolomitic in part, fossiliferous.

Interbedded limestone, dolomite and shale from 5, 550 to 5, 580 feet. Some very fine to coarse grained glauconitic and dolomitic sand at the base of the section 5, 570 to 5, 580 feet.

Mainly shale from 5, 580 to 5, 634 feet. Two minor thin sand stringers near base of interval, and minor interbeds of siltstone. Much of the section showed evidence of fractures (Core No. 16).

Pacoota Formation - 5, 634 to 6, 658 feet.

Age: Palaeozoic (Ordovician)

Interbedded sandstone and shale from 5, 634 to 6, 390 feet. Sandstone - generally white and light to dary grey, white, pink and rusty red sand from 6, 010 to 6, 130 feet, fine to medium grained, occasionally coarse grained angular to rounded, poorly to well sorted, siliceous, slightly dolomitic to calcareous in part, occasionally micaceous and silty, some dark mineral grains and black shaly partings and black fossil debris.

The interval from 6,220 to 6,400 feet is glauconitic to very glauconitic. The sandstone occurs partly as well defined beds and partly as a mixed pattern of sandstone and shale with worm tubes suggesting organic reworking and giving some of the sand-shale intervals a mottled appearance. No intergranular porosity was noted in the samples over this interval, fracture porosity was noted in Cores Nos. 16, 17 and 19.

Predominantly sandstone from 6, 390 to 6, 658 feet. Some interbeds of dark grey to black shale and grey siltstone. Sandstone-white to light and dark grey, siliceous, slightly dolomitic in part, occasionally silty, minor white clay, mainly fine to medium grained, occasionally coarse grained, angular to subrounded, occasional well rounded quartz grains (medium and coarse grained sand), poorly to well sorted. Drilling was terminated in a zone (6, 646 to 6, 685 feet) of white to reddish brown very fine to fine grained silty sand interbedded with dark reddish brown shale and minor grey to black silty shale. The interval 6, 580 to 6, 610 feet appeared to have some poor intergranular porosity from samples.

E. STRUCTURE

On the surface the Palm Valley anticline is expressed as an east-west trending ridge that makes up the eastern portion of the Krichauff Ranges. Surface mapping and studies of aerial photographs show the structure to plunge easterly at the east end of the ridge and suggests a weak westerly plunge for the western portion of the structure.

Dips determined from cores show the sediments penetrated by Palm Valley No. 1 well to be flat-lying.

Although the amount of closure at the surface appears to be small, the anticline probably has greater relief below the unconformity at the base of the Pertnjara. There are indications that the gas encountered in Palm Valley No. 1 occupies one communicated reservoir. If such is the case, closure for the gas accumulation exceeds 1,000 feet. Additional subsurface information will be required to determine whether folding, faulting, stratigraphic changes or a combination of these factors provides reservoir closure at Palm Valley.

F. RELEVANCE TO OCCURRENCE OF PETROLEUM

The discovery of gas by the Palm Valley No. 1 well greatly enhances the prospects for finding additional hydrocarbon accumulations in the Amadeus basin. Both the Palm Valley structure and the Mereenie field, located 70 miles to the west, produce from reservoirs in marine Ordovician sediments. This increases the probability that closed structures in the Amadeus basin, which have marine Ordovician sediments unbreached by erosion, will contain oil and/or gas reservoirs.

G. POROSITY AND PERMEABILITY OF SEDIMENTS PENETRATED

Cuttings and cores from Palm Valley No. 1 were microscopically examined by the well-site geologist and visual determinations of porosity were reported in descriptions of the cutting samples. Selected core samples were analyzed for porosity and permeability by Core Laboratories, Inc. The results of these analyses are presented in Appendix 3.

Intervals of good porosity and permeability in the Mereenie sandstones are indicated by samples, cores and log data, and by flows of fresh water encountered by the well. The Stairway sandstones appear to be nonporous to 5,193 feet. Below that depth the Stairway, Horn Valley, and Pacoota formations are fractured and also exhibit occasional zones of fair intergranular porosity in the sandstones.

H. CONTRIBUTION TO GEOLOGICAL CONCEPTS

Palm Valley No. 1 provides the first subsurface information about much of the Ordovician and post Ordovician section for a large area in the north-central portion of the Amadeus basin.

The section penetrated by the well is similar to that predicted from studies of outcrops. Valuable information regarding the thickness and lithology of the penetrated rocks was obtained.

The presence of gas in an interval of over 1,000 feet in the well indicates the subsurface structural closure of the Palm Valley anticline to be considerably greater than that which could be determined from geological mapping of the surface.

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APPENDIX 1

WATER AND GAS ANALYSES

A. WATER ANALYSIS

by Northern Territory Administration-Animal Industry Branch

Report SN 65/570 Dated 27/4/65

Sample Description:	No. 1	No. 2
Origin	Mud filtrate	DST #7
Depth (feet)	Surface	6318-6476
Date	26/4/65	26/4/65
Results In Parts Per Million:		
Chloride	14,500	112,150
Sulphate	1,350	60
Calcium	1,400	16,400
Bicarbonate	700*	600*
Carbonate	200*	Nil
Sodium	11,000*	56,000*
Potassium	400	4,000
Magnesium	Nil	40
Residue on Evaporation	28,600	217,300
pH	9.5	7.1

B. GAS ANALYSIS

by The Australian Mineral Development Laboratories

Report AN 2310/65

Sample Description:	No. 1	No. 2	No. 3
Formation	Stairway	U. P1	L. P1
Test	Open hole	DST #1	DST #6
Depth (feet)	3292-5290	5500-5640	6134-6318
Date	12/3/65	21/3/65	19/4/65

* approximately

B. GAS ANALYSIS (Continued)

Analysis - Gas Chromatography (Percent, air and moisture free)	No. 1	No. 2	No. 3
Nitrogen N_2	1.57	1.52	1.25
Methane CH_4	86.4	86.2	86.3
Ethane C_2O_6	10.1	10.4	10.4
Propane C_3H_8	1.23	1.20	1.38
i-Butane C_4H_{10}	0.16	0.15	0.16
n-Butane C_4H_{10}	0.28	0.27	0.29
Higher Hydrocarbons C_5-C_9	<0.3	<0.3	<0.3
	100.0	100.0	100.0
Contaminants:			
Water vapor and air	3.4%	1.9%	11.5%

Report AN 2469/65

Sample Description:	No. 1	No. 2	No. 3	No. 4
Formation	Stairway +	U. P1	L. P1	L. P1
Test	Compl. #3	Compl. #2	Compl. #1	DST #6
Depth (feet)	5178-5916	5550-5916	6134-6169	6134-6318
Date	20/5/65	15/5/65	10/5/65	19/4/65
Analysis - Gas Chromatography (Percent, air and moisture free)				
Nitrogen N_2	5.15	4.15	2.59	2.25
Helium He	0.13	0.15	0.16	0.14
Carbon Dioxide CO_2	0.12	0.38	0.17	0.53
Methane CH_4	82.6	83.2	84.2	84.3
Ethane C_2H_6	9.6	9.8	10.4	10.1
Propane C_3H_8	1.51	1.58	1.63	1.72
i-Butane C_4H_{10}	0.21	0.16	0.20	0.30
n-Butane C_4H_{10}	0.39	0.29	0.37	0.35
i-Pentane C_5H_{12}	0.07	0.08	0.07	0.07
n-Pentane C_5H_{12}	0.06	0.05	0.05	0.05
Hexanes C_6H_{14}	0.07	0.07	0.06	0.06
Higher Hydrocarbons	<0.1	<0.1	<0.1	<0.1
	100.0	100.0	100.0	100.0

B. GAS ANALYSIS (Continued)

Contaminants:	No. 1	No. 2	No. 3	No. 4
Air	16.2	6.75	11.2	16.2

Report AN 2677/65

Sample Description:	No. 1
Formation	All zones
Test	production
Depth (feet)	5178-6169 gross
Date	8/June/65

Analysis -
Gas Chromatography
(Percent, air and moisture free)

Nitrogen N_2	2.10
Hydrogen H_2	0.02
Helium He	0.18
Carbon Dioxide CO_2	0.11
Methane CH_4	88.0
Ethane C_2H_6	8.0
Propane C_3H_8	1.11
i-Butane C_4H_{10}	0.12
n-Butane C_4H_{10}	0.24
i-Pentane C_5H_{12}	600 ppm
n-Pentane C_5H_{12}	340 ppm
Hexanes C_6H_{14}	350 ppm
Higher Hydrocarbons	<250 ppm
	99.9

Contaminants:

Air	4.3%

APPENDIX 2

DESCRIPTIONS OF CUTTINGS SAMPLES

by

Ron Hay, Magellan Petroleum (N. T.) Pty. Ltd.

PALM VALLEY NO. 1 WELL

Rotary Table Elevation 1921 Feet (Datum)

Depth	Description
0-10	No sample.
20	Sandstone light orange and red, unconsolidated, calcareous to dolomitic, very fine to fine grained, well sorted, angular to subrounded, silty (sample very fine, powdery).
30	Sandstone orange and reddish brown, unconsolidated, very fine to fine grained, angular to subrounded, well sorted, silty, dolomitic to calcareous, minor green feldspar? grains.
50	Sandstone as above very fine to medium grained, medium sorted, trace white clay and dark reddish brown shaly partings.
70	Sandstone dark orange and reddish brown, unconsolidated, angular to subrounded, very fine to medium grained, occasional coarse grained quartz grains, medium sorted, silty, dolomitic to calcareous, some light to dark green mineral grains, minor white clay.
80	Sandstone dark reddish brown, unconsolidated, very fine to fine grained, angular to subrounded, well sorted, silty, dolomitic to calcareous, some green feldspar? grains, some dark reddish brown shaly partings.
100	Sandstone as above, very fine to coarse grained, angular to subrounded, poorly sorted, unconsolidated, dark red brown shaly partings.
120	Sandstone orange to light reddish brown, unconsolidated, very fine to medium grained, medium sorted, angular to subrounded, silty, dolomitic to calcareous, some green feldspar? grains, minor white clay.

APPENDIX 2 (Continued)

Depth	Description
130	Shale (70%) dark reddish brown, platy, micaceous, silty in part. Sandstone (30%) as above.
170	Sandstone orange to light reddish brown, unconsolidated, angular to subrounded, very fine to medium grained, medium sorted, silty, dolomitic to calcareous, some green mineral grains, minor white clay and dark red shaly partings.
180	Sandstone light orange to light reddish brown, unconsolidated aa trace dark red shaly partings.
200	Sandstone aa, very silty.
220	Sandstone orange-red, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, silty, dolomitic to calcareous, minor white clay and green feldspar? grains.
250	Sandstone light orange to reddish brown, unconsolidated, angular to subrounded, very fine to medium grained, medium sorted, silty, dolomitic to calcareous, minor dark red shaly partings and green mineral grains, trace white clay.
290	Sandstone light orange-red unconsolidated aa? samples fine powdery.
310	Sandstone aa trace minor dark red shaly partings.
340	Sandstone light orange to light red, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, dolomitic to calcareous, silty, some green mineral grains, trace white clay.
350	Sandstone orange to light red, unconsolidated, angular to subrounded, fine to medium grained, well sorted, occasional coarse quartz grain, slightly silty in part, dolomitic to calcareous, some green feldspar? some pink feldspar? grains.

APPENDIX 2 (Continued)

Depth	Description
370	Sandstone light orange to light red unconsolidated, angular to subrounded, very fine to fine grained, occasional medium grained quartz grains, well sorted, dolomitic to calcareous, silty, some green mineral grains.
380	Sandstone aa trace large angular white quartz fragments.
390	Sandstone light orange to light red, unconsolidated, as above.
400	Sandstone aa trace clear to white large angular quartz fragments.
410	Sandstone light orange to light red, unconsolidated, very fine to medium grained, medium sorted, silty, dolomitic to calcareous, occasional scattered coarse quartz grains, some light to dark green grains, (feldspar?), minor white clay partings.
420	Sandstone light reddish brown and orange, unconsolidated, very fine to medium grained, occasional scattered coarse quartz grains, silty, medium sorted, dolomitic to calcareous, green feldspar? grains, minor dark red shaly partings.
460	Sandstone aa minor medium grey to green silty sand, minor dark reddish brown micaceous shaly partings.
470	Siltstone (90%) dark reddish brown, dolomitic, sandy and shaly in part, slightly micaceous. Sandstone (10%) aa.
480	Sandstone reddish brown and orange, well consolidated, siliceous in part, very fine to fine grained, well sorted, silty, dolomitic to calcareous, abundant green feldspar? grains, some dark red shaly partings and grey to green silty sand.

APPENDIX 2 (Continued)

Depth	Description
500	Sandstone (60%) aa Siltstone (40%) dark reddish brown, micaceous in part, dolomitic, sandy and shaly in part.
520	Sandstone (60%) reddish brown and orange, poorly to well consolidated, siliceous in part, very fine to fine grained, occasional medium to coarse quartz grains, well sorted, silty, dolomitic to calcareous, some green feldspar? grains. Shale (30%) dark reddish brown, blocky to platy, dolomitic in part, micaceous, silty in part. Siltstone (10%) aa.
530	Sandstone (70%) reddish brown and orange, poorly to well consolidated, siliceous in part, very fine to medium grained, medium sorted, silty dolomitic to calcareous, green feldspar? grains. Shale (30%) dark reddish brown, micaceous, blocky to platy, silty in part.
550	Sandstone orange to light brownish red, poorly to well consolidated, siliceous in part, very fine to medium grained, medium sorted, angular to subrounded, silty, green feldspar? grains, some light grey to greyish green silty sand. Trace of coarsely crystalline vein calcite, some white clay.
560	Sandstone (80%) orange to dark reddish brown, well consolidated, siliceous in part, very fine to medium grained, medium sorted, angular to subrounded, dolomitic to calcareous, abundant green mineral grains, some white clay, minor greyish green silty sand, silty. Siltstone (20%) dark reddish brown, dolomitic, micaceous in part, sandy to shaly in part.
570	Sandstone (80%) as above, occasional coarse grained quartz grains, silty. Shale (20%) dark reddish brown, blocky to platy, micaceous, silty in part.
580	Shale (60%) as above, grading in part to a dolomitic siltstone. Sandstone (40%) orange to dark reddish brown, well consolidated, siliceous in part, angular to subrounded, fine to coarse grained, poorly sorted, dolomitic to calcareous, silty, green feldspar? grains, some white clay.

APPENDIX 2 (Continued)

Depth	Description
590	Sandstone orange, well consolidated, siliceous in part, very fine to medium grained, medium sorted, angular to subrounded, dolomitic to calcareous, silty in part, green mineral grains, trace coarsely crystalline calcite probably vein calcite. Minor dark reddish brown shaly partings. Some white clay or gypsum?
600	Sandstone (70%) aa. Shale (30%) dark reddish brown, blocky to platy, micaceous, grading in part to a dolomitic siltstone. Trace of vein calcite.
610	Sandstone (70%) as above trace light grey to green silty sand, much white clay (gypsum or barite?) Shale (30%) as above.
620	Shale (80%) dark reddish brown, blocky to platy, micaceous, grading in part to dolomitic siltstone. Sandstone (20%) orange, poorly to well consolidated, siliceous in part, angular to subrounded, fine to medium grained, medium sorted, occasional coarse quartz grains, green mineral grains, white clay, dolomitic to calcareous, silty in part.
650	Shale (70%) as above. Sandstone (30%) as above. Trace grey to green silty sandstone.
660	Shale (70%) as above, very micaceous in part. Sandstone (30%) as above, unconsolidated to well consolidated.
670	Sandstone light orange to light reddish brown, poorly to well consolidated, friable in part, some poor to fair intergranular and pinpoint porosity (5-8%) fine to medium grained, well sorted, angular to subrounded, dolomitic to calcareous, green mineral grains, minor white clay, slightly silty in part. Trace dark red shaly partings.
680	Sandstone light orange, unconsolidate, angular to subrounded, very fine to medium grained, medium sorted, dolomitic to calcareous, slightly silty in part, some green mineral grains (feldspar?) minor white clay and dark red shaly partings.

APPENDIX 2 (Continued)

Depth	Description
693	Sandstone orange to light reddish brown, poorly to well consolidated, siliceous in part, very fine to medium grained, medium sorted, angular to subrounded, dolomitic to calcareous, green feldspar? grains, some white clay (or gypsum?) silty in part.
693-702	CORE NO. 1 Cored 9' Recovered 8'2" 90% Recovery.
710	Sandstone (70%) orange, poorly to well consolidated, siliceous in part, very fine to medium grained, medium sorted, angular to subrounded, dolomitic to calcareous, some green feldspar? grains, silty, minor white clay, trace of white to light orange soft gypsum. Shale (30%) dark reddish brown, blocky, dolomitic, silty, micaceous.
730	Sandstone (70%) orange, unconsolidated as above, trace gypsum. Shale (30%) as above.
740	Sandstone (60%) orange to reddish brown, unconsolidated, angular to subrounded, very fine to medium grained, medium sorted, dolomitic to calcareous, silty in part, green mineral grains, some white clay, trace clear to white soft anhydrite. Shale (40%) dark reddish brown platy, micaceous, silty.
750	Sandstone as above with dark reddish brown shaly partings.
760	No sample.
770	Sandstone (50%) orange to reddish brown, unconsolidate, angular to subrounded, very fine to fine grained, well sorted, dolomitic to calcareous, green mineral grains, minor white clay, silty. Shale (50%) dark reddish brown, platy, micaceous, silty.
780	Shale (60%) as above. Sandstone (40%) orange, poorly to well consolidated, angular to subrounded, very fine to medium grained, medium sorted, dolomitic to calcareous, green mineral grains, white clay.

Depth	Description
790	Sandstone (60%) as above. Shale (40%) as above.
800	Shale (70%) as above grading in part to siltstone. Sandstone (30%) as above. Trace clear to white long thin laths of anhydrite.
810	Sandstone (60%) orange, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, dolomitic to calcareous, silty in part, green mineral grains, some white clay. Shale (40%) dark reddish brown, blocky to platy, micaceous, silty.
820	Shale (90%) as above. Sandstone (10%) as above.
830	Sandstone (80%) as above. Shale (20%) as above.
840	Sandstone (60%) as above. Shale (40%) as above. Trace clear to white anhydrite.
860	Sandstone (80%) orange to reddish brown, unconsolidated, angular to subrounded, very fine to medium grained, medium sorted, dolomitic to calcareous, green feldspar? grains, silty in part. Shale (20%) dark reddish brown, blocky to platy, micaceous, silty, minor green shale and siltstone.
870	Sandstone (90%) as above. Shale (10%) as above.
880	Sandstone (70%) as above. Shale (30%) as above.
	TOP PERTNJARA SHALE 880' (+1041)
890	Shale (90%) dark reddish brown, blocky to platy, micaceous, dolomitic in part, silty in part, minor inclusions and flecks of white to light orange anhydrite. Sandstone (10%) as above.
900	Shale (80%) as above. Sandstone (20%) as above.
910	Shale dark reddish brown, blocky to platy, micaceous, silty in part, slightly dolomitic in part, trace of anhydrite and sandstone.

APPENDIX 2 (Continued)

Depth	Description
920	Shale (50%) dark reddish brown, blocky to platy, dolomitic in part, micaceous, trace of flecks and inclusions of white anhydrite, silty. Siltstone (50%) orange to dark reddish brown, dolomitic, grading to sandstone in part.
930	Siltstone (50%) as above. Shale (30%) as above. Sandstone (20%) light orange, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, dolomitic to calcareous, silty.
950	Shale (60%) dark reddish brown, blocky to platy, dolomitic in part, micaceous, silty. Siltstone (40%) orange-red to reddish brown, dolomitic, sandy. Trace sandstone and anhydrite.
970	Shale (80%) as above. Siltstone (20%) as above. Trace sandstone and clear to white anhydrite.
990	Shale (60%) as above. Siltstone (40%) orange red to dark reddish brown, dolomitic, grading in part to sandstone.
1000	Siltstone (50%) as above. Shale (30%) as above. Sandstone (20%) orange to reddish brown, poorly to well consolidated, angular to subrounded, very fine to fine grained, well sorted, silty, dolomitic to calcareous, some green mineral grains.
1010	Shale (40%) dark reddish brown, blocky to platy, micaceous, slightly dolomitic in part, silty. Siltstone (30%) orange-red to dark reddish brown, dolomitic, sandy. Sandstone (30%) light orange, unconsolidated, angular to subrounded, very fine to medium grained, medium sorted, dolomitic to calcareous, silty in part.
	TOP MEREENIE 1010' (+911)
1020	Sandstone (70%) as above. Shale (30%) as above.

APPENDIX 2 (Continued)

Depth	Description
1040	Sandstone (80%) light orange to orange, angular to subrounded, fine to medium grained, well sorted, unconsolidated to well consolidated, dolomitic to calcareous, light green mineral grains, slightly silty. Shale (20%) dark reddish brown, platy, micaceous, dolomitic in part, silty.
1070	Sandstone light orange, unconsolidated, angular to subrounded, fine grained, well sorted, dolomitic to calcareous, light green mineral grains and dark reddish brown shaly partings.
1080	Sandstone light orange to orange red, unconsolidated, angular to subrounded, fine to medium grained, well sorted, dolomitic in part, light to dark green mineral grains, occasional black mineral grains, some dark reddish brown shaly partings.
1090	Sandstone as above very fine to medium grained, medium sorted.
1100	Sandstone very light orange, unconsolidated, angular to subrounded, very fine grained, well sorted, very silty, slightly dolomitic in part, dark reddish brown shaly partings. (Sample very fine powdery).
1120	Sandstone light orange and orange, unconsolidated, angular to subrounded, very fine to fine grained, some medium grained sand, medium to well sorted, slightly silty in part, dolomitic in part, dark reddish brown shaly partings.
1162	Sandstone light orange, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, very silty, slightly dolomitic, minor dark brown shaly parting, occasional dark reddish brown to green silty partings. (Samples very fine powdery).
1162-1167	CORE NO. 2 Cored 5' Recovered 5' 100% Recovery.

APPENDIX 2 (Continued)

Depth	Description
1170	Sandstone light orange, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, dolomitic, minor white clay and dark reddish brown shaly parting, light green mineral grains with occasional black mineral grains.
1190	Sandstone orange to reddish orange, unconsolidated, angular to subrounded, fine to medium grained, well sorted, dolomitic, green mineral grains, minor dark reddish brown shaly partings.
1200	Sandstone deep orange to reddish orange, unconsolidated as above.
1210	Sandstone as above, very fine to fine grained, well sorted.
1220	Sandstone bright orange, unconsolidated, angular to subrounded very fine to medium grained, medium to well sorted, dolomitic, greyish green and green mineral grains, minor white clay, dark reddish brown shaly partings.
1230	Sandstone as above unconsolidated, reddish orange.
1240	Sandstone bright orange, unconsolidated, angular to subrounded very fine to fine grained, occasional medium grained, well sorted, dolomitic, dark reddish brown shaly partings.
1260	Sandstone as above, minor greyish green silty parting and white clay.
1270	Sandstone (95%) as above, shale (5%) dark reddish brown, blocky to platy, micaceous.
1300	Sandstone bright orange, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, dolomitic, green mineral grains, minor white clay and dark reddish brown shaly partings.

APPENDIX 2 (Continued)

Depth	Description
1320	Sandstone light to bright orange, unconsolidated to poorly consolidated, angular to subrounded, fine to medium grained, medium to well sorted, dolomitic, green mineral grains, minor white clay, minor dark reddish brown shaly partings.
1360	Sandstone white to light orange-red, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, slightly dolomitic in part, minor light green mineral grains and dark reddish brown shaly parting.
1390	Sandstone light orange, minor white sand, unconsolidated, angular to subrounded, fine to medium grained, well sorted, slightly dolomitic, some green mineral grains, minor white clay and dark reddish brown shaly partings.
1420	Sandstone orange-red, minor white sand, unconsolidated, angular to subrounded, very fine to medium grained, medium sorted, dolomitic in part, green mineral grains, dark reddish brown shaly partings, minor white clay, minor white to green silty sand, trace of coarse quartz grains.
1430	Missing. No sample.
1440	Sandstone white to light orange-red, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, slightly dolomitic in part, green mineral grains, minor white clay and dark reddish brown shaly partings.
1450	Sandstone as above, very fine to medium grained, medium sorted.
1480	Sandstone orange-red, minor white sand, unconsolidated to well consolidated, siliceous in part, angular to subrounded, very fine to fine grained, well sorted, dolomitic in part, green to black mineral grains, minor whitish green silty sand, white clay and dark reddish brown shaly partings.

APPENDIX 2 (Continued)

Depth	Description
1520	Sandstone white to light orange-red, unconsolidated, angular to subrounded, very fine to fine grained, minor medium grained sand, well sorted, dolomitic in part, minor green mineral grains, minor white clay and dark reddish brown shaly partings.
1540	Sandstone as above, some cream to greyish-green and green silty sand.
1560	Sandstone (95%) as above, occasional medium to coarse quartz grains. Shale (5%) dark reddish brown, platy to blocky, micaceous.
1570	Sandstone white to light orange, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, minor green mineral grains, white clay and dark reddish brown shaly partings.
1590	Sandstone light orange, unconsolidated, as above.
1600	Sandstone orange minor white sand, unconsolidated to well consolidated, angular to rounded, very fine to medium grained, medium sorted, dolomitic in part, dark reddish brown shaly partings, minor green mineral grains and white clay, silty in part.
1621	Sandstone white to very light orange, unconsolidated, subangular to rounded, very fine to fine grained, well sorted, some white clay, minor green mineral grains.
1621-1624	CORE NO. 3 Cored 3' Recovered 2'9" 91% Recovery.
1640	Sandstone white to orange-red, unconsolidated, subangular to rounded quartz grains, very fine to fine grained, well sorted, dolomitic in part, green and black mineral grains, dark reddish brown shaly partings, minor white clay.

APPENDIX 2 (Continued)

Depth	Description
1650	Sandstone light orange, unconsolidated, subangular, to rounded quartz grains, clear to frosted, fine to medium grained, well sorted, minor white clay and dark red shaly partings.
1660	Sandstone white to light orange-red, unconsolidated, subangular to subrounded quartz grains, clear to frosted, very fine to fine grained, well sorted, minor dark red shaly partings and white clay.
1670	Sandstone orange-red, minor white sand, unconsolidated, as above.
1680	Sandstone (90%) as above. Shale (10%) dark reddish brown, blocky to platy, micaceous, silty in part.
1700	Sandstone light orange, some white sand, unconsolidated, as above, some dark red shaly partings.
1720	Sandstone (90%) white to light orange red, unconsolidated, angular to rounded, clear to frosted quartz grains, very fine to medium grained, medium sorted, minor white clay. Shale (10%) dark reddish brown, blocky, micaceous, silty in part.
1740	Sandstone very light orange, unconsolidated, subangular to rounded, very fine to fine grained, well sorted, minor white clay and reddish brown shaly partings.
1760	Sandstone white to light orange-red, unconsolidated, as above.
1770	Sandstone white to orange, unconsolidated, subangular to rounded clear to frosted quartz grains, fine to medium grained, well sorted, minor white clay, black mineral grains and dark red shaly partings.
1780	Sandstone white to very light orange, unconsolidated, as above.
1800	Sandstone white to light orange-red, unconsolidated, as above.

APPENDIX 2 (Continued)

Depth	Description
1810	Sandstone white to bright orange-red, unconsolidated, subangular to rounded clear to frosted quartz grains, fine to medium grained, minor white clay and dark red shaly partings.
1830	Sandstone very light orange, unconsolidated, as above.
1840	Sandstone white to light orange-red, unconsolidated, subangular to rounded, clear to frosted quartz grains, fine to medium grained, well sorted, minor white clay and some dark red shaly partings.
1890	Sandstone very light orange, unconsolidated, as above.
1910	Sandstone white to light orange, unconsolidated, subangular to rounded clear to frosted quartz grains, very fine to fine grained, occasionally medium grained, medium to well sorted, some white clay, trace dark red shaly partings.
1920	Sandstone (90%) light orange-red, unconsolidated, as above. Shale (10%) dark reddish brown, micaceous.
1930	Sandstone white to bright orange, unconsolidated, subangular to rounded clear to frosted quartz grains, very fine to fine grained, well sorted, some white clay, minor dark red shaly partings.
1940	Sandstone as above very fine to medium grained, medium sorted.
1960	Sandstone white to very light orange, unconsolidated, subangular to rounded clear to frosted quartz grains, very fine to medium grained, medium sorted, some white clay.
1970	Sandstone white to light red, unconsolidated, subangular to rounded, clear to frosted quartz grains, very fine to medium grained, medium sorted, some bright red silty to sandy shaly partings, minor white clay.

APPENDIX 2 (Continued)

Depth	Description
1980	Sandstone (60%) as above, silty in part, dolomitic in part. Shale (40%) bright red to dark red, blocky to platy, silty to sandy in part, slightly dolomitic in part.
2000	Sandstone (80%) white, pink and light red, unconsolidate, subangular to rounded, clear to frosted quartz grains, very fine to medium grained, medium sorted, silty in part. Shale (20%) bright red, blocky, silty to sandy in part.
2010	Sandstone white, pink and light red, unconsolidated, subangular to rounded, clear to frosted quartz grains, very fine to fine grained, well sorted, minor white clay and red shaly partings.
2030	Sandstone white and orange-red, as above.
2040	Sandstone white and light orange, unconsolidated, subangular to rounded, clear to frosted quartz grains, fine to medium grained, well sorted, some white clay.
2060	Sandstone bright orange, minor white sand all as above.
2070	Sandstone orange to orange-red, minor white sand, unconsolidated subangular to rounded, clear to frosted quartz grains, medium grained, well sorted, minor white clay and red shaly partings.
2080	Sandstone white and light orange, unconsolidated, subangular to rounded, clear to frosted quartz grains, fine to medium grained, well sorted, minor white clay and red shaly partings.
2090	Sandstone light orange, as above.
2180	Sandstone light bright orange, minor light red sand, unconsolidated, subangular to rounded, fine to medium grained, well sorted, minor white clay.

APPENDIX 2 (Continued)

Depth	Description
2190	Sandstone light orange and light orange red, as above.
2200	Sandstone light orange and light orange red, unconsolidated to well consolidated, siliceous in part, subangular to rounded, fine to medium grained well sorted, minor black mineral flecks and inclusions, minor white clay, trace of poor intergranular porosity.
2219	Sandstone light orange, unconsolidated, subangular to rounded, fine to medium grained, well sorted, minor white clay, minor chips of friable sand, trace of intergranular porosity.
2219-2234	CORE NO. 4 Cored 15' Recovered 15' 100% Recovery.
2240	Sandstone very light orange, unconsolidated, subangular to rounded, fine to medium grained, well sorted, minor white clay.
2250	Sandstone as above, occasional coarse quartz grains.
2260	Sandstone light to bright orange-red, unconsolidated, subangular to rounded, fine to medium grained, well sorted, some white clay.
2290	Sandstone as above, silty in part, occasional coarse quartz grains.
2300	Sandstone very light orange, unconsolidated, subangular to rounded, medium grained, minor fine grained sand, well sorted, minor white clay.
2310	Sandstone white, minor light orange sand, as above.
2320	Sandstone white and light orange, unconsolidated, subangular to rounded, fine to medium grained, occasional coarse quartz grains, well sorted, minor white clay.
2330	Sandstone very light orange-red, as above.

APPENDIX 2 (Continued)

Depth	Description
2360	Sandstone white and light pink to orange, unconsolidated, subangular to subrounded, fine to medium grained, occasional coarse quartz grains, well sorted, minor white clay.
2370	Sandstone light bright orange, unconsolidated, as above.
2400	Sandstone light bright orange, unconsolidated, angular to subrounded, very fine to medium grained, medium sorted, occasional coarse quartz grains, minor white clay, silty in part.
2410	Sandstone light bright orange, unconsolidated, angular to subrounded, very fine to fine grained, occasional medium quartz grains, well sorted, minor white clay.
2420	Sandstone bright orange, unconsolidated, angular to subrounded, fine grained, well sorted, minor white clay.
2470	Sandstone as above, very fine to fine grained, occasional medium grained quartz grains, well sorted, slightly silty in part.
2480	Sandstone light orange, unconsolidated, angular to subrounded, very fine to medium grained, medium sorted, minor white clay, slightly silty.
2500	Sandstone bright orange, unconsolidated, subangular to rounded, fine to medium grained, well sorted, minor white clay.
2550	Sandstone light to bright orange, unconsolidated, angular to subrounded, very fine to medium grained, medium sorted, minor white clay.
2560	Sandstone bright orange-red, unconsolidated, angular to subrounded, fine to medium grained, well sorted, minor white clay.

Depth	Description
2570	Sandstone bright orange, unconsolidated, subangular to rounded, fine to medium grained, well sorted, occasional coarse quartz grains, minor white clay.
2580	Sandstone bright orange and orange-red, mostly unconsolidated sand a few minor chips, subangular to rounded, fine to coarse grained, medium sorted, dolomitic in part, minor white clay, trace intergranular porosity.
2590	Sandstone bright orange, unconsolidated, subangular to rounded, medium grained, well sorted, trace white clay.
2620	Sandstone as above, fine to medium grained, well sorted, occasional coarse quartz grains.
2640	Sandstone bright orange and orange-red, subangular to subrounded, very fine to medium grained, medium sorted, minor white clay.
2660	Sandstone as above, occasional coarse grained quartz grains.
2670	Sandstone orange-red, unconsolidated, subangular to subrounded, fine to medium grained, well sorted, minor white clay, occasional dark mineral grains.
2680	Sandstone orange-red, minor white sand, unconsolidated, very fine to medium grained, medium sorted, subangular to subrounded, minor white clay.
2710	Sandstone bright orange-red, unconsolidated, subangular to rounded, fine to medium grained, occasional coarse quartz grains, well sorted, minor white clay.
2730	Sandstone bright orange-red, unconsolidated, subangular to rounded, fine to coarse grained, medium sorted, minor white clay.
2740	Sandstone reddish orange and rusty red, unconsolidated, subangular to round, very fine to medium grained, medium sorted, occasional coarse quartz grains, minor white clay.

APPENDIX 2 (Continued)

Depth	Description
2760	Sandstone bright orange-red,unconsolidated,as above.
2770	Sandstone bright orange-red, unconsolidated, sub-angular to rounded, medium to coarse grained, well sorted, minor white clay.
2780	Sandstone as above, medium grained, well sorted, occasional coarse quartz grains.
2789	Sandstone as above, medium to coarse grained, well sorted, minor white clay.
2789-2799	CORE NO. 5 Cut 10' Recovered 9'2" 92% Recovery.
2810	Sandstone white, whitish pink and light purple, minor orange, sand, unconsolidated, angular to subrounded, fine to medium grained, occasional coarse quartz grains, well sorted, some white clay.
2820	Sandstone as above, medium to coarse grained, well sorted.
2830	Sandstone white and light reddish pink, unconsolidated, angular to rounded, medium to coarse grained, well sorted, minor white clay.
2850	Sandstone as above, fine to coarse grained, medium sorted.
2860	Sandstone white and cream, unconsolidated, angular to rounded, fine to medium grained, occasional coarse quartz grains, well sorted, minor white clay, trace dark red shale.
2870	Sandstone white and light pink, minor orange sand, unconsolidated, angular to rounded, fine to coarse grained, medium sorted, some white clay.
2880	Sandstone white, minor orange sand, unconsolidated, angular to subrounded, occasional rounded quartz grains, fine to medium grained, well sorted, some white clay.

APPENDIX 2 (Continued)

Depth	Description
2890	Sandstone white and very light pink, unconsolidated, angular to subrounded, fine to coarse grained, medium sorted, minor white and trace dark red shale, some orange sand (cavings?)
2900	Sandstone white, minor light pink and some light orange sand, unconsolidated, fine to coarse grained, medium sorted, angular to subrounded, occasional well rounded quartz grains.
2920	Sandstone white, minor light pink and orange sand, unconsolidated, angular to subrounded, fine to coarse grained, medium sorted, minor white clay.
2930	Sandstone white and light pink, minor orange sand, unconsolidated, angular to subrounded, fine to medium grained, occasional coarse quartz grains, well sorted, minor white clay.
2940	Sandstone white and light orange-pink, unconsolidated, angular to subrounded, fine grained, well sorted, some white clay.
2960	Sandstone white to light rusty red, as above, occasional medium grained quartz grains, slightly argillaceous in part.
2970	Sandstone white to orange and rusty red, unconsolidated, angular to subrounded, fine grained, occasional medium to coarse quartz grains, well sorted, trace green silty sand, some white clay.
2980	Sandstone as above, silty to shaly in part, some green silty sand and some dark red shaly to silty partings.
2990	Shale (80%) reddish brown, blocky, silty, micaceous, some inclusion and flecks of green silty shale. Sandstone (20%) white, orange and red, fine grained, occasional medium to coarse quartz grains, well sorted, silty in part, minor white clay.

APPENDIX 2 (Continued)

Depth	Description
3000	Shale (70%) red to reddish brown, blocky to platy, silty, micaceous, flecks and spots of green silty shale. Sandstone (30%) as above.
3010	Sandstone (50%) white, orange and red, angular to subrounded, fine grained well sorted, occasional medium to coarse quartz grains, silty, some green silty sand. Shale (50%) as above grading to siltstone.
3020	Sandstone (80%) white to orange and red, unconsolidated, angular to subrounded, fine grained, silty. Siltstone (20%) red and dark red, minor green sandy and shaly partings.
3050	Sandstone white and rusty red, unconsolidated to poorly consolidated, angular to subrounded, fine to medium grained, occasional coarse quartz grains, medium to well sorted, silty in part, some white clay, dark red silty and shaly partings, trace green silty and shaly partings.
	TOP STOKES FORMATION 3050 (-1129)
3060	Shale (60%) red to dark red, blocky to platy, micaceous, silty, some green shale, silty, some medium to coarse, subangular to rounded floating quartz grains, trace of gypsum? Siltstone (40%) red with some green siltstone, micaceous in part, sandy in part. Trace white and rusty red sandstone as above.
3080	Siltstone (60%) as above. Shale (40%) as above, some white to light red fine grained sandstone.
3090	Shale (70%) red to dark red, some flecks inclusions and patches of green shale, blocky to platy, silty, micaceous, dolomitic to calcareous in part. Trace of medium to coarse subrounded to rounded floating quartz grains. Siltstone (30%) red and green, sandy in part.
3100	Shale (50%) as above. Siltstone (50%) as above, grading in part to a white and light red fine grained, silty sandstone.

APPENDIX 2 (Continued)

Depth	Description
3120	Shale (80%) light to dark red, blocky to platy, micaceous, dolomitic to calcareous in part, silty, minor green shale. Siltstone (20%) red with minor green siltstone, sandy in part.
3140	Shale (80%) light to dark red, blocky to platy, micaceous, dolomitic to calcareous in part, silty, some minor patches and inclusions of green shale. Siltstone (20%) red and green, sandy in part.
3150	Shale (60%) aa. Siltstone (40%) aa. Trace sandstone and gypsum?
3170	Shale (80%) light to dark red, some green shale, micaceous, blocky to platy, dolomitic to calcareous in part, silty. Siltstone, (20%) red, green and whitish grey, sandy in part. Trace white to light red fine grained silty sandstone.
3180	Shale (50%) aa. Sandstone (30%) white to orange-red, fine grained, silty, well sorted, angular to subrounded. Siltstone (20%) red and green sandy in part.
3181"-3181'8"	CORE NO. 6 Cut 8" No Recovery Used 8-3/4" Hughes hard formation core bit Type J. Pulled out of hole after attempting to cut a core. Core bit came out of hole minus the cones. Ran back in the hole with a 12-1/2" rerun bit, milled up the cones and made 8 feet of new hole. Pulled out of hole to run a new 12-1/4" drilling bit and on the way back in the hole the drill pipe backed off. Dropped 24 drill collars and 54 joints of 4-1/2" drill pipe in the hole. Fishing.
3190	Shale (70%) light to dark red and green, blocky to platy, micaceous, dolomitic to calcareous in part, silty. Siltstone (30%) red, green and white, sandy in part. Minor white to light red fine silty sandstone.

APPENDIX 2 (Continued)

Depth	Description
3200	No sample, 99% cement. Set 9-5/8" casing at 3192' with 600 sacks of construction cement. Drilled out cement and drying up hole.
3210	Sandstone (50%) white, light pink, rusty red, unconsolidated, very fine to fine grained, angular to subrounded, well sorted, silty. Shale (50%) red to dark red, minor green, blocky to platy, micaceous, slightly dolomitic, silty to sandy in part.
3220	Sandstone (90%) cream to light rusty red, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, silty, minor green silty sand and white clay. Shale (10%) aa.
3230	Sandstone (50%) rusty red, unconsolidated, angular to subrounded very fine to fine grained, very silty. Siltstone (50%) red to dark red, minor green, sandy in part, grading to dark red, shale in part. Trace gypsum?
3240	Sandstone (80%) rusty red, minor white and pink sand, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, very silty. Siltstone (20%) red to dark red, shaly and sandy in part, minor green to grey siltstone.
3250	Sandstone (40%) as above. Siltstone (40%) as above. Shale (20%) red to dark reddish brown, blocky to platy, micaceous, silty. Trace green siltstone and shale.
3260	Sandstone (80%) white, light orange red, unconsolidated to well consolidated, siliceous in part, angular to subrounded, fine grained, occasional medium grained sand, silty. Shale (20%) dark reddish brown, minor green, blocky, silty in part, micaceous in part. Trace gypsum?
3270	Shale (70%) red to dark reddish brown, blocky, silty. Siltstone (30%) red to dark red, sandy in part. Minor green siltstone and shale, trace sandstone.

Depth	Description
3293	Shale (80%) light to dark reddish brown, some green shale, blocky to platy, silty. Siltstone (20%) red to green, sandy in part. Trace sandstone, trace medium grained floating sand grains in the shale and siltstone.
3293-3298	CORE NO. 7 Cut 5' Recovered 4'7" 92% Recovery.
3330	Shale (70%) red to dark reddish brown and green, mottled, blocky to platy, micaceous, silty and slightly dolomitic in part. Siltstone (30%) white, red and green, sandy dolomitic in part, minor grey siltstone and shale.
3360	Shale (80%) as above, minor grey to greyish purple shale. Siltstone (20%) as above. Trace sandstone.
3370	Siltstone (60%) red to reddish brown, minor white, sandy in part, dolomitic in part. Shale (40%) dark reddish brown, minor green shale, dolomitic and micaceous in part. Sample very fine.
3380	Shale (70%) red, dark reddish brown, green, minor light to dark grey shale, blocky to platy, micaceous, slightly dolomitic, silty in part. Siltstone (30%) white, red, green, grey, sandy and dolomitic in part.
3390	Shale (80%) as above. Siltstone (20%) as above. Trace sandstone.
3410	Shale (90%) as above. Siltstone (10%) as above.
3420	Shale (80%) dark reddish brown and green, minor dark grey to purple shale, blocky to platy, micaceous, dolomitic in part, silty in part. Siltstone (20%) red and green, minor white and light grey siltstone, sandy and dolomitic in part. (Sample very fine).
3450	Siltstone (50%) as above. Shale (50%) as above. (Samples very fine).

APPENDIX 2 (Continued)

Depth	Description
3470	Shale (80%) red to dark reddish brown and green, mottled, blocky to platy, micaceous, silty and dolomitic in part. Siltstone (20%) red and green, minor white, light pink and light grey siltstone, sandy and dolomitic in part. Trace floating quartz grains in the shale and siltstone.
3490	Shale (80%) red to dark reddish brown, grey to greyish green and green, blocky to platy, dolomitic in part, silty in part, micaceous. Siltstone (20%) red, grey and green, minor white and light pink, dolomitic and micaceous in part, sandy in part. Trace sandstone, gypsum? (note from 3450 to 3570' large cuttings in samples, cavings).
3500	Shale (90%) as above. Siltstone (10%) as above.
3520	Shale (80%) as above. Siltstone (20%) as above. Trace sandstone.
3530	Shale (90%) as above slightly gypsiferous. Siltstone (10%) as above.
3580	Shale (80%) red to dark reddish brown, grey, green and greyish green, blocky to platy, slightly dolomitic and silty. Siltstone (20%) red, grey, green, minor white to light pink, slightly dolomitic, sandy in part. Trace gypsum.
3620	Shale (90%) brick red, minor greyish green and green shale blocky to platy, micaceous, slightly dolomitic and silty. Siltstone (10%) red, grey and green, minor white and light pink, dolomitic in part, slightly sandy in part. Trace gypsum.
3622-3632	CORE NO. 8 Cut 10' Recovered 8' 80% Recovery
3640	Shale (90%) brick red, minor greyish green and green shale, blocky to platy, micaceous, slightly dolomitic and silty in part, trace gypsum. Siltstone (10%) green, red, minor white, slightly sandy in part.

APPENDIX 2 (Continued)

Depth	Description
3680	Shale (80%) brick red, greyish green and grey, gypsiferous aa. Siltstone (20%) red, greyish green and green, slightly sandy in part.
3710	Shale (80%) brick red to dark reddish brown, greyish green, green, blocky to platy, dolomitic in part, micaceous, slightly silty, trace gypsum. Siltstone (20%) green, red, grey, minor white, slightly sandy in part. (Samples very fine).
3760	Shale (90%) as above gypsiferous in part. Siltstone (10%) aa.
3830	Shale (90%) brick red to dark reddish brown, minor greyish green and green shale, blocky to platy, micaceous, slightly dolomitic in part, silty in part. Siltstone (10%) red and green, slightly sandy in part. Trace gypsum.
3860	Shale (90%) dark reddish brown, minor green and greyish green shale, blocky to platy, micaceous, slightly dolomitic in part, slightly gypsiferous, occasionally silty. Siltstone (10%) red, green, minor whitish grey, slightly dolomitic.
3899	Shale (90%) brick red to dark reddish brown, minor green shale as above. Siltstone (10%) as above. Trace white to light pink gypsum.
3899-3909	CORE NO. 9 Cored 10' Recovered 8'4" 83% Recovery.
3920	Shale (100%) dark reddish brown and green, blocky to platy, dolomitic in part, silty in part. Trace gypsum.
3940	Shale (100%) brick red to dark reddish brown and green as above.
3980	Shale (100%) brick red to dark reddish brown, minor green shale, all as above, trace gypsum.

APPENDIX 2 (Continued)

Depth	Description
4010	Shale (100%) reddish brown, some green, blocky to platy, micaceous, slightly dolomitic in part, silty in part. Trace gypsum.
	LOWER STOKES 4015 (-2094)
4020	Shale (95%) dark reddish brown and green, minor grey, greyish green and purple shale, blocky to platy, slightly dolomitic to calcareous and silty. Limestone (5%) white, cream, light red, greyish green and green, crypto-x, slightly argillaceous in part, dolomitic in part.
4040	Shale (100%) as above with some partings of white, cream, whitish brown, red, greyish green and green, crypto-x, slightly silty in part, dolomitic limestone.
4050	Shale (80%) as above. Limestone (20%) as above.
4130	Shale (100%) dark reddish brown, minor green and greyish green shale, blocky to platy, micaceous, dolomitic to calcareous in part, some white, red, greyish green and green shaly to silty limestone partings.
	TOP LOWER STOKES ON COLOUR CHANGE 4130 (-2209)
4150	Shale (100%) dark grey, minor red and green shale, blocky to platy, micaceous, dolomitic to calcareous in part, some white to dark grey limy partings.
4180	Shale (95%) as above. Limestone (5%) white, light grey and dark grey, crypto to very finely crystalline, argillaceous, slightly dolomitic in part.
4200	Shale (90%) dark grey, minor red shale, blocky to platy, micaceous, dolomitic to calcareous in part. Limestone (10%) whitish grey to dark grey, crypto to finely crystalline, argillaceous in part, fossiliferous.

Depth	Description
4230	Shale (90%) dark grey, minor red shale, blocky to platy, micaceous, dolomitic to clacareous, slightly silty in part. Limestone (10%) whitish grey to dark grey, crypto to finely crystalline, dolomitic in part, argillaceous in part, micaceous in part, trace of fossil fragments.
4240	Shale (80%) as above. Limestone (20%) as above.
4250	Shale (90%) as above, silty. Dolomite (10%) white to greyish brown, calcareous in part, silty in part.
	TOP TRANSITION ZONE STOKES TO STAIRWAY 4255 (-2334)
4265	Shale (60%) dark grey, blocky to platy, micaceous, dolomitic, silty in part. Siltstone (40%) light to dark grey, dolomitic, slightly sandy in part.
4265-4275	CORE NO. 10 Cut 10' Recovered 9' 90% Recovery.
4280	Shale (50%) dark grey, some red shale, blocky to platy, micaceous, dolomitic. Siltstone (50%) white to dark grey and greyish brown, dolomitic, slightly sandy in part.
4290	Shale (60%) brick red to dark reddish brown and dark grey, blocky to platy, dolomitic, silty in part. Siltstone (40%) white to greyish brown and grey, dolomitic, grading in part to a very fine grained sandstone.
	TOP STAIRWAY 4298 (-2377)
4300	Siltstone (50%) as above. Shale (30%) brick red, dark reddish brown, grey, dark grey, blocky to platy, dolomitic, silty. Sandstone (20%) white to light grey and greyish brown, very fine to medium grained, medium sorted, angular to subrounded, dolomitic and silty in part.

Depth	Description
4310	Shale (40%) dark grey, green, dark reddish brown and purple, blocky to platy, dolomitic in part, silty. Sandstone (40%) white, minor light grey and greenish grey, unconsolidated to well consolidated, siliceous, hard, angular to subrounded, occasional well rounded quartz grains, very fine to coarse grained, poorly sorted, silty in part. Siltstone (20%) white to grey and greyish green, dolomitic in part, sandy in part.
4320	Shale (90%) dark reddish brown and green, blocky to platy, red shale slightly dolomitic, green shale dolomitic to calcareous, silty in part. Sandstone (10%) white, siliceous in part, angular to subrounded, very fine grained, well sorted, trace medium to coarse grained well rounded quartz grains. (Note trip for bit at 4315, shale mostly cavings?)
4330	Shale (60%) dark grey, black, some red and green shale, blocky to platy, dolomitic, silty in part. Sandstone (40%) white, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, occasional medium grained quartz grains, silty in part. Trace of pyrite.
4340	Shale (60%) as above. Sandstone (40%) white, poorly to well consolidated, siliceous in part, angular to subrounded, very fine to fine grained, with scattered medium to coarse subrounded to rounded quartz grains in the fine grained sand, dolomitic, minor dark grey and greyish green silty sand.
4350	Sandstone (80%) white, minor greyish brown and whitish green sand, poorly to well consolidated, dolomitic to calcareous, as above. Shale (20%) red, minor green and dark grey shale.
4360	Sandstone (70%) as above, minor whitish pink sand. Shale (30%) red and light reddish brown and light to dark green.
4370	Shale (70%) red to dark reddish brown, light to dark green, blocky to platy, dolomitic, green shale calcareous in part, silty in part. Sandstone (30%) as above, minor white clay.

APPENDIX 2 (Continued)

Depth	Description	066
4380	Shale (60%) as above. Sandstone (40%) white, minor whitish pink sand, poorly to well consolidated, angular to subrounded, very fine to fine grained, well sorted, dolomitic to calcareous, some white to pink calcareous clay.	
4390	Sandstone (70%) white to light grey, minor dark grey, poorly to well consolidated, siliceous in part, angular to subrounded, very fine to fine grained, well sorted, silty in part, dolomitic to calcareous in part, minor white clay. Shale (30%) as above.	
4400	Sandstone (70%) white, light to dark grey, poorly to well consolidated, siliceous, angular to subrounded, very fine to fine grained, well sorted, scattered black mineral grains and shaly partings, slightly dolomitic in part, argillaceous in part. Shale (30%) red, dark reddish brown, minor grey and green, some dark grey to black silty shale.	
4420	Shale (60%) as above. Sandstone (40%) as above.	
4430	Sandstone (80%) clear, light to dark grey, unconsolidated to poorly consolidated, angular to subrounded, very fine to fine grained, some black mineral grains and black shaly partings, micaceous and silty in part. Shale (20%) dark grey to black, silty, micaceous, minor red shale as above.	
4440	Sandstone (60%) white, light to dark greyish brown and dark grey, siliceous in part, very fine to fine grained, well sorted, angular to subrounded, occasional medium grained quartz grains, slightly dolomitic, some black mineral grain and shaly partings, micaceous in part, silty, slightly pyritic. Siltstone (20%) dark grey to black, dolomitic in part, micaceous, sandy in part. Shale (20%) dark grey to black, blocky to platy, micaceous, silty, some reddish brown shale (cavings?).	

APPENDIX 2 (Continued)

Depth	Description
4450	Sandstone (80%) as above. Siltstone (10%) as above. Shale (10%) as above.
4460	Sandstone (70%) as above. Siltstone (20%) as above. Shale (10%) as above.
4470	Sandstone (40%) as above. Siltstone (40%) as above. Shale (20%) as above.
4480	Shale (40%) dark grey to black, minor red shale, blocky to platy, micaceous, silty. Siltstone (30%) light to dark greyish brown, dolomitic in part, micaceous, sandy in part. Sandstone (30%) white to greyish brown, siliceous in part, very fine to fine grained, angular to subrounded, well sorted, dolomitic in part, scattered black mineral grains and shaly partings, silty, micaceous in part.
4500	Siltstone (50%) as above. Sandstone (30%) as above. Shale (20%) as above.
4530	Shale (60%) dark grey to black, blocky to platy, very micaceous, silty, minor red shale (cavings?). Siltstone (30%) light to dark grey, micaceous in part, slightly pyritic, argillaceous to sandy in part. Sandstone (10%) white to dark grey, very fine to fine grained, angular to subrounded, well sorted, scattered dark mineral grains and black shaly partings, silty.
4560	Shale (50%) as above. Siltstone (30%) as above. Sandstone (20%) as above.
4570	Sandstone (70%) white to light grey, well consolidated, siliceous in part, angular to subrounded, very fine to fine grained, well sorted, some dark mineral grains and minor black shaly partings, dolomitic to calcareous in part, silty in part. Shale (20%) dark grey to black, micaceous, silty. Siltstone (10%) light to dark grey, micaceous in part, sandy in part.

APPENDIX 2 (Continued)

Depth	Description
4580	Siltstone (40%) light grey to greyish green, micaceous in part, sandy. Sandstone (40%) white, light grey and light greenish white, as above. Shale (20%) dark grey to black, some greyish green shale, minor red shale.
4600	Sandstone (70%) white, minor light grey, whitish pink and whitish green sand, well consolidated, siliceous in part, very fine to fine grained, well sorted, angular to subrounded, dolomitic in part, silty in part. Siltstone (20%) grey, green, dark grey, dolomitic in part, slightly micaceous, sandy in part. Shale (10%) dark grey to black, green, some red shale.
4610	Sandstone (100%) white, minor light grey and whitish green sand, well consolidated, siliceous in part, angular to subrounded, very fine to fine grained, well sorted, dolomitic to slightly calcareous in part, some white clay. Minor dark red, green and black shaly partings.
4611-4621	CORE NO. 11 Cut 10' Recovered 10' 100% Recovery.
4640	Shale (80%) dark reddish brown, minor grey, black and green shale, micaceous, blocky to platy, dolomitic, silty. Sandstone (20%) white and grey, very fine to fine grained, well sorted, angular to subrounded, dolomitic to calcareous in part, silty.
4650	Sandstone (70%) white to light green, unconsolidated to poorly consolidated, fine grained, well sorted, dolomitic to calcareous in part, silty. Shale (30%) dark reddish brown, minor grey, black and green shale, micaceous, silty in part.
4670	Sandstone (70%) white to light grey, as above. Shale (30%) dark grey to black, some red shale and minor green shale, dolomitic in part, silty.

APPENDIX 2 (Continued)

Depth	Description
4700	Sandstone (80%) white, minor light to dark grey and green sand, unconsolidated to well consolidated, siliceous in part, angular to subrounded, fine grained, well sorted, dolomitic to calcareous in part, silty. Shale (20%) dark reddish brown and green, minor dark grey to black shale, silty in part.
4730	Sandstone (70%) white, light to dark grey, poorly to well consolidated, siliceous in part, angular to subrounded, fine grained, well sorted, silty, dolomitic in part, micaceous. Siltstone (20%) light to dark grey, dolomitic, micaceous, sandy in part. Shale (10%) dark grey to black, red to reddish brown.
4740	Shale (50%) dark grey to black, minor red and green shale, blocky to platy, micaceous, pyritic in part, silty in part. Siltstone (30%) light to dark grey and black, micaceous and pyritic in part, sandy in part. Sandstone (20%) white to light grey, siliceous in part, angular to subrounded, very fine to fine grained, well sorted, contains scattered dark mineral grains and flecks and inclusions of black shale, dolomitic in part, micaceous in part, silty in part.
4760	Siltstone (40%) as above. Sandstone (30%) as above. Shale (30%) as above.
4790	Siltstone (40%) as above. Shale (40%) dark grey to black and red, minor green shale, blocky to platy, dolomitic in part, silty. Sandstone (20%) white to light and dark grey as above.
4800	Shale (50%) as above. Siltstone (30%) as above. Sandstone (20%) as above.
4810	Shale (40%) as above. Sandstone (40%) white to light and dark grey, unconsolidated to poorly consolidated, angular to subrounded, very fine to fine grained, well sorted, silty, micaceous in part, scattered flecks and inclusions of black shaly partings, pyritic in part, minor white clay. Siltstone (20%) as above.

APPENDIX 2 (Continued)

Depth	Description
4830	Shale (40%) as above. Siltstone (30%) as above. Sandstone (30%) as above. Trace pyrite.
4850	Shale (50%) dark grey to black, minor red shale, blocky to platy, micaceous, silty in part. Siltstone (30%) light to dark grey and black, micaceous and dolomitic in part, sandy in part. Sandstone (20%) white to light grey, very fine grained, well sorted, angular to subrounded, dolomitic, siliceous in part, abundant black shaly partings and inclusions, silty in part. Trace pyrite.
4860	Sandstone (50%) white to greyish brown and grey, unconsolidated, angular to subrounded, very fine to fine grained, well sorted, silty in part, dolomitic, scattered dark mineral grains. Shale (30%) dark grey to black, red, minor green shale. Siltstone (20%) dark grey, dolomitic in part, sandy in part.
4870	Siltstone (40%) light to dark grey, micaceous in part, slightly dolomitic, sandy in part. Shale (40%) as above. Sandstone (20%) as above.
4880	Sandstone (40%) as above. Shale (40%) as above. Siltstone (20%) as above.
4900	Sandstone (70%) white, minor light to dark grey sand, siliceous in part, slightly dolomitic, very fine to fine grained, micaceous in part, angular to subrounded, well sorted, minor white clay, silty in part, scattered dark grey to black shaly and silty partings. Shale (20%) dark grey to black, red, minor green shale, silty in part. Siltstone (10%) light to dark grey, slightly dolomitic and sandy. Trace pyrite.
4920	Sandstone (80%) as above. Shale (20%) as above.
4930	Sandstone (80%) white to light greyish green as above. Shale (20%) as above.

APPENDIX 2 (Continued)

Depth	Description
4942	Sandstone (60%) white to grey and greyish green as above. Siltstone (20%) grey, micaceous, dolomitic in part. Shale (20%) dark grey to black, minor red and green shale.
4942-4952	CORE NO. 12 Cut 10' Recovered 10' 100% Recovery
4960	Shale (60%) dark grey to black, minor green shale, abundant red shale (cavings?), blocky to platy, dolomitic in part, silty. Sandstone (20%) white to light grey, very fine to fine grained, well sorted, angular to subrounded, dolomitic in part, minor white clay, silty. Siltstone (20%) dark grey, dolomitic, sandy in part.
4970	Shale (60%) dark grey to black, red, minor green shale, dolomitic in part, silty. Sandstone (40%) as above.
4980	Sandstone (70%) white, minor light grey and greyish brown sand, poorly consolidated, angular to subrounded, very fine to fine grained, well sorted, silty in part. Shale (30%) red, dark grey to black, green, blocky to platy, dolomitic to calcareous in part, silty.
4990	Sandstone (70%) white, light pink and whitish green, poorly consolidated, siliceous in part, very fine to fine grained, occasional medium grained quartz grains, well sorted, angular to subrounded, dolomitic to calcareous in part, silty. Shale (30%) as above.
5000	Sandstone (80%) light rusty red, minor white and whitish green sand, poorly consolidated, dolomitic to calcareous in part, fine grained, well sorted, angular, silty in part, minor white and light pink clay. Shale (20%) red, minor dark grey and green shale.
5010	Sandstone (80%) white to dark greyish brown and dark rusty red, poorly consolidated, dolomitic to calcareous in part, fine grained, occasional medium grained, well sorted angular, silty. Shale (20%) red dark grey and black.

APPENDIX 2 (Continued)

Depth	Description
5020	Sandstone (100%) white, poorly to well consolidated, siliceous, slightly dolomitic in part, angular fine grained, well sorted, minor dark grey to black shaly partings and dark greyish brown siltstone. Trace pyrite.
5030	Sandstone (90%) as above. Shale (10%) red dark grey to black, minor green shale, micaceous, silty.
5050	Sandstone (70%) white, minor light to dark grey sandstone, siliceous, dolomitic in part, angular, fine grained, well sorted, slightly silty in part, some white clay. Shale (30%) red, dark grey to black, blocky, dolomitic to calcareous, silty, minor green shale.
5060	Sandstone (90%) as above. Shale (10%) red, green, dark grey to black, micaceous, dolomitic to calcareous in part. Trace pyrite.
5070	Sandstone (90%) white, unconsolidated, angular, very fine to fine grained, well sorted, silty. Shale (10%) red, grey and black, minor green shale. (Sample very fine).
5080	Sandstone (50%) white, minor light to dark grey, angular, very fine to fine grained, well sorted, slightly dolomitic in part, silty. Shale (50%) red, green, dark grey to black, blocky, dolomitic to calcareous in part, silty. Trace pyrite.
5090	Sandstone (70%) cream, light greyish green, light grey and greyish brown, angular, very fine to fine, silty, dirty looking sand, argillaceous in part, micaceous in part. Shale (30%) red, green, dark grey to black.
5100	Sandstone (70%) white, minor light grey sand, angular to subrounded, very fine to fine grained with some coarse subrounded to rounded quartz grains, poorly sorted, some white clay, silty. Shale (30%) red, green, dark grey to black.

APPENDIX 2 (Continued)

Depth	Description
5120	Sandstone (60%) as above. Shale (40%) as above.
5130	Sandstone (70%) white, angular to subround, very fine to fine grained with some minor medium to coarse grained subrounded to rounded quartz grains, poorly sorted, silty, minor white clay. Shale (30%) red, green, dark grey to black.
5140	Sandstone (80%) cream to light whitish buff, siliceous in part, slightly dolomitic in part, angular very fine to fine grained, with some subrounded to well rounded coarse quartz grains, the coarse quartz grains appear to be scattered throughout the fine grained sand (in other words coarse floating sand grains in a fine sand matrix), silty in part, some white clay. Shale (20%) red, green, dark grey to black.
5150	Sandstone (100%) white, cream to light greyish buff, as above.
5160	Sandstone (100%) white, cream and light whitish grey, angular to rounded, very fine to coarse grained, poorly sorted, silty in part. Minor dark red, green and dark grey to black shale.
5170	Sandstone (60%) white to dark greyish-brown, angular to rounded, fine to coarse grained, poorly sorted, silty. Siltstone (30%) greyish brown, dolomitic in part, sandy in part. Shale (10%) red, green, dark grey to black.
5180	Sandstone (90%) clear to white, unconsolidated, angular to subrounded, fine to coarse grained, medium sorted, slightly pyritic and silty in part. Shale (10%) dark greyish brown and black, micaceous, silty, minor red shale.
5190	Sandstone (70%) as above, slightly pyritic. Shale (30%) dark grey to black, red, minor green shale.

APPENDIX 2 (Continued)

Depth	Description
	Drilled to 5193' and got gas to surface, measured with pitot tube and manometer on three inch riser with Hg; after 35 minutes gas flow was 2,470 MCF/D.
5197-5200	CORE NO. 13 Cored 3' Recovered 1'9" 58% Recovery.
5210	Sandstone (90%) clear to white and light grey, unconsolidated, angular to subround with occasional well rounded quartz grains, fine to coarse grained, medium sorted, trace of pyrite pellets and black shaly partings. Shale (10%) red, green, dark grey to black (red and green shale cavings).
5220	Sandstone (60%) as above. Shale (40%) red, green, dark grey to black. (red and green shale probably caving, round trip for bit at 5213).
5230	Sandstone (100%) clear to cream, unconsolidated, angular to subrounded, very fine to fine grained (well sorted), minor medium grained sand, silty, minor white clay, black shaly partings and red and green shale.
5240	Sandstone (100%) clear to white as above.
5260	Sandstone (100%) clear to white, unconsolidated, angular to subrounded, fine to medium grained, with occasional coarse quartz grains, well sorted to medium sorted, slightly silty in part, black shaly partings, minor red and green shale. Trace pyrite.
5270	Sandstone (90%) clear to white, minor light greyish brown sand, unconsolidated, angular to subrounded, medium to coarse grained, well sorted, some black mineral grains and black shaly partings. Shale (10%) red, green, dark grey to black.
5280	Sandstone (100%) cream to light greyish brown, unconsolidated, angular, very fine to fine grained, well sorted, silty, black shaly partings and black mineral grains. Minor red, green, dark grey to black shale.

APPENDIX 2 (Continued)

Depth	Description
5290	Sandstone(50%)as above, some very fine pyrite pellets present in the sample. Shale (50%) black, blocky to platy, carbonaceous, minor red, green and dark grey shale.
5300	Sandstone (70%) clear to white, unconsolidated, angular to subrounded, fine to medium grained, occasional coarse quartz grains, well sorted, abundant pyrite pellets, some dark mineral grains and black shaly partings. Shale (30%) black, red, green and grey shale.
5310	Sandstone (70%) clear to white, unconsolidated, angular to subrounded, fine to coarse grained, medium sorted, abundant pyrite pellets, dark mineral grains and black shaly partings, silty in part. Shale (30%) red, green, dark grey to black.
5320	Sandstone (90%) clear, white and light greyish brown, unconsolidated, angular to subrounded, very fine to medium grained, occasional coarse quartz grains, silty in part, abundant pyrite pellets, minor dark mineral grains, black shaly partings. Shale (10%) dark grey to black, minor red and green shale.
5330	Sandstone (70%) white to cream, as above, poorly to well consolidated, siliceous in part, trace minor intergranular porosity (estimated at 5 to 7%). Shale (30%) dark grey to black, minor red and green shale.
	HORN VALLEY 5330 (-3409)
5340	Shale (50%) black, blocky, micaceous, dolomitic in part. Dolomite (30%) whitish brown to dark brown, crypto to finely crystalline, argillaceous to sandy in part, calcareous in part. Sandstone (20%) as above.
5350	Shale (100%) dark brownish black to black, blocky, micaceous, dolomitic in part, silty in part, some minor red and green shale (cavings). Trace sandstone and pyrite.

Depth	Description
5360	Shale (50%) dark grey to black, blocky to platy, micaceous, silty in part. Dolomite (50%) light grey, light and dark greyish brown, crypto to finely crystalline, argillaceous to silty in part, calcareous in part.
5380	Shale (70%) as above. Dolomite (30%) as above. Sample very fine. Red and green shale and sandstone cavings.
5400	Shale (90%) as above. Dolomite (10%) as above.
5420	Shale (80%) as above. Dolomite (20%) as above. Some red and green shale, trace sandstone.
5440	Shale (100%) black, blocky to platy, micaceous, silty in part, minor dark brown dolomite as above, pyrite.
5450	Shale (90%) as above. Dolomite (10%) dark greyish brown, and light to dark brown, crypto- to finely crystalline, calcareous in part, argillaceous in part.
5480	Shale (100%) dark grey to black, blocky to platy, micaceous, dolomitic in part, silty in part, pyritic in part, grading in part to dark greyish brown argillaceous dolomite.
5490	Shale (50%) as above. Limestone (50%) white, light brown and dark greyish brown, crypto- to finely crystalline, dolomitic in part, argillaceous.
5530	Shale (90%) dark grey to black, blocky to platy, micaceous, clacareous in part, silty in part, slightly pyritic. Limestone (10%) as above.
5570	Shale (70%) dark grey, blocky to platy, micaceous, calcareous in part. Limestone (30%) greyish brown and dark grey, minor white, crypto-crystalline, dolomitic in part, argillaceous.
	Depth correction at 5570' from pipe tally 5570' equals 5565'.

APPENDIX 2 (Continued)

Depth	Description
5565-5573	CORE NO. 14 Cut 8' Recovered 7' 88% Recovery.
	HORN VALLEY GLAUCONITE MARKER 5575 (-3654)
5580	Limestone (30%) as above, slightly sandy in part, glauconitic. Dolomite (30%) as above, slightly sandy in part, glauconitic. Shale (20%) dark grey to black, dolomitic to calcareous, pyritic. Sandstone (20%) white to medium grey, poorly to well concolidated, dolomitic to calcareous, angular to subrounded, very fine to coarse grained, poorly sorted, glauconitic, also contains black mineral grains and some dark grey to black shaly partings.
5580-5638	CORE NO. 15 Cored 58' Recovered 58' 100% Recovery.
5640	Shale (90%) medium to dark grey, minor black shale, blocky to platy, micaceous, slightly dolomitic in part, silty. Sandstone (10%) white to medium grey, well condolidated, siliceous, dolomitic and calcareous in part, fine to coarse grained, medium sorted, angular to rounded, some well rounded individual quartz grains in sample, silty in part.
5645	Sandstone (90%) white, whitish grey to light grey in part, siliceous in part, white to whitish grey clay matrix also present outlining quartz grains, angular to subrounded, fine grained, well sorted, scattered dark mineral grains and black carbonaceous? stain, friable in part with some scattered poor intergranular porostiy (5 to 8%) probably no permeability due to clay matrix in fill, minor partings white clay. Shale (10%) dark grey to black, blocky to splintery, micaceous, silty. Trace pyrite.
5650	Sandstone (70%) as above. Shale (30%) as above. Trace of medium to coarse grained quartz grains.
5655	Sandstone (80%) as above. Shale (20%) as above.

APPENDIX 2 (Continued)

Depth	Description
5660	Shale (80%) dark grey to black, blocky to splintery, micaceous, slightly silty in part, trace of pyrite. Sandstone (20%) white, minor whitish grey and light grey sand, siliceous in part, white clay matrix in part outlining quartz grains, friable in part, angular to subrounded, fine grained, well sorted, occasional scattered individual medium to coarse well rounded quartz grains, some white clay partings, trace pyrite, silty in part (dark grey sand).
5665	Shale (60%) as above. Sandstone (40%) as above.
5670	Sandstone (60%) as above with some minor individual well rounded frosted quartz grains. Shale (40%) as above.
5680	Shale (70%) as above grading in part to a hard medium grey siltstone. Sandstone (30%) as above, slightly dolomitic to calcareous in part, pyritic in part.
5690	Shale (60%) dark grey to black, blocky to splintery, micaceous, silty and carbonaceous? in part, some red shale (cavings). Sandstone (40%) white to light grey, subangular to subrounded, fine grained, occasional medium grained sand with some well rounded quartz grains, siliceous matrix for the most part, occasionally dolomitic to calcareous in part, slightly silty in part. Trace pyrite and limestone (cavings?).
5700	Shale (60%) as above. Sandstone (40%) white to medium grey, fine grained, some minor medium grained sand, subangular to subrounded, occasional well rounded quartz grains, well sorted, siliceous, slightly dolomitic to calcareous in part, silty in part, trace pyrite, individual frosted well rounded coarse quartz grains.
5710	Shale (60%) as above. Sandstone (35%) as above, minor medium to coarse grained sand subangular to rounded quartz grains, poorly consolidated, minor intergranular prorsity? Limestone (5%) medium grey to dark greysih brown, dense, argillaceous.

APPENDIX 2 (Continued)

Depth	Description
5715	Shale (70%) dark grey to black, blocky to splintery, micaceous, carbonaceous in part, silty in part. Sandstone (25%) white to light grey, very fine to fine grained, siliceous in part, dolomitic to calcareous in part, subangular to subrounded, occasional medium to coarse grained sand, minor white clay, silty in part. Limestone (5%) dark grey and greyish brown, dense, argillaceous.
5724	Shale (60%) as above, some red shale (cavings). Sandstone (35%) as above with some medium to coarse grained, subrounded to well rounded clear to frosted quartz grains. Limestone (5%) as above.
5724-5784	CORE NO. 16 Cut 60' Recovered 60' 100% Recovery
5790	Shale (60%) dark grey to black, blocky to splintery, micaceous, silty in part, minor red and green shale (cavings). Sandstone (40%) white, minor light to medium grey silty sand, very fine to fine grained, very minor medium grained sand, some individual clear to frosted well rounded coarse quartz grains, subangualr to subrounded, well sorted, siliceous in part, slightly dolomitic to calcareous in part, some white clay partings, trace pyrite, glauconite and limy fragments.
5795	Sandstone (50%) as above, minor flecks and inclusions of black shale (chitinous fragments?), white calcareous clay partings and dark greyish brown limestone fragments. Trace glauconite, pyrite and fossil fragments. Shale (50%) as above.
5800	Sandstone (60%) white and light grey, well consolidated, siliceous, slightly dolomitic in part, some white clay, silty and micaceous in part, very fine to fine grained, well sorted, angular to subrounded, pyritic in part. Shale (40%) grey, dark grey and black, blocky to splintery, micaceous, silty, pyritic in part, trace of vein calcite, some red and green shale (cavings), minor grey to greyish brown, dense, argillaceous limestone fragments. Trace of fossil fragments.

APPENDIX 2 (Continued)

Depth	Description
5805	Sandstone (65%) as above. Shale (30%) as above. Limestone (5%) grey to dark greyish brown, dense, argillaceous. Trace: fossil fragments.
5810	Shale (70%) as above. Sandstone (30%) as above, some minor medium grained sand. Trace limestone fragments and glauconite.
5815	Sandstone (60%) white, light and medium grey, well consolidated, siliceous in part (vitreous luster), calcareous in part, contains abundant fine carbonaceous flecks and inclusions and black chitinous fragments, fine grained, well sorted, subangular to sobrounded, silty and pyritic in part, some white clay partings. Shale (35%) grey, dark grey and black, blocky to splintery, micaceous, slightly dolomitic in part, silty in part. Limestone (5%) dark grey and dark greyish brown, dense, argillaceous, fossiliferous in part (cavings?).
5820	Sandstone (75%) white, light grey, well consolidated, siliceous in part, calcareous in part, minor black flecks and inclusions, fine grained, well sorted, angualr to subrounded,occasional scattered well rounded quartz grains in a fine sand matrix, silty in part, some white clay partings, trace glauconite. Shale (20%) as above. Limestone (5%) dark grey and dark greyish brown, dense.
5825	Sandstone (60%) white, minor light grey, siliceous, slightly dolomitic in part, fine grained, angular to subrounded, well sorted, minor medium grained, subangular to subrounded sand and quartz grains, some white clay partings, slightly pyritic, trace glauconite. Shale (40%) grey, dark grey to black, blocky to splintery, micaceous, silty in part, minor grey and greyish brown limestone fragments.

Depth	Description
5830	Sandstone (65%) white, minor light grey, siliceous, slightly dolomitic, fine grained with some medium grained sand, angular to subrounded, well sorted, medium grained sand friable in part with minor intergranular porosity. Shale (30%) as above. Limestone (5%) grey to dark greyish brown, dense, argillaceous in part.
5840	Shale (50%) grey, dark grey and black, blocky to splintery, dolomitic to calcareous in part, micaceous in part, silty in part, some red and green shale (cavings), minor brownish black shale. Sandstone (45%) mainly white, minor grey and dark grey sand, fine grained, angular to subrounded, well sorted, occasional medium grained sand with minor individual well rounded coarse quartz grains, siliceous, dolomitic to calcareous in part, minor dark mineral grains and fine black shaly partings, some white clay, very slightly glauconitic, silty in part. Limestone (5%) grey to dark brown, dense, argillaceous in part. Trace: calcite, pyrite and fossil fragments?
5845	Sandstone (60%) as above with occasional medium to coarse clear to frosted, angular to rounded quartz grains in fine sand matrix. Shale (35%) as above. Limestone (5%) grey and dark brown, dense, argillaceous in part. Trace pyrite, calcite.
5850	Shale (60%) as above. Sandstone (35%) as above. Limestone (5%) as above.
5855	Sandstone (55%) as above. Shale (40%) as above. Limestone (5%) as above.
5860	Sandstone (65%) white, minor light grey, siliceous, dolomitic to clacareous in part, fine grained, well sorted, angular to subrounded, slightly silty in part, some white clay, occasional well rounded clear to frosted, subrounded to rounded individual coarse quartz grains. Shale (35%) grey to black, blocky to splintery, dolomitic to calcareous in part, micaceous in part, slightly silty, some red and green shale (cavings). Trace limestone, pyrite, calcite.

APPENDIX 2 (Continued)

Depth	Description
5870	Shale (65%) as above. Sandstone (30%) light to dark grey, minor white sand, siliceous in part, slightly dolomitic in part, fine grained, well sorted, angular to subrounded, some black flecks and inclusions and dark mineral grains, pyritic in part, silty in part. Limestone (5%) grey to dark brown, dense, argillaceous in part.
5880	Sandstone (75%) light grey, slightly siliceous in part, light grey to white clay matrix, dolomitic in part, fine grained, well sorted, angular to subrounded, micaceous in part, silty in part, abundant fine flecks and inclusions black shaly partings, slightly pyritic. Shale (25%) grey to black, blocky to splintery, micaceous, dolomitic to calcareous in part, fossiliferous in part, silty. Limestone (5%) grey to dark brown, dense, argillaceous.
5885	Shale (60%) as above, minor red and green shale (cavings). Sandstone (40%) as above with 20% unconsolidated, clear to frosted, angular to rounded coarse (some very coarse) quartz grains. Trace: Limestone, pyrite.
5890	Sandstone (90%) clear to light grey, unconsolidated, coarse to very coarse grained sandstone, angular to well rounded quartz grains, well sorted, pyritic in part, minor fine grained sand as above. Shale (10%) as above. Trace: Limestone and calcite.
5894	Sandstone (80%) clear to white and light grey, (40%) fine grained sand, (40%) coarse grained unconsolidated sand as above. Shale (20%) as above.
5894-5924	CORE NO. 17 Cut 30' Recovered 30' 100% Recovery.
5930	Shale (45%) grey to dark grey, minor greyish green, reddish brown (cavings?), blocky, platy and splintery, hard, silty in places, micaceous, calcareous in few places, interbedded with sandstone. Sandstone (55%) white to colourless and light grey, fine to very fine with occasional floating medium sized grains, slightly

APPENDIX 2 (Continued)

Depth	Description
5930 (continued)	silty in places (60%), medium to coarse grained with occasional very coarse grains (40%), subangular to rounded, some of the larger grains showing the better rounding, good sorting, frosted surfaces on grains, vitreous lustre on chips, subvitreous on some chips, well consolidated, bonded by secondary silica, calcareous in few places, slightly argillaceous in places, a few white clay fragments and coatings about some grains, minor pyrite crystals and oolites, and dark mineral grains, trace glauconite, no visible porosity. Trace silty limestone.
5935	Shale (50%) as above, trace fossil fragments. Sandstone (50%) as above.
5940	Shale (45%) as above. Sandstone (55%) fine to very fine with occasional floating medium sized grains, slightly silty in places (80%), medium grained with a few coarse grains, occasionally very coarse (20%), as above.
5945	Shale (70%) grey to dark grey, red, minor green, blocky, platy and splintery, compact, grading to grey and light grey silstone in places, micaceous, slightly calcareous and dolomitic interbedded with sandstone, trace fossil fragments, red shale contains small pockets of gypsum (?). Sandstone (30%) very fine to fine, with few medium sized grains and occasional coarse grains, white and clear to light grey and reddish brown, subangular to subrounded, some larger grains rounded, good sorting, subvitreous lustre, vitreous in places, well consolidated, bonded by secondary silica, calcareous in places, grading to siltstone in places, minor dark mineral grains, white clay fragments, pyrite, no visible porosity.
5950	Shale (60%) as above. Sandstone (40%) very fine to fine, subangular to subrounded, some rounded, floating, medium, coarse and very coarse grains, with frosted surfaces, white and clear, to light grey, and reddish brown, poor sorting, subvitreous lustre, vitreous in places, well consolidated, bonded by secondary silica, calcareous in places, grading to siltstone in places, minor dark mineral grains, white

APPENDIX 2 (Continued)

Depth	Description
5950 (Continued)	clay fragments, pyrite, no visible porosity. Trace argillaceous limestone.
5955	Shale (60%) as above, calcareous and dolomitic in places. Sandstone (40%) very fine to fine, subangular to subrounded grains, some rounded medium coarse grains, occasional very coarse grains, with frosted surfaces, some with secondary quartz growths, as above.
5960	Shale (50%) grey, dark grey, black, red, minor green, blocky, platy and splintery, compact, grading to siltstone in places, micaceous, calcareous in places, slightly dolomitic, interbedded with sandstone, trace fossil fragments, red shale contains small pockets of gypsum (?), trace calcite veins in shale. Sandstone (50%) very fine to fine, subangular to subrounded grains, some rounded, floating, medium, coarse and very coarse grains, with frosted surfaces, some with secondary quartz growth, reddish brown prominent, white, colourless and light grey, poorly sorted, subvitreous to vitreous lustre, well consolidated, bonded by secondary silica, slightly dolomitic, argillaceous in places, grading to siltstone in few places, minor dark mineral grains, micaceous, pyrite, white clay fragments, no visible porosity. Trace argillaceous limestone.
5965	Shale (60%) as above. Sandstone (40%) very fine to fine, subangular to subrounded grains, some rounded, floating, medium and coarse grains, few very coarse, as above.
5970	Shale (50%) as above, faulted in places. Sandstone (50%) very fine to fine, subangular to subrounded grains, some rounded, floating, medium grains, a few coarse and very coarse grains, poor sorting, as above.
5975	Shale (60%) as above, interbedded calcareous laminae and thin lenses, trace fossil fragments. Sandstone (40%) very fine to fine, subangular to subrounded grains, numerous rounded, medium and coarse grains,

APPENDIX 2 (Continued)

Depth	Description
5975 (continued)	some very coarse with frosted surfaces, poor sorting, loosely consolidated in few places, bonded by secondary silica, slightly dolomitic and clacareous, argillaceous in few places, grading to siltstone in few places, minor dark mineral grains, micaceous, white clay fragments, pyrite, trace glauconite, slight visible intergranular porosity. Trace argillaceous limestone.
5980	Shale (50%) as above, trace pyrite. Sandstone (50%) very fine to fine, subangular to subrounded grains, abundant rounded, medium and coarse grains, some very coarse grains up to 2 mm across, with frosted surfaces, poor sorting, loosely consolidated in few places, white, light grey and reddish brown colour, bonded by secondary silica, slightly dolomitic, argillaceous in few places, grading into siltstone in few places, minor dark mineral grains, micaceous, white clay fragments, pyrite, trace glauconite. Trace argillaceous limestone.
5985	Shale (45%) as above. Sandstone (55%) as above.
5990	Sandstone (90%) light pink and light rusty brown, minor white sand, siliceous in part (vitreous to subvitreous lustre), very slightly dolomitic in part, argillaceous in part (iron stained clay matrix), predominantly fine grained, subangular to subrounded, with some coarse individual clear to frosted well rounded quartz grains, some appear as floating quartz grains in a fine sand matrix, poorly sorted, minor white clay partings, possible minor intergranular and pinpoint porosity (estimated as poor 5%). Shale (10%) brick red, dark grey and minor green, blocky to splintery, trace of gypsum (?) in small flecks in the red blocky shale. Trace limestone.
6000	Sandstone (80%) as above, slight increase in individual (unconsolidated) coarse quartz grains, some as large as 2 mm and some show crystal facets others well rounded. Shale (20%) as above, trace pyrite, argillaceous limestone.

APPENDIX 2 (Continued)

086

Depth	Description
6005	Sandstone(90%) white, light pink and light rusty brown, poorly consolidated, siliceous in part, slightly argillaceous in part (some iron stained clay matrix), fine grained, subangular to subround with abundant coarse grained quartz grains (unconsolidated) subrounded to rounded, clear to frosted, some grains up to 2 mm in size, minor medium grained sand. Shale (10%) red, dark grey, minor green, blocky to splintery, micaceous in part. Trace pyrite, minor white clay.
6010	Sandstone (80%) as above. Shale (20%) dark grey to black, red, minor green. Trace: pyrite, argillaceous limestone.
6020	Sandstone (70%) white, light pink and light rusty brown, poorly to well consolidated, fine grained, subangular to subrounded, siliceous, slightly dolomitic and calcareous in part, minor white clay partings, abundant usbrounded to rounded coarse quartz grains, some up to 2 mm, poorly sorted. Shale (30%) grey to dark grey, red and minor green, blocky to splintery, micaceous in part, silty in part. Trace: pyrite, argillaceous limestone, minor greenish white fine grained sandstone.
6030	Sandstone (80%) white, light pink, light grey and light rusty brown as above. Shale (20%) as above.
6035	Sandstone (70%) as above, some whitish green sand. Shale (30%) as above.
6040	Shale (40%) grey to dark grey, red, minor black and green, blocky, platy and splintery, compact, micaceous in places, grading to siltstone in places, calcareous in places, slightly dolomitic, trace pyrite, fossil fragments. Sandstone (60%) white, light pink, light reddish brown and light grey, trace pale green, fine to very fine, subangular to subrounded, some medium and coarse, a few very coarse grains up to 2 mm across, subangular and rounded, some medium and coarse grains floating in fine sandstone, clear and frosted, poor sorting, subvitreous lustre, loosely consolidated in places, bonded by secondary silica,

APPENDIX 2 (Continued)

Depth	Description
6040 (continued)	slightly dolomitic, argillaceous in few places, grading to siltstone in places, minor dark mineral grains, white clay fragments, no visible porosity. Trace argillaceous limestone.
6045	Shale (30%) as above. Sandstone (70%) white, light pink, light reddish brown, light grey, trace pale green, fine to very fine, subangular to subrounded, abundant medium and coarse grains, some very coarse, subangular and rounded, clear and frosted, some medium and coarse grains float in fine grained sandstone, poor sorting, as above.
6050	Shale (40%) grey, dark grey, black, red, minor green, as above, red shale contains small pockets of gypsum (?), shale interbedded with sandstone. Sandstone (60%) as above, very coarse grains up to 2 mm across, trace glauconite, pyrite, slight visible intergranular porosity.
6055	Sandstone (70%) white and light pink, minor light grey trace pale green, fine to very fine, subangular to subrounded, numerous medium, some coarse and very coarse grains, subangular and rounded, clear and frosted, poor sorting, loosely consolidated in places, bonded by secondary silica, slightly dolomitic, argillaceous in few places, grading to siltstone in few places, minor dark mineral grains, white clay fragments, pyrite, trace glauconite, slight visible intergranular porosity. Shale (30%) as above, slickensides indicate faulting. Trace argillaceous limestone.
6060	Sandstone (70%) as above, minor micaceous. Shale (30%) as above, minor pyrite.
6065	Sandstone (75%) white and light pink to reddish brown and rusty coloured, light grey, minor pale green, fine grained, subangular to subrounded, abundant medium and coarse, some very coarse grains up to 2 mm across, subangular and rounded, clear and frosted, poor sorting, some fragments consist of coarse and medium sized grains set in fine grained

APPENDIX 2 (Continued)

Depth	Description
6065 (continued)	sand, loosely consolidated in few places, bonded by secondary silica, slightly dolomitic, argillaceous in few places, grading into grey siltstone in few places, minor dark mineral grains, white clay fragments, minor glauconite, very slight visible intergranular porosity. Shale (25%) as above, dark grey and black laminae interbedded with grey and light grey siltstone and very fine sandstone, minor pyrite. Trace argillaceous limestone.
6070	Sandstone (65%) as above, minor pyrite oolites and crystals, trace glauconite. Shale (35%) grey, dark grey, black, red, minor green, as above, trace calcite.
6075	Sandstone (70%) white and light pink to reddish brown and rusty coloured, light grey, minor pale green, fine grained, subangular to subrounded, numerous medium and coarse, some very coarse grains, subangular and rounded, clear and frosted, subvitreous lustre on chips, occasionally vitreous, poor sorting, as above, no fluoresence. Shale (30%) as above.
6080	Sandstone (75%) fine grained, subangular to subrounded, abundant medium and coarse, numerous very coarse grains, subangular and rounded, clear and frosted, poor sorting, as above, slight intergranular porosity, no fluoresence. Shale (25%) as above.
6085	Sandstone (70%) white, light pink, a few grains reddish brown and rusty, light grey, minor pale green, fine grained, subangular to subrounded, numerous medium and coarse grains, some very coarse, subangular and rounded, clear and frosted, subvitreous to vitreous lustre on chips, poor sorting, loosely consolidated in places, bonded by secondary silica, slightly dolomitic and calcareous, argillaceous in few places, grading into very fine sandstone in few places, minor dark mineral grains, white clay fragments, few black argillaceous spots in places, no visible intergranular porosity.

APPENDIX 2 (Continued)

Depth	Description
6090	Sandstone (90%) white, light pink, pale green, reddish brown and light grey, fine, medium and coarse grained fragments equally prevalent, with some very coarse grains, poor sorting, as above, glauconite, no visible intergranular porosity. Shale (10%) grey, dark grey, black, red, minor green, grading to siltstone in places, thin shaly laminae interbedded with fine sandstone in places, micaceous, calcareous in places.
6095	Sandstone (85%) white to colourless, light pink, pale green, grey, light grey, minor reddish brown, fine, medium and coarse grained chips and grains, equally prevalent, with some very coarse grains, subangular to rounded, clear and frosted grain surfaces, vitreous to subvitreous lustre on chips, poor sorting, loosely consolidated in places, bonded by secondary silica, slightly dolomitic, argillaceous in few places, glauconite, minor dark mineral grains, white clay fragments, no visible intergranular porosity. Shale (15%) as above, occasional brown.
6100	Sandstone (90%) white to colourless, light pink, light grey, minor pale green, medium and coarse grained chips and grains, with some very coarse grains, and fine grained chips, poor sorting, vitreous lustre as above, minor pyrite, trace glauconite, no fluoresence. Shale (10%) as above.
6105	Sandstone (90%) as above. Shale (10%) as above.
6110	Sandstone (80%) white, light pink, reddish brown to rusty, light grey, minor pale green, fine grained with some medium and coarse grained chips and grains, very fine grained in places, poor sorting, subvitreous lustre, well consolidated, in places loosely consolidated, bonded by secondary silica, slightly dolomitic, argillaceous in places, minor dark mineral grains and white clay fragments, minor glauconite, no visible porosity, no fluoresence. Shale (20%) grey, dark grey, black, red, minor green and brown, grading to siltstone in places, interbedded with grey and light grey siltstone and very fine sandstone laminae in

APPENDIX 2 (Continued)

Depth	Description
6110 (continued)	places, calcareous in places, slightly dolomitic, micaceous, red shale contains small pockets of gypsum (?).
6115	Sandstone (70%) white, pink, light grey, rusty brown, light green, poorly to well consolidated, fine to coarse grained, angular to rounded, poorly sorted, siliceous in part, slightly dolomitic and argillaceous in part, some of the fine sand also slightly micaceous and silty, occasional dark mineral grains, minor white clay partings. Shale (30%) grey to black, red and green, blocky to splintery, dolomitic to calcareous in part, silty in part, slightly pyritic. Trace: argillaceous limestone and calcite.
6125	Sandstone (90%) white, light pink and light rusty brown, minor light grey and light green sand, poorly to well consolidated, fine to coarse grained (mostly fine grained), angular to subrounded some rounded (coarse grains), siliceous, slightly dolomitic in part, silty in part, coarse sand mostly made up of individual quartz grains, some up to 2 mm, some of the whitish green sand slightly micaceous. Shale (10%) dark grey and black, red and green as above. Trace: pyrite, limestone.
6130	Sandstone (90%) white to medium grey, minor light pink and pale green sand, poorly to well consolidated, fine to coarse grained (60% coarse grained) angular to rounded, poorly sorted, siliceous, slightly pyritic, minor dark mineral grains and white clay partings. No visible intergranular porosity, occasional coarse quartz grains over 2 mm (grit size). Shale (10%) grey to black, red and green. Trace: fossil fragments (in the shale) calcite, limestone.
6145	Sandstone (90%) white to dark grey (mottled), minor light buff, poorly to well consolidated, fine to coarse grained (mainly coarse grained), angular to rounded, poorly sorted, siliceous, very slightly dolomitic in part, abundant dark mineral grains and black shaly partings (chitinous fragments?), pyritic.

APPENDIX 2 (Continued)

Depth	Description
6145	Shale (10%) grey to black, red and green. Trace: limestone. NOTE: Some quartz grains up to 2 mm in diameter and some of the grains appear to be pitted with black shaly inclusions in the pits.
6150	Sandstone (90%) white and light to medium grey, poorly to well consolidated, fine to coarse grained, angular to subrounded and rounded, poorly sorted, siliceous, slightly dolomitic in part (fine grained sand), pyritic, black shaly parting (chitinous fragments) dark mineral grains, minor white clay fragments, no visible intergranular due to siliceous cement and slightly dolomitic cement. Shale (10%) dark grey and black, red, minor green.
6160	Sandstone (90%) white to light grey, minor medium grey, as above, dark mineral grains and black shaly parting not so common. Shale (10%) as above. Trace: Limestone, glauconite.
at 6164	lost circulation, mixed mud, regained circulation, drilled ahead to 6166, lost circulation.
6165	No sample.
6166-6168	CORE NO. 18 cut 2' Recovered 1'9" 88% Recovery.
6185	Sandstone (50%) white to medium grey, poorly to well consolidated, siliceous, angular to subrounded, fine to coarse grained, poorly sorted, silty in part. Shale (50%) grey to dark grey, minor black, blocky to platy, silty in part. NOTE: Samples severely contaminated with cement, glass and gravel, very poor.
6190	Sandstone (85%) white to light grey, poorly to well consolidated, siliceous, fine to very coarse grained, poorly sorted, subangular to subrounded, minor well rounded quartz grains, slightly silty in part. Siltstone (10%) light to medium grey, micaceous. Shale (5%) grey to dark grey, minor black.
6195	Sandstone (95%) white to light grey, minor medium grey, unconsolidated to well consolidated, siliceous

APPENDIX 2 (Continued)

Depth	Description
6195 (continued)	individual grains up to 2 mm), poorly sorted, subangular to rounded, slightly silty and micaceous in part (fine grained sand), minor black shaly partings and white clay fragments. Shale (5%) grey to black, blocky to platy, micaceous and silty in part.
6200	Sandstone (100%) white to light grey, mainly unconsolidated, siliceous, medium to coarse grained, minor fine grained sand, well sorted, subangular to rounded, slightly pyritic, some white clay fragments and dark shaly partings.
6205	Sandstone (100%) white to light grey, unconsolidated to well consolidated (fine grained sand), siliceous, fine to coarse grained with occasional very coarse quartz grains, poorly sorted, subangular to subrounded, minor black shaly partings and dark mineral grains, minor white powdery mineral surrounding quartz grains in fine grained sand, slightly pyritic. Minor dark grey to black silty shale(samples still contain some cement and glass).
6220	Sandstone (100%) as above, very slightly dolomitic in part, minor white clay fragments, silty in part.
6225	Sandstone (90%) white to light grey, minor light buff sand, poorly to well consolidated, siliceous, fine to coarse grained, poorly sorted, subangular to rounded, minor white powdery mineral surrounding quartz grains in fine grained sand, pyritic in part, occasional dark mineral grains and black shaly partings, minor white clay fragments, slightly silty in part. Shale (10%) grey to black, blocky to platy, micaceous, silty in part.
6230	Sandstone (80%) white to medium grey, poorly to well consolidated, siliceous, fine grained with some medium to coarse grained sand, poorly to well sorted, pyritic and silty in part, glauconitic, minor white clay fragments, some dark grey to black mineral grains and shaly partings giving the sand a mottled appearance. Shale (20%) grey to black, blocky to platy, micaceous, grading in part to siltstone.

APPENDIX 2 (Continued)

Depth	Description
6240	Sandstone (80%) as above. Shale (20%) as above. (Still getting fair amount of cement and glass in the samples).
6250	Sandstone (80%) white to medium grey, well consolidated, siliceous, fine grained with some medium to coarse grained sand, poorly to well sorted, subangular to rounded, clear to frosted quartz grain, coarse sand contained in a fine sand matrix, silty in part, glauconitic in part, some dark mineral grains and black shaly partings giving some of the sand a mottled appearance, minor white clay fragments. Shale (20%) grey to black, blocky to platy, micaceous, grading in part to siltstone.
6255	Sandstone (70%) as above, pyritic in part. Shale (30%) as above.
6260	Sandstone (60%) white to dark grey, well consolidated, siliceous, very fine to fine grained, minor medium to coarse grained sand, well sorted, angular to subrounded, silty, grading in part to micaceous siltstone, some dark mineral grains and black shaly partings, slightly glauconitic and pyritic in part. Shale (40%) grey to black, blocky to platy, micaceous, silty in part.
6265	Shale (60%) grey to black, blocky to platy, micaceous, grading in part to argillaceous siltstone. Sandstone (40%) white to medium grey, minor greyish buff, well consolidated, siliceous, very slightly dolomitic in part, minor medium to coarse grained sand in fine sand matrix, well sorted, angular to subrounded, argillaceous to silty in part, slightly pyritic and glauconitic, some dark mineral grains and black shaly partings, minor white clay fragments.
6275	Sandstone (50%) as above quite glauconitic. Shale (50%) as above.

Depth	Description
6280	Sandstone (60%) white to medium grey, well consolidated, siliceous, very slightly dolomitic in part, very fine to fine grained, well sorted, angular to subrounded, glauconitic, argillaceous in part, grades in part to siltstone, micaceous in part. Shale (40%) grey to black, blocky to platy, occasional splintery, micaceous, silty.
6290	Shale (60%) grey to black, blocky to platy, occasional splintery, micaceous, grading in part to siltstone. Sandstone (40%) light to dark grey, well consolidated, siliceous, very slightly dolomitic in part, very fine to fine grained, well sorted, angular to subrounded, occasional coarse quartz grain, argillaceous in part, grades in part to siltstone, some dark mineral grains and black shaly fragments, glauconitic and slightly micaceous in part. Trace dark greyish brown limestone.
6300	Shale (70%) as above. Sandstone (30%) as above.
6320	Shale (60%) as above. Sandstone (40%) as above.
6330	Shale (60%) grey to black, blocky to platy, occasionally splintery, micaceous, grading in part siltstone. Sandstone (40%) white, cream and light grey, siliceous, fine grained, minor medium to coarse grained sand, well to poorly sorted, angular to subrounded, silty, some white powdery mineral in fine grained sand, slightly glauconitic and pyritic in part, minor dark mineral grains and black shaly partings. (NOTE: samples heavily contaminated with cement, glass, rubber and gravel).
6340	Sandstone (60%) white, cream, some light pink and light red sand, siliceous, poorly to well consolidated, fine to coarse grained, (coarse grained sand mostly unconsolidated) poorly to well sorted, angular to rounded, pyritic and glauconitic in part, silty in part (fine grained sand), minor black shaly partings and white clay fragments. Shale (40%) grey to black, some red shale and minor greyish green shale, blocky to platy, micaceous, silty in part.

Depth	Description
6345	Sandstone (50%) as above. Shale (50%) grey to black, some red and green shale, blocky to platy, occasionally splintery, micaceous, silty in part.
6346-6393	CORE NO. 19 Cut 47' Recovered 47' 100% Recovery.
6400	Shale (70%) grey to black, blocky to platy, occasionally splintery, silty in part. Sandstone (30%) white to medium grey, fine to coarse grained, angular to subrounded, poor to well sorted, siliceous in part, argillaceous in part, glauconitic.
6410	Sandstone (100%) white to light grey, mainly fine to medium grained, minor coarse sand, angular to subrounded, poorly to well sorted, siliceous in part, slightly dolomitic to calcareous in part, glauconitic in part, black shaly partings.
6420	Sandstone (100%) as above.
6430	Sandstone (100%) white to light grey, fine grained, angular to subrounded, well sorted, well consolidated, siliceous, slightly micaceous, some white clay fragments, grey to black micaceous shaly partings.
6435	Sandstone (100%) white to dark grey, some medium and coarse grained sand in fine sand matrix, angular to subrounded, poorly to well sorted, some dark mineral grains, black shaly partings, some white clay fragments, slightly pyritic.
6445	Sandstone (70%) as above. Shale (30%) grey to black, blocky to platy, silty in part.
6450	Sandstone (80%) as above, trace glauconite. Shale (20%) as above.
6460	Sandstone (90%) white to light grey, minor medium and dark grey sands, mainly fine grained with some medium to coarse sand, angular to subrounded, poorly to well sorted, some dark mineral grains, white clay fragments, trace glauconite and pyrite. Shale (10%) silty in places.

Depth	Description
6470	Sandstone (90%) as above. Shale (10%) as above.
6470-6474	CORE NO. 20 Cut 4' Recovered 3'10" 96% Recovery.
6474-6476	CORE NO. 21 Cut 2' Recovered 1'10" 92% Recovery.
6480	Sandstone (80%) white to light and medium grey, poorly to well consolidated, siliceous, vitreous lustre, slightly dolomitic to calcareous in part, slightly argillaceous in part, fine to medium grained with occasional coarse quartz grains, angular to subrounded, poorly to well sorted, some dark mineral grains and black shaly partings, some minor fine grained glauconitic sand (cavings?). Shale (20%) dark grey to black, blocky to platy, occasional splintery, micaceous silty in part. (Much lost circulation material in samples (mica)).
6485	Sandstone (90%) as above. Shale (10%) as above.
6490	Sandstone (100%) white, minor light to medium grey sand, siliceous, glassy lustre, mainly fine to medium grained with minor coarse grained sand, angular to subrounded, poorly to well sorted, minor dark mineral grains, some black shaly partings and white clay fragments, trace glauconite.
6500	Sandstone (90%) white to light and medium grey, siliceous in part, some white powdery mineral around quartz grains (fine grained sand), mainly fine grained with some minor medium to coarse grained sand, some dark mineral grains and black shaly partings, some white clay fragments. Trace glauconite, pyrite. Shale (10%) grey to black, blocky to platy, micaceous, silty in part.
6510	Sandstone (80%) light to medium grey some white sand, well consolidated, siliceous, glassy lustre, slightly dolomitic to calcareous in part, fine to medium grained, well sorted, angular to subrounded, clear to frosted quartz grains, dark mineral grains and black shaly partings, some white clay fragments, occasional coarse floating quartz grains, slightly

Depth	Description
6510 (continued)	pyritic and glauconitic in part. Shale (20%) grey to black, blocky to platy, occasionally splintery, micaceous grading in part to siltstone.
6520	Sandstone (80%) as above, silty in part. Shale (20%) as above.
6530	Sandstone (80%) light to medium grey, white, buff to rusty pink (probably due to heating sample too long while drying) well consolidated, siliceous, slightly dolomitic to calcareous in part, fine to medium grained with occasional coarse quartz grains, angular to subrounded, poorly to well sorted, dark mineral grains and black shaly partings, some white clay fragments, trace pyrite. Shale (20%) grey to black, minor red shale, blocky to platy, micaceous, silty.
6535	Sandstone (90%) white minor light and medium grey sand, siliceous, vitreous lustre, slightly dolomitic in part, minor white powdery mineral, fine to medium grained, occasional coarse unconsolidated quartz grains, angular to subrounded, well sorted, occasional dark mineral grains and black shaly partings, some white clay fragments. Shale (10%) grey to black, micaceous, silty in part.
6540	Sandstone (90%) as above, fine to coarse grained. poorly sorted, pyritic in part. Shale (10%) as above.
6550	Sandstone (90%) white, minor light to medium grey, poorly to well consolidated, siliceous, vitreous lustre, slightly dolomitic in part, mainly fine to medium grained with some unconsolidated coarse quartz grains, poorly to well sorted, angular to subrounded with occasional well rounded coarse quartz grain, pyritic in part, some dark mineral grains and black shaly partings, white clay fragments, trace glauconite. Shale (10%) grey to black, blocky to platy, micaceous, occasionally silty.
6560	Sandstone (95%) as above, fine to coarse grained, poorly sorted. Shale (5%) as above.

APPENDIX 2 (Continued)

Depth	Description
6570	Sandstone (80%) white to light and medium grey, well consolidated, siliceous, quartzitic, slightly dolomitic in part, fine to coarse grained, angular to subrounded, occasional well rounded coarse quartz grain, poorly sorted, some dark mineral grains and black shaly partings, some white clay fragments and minor white powdery mineral, slightly pyritic in part. Shale (20%) grey to black, micaceous, silty in part.
6580	Sandstone (100%) white, minor light grey, poorly to consolidated, siliceous, vitreous lustre, some white powdery mineral, mainly fine to medium grained with some scattered coarse quartz grains in a fine sand matrix, angular to subrounded, clear to frosted quartz grains with occasional well rounded coarse quartz grains, poorly to well sorted, abundant white clay fragments, dark grey to black shaly partings, minor medium to dark grey sand, trace pyrite.
6610	Sandstone (100%) white, poorly to well consolidated, siliceous, vitreous lustre, some white powdery mineral, fine to coarse grained, angular to subrounded, occasional well rounded coarse quartz grains, poorly sorted, abundant white clay fragments, dark grey to black shaly parting, minor greenish grey argillaceous fragments, slightly pyritic in part, possible poor intergranular porosity, estimated at 6 to 8%.
6620	Sandstone (100%) as above, slight increase in black shaly partings.
6630	Sandstone (100%) white, poorly to well consolidated, siliceous, glassy lustre, some white powdery mineral, fine to coarse grained (more coarse sand than in samples above) angular to rounded clear to frosted quartz grains, poorly sorted, pyritic in part, abundant white clay fragments, some grey to black shaly partings, trace glauconite.
6635	Sandstone (100%) white to light rusty pink, poorly to well consolidated, siliceous, glassy lustre, fine to coarse grained, angular to rounded, clear to frosted quartz grains, poorly sorted, abundant white clay fragments, minor black shaly partings.

APPENDIX 2 (Continued)

Depth	Description
6645	Sandstone (100%) white, rusty pink and light rusty red, as above.
6650	Sandstone (80%) as above. Siltstone (20%) rusty red and brown, micaceous, sandy in part, minor grey to black shaly partings. NOTE: Four foot depth correction at 6650' actual depth 6646'.
6646-6650	CORE NO. 22 Cut 4' Recovered 3'3" 81% Recovery.
6650-6651	CORE NO. 23 Cut 1' No recovery.
6655-6658	CORE NO. 24 Cut 3' Recovered 3' 100% Recovery.
6658	TOTAL DEPTH (DRILLER) 6657 (WELEX)

APPENDIX 3

CORE DESCRIPTIONS AND ANALYSIS

PALM VALLEY NO. 1 WELL
Rotary Table Elevation 1921 Feet (Datum)

A. CORE DESCRIPTIONS

By Ron Hay, Magellan Petroleum (N. T.) Pty. Ltd.

Depth (Recovered)	Description
	CORE NO. 1 - 693' to 702'. Cored 9', recovered 8'2", 90% recovery.
	PERTNJARA FORMATION
693'-695'1" (2'1")	Sandstone (95%) with minor interbeds of shale and siltstone near base of interval.
	Sandstone - orange to reddish brown, well consolidated, siliceous in part, hard, tight, very fine to medium grained, medium sorted, angular to subrounded, dolomitic to calcareous, some green to black mineral grains, slightly silty in part, scattered blebs and patches dark red shale (clay pellets), anhydritic in part (minor scattered flecks of clear anhydrite), six inches from base of interval one knot (3/4 inch in diameter) of clear crystalline anhydrite (or barite?).
	Shale - dark reddish brown, platy, micaceous.
	Siltstone - medium grey to greenish grey, dolomitic, sandy.
695'1"-698'8" (3'7")	Shale - dark reddish brown, blocky to platy, dolomitic, micaceous, silty, slightly sandy in part, minor scattered patches and pockets of greyish green to green silty shale, minor fine flecks and inclusions of clear to white calcite.
698'8"-701'2" (2'6")	Sandstone (95%) with minor thin interbeds of shale and siltstone near top of interval.

APPENDIX 3 (Continued)

Depth (Recovered)	Description
	Core No. 1 (Continued)
	Sandstone - orange to reddish brown, well consolidated siliceous in part, hard, tight, very fine to medium grained, medium sorted, angular to subrounded, dolomitic to calcareous, silty in part, green mineral grains (feldspar?), scattered small flecks and inclusions of clear to white anhydrite (and/or barite?), some minor scattered flecks of dark red shale.
	Shale - dark red, platy, micaceous.
	Siltstone - grey to greyish green, dolomitic, sandy in part.
	CORE NO. 2 - 1162' to 1167'. Cored 5', recovered 5', 100% recovery.
	MEREENIE FORMATION
1162'-1167' (5')	Sandstone - orange to orange-red, well consolidated, siliceous, hard, tight, angular to subrounded, very fine to fine grained, well sorted, dolomitic, green mineral grains, minor white clay, scattered thin lenses and pockets of dark reddish brown shale, bottom foot of interval slightly shalier than top four feet. Six inches from base of cored section two-inch stringer of greyish green silty sand interbedded with dark reddish brown shale.
	CORE NO. 3 - 1621' to 1624'. Cored 3', recovered 2'9", 91% recovery.
	Coring times: 27, 29 and 43 minutes per foot.
	Core bit: Hughes hard formation type J 8-3/4".
	MEREENIE FORMATION

APPENDIX 3 (Continued)

Depth (Recovered)	Description
	Core No. 3 (Continued)
1621'-1623'9" (2'9")	Sandstone - orange-red, bottom foot of interval is white to greyish white and light orange to orange-red, mottled, the sandstone is well consolidated, siliceous, hard, tight, very fine to fine grained, occasionally medium grained, medium to well sorted, subangular to rounded, dolomitic to calcareous in part, dark mineral grains, scattered fine wavy lenses and inclusions of dark reddish brown shale.
	CORE NO. 4 - 2219' to 2234'. Cored 15', recovered 15', 100% recovery.
	Coring times: 12, 9, 8, 5, 4, 3, 3, 4, 3, 3, 2, 2, 3, 2 and 3 minutes per foot.
	MEREENIE FORMATION
2219'-2234' (15')	Sandstone - light orange to orange, subangular to rounded quartz grains, fine to medium grained, well sorted, some thin stringers of coarse grained sand scattered throughout, friable, fair to good intergranular and pinpoint porosity (estimated at 10 to 16 percent). At 2227' three-inch band of grey to red and purple hard siliceous sand with minor shaly partings. Cross-bedding in the core from 2230' to 2234' with sets up to 25-30 degrees (fine thin scattered black lines show up the cross-bedding). From 2232' to 2234' the core is fractured. Some fractures occur parallel to the cross-bedding and others at approximately 45 to 50 degrees.
	CORE NO. 5 - 2789' to 2799'. Cored 10', recovered 9'2", 92% recovery.
	Coring times: 16, 20, 17, 13, 13, 13, 14, 16, 20 and 11 minutes per foot.

Depth (Recovered)	Description
	Core No. 5 (Continued)
	MEREENIE FORMATION
2789'-2797'11" (8'11")	Sandstone(95%) interbedded with minor thin irregular stringers, pockets and inclusions of dark reddish brown micaceous shale. Sandstone - white, whitish pink and purple, well consolidated, siliceous, hard, medium to coarse grained orthoquartzite (fresh sparkling appearance), angular to subrounded quartz grains, many well developed crystal facets on individual quartz grains,well sorted, minor scattered flecks of white and orange clay(feldspar?) occasional black mineral grains. The sandstone is slightly friable in part with some scattered poor pinpoint and intergranular porosity (estimated at 5% to 8%), but no effective permeability. Fine vertical fractures healed with quartz occur from 2791' to 2793'. Horizontal fracture at 2791' and a fracture at 2796' at approximately 20 degrees.
2797'11"-2798'2" (3")	Sandstone - dark reddish brown with patches and pockets of greenish white sand, well consolidated, siliceous in part, medium to coarse grained, subangular to rounded, well sorted, iron stained clay matrix and whitish green clay matrix in greenish white patches of sandstone, friable in part, no porosity due to clay matrix in fill.
	CORE NO. 6 - 3181' to 3181'8". Cored 8", no recovery.
	CORE NO. 7 - 3293' to 3298'. Cored 5', recovered 4'7", 92% recovery.
	Coring times: 13, 11, 21, 13 and 16 minutes per foot.
	STOKES FORMATION

APPENDIX 3 (Continued)

Depth (Recovered)	Description
	Core No. 7 (Continued)
3293'-3293'10" (10")	Siltstone (80%) and shale (20%) interbedded. Siltstone - white, light pink and red, green and minor grey, micaceous sandy and dolomitic in part, small scattered pockets and inclusions of clear to white gypsum. Shale - brick red to dark reddish brown, green, minor greyish green shale, blocky to platy, micaceous, slightly dolomitic, silty in part. The shale is distributed throughout the interval in thin wavy irregular lenses and stringers.
3293'10"-3294'10" (1')	Shale - brick red to dark reddish brown, blocky to platy, micaceous in part, silty in part, minor thin white to greyish green and green silty and sandy partings and inclusions, slickensides.
3294'10"-3296' (1'2")	Shale (60%) brick red, green, grey and purple, blocky to platy, micaceous in part, silty and dolomitic in part. Siltstone (30%) white, greyish green, pink, dolomitic and micaceous in part, sandy in part. Sandstone (10%) white to pink and red, siliceous, hard, angular to subrounded, fine grained, well sorted, silty, distributed in thin stringers and lenses, none thicker than one inch. Trace of relic salt casts?
3296'-3297'7" (1'7")	Shale - brick red with minor flecks and thin partings of green shale and siltstone, blocky to platy, micaceous in part, slightly silty and dolomitic, slickensides. No hydrocarbon shows, no apparent dip (flat?).

APPENDIX 3 (Continued)

Depth (Recovered)	Description
	CORE NO. 8 - 3622' to 3632'. Cored 10', recovered 8', 80% recovery.
	Coring times: 14, 8, 10, 8, 8, 11, 17, 16, 12 and 10 minutes per foot.
	STOKES FORMATION
3622'-3623' (1')	Shale - green and greyish green with thin irregular interbeds of red shale, blocky to platy, micaceous, dolomitic in part, silty in part.
3623'-3627' (4')	Shale - brick red with minor flecks and partings of green shale, blocky to platy, micaceous, slightly dolomitic and silty in part, scattered small pockets and inclusions of white gypsum, at 3626' (plus) fracture at approximately 40 degrees (2 inches long) filled with white gypsum.
3627'-3627'7" (7")	Shale - green and greyish green with thin irregular interbeds of red shale, silty in part.
3627'7"-3630' (2'5")	Shale - brick red, minor flecks and partings of greyish green and green shale, blocky to platy, micaceous, slightly dolomitic in part, a few scattered small pockets and spots of white gypsum.
	No apparent dip (flat?).
	CORE NO. 9 - 3899' to 3909'. Cored 10', recovered 8'4", 83% recovery.
	Coring times: 5, 4, 3, 4, 5, 3, 3, 4, 4 and 4 minutes per foot.
	STOKES FORMATION

Depth (Recovered)	Description
	Core No. 9 (Continued)
3899'-3907'4" (8'4")	Shale - brick red to reddish brown interbedded with scattered lenses, stringer and pockets of green shale, some stringers of green shale up to 6 inches thick. The shale is blocky to platy, micaceous, dolomitic and silty in part, minor scattered small flecks and inclusions of white gypsum. Severe slickensides scattered throughout the cored interval. No apparent dip (flat?).
	CORE NO. 10 - 4265' to 4275'. Cored 10', recovered 9', 90% recovery.
	Coring times: 40, 18, 10, 8, 6, 6, 9, 5, 9 and 11 minutes per foot.
	LOWER STOKES FORMATION
4265'-4267'3" (2'3")	Shale (60%) interbedded with sandstone (40%).
	Shale - dark grey to black, platy, micaceous, dolomitic, calcareous in part, silty in part.
	Sandstone - white to light grey, well consolidated, angular to subrounded, very fine grained, well sorted, dolomitic, calcareous in part, silty in part. The sandstone is distributed in thin irregular lenses and stringers throughout the interval. Some fossil fragments and worm tubes?
4267'3"-4269'8" (2'5")	Shale - dark greyish green and dark green, blocky to platy, micaceous, dolomitic, silty and slightly sandy in part. Bottom 8 inches mainly dark grey platy shale, fossiliferous.
4269'8"-4273'8" (4')	Shale (50%) interbedded with sandstone (50%).
	Shale - dark grey to black, platy, micaceous, dolomitic, silty in part.

Depth (Recovered)	Description
	Core No. 10 (Continued)
	Sandstone - white to dark grey, minor greyish brown sand, very fine to fine grained with occasional thin stringer of fine to medium grained sand, angular to subrounded with occasional well rounded quartz grains, well sorted, dolomitic to calcareous, silty in part. The sand is distributed in thin irregular lenses throughout the interval, some worm tubes? Bottom 6 inches consists of medium grey, hard, dolomitic, slightly sandy siltstone.
4273'8"-4274' (4")	Shale - dark green, blocky, hard, dolomitic, silty, slickensides at base of interval.
	No hydrocarbon shows. No dip.
	CORE NO. 11 - 4611' to 4621'. Cored 10', recovered 10', 100% recovery.
	Coring times: 20, 12, 12, 8, 8, 7, 12, 7, 14, 14 and 9 minutes per foot.
	STAIRWAY FORMATION
4611'-4612'9" (1'9")	Sandstone-white to light grey and light green (bottom 8 inches), siliceous in part, dolomitic to calcareous in part, angular to subrounded, very fine to fine grained, well sorted, silty in part, scattered paper thin irregular dark grey to black shaly partings, scattered minor dark mineral grains, the sandstone is thin bedded, micaceous in part and phosphatic?
4612'9"-4615' (2'3")	Sandstone - dark green and greyish green, siliceous in part, angular to subrounded, very fine grained, well sorted, slightly dolomitic in part, silty, abundant green shale distributed throughout the interval in small partings, flecks, inclusions and pockets. The sandstone is dense, hard, brittle and chloritic.

Depth (Recovered)	Description
4615'-4616'8" (1'8")	Sandstone - dark rusty brown, with minor stringers of greyish green and green sand, siliceous in part, angular to subrounded, very fine grained, well sorted, very slightly dolomitic, argillaceous in part, silty and shaly. The shale is scattered throughout the interval in fine flecks, partings, inclusions and pockets, some of which are slickensided.
4616'8"-4618'6" (1'10")	Sandstone - dark reddish brown, greyish green and green, interbedded, siliceous in part, angular to subrounded, very fine to fine grained, well sorted, dolomitic to calcareous in part, silty, some scattered thin lenses of dark reddish brown shale, flecks, partings and inclusions of red and green shale.
4618'6"-4621' (2'6")	Sandstone - white to light and dark grey to whitish green, grading to grey and brown sand towards the base, bottom two inches is a white sand, siliceous in part, very fine to fine grained, well sorted, dolomitic to calcareous, silty, scattered thin lenses and pockets of rusty brown shale, dark grey shale and green shale, abundant inclusions, flecks and small patches of grey, green, rusty brown and red shale, some of which show slickensides, at 4619'8" one small inclusion of whitish orange gypsum. The sand may also be phosphatic in part. The entire cored intervals showed no porosity or permeability whatsoever. No hydrocarbon shows, no dip.

CORE NO. 12 - 4942' to 4952'. Cored 10', recovered 10', 100% recovery.

Coring times: 14, 17, 16, 11, 17, 40, 10, 22, 24 and 17 minutes per foot.

STAIRWAY FORMATION

APPENDIX 3 (Continued)

Depth (Recovered)	Description
	Core No. 12 (Continued)
4942'-4943'8" (1'8")	Shale (70%) dark grey and black with irregular inclusions, pockets and patches of white and light to dark grey sandstone and siltstone, giving the entire interval a mottled appearance. Shale - dark grey to black, micaceous, silty in part, carbonaceous? slightly dolomitic, abundant small slickensides in the shale, no bedding evident. Sandstone - white to light grey, siliceous, very fine grained, well sorted, angular, dolomitic in part, silty. Siltstone - dark grey, slightly dolomitic and sandy. The sand and siltstone content increases towards the base of the interval, scattered worm tubes at random angles throughout the section.
4943'8"-4947'11" (4'3")	Sandstone with scattered inclusions, pockets, thin irregular lenses and partings of dark grey to black shale. Sandstone - white to light grey, siliceous in part, angular, very fine to fine grained, well sorted, micaceous in part, dolomitic, silty. Shale - mainly dark grey, minor black shale, micaceous, silty, at 4946' 4-inch stringer of dark grey to black silty shale.
4947'11"-4949' (1'1")	Top 5 inches of interval shale (80%) dark grey to black with irregular inclusions, pockets and patches of white and light grey sandstone and light to dark grey siltstone, giving the section a mottled appearance as in the top zone of the core, some worm tubes scattered at random angles. Bottom 8 inches consists of medium grey and greyish yellow-brown, dolomitic, micaceous, slightly pyritic and sandy siltstone, with minor inclusions of dark grey to black shale.

Depth (Recovered)	Description
	Core No. 12 (Continued)
4949'-4952' (3')	Sandstone (90%) light greyish green at top, white and light grey towards base, interbedded with thin irregular lenses, partings and inclusions of light to medium grey shale.
	Sandstone - siliceous in part, dolomitic in part, very fine to fine grained, well sorted, angular, silty, micaceous in part.
	Shale - light to medium grey, micaceous, silty in part, at 4950'4" thin 2-inch band of white to light grey, dolomitic to calcareous sandstone with black shaly partings and flecks, dark mineral grains, inclusions of clear to white soft coarsely crystalline gypsum and scattered dark brown oolites. The sandstone is thin bedded in part with fine scattered horizontal hairline fractures parallel to the bedding plane.
	Overall cored interval considered tight, with no hydrocarbon shows.
	CORE NO. 13 - 5197' to 5200'. Cored 3', recovered 1'9", 58% recovery.
	Coring times: 44, 48 and 61 minutes per foot.
	STAIRWAY FORMATION
5197'-5198'9" (1'9")	Sandstone (orthoquartzitic) light to medium grey, siliceous, hard, angular to subrounded, occasional rounded quartz grains, fine to coarse grained, medium sorted, friable in part, scattered fine lenses, minor patches and flecks of black carbonaceous? shale, abundant pyrite oolites with soft carbonaceous centres scattered throughout the interval. The sandstone has a vitreous lustre on freshly broken surfaces. The top one foot two inches of the core has

Depth (Recovered)	Description
	Core No. 13 (Continued)
	some minor poor intergranular porosity (estimated at 5%)and numerous thin horizontal fractures parallel to the bedding plane. The fractures break the core up into thin biscuits in part, the drilling fluid (water and soap) has invaded the fractures,in some cases to the centre of the core.
	CORE NO. 14 - 5565' to 5573'. Cored 8', recovered 7', 88% recovery.
	Coring times: 36, 20, 15, 16, 13, 14, 12 and 10 minutes per foot.
	HORN VALLEY FORMATION
5565'-5572' (7')	Limestone (35%), dolomite (35%) and shale (30%), all interbedded.
	Limestone - white, light to medium grey, crypto to coarsely crystalline, hard, tight, dolomitic, argillaceous and pyritic in part, fossiliferous, occasional knots and thin lenses of white calcite.
	Dolomite - whitish grey and greyish brown to light brown, crypto to coarsely crystalline, hard, tight, calcitic, argillaceous and pyritic in part, fossiliferous.
	Shale - dark grey and black, dolomitic to calcareous in part, slightly silty and pyritic, fossiliferous. The shale is distributed throughout the interval in thin irregular lenses, patches and partings, severely contorted in part, the top and bottom foot of the cored zone are shalier than the middle section. The bottom foot of the core (5571'-5572')has two very fine near-vertical fractures healed with calcite. No hydrocarbon shows or fluorescence was evident in the core.

Depth (Recovered)	Description
	CORE NO. 15 - 5580' to 5638'. Cored 58', recovered 58', 100% recovery.
	Coring times: 44, 15, 18, 11, 18, 9, 10, 9, 15, 15, 7, 7, 12, 11, 8, 8, 7, 9, 7, 9, 7, 8, 9, 13, 13, 15, 15, 10, 10, 8, 11, 16, 13, 16, 14, 14, 11, 10, 9, 11, 11, 14, 15, 15, 9, 8, 10, 14, 10, 25, 15, 19, 25, 16, 20, 22, 36 and 32 minutes per foot.
	PACOOTA FORMATION
5580'-5626'6" (46'6")	Shale (90%), sandstone and siltstone (10%), all interbedded.
	Shale - dark grey to black, platy, micaceous, fossiliferous in part, silty in part.
	Sandstone - light to dark grey, siliceous and dolomitic in part, very fine grained, well sorted, silty, fossiliferous and pyritic in part.
	Siltstone - light to dark grey, dolomitic and sandy in part. The sandstone and siltstone is distributed throughout the interval in thin lenses and partings. Fractures are present at the following depths: 5584'-5585' one vertical fracture, 5605'-5607'6" four fractures at approximately 40° to 45°, at 5620'-5622' one vertical fracture approximately 2 feet long, at 5623'-5626' severe zone of vertical fractures with possible horizontal fractures. No porosity noted in the interval except for the fractured zones.
5626'6"-5627'9" (1'3")	Sandstone - medium to coarse grained orthoquartzite with calcite cement, with pyrite and black chitinous fragments grading downward into thoroughly welded, vitreous orthoquartzite, one 70° vertical fracture.
5627'9"-5636'6" (8'9")	Shale and siltstone as described above in section from 5580' to 5625'6".

APPENDIX 3 (Continued)

Depth (Recovered)	Description
	Core No. 15 (Continued)
5636'6"-5638' (1'6")	Sandstone - medium to coarse grained orthoquartzite with barite? surrounding well rounded quartz grains grading downward through mottled orthoquartzite to vitreous, welded orthoquartzite.
	Notes on above core by D. A. McNaughton:
	5599' -laminated siltstone and shale cut by filled and mineralized vertical fracture. Mineralization consists of sphalerite? and chalcopyrite and possibly galena. Gangue mineral in fracture may be anhydrite.
	5606' to 5608' - 45° fractures in black shales mineralized with pyrite. Pebble tracks and chatter marks indicate hanging wall moved down with reference to foot wall; i. e.; normal fault.
	5580' to 5626'4" - seams, slots, and laminations of sands in mottled sediments. These sediments show abundant evidence of organic reworking. The fine-grained sands and silts may contain some hydrocarbons although no odor or bubbling was noted. However, from a reserve viewpoint, these sands and silts will not be significant unless they are cut by networks of fractures.
	CORE NO. 16 - 5724' to 5784'. Cored 60', recovered 60', 100% recovery.
	Coring times: 64, 35, 22, 14, 10, 12, 15, 14, 18, 19, 18, 17, 15, 21, 15, 12, 13, 17, 13, 14, 12, 14, 14, 13, 14, 12, 13, 15, 17, 14, 15, 16, 33, 11, 10, 12, 9, 10, 15, 14, 20, 17, 15, 18, 17, 15, 23, 19, 26, 18, 21, 14, 13, 17, 33, 25, 18, 16, 21 and 25 minutes per foot.
	PACOOTA FORMATION

Depth (Recovered)	Description
	Core No. 16 (Continued)
5724'-5733' (9')	Shale (70%) interbedded with sandstone and siltstone (30%). Shale - dark grey to black, blocky to platy, micaceous, slightly dolomitic in part, slightly pyritic, silty in part. Sandstone - light to dark grey, very fine to fine grained, well sorted, siliceous, dolomitic to calcareous in part, grading in part to medium grey siltstone. The sandstone is scattered throughout the interval in thin lenses, knots and laminations giving the overall section a mottled appearance (organic reworking). The top four and one half feet (5724'-5728'6") of the interval was vertically fractured (open fracture).
5733'-5739' (6')	Shale (90%) as above with minor interbeds of light to medium grey fine silty sandstone. Five-inch stringer of sandstone near centre of section (5736'6") medium to dark grey, medium to coarse grained, subrounded to rounded, calcareous, argillaceous (barite?), siliceous in part, occasional dark mineral grains, thin irregular band of black contorted shale at the centre of the sand. The shale becomes slightly mottled near the centre of the section and towards the base.
5739'-5757' (18')	Sandstone (60%) interbedded with shale (40%). Sandstone - light to medium grey, very fine to fine grained, angular to subrounded, well sorted, calcareous and siliceous in part, slightly argillaceous, minor scattered small argillaceous spots possibly of organic origin, micaceous, occasional scattered dark mineral grains, slightly pyritic, some healed vertical hairline fracture lines (not open), wishy-washy cross-bedding.

Depth (Recovered)	Description
	Core No. 16 (Continued)
	Shale - dark grey to black, micaceous, silty in part, slightly pyritic, distributed in thin lenses, partings, laminations and knots throughout the interval, partly concentrated in bands and lenses up to five and six inches thick with patches of sand giving the band or lense a mottled appearance.
5757'-5758'3" (1'3")	Shale (70%) and sandstone (30%) interbedded.
	Shale - as described in above interval.
	Sandstone - light to medium grey, very fine to fine grained distributed throughout the interval in thin laminations and knots giving the section a mottled appearance.
5758'3"-5759'5" (1'2")	Sandstone - light to medium grey and dark grey, coarse grained orthoquartzite, subrounded to rounded quartz grains, siliceous, very slightly calcareous, well sorted, vitreous lustre, hard, tight grading downwards (bottom 8 inches) to medium and dark grey medium to coarse grained sandstone with argillaceous matrix (barite?) also siliceous in part. Minor dark grey to black shale knots and thin laminations.
5759'5"-5770' (10'7")	Shale (90%) and sandstone (10%) interbedded.
	Shale - dark grey to black, blocky to platy, micaceous, silty, pyritic in part.
	Sandstone - light to medium grey, siliceous in part, calcareous in part, scattered in thin lenses and knots, overall interval has mottled appearance in part, suggesting organic reworking.

Depth (Recovered)	Description
	Core No. 16 (Continued)
5570'-5780'4" (10'4")	Sandstone (80%) interbedded with shale (20%). Sandstone - light grey, fine grained, well sorted, siliceous, glassy lustre, hard, tight. Bottom two feet of interval consists of white to light grey medium to coarse grained orthoquartzite, subrounded to rounded quartz grains, siliceous, very slightly calcareous in part, well sorted, abundant scattered black flecks and inclusions of black chitinous fragments (fossil debris), very slightly friable in part, minor poor intergranular porosity (5% to 7%). Very fine vertical fracture in bottom portion of sandstone (that is, in the medium to coarse grained sand).
5780'4"-5784' (3'8")	Shale (60%) and sandstone (40%) interbedded. Shale - dark grey to black, blocky to platy, micaceous, silty in part. Sandstone - light grey, siliceous and calcareous in part, fine grained, well sorted, hard, tight. The sandstone is scattered throughout the interval in thin stringers, lenses and knots (some lenses 4 to 5 inches thick) and with parts of the section having a mottled appearance. Representative samples taken for analysis at: 5828'8", 5744'4", 5748', 5756', 5758'6", 5770'6", 5779' and 5780'.
	CORE NO. 17 - 5894' to 5924'. Cored 30', recovered 29'2", 97% recovery. Coring times: 38, 17, 20, 15, 10, 9, 11, 11, 14, 12, 8, 14, 8, 13, 19, 18, 29, 15, 25, 18, 18, 26, 28, 32, 38, 34, 27, 49, 31 and 26 minutes per foot. PACOOTA FORMATION

Depth (Recovered)	Description
	Core No. 17 (Continued)
5894-5901' (7')	Sandstone (100%) light grey to medium grey, very fine to fine, silty and argillaceous in places, occasional medium grains, subangular to subrounded, well consolidated, good sorting, irregular bedding suggested organic reworking, and few worm tubes in lower 4'6", slightly calcareous and dolomitic to very micaceous in places, slight pyrite crystals and dark mineral grains, no visible porosity.
5901'-5903' (2')	Sandstone (50%) light grey to medium grey, very fine to fine, occasional medium sized grains, silty and argillaceous in places and few thin shaly partings, well consolidated, mottled appearance suggested organic reworking, minor dark mineral grains and black argillaceous spots of organic origin. Shale (50%) grey to dark grey sands and laminae interbedded with sandstone, micaceous.
5903'-5908' (5')	Sandstone (100%) light grey to medium grey, very fine to fine, silty in few places, well consolidated minor cross-bedding in lower one foot irregular vertical fractures at 1'6", 2'9" from top and at base, slightly calcareous and dolomitic, minor dark mineral grains, micaceous and pyrite.
5908'-5917'6" (9'6")	Sandstone (70%) light grey to medium grey, very fine to fine with few medium sized grains, silty in places, well consolidated, mottled in few places, irregular vertical fractures along most of section and some irregular horizontal fractures, very slightly calcareous, minor dark mineral grains, micaceous and few shaly partings and spots. Shale (30%) interbedded with sandstone as above.

Depth (Recovered)	Description
	Core No. 17 (Continued)
5917'6"-5923'2" (5'8")	Sandstone (100%) light grey coarse grained, grading to medium and fine grained in places, occasional grains very coarse, subangular to subrounded, occasionally rounded, good to medium sorting, well consolidated by secondary silica filling interstitial spaces, numerous small interbedded thin lenses of black shale, minor dark mineral grains and black argillaceous spots and patches of organic origin, very slightly calcareous, no visible porosity. Sandstone bubbling gas slightly in places, no fluorescence, no petroliferous odor.
	CORE NO. 18 - 6166' to 6168'. Cored 2', recovered 1'9", 88% recovery. Coring times: 76 and 63 minutes per foot. Lost circulation at 6168 feet. PACOOTA FORMATION
6166'-6166'9" (9")	Shale (45%) and siltstone (45%) and minor sandstone (10%) interbedded. Shale - grey to dark grey and green, minor black shale, blocky to platy, micaceous, silty. Siltstone - grey to greyish green and light green, micaceous in part, sandy in part. Sandstone - light grey and pale green, fine grained, micaceous and silty in part, hard, tight. Overall interval basically light green and greyish green with dark grey and black shale showing flow structures (flame structure), worm tubes (scolithids?) in bottom three inches of interval.

Depth (Recovered)	Description
	Core No. 18 (Continued)
6166'9"-6167'3" (6")	Sandstone - clear, white to medium grey, slightly greyish green in part, fine to coarse grained orthoquartzite, angular to subrounded with some scattered well rounded coarse quartz grains, poorly sorted, siliceous cement and minor white powdery mineral, dark grey and black fossil fragments scattered throughout, one vertical worm tube?, overall interval hard, tight.
6167'3"-6167'9" (6")	Interbedded shale (40%), sandstone (40%)and siltstone (20%).
	Sandstone - clear, light grey with minor light reddish pink sand, fine to coarse grained orthoquartzite (some grains over 1 mm), siliceous cement, vitreous lustre, silty and shaly in part, dark grey to black fossil fragments, hard, tight.
	Shale - dark grey and black, micaceous, silty, present in thin lenses and interbeds showing micro faults, flow structures and possible organic structures.
	Siltstone - light to dark grey and dark greyish brown, micaceous, sandy to shaly in part.
	The cored interval had no fractures, no fluorescence and no petroliferous odor. Washouts(1/4 to 1/2 inch) occurred in the core in one spot(one side only) in the bottom three inches of the core, mainly in shale. Mud had partly invaded one irregular parting in the sand section.
	CORE NO. 19 - 6346' to 6393'. Cored 47', recovered 47', 100% recovery.
	Coring times: 18, 17, 9, 9, 7, 11, 7, 6, 7, 6, 5, 6, 5, 7, 7, 7, 6, 8, 7, 6, 7, 7, 6, 7, 7, 9, 12, 12, 14, 16, 11, 13, 12, 13, 15, 22, 21, 17, 16, 17, 22, 26, 22, 26, 22 and 22 minutes per foot.

Depth (Recovered)	Description
	Core No. 19 (Continued)
	PACOOTA FORMATION
6346'-6349'9" (3'9")	Sandstone (70%) and shale (30%) interbedded. Sandstone -white to light and medium grey, siliceous, argillaceous to silty in part, slightly dolomitic to calcareous in part, very fine to fine grained, angular to subrounded, well sorted, glauconitic, some dark mineral grains, micaceous in part, slightly pyritic. Shale - grey to black, micaceous, silty in part, the shale is distributed throughout the interval in paper thin wavy irregular lenses and partings, minor thin lenses of shale near base of interval. Worm tubes scattered throughout at random angles. One vertical fracture extending from 6346'6" to 6349'5" except for the fractured zone overall interval considered tight.
6349'9"-6351'10" (2'1")	Sandstone (50%) and shale (50%) interbedded. Sandstone - light to medium grey, siliceous in part, argillaceous and silty in part, very fine to fine grained, well sorted, angular to subrounded, micaceous and glauconitic in part, slightly pyritic. Shale - grey to black, micaceous, silty, fossiliferous?, distributed in thin irregular lenses throughout the interval. Six-inch vertical fracture at 6351'.
6351'10"-6359'1" (7'3")	Sandstone (70%) and shale (30%) interbedded. Sandstone - white to light and medium grey, siliceous in part, slightly dolomotic to calcareous in part, argillaceous to silty in part, mainly fine grained with occasional streaks of medium to coarse grained sand and occasional coarse quartz grains in a fine sand matrix, angular to rounded, poorly to well sorted, glauconitic, micaceous in part, slightly pyritic in part, some dark mineral grains.

APPENDIX 3 (Continued)

Depth (Recovered)	Description
	Core No. 19 (Continued)
6359'1"-6365'8" (6'7")	Shale (60%) and sandstone (40%) interbedded. Shale - grey to black, platy, micaceous, silty in part. Sandstone - light to medium grey, siliceous in part, argillaceous to silty in part, very fine to fine grained, angular to subrounded, well sorted, glauconitic and micaceous in part. The sandstone and shale are interbedded in thin irregular lenses and patches. The zone from 6360'6" to 6367'4" contains worm tubes, suggesting organic reworking giving the section a mottled appearance, the basal eight inches of the overall interval consists mostly of black shale. No fractures were noted in this interval.
6365'8"-6393' (27'4")	Sandstone (70%) and shale (30%) interbedded. Sandstone - white to medium grey, minor pale green, siliceous in part, argillaceous to silty in part, dolomitic to calcareous in part, glauconitic to very glauconitic in part, mainly fine grained with some stringers of medium to coarse grained sand and some scattered patches and lenses of medium to coarse floating quartz grains in a fine sand matrix, angular to rounded, poorly to well sorted, the sand is very glauconitic in part, the glauconite is often distributed in thin concentrated lenses and patches, some dark mineral grains, trace pyrite, slightly micaceous in part. Worm tubes scattered throughout. Shale - grey to black, micaceous, silty. The shale is distributed in paper thin wavy irregular lines and some minor thin lenses scattered throughout the interval. One vertical fracture at 6365' and from 6361'3" to 6373' and one six-inch vertical fracture at 6380'.

APPENDIX 3 (Continued)

Depth (Recovered)	Description
	Core No. 19 (Continued)
	The entire cored interval had no petroliferous odor, no fluorescence, except for the fracture noted, the interval is considered tight.
	The following representative samples were taken for analysis: 6340'4", 6347', 6353', 6355'6", 6357',6361', 6365', 6367', 6369', 6370', 6373', 6375', 6378',6383', 6385', 6388' and 6391'.
	CORE NO. 20 - 6470' to 6474'. Cored 4', recovered 3'10", 96% recovery.
	Coring times: 46, 83, 32 and 75 minutes per foot (core barrel jammed).
	PACOOTA FORMATION
6470'-6472'9" (2'9")	Sandstone (90%) and shale (10%) interbedded.
	Sandstone - light to medium grey, quartzitic, siliceous, vitreous lustre, slightly dolomitic to calcareous in part, mainly fine to medium grained, with occasional coarse quartz grains and coarse sand lenses, angular to subrounded, poorly to well sorted, dark mineral grains and black shaly partings, pyritic in part (some pyrite oolites). Two large vugs 7-1/2 inches from top of interval possibly due to the washing out of argillaceous material. The interval was severely broken up, several vertical and near vertical and near vertical fractures, no visible intergranular porosity.
	Shale - dark grey to black, platy, micaceous, silty, in part, distributed throughout the section in thin irregular lenses up to 1/2 and 1/2 inch thick.

Depth (Recovered)	Description
	Core No. 20 (Continued)
6472'9"-6473'10" (1'1")	Sandstone (50%) and shale (50%) interbedded. Sandstone - light to medium grey, siliceous, grading to siltstone in part, very fine to fine grained, angular to subrounded, well sorted, pyritic in part, hard, dense. Shale - dark grey to black, platy, micaceous, silty, in part, distributed in thin wavy irregular partings and lenses throughout the section, overall interval slightly mottled with possible worm tubes suggesting organic reworking. The core had no fluorescence or petroliferous odor. Samples taken for analysis at 6471' and 6472'6".
	CORE NO. 21 - 6474' to 6476'. Cored 2', recovered 1'10", 92% recovery. Coring times:85 and 93 minutes per foot (core barrel jammed). PACOOTA FORMATION
6474'-6475'10" (1'10")	Sandstone (100%) light to dark grey, siliceous, quartzitic, vitreous lustre, dolomitic to calcareous in part, fine to medium grained with occasional coarse quartz grains, angular to subrounded, poorly to well sorted dark mineral grains and black shaly partings, some black chitinous fossil debris, minor scattered inclusions and partings of light grey clay, pyritic in part, some wishy-washy cross-bedding. Entire interval broken up with vertical and near vertical fractures, no visible intergranular porosity. Sample for analysis at 6475'.

APPENDIX 3 (Continued)

Depth (Recovered)	Description
	CORE NO. 22 - 6646' to 6650'. Cored 4', recovered 3'3", 80% recovery.
	Coring times:44, 28, 34 and 44 minutes per foot(core barrel jammed).
	PACOOTA FORMATION
6646'-6649'3" (3'3")	Shale (50%), siltstone (40%) and sandstone (10%) interbedded.
	Shale-mainly dark reddish brown with some stringer of greyish green shale and occasional stringers of greyish green shale and occasionally stringers of dark grey to black shale, platy, micaceous, silty in part.
	Siltstone - light to dark reddish brown, minor grey and greyish green siltstone, micaceous, sandy in part, the siltstone is distributed throughout the interval in thin lenses and parting, grading to a very fine silty sand in places.
	Sandstone-white some light reddish pink sand grains, siliceous, vitreous lustre, very fine grained, angular to subrounded, well sorted. The sandstone is mainly concentrated in the bottom foot of the interval in four separate thin lenses. No visible porosity, no vertical fracture, bottom foot of cored section could contain possible horizontal fractures. The bedding appears to be flat.
	No samples taken for analysis.
	CORE No. 23 - 6650' to 6651'. Cored 1', no recovery.
	Coring times: 94 minutes per foot (core barrel jammed on core left in the hole).
	PACOOTA FORMATION

APPENDIX 3 (Continued)

Depth (Recovered)	Description
	CORE NO. 24 - 6655' to 6658'. Cored 3', recovered 3', 100% recovery.
	Coring times: 75, 72 and 64 minutes per foot (core barrel jammed).
	PACOOTA FORMATION
6655'-6658' (3')	Sandstone (40%), siltstone (40%) and shale (20%), interbedded.
	Sandstone - mainly dark reddish brown, some medium grey and two thin stringers of white sand spotted with light pink flecks at base of interval, siliceous in part, argillaceous to silty in part, very fine to fine grained, angular to subrounded, well sorted, micaceous in part, hard, tight, interbedded with siltstone and shale.
	Siltstone - mainly light to dark reddish brown, some medium to dark grey, micaceous sandy in part with some scattered very fine to medium grained floating quartz grains. The siltstone is distributed throughout the interval in thin lenses and patches.
	Shale - mainly dark reddish brown to dark brown, minor dark grey to black shale, platy, micaceous, silty in part, scattered throughout the interval in thin lenses, partings and pockets, the core tends to break along the shaly planes, bedding flat. No visible porosity, no vertical or near vertical fractures.
	No samples taken for analysis.

APPENDIX 3 (Continued)

B. CORE ANALYSIS

By Core Laboratories, Inc.

Sample Number	Depth (Feet)	Permeability (Millidarcys)	Porosity (Percent)
41	5626.4	less than 0.1	1.8
42	5627.3	less than 0.1	2.0
43	5636.5	---	5.0
44	5637.5	less than 0.1	2.1
1	5728	less than 0.1	16.5
2	5744	less than 0.1	14.5
3	5748	less than 0.1	13.1
4	5756	less than 0.1	5.2
5	5758	less than 0.1	1.7
6	5770	less than 0.1	2.4
7	5779	less than 0.1	2.3
8	5780	less than 0.1	2.3
9	5895	less than 0.1	6.0
10	5898	less than 0.1	6.8
11	5903	less than 0.1	4.4
12	5906	less than 0.1	2.9
13	5908	less than 0.1	5.4
14	5910	less than 0.1	1.1
15	5912	less than 0.1	4.2
16	5914	less than 0.1	6.7
17	5918	less than 0.1	1.7
18	5920	less than 0.1	2.5
19	5922	less than 0.1	3.5
20	6167	less than 0.1	1.7
21 No core cut	6304 ?	less than 0.1	2.2
22	6347	less than 0.1	4.4
23	6353	less than 0.1	4.8
24	6355	less than 0.1	4.9
25	6357	less than 0.1	4.1
26	6361	less than 0.1	4.4
27	6365	less than 0.1	3.5
28	6367	less than 0.1	3.0
29	6369	less than 0.1	4.7
30	6370	less than 0.1	4.6
31	6373	less than 0.1	3.8
32	6375	less than 0.1	6.2
33	6378	less than 0.1	3.9
34	6383	less than 0.1	4.0
35	6385	less than 0.1	3.1
36	6388	less than 0.1	3.3
37	6391	less than 0.1	5.4
38	6471	less than 0.1	1.7
39	6472	less than 0.1	1.7
40	6475	less than 0.1	1.5

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APPENDIX 4

LIST AND INTERPRETATIONS OF ELECTRIC LOGS AND OTHER SURVEYS

A. ELECTRIC AND RADIOACTIVITY LOGS by Welex

Log	Run No.	Interval Logged (Feet)
Induction-Electric	1	404-3188
	2	3188-5626
	3	5626-6162
	4	6162-6651
Guard	1	3189-5626
	2	5500-6162
	3	6132-6651
Caliper	1	404-3193
FoRxo-Caliper	1	3000-5628
	2	5500-6159
	3	6132-6654
Temperature	1	500-2700
	2	3200-6072
Acoustic Velocity-Gamma	1	10-3185
	2	3184-5626
	3	5626-6162
	4	6132-6650
Gamma-Neutron	1	3000-5626
	2	3000-6167
		200-3000
	3	6167-6653

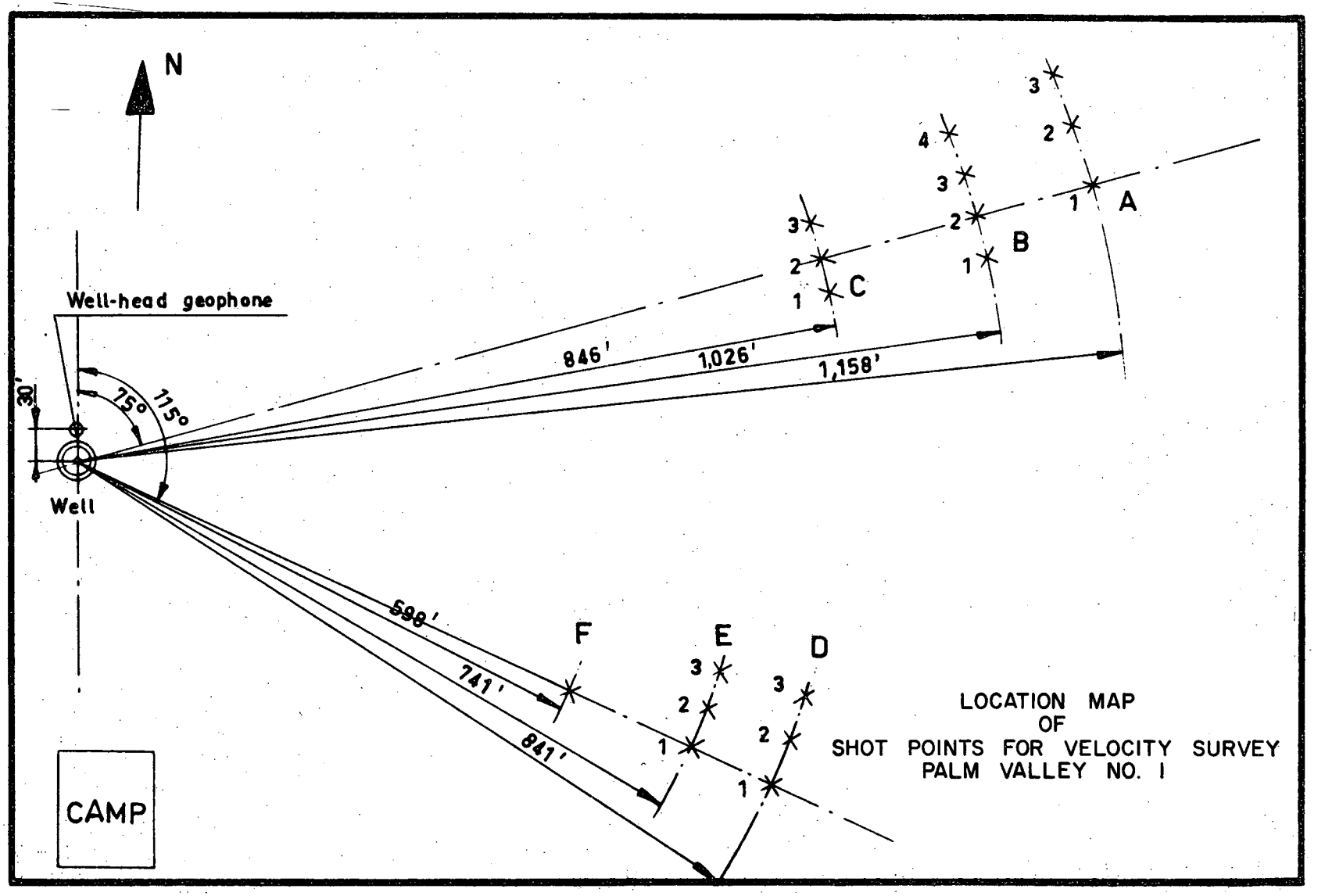
B. VELOCITY SURVEY AND ACOUSTIC VELOCITY LOG CALIBRATION by Compagnie Generale de Geophysique

Interpretation of the Results

Measurements

1. Well conditions

The well is located on a particularly uneven area; the rig is set up on a small square banking situated on a saddle of


N
Well-head geophone
30'
115°
75°
Well
846'
1,026'
1,158'
A
B
C
598'
741'
841'
D
E
F
CAMP
LOCATION MAP
OF
SHOT POINTS FOR VELOCITY SURVEY
PALM VALLEY NO. 1

APPENDIX 4 (Continued)

1. Well conditions (Continued)

mountain. The well was cased as deep as 6, 132 feet and the casing was cemented only from 4, 200 to 6, 132 feet deep. Bubbles of gas were rising from the bottom of the well.

The results cannot be absolutely warranted in such conditions:

seismic wave traveling through a part of the casing,
possible continuous vibrations of the casing,
important noise level brought about by gas bubbling.

2. Recording conditions (By night - No wind)

Shot points: The surroundings of the well are much more favorable to shooting in holes than to surface shooting. The lack of access to places situated at the same elevation as the well ground level and sufficiently distant, prevented shooting on two opposite sides of the well. Consequently, the shot points were located on a hill-flank for the shallow measurements and in the valley, 72 feet lower for the deeper ones.

Gulf well-geophone was fitted to Welex single-wired cable with a special adaptor provided in Brisbane by Halliburton-Welex division. The ground connection being plugged in this adaptor, there is no possibility of checking the cable insulation during the survey. The working of the geophone could be affected by this type of connection.

The above mentioned conditions explain the very poor quality of the records.

3. Records

Shot No. 1 to No. 3: high noise level, no visible break, 80 cps noise.

Shot No. 4: (geophone 2, 000 feet deep) from this shot until the end of the survey the power plant of the camp was stopped. The

3. Records (Continued)

80 cps noise still appeared (casing vibration?). An arrival was recorded.

Shot No. 5: (geophone 4, 545 feet deep) carried out in order to know if any change occurred on the signal/noise ratio when the well geophone is deeper in the well. No result. After this shot, the geophone was raised to a depth of 1, 000 feet and a checking of the geophone by striking on the cable with a hammer gave good strong breaks. Nevertheless, the gulf geophone was replaced by the Welex geophone including a sealed vacuum-tube preamplifier. The same test at 1, 000 feet showed a lower sensitivity than the gulf geophone, yet a measurement was decided with the geophone at 3, 208 feet. (Shot No. 6).

Shot No. 6: (geophone at 3, 208 feet) a strong 80 cps signal was recorded. No visible break. Unfitted impediances could explain this result. For the following shots, the gulf geophone was used again.

Shot No. 7: (geophone at 6, 140 feet) a battery leakage discovered by measuring three to four volts DC on the amplifiers input was repaired, thus decreasing the 80 cps noise. A double explosive charge was fired (500 pounds). A break is recorded.

Shot No. 8: (geophone at 5, 550 feet) the record is pickable .

Shot No. 9: (geophone at 4, 865 feet) a second earth circuit was connected between the Welex pannel and the SIE input pannel, suppressing almost completely the time - break cross - feeds. Record usable.

Shots No. 12 and No. 13: (geophone at 3, 700 and 3, 208 feet) no record. Switch broken down in the recorder.

3. Records (Continued)

Quality of the records:

Shots No. 4, 7, 8, 9, 10, 14 and 15	: Poor
Shots No. 2, 5 and 11	: Doubtful
Shots No. 1, 3 and 6	: Unusable

The first break, on the records, is downward for the well-geophone and for the well-head geophones (traces 2 to 6).

Computation and Corrections

Times and velocities are computed from the ground level of the well. Times are read on trace No. 3 (medium gain AGC off) of the records. Times read on the records are directly corrected for obliquity, considering linear ray-paths from the shot point to the well-geophone.

Weathered Zone

In such an area it can be considered that the weathered zone is very thin and does not affect the measurements.

Elevation Corrections

Elevation corrections to the ground level of the well are computed with Ve = 8,000 feet/second. The times read on trace No. 6 of the records (well-head geophone) allow to consider that the vertical velocity from the ground level of the well to a depth of 72 feet (shot point A elevation) is ranging from 6,000 to 10,000 feet/second.

(72 feet at 6,000 feet/second = 12 msec.)
(72 feet at 8,000 feet/second = 9 msec.)
(72 feet at 10,000 feet/second = 7.2 msec.)

The 40% variation of this velocity does not lead to more than 4.8 milliseconds difference on the seismic corrected times.

3. Records (Continued)

Acoustic Velocity Log Calibration

The integrated time, computed manually with a space = 10 feet in 399.9 milliseconds from 400 to 6,650 feet below KB. For the same interval, the integrated time on the log provided by Welex is 396.7 milliseconds. Difference: 399.9 - 396.7 = 3.2 milliseconds or 0.80%. The second log is used for the calibration (see calibration chart).

The discrepancies between acoustic integrated times and seismic corrected times, difficult to estimate for the shallower measurements, are small for the deeper measurements (between 4,500 feet and total depth).

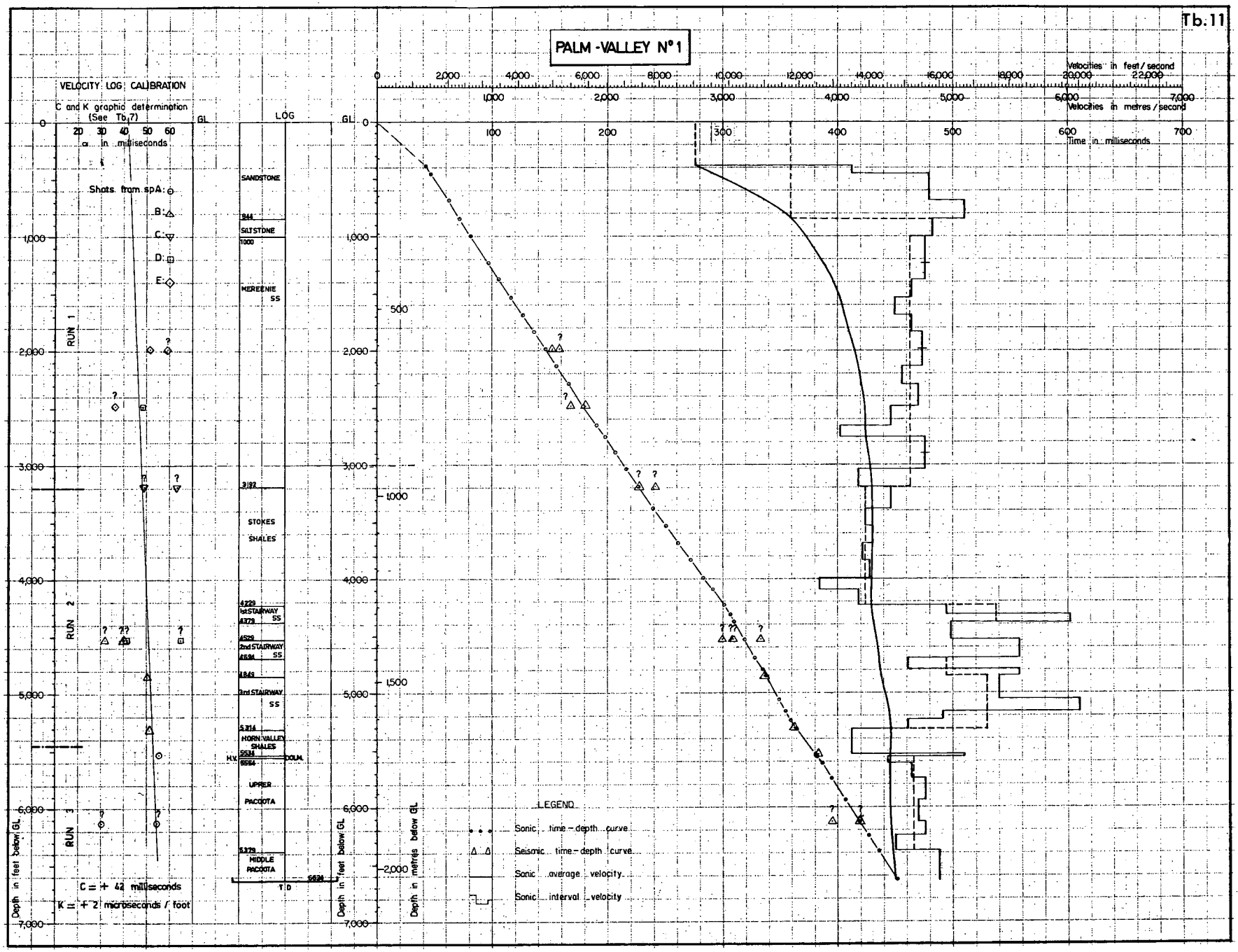
Drift retained for this calibration

C = + 42 milliseconds
K = + 2 microseconds/foot

Remarks

1. Considering the vertical velocity between the ground level of the well and 72 feet below is 8,000 feet/second (time = 9 msec.), and the time at 384 feet below GL is 42.5 msec. (acoustic corrected time), the vertical velocity in the layer between 72 and 384 feet below GL is 312 feet/33.5 msec. or 9,300 feet/second. This consideration was taken in account for C and K determination.

2. The acoustic corrected times are extrapolated between 6,140 and 6,650 feet below KB.


Tb.11
PALM-VALLEY N°1
VELOCITY LOG CALIBRATION
C and K graphic determination
(See Tb.7)
α in milliseconds
Shots from spA:
B:
C:
D:
E:
RUN 1
RUN 2
RUN 3
C = + 42 milliseconds
K = + 2 microseconds / foot
LOG
SANDSTONE
844
SILTSTONE
1000
MEREENIE SS
3192
STOKES SHALES
4229
1st STAIRWAY SS
4379
4529
2nd STAIRWAY SS
4694
4849
3rd STAIRWAY SS
5214
HORN VALLEY SHALES
5334
H.V.
DOLM.
5564
UPPER PACOOTA
5379
MIDDLE PACOOTA
6624
T.D
Depth in feet below GL
Depth in metres below GL
Velocities in feet / second
Velocities in metres / second
Time in milliseconds
LEGEND
Sonic time-depth curve
Seismic time-depth curve
Sonic average velocity
Sonic interval velocity

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APPENDIX 5

FORMATION TESTING AND RESULTS

A. EMPTY HOLE TESTS

The first gas show was encountered while drilling with air-mist at 5193' on March 10, 1965. The following table outlines the testing operations which were conducted while air-mist drilling.

Time	Hours Flowed	Gas (MCF/Day)	Remarks
March 10, 1965, at 5193 feet.			Casing shoe at 3192 feet.
7:40 p.m	0		Gas to surface ignited by pilot on flow line.
7:45 p.m.			Bit picked off bottom for flow test.
8:45 p.m.	1:00	1,030	Pitot tube measurements.
8:50 p.m.	1:05	1,460	
8:55 p.m.	1:10	1,930	
9:00 p.m.	1:15	2,180	
9:05 p.m.	1:20	2,360	
9:15 p.m.	1:30	2,410	
9:20 p.m.	1:35	2,470	
9:30 p.m.			Slugging drilling water, resumed drilling.
March 12, 1965, at 5290 feet.			
2:55 p.m.	31:15	1,460	Pitot tube measurements.
3:00 p.m.	31:20	1,560	
3:10 p.m.	31:30	1,630	
3:20 p.m.	31:40	1,630	
3:40 p.m.	32:00	1,630	Resumed drilling.
March 13, 1965, at 5565 feet.			
6:30 a.m.	46:50		Noticeable increase in flow.
6:40 a.m.	47:00	3,050	Pitot tube measurements.
6:50 a.m.	47:10	5,150	
8:00 a.m.	48:20	5,860	Side static pressure, 2" line.
8:00 a.m.			Pulled out for core barrel to cut core No. 14.
Coring at 5573 feet.			
6:15 p.m.	58:35		Sudden increased flow; pulled core bit to casing at 3192'.

A. EMPTY HOLE TESTS (Continued)

Time	Hours Flowed	Gas (MCF/Day)	Remarks
March 14, 1965, at 5573 feet.			
9:55 a.m.	74:15	7,200	Side static pressure measurement.
10:00 a.m.	74:20	7,900	
10:03 a.m.	74:23	9,100	
10:08 a.m.	74:28	10,600	
10:13 a.m.	74:33	11,000	
10:18 a.m.	74:38	11,300	
10:23 a.m.	74:43	11,700	
10:28 a.m.	74:48	11,700	
10:33 a.m.	74:53	11,700	
10:43 a.m.	74:58	11,700	Shut in to mud up.

B. DRILL-STEM TESTING
By B. J. Services

Drill-stem tests were conducted on each prospective zone after mudding up the hole. The results are presented below.

D. S. T. No. 1 from 5500 to 5640 feet, March 21, 1965.

Mud weight 11.4 pounds/gallon Viscosity - 55 seconds	Pressure Recordings (psig) No. 1942	 No. 1943
Depth (feet)	5536	5342
Initial Hydrostatic	3291	3374
Initial Shut-in (30 minutes)	2643	2742
Initial flow	2324	2407
Final flow (196 minutes)	861 (stab.)	902
Final shut-in (210 minutes)	2896 (stab.)	2928
Final hydrostatic	3204	3269

Bottom hole temperature 154° Fahrenheit
Remarks: Good initial puff, good air blow, gas to surface in 17 minutes, mud to surface in 25 minutes, blew mud throughout test. Estimated 4 to 5 MMCF/day. Recovered 450 feet gassy mud.

B. DRILL-STEM TESTING (Continued)

D. S. T. No. 2 from 5170 to 5310 feet, March 22, 1965.

Mud weight 11.1 pounds/gallon Viscosity - 47 seconds	Pressure Recordings (psig) No. 1942	 No. 1943
Depth (feet)	5155	5209
Initial hydrostatic	3093	3130
Initial shut-in (30 minutes)	2859 (incr.)	2886
Initial flow	616	706
Final flow (90 minutes)	755 (incr.)	834
Final shut-in (120 minutes)	2838	2853
Final hydrostatic	3021	3071

Bottom hole temperature 154° Fahrenheit

Remarks: Straddle test. Good initial puff, good air blow, gas to surface in 2 minutes. Measured 728 MCF/day in 20 minutes; remained steady throughout test. Recovered 1200 feet gas cut mud.

D. S. T. No. 3 from 5630 to 5784 feet, March 24, 1965.

Mud weight 11.3 pounds/gallon Viscosity - 49 seconds	Pressure Recordings (psig) No. 1942	 No. 1943
Depth (feet)	5776	5780
Initial hydrostatic	3349	3370
Initial shut-in (30 minutes)	2917	2937
Initial flow	574	587
Final flow (60 minutes)	578	587
Final shut-in (90 minutes)	2917 (stab.)	2937
Final hydrostatic	3304	3319

Bottom hole temperature 150° Fahrenheit

Remarks: Full hole test. Good initial puff, good air blow, gas to surface in 5 minutes. Measured 1750 MCF/day at 10 minutes, 1550 MCF/day at 20 minutes. Mud sprayed at surface at 32 minutes. Recovered 420 feet mud.

APPENDIX 5 (Continued)

B. DRILL-STEM TESTING (Continued)

D. S. T. No. 4 from 5784 to 5924 feet, March 28, 1965

Mud weight 11.4 pounds/gallon Viscosity - 57 seconds	Pressure Recordings (psig) No. 1942	 No. 1943
Depth (feet)	5916	5920
Initial hydrostatic	3475	3483
Initial shut-in (47 minutes)	1714 (incr.)	1719
Initial flow	152	162
Final flow (60 minutes)	139	149
Final shut-in (90 minutes)	2162 (incr.)	2172
Final hydrostatic	3441	3456

Bottom hole temperature 152° Fahrenheit

Remarks: Full hole test. Good initial puff, good air blow, gas to surface in 17 minutes, too small to measure. Recovered 125 feet gassy mud.

D. S. T. No. 5 from 5924 to 6110 feet, April 2, 1965.

Mud weight 11.4 pounds/gallon Viscosity - 46 seconds	Pressure Recordings (psig) No. 1942	 No. 1943
Depth (feet)	6110	6105
Initial hydrostatic	3520	3517
Initial shut-in (30 minutes)	186	170
Initial flow	143	145
Final flow (52 minutes)	219	217
Final shut-in (30 minutes)	262	255
Final hydrostatic	3512	3504

Bottom hole temperature not recorded.

Remarks: Full hole test. Fair initial puff, tool opened dead; reset after 18 minutes. Fair air blow, died in 15 minutes. Recovered 100 feet mud.

D. S. T. No. 6 from 6134 to 6476 feet, April 25, 1965.

Mud weight 8.4 pounds/gallon
Viscosity - 26 seconds
Bottom hole temperature 152° Fahrenheit

Remarks: Full hole test. Good inital puff. Good air blow. Gas to surface in 1 minute. Muddy water to surface in 4 minutes. No pressures recorded. Apparent plugged bomb hangers. Recovered 40 feet drilling water.

B. DRILL-STEM TESTING (Continued)

D. S. T. No. 7 from 6318 to 6476 feet, April 25, 1965.

Mud weight 9.9 pounds/gallon Viscosity - 39 seconds	Pressure Recordings (psig) No. 1942	 No. 1943
Depth (feet)	6346	6471
Initial hydrostatic	3254	3361
Initial shut-in (30 minutes)	3166 (incr.)	3227
Initial flow	186	272
Final flow (60 minutes)	540 (incr.)	604
Final shut-in (60 minutes)	2975 (incr.)	3046
Final hydrostatic	3191	3252

Bottom hole temperature 153° Fahrenheit
Remarks: Full hole test. Weak initial puff, weak air blow, remained steady throughout test. No gas to surface. Recovered 1080 feet (17 barrels) salt water (112, 150 ppm chlorides).

D. S. T. No. 8 from 6530 to 6658 feet, May 2, 1965.

Mud weight 10.1 pounds/gallon Viscosity - 38 seconds	Pressure Recordings (psig) No. 1942	 No. 1943
Depth (feet)	6551	6654
Initial hydrostatic	3429	3479
Initial shut-in (30 minutes)	2963	3000
Initial flow	85	140
Final flow (60 minutes)	143	179
Final shut-in (30 minutes)	591	629
Final hydrostatic	3370	3462

Bottom hole temperature not recorded.
Remarked: Full hole test. Fair initial puff. Good air blow, decreasing steadily throughout test. Recovered 270 feet (4-1/2 barrels) gassy mud.

Charts and tables of pressure recordings for the drill-stem tests are found in Enclosure 5 (a).

SUMMARY OF OPERATIONS

C. COMPLETION TESTS

Completion Test No. 1

Lower P1 zone, Pacoota formation, 6134 to 6169 feet.

Welex perforated the interval 6146' to 6156' with 2 open hole torpedo jets per foot on May 3, 1965. The test string was run in the hole with a B-J type F. F. C. packer. The packer was lost in the hole while attempting to set it. The packer was recovered on May 6; the hole was circulated to condition mud and a velocity survey was run by Compagnie Generale de Geophysique.

A test string consisting of 3-1/2" drill pipe, a Halliburton R-3 packer, a shear disk and 90' of 3-3/8" tail pipe was run in the hole on May 7, The disk leaked and the packer failed; the string was pulled out of the hole to redress the packer. On May 8, the R-3 packer was successfully set at 6060 feet. The disk was ruptured and the lower P1 zone started flowing mud, water and gas at 10:35 a.m. on May 8, 1965. The well was intermittently flowed and shut-in to aid cleaning up for 24 hours.

B. J. Services acidized the zone with 135 gallons of 7-1/2% hydrochloric mud acid at 10:30 a.m. on May 9, 1965. After recovering the spent acid the well was again intermittently flowed through the flare line for 22 hours to clean up. A bottom hole pressure recorder (Chart No. 1) was run to 6060' at 11:00 a.m. on May 10, 1965, for a pressure build-up test. At 8:00 p.m. Chart No. 1 was pulled and Chart No. 2 was run to 6000' to record pressures during a four-point modified isochronal flow test. A static pressure gradient was recorded while running in with Chart No. 2 and is shown in Enclosure 5 (b).

Completion Test No. 2

Upper P1 zone, Pacoota formation, 5550 to 5916 feet.

The test of the lower P1 zone was completed at 10:15 a.m. on May 11, 1965. B. J. Services pumped down 6 barrels of Formjel to plug off the open hole.

Welex perforated 74' net with 4 jets per foot in the upper P1 zone at selected intervals between 5550 and 5916 feet. A Halliburton type R-3 packer was set at 5485' on 3-1/2" drill pipe with a shear disk at 5552' and 90'

Completion Test No. 2 (Continued)

of 2-3/8" tail pipe extending to 5582 feet. Three bars were dropped attempting to rupture the disk. The test string was pulled out and the disk found to be ruptured and plugged. The packer was redressed and the same assembly was run in the hole setting the packer at 5485 feet. A bar was dropped to rupture the disk. A weak blow died in one hour. The flow line was found plugged at the well head. The obstruction was removed and the well was turned to the flare line on May 12 at 11:00 p. m. flowing mud and gas at 350 to 500 psi well-head pressure. The well was flowed intermittently for 17 hours to clean up. B. J. Services acidized the perforations with 1350 gallons of 7-1/2% hydrochloric mud acid. The spent acid was recovered at 6:00 p. m. on May 13 and the well was subsequently flowed for 17 hours on a 3/4" choke to clean out. The bottom hole pressure recorder (Chart No. 3) was run to 5000' and the well was shut in for a 12-hour pressure build up. A static pressure gradient was recorded while pulling Chart No. 3 at 6:45 p. m. on May 14. Chart No. 4 was run to 5485' to record the four-point modified isochronal flow test of the upper P1 zone which began at 9:30 p. m. on May 14. The four-point test was completed and a 10 barrel Formjel plug pumped down by B. J. Services to plug the perforations at 10:30 a. m. on May 15. The plug failed to set up and circulation was lost as the packer was unseated. Circulation was restored by adding high concentrations of gel flakes to the mud. The drill pipe was pulled out of the hole and layed down.

Completion Test No. 3

Lower Stairway formation, 5178 to 5300 feet.

Welex perforated 65' with 4 jets per foot in selected intervals between 5178 and 5300 feet.

The completion string of 2-3/8" E. U. tubing was run in the hole with a Halliburton R-3 packer set at 5109' with 93' of tail pipe having a bell collar open at 5202 feet. The blow-out preventers were removed; the tubing string was landed on a National type H-1 tubing hanger with 7000 pounds weight setting on the packer and mud weighing 11.2 pounds per gallon in the annulus. The well head was installed and the tubing swabbed down to 2000 feet.

The well started flowing at 4:40 a. m. on May 18 and unloaded the rat hole mud. B. J. Services acidized the perforated section with 1350 gallons of 7-1/2% hydrochloric mud acid. After recovering the spent acid, the well

Completion Test No. 3 (Continued)

was flowed through the flare line for 25 hours to clean up. The well was shut in at 8:30 a.m. on May 19 to run the bottom hole pressure recorder (Chart No. 5) to 5310 feet. Surface well head pressure appeared to be stabilized at 11:00 a.m. and the well was opened to the critical flow prover for a four-point modified isochronal flow test. The well was shut in at the completion of the isochronal test at 8:15 p.m. on May 19 and a static pressure gradient survey was recorded while pulling Chart No. 5. Chart No. 6 was run to 5300' with stops to record the static pressure gradient and the well was opened for a two rate flow test. The well was shut in for a pressure build-up test at 5:00 a.m. on May 20 and Chart No. 6 was pulled at 9:15 a.m. concluding the completion tests.

The charts and tables of completion test pressure recordings are found in Enclosure 5 (b).

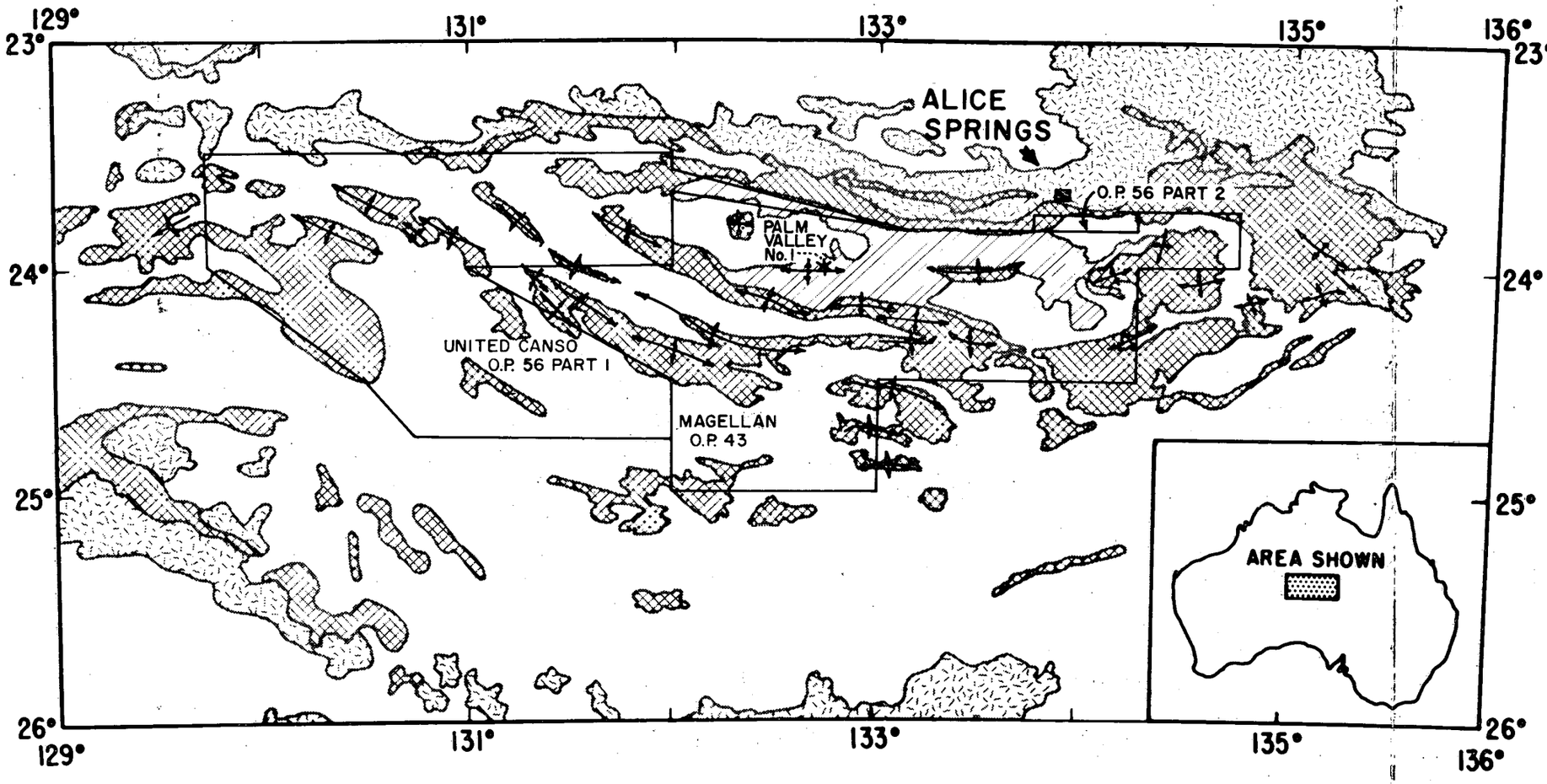
ENCLOSURE NO. 1

LOCALITY MAP

SHOWING

REGIONAL GEOLOGY

GENERALIZED GEOLOGICAL MAP
OF THE
AMADEUS BASIN



Enclosure (1)

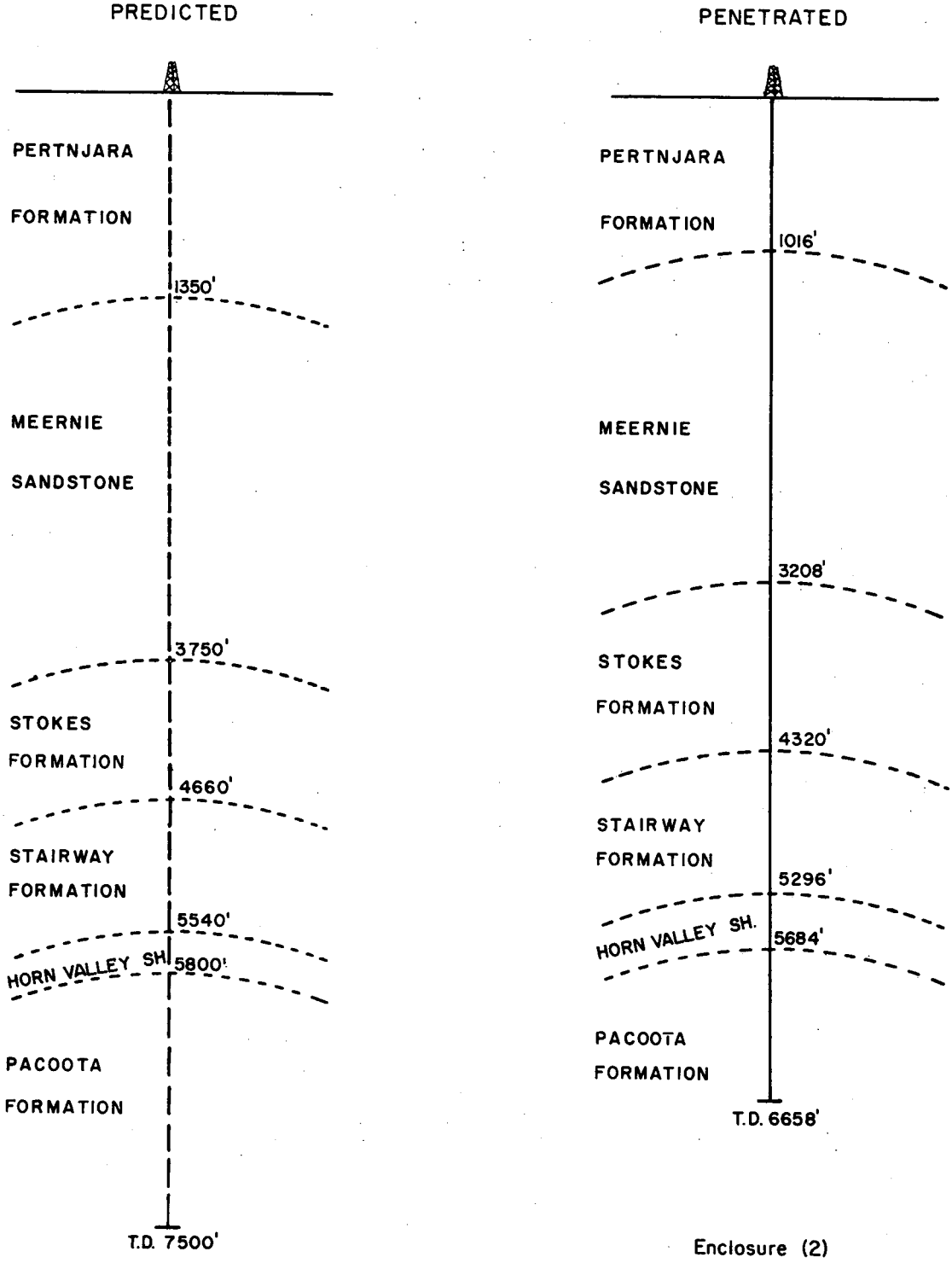
ENCLOSURE NO. 2

GRAPHIC GEOLOGICAL SECTIONS

MAGELLAN PETROLEUM (N. T.) PTY. LTD.

GRAPHIC GEOLOGICAL SECTIONS

PALM VALLEY NO. 1
NORTHERN TERRITORY, AUSTRALIA



Enclosure (2)

ENCLOSURE NO. 3

COMPOSITE WELL LOG

PALM VALLEY NO. 1

MAGELLAN PETROLEUM (N.T.) PTY. LTD.

COMPOSITE WELL LOG

PETROLEUM TENEMENT: OIL PERMIT NO. 43

WELL NUMBER: PALM VALLEY NO. I

STATE: NORTHERN TERRITORY

4 MILE SHEET: HENBURY AND HERMANNSBURG

BASIN: AMADEUS

WELL STATUS: SHUT-IN GAS WELL

LOCATION: Lat. 24° 00' SOUTH Long. 136° 46' 20" EAST
ELEVATION: Reference Pt. (R.T.), 1921 FEET
Ground, 1907 FEET

Date Spudded: 7 JANUARY 1965
Date Drilling Stopped: 1 MAY 1965
Date Rig Off: 21 MAY 1965
Total Depth: 6658', AB. T.D.: 6169'

Hole Size:

In.	From (KB=0)	To
24	14	20
17 1/2	20	408
12 1/4	408	3192
8 3/4	3192	6168
6 1/8	6168	6658

Casing

In.	Wt.	Gr.	Depth	Cmt.	Cmt. To (Ft.)
20	40	MILN	6	5	G.L.
13 3/8	48	J-55	403	310	G.L.
9 5/8	36	J-55	3192	600	2225
7	26	N80+T55	6134	360	4400

Cement Plugs

	From	To	Top	Sacks
NO. 1	6168	6108	6165	25
NO. 2	6165	6110	6165	20
GRAVEL	6165	6160	6160	1 BBL Loose Gravel
NO. 3	6160	6105	6130	25
RAN 7" CASING AND DRILLING OUT				
NO. 4	6658	6165	6168	85

Perforations:

	Type	Size	From	To	No/Ft.
Open hole: Welex	Torpedo-Jet	5-3/8"	6146	6156	2
Casing: Welex	Super Dyna-Jet	4"	5910	5916	4
			5865	5870	4
			5765	5771	4
			5706	5718	4
			5644	5654	4
			5632	5642	4
			5550	5575	4
			5296	5300	4
			5270	5280	4
			5246	5250	4
			5228	5240	4
			5195	5224	4
			5178	5184	4

Well Head Fittings: National Type B (2 inch)
Drilled by: Richter-Bawden Drilling PTY. LTD.
Logged by: Halliburton-Welex Division
Drilling Method: Rotary (Air and Mud)
Cement by: B.J. Service (Aust.) PTY. LTD.

ELECTRIC LOG DATA

Run Number	1	2	3	4	5	6
Date	21 FEB, 1965	20 MAR, 1965	6 APR, 1965	2 MAY, 1965		
Footage Logged	2784	1437	62	519		
Logged From	3188	5626	6162	6651		
Logged To	404	3189	5500	6132		
Total Depth-Electric Log	3193	5631	6167	6657		
Total Depth-Driller	3192	5640	6168	6657		
Casing Shoe-Electric Log	404	3189	3189	6132		
Casing Shoe-Driller	13-3/8 at 403	9-5/8 at 3192	9-5/8 at 3192	7" at 6134		
Bit Size	12-1/4	8-3/4	8-3/4	6-1/8		
Mud - Type	F.M. WATER	WATER-BASE	WATER-BASE	WATER-BASE		
- Treatment	Natural Fill	Unical-Caustic	Unical-Caustic	Unical-Caustic		
- Water loss ccs/30m	N/A	8.4		22.5		
- Weight lbs/cu. ft.	N/A	11.4	11.4	10.1		
- Viscosity (marsh) sec.	N/A	55	48	38		
- ph	N/A	9.0		9.0		
Rm	3.15 at 90°F	1.84 at 94°F	2.12 at 76°F	0.51 at 78°F		
Rm_f Resistivity $\Omega m^2/m$	N/A	1.30 at 94°F	1.90 at 76°F	0.46 at 78°F		
Rm_c & Temp.	N/A	2.90 at 94°F	1.80 at 76°F	0.80 at 78°F		
Rm at BHT	N/A	1.15 at 152°F	1.05 at 158°F	0.27 at 153°F		
Max. Record Temperature	126°F at 3193	152°F at 5640	158°F 6100	153° 6651		
Electrode Spacing						
Symmetrical	18"	18"	18"	18"		
	40" IND.	40" IND.	40" IND	40" IND.		
Non-Symmetrical	18' 8"	18' 8"	18' 8"	18' 8"		
Recorded	T. J. WALL	T. J. WALL	T. J. WALL	C.M. MYERS		

RADIOMETRIC LOG DATA

Type of Log	GAMMA-AC	GAMMA-NEUT.	GAMMA-NEUT.	GAMMA-NEUT.		
Run Number	1	2	3	4	5	6
Date	21 FEB, 1965	20 MAR, 1965	6 APR, 1965	2 MAY, 1965		
Total Depth-Driller	3192	5640	6168	6657		
Top of Logged Interval	10	3000	5627 200	6167		
Bottom of Logged Interval	3185	5627	6167 3000	6653		
Type of Fluid in hole	WATER	MUD	MUD	MUD		
Fluid level		SURFACE	SURFACE	SURFACE		
Max. recorded temp.	126° at 3193	152°F 5640'	158°F 6100'	153 at 6651		
Neutron source, streng. type	N/A	6.1×10^6, RaBe	6.1×10^6, RaBe	6.1×10^6, RaBe		
Source spacing	N/A	12"	12"	12"		
Length of measuring devise	28"	14"	14"	14"		
O.D. of instrument-in	3-5/8	3-5/8	3-5/8	3-5/8		
Time Constant-Secs.	2	2	2	2		
Logging speed-ft/min	40	23	23	29		
Statistical Variation-in	N/A	N/A	N/A	N/A		
Sensitivity reference	100	100 2000	100 2000	100 1500		
Recorded by	T. J. WALL	T. J. WALL	T. J. WALL	C. M. MYERS		

CASING RECORD

Run No.	Size - In	Wt. Lbs.	Interval - ft.	to
1	13 3/8	48	0	403
2	9 5/8	36	0	3192
3	7	26	0	6131

BORE HOLE RECORD

Bit Size-in	Interval - ft.	to
17 1/2	0	403
12 1/4	403	3192
8 3/4	3192	6168
6 1/8	6168	6657

WELL SYMBOLS

- Gas show, slight
- Gas show, strong
- Oil show, slight
- Oil show, strong
- Oil and gas show
- Fluorescence
- Circulation loss partial and s.g. mud
- Circulation loss complete and s.g. mud
- Casing shoe
- RR Rerun bit
- Blowout
- Core, interval, No. and recovery
- Sidewall core
- Perforated interval
- Formation test interval and no. (O.H / in. CSG.)
- Plugged interval
- RM Reamer
- CB Core Bit
- Macro, Micro, Plant, Spore, pollen — Fossils

LITHOLOGIC REFERENCE

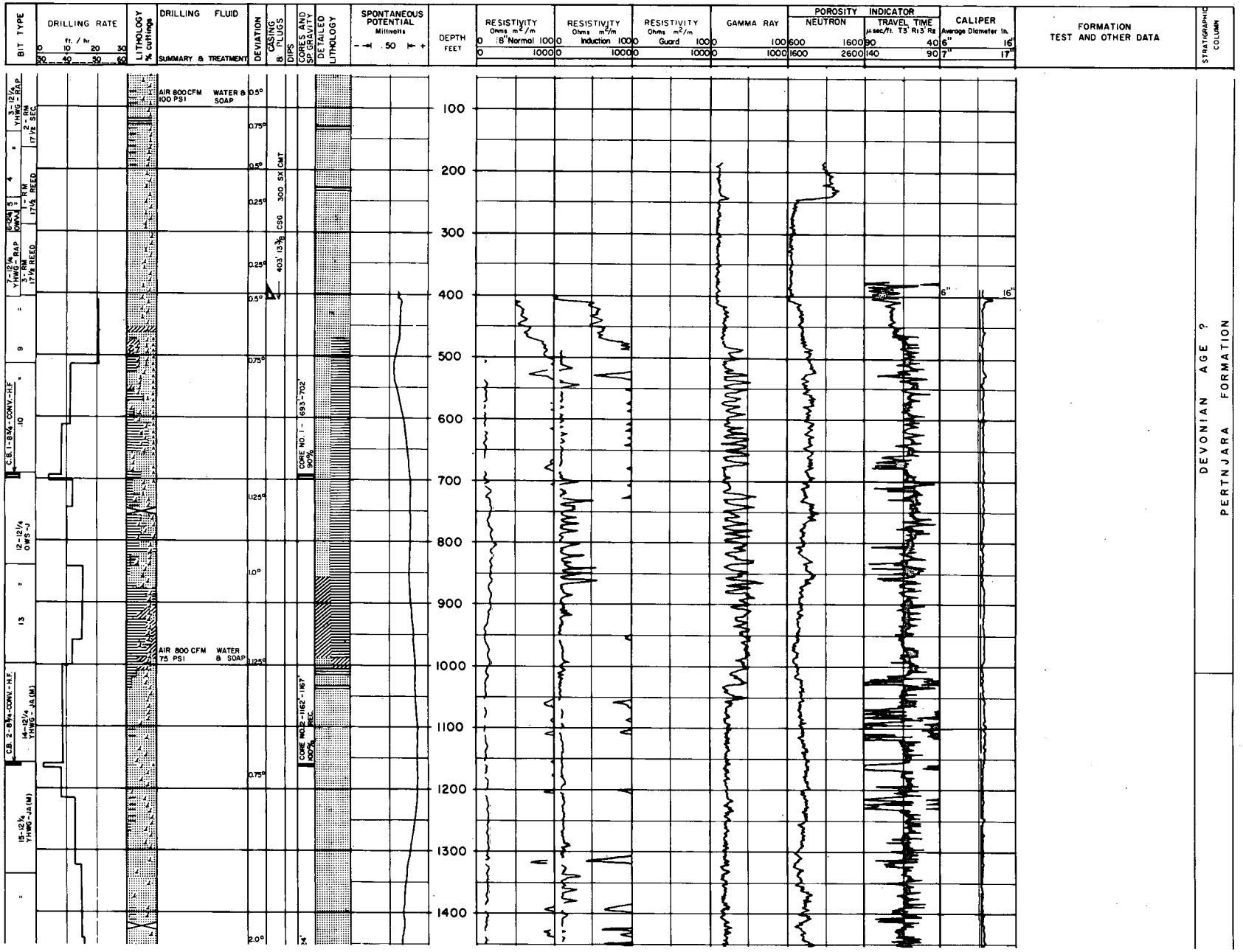
- Sandstone
- Siltstone
- Limestone
- Shale
- Conglomerate
- Dolomite
- Evaporite S: Salt
- Coal
- mi: Micaceous
- dol: Dolomitic
- Cal: Calcareous
- gl: Glauconitic
- py: Pyritic
- Limestone Bed
- Siliceous
- Dolomite Bed
- F Fracturing
- No Samples

OTHER ELECTRICAL LOGS

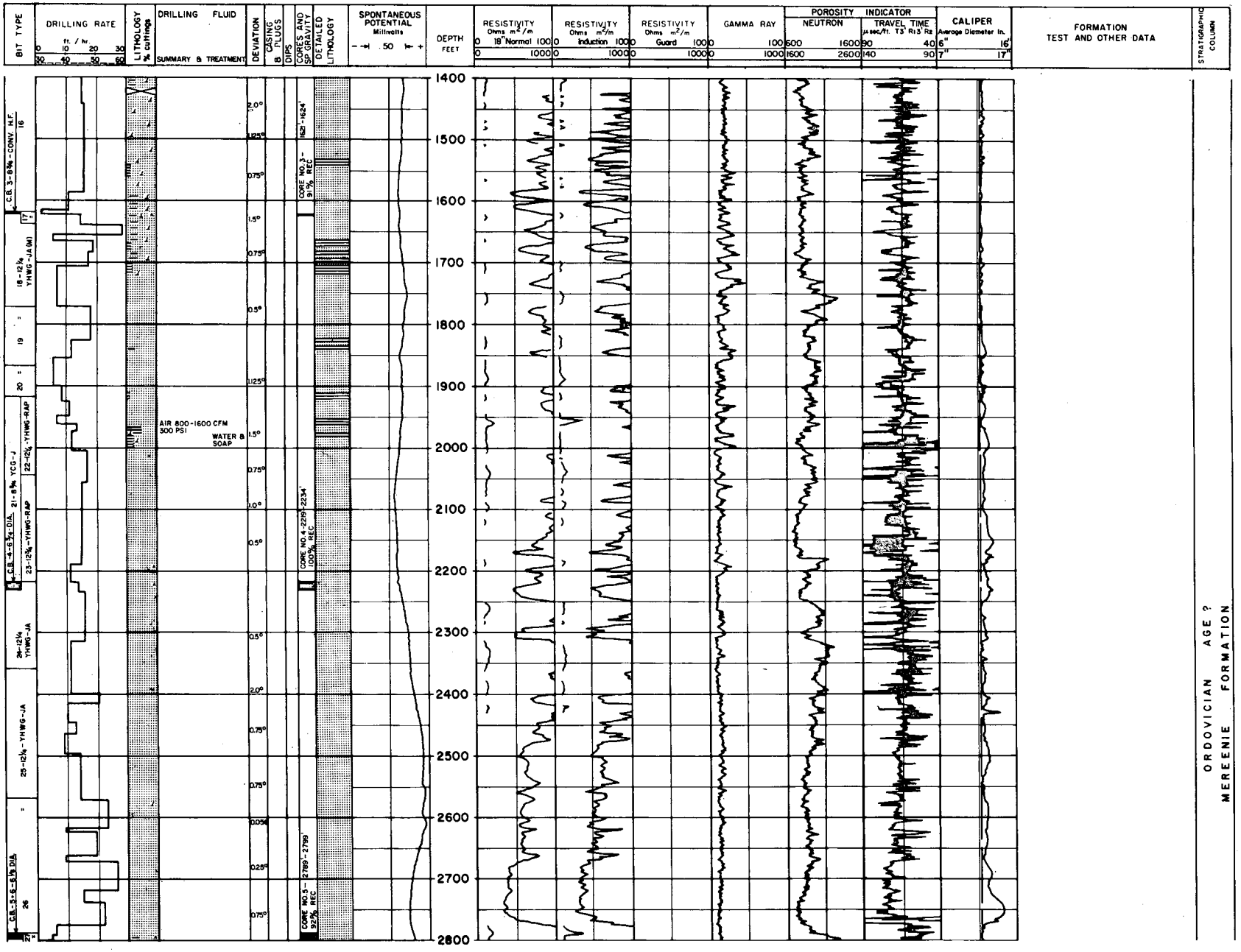
TEMPERATURE
FORXO
18' 8" LATERAL

LITHOLOGY BY: RON HAY
MAGELLAN PETROLEUM (N.T.) PTY. LTD.

BIT TYPE	DRILLING RATE ft. / hr 0 10 20 30 / 30 40 50 60	LITHOLOGY % cuttings	DRILLING FLUID SUMMARY & TREATMENT	DEVIATION	CASING & PLUGS	DIPS	CORES AND SP. GRAVITY	DETAILED LITHOLOGY	SPONTANEOUS POTENTIAL Millivolts — 50 +	DEPTH FEET	RESISTIVITY Ohms m^2/m 0 18" Normal 100 / 0 1000	RESISTIVITY Ohms m^2/m 0 Induction 100 / 0 1000	RESISTIVITY Ohms m^2/m 0 Guard 100 / 0 1000	GAMMA RAY 0 100 / 0 1000	POROSITY INDICATOR NEUTRON 600 1600 / 1600 2600	POROSITY INDICATOR TRAVEL TIME μsec/ft. T3' R13' R2 90 40 / 140 90	CALIPER Average Diameter In. 6" 16" / 7" 17"	FORMATION TEST AND OTHER DATA	STRATIGRAPHIC COLUMN
2-12¼ W7R 1-RM 17½				0.25°															
12¼ RAP			AIR 800 CFM 100 PSI WATER & SOAP	0.5°						100									


BIT TYPE
DRILLING RATE
ft. / hr
0 10 20 30
30 40 50 60
LITHOLOGY % cuttings
DRILLING FLUID
SUMMARY & TREATMENT
DEVIATION
CASING & PLUGS
DIPS
CORES AND SP GRAVITY
DETAILED LITHOLOGY
SPONTANEOUS POTENTIAL
Millivolts
- 50 +
DEPTH FEET
RESISTIVITY Ohms m²/m
0 16" Normal 1000
0 1000
RESISTIVITY Ohms m²/m
0 Induction 1000
0 1000
RESISTIVITY Ohms m²/m
Guard
0 1000
0 1000
GAMMA RAY
100
1000
POROSITY INDICATOR
NEUTRON
1600 600
1600 2600
TRAVEL TIME
µsec/ft. T3' Ri3' Ra
90 40
140 90
CALIPER
Average Diameter In.
6" 16"
7" 17"
FORMATION TEST AND OTHER DATA
STRATIGRAPHIC COLUMN
AIR 800 CFM 100 PSI WATER & SOAP
AIR 800 CFM 75 PSI WATER & SOAP
0.5°
0.75°
0.5°
0.25°
0.25°
0.5°
0.75°
1.125°
1.0°
1.125°
0.75°
2.0°
403' 13⅜" CSG 300 SX CMT
CORE NO. 1 - 693'-702' 90%
CORE NO. 2 - 1162'-1167' 100% REC.
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
6"
16"
DEVONIAN AGE ?
PERTNJARA FORMATION

MAGELLAN PETROLEUM (N. T.) PTY. LTD.



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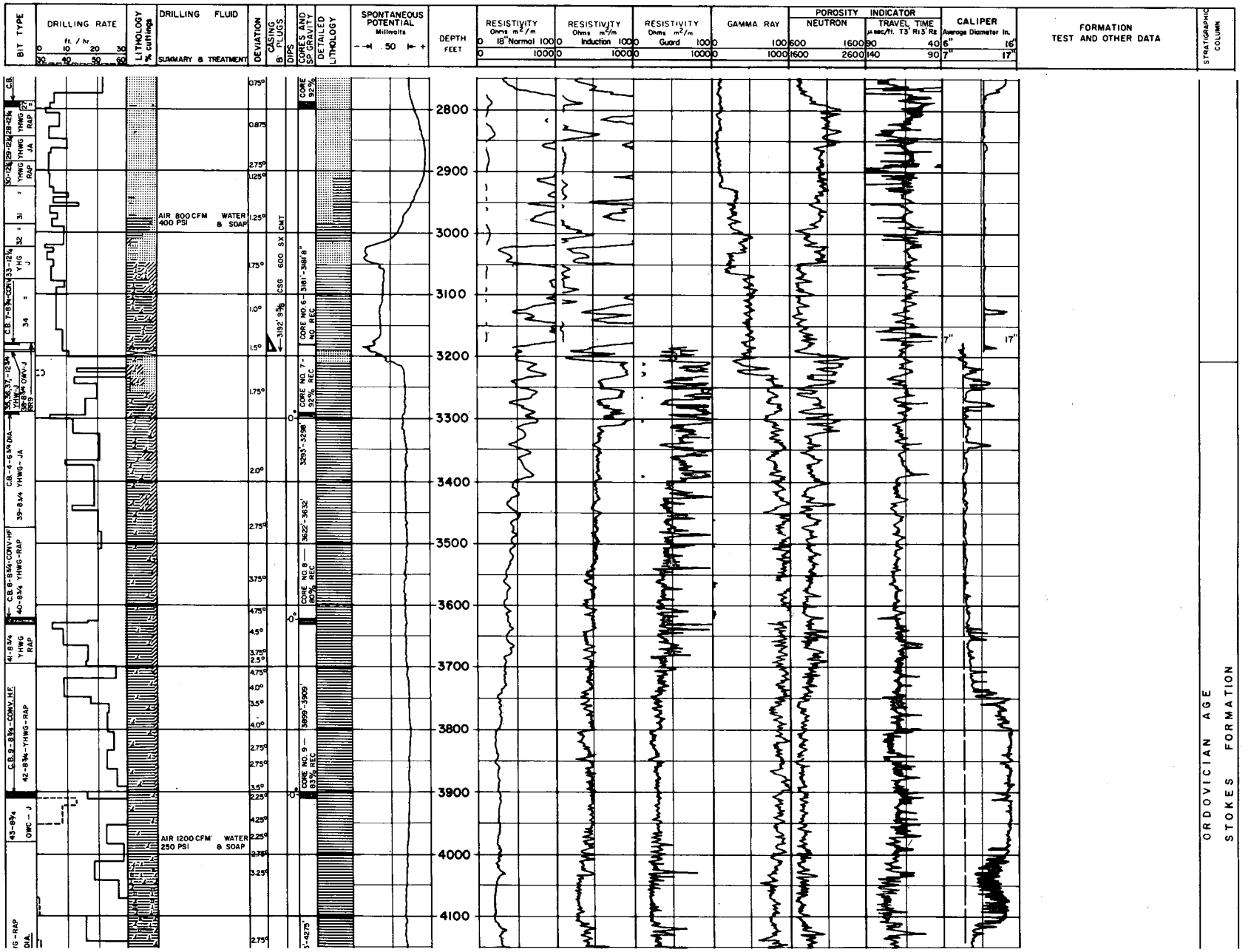

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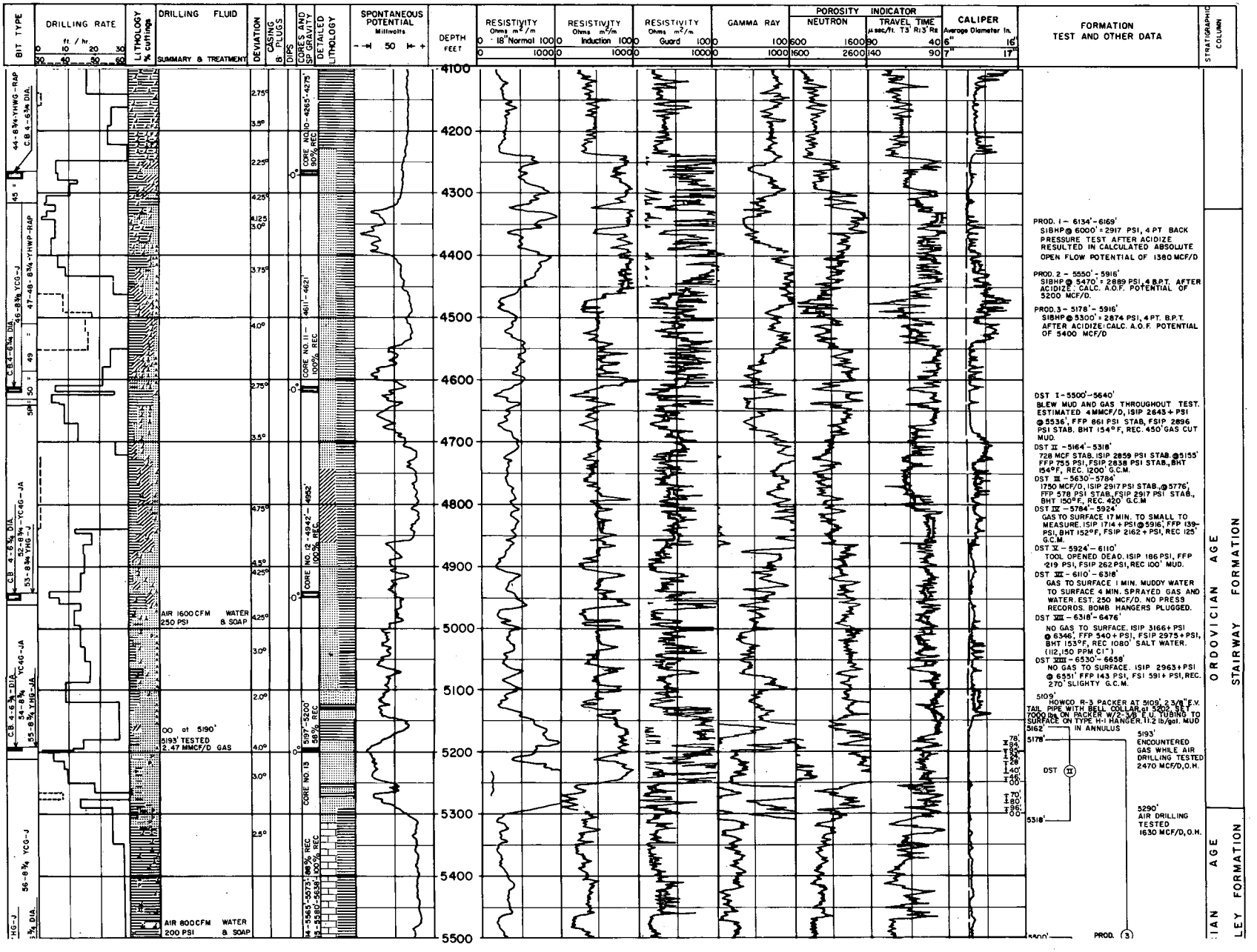

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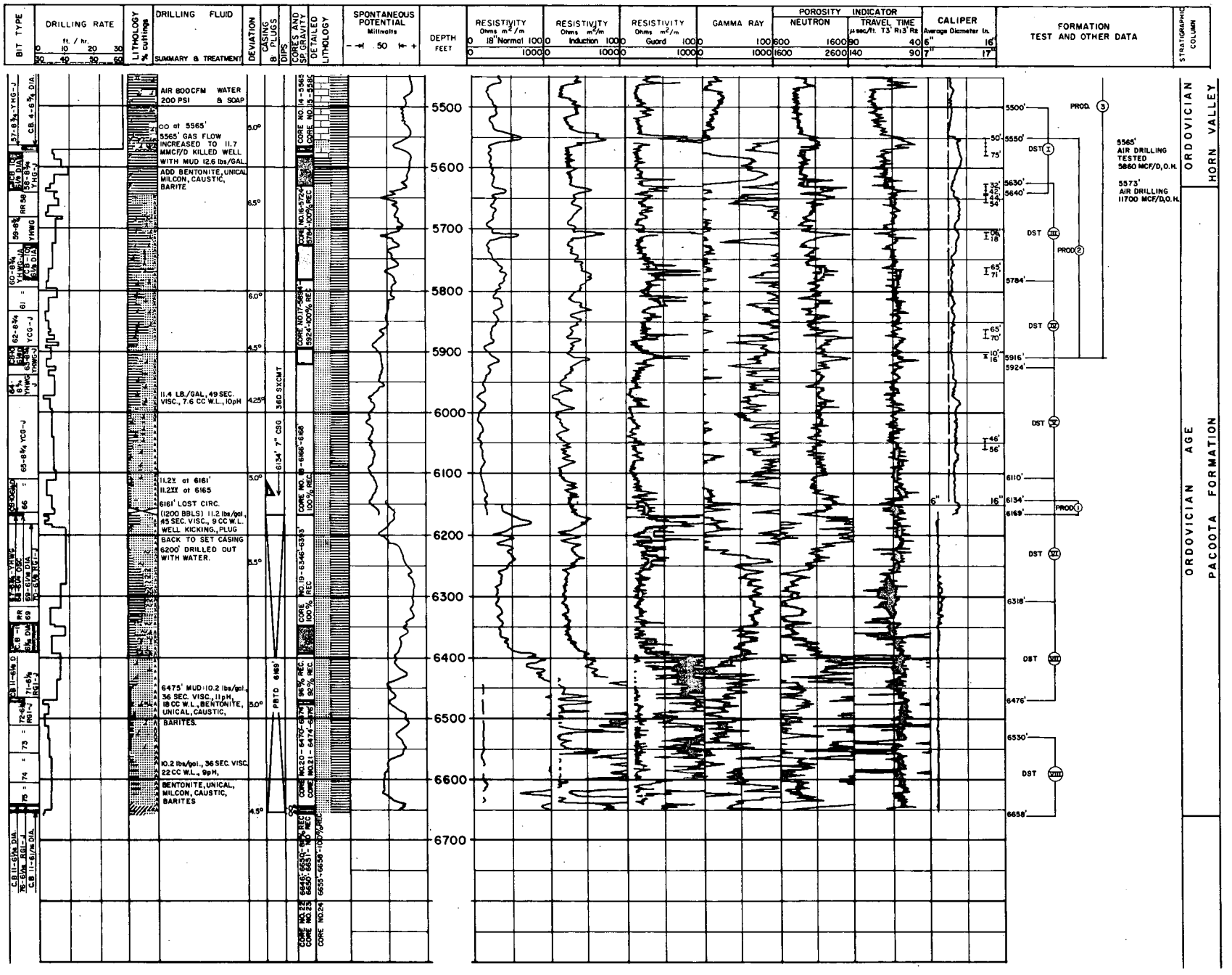


MAGELLAN PETROLEUM (N. T.) PTY. LTD.

ENCLOSURE NO. 4

ELECTRICAL AND OTHER SURVEYS

(a) Electrical and Radioactivity Logs
by Welex
(Enclosed under separate cover)

(b) Velocity Survey
by Compagnie Generale De Geophysique

ENCLOSURE 4 (b)

Tb.1

MAGELLAN PETROLEUM Co Ltd
VELOCITY SURVEY
ACOUSTIC VELOCITY LOG
CALIBRATION
WELL : PALM VALLEY No 1

D.P. = GROUND LEVEL

COORDINATES OF THE WELL LOCATION

X : 132° 46' 20" E
Y : 24° 00' 00" S
Z KB : 1,945 feet
Z GL : 1,929 feet

DEPTH OF WELL : 6,658 feet

DEPTH OF CASING : 6,132 feet

MEASUREMENT RECORDED BY : X.6526

COMPAGNIE GENERALE DE GEOPHYSIQUE

LOCATION MAP

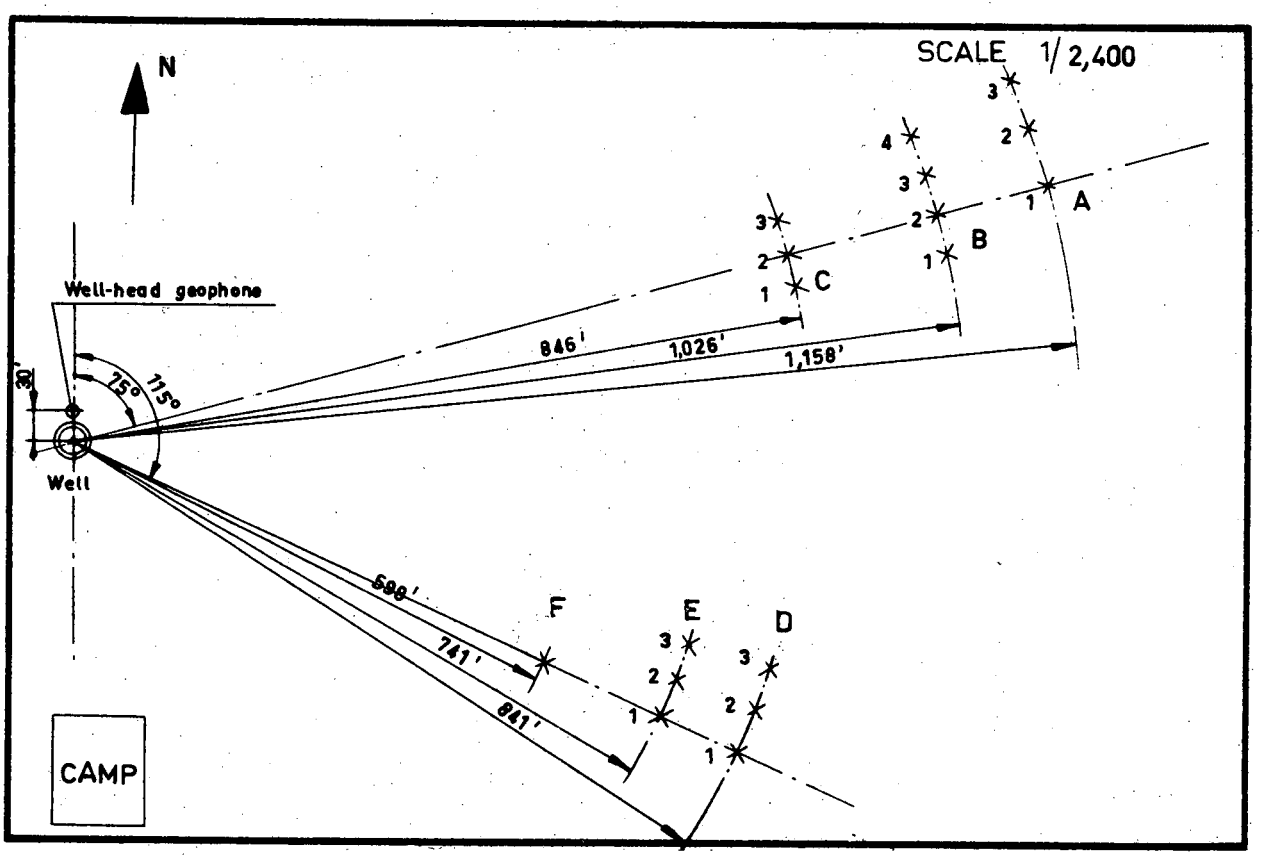
Tb. 2

Z KB : 1,945 feet

Z GL : 1,929 feet

WELL : PALM-VALLEY No 1

Shot point	Number	Distance	z ft	Δz ft	Shot point	Number	Distance	z	Δz
A	1 to 3	1,158ft	1,857	88					
B	1	1,026	1,869	76					
B	2	1,026	1,870	75					
B	3 and 4	1,026	1,871	74					
C	1	846	1,870	75					
C	2	846	1,872	73					
C	3	846	1,879	66					
D	1 to 3	841	1,901	44					
E	1	741	1,922	23					
E	2 and 3	741	1,919	26					
F		598	1,924	21					
Reference geophone 30			1,929	16					



HISTORICAL and STATISTICAL Tb. 3

Observer CGG A.LAMURE	OPERATIONS		
	Date	Time first shot	Time last shot
Observer ~~SRS~~ Welex Mr.MYERS	7 th May 1965	0.15 am	7.30 am

No of holes drilled	Tested levels 10	Records computed.	8
No of holes shot	Records taken 13	Explosives used	2,350 lbs

Departure from Brisbane : 6 th May at 6.30 am
Velocity survey carried out : 7 th May
Return to Brisbane : 8 th May at 2.30 am

Shooting on the surface on a mountainous and rocky area .

TECHNICAL

RECORDING EQUIPMENT - Laboratory SIE P .11
Camera PRO 11 - 25 traces

GEOPHONES - Gulf- well-pressure geophone, type GCE 101
Well-head geophones (3, grouped and buried) : Hall Sears Junior type HSJ -K-

CONNECTION OF TRACES -

Trace 1 : Time-Break
Trace 2 : Well-geophone Low Gain filter : out - 64 - Without AGC
Trace 3 : " " Medium " " " " " "
Trace 4 : " " High " " " " " "
Trace 5 : " " Medium " " " " with AGC
Trace 6 : Well-Head geophones Filter : out 42 - Without AGC

INTERPRETATION of the RESULTS Tb.4a

MEASUREMENTS

1- Well conditions

The well is located on a particularly uneven area , the rig is set up on a small square banking situated on a saddle of mountain.

- The well was cased as deep as 6,132 feet and the casing was cemented only from 4,200 to 6,132 ft deep .
- Bubbles of gas were raising from the bottom of the well .

- The results cannot be absolutely warranted in such conditions :
- Seismic wave travelling through a part of the casing
- Possible continuous vibrations of the casing
- Important noise level brought about by gas-bubbling .

2- Recording conditions : By night - No wind

Shot points : The surroundings of the well are much more favourable to shooting in holes than to surface shooting .

The lack of access to places situated at the same elevation as the well ground level and sufficiently distant, prevented shooting on 2 opposite sides of the well. Consequently , the shot points were located on a hill-flank for the shallow measurements and in the valley , 72 feet lower, for the deeper ones. (See Tb 2 and Tb 12)

Gulf well-geophone : was fitted to Welex single-wired cable with a special adaptor provided in Brisbane by Halliburton-Welex division . The ground connection being plugged in this adaptor, there is no possibility of checking the cable insulation during the survey .

The working of the geophone could be affected by this way of connection as it is not designed for .

- All the above mentioned conditions explain the very poor quality of the records

3- Records

Shot No 1 to No 3 : High noise level, no visible break, 80 cps noise

Shot No 4 : (geophone 2,000 feet deep) from this shot until the end of the survey the power plant of the camp was stopped - the 80 cps noise still appeared (casing vibrations ?) An arrival was recorded .

Shot No 5 (geophone 4,545 ft deep) carried out in order to know if any change occured on the signal/noise ratio when the well geophone is deeper in the well. No result .

- After this shot, the geophone was raised to a depth of 1,000 ft and a checking of the geophone by striking on the cable with a hammer gave good strong breaks
- Nevertheless , the gulf geophone was replaced by the Welex geophone including a sealed vacuum-tube preamplifier .
- The same test at 1,000 ft showed a lower sensitivity than the gulf geophone, yet a measurement was decided with the geophone at 3,208 ft (Shot No 6).
- A strong 80 cps signal was recorded . No visible break . Unfitted impedances

INTERPRETATION of the RESULTS Tb.4 b

could explain this result .
- For the following shots, the gulf geophone was used again .
-Shot No 7 : (geophone at 6,140 ft) . A battery leakage discovered by measuring 3 to 4 volts DC on the amplifiers input was repaired , thus decreasing the 80 cps noise. A double explosive charge was fired (500 lbs). A break is recorded .
-Shot No 8 (geophone at 5,550 ft)the record is pickable .
-Shot No 9 (geophone at 4,865 ft) a second earth circuit was connected between the Welex pannel and the SIE input pannel, suppressing almost completely the time-break cross-feeds. Record usable .
-Shots No 12 and No 13: (geophone at 3,700 and 3,208 ft) No record . Switch broken down in the recorder .

Quality of the records :

Shots No 4,7,8,9,10,14 and 15	: Poor
Shots No 2,5 and 11	: Doubtful
Shots No 1,3 and 6	: unusable

- The first break , on the records, is downward for the well-geophone and for the well-head geophones (traces 2 to 6)

COMPUTATION AND CORRECTIONS

- Times and velocities are computed from the ground-level of the well
-Times are read on trace No 3 (medium gain AGC off) of the records .
-Times read on the records are directly corrected for obliquity , considering linear ray-paths from the shot point to the well-geophone .

Weathered Zone

In such an area it can be considered that the weathered zone is very thin and does not affect the measurements .

Elevation corrections

Elevation corrections to the ground level of the well are computed with Vc= 8,000 ft second .
- The times read on trace No 6 of the records (well-head geophone) allow to consider that the vertical velocity from the ground level of the well to a depth of 72 ft (shot point A elevation) is ranging from 6,000 to 10,000 ft/sec.
(72 ft at 6,000 ft/sec = 12 msec
(72 ft at 8,000 ft/sec = 9 msec
(72 ft at 10,000 ft/sec = 7.2 msec
- Thus ±0% variation of this velocity do not lead to more than 1.8 milliseconds difference on the seismic corrected times

ACOUSTIC VELOCITY LOG CALIBRATION

- The integrated time, computed manually with a pace = 10 feet in 399.9

INTERPRETATION of the RESULTS

Tb.4 c

milliseconds from 400 to 6,650 feet below KB.

- For the same interval, the integrated time on the log provided by Welex is 396.7 milliseconds .
- Difference : 399.9 - 396.7 = 3.2 milliseconds or 0.8%
- The second log is used for the calibration (See Tb 8 and Tb 11)

- The discrepancies between acoustic integrated times and seismic corrected times, difficult to estimate for the shallower measurements, are small for the deeper measurements (between 4,500 ft and total depth)

- Drift retained for this calibration

C = + 42 milliseconds

K = + 2 microseconds / foot

- C and K are determined graphically on Tb 11.

REMARKS

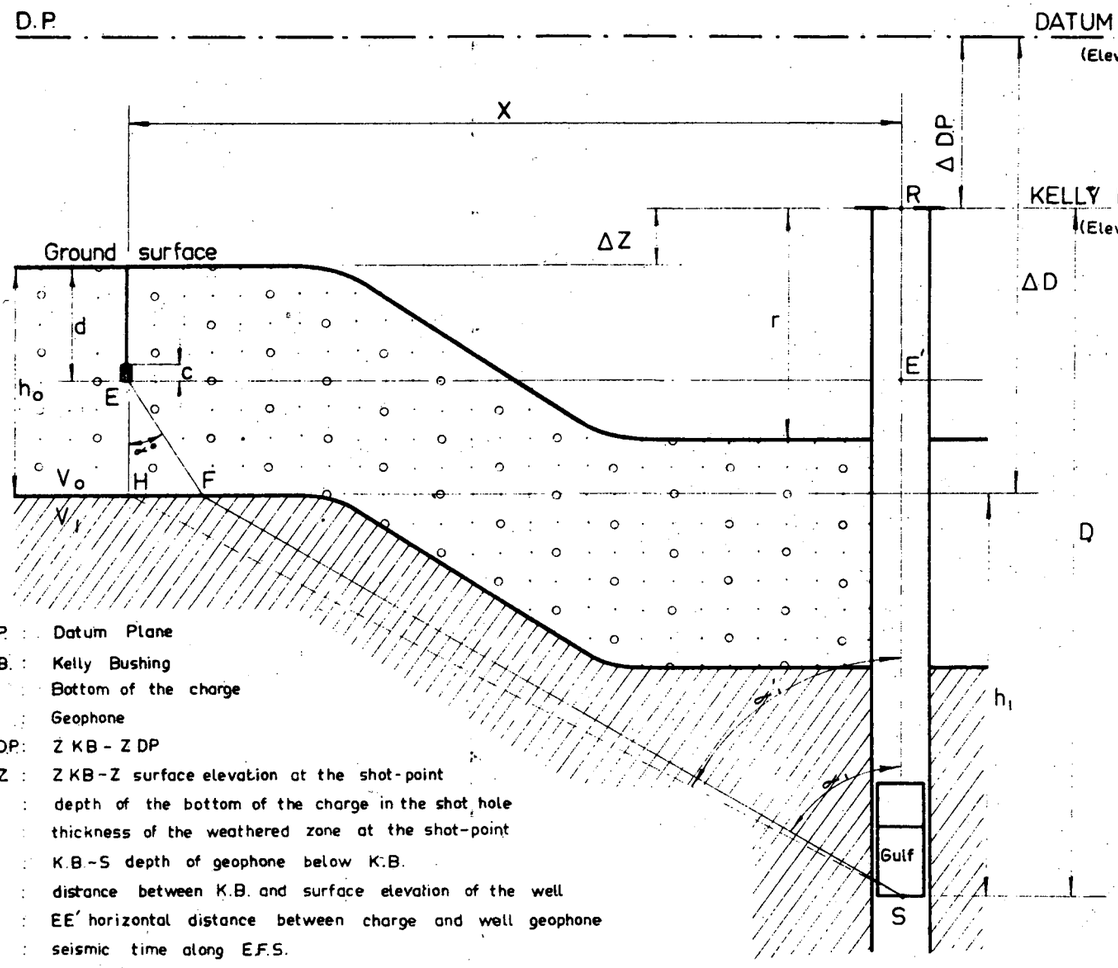
1 - Considering the vertical velocity between the ground-level of the well and 72 ft below is 8,000 ft/sec (time = 9 msec) and the time at 384 feet below GL: 42.5 msec (acoustic corrected time) the vertical velocity in the layer comprised between 72 and 384 ft below GL is : 312 ft/33.5 msec = 9,300 ft/sec
- This consideration was taken in account for C and K determination.

2- The acoustic corrected times are extrapolated between 6,140 and 6,650 feet below KB.

3- Tb 6 (weathered zone determination) is not included in this report .

4- On Tb 8, 9, 10 and 11 the acoustic velocity log is called " sonic log", nevertheless, the principle of calibration and the computation remain the same.

INDEX OF ABBREVIATIONS



D.P. : Datum Plane
K.B. : Kelly Bushing
E : Bottom of the charge
S : Geophone
Δ D.P. : Z K.B - Z D.P
Δ Z : Z K.B - Z surface elevation at the shot-point
d : depth of the bottom of the charge in the shot hole
h_o : thickness of the weathered zone at the shot-point
D : K.B.-S depth of geophone below K.B.
r : distance between K.B. and surface elevation of the well
X : EE' horizontal distance between charge and well geophone
T : seismic time along E.F.S.
ΔT : seismic time along E.F.
T' : T - ΔT
V_o : vertical velocity in the weathered zone
V_1 : vertical velocity below the weathered zone
c : height of charge

INDEX OF CORRECTIONS

1st CASE : SHOT on the BOTTOM of the WEATHERED ZONF ($d \neq h_o$) or BELOW the WEATHERED ZONE. ($d > h_o$)

T (raw time read on the record) = T' ($\Delta T = 0$)

T'' Recorded time reduced to the vertical $T' \times \frac{h_1}{L}$ where $\frac{h_1 = D - (d \pm \Delta Z)}{L = \sqrt{X^2 + h_1^2}}$

T''' Corrected time from D.P. = T'' + t where $t = \frac{\Delta D}{V_1}$ and $\Delta D = d \pm \Delta Z \pm \Delta D.P.$

2nd CASE : SHOT on the SURFACE ($d = 0$)

T' (Recorded time - time of path in the weathered zone) = $T - \Delta T$ where ΔT (seismic time in the weathered zone) = $\frac{h_o}{V_o \cos \alpha'_o}$

T'' Time below the weathered zone reduced to the vertical = $T' \times \frac{h_1}{L}$ where $\frac{h_1 = D - (h_o \pm \Delta Z)}{L = \sqrt{h_1^2 + (X - h_o \operatorname{tg} \alpha'_o)^2}}$

T''' Corrected time from D.P. = T'' + t where $t = \frac{\Delta D}{V_1}$ and $\Delta D = h_o \pm \Delta Z \pm \Delta D.P.$

α'_o Is determined by $\sin \alpha'_o = \sin \alpha'_1 \frac{V_o}{V_1}$ and $\sin \alpha'_1 = \frac{X}{\sqrt{X^2 + h_1^2}}$

It is proved that no noticeable error is made considering :

α'_1 maximum angle = α_1 real angle

α'_o approximate angle = α_o real angle

3rd CASE. SHOT in the WEATHERED ZONE ($d \neq 0$)

Compute T', T'' and T''' as in the second case, using $\Delta T = \frac{h_o - d}{V_o \cos \alpha'_o}$

and $L = \sqrt{h_1^2 + [X - (h_o - d) \operatorname{tg} \alpha'_o]^2}$

NOTE It will be admitted therefore, that in these three cases, the seismic travel F.S. is not affected by noticeable refraction effects.

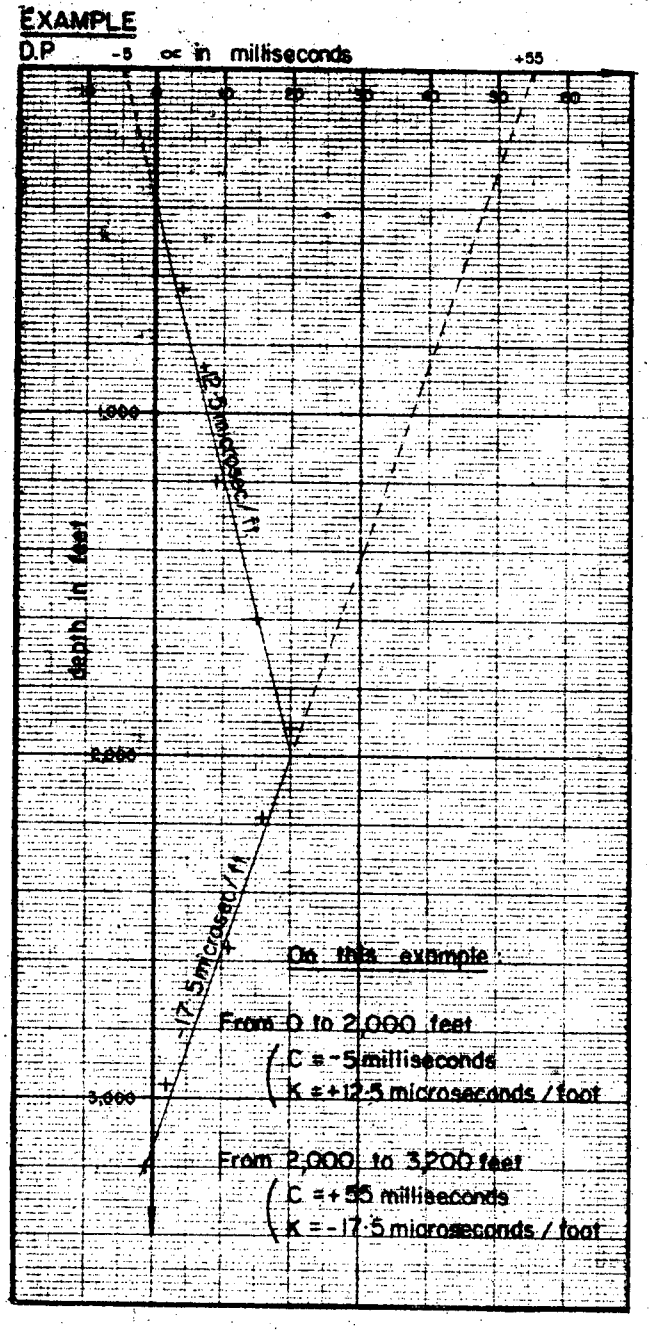
MEASUREMENT and COMPUTATION

Tb. 7

SHOT POINT Row	Hole	No. of SHOT Down	Up	D	d	ΔZ	ΔZ-ΔDP	h_1	X	Sin α'_1	Sin α'_0	Cos α'_0	Tg α'_0	ΔT	L	$\frac{h_1}{L}$	t	T	T'	T''	T'''
E	1	2		2,000	0	23	7	1,977	741						2,111	0.9365	0.9	169 ?		158.3?	159.2?
E	3	4		2,000	0	26	10	1,974	741						2,108.5	0.9362	1.3	161 P		150.7	152
E	2	3		2,500	0	26	10	2,474	741						2,583	0.9578	1.3	174?		166.7?	168?
																		234?		224.1?	225.4?
D	2		15	2,500	0	44	28	2,456	841						2,596	0.9461	3.5	187 P		176.9	180.4
																		230?		217.6?	221.1?
C	3	6		3,208	0	66	50	3,142	846						3,254	0.9656	6.3				
C	2		14	3,208	0	73	57	3,135	846						3,247	0.9655	7.1	228?		220.1?	227.2?
																		243?		231.6?	241.7?
D	1-3	5		4,545	0	44	28	4,501	841						4,579	0.9830	3.5	311?		305.7?	309.2?
																		335?		329.3?	332.8?
B	3		11	4,545	0	74	58	4,471	1,026						4,587	0.9747	7.3	300?		292.4?	299.7?
																		309?		301.2?	308.8?
B	1		9	4,865	0	76	60	4,789	1,026						4,898	0.9777	7.5	336P		328.5	336
B	2		10	5,330	0	75	59	5,255	1,026						5,354	0.9815	7.4	362P		355.3	362.7
A	1		8	5,550	0	88	72	5,462	1,158						5,583	0.9783	9	382P		373.7	382.7
A	2-3	7		6,140	0	88	72	6,052	1,158						6,162	0.9821	9	393?		386?	395?
																		418 ?		410.5?	419.5?

SONIC CALIBRATION

Principle and Abbreviations



b: Seismic corrected times

a: Times read on the sonic log from an arbitrary origin. This origin is chosen so that the difference $\alpha = b - a$ is small

-The value of α (positive or negative for each calibration point is plotted on a diagram, in relation to the depth D in feet .

-The points are joined with segments of a straight line the breaks of which must correspond to layer changes and / or to noticeable velocity contrasts .

- The equations of these segments determine :

1 - the ordinate of the origin : Calibration constant C in msec.

2 -the gradient: Calibration factor K in microsec / foot .

- Thus , C and K x D are algebraically added to each raw sonic time (a) to obtain the corresponding sonic corrected time .

NOTE : Ideal conditions of calibration :

α = Constant for all calibration points, whence: $C = \alpha$ and $K = 0$.

SONIC CALIBRATION

Tb. 9a

Sonic corrected time = Sonic raw time + (K × D) + calibration constant
K : calibration factor in microseconds / foot (See Tb. 10.)

ORIGIN : GL

	Depth in feet from K.B.	Depth in feet from D.P	Sonic raw time a	Seismic corrected time b	∝ (b−a)	K × D	Calibration constant c	Sonic corrected time	Average vertical velocity	Interval velocity
	16	0					+42	0		
	400	384	-0.3			+0.8		42.5	8,050	
	470	454	+4.8			+0.9		47.7	9,500	
	700	684	18.9			+1.4		62.3	11,000	
	860	844	28.2			+1.7		71.9	11,750	
	1,016	1,000	37.8			+2		81.8	12,200	
	1,250	1,234	52.4			+2.4		96.8	12,700	
	1,390	1,374	61			+2.8		105.8	13,000	
	1,550	1,534	71.2			+3.1		116.3	13,200	
	1,700	1,684	81.1			+3.4		126.5	13,300	
	1,850	1,834	90.7			+3.7		136.4	13,400	
E1	2,000	1,984	100.1	159.2?	+59.1?	+4		146.1	13,600	
E3	2,000	1,984	100.1	152	+51.9	+4		146.1	13,600	
	2,150	2,134	109.5			+4.3		155.8	13,700	
	2,310	2,294	119.9			+4.6		166.5	13,750	
E2	2,500	2,484	131.8	168 ?	+36.2?	+5		178.8	13,900	
D2	2,500	2,484	131.8	180.4	+48.6	+5		178.8	13,900	
	2,672	2,656	143.3			+5.3		190.6	13,900	
	2,770	2,754	150.5			+5.5		198	13,900	
	2,910	2,894	159.2			+5.8		207	14,000	
	3,050	3,034	167.9			+6.1		216	14,050	
C2	3,208	3,192	178.1	227.2?	+49.1?	+6.4		226.5	14,100	
	3,208	3,192	178.1	241.7?	+63.6?	+6.4		226.5	14,100	
	3,400	3,384	190.8			+6.8		239.6	14,100	
	3,550	3,534	201.3			+7.1		250.4	14,100	
	3,700	3,684	211.6			+7.4		261	14,100	
	3,850	3,834	222.2			+7.7		271.9	14,100	
	4,010	3,994	233.3			+8		283.3	14,100	
	4,110	4,094	241			+8.2		291.2	14,050	
	4,244	4,228	250.5			+8,5		301	14,050	
	4,330	4,314	255.7			+8.6		306.3	14,100	
	4,395	4,379	258.9			+8.7		309.6	14,150	
D 1-3	4,545	4,529	267.7	309.2?	+41.5?	+9.1		318.8	14,200	
	4,545	4,529	267.7	332.8?	+65.1?	+9.1		318.8	14,200	
B3	4,545	4,529	267.7	299.7?	+32 ?	+9.1		318.8	14,200	
	4,545	4,529	267.7	308.5?	+40.8?	+9.1		318.8	14,200	
	4,710	4,694	276.4			+9.4		327.8	14,300	
	4,810	4,794	282.8			+9.6		334.4	14,300	
B1	4,865	4,849	285.7	336	+50.3	+9.7		337.4	14,350	
	5,070	5,054	296.9			+10.1		349	14,500	
	5,176	5,160	302			+10.3	+42	354.3	14,550	

SONIC CALIBRATION

Sonic corrected time = Sonic raw time + (K × D) + calibration constant
K : calibration factor in microseconds / foot (See Tb. 10.)

ORIGIN : GL

	Depth in feet from K.B.	Depth in feet from D.P	Sonic raw time a	Seismic corrected time b	∝ (b−a)	K×D	Calibration constant c	Sonic corrected time	Average vertical velocity	Interval velocity
	5,250	5,234	306.4			+10.5	+42	358.9	14,550	
B2	5,330	5,314	311.6	362.7	+51.1	+10.6	↑	364.2	14,600	
A1	5,550	5,534	327.4	382.7	+55.3	+11.1		380.5	14,550	
	5,570	5,554	328.6			+11.1		381.7	14,550	
	5,634	5,618	332.9			+11.2		386.1	14.550	
	5,760	5,744	340.9			+11.5		394.4	14.550	
	5.950	5.934	352.7			+11.9		406.6	14.600	
A2-3	6,140	6,124	364.7	395 ?	+30.3?	+12.2		418.9	14,600	
	6,140	6,124	364.7	419.5?	+54.8?	+12.2		418.9	14,600	
	6,260	6,244	372.1			+12.5		426.6	14,600	
	6,395	6,379	381.1			+12.7	↓	435.8	14,650	
	6,650	6,634	396.4			+13.3	+42	451.7	14,700	

SONIC INTERVAL VELOCITIES

Tb. 10 a

Z KB 1,945ft ORIGIN : GL Z GL : 1,929 ft

Depth in feet from K.B.	Depth in feet from D.P.	Sonic corrected time in milliseconds.	Interval depth	Interval time	Interval velocity in feet / second
16	0	0			
			384	42.5	9.050
400	384	42.5			
			70	5.2	13,500
470	454	47.7			
			230	14.6	15,700
700	684	62.3			
			160	9.6	16,700
860	844	71.9			
			156	9.9	15,800
1,016	1,000	81.8			
			234	15.	15,600
1,250	1,234	96.8			
			140	9.	15,600
1,390	1,374	105.8			
			160	10.5	15,200
1,550	1,534	116.3			
			150	10.2	14,700
1,700	1,684	126.5			
			150	9.9	15,200
1,850	1,834	136.4			
			150	9.7	15,500
2,000	1,984	146.1			
			150	9.7	15,500
2,150	2,134	155.8			
			160	10.7	14,900
2,310	2,294	166.5			
			190	12.3	15,400
2,500	2,484	178.8			
			172	11.8	14,600
2,672	2,656	190.6			
			98	7.4	13,200
2,770	2,754	198			
			140	9.	15,600
2,910	2,894	207			
			140	9.	15,600
3,050	3,034	216			
			158	10.5	13,700
3,208	3,192	226.5			
			192	13.1	14,600
3,400	3,384	239.6			
			150	10.8	13,900
3,550	3,534	250.4			
			150	10.6	14,100
3,700	3,684	261			
			150	10.9	13,800
3,850	3,834	271.9			

SONIC INTERVAL VELOCITIES

Tb. 10 b

Z KB 1,945 ft ORIGIN GL Z GL 1,9129ft

Depth in feet from K.B.	Depth in feet from D.P.	Sonic corrected time in milliseconds.	Interval depth	Interval time	Interval velocity in feet/second
3,850	3,834	271.9			
			160	11.4	14,000
4,010	3,994	283.3			
			100	7.9	12,600
4,110	4,094	291.2			
			134	9.8	13,700
4,244	4,228	301			
			86	5.3	16,200
4,330	4,314	306.3			
			65	3.3	19,700
4,395	4,379	309.6			
			150	9.2	16,300
4,545	4,529	318.8			
			165	9	18,300
4,710	4,694	327.8			
			100	6.6	15,100
4,810	4,794	334.4			
			55	3	18,300
4,865	4,849	337.4			
			205	11.6	17,700
5,070	5,054	349			
			106	5.3	20.000
5,176	5,160	354.3			
			74	4.6	16,100
5,250	5,234	358.9			
			80	5.3	15,100
5,330	5,314	364.2			
			220	16.3	13,500
5,550	5,534	380.5			
			20	1.2	16,700
5,570	5,554	381.7			
			64	4.4	14,500
5,634	5,618	386.1			
			126	8.3	15.200
5,760	5,744	394.4			
			190	12.2	15,600
5,950	5,934	406.6			
			190	12.3	15,400
6,140	6,124	418.9			
			120	7.7	15,600
6,260	6,244	426.6			
			135	9.2	14,700
6,395	6,379	435.8			
			255	15.9	16,000
6,650	6,634	451.7			

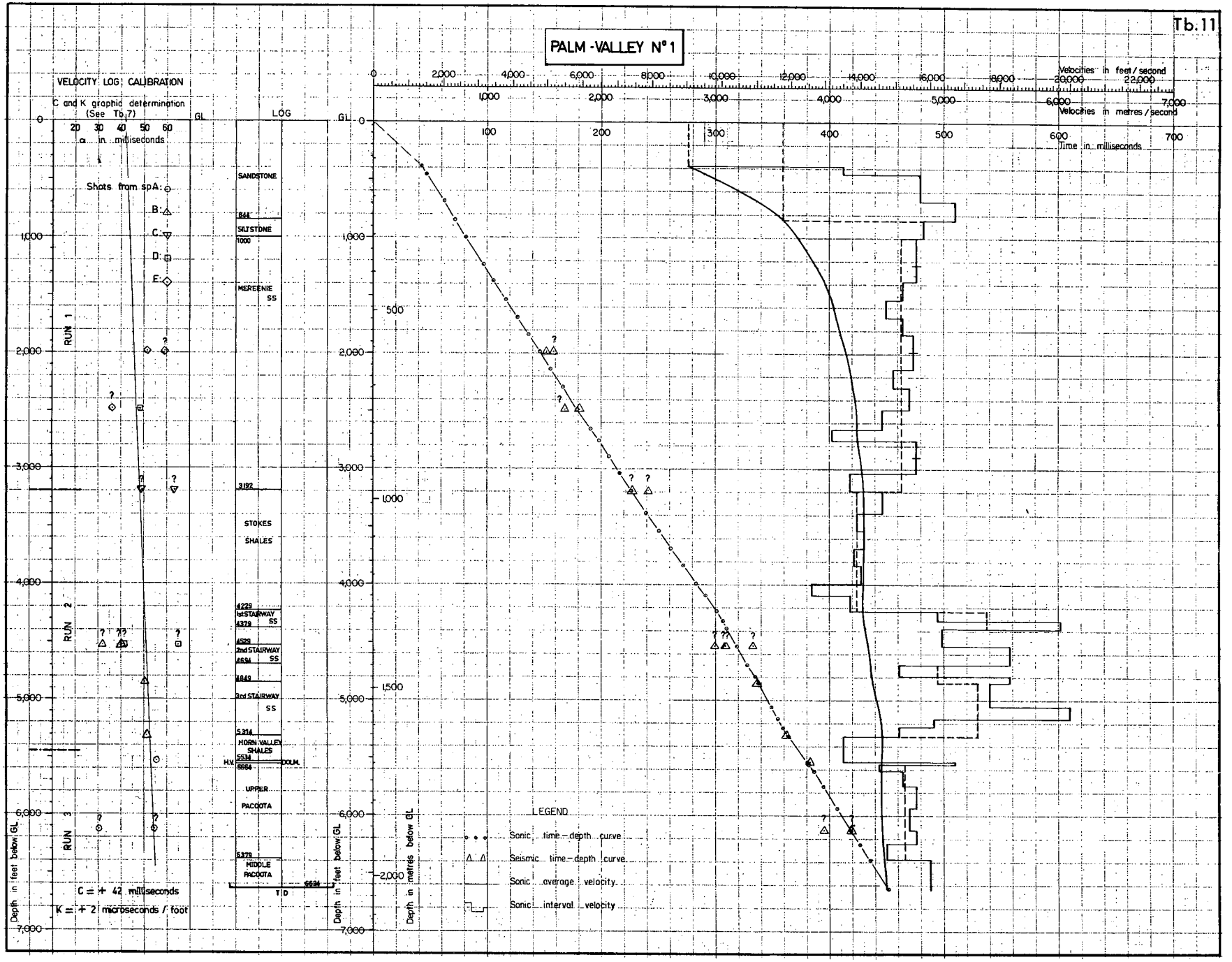
SONIC INTERVAL VELOCITIES

Tb. 10$_c$

Z KB 1,945 ft ORIGIN GL Z GL 1,929ft

Depth in feet from K.B.	Depth in feet from D.P.	Sonic corrected time in milliseconds.	Interval depth	Interval time	Interval velocity in feet / second
		FORMATIONS INTERVAL VELOCITIES			
16	0	0			
			844	71.9	11,750
860	844	71.9			
			156	9.9	15,800
1,016	1,000	81.8			
			2,192	144.7	15,150
3,208	3,192	226.5			
			1,036	74.5	13.900
4,244	4,228	301			
			151	8.6	17.600
4,395	4,379	309.6			
			150	9.2	16,300
4,545	4,529	318.8			
			165	9	18,300
4,710	4,694	327.8			
			155	9,6	16,200
4,865	4,849	337.4			
			465	26.8	17,350
5,330	5,314	364.2			
			220	16.3	13,500
5,550	5,534	380.5			
			20	1.2	16,700
5,570	5,554	381.7			
			825	54.1	15,250
6,395	6,379	435.8			
			255	15.9	16,000
6,650	6,634	451.7			

Tb.11


PALM-VALLEY N°1
VELOCITY LOG: CALIBRATION
C and K graphic determination (See Tb.7)
a in milliseconds
Shots from spA:
B:
C:
D:
E:
RUN 1
RUN 2
RUN 3
C = + 42 milliseconds
K = + 2 microseconds / foot
LOG
SANDSTONE
844
SILTSTONE
1000
MEREENIE SS
3182
STOKES SHALES
4229
1st STAIRWAY SS
4379
4529
2nd STAIRWAY SS
4694
4849
3rd STAIRWAY SS
5214
HORN VALLEY SHALES
5534
H.V.
DOLM.
5664
UPPER PACCOTA
5379
MIDDLE PACCOTA
5694
T.D.
Depth in feet below GL
Depth in metres below GL
Velocities in feet / second
Velocities in metres / second
Time in milliseconds
LEGEND
Sonic time-depth curve
Seismic time-depth curve
Sonic average velocity
Sonic interval velocity

MEASUREMENTS

No. of Shot			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Hour of Shot			0.15 am	0.45	1.10	1.30	2.30	4.15	5.30	6.00	6.30	6.40	6.50	7.00	7.10	7.20	7.30
No. of Shot Point			F	E1	E2	E3	D1-D3	C3	A2-A3	A1	B1	B2	B3	B4	C1	C2	D2
Depth of Well Geophone	metres																
	feet below KB		1,016	2,000	2,500	2,000	4,545	3,208	6,140	5,550	4,865	5,330	4,545	3,700	3,208	3,208	2,500
Shot Point - well distance in feet			600	750	750	750	860	860	1,200	1,200	1,050	1,050	1,050	1,059	860	860	360
Depth of charge in feet			← SHOTS ON THE SURFACE →														
Explosive charge in lbs.			20	30	50	50	250	100	500	200	200	200	200	150	150	150	100
Total charge in lbs.			20	50	100	150	400	500	1,000	1,200	1,400	1,600	1,800	1,950	2,100	2,250	2,350 Lbs geophex
Blasting caps			1	1	1	1	5	1	10	4	3	2	2	2	2	2	2 = 39 detonators
Time Break	1	Gains / Filters															
Gulf pressure-geop AGC:off	2	G	20/50	=	=	=	=	=	=	=	30/50	=	=	=	25/50	=	=
		F	out-64														
	3	G	30/50	35/50	=	=	=	=	=	=	50/50	=	=	=	40/50	=	=
		F	out-64														
	4	G	40/50	50/50	=	=	=	=	=	=	80/50	=	=	=	60/50	=	=
		F	out-64														
AGC : on	5	G	30/50	=	=	=	=	=	=	=	=	=	=	=	=	=	=
		F	out-64														
well-head geophones AGC: off	6	G	20/50	=	=	=	=	=	=	=	=	=	=	=	=	=	=
		F	out-42														
	7	G															
		F															
	8	G															
		F															
	9	G															
		F															
	10	G															
		F															
	11	G															
		F															
	12	G															
		F															

No possibility to check the insulation of the cable, when connected to the well-geophone.

OBSERVATIONS

Noise brought about by the motor of the camera

Camera connected to a separate battery

Welex geophone is used for this shot

Gulf pressure geophone is used again earth circuit differently connected noise level lower

Time break cross-feed

No record

No record

C.G.G PARTY X 6526 Client MAGELLAN Pet. Well Palm Valley N°1

Date 6. 7th to 8th May 1965
Hour H 6.15 am to H
No. of Shot 1
Shot Point F
Shot Point to well distance in feet 660
Depth of charge in feet Surface
Charge in lbs 25
Perturbations
Observations Pressure line at shale of the water.
Depth of well geophone in feet below K.B. 1,015
Datum
Well geophones Pressure GULF GCE 101
Rod geophones HALL SEARS
Equipment : S.I.E.
Amplifiers P.T.T. S.I.E.
Camera PROTI S.I.E.

No. of Trace	DESIGNATION	GAIN Input	GAIN Output	FILTER L.F.	FILTER H.F.	A.G.C.
1	Time-break					
2	gulf well geoph.	4e	50	out	64	off
3	" " "	8e	50	out	64	off
4	" " "	4e	50	out	64	off
5	" " "	8e	50	out	64	on
6	well-head geoph.	20	50	out	42	off
7						
8						
9						
10						
11						
12						

C.G.G PARTY X 6526 Client MAGELLAN Pet. Well Palm Valley N°1

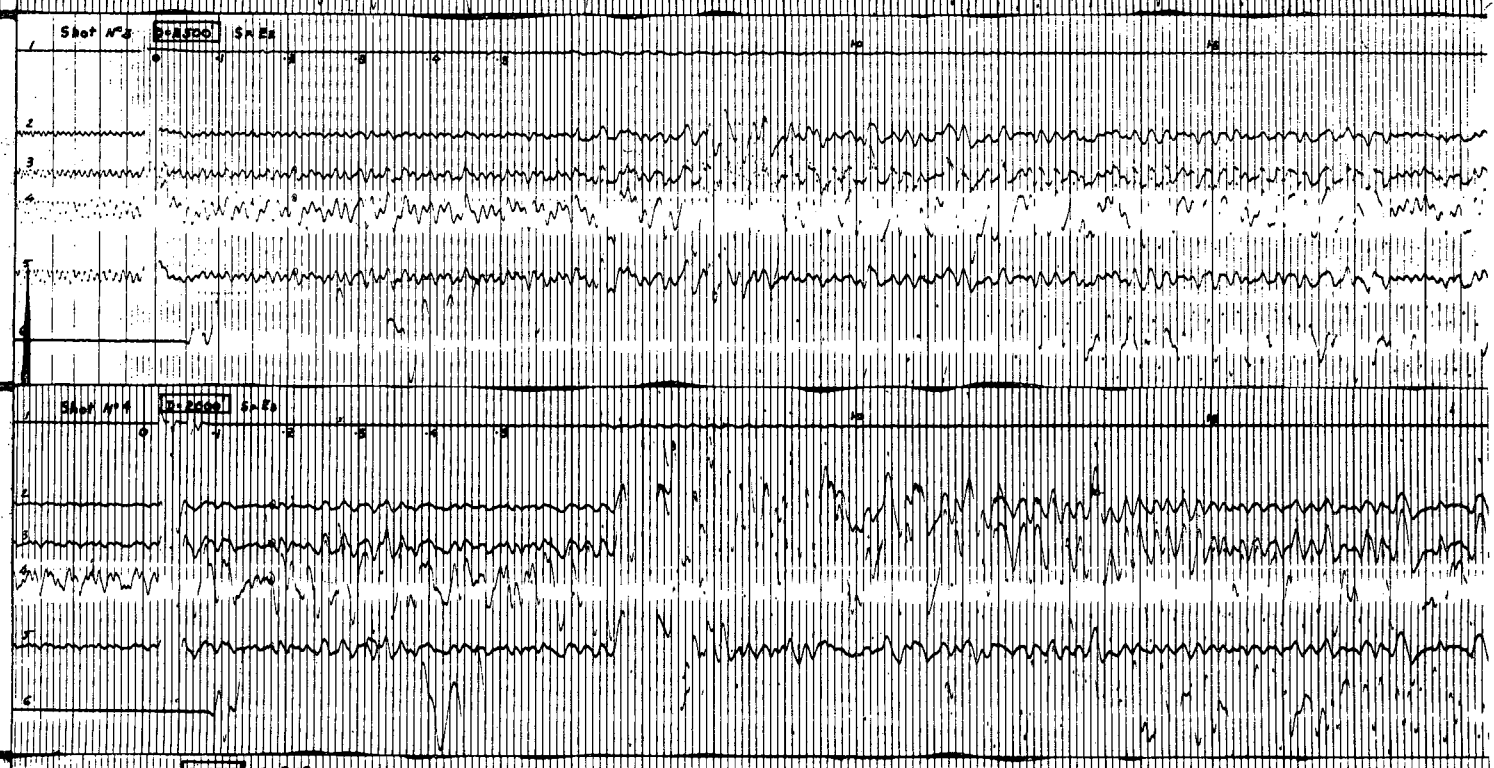
Date 6. 7th to 8th May 1965
Hour H 8.45 am H
No. of Shot 2
Shot Point E1
Shot Point to well distance in feet 750
Depth of charge in feet Surface
Charge in lbs 50
Perturbations
Observations Misty - No break
Depth of well geophone in feet below K.B. 2,000
Datum
Well geophones Pressure GULF GCE 101
Rod geophones HALL SEARS
Equipment : S.I.E.
Amplifiers P.T.T. S.I.E.
Camera PROTI S.I.E.

No. of Trace	DESIGNATION	GAIN Input	GAIN Output	FILTER L.F.	FILTER H.F.	A.G.C.
1	Time-break					
2	gulf well geoph.	4e	50	out	64	off
3	" " "	8e	50	out	64	off
4	" " "	4e	50	out	64	off
5	" " "	8e	50	out	64	on
6	well-head geoph.	20	50	out	42	off
7						
8						
9						
10						
11						
12						

C.G.G PARTY X 6526 Client MAGELLAN Pet. Well Palm Valley N°1

Date 6. 7th to 8th May 1965
Hour H 1.10 am H
No. of Shot 3
Shot Point E2
Shot Point to well distance in feet 750
Depth of charge in feet Surface
Charge in lbs 50
Perturbations
Observations Mists : 50 ft. No break.
Depth of well geophone in feet below K.B. 8,500
Datum
Well geophones Pressure GULF GCE 101
Rod geophones HALL SEARS
Equipment : S.I.E.
Amplifiers P.T.T. S.I.E.
Camera PROTI S.I.E.

No. of Trace	DESIGNATION	GAIN Input	GAIN Output	FILTER L.F.	FILTER H.F.	A.G.C.
1	Time-break					
2	gulf well geoph.	4e	50	out	64	off
3	" " "	8e	50	out	64	off
4	" " "	4e	50	out	64	off
5	" " "	8e	50	out	64	on
6	well-head geoph.	20	50	out	42	off
7						
8						
9						
10						
11						
12						



C.G.G PARTY X 6526 Client MAGELLAN Pet. Well Palm Valley N°1

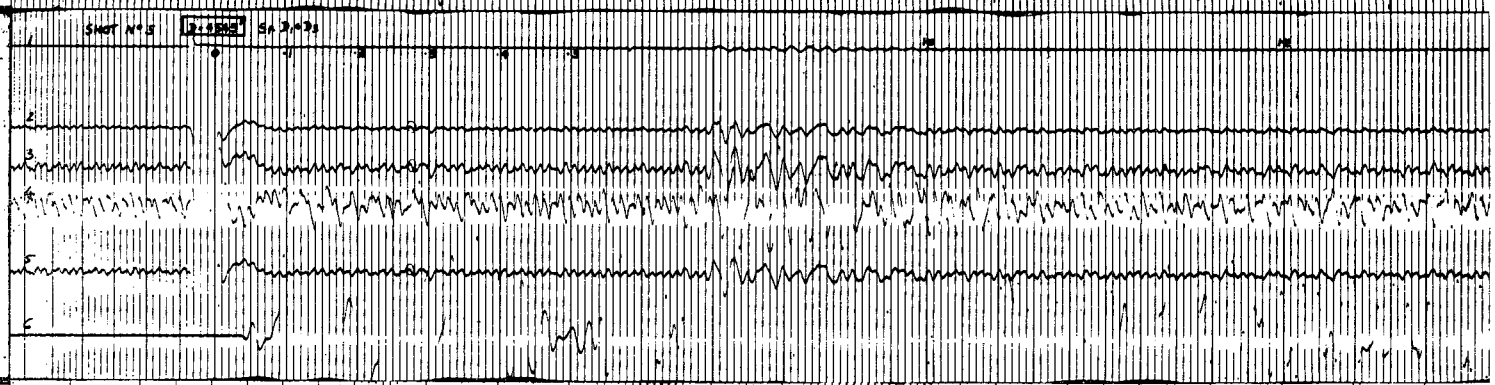
Date 6. 7th to 8th May 1965
Hour H 1.30 am H
No. of Shot 4
Shot Point E3
Shot Point to well distance in feet 770
Depth of charge in feet Surface
Charge in lbs 50
Perturbations
Observations Mists. T.B. muffled - No break.
Depth of well geophone in feet below K.B. 8,000
Datum
Well geophones Pressure GULF GCE 101
Rod geophones HALL SEARS
Equipment : S.I.E.
Amplifiers P.T.T. S.I.E.
Camera PROTI S.I.E.

No. of Trace	DESIGNATION	GAIN Input	GAIN Output	FILTER L.F.	FILTER H.F.	A.G.C.
1	Time-break					
2	gulf well geoph.	4e	50	out	64	off
3	" " "	8e	50	out	64	off
4	" " "	4e	50	out	64	off
5	" " "	8e	50	out	64	on
6	well-head geoph.	20	50	out	42	off
7						
8						
9						
10						
11						
12						

C.G.G PARTY X 6526 Client MAGELLAN Pet. Well Palm Valley N°1

Date 6. 7th to 8th May 1965
Hour H 2.50 am H
No. of Shot 5
Shot Point D1 - D2
Shot Point to well distance in feet 760
Depth of charge in feet Surface
Charge in lbs 250
Perturbations
Observations Thin - Sharp Shotfire 30 ft. No ground.
Depth of well geophone in feet below K.B. 4,545
Datum
Well geophones Pressure GULF GCE 101
Rod geophones HALL SEARS
Equipment : S.I.E.
Amplifiers P.T.T. S.I.E.
Camera PROTI S.I.E.

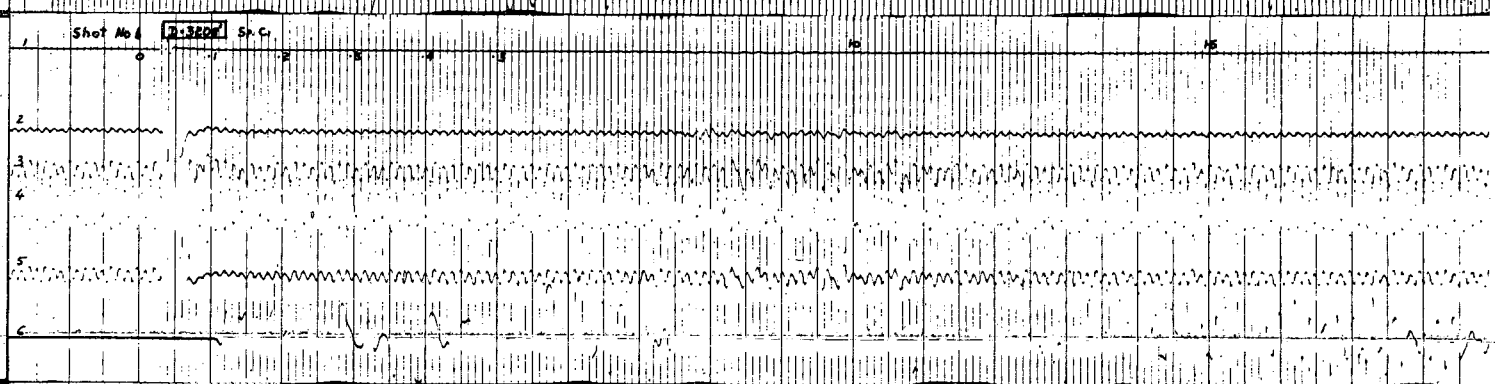
No. of Trace	DESIGNATION	GAIN Input	GAIN Output	FILTER L.F.	FILTER H.F.	A.G.C.
1	Time-break					
2	gulf well geoph.	4e	50	out	64	off
3	" " "	8e	50	out	64	off
4	" " "	4e	50	out	64	off
5	" " "	8e	50	out	64	on
6	well-head geoph.	20	50	out	42	off
7						
8						
9						
10						
11						
12						



C.G.G PARTY X 6526 Client MAGELLAN Pet. Well Palm Valley N-1

Date 6. 7th to 8th May 1965
Hour H 4.15 am H
No. of Shot 6
Shot Point C2
Shot Point to well distance in feet 760
Depth of charge in feet Surface
Charge in lbs 100
Perturbations
Observations Shotfire not sharp - present trigh to break
Depth of well geophone in feet below K.B. 3,208
Datum
Well geophones Mullins -
Rod geophones HALL SEARS
Equipment S.I.E.
Amplifiers P.T.T. S.I.E.
Camera PROTI S.I.E.

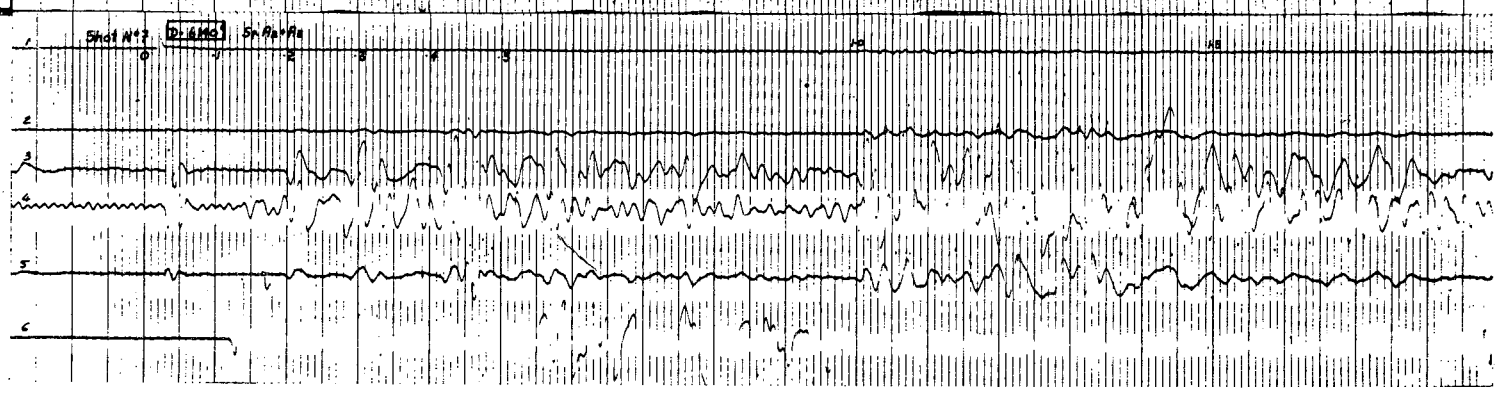
No. of Trace	DESIGNATION	GAIN Input	GAIN Output	FILTER L.F.	FILTER H.F.	A.G.C.
1	Time-break					
2	gulf well geoph.	4e	50	out	64	off
3	" " "	8e	50	out	64	off
4	" " "	4e	50	out	64	off
5	" " "	8e	50	out	64	on
6	well-head geoph.	20	50	out	42	off
7						
8						
9						
10						
11						
12						

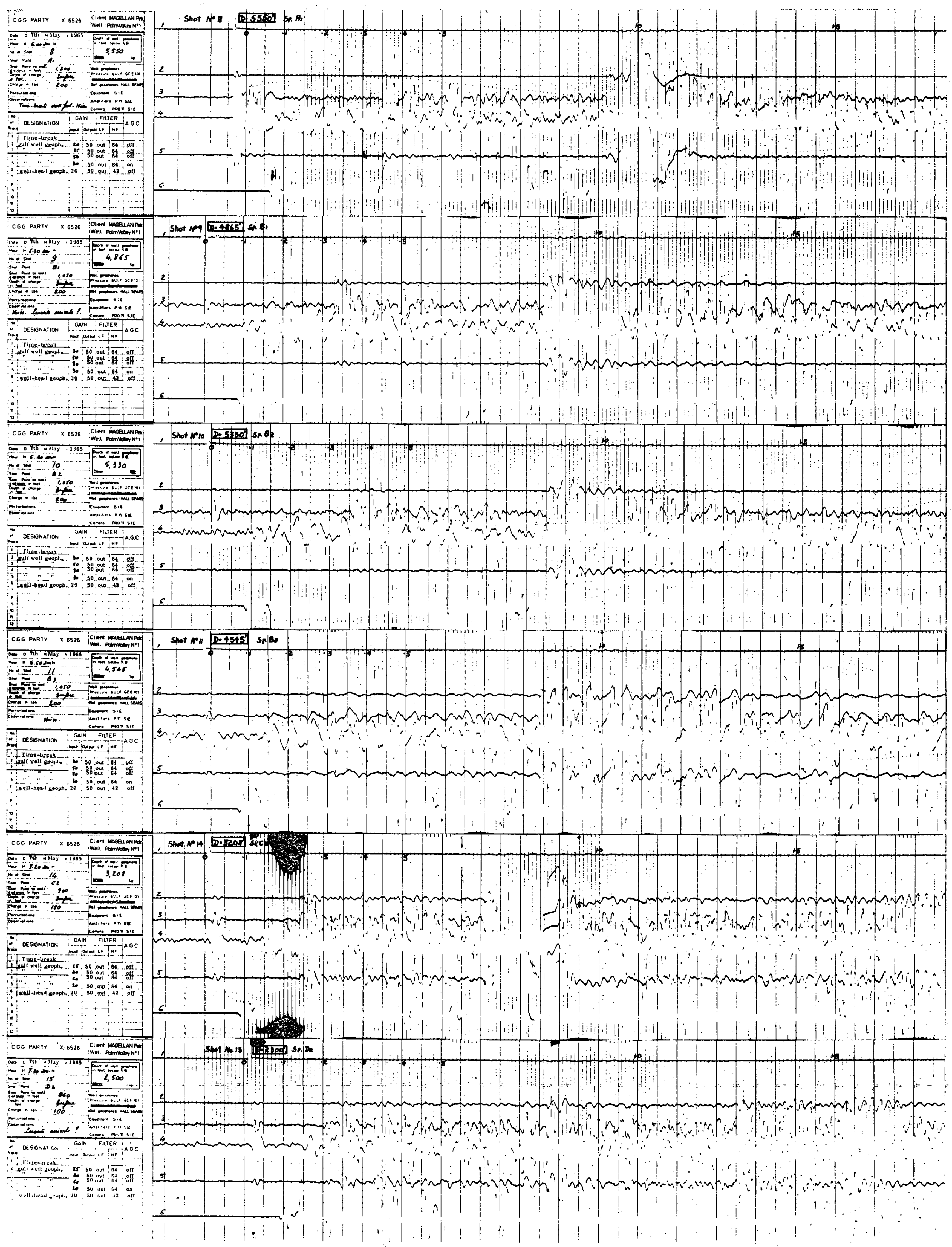


C.G.G PARTY X 6526 Client MAGELLAN Pet. Well Palm Valley N-1

Date 6. 7th to 8th May 1965
Hour H 6.30 am H
No. of Shot 7
Shot Point B2 - B1
Shot Point to well distance in feet 1,100
Depth of charge in feet Surface
Charge in lbs 100
Perturbations
Observations Mists -
Depth of well geophone in feet below K.B. 6,140
Datum
Well geophones Pressure GULF GCE 101
Rod geophones HALL SEARS
Equipment S.I.E.
Amplifiers P.T.T. S.I.E.
Camera PROTI S.I.E.

No. of Trace	DESIGNATION	GAIN Input	GAIN Output	FILTER L.F.	FILTER H.F.	A.G.C.
1	Time-break					
2	gulf well geoph.	4e	50	out	64	off
3	" " "	8e	50	out	64	off
4	" " "	4e	50	out	64	off
5	" " "	8e	50	out	64	on
6	well-head geoph.	20	50	out	42	off
7						
8						
9						
10						
11						
12						




CGG PARTY X 6526
Client MAGELLAN Pet.
Well Palm Valley No1
Date 7th May 1965
No of Shot 8
Shot Point A1
Depth of well geophone in feet below KB 5,550
Charge in lbs 200
DESIGNATION
GAIN
FILTER
AGC
Input
Output
LF
HF
Time-break
gulf well geoph.
well-head geoph.
Shot No 8
D-5550'
Sp. A1
Shot No 9
D-4865'
Sp. B1
No of Shot 9
4,865
Shot No 10
D-5330'
Sp. B2
No of Shot 10
5,330
Shot No 11
D-4545'
Sp. B2
No of Shot 11
4,545
Shot No 14
D-3208'
No of Shot 14
3,208
Shot No 15
D-2500'
Sp. D2
No of Shot 15
2,500

ENCLOSURE NO. 5

FORMATION TEST CHARTS

(a) Drill Stem Test Charts
by B. J. Services

(b) Completion Test Charts

Well PALM VALLEY NO.1

Company MAGELLAN PETROLEUM(N.T.) PTY. LTD.

Comp. Rep. M. Brown

Tester B.J. Flahr

B J SERVICE (AUSTRALIA) PTY. LTD.

ROOM 3, THIRD FLOOR, PERRY HOUSE, 131-145 ELIZABETH ST., BRISBANE

Test No. 1

Date March 21, 1965

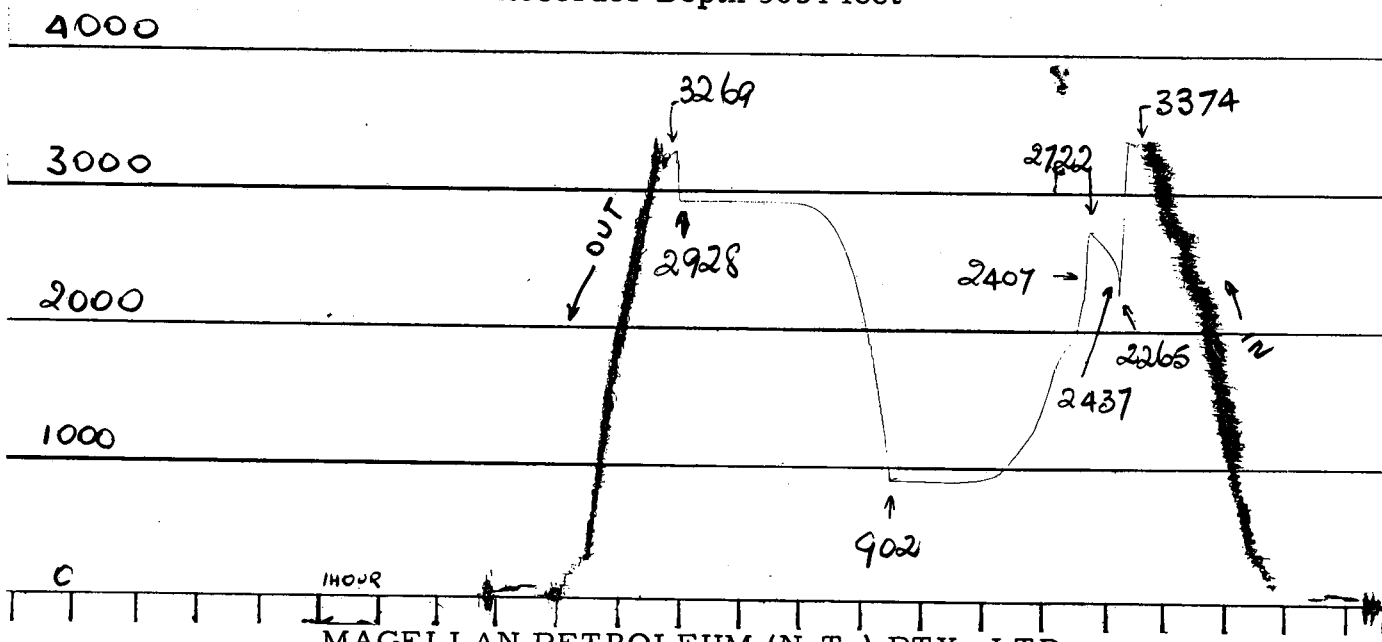
Mud Wt.	11.4	Tool Open	11:03 A.M.	Main Hole Size	8¾"
Viscosity	55	Tool Shut-In	11:09 A.M.	Rat Hole Size	
Filter Cake	2/32	Time Shut-In	30 Mins.	Top Packer Depth	5494'
Water Loss	8.4	Initial Shut-In Pres.	2643	Bottom Packer Depth	5500'
Mud Drop	1'	Tool Open	11:39 A.M.	Total Depth	5640'
Formation	Pacoota Horn Valley	Initial Flow Pres.	(2178 Pre-ISI) 2324	Rubber Size	7½"
Recorder No.	1942	Final Flow Pres.	(2332 Pre-ISI) 861	Hole Condition	Good
Clock Range	12 hr.	Tool Closed	2:55 P.M.	Pipe Size	4½" I.F.
Depth	5536'	Time Shut-In	210 Mins.	D.C. Size	2 7/8" I.D.
Recorder No.	1943	Final Shut-In Pres.	2896	Ft. D.C. Run	332
Clock Range	24 hr.	Initial Hydro Mud Pres.	3291	Water Cushion Run	
Depth	5634'	Final Hydro Mud Pres.	3204	Bottom Hole Choke	½"
B.H. Temperature	154°	Type Test	Full Hole	Surface Choke	¾" Adjustable

Remarks Good initial puff, good air blow, gas to surface 17 mins., mud to surface 25 mins., blew mud throughout test. - Estimate 4-5 MMCF.

Recovery 450 ft. Gassy mud

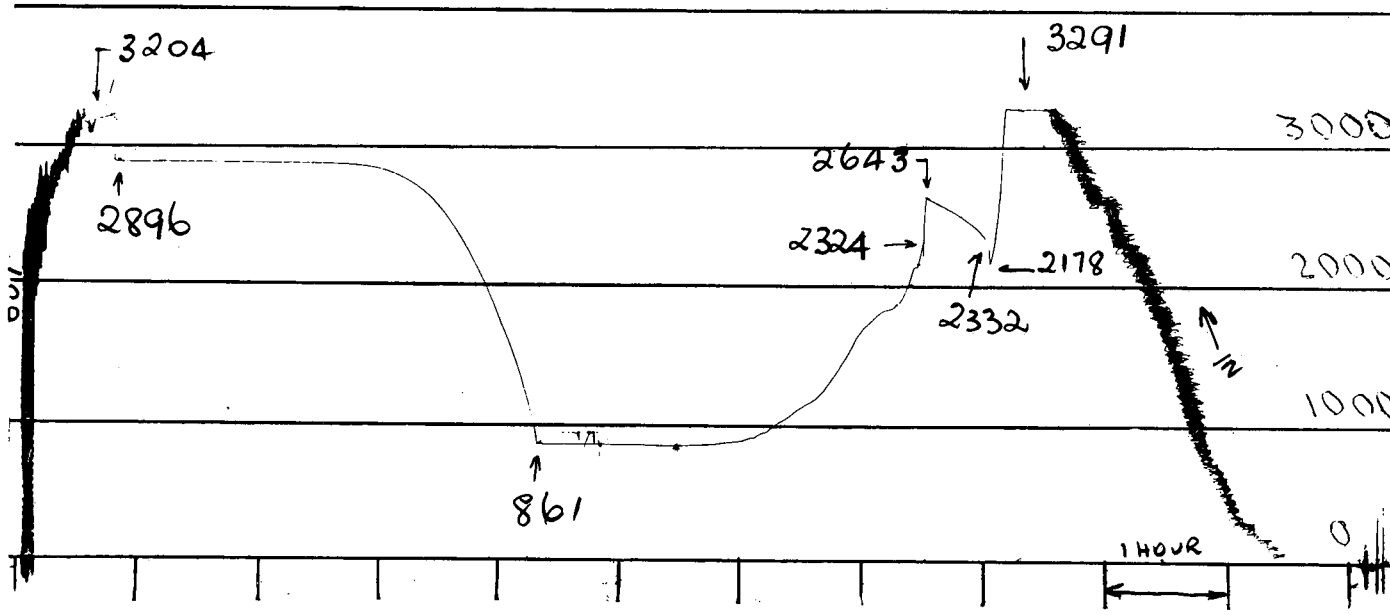
MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 1
Recorder No. 1943
March 21, 1965
Recorder Depth 5634 feet



MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 1
Recorder No. 1942
March 21, 1965
Recorder Depth 5536 feet



Well PALM VALLEY NO.1

Company MAGELLAN PETROLEUM N.T. PTY. LTD.

Comp. Rep. M. Brown

Tester E.J. Flahr

B J SERVICE (AUSTRALIA) PTY. LTD.

ROOM 3, THIRD FLOOR, PERRY HOUSE, 131-145 ELIZABETH ST., BRISBANE

Test No. 2

Date March 22, 1965

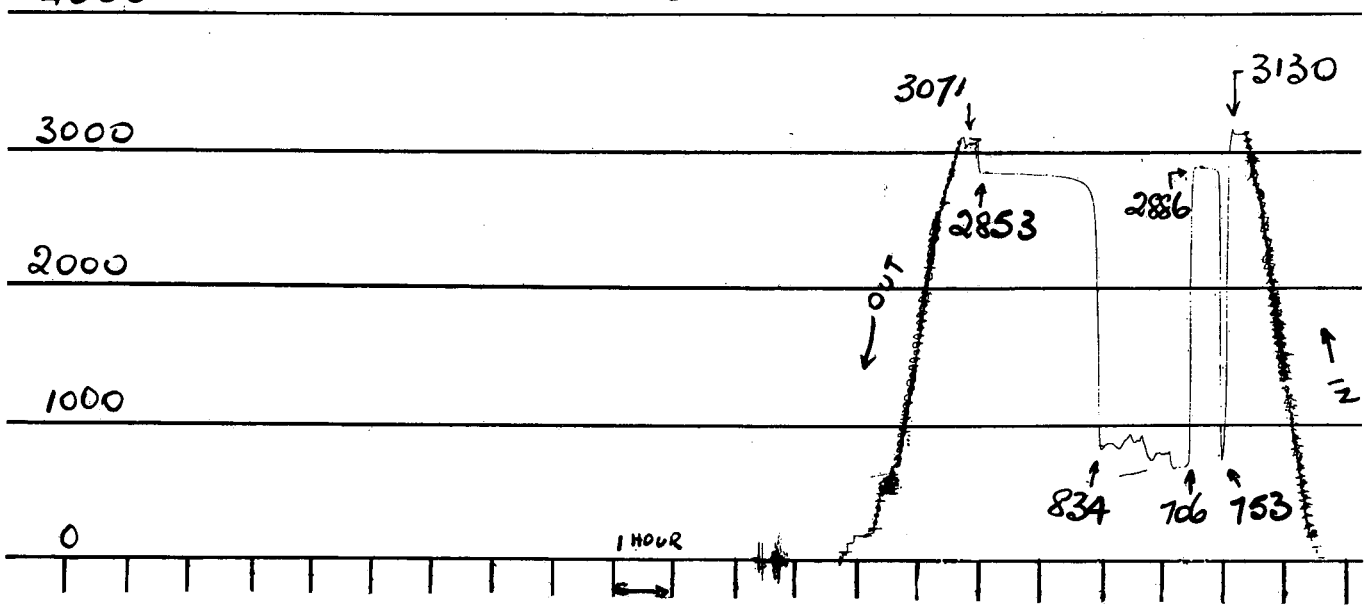
Mud Wt.	11.1	Tool Open	5:52 P.M.	Main Hole Size	8¾"
Viscosity	47	Tool Shut-In	5:57 P.M.	Rat Hole Size	
Filter Cake	2/32	Time Shut-In	30 Mins.	Top Packer Depth	5164'
Water Loss	8.8	Initial Shut-In Pres.	2859	Bottom Packer Depth	5316'
Mud Drop	4'	Tool Open	6:27 P.M.	Total Depth	5680'
Formation	Stairways	Initial Flow Pres.	(608 Pre-ISI) 616	Rubber Size	7½"
Recorder No.	1942	Final Flow Pres.	755	Hole Condition	Good
Clock Range	12 hr.	Tool Closed	7:57 P.M.	Pipe Size	4½" I.F.
Depth	5155'	Time Shut-In	120 Mins.	D.C. Size	2 7/8" I.F.
Recorder No.	1943	Final Shut-In Pres.	2838	Ft. D.C. Run	302
Clock Range	24 hr.	Initial Hydro Mud Pres.	3093	Water Cushion Run	
Depth	5209'	Final Hydro Mud Pres.	3021	Bottom Hole Choke	½"
B.H. Temperature	154°	Type Test	Straddle	Surface Choke	¾" Adjustable

Remarks Good initial puff, good air blow, gas to surface in 2 mins. 728 M.C.F. in 20 mins. remained steady throughout test.

Recovery 1200 ft. gas cut mud.

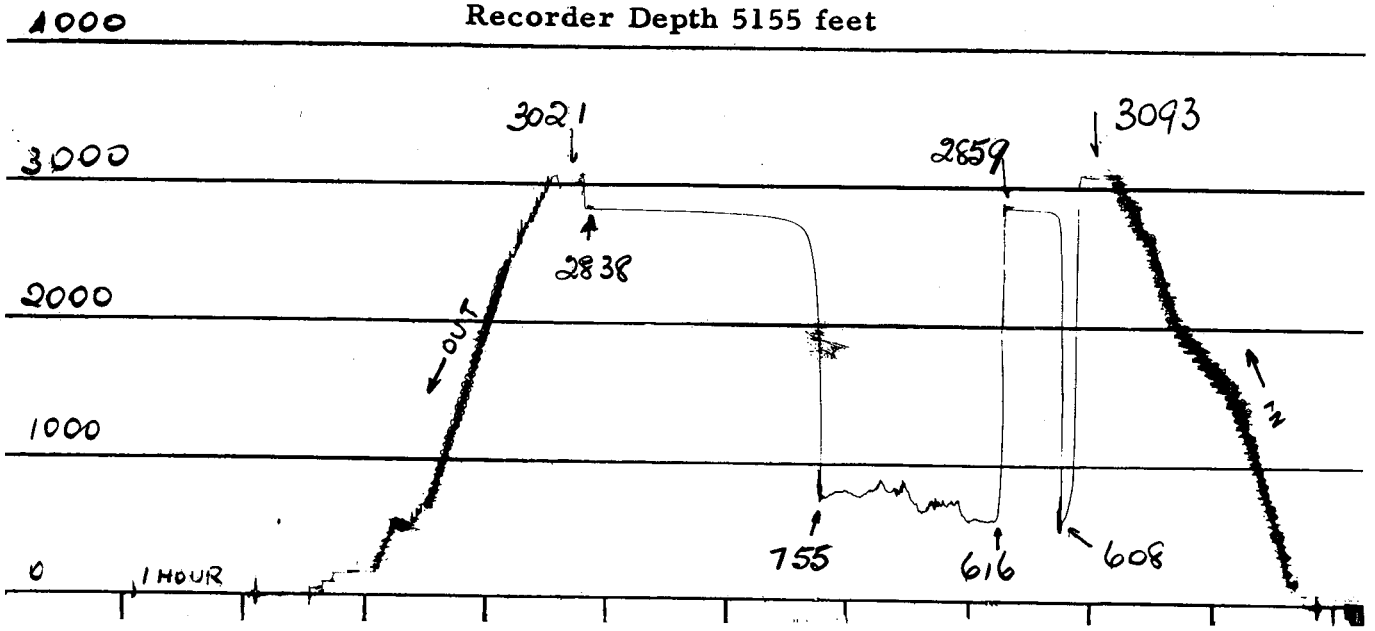
MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 2
Recorder No. 1943
March 22, 1965
Recorder Depth 5209 feet



MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 2
Recorder No. 1942
March 22, 1965
Recorder Depth 5155 feet



Well PALM VALLEY NO.1

Company MAGELLAN PETORLEUM N.T. PTY. LTD.

Comp. Rep. M. Brown

Tester E.J. Flahr

B J SERVICE (AUSTRALIA) PTY. LTD.

ROOM 3, THIRD FLOOR, PERRY HOUSE, 131-145 ELIZABETH ST., BRISBANE

Test No. 3

Date March 24, 1965

Mud Wt.	11.3	Tool Open	8:08 P.M.	Main Hole Size	8¾"
Viscosity	49	Tool Shut-In	8:13 P.M.	Rat Hole Size	6⅛"
Filter Cake	2/32	Time Shut-In	30 Mins.	Top Packer Depth	5624'
Water Loss	7.8	Initial Shut-In Pres.	2917	Bottom Packer Depth	5630'
Mud Drop	2'	Tool Open	8:43 P.M.	Total Depth	5784'
Formation	Pacoota	Initial Flow Pres.	(464 Pre-ISI) 574	Rubber Size	7½"
Recorder No.	1942	Final Flow Pres.	578	Hole Condition	Good
Clock Range	12 hr.	Tool Closed	9:43 P.M.	Pipe Size	4½" I.F.
Depth	5776'	Time Shut-In	90 Mins.	D.C. Size	2 7/8" I.D.
Recorder No.	1943	Final Shut-In Pres.	2917	Ft. D.C. Run	302
Clock Range	24 hr.	Initial Hydro Mud Pres.	3349	Water Cushion Run	
Depth	5780'	Final Hydro Mud Pres.	3304	Bottom Hole Choke	½"
B.H. Temperature	150°	Type Test	Conventional	Surface Choke	¾" Adjustable

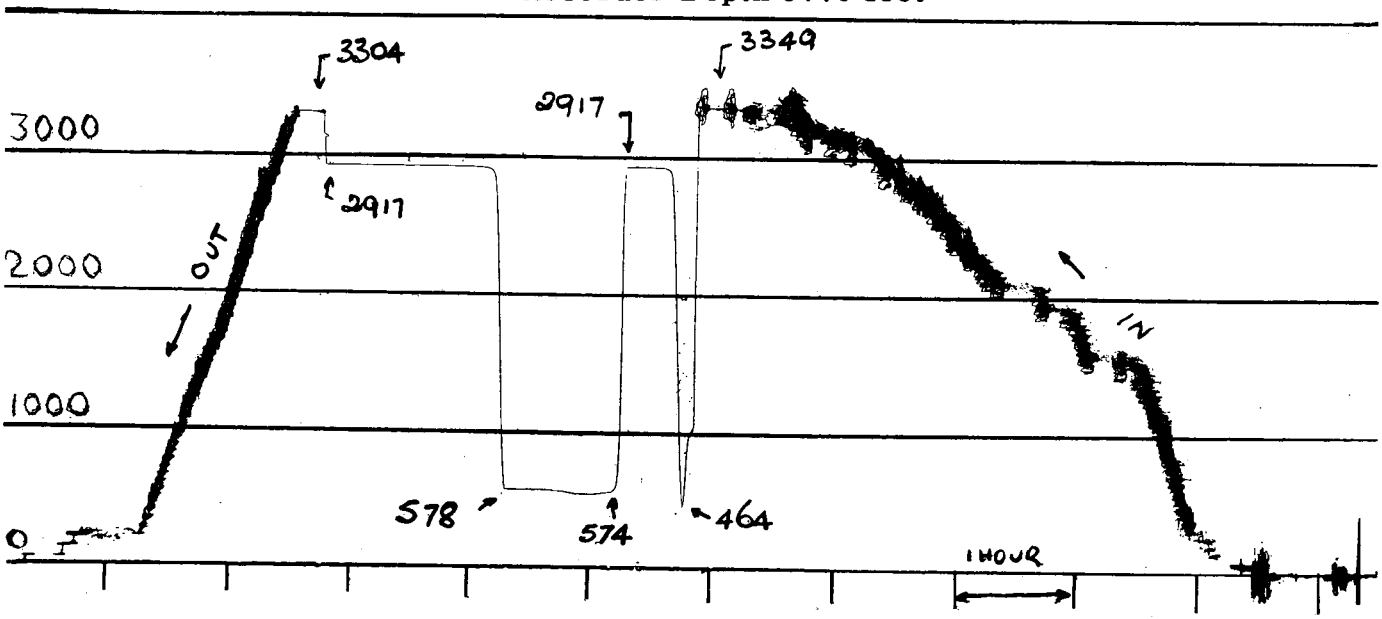
Remarks Good initial puff, good air blow, gas to surface 5 mins. - 1750 M.C.F. in 10 mins. - 1550 M.C.F. in 20 mins. Mud dprayed to surface in 32 mins.

Recovery 420 ft. Mud

BJS-7.

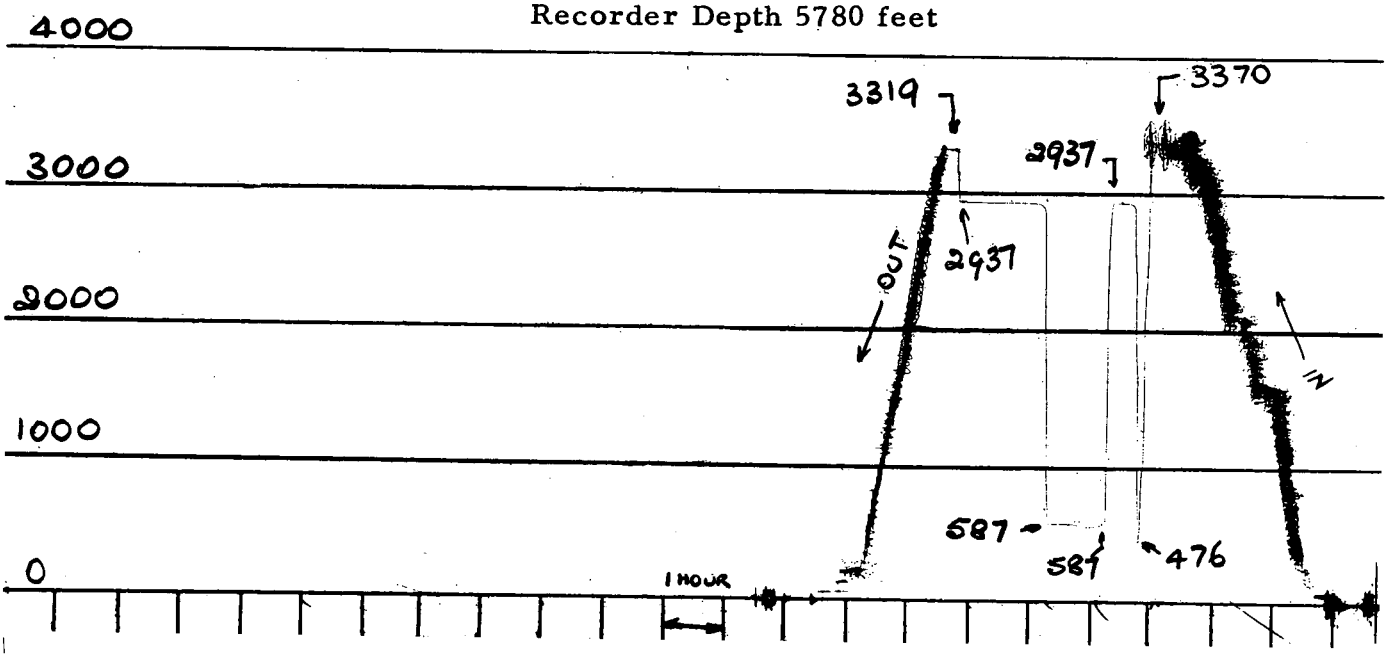
MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 3
Recorder No. 1942
March 24, 1965
Recorder Depth 5776 feet



MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 3
Recorder No. 1943
March 24, 1965
Recorder Depth 5780 feet



Well PALM VALLEY NO.1

Company MAGELLAN PETROLEUM N.T. PTY. LTD.

Comp. Rep. M. Brown

Tester B.J. Flahr

B J SERVICE (AUSTRALIA) PTY. LTD.

ROOM 3, THIRD FLOOR, PERRY HOUSE, 131-145 ELIZABETH ST., BRISBANE

Test No. 4

Date March 28, 1965

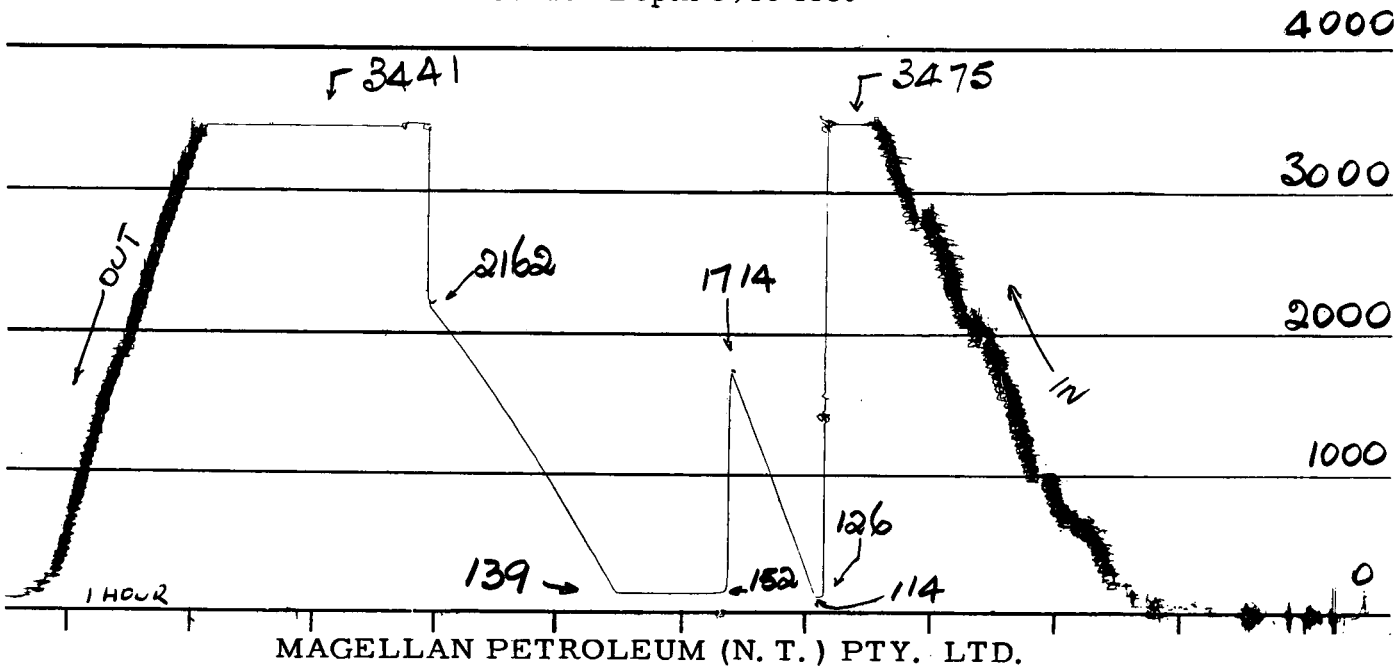
Mud Wt.	11.4	Tool Open	8:25 P.M.	Main Hole Size	8¾"
Viscosity	57	Tool Shut-In	8:30 P.M.	Rat Hole Size	6⅛"
Filter Cake	2/32	Time Shut-In	47 Mins.	Top Packer Depth	5778'
Water Loss	8	Initial Shut-In Pres.	1714	Bottom Packer Depth	5784'
Mud Drop	2'	Tool Open	9:17 P.M.	Total Depth	5924'
Formation	Pacoota	Initial Flow Pres.	(126 Pre-ISI) 152	Rubber Size	7½"
Recorder No.	1942	Final Flow Pres.	(114 Pre-ISI) 139	Hole Condition	Good
Clock Range	12 hr.	Tool Closed	10:17 P.M.	Pipe Size	4½" I.F.
Depth	5916'	Time Shut-In	90 Mins.	D.C. Size	2 7/8" I.D.
Recorder No.	1943	Final Shut-In Pres.	2162	Ft. D.C. Run	302
Clock Range	24 hr.	Initial Hydro Mud Pres.	3475	Water Cushion Run	
Depth	5920'	Final Hydro Mud Pres.	3441	Bottom Hole Choke	½"
B.H. Temperature	152°	Type Test	Conventional	Surface Choke	¾" Adjustable

Remarks Good intiial puff, good air blow, gas to surface in 17 mins. too small to measure.

Recovery 125 ft. gassy mud.

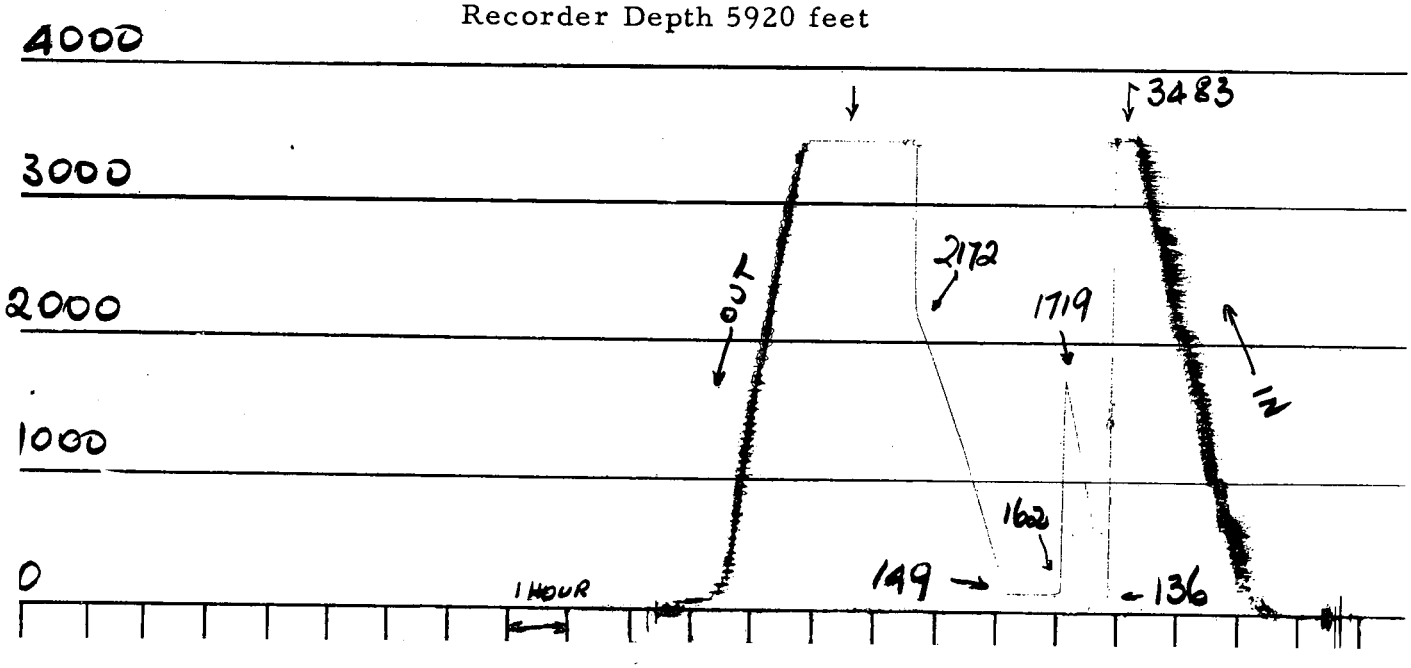
MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 4
Recorder No. 1942
March 28, 1965
Recorder Depth 5916 feet



MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 4
Recorder No. 1943
March 28, 1965
Recorder Depth 5920 feet



PALM VALLEY NO. 1 DST NO. 4

PRESSURE INCREMENTS

Recorder No. 1942 Depth: 5916 Feet

Initial Closed-In Pressure				Final Closed-In Pressure			
Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG	Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG
0	25 + 0		114	0	370 + 0		139
35	25 + 35	1.714	290	68	370 + 68	6.441	355
65	25 + 65	1.385	469	131	370 + 131	3.823	606
95	25 + 95	1.263	633	190	370 + 190	2.907	838
125	25 + 125	1.200	792	257	370 + 257	2.440	1055
155	25 + 155	1.161	973	320	370 + 320	2.157	1264
185	25 + 185	1.135	1130	383	370 + 383	1.966	1462
215	25 + 215	1.116	1297	446	370 + 446	1.830	1654
245	25 + 245	1.102	1466	509	370 + 509	1.727	1828
275	25 + 275	1.091	1615	572	370 + 572	1.647	2001
305	25 + 305	1.081	1714	635	370 + 635	1.582	2162

Recorder No. 1943 Depth: 5920 Feet

Initial Closed-In Pressure				Final Closed-In Pressure			
Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG	Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG
0	5 + 0		136	0	177 + 0		149
18	5 + 18	1.277	290	39	177 + 39	5.538	388
34	5 + 34	1.148	421	71	177 + 71	3.493	581
50	5 + 50	1.100	630	103	177 + 103	2.719	815
66	5 + 66	1.074	822	135	177 + 135	2.312	1028
82	5 + 82	1.061	1011	167	177 + 167	2.060	1273
98	5 + 98	1.051	1202	199	177 + 199	1.889	1454
114	5 + 114	1.043	1383	231	177 + 231	1.766	1662
130	5 + 130	1.039	1559	263	177 + 263	1.673	1846
146	5 + 146	1.034	1719	295	177 + 295	1.600	2024
162	5 + 162	1.030	1719	327	177 + 327	1.541	2172

Well PALM VALLEY NO.1

Company MAGELLAN PETROLEUM N.T. PTY. LTD.

Comp. Rep. J. Telfer

Tester B.J. Flahr

B J SERVICE (AUSTRALIA) PTY. LTD.

ROOM 3, THIRD FLOOR, PERRY HOUSE, 131-145 ELIZABETH ST., BRISBANE

Test No. 5

Date April 2, 1965

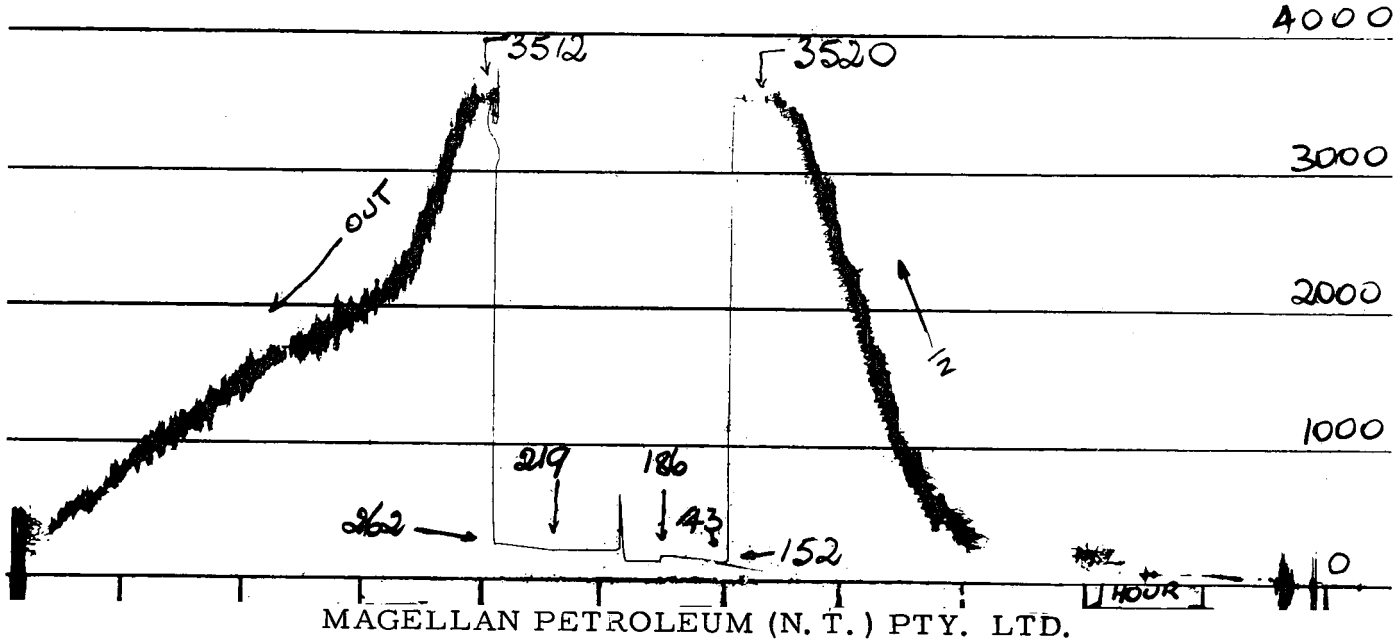
Mud Wt.	11.4	Tool Open	7:10 A.M.	Main Hole Size	8¾"
Viscosity	46	Tool Shut-In	7:15 A.M.	Rat Hole Size	
Filter Cake	2/32	Time Shut-In	30 Min.	Top Packer Depth	5918'
Water Loss	8.2	Initial Shut-In Pres.	186	Bottom Packer Depth	5924'
Mud Drop	8'	Tool Open	7:45 A.M.	Total Depth	6110'
Formation	Pacoota	Initial Flow Pres.	(152 Pre-ISI) 143	Rubber Size	7½"
Recorder No.	1942	Final Flow Pres.	(143 Pre-ISI) 219	Hole Condition	Good
Clock Range	12 hr.	Tool Closed	8:37 A.M.	Pipe Size	4½" I.F.
Depth	6100'	Time Shut-In	30 Mins.	D.C. Size	2 7/8" I.D.
Recorder No.	1943	Final Shut-In Pres.	262	Ft. D.C. Run	271
Clock Range	24 hr.	Initial Hydro Mud Pres.	3520	Water Cushion Run	
Depth	6105'	Final Hydro Mud Pres.	3512'	Bottom Hole Choke	½"
B.H. Temperature	N.R.	Type Test	Full Hole	Surface Choke	¾" Adjustable

Remarks Fair initial puff, tool opened dead, reset after 18 mins. Fair air blow died in 15 mins.

Recovery 100 ft. mud

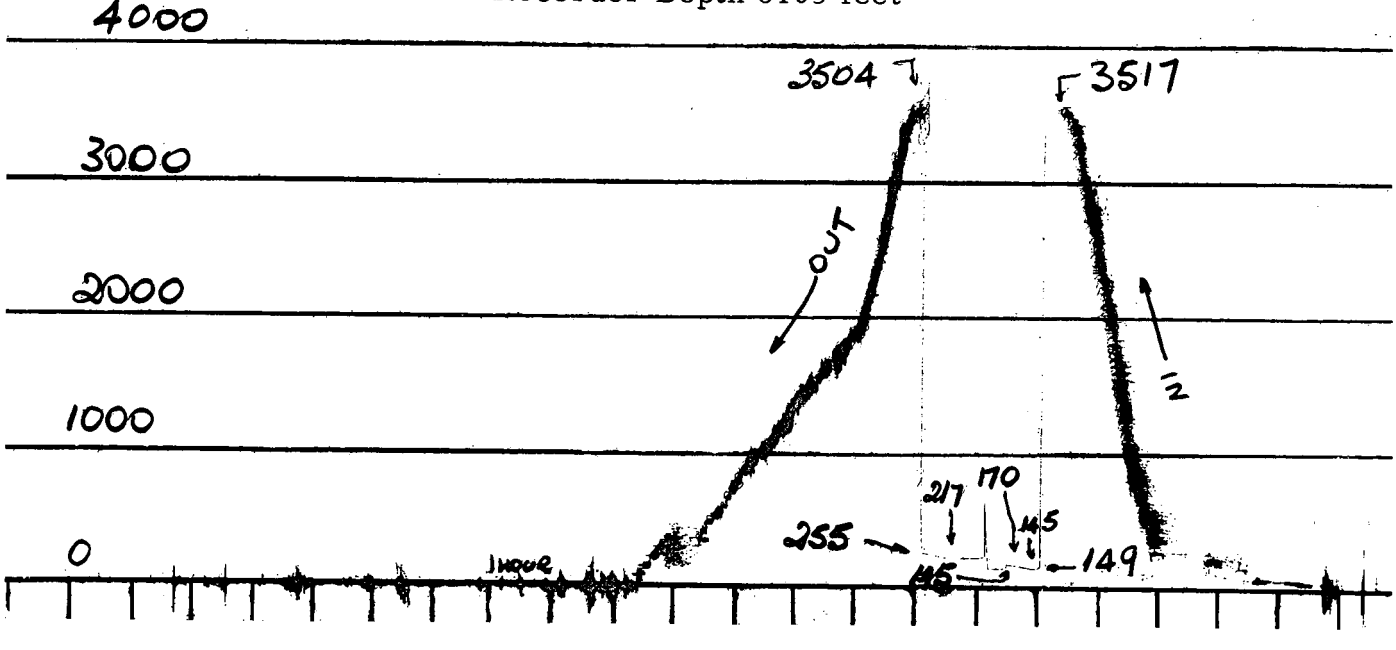
MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 5
Recorder No. 1942
April 4, 1965
Recorder Depth 6100 feet



MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 5
Recorder No. 1943
April 4, 1965
Recorder Depth 6105 feet



MAGELLAN PETROLEUM (N. T.) PTY. LTD.

PALM VALLEY NO. 1 DST NO. 5

PRESSURE INCREMENTS

Recorder No. 1942 Depth: 6100 Feet

Initial Closed-In Pressure				Final Closed-In Pressure			
Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG	Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG
0	35 + 0		143	0	378 + 0		219
20	35 + 20	2.750	150	21	378 + 21	19.000	225
40	35 + 40	1.875	159	42	378 + 42	10.000	229
60	35 + 60	1.583	165	63	378 + 63	7.000	233
80	35 + 80	1.438	167	84	378 + 84	5.500	237
100	35 + 100	1.350	170	105	378 + 105	4.600	243
120	35 + 120	1.292	173	126	378 + 126	4.000	247
140	35 + 140	1.250	179	147	378 + 147	3.572	253
160	35 + 160	1.219	182	168	378 + 168	3.250	257
180	35 + 180	1.192	186	189	378 + 189	3.014	260
200	35 + 200	1.175	186	210	378 + 210	2.800	262

Recorder No. 1943 Depth: 6105 Feet

Initial Closed-In Pressure				Final Closed-In Pressure			
Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG	Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG
10	17 + 10	2.700	145	8	213 + 8	27.625	217
20	17 + 20	1.850	147	16	213 + 16	14.312	224
30	17 + 30	1.599	150	24	213 + 24	9.875	232
40	17 + 40	1.425	154	32	213 + 32	7.657	235
50	17 + 50	1.340	159	40	213 + 40	6.325	239
60	17 + 60	1.283	164	48	213 + 48	5.438	243
70	17 + 70	1.243	168	56	213 + 56	4.821	248
80	17 + 80	1.213	169	64	213 + 64	4.328	251
90	17 + 90	1.188	170	72	213 + 72	3.958	252
101	17 + 101	1.168	170	81	213 + 81	3.630	255

Well PALM VALLEY NO.1

Company MAGELLAN PETROLEUM N.T. PTY. LTD.

Comp. Rep. J. Telfor

Tester B.J. Flahr

B J SERVICE (AUSTRALIA) PTY. LTD.

ROOM 3, THIRD FLOOR, PERRY HOUSE, 131-145 ELIZABETH ST., BRISBANE

Test No. 6

Date April 19, 1965

Mud Wt.	Water	Tool Open		Main Hole Size	6⅛"
Viscosity		Tool Shut-In		Rat Hole Size	
Filter Cake	2/32	Time Shut-In		Top Packer Depth	6106'
Water Loss		Initial Shut-In Pres.		Bottom Packer Depth	
Mud Drop		Tool Open		Total Depth	6318'
Formation	Pacoota	Initial Flow Pres.		Rubber Size	5½"
Recorder No.	1942	Final Flow Pres.		Hole Condition	Good
Clock Range	12 hr.	Tool Closed		Pipe Size	3½" F.H.
Depth	6307'	Time Shut-In		D.C. Size	2¼" I.D.
Recorder No.	1943	Final Shut-In Pres.		Ft. D.C. Run	567
Clock Range	24 hr.	Initial Hydro Mud Pres.		Water Cushion Run	
Depth	6312'	Final Hydro Mud Pres.		Bottom Hole Choke	½"
B.H. Temperature	152°	Type Test	Full Hole	Surface Choke	¾" Adjustable

Remarks Good initial puff. Good air blow. Gas to surface 1 min. Muddy water to surface in 4 mins. sprayed steadily throughout test. Estimated 250 M.C.F.

No pressure readings, possible plugging of bomb hangers.

Well PALM VALLEY NO.1

Company MAGELLAN PETROLEUM N.T. PTY. LTD.

Comp. Rep. J. Telfer

Tester E.J. Flahr

B J SERVICE (AUSTRALIA) PTY. LTD.

ROOM 3, THIRD FLOOR, PERRY HOUSE, 131-145 ELIZABETH ST., BRISBANE

Test No. 7

Date April 25, 1965

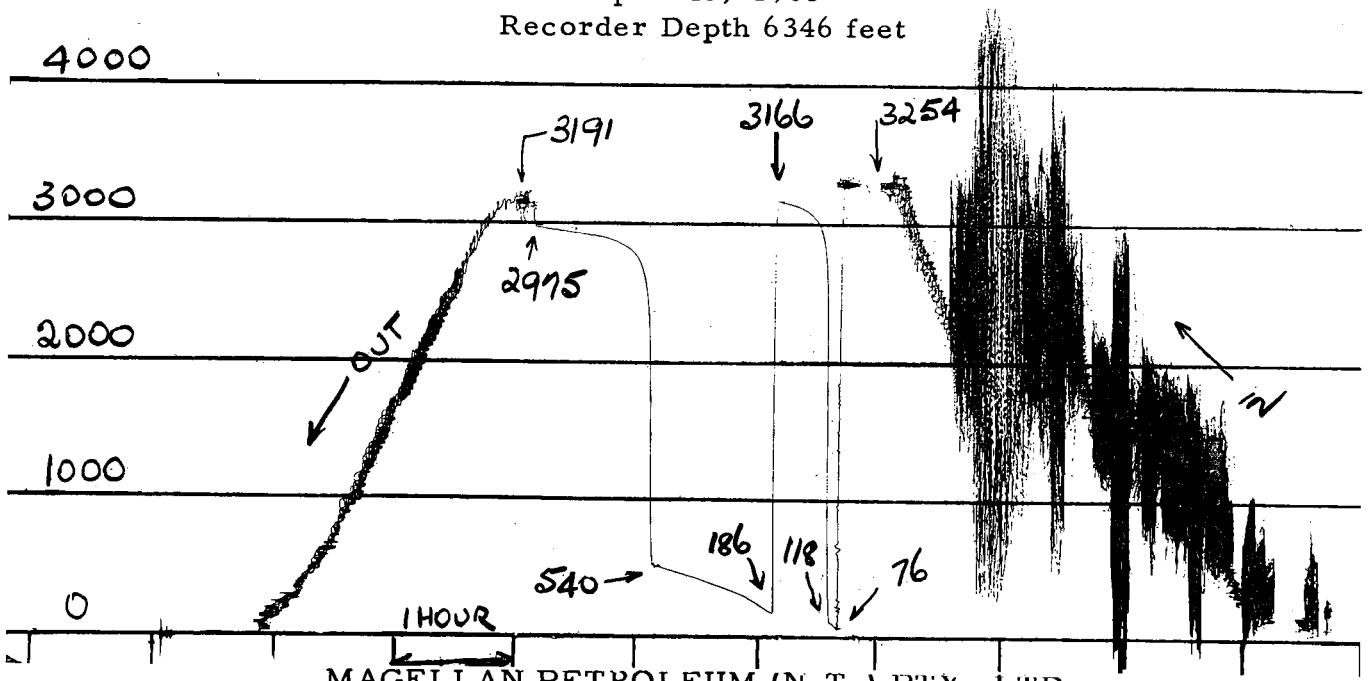
Mud Wt.	9.9	Tool Open	7:53 P.M.	Main Hole Size	6⅛"
Viscosity	39	Tool Shut-In	7:58 P.M.	Rat Hole Size	
Filter Cake	2/32	Time Shut-In	30 Mins.	Top Packer Depth	6312'
Water Loss		Initial Shut-In Pres.	3166	Bottom Packer Depth	6318'
Mud Drop	2'	Tool Open	8:28 P.M.	Total Depth	6476'
Formation	Pacoota	Initial Flow Pres.	(76 Pre-ISI) 186	Rubber Size	5½"
Recorder No.	1942	Final Flow Pres.	(118 Pre-ISI) 540	Hole Condition	Good
Clock Range	12 hr.	Tool Closed	9:28 P.M.	Pipe Size	3½" F.H.
Depth	6346'	Time Shut-In	60 Mins.	D.C. Size	2¼" I.D.
Recorder No.	1943	Final Shut-In Pres.	2975	Ft. D.C. Run	598
Clock Range	24 hr.	Initial Hydro Mud Pres.	3254	Water Cushion Run	
Depth	6471'	Final Hydro Mud Pres.	3191	Bottom Hole Choke	½"
B.H. Temperature	153°	Type Test	Full Hole	Surface Choke	¾" Ajustable

Remarks Weak initial puff, Weak air blow, remained steady throughout.

Recovery 1080 ft. Salt water.

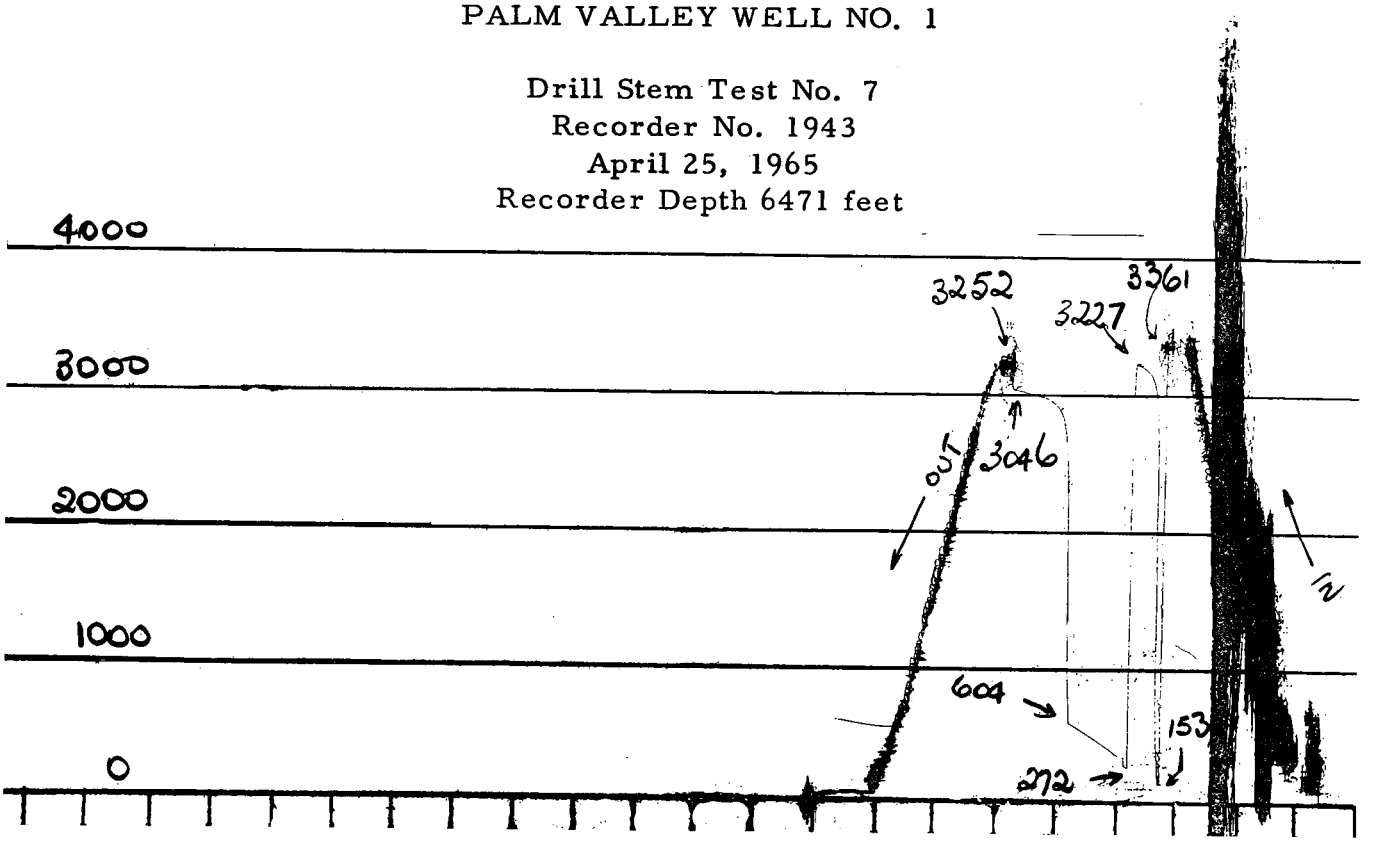
MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 7
Recorder No. 1942
April 25, 1965
Recorder Depth 6346 feet



MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 7
Recorder No. 1943
April 25, 1965
Recorder Depth 6471 feet



MAGELLAN PETROLEUM (N. T.) PTY. LTD.

PALM VALLEY NO. 1 DST NO. 7

PRESSURE INCREMENTS

Recorder No. 1942 Depth: 6346 Feet

Initial Closed-In Pressure				Final Closed-In Pressure			
Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG	Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG
0	32 + 0		118	0	416 + 0		540
23	32 + 23	2.360	2411	46	416 + 46	10.043	2543
42	32 + 42	1.761	2893	88	416 + 88	5.727	2789
61	32 + 61	1.524	3018	130	416 + 130	4.200	2854
80	32 + 80	1.400	3061	172	416 + 172	3.412	2894
99	32 + 99	1.323	3095	214	416 + 214	2.943	2916
118	32 + 118	1.271	3117	256	416 + 256	2.625	2928
137	32 + 137	1.234	3136	298	416 + 298	2.496	2939
156	32 + 156	1.205	3147	340	416 + 340	2.222	2951
175	32 + 175	1.182	3158	382	416 + 382	2.088	2962
194	32 + 194	1.164	3166	424	416 + 424	1.980	2975

Recorder No. 1943 Depth: 6471 Feet

Initial Closed-In Pressure				Final Closed-In Pressure			
Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG	Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG
0	5 + 0		157	0	223 + 0		604
15	5 + 15	1.333	339	26	223 + 26	9.573	2600
25	5 + 25	1.200	658	46	223 + 46	5.847	2870
35	5 + 35	1.142	2966	66	223 + 66	4.378	2933
45	5 + 45	1.111	3074	86	223 + 86	3.593	2966
55	5 + 55	1.090	3153	106	223 + 106	3.010	2986
65	5 + 65	1.076	3175	126	223 + 126	2.769	2999
75	5 + 75	1.066	3197	146	223 + 146	2.528	3009
85	5 + 85	1.058	3213	166	223 + 166	2.343	3022
95	5 + 95	1.052	3223	186	223 + 186	2.198	3033
105	5 + 105	1.047	3227	206	223 + 206	2.082	3046

Well PALM VALLEY NO.1

Company MAGELLAN PETROLEUM N.T. PTY. LTD.

Comp. Rep. J. Telfer

Tester B.J. Flahr

B J SERVICE (AUSTRALIA) PTY. LTD.

ROOM 3, THIRD FLOOR, PERRY HOUSE, 131-145 ELIZABETH ST., BRISBANE

Test No. 8

Date May 2, 1965

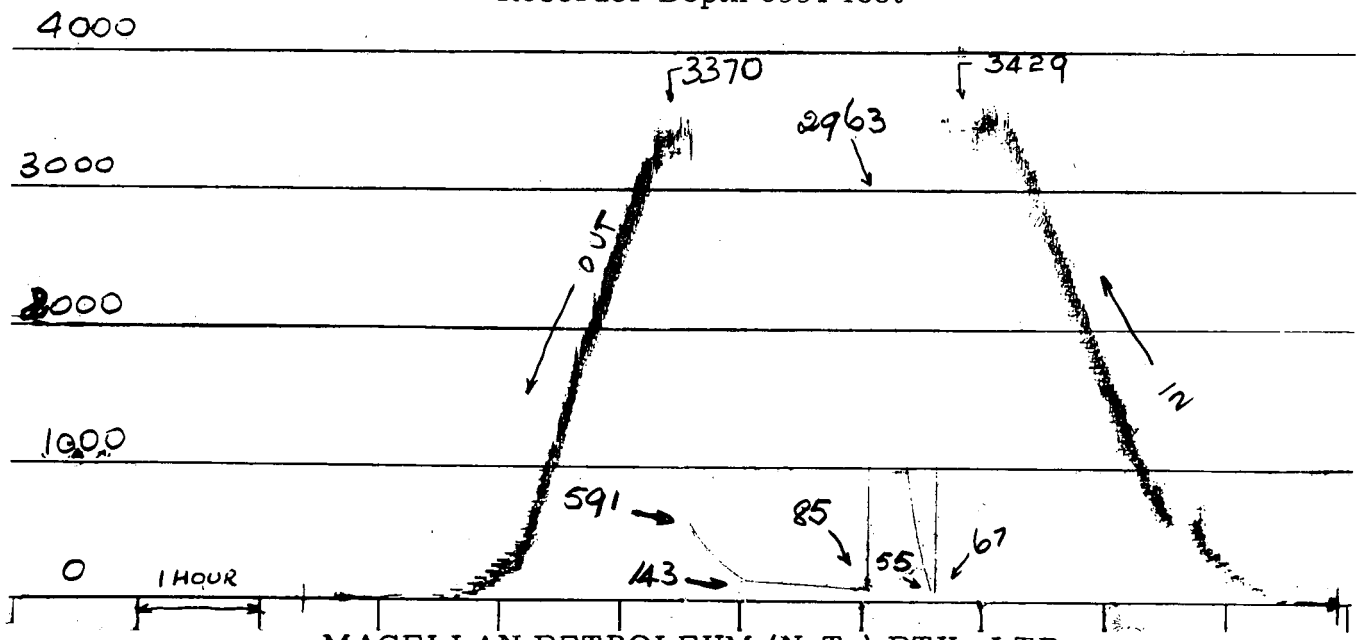
Mud Wt.	10.1	Tool Open	2:13 P.M.	Main Hole Size	6⅛"
Viscosity	38	Tool Shut-In	2:15 P.M.	Rat Hole Size	
Filter Cake	2/32	Time Shut-In	30 Mins.	Top Packer Depth	6524'
Water Loss	22	Initial Shut-In Pres.	2963	Bottom Packer Depth	6530'
Mud Drop		Tool Open	2:45 P.M.	Total Depth	6658'
Formation	Pacoota	Initial Flow Pres.	(69 Pre-ISI) 85	Rubber Size	5½"
Recorder No.	1942	Final Flow Pres.	(55 Pre-ISI) 143	Hole Condition	Good
Clock Range	12 hr.	Tool Closed	3:45 P.M.	Pipe Size	3½" F.H.
Depth	6551'	Time Shut-In	30 Mins.	D.C. Size	2¼" I.D.
Recorder No.	1943	Final Shut-In Pres.	591	Ft. D.C. Run	626
Clock Range	24 hr.	Initial Hydro Mud Pres.	3429	Water Cushion Run	
Depth	6654'	Final Hydro Mud Pres.	3370	Bottom Hole Choke	½"
B.H. Temperature	N.R.	Type Test	Full Hole	Surface Choke	¾" Adjustable

Remarks Fair initial puff. Good air blow decreasing steadily throughout test.

Recovery 270 ft. Gassy mud

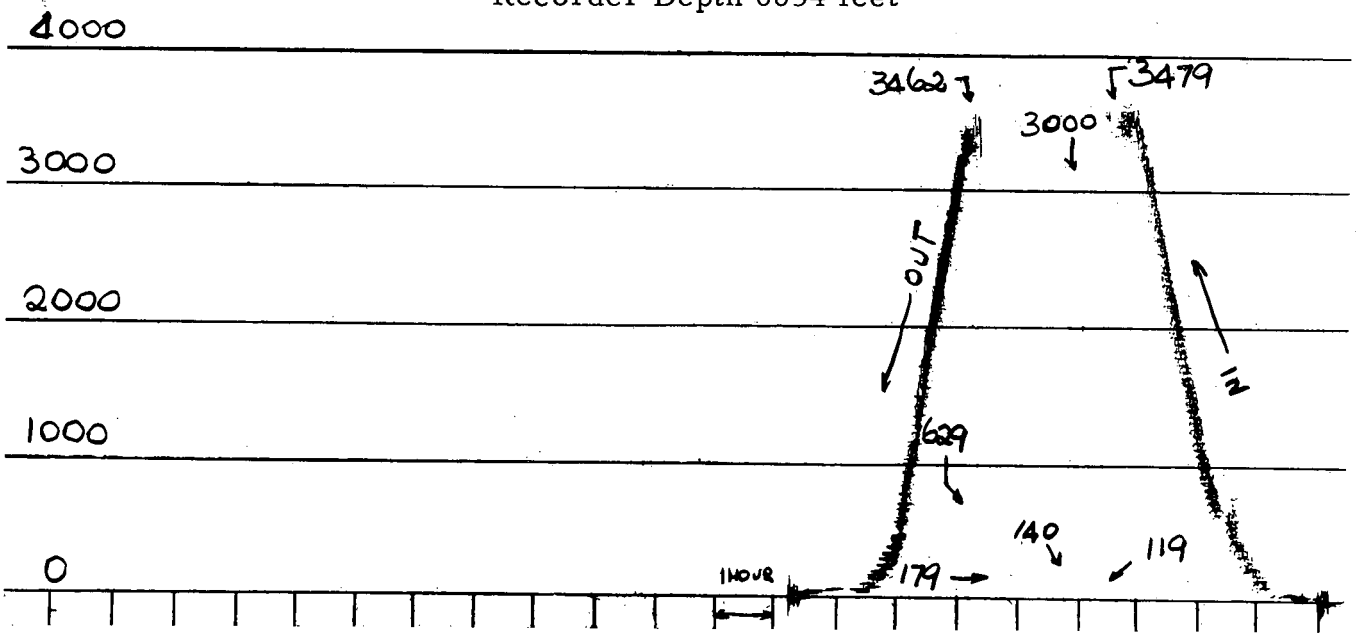
MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 8
Recorder No. 1942
May 2, 1965
Recorder Depth 6551 feet



MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1

Drill Stem Test No. 8
Recorder No. 1943
May 2, 1965
Recorder Depth 6654 feet



MAGELLAN PETROLEUM (N. T.) PTY. LTD.

PALM VALLEY NO. 1 DST NO. 8

PRESSURE INCREMENTS

Recorder No. 1942 Depth: 6551 Feet

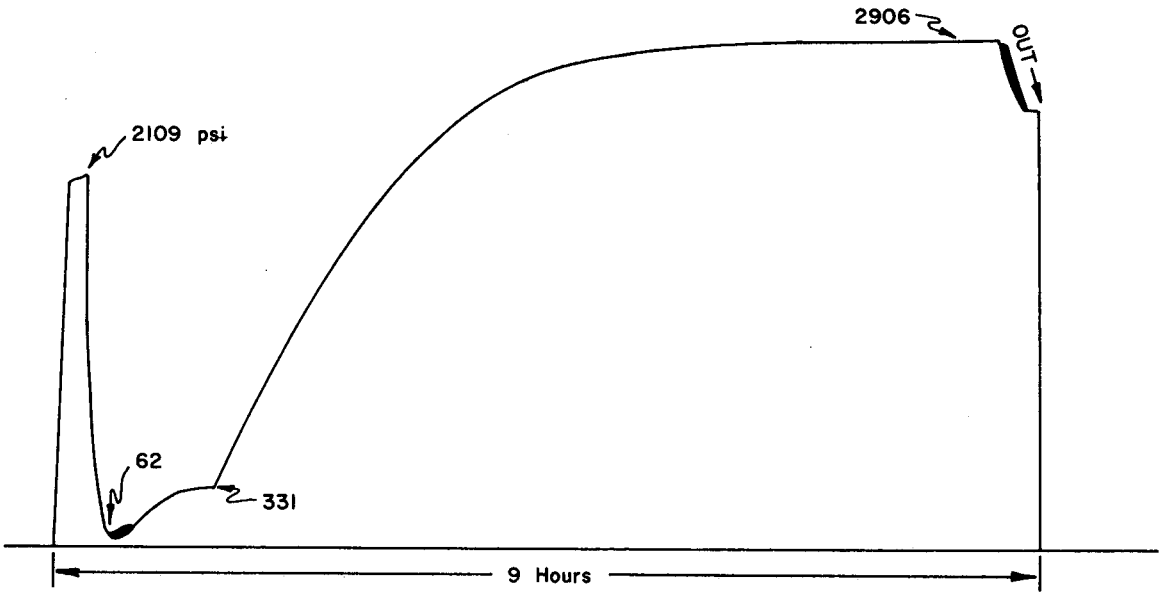
Initial Closed-In Pressure				Final Closed-In Pressure			
Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG	Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG
0	13 + 0		55	0	410 + 0		143
30	13 + 30	1.433	236	27	410 + 27	16.111	169
52	13 + 52	1.250	402	47	410 + 47	9.297	196
74	13 + 74	1.175	638	67	410 + 67	7.119	228
96	13 + 96	1.135	941	87	410 + 87	5.712	263
118	13 + 118	1.110	1281	107	410 + 107	4.831	306
140	13 + 140	1.092	1675	127	410 + 127	4.228	348
162	13 + 162	1.080	2166	147	410 + 147	3.789	391
184	13 + 184	1.070	2576	167	410 + 167	3.454	439
206	13 + 206	1.063	2835	187	410 + 187	3.193	498
228	13 + 228	1.057	2963	207	410 + 207	2.980	591

Recorder No. 1943 Depth: 6654 Feet

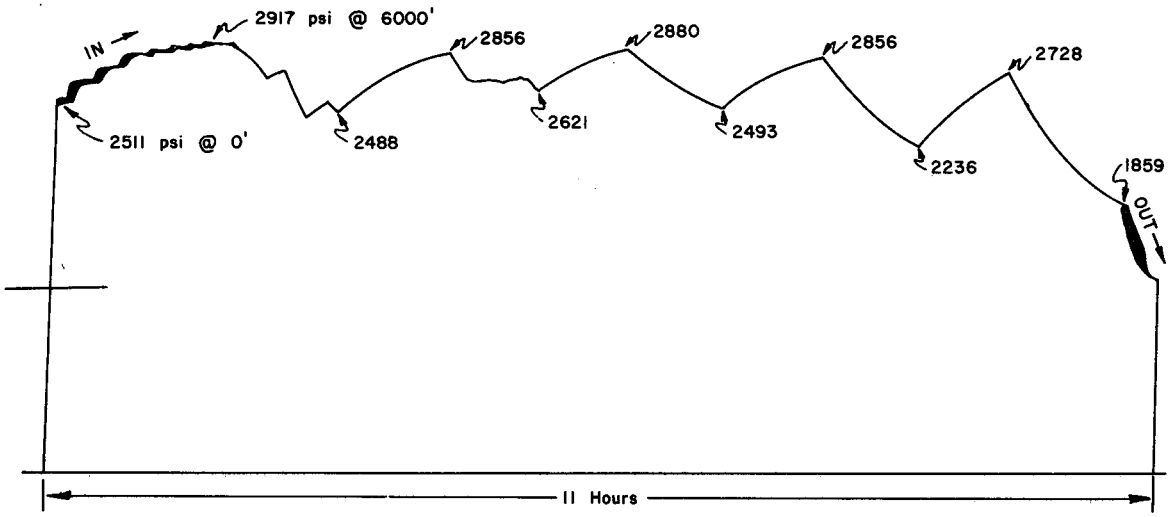
Initial Closed-In Pressure				Final Closed-In Pressure			
Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG	Time Deflection (Minutes)	T + θ	$\frac{T + \theta}{\theta}$	PSIG
0	5 + 0		170	0	219 + 0		179
15	5 + 15	1.333	377	12	219 + 12	19.250	202
25	5 + 25	1.200	492	22	219 + 22	10.954	234
35	5 + 35	1.142	663	32	219 + 32	7.843	263
45	5 + 45	1.111	889	42	219 + 42	6.190	298
55	5 + 55	1.090	1113	52	219 + 52	5.211	333
65	5 + 65	1.076	1460	62	219 + 62	4.532	382
75	5 + 75	1.066	1849	72	219 + 72	4.041	428
85	5 + 85	1.058	2267	82	219 + 82	3.670	474
95	5 + 95	1.052	2697	92	219 + 92	3.380	526
105	5 + 105	1.047	3000	102	219 + 102	3.147	629

MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1
Completion Test No. 1
May 10 & 11, 1965

Bottom Hole Pressure Chart No. 1
Recorder Depth 6060 feet



Bottom Hole Pressure Chart No. 2
Recorder Depth 6000 feet



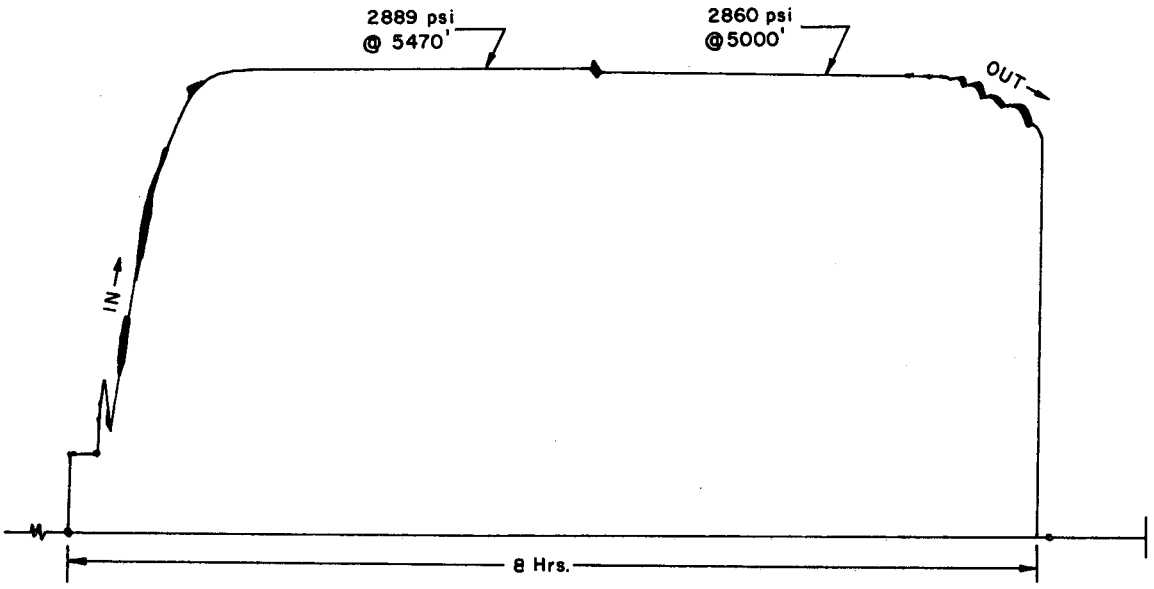
Palm Valley No. 1
COMPLETION TEST NO. 1

Lower P 1 Zone Pacoota Formation 6134-6169 Feet

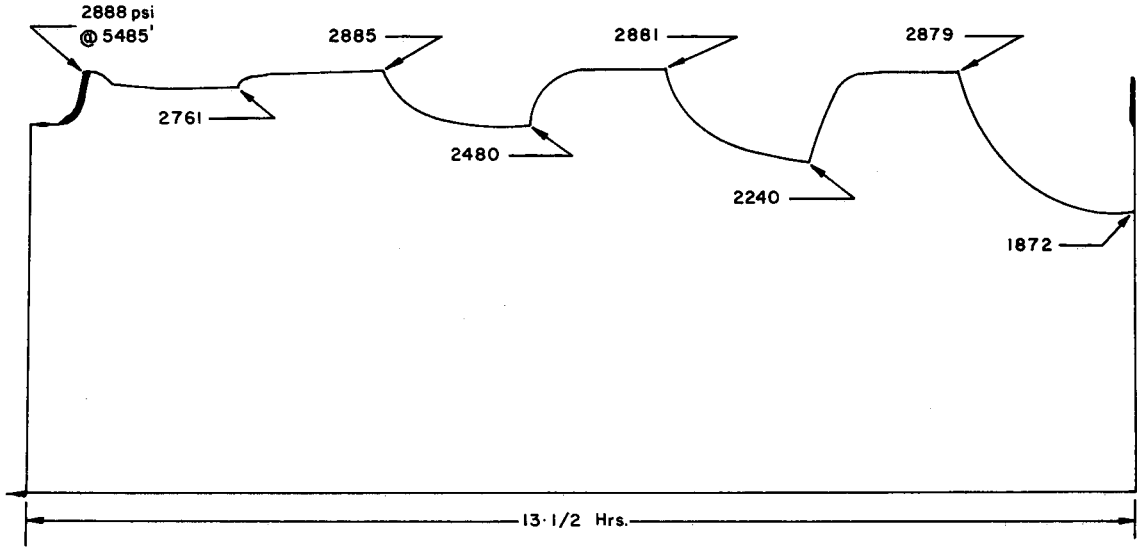
Date / Time	Pressure (PSIG) Well Head	Pressure (PSIG) Bottom Hole	Flow Rate MCF/D	Remarks
May 9, 1965				
10:00 A. M.	50		57	Acidize, 1350 gals. 7-1/2 % HCl.
2:30 P. M.	20			Recovered spent acid, heading.
				Open 15 minutes each hour, cleaning out
May 10, 1965				
8:45 A. M.	70			Shut in for build up
11:00 A. M.	1920		0	BHP Chart No. 1 in lubricator
11:30 A. M.	2100	2109	0	Open well, Chart at 6060 feet
12:45 P. M.	65	331	240	Shut in for build up
1:00 P. M.	405	738	0	
1:15 P. M.	660	992		
1:30 P. M.	920	1240		
1:45 P. M.	1150	1489		
2:05 P. M.	1440	1816		
2:15 P. M.	1560	1957		
2:35 P. M.	1780	2197		
2:55 P. M.	2000	2411		
3:15 P. M.	2115	2572		
3:35 P. M.	2240	2681		
4:15 P. M.	2370	2812		
4:35 P. M.	2415	2848		
4:55 P. M.	2450	2873		
5:00 P. M.	2460	2866		B. H. recorder moved to 6000 feet
5:15 P. M.	2475	2879		
5:36 P. M.	2485	2888		
6:15 P. M.	2515	2895		
6:35 P. M.	2525	2899		
6:55 P. M.	2535	2903		
7:15 P. M.	2550	2906		
7:35 P. M.	2550	2906		
7:50 P. M.	2550	2906		
9:00 P. M.	2550	2511		Pulled Chart No. 1 out of hole
		2692		Run Chart No. 2, stop at 0 feet
		2752		Stop at 2000 feet (. 071 psi/ft.)
		2848		Stop at 3500 feet (. 067 psi/ft.)
9:38 P. M.		2882		Stop at 5000 feet (. 064 psi/ft.)
		2903		Stop at 5500 feet (. 068 psi/ft.)
		2910		Stop at 5800 feet (. 070 psi/ft.)
10:10 P. M.	2550	2917		Stop at 5900 feet (. 070 psi/ft.)
10:35 P. M.	2550	2917		Stop at 6000 feet (. 080 psi/ft.)
10:45 P. M.	2445	2836	0	Well opened on first flow rate
11:15 P. M.	2160	2526	100	First flow rate
11:45 P. M.	2160	2488		
			86	Shut in for build-up
May 11, 1965				
12:15 A. M.	2370	2719	0	
12:45 A. M.	2490	2856	0	Open on second flow rate.
1:15 A. M.	2350	2691	231	
1:45 A. M.	2350	2621	204	Shut in for build up.
2:05 A. M.	2460	2752	0	
2:45 A. M.	2520	2880	0	Open on third flow rate.
3:15 A. M.	2345	2652	398	
3:45 A. M.	2180	2493	406	Shut in for build up.
4:15 A. M.	2390	2717	0	
4:50 A. M.	2500	2856	0	Open on Fourth flow rate
5:20 A. M.	2220	2473	559	
5:50 A. M.	1950	2236	561	Shut in for build up.
6:20 A. M.	2180	2556	0	
6:50 A. M.	2380	2728	0	Open on Fifth flow rate
7:20 A. M.	1980	2230	705	
7:50 A. M.	1640	1904	706	
8:00 A. M.	1560	1859	705	Pulled Chart No. 2
9:15 A. M.	960		620	
10:15 A. M.	720		500	B. J. pumped formjel plug

MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1
Completion Test No. 2
May 14 & 15, 1965

Bottom Hole Pressure Chart No. 3
Recorder Depth 5470 feet



Bottom Hole Pressure Chart No. 4
Recorder Depth 5485 feet



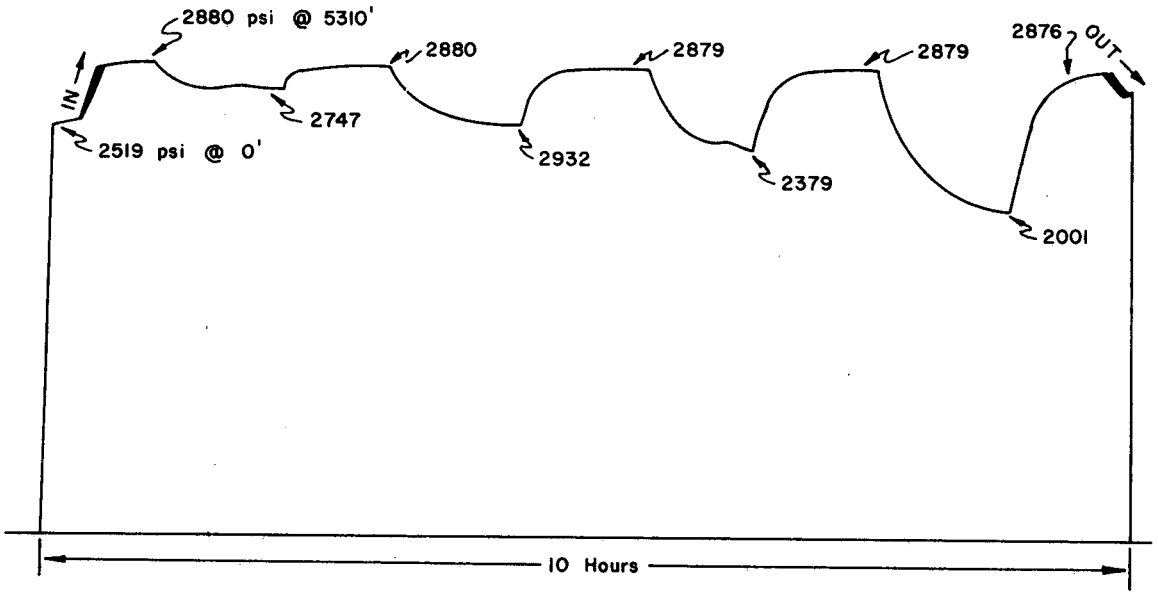
Palm Valley No. 1
COMPLETION TEST NO. 2

Upper P 1 Zone Pacoota Formation 5550-5916 Feet

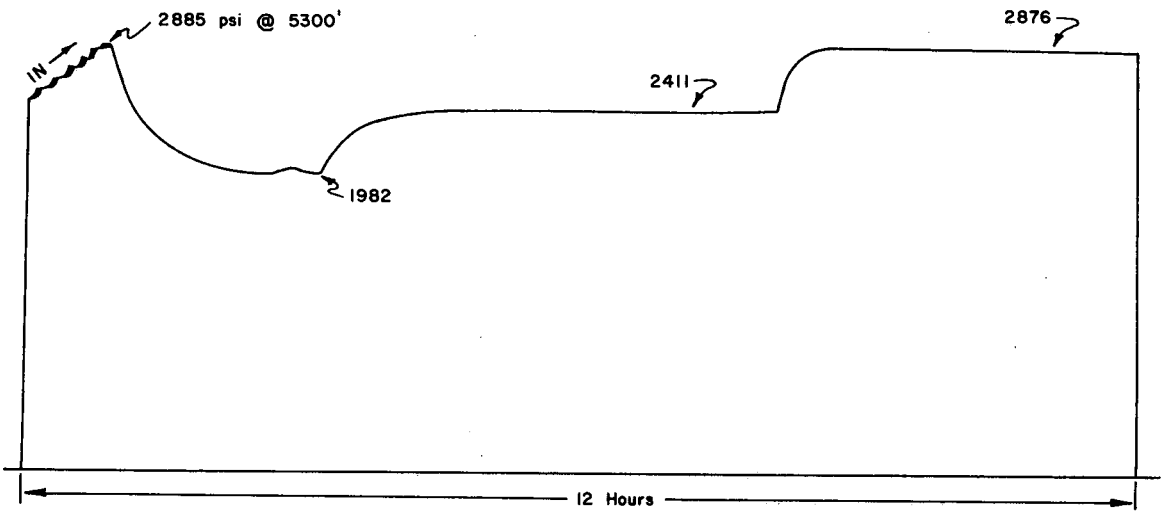
Date / Time	Pressure (PSIG) Well Head	Pressure (PSIG) Bottcm Hole	Flow Rate MCF/D	Remarks
May 13, 1965				
4:30 P. M.	350			Acidized with 1350 gals. HCl. Cleaning up.
May 14, 1965				
11:15 A. M.	480		5, 180	Shut In
12:00 Noon	2472	2889		Run Chart No. 3 to 5470 feet
3:30 P. M.	2545	(stab.) 2860		Pulled up Chart No. 3 to 5000 feet
6:45 P. M.	2560	2850		POH, stop at 4900 feet (. 080 psi/ft.)
		2843		Stop at 4799 feet (. 069 psi/ft.)
		2836		Stop at 4700 feet (. 021 psi/ft.)
		2794		Stop at 4000 feet (. 060 psi/ft.)
		2725		Stop at 2996 feet (. 069 psi/ft.)
		2661		Stop at 1997 feet (. 064 psi/ft.)
7:45 P. M.	2550	2523		Stop at 0 feet (. 069 psi/ft.) BHT 171°F
8:45 P. M.	2550	2525		Run Chart No. 4 (0 feet)
	2546	2888		Stop Chart No. 4 at 5485 feet
9:30 P. M.	2546	2888		Open on First flow rate
10:30 P. M.	2430	2761	1, 340	5/8 inch orifice
11:00 P. M.	2430	2761	1, 340	Shut in for build up
11:30 P. M.	2550	3885	0	
May 15, 1965				
12:30 A. M.	2550	2885	0	Open on Second flow rate
1:30 A. M.	2220	2520	2, 470	3/4 inch orifice
2:00 A. M.	2190	2480	2, 470	Shut in for build up
2:30 A. M.	2521	2868	0	
3:30 A. M.	2545	2881	0	Open on Third flow rate
4:30 A. M.	2025	2303	3, 171	7/8 inch orifice
5:00 A. M.	1980	2240	3, 171	Shut in for build up
5:30 A. M.	2520	2840	0	
6:30 A. M.	2545	2879	0	Open on Fourth flow rate
7:00 A. M.	2020	2217	3, 689	7/8 inch orifice
7:30 A. M.	1790	2007	3, 689	
8:00 A. M.	1680	1901	3, 689	
9:45 A. M.	1620	1872	3, 689	Shut in for build up
10:20 A. M.	2528	2806		Pulled Chart No. 4
10:35 A. M.				B. J. pumped formjel plug - failed

MAGELLAN PETROLEUM (N. T.) PTY. LTD.
PALM VALLEY WELL NO. 1
Completion Test No. 3
May 19, 1965

Bottom Hole Pressure Chart No. 5
Recorder Depth 5310 feet



Bottom Hole Pressure Chart No. 6
Recorder Depth 5300 feet



MAGELLAN PETROLEUM (N. T.) PTY. LTD.

Palm Valley No. 1
COMPLETION TEST NO. 3

Lower Stairway Formation 5178-5300 Feet

Data / Time	Pressure (PSIG) Well Head	Pressure (PSIG) Bottom Hole	Flow Rate MCF/D	Remarks
May 19, 1965				
8:30 A. M.	1620		5,000	Cleaning up, shut in
10:20 A. M.	2560	2880	0	Run BHP Chart No. 5 to 5310 feet
11:00 A. M.	2560	2880	0	Open on First flow rate
11:40 A. M.	2753		1,333	7/8 inch orifice
12:15 P. M.	2400	2747	1,333	Shut in for build up
12:40 P. M.	2515	2876	0	7/8 inch orifice
1:15 P. M.	2520	2880	0	Open on Second flow rate
2:00 P. M.	2220	2563	2,010	7/8 inch orifice
2:30 P. M.	2215	2532	2,010	Shut in for build up
3:00 P. M.	2518	2876	0	
3:45 P. M.	2520	2879	0	Open on Third flow rate
4:15 P. M.	2110	2459	2,750	1 inch orifice
4:45 P. M.	2040	2379	2,729	Shut in for build up
5:35 P. M.	2520	2876	0	
6:00 P. M.	2520	2879	0	Open on Fourth flow rate
6:30 P. M.	1895	2223	3,545	1 inch orifice
7:15 P. M.	1680	2048	3,545	Shut in for build up
8:15 P. M.	2520	2876		Pull Chart No. 5 from 5310 feet
		2807	0	Stop at 4250 feet (. 065 psi/ft.)
8:20 P. M.	2520	2745	0	Stop at 3250 feet (. 062 psi/ft.)
		2678		Stop at 2250 feet (. 067 psi/ft.)
8:30 P. M.	2520	2516		Stop at 0 feet (. 072 psi/ft.) BHT=140°F
9:00 P. M.	2520	2523		Run BHP Chart No. 6, stop at 0 feet
		2597		Stop at 1000 feet (. 074 psi/ft.)
		2666		Stop at 2000 feet (. 069 psi/ft.)
9:30 P. M.		2733		Stop at 3000 feet (. 067 psi/ft.)
		2799		Stop at 4000 feet (. 066 psi/ft.)
		2865		Stop at 5000 feet (. 066 psi/ft.)
9:55 P. M.	2520	2885	0	Stop at 5300 feet (. 067 psi/ft.)
10:00 P. M.	2540	2885	0	Open on First flow rate
11:00 P. M.	1735	2051		1 inch orifice
11:15 P. M.	1700	2022	3,500	
11:30 P. M.	1685	1995	3,600	
12:00 Midnight	1710	2015	3,600	
May 20, 1965				
12:15 A. M.	1740	2008	3,720	Change choke, Second flow rate
1:00 A. M.	2095	2391	2,728	
2:00 A. M.	2120	2428	2,720	
3:00 A. M.	2120	2424	2,728	
4:00 A. M.	2100	2411	2,772	
5:00 A. M.	2100	2411	2,838	Shut in for build up
5:15 A. M.	2460	2792	0	
5:30 A. M.	2522	2865	0	
5:45 A. M.	2525	2870	0	
6:00 A. M.	2525	2873	0	
7:00 A. M.	2525	2876	0	
9:15 A. M.	2525	2874	0	Pulled Chart No. 6 from 5300 feet BHT=140°F

ENCLOSURE NO. 6

WELL HISTORY CHARTS

(a) Drilling Time Summary

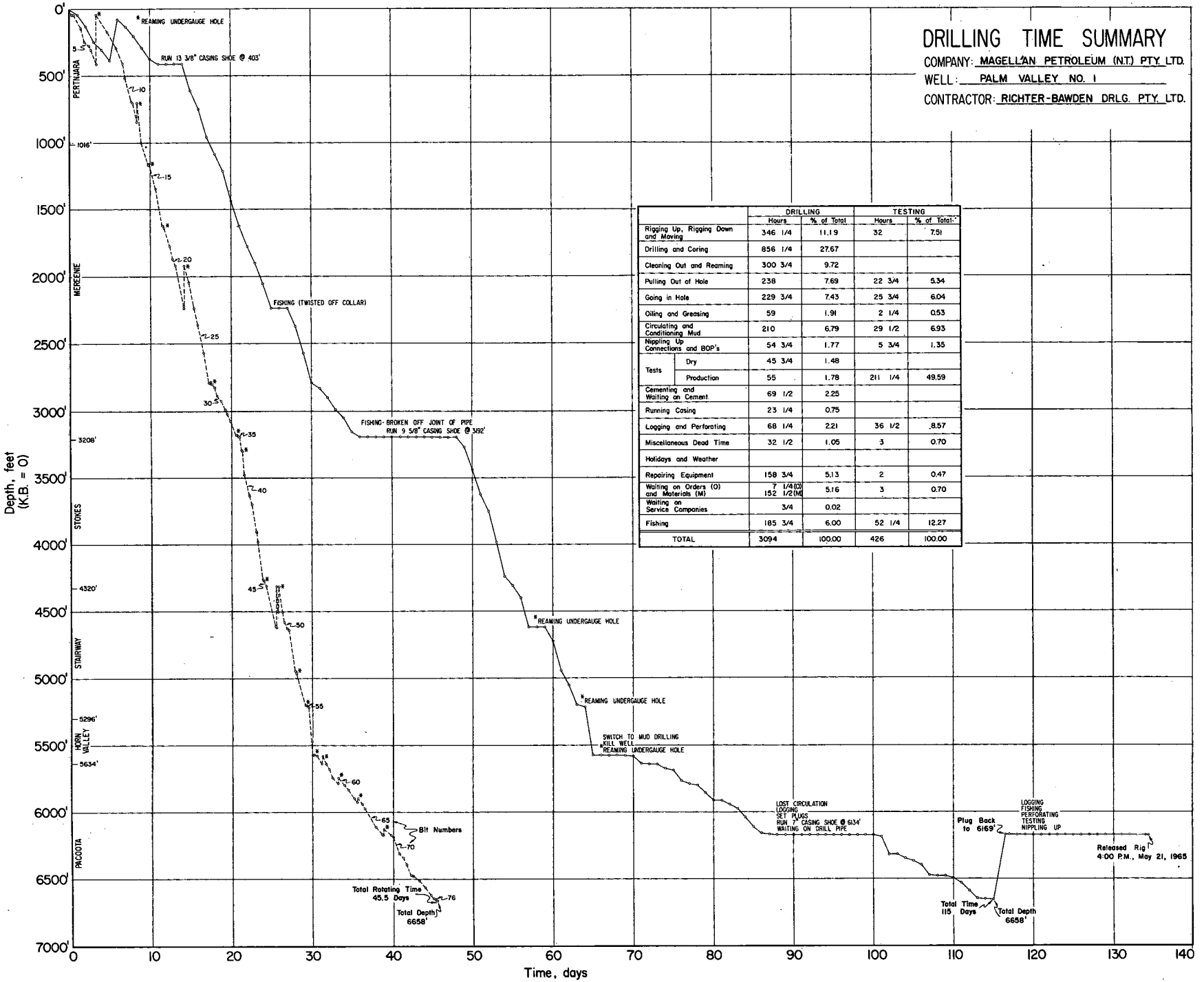
(b) Daily Drilling Summary - Table 1

(c) Rig Time Distribution - Table 2

DRILLING TIME SUMMARY

COMPANY: MAGELLAN PETROLEUM (N.T.) PTY. LTD.
WELL: PALM VALLEY NO. 1
CONTRACTOR: RICHTER-BAWDEN DRLG. PTY. LTD.

	DRILLING		TESTING	
	Hours	% of Total	Hours	% of Total
Rigging Up, Rigging Down and Moving	346 1/4	11.19	32	7.51
Drilling and Coring	856 1/4	27.67		
Cleaning Out and Reaming	300 3/4	9.72		
Pulling Out of Hole	238	7.69	22 3/4	5.34
Going in Hole	229 3/4	7.43	25 3/4	6.04
Oiling and Greasing	59	1.91	2 1/4	0.53
Circulating and Conditioning Mud	210	6.79	29 1/2	6.93
Nippling Up Connections and BOP's	54 3/4	1.77	5 3/4	1.35
Tests Dry	45 3/4	1.48		
Tests Production	55	1.78	211 1/4	49.59
Cementing and Waiting on Cement	69 1/2	2.25		
Running Casing	23 1/4	0.75		
Logging and Perforating	68 1/4	2.21	36 1/2	8.57
Miscellaneous Dead Time	32 1/2	1.05	3	0.70
Holidays and Weather				
Repairing Equipment	158 3/4	5.13	2	0.47
Waiting on Orders (O) and Materials (M)	7 1/4(O) 152 1/2(M)	5.16	3	0.70
Waiting on Service Companies	3/4	0.02		
Fishing	185 3/4	6.00	52 1/4	12.27
TOTAL	3094	100.00	426	100.00



DAILY DRILLING SUMMARY

		BIT RECORD									DRILLING FLUID RECORD								
Date	Depth at 8 a.m. (Feet)	No.	Size (Inches)	Type	Depth Out (Feet)	Feet Drilled	Hours Drilled	Cumulative Rotation Time (Hours)	Weight (1000 pounds)	Speed RPM	Condition T - B - G	Circulation Rate CFPM	Circulation Rate GPM	Pressure psi	Weight (lbs/gal.)	Viscosity Reference (Seconds)	Water Loss (cc)	PH	Soap (Percent)	Chemical Treatment[1]
1- 7-65	0	1	12-1/4	OWV	Dig Mouse Hole and Rat Hole															2-C
SPUD at 11 a.m.		2	12-1/4	W7R	45	32	7-1/4	7.25			2 - 2 - 1	800		60						2-C
1- 8-65	45	RM 1	17-1/2	REAMER	45	32	5	12.25				800		100						2-C
1- 9-65	134	3	12-1/4	YHWG-RAP	143	98	21	33.25	8/10	60/70		800		100						2-C
1-10-65	250	4	12-1/4	YHWG-RAP	250	107	13-1/2	46.75	8/10	60/70	1 - 1 - 1	1200		100						3-C
1-11-65	272	5	12-1/4	YHWG-RAP	272	22	10-1/4	57.00	8	60	1 - 1 - 1	1200		110						3-C
	306	6	12-1/4	OWV-J	306	34	7-3/4	64.75	8	60	1 - 3 - 1	1200		75						3-C; water
1-12-65	386	7	12-1/4	YHWG-RAP	410	104	17	81.75	25	55	2 - 1 - 1	1600		75						4-C; water
1-13-65	80	RM 2	17-1/2	SECURITY								800		50						2-C; water
1-14-65	135	RM 2	17-1/2	SECURITY	169	124	33-1/2	115.25	5/10	80/90	Dull	1200		75						3-C; water
1-15-65	207	RM 1	17-1/2	REED								1200		75						3-C; water-70 bbls; soap-68 gal.
1-16-65	293	RM 1	17-1/2	REED	293	124	25-1/4	140.50	5/10	70/80	Dull	1200		75						3-C; water-25 bbls; soap-25 gal.
1-17-65	375	RM 3	17-1/2	REED								1200		75						3-C; water-30 bbls; soap-7 gal.
1-18-65	410	RM 3	17-1/2	REED	408	115	18-3/4	159.25	10/15	80/90	Fair	1200		75						3-C
1-19-65	410										WOC									
1-20-65	410										Head Up									
1-21-65	410	8	12-1/4	OWV	410	--	--	159.25			Drill Cement	1200		80						3-C; water-32 bbls; soap-8 gal.
		9	12-1/4	YHWG-RAP	514	104	6-1/4	165.50	15	60	2 - 1 - 1	1200		175						3-C; water-16 bbls; soap - 4 gal.
1-22-65	610	10	12-1/4	YHWG-RAP	693	179	18-1/2	184.00	12/15	50	3 - 2 - 1	1200		175						3-C & 1-B; water-200 bbls; soap-40 gal.
		CB 11	8-3/4	CONV-HF	702	9	2-1/2	186.50	5/10	50	3 - 3 - 1	1200		175						3-C & 1-B; water-40 bbls; soap-10 gal.
1-23-65	744	12	12-1/4	OWS-J	842	140	13-3/4	200.25	30	80	3 - 3 - 0 1/8	1200		150						3-C; water-23 bbls; soap-23 gal.
1-24-65	956	13	12-1/4	OWS	1000	158	13-3/4	214.00	30	75	3 - 2 - 0 1/4	1200		75						3-C; water-14 bbls; soap-13-1/2 gal.
1-25-65	1084	14	12-1/4	YHWG-JA(M)	1162	162	19	233.00	35	75	4 - 2 - 1	1200		75						3-C; water-45 bbls; soap-45 gal.
		CB 2	8-3/4	CONV-HF	1167	5	2-1/4	235.25	5/10	50	4 - 4 - 1	1200		75						3-C; water-10 bbls; soap-10 gal.
1-26-65	1215	15	12-1/4	YHWG-JA(M)	1341	179	20-1/2	255.75	35	60	3 - 3 - 1	1200		75						3-C; water-40 bbls; soap-40 gal.

(1) C is abbreviation for compressor and B is abbreviation for booster.

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Table 1
Page 1 of 6

MAGELLAN PETROLEUM (N. T.) PTY. LTD.

DAILY DRILLING SUMMARY

		BIT RECORD										DRILLING FLUID RECORD								
												Circulation Rate								
Date	Depth at 8 a.m. (Feet)	No.	Size (Inches)	Type	Depth Out (Feet)	Feet Drilled	Hours Drilled	Cumulative Rotation Time (Hours)	Weight (1000 pounds)	Speed RPM	Condition T - B - G	CFPM	GPM	Pressure psi	Weight (lbs/gal.)	Viscosity Reference (Seconds)	Water Loss (cc)	PH	Soap (Percent)	Chemical Treatment[1]
1-27-65	1436	16	12-1/4	YHWG-JA(M)	1621	280	19-1/2	275.25	50	75	3 - 3 - 0 1/8	1600		80						4-C; water-38 bbls; soap-38 gal.
		CB 3	8-3/4	CONV-HF	1624	3	2-1/2	277.75	5/10	50	4 - 4 - 0	1600		50						4-C; water-6 bbls; soap-6 gal.
1-28-65	1624	17	12-1/4	YHWG-JA(M)	1640	16	5-1/4	283.00	40	60	2 - 2 - 1	1600		100						4-C; water-6 bbls; soap-6 gal.
1-29-65	1775	18	12-1/4	YHWG-JA(M)	1775	135	15	298.00	50	65	4 - 3 - 1	1600		125						4-C & 2-B, water-22 bbls; soap-22 gal.
1-30-65	1900	19	12-1/4	YHWG-JA(M)	1871	96	8-3/4	306.75	40	80	4 - 2 - 1	1600		125						4-C & 2-B; water-25 bbls; soap-25 gal.
1-31-65	2054	20	12-1/4	YHWG-JA	1921	50	7	313.75	40	75	3 - 2 - 1	1600		125						4-C & 2-B, water-10 bbls; soap-10 gal.
2- 1-65	2234	21	8-3/4	YCG-J	2219	298	25	338.75	30	60	1 - 2 - 1	1600		125						4-C & 2-B; water-22 bbls; soap-22 gal.
		CB 4	6-3/4	DIA. CORE	2234	15	1-1/2	340.25	10	80	Good	800		300						2-C & 1-B; air and water
2- 2-65	2234	22	12-1/4	YHWG-RAP	2046	125	14	354.25	20	80	2 - 2 - 1	800	300	250						2-C & 1-B; air and water; lime-21 sx.
2- 3-65	2234	23	12-1/4	YHWG-RAP	2236	190	15-1/4	369.50	15	100	3 - 2 - 1	800	300	300						2-C & 1-B; air and water; lime-25 sx.
2- 4-65	2368	24	12-1/4	YHWG-RAP	2359	123	10-1/2	380.00	40	60	3 - 2 - 1	800	300	350						2-C & 1-B; air and water; lime-28 sx.
2- 5-65	2571	25	12-1/4	YHWG-JA	2571	212	17-1/2	397.50	40	65	3 - 2 - 1	800	300	350						2-C & 1-B; air and water; lime-34 sx.
2- 6-65	2789	26	12-1/4	YHWG-JA	2789	218	16	413.50	30/35	75	3 - 2 - 1	800	300	350						2-C & 1-B; air and water; lime-30 sx.
		CB 5	6-1/8	DIA. CORE	2789	0	1-1/4	414.50	12	60	Burned	800	300	350						2-C & 1-B; air and water
		CB 6	6-1/8	DIA. CORE	2799	10	3	417.50	12	60	Good	800	300	600						2-C & 2-B; air and water
		27	12-1/4	YHWG-JA	2803	4	5-3/4	423.25	40	70	3 - 2 - 1	800	275	350						2-C & 1-B; air and water; lime-22 sx.
2- 7-65	2828	28	12-1/4	YHWG-RAP	2844	41	8	431.25	40	70	4 - 1 - 1	800	275	350						2-C & 1-B; air and water; lime-10 sx.
		29	12-1/4	YHWG-JA	2883	39	7-1/4	438.50	40	70	3 - 2 - 1	800	275	350						2-C & 1-B; air and water; lime-10 sx.
2- 8-65	2901	30	12-1/4	YHWG-RAP	2925	42	10-3/4	449.25	30	70	3 - 1 - 1	800	275	350						2-C & 1-B; air and water; lime-22 sx.
2- 9-65	2987	31	12-1/4	YHWG-RAP	2987	62	11-3/4	461.00	32	70	3 - 2 - 1	800	275	350						2-C & 1-B; air and water; lime-22 sx.
		32	12-1/4	YHWG-RAP	3023	36	5-1/2	466.50	30	70	2 - 2 - 1	800	275	350						2-C & 1-B; air and water; lime-9 sx.
2-10-65	3051	33	12-1/4	YHG-J	3075	52	11-1/4	477.75	35	70	3 - 2 - 1	800	275	400						2-C & 1-B; air and water; lime-20 sx.
2-11-65	3154	34	12-1/4	YHG-J	3181	106	16-1/2	494.50	35	70	2 - 2 - 1	800	275	400						2-C & 1-B; air and water; lime-30 sx.
		CB 7	8-3/4	CONV-HF	3181	--	2	496.50	5/18	60	4 - 4 - 0	800	275	400						2-C & 1-B; air and water; lime-4 sx.
		RR 9	12-1/4	YHWG-RAP	3189	8	3-1/2	500.00	30	70	Fishing	800	275	400						2-C & 1-B; air and water; lime-2 sx.

(1) C is abbreviation for compressor and B is abbreviation for booster.

MAGELLAN PETROLEUM (N. T.) PTY. LTD.

DAILY DRILLING SUMMARY

		BIT RECORD										DRILLING FLUID RECORD								
Date	Depth at 8 a.m. (Feet)	No.	Size (Inches)	Type	Depth Out (Feet)	Feet Drilled	Hours Drilled	Cumulative Rotation Time (Hours)	Weight (1000 pounds)	Speed RPM	Condition T - B - G	Circulation Rate CFPM	Circulation Rate GPM	Pressure psi	Weight (lbs/gal.)	Viscosity Reference (Seconds)	Water Loss (cc)	PH	Soap (Percent)	Chemical Treatment(1)
2-12-65	3189	35/36	12-1/4	YHW-J	3189						Fishing									
2-13-65	3189										Fishing									
2-14-65	3189										Fishing									
2-15-65	3189										Fishing									
2-16-65	3189										Fishing									
2-17-65	3189										Fishing									
2-18-65	3189										Fishing									
2-19-65	3189										Fishing									
2-20-65	3189										Fishing									
2-21-65	3192	37	12-1/4	YHW-J	3192	3	4-1/4	504.25	20	60	2 - 1 - 1	800	275	400						2-C & 1-B; air and water
2-22-65	3192										Log & WOC									
2-23-65	3192										Head Up									
2-24-65	3192										Pressure Test BOP									
2-25-65	3264	38	8-3/4	OWV-J	3293	101	6-1/2	510.75	30	60	3 - 2 - 0	1600	200							4-C & 2-B; dry up hole
		CB 4	6-3/4	DIA. CORE	3298	5	1-1/4	512.00	10	60	Fair	1600	180							4-C & 2-B; water-24 bbls; soap-6 gal.
2-26-65	3435	39	8-3/4	YHWG-JA	3475	177	13	525.00	30	60	2 - 2 - 0	1200	225							3-C & 2-B; water-64 bbls; soap-16 gal.
2-27-65	3622	40	8-3/4	YHWG-RAP	3622	147	9	534.00	20	75	2 - 2 - 1	1200	200							3-C & 2-B; water-64 bbls; soap-16 gal.
		CB 8	8-3/4	CONV-HF	3632	10	2-1/4	536.25	8	50	2 - 2 - 1	1200	200							3-C & 2-B; water-16 bbls; soap-4 gal.
		41	8-3/4	YHWG-RAP	3695	63	5	541.25	2	80	1 - 1 - 1	1200	250							3-C & 2-B; water-24 bbls; soap-6 gal.
2-28-65	3753	42	8-3/4	YHWG-RAP	3899	204	11-3/4	553.00	15	75	2 - 2 - 1	1200	200							3-C & 2-B; water-36 bbls; soap-9 gal.
		CB 9	8-3/4	CONV-HF	3909	10	3/4	553.75	10	60	2 - 2 - 1	1200	200							3-C & 2-B; water-8 bbls; soap-2 gal.
3- 1-65	3981	43	8-3/4	OWC-J	3981	72	3	556.75	15	75	Plugged	1200	200							3-C & 2-B; water-24 bbls; soap-6 gal.
3- 2-65	4240	44	8-3/4	YHWG-RAP	4265	284	15-3/4	572.50	15	75	2 - 2 - 1	1200	200							3-C & 2-B; water-52 bbls; soap-13 gal.
		CB 4	6-3/4	DIA. CORE	4275	10	2	574.50	12	60	Fair	1200	350							3-C & 2-B; water-8 bbls; soap-2 gal.
3- 3-65	4312	45	8-3/4	YHWG-RAP	4315	40	7	581.50	15	60	3 - 3 - 1	1200	200							3-C & 2-B; water-24 bbls; soap-6 gal.

(1) C is abbreviation for compressor and B is abbreviation for booster.

MAGELLAN PETROLEUM (N. T.) PTY. LTD.

DAILY DRILLING SUMMARY

		BIT RECORD										DRILLING FLUID RECORD							
												Circulation Rate							
Date	Depth at 8 a. m. (Feet)	No.	Size (Inches)	Type	Depth Out (Feet)	Feet Drilled	Hours Drilled	Cumulative Rotation Time (Hours)	Weight (1000 pounds)	Speed RPM	Condition T - B - G	CFPM	GPM	Pressure psi	Weight (lbs/gal.)	Viscosity Reference (Seconds)	Water Loss (cc)	PH	Soap (Percent)	Chemical Treatment[1]
3- 4-65	4400	46	8-3/8	YCG-J	4611	286	28-1/2	610.00	30	65	3 - 3 - 0 3/8	1200		200						3-C & 2-B; water-128 bbls; soap-32 gal.
3- 5-65	4621	CB 4	6-3/4	DIA. CORE	4621	10	2	612.00	10	50	Fair	1600		300						4-C & 2-B; water-8 bbls; soap-2 gal.
		47	8-3/4	YHWG-RAP	4621	--	6	618.00	6	80	2 - 2 - 0	1600		350						4-C & 2-B; water-24 bbls; soap-6 gal.
3- 6-65	4621	48	8-3/4	YHWG-RAP	4621	--	11-1/2	629.50	3	80	2 - 1 - 0	1600		350						4-C & 2-B; water-46 bbls; soap-11-1/2 gal.
		49	8-3/4	YHWG-RAP	4621	--	7-1/4	636.75	3	80	2 - 1 - 0	1600		350						4-C & 2-B; water-28 bbls; soap-7 gal.
3- 7-65	4621	50	8-3/4	YHWG-RAP	4629	8	9	645.75	3	75	2 - 1 - 0	1600		350						4-C & 2-B; water-36 bbls; soap-9 gal.
		51	8-3/4	YHWG-RAP	4640	11	3-3/4	649.50	3	75	2 - 2 - 1	1600		350						4-C & 2-B; water-16 bbls; soap-4 gal.
3- 8-65	4724	52	8-3/4	YC4G-JA	4942	302	19-1/4	668.75	25	70	3 - 3 - 0 1/8	1600		350						4-C & 2-B; water-86 bbls; soap-21-1/2 gal.
3- 9-65	4942	CB 4	6-3/4	DIA. CORE	4952	10	3	671.75	12	50	Fair	1600		350						4-C & 2-B; water-24 bbls; soap-6 gal.
		53	8-3/4	YHG-J	4960	8	3	674.75	20	65	2 - 1 - 1	1600		280						4-C & 2-B; water-24 bbls; soap-6 gal.
3-10-65	5053	54	8-3/4	YC4G-JA	5197	237	17-1/2	692.25	30	70	2 - 2 - 1	1600		250						4-C & 2-B; water-128 bbls; soap-32 gal.
3-11-65	5197	CB 4	6-3/4	DIA. CORE	5200	3	3	695.25	12	50	Fair	800		250						2-C & 1-B; water-24 bbls; soap-6 gal.
		55	8-3/4	YHG-JA	5213	13	4	699.25	25	65	3 - 2 - 1	800		200						2-C & 1-B; water-24 bbls; soap-6 gal.
3-12-65	5213	56	8-3/4	YCG-J	5570	357	19-3/4	719.00	30	65	2 - 2 - 0 1/4	800		200						2-C & 1-B; water-56 bbls; soap-14 gal.
3-13-65	5570	CB 4	6-3/4	DIA. CORE	5573	3	2-1/2	721.50	8	50	Fair	800		250						2-C & 1-B; barites-400 sx.; gel-250 sx.; unical-50 sx.; milcon-12 sx.; lime-24 sx.
3-14-65	5573	CB 4	6-3/4	DIA. CORE							Kill Well									Barites-1200 sx.; gel-50 sx.
3-15-65	5573	CB 4	6-3/4								Kill Well									Barites-270 sx.; gel-355 sx.
3-16-65	5573							721.50			Kill Well				11.0	45				Barites-1140 sx.; gel-110 sx.; caustic-100#, unical-15 sx.
3-17-65	5573	57	8-3/4	YHG-J				721.50			Ream				12.6	52	12.0	9		Barites-1004 sx.; gel-36 sx.; unical-19 sx.
3-18-65	5580	57	8-3/4	YHG-J	5580	7	11-3/4	733.25	20	70	2 - 2 - 1	375	400		11.0	43	16.0	9		Barites-40 sx.; gel-15 sx.
3-19-65	5634	CB 10	6-1/8	DIA. CORE	5638	58	15-1/2	748.75	12	65	Good	210	1300		11.4	56	9.4	10		Barites-501 sx.; gel-80 sx.; jel flake-12 sx.; unical-8 sx.; caustic-350#; milcon-10 sx.
3-20-65	5640	58	8-3/4	YHG-J	5640	2	12	760.75	20	65	1 - 1 - 1	300	600		11.4	55	8.4	9		Barites-120 sx.; gel-5 sx.; unical-8 sx.; milcon-7 sx.; caustic-50#
3-21-65	5640										Logging									
3-22-65	5673	RR 58	8-3/4	YHG-J	5680	40	11	771.75	45	65	4 - 2 - 1	350	1350		11.2	46	8.4	9.5		Barites-50 sx.
3-23-65	5683	59	8-3/4	YHWG	5724	44	8-3/4	780.50	42	65	2 - 1 - 1	360	900		11.8	56	8.0	10.0		Barites-250 sx.; gel-15 sx.

(1) C is abbreviation for compressor and B is abbreviation for booster.

MAGELLAN PETROLEUM (N. T.) PTY. LTD.

DAILY DRILLING SUMMARY

		BIT RECORD										DRILLING FLUID RECORD								
												Circulation Rate								
Date	Depth at 8 a.m. (Feet)	No.	Size (Inches)	Type	Depth Out (Feet)	Feet Drilled	Hours Drilled	Cumulative Rotation Time (Hours)	Weight (1000 pounds)	Speed RPM	Condition T - B - G	CFPM	GPM	Pressure psi	Weight (lbs/gal.)	Viscosity Reference (Seconds)	Water Loss (cc)	PH	Soap (Percent)	Chemical Treatment(1)
3-24-65	5763	CB 10	6-1/8	DIA. CORE	5784	60	17-1/4	797.75	14	65	Good		200	1100	11.5	53	7.6	9.0		Barites-120 sx.; gel-7 sx.; unical-5 sx.; milcon-2 sx.; caustic-50#
3-25-65	5784	60	8-3/4	YHWG-JA							Reaming		360	900	11.3	49	8.2	9.0		Barites-214 sx.
3-26-65	5797	60	8-3/4	YHWG-JA	5797	13	19	816.75	40	60	3 - 2 - 0		360	950	11.6	53	7.0	9.0		Barites-32 sx.; gel-22 sx.; unical-5 sx.; milcon-5 sx.; caustic-50#
		61	8-3/4	YHWG-JA	5835	38	10-3/4	827.50	45	60	3 - 2 - 1		360	950	11.4	52	8.0	10.0	1/4	Barites-12 sx.
3-27-65	5850	62	8-3/4	YCG-J	5894	59	17-1/4	844.75	45	60			360	1250	11.4	53	8.2	10.0	1/8	
3-28-65	5911	CB 10	6-1/8	DIA. CORE	5924	30	11	855.75	12	60	Fair		200	1050	11.5	56	8.0	10.0	1/8	Barites-100 sx.; gel-20 sx.
3-29-65	5911	63	8-3/4	YHWG-JA	5940	16	12-3/4	868.50	45	60	3 - 2 - 0		360	900	11.4	56	8.0	9.5	1/8	Barites-57 sx.; caustic-100#
3-30-65	5940	--									Repair Draw Works									
3-31-65	5970	64	8-3/4	YHWG-J	5976	6	9	877.50	45	65	2 - 2 - 1		360	1000	11.5	49	7.6	10.0	1/4	
4- 1-65	6038	65	8-3/4	YCG-J	6110	134	31-1/4	908.75	40	60	4 - 3 - 1		360	1200	11.4	47	7.6	9.0	1/4	Barites-15 sx.
4- 2-65	6110	---									Testing									Barites-20 sx.
4- 3-65	6158	66	8-3/4	YCG-J	6166	56	17-3/4	926.50	40	60	2 - 1 - 1		360	1100	11.3	45	8.4	10.0	1/4	Barites-175 sx.; gel-20 sx.; unical-5 sx.; caustic-100#
4- 4-65	6166	CB 10	6-1/8	DIA. CORE	6168	2	2-3/4	929.25	12	60	Fair		200	600	11.3	48				Barites-1240 sx.; gel-116 sx.; jellflake-355 sx.; mica-6 sx.; caustic-100#
4- 5-65	6168	67	8-3/4	YHWG	6168	--	3/4	930.00	12	50	2 - 1 - 1		200	300	11.4	48				Barites-1560 sx.; gel-90 sx.; mica-40 sx.; caustic-200#
4- 6-65	6168										Logging									Barites-200 sx.; gel-10 sx..
4- 7-65	6168										Run Plug									Barites-120 sx.; gel-10 sx.; caustic-50#/
4- 8-65	6168										Run Plug									Barites-40 sx..
4- 9-65	6168										Lay Down Drill Pipe									
4-10-65	6168										Ran 7" Casing - WOC									
4-11-65	6168										WOC									
4-12-65	6168										Run Tubing									
4-13-65		68	6-1/4	OSC							Drill Cement		150	800	Water					Water
4-14-65	6168	68	6-1/4	OSC	6168	--	22-3/4	952.75	2	45	2 - 2 - 1									
4-15-65	6168										WODP									
4-16-65	6168										WODP									

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MAGELLAN PETROLEUM (N. T.) PTY. LTD.

DAILY DRILLING SUMMARY

		BIT RECORD										DRILLING FLUID RECORD								
												Circulation Rate								
Date	Depth at 8 a.m. (Feet)	No.	Size (Inches)	Type	Depth Out (Feet)	Feet Drilled	Hours Drilled	Cumulative Rotation Time (Hours)	Weight (1000 pounds)	Speed RPM	Condition T - B - G	CFPM	GPM	Pressure psi	Weight (lbs/gal.)	Viscosity Reference (Seconds)	Water Loss (cc)	PH	Soap (Percent)	Chemical Treatment[1]
4-17-65	6168										WODP									
4-18-65	6183	69	6-1/16	DIA. DRILL	6183	15	7-1/4	960.00	25	60	Good		200	1500	Water					Soap-10 gal.; diesel-180 gal.
4-19-65	6318	70	6-1/8	RGI-J	6318	135	19-1/4	979.25	27	45	4 - 4 - 1		225	1200	Water					
4-20-65	6318										Testing									
4-21-65	6346	RR 69	6-1/16	DIA. DRILL	6346	28	10-1/4	989.50	25	60	Ruined		200	1500	Water					
4-22-65	6365	CB 11	6-1/16	DIA. CORE	6393	47	10	999.50	13	60	Good		200	1500	Water					
4-23-65	6393										Repair Compressor		200	800	Water					
4-24-65	6470	71	6-1/8	RGI-J	6470	77	14	1013.50	27	45	4 - 4 - 1		200	800	Water					
4-25-65	6474	CB 11	6-1/16	DIA. CORE	6474	4	4-1/4	1017.75	13	60	Good		200	1700	10.0	36		11.0	1/2	Gel-109 sx.; caustic-500#; unical-15 sx.
4-26-65	6476	CB 11	6-1/16	DIA. CORE	6476	2	3	1020.75	13	60	Good				10.2	39		9.5		Barites-100 sx.; caustic-50#
4-27-65	6491	72	6-1/8	RGI-J	6516	40	18-1/4	1039.00	27	45	2 - 3 - 1		200	900	10.3	38		10.5	1	
4-28-65	6533	73	6-1/8	RGI-J	6561	45	16-3/4	1055.75	27	45	3 - 4 - 1		200	1000	10.4	37		10.0	1-1/4	Gel-20 sx.; unical-2 sx.
4-29-65	6592	74	6-1/8	RGI-J	6618	57	17	1072.75	27	45	3 - 3 - 1		200	900	10.1	37		10.0	1	Gel-28 sx., caustic-75#.
4-30-65	6646	75	6-1/8	RGI-J	6646	28	8-1/2	1081.25	27	45	3 - 2 - 1		250	1150	10.1	36		9.5	1	Gel-5 sx.
		CB 11	6-1/16	DIA. CORE	6650	4	3-1/4	1084.50	13	60	Fair		200	1400	10.2	37		9.0	1	Milcon-3 sx.
		CB 11	6-1/16	DIA. CORE	6651	1	2-1/2	1087.00	13	55	Fair		200	1400	10.0	42		9.0	1-1/2	Milcon-7 sx.
5- 1-65	6655	76	6-1/8	RGI-J	6655	4	1-1/4	1088.25	20	45	1 - 1 - 1		200	900						
		CB 11	6-1/16	DIA. CORE	6658	3	4-1/4	1092.50	13	45	Fair		200	1550	10.1	38	22	9.0	1-1/4	Milcon-8 sx.; barites-7 sx.
5- 2-65	6658										Logging									
5- 3-65	6658 TD										Run Plug									
5- 4-65	6169 PBTD										Run Packer									
5- 5-65	6169										Fishing									
5- 6-65	6169										Fishing									
5- 7-65	6169										Velocity Survey									
5- 8-65	6169										Run R-3 Packer									
5- 9-65	6169										Test Open Hole									

(1) C is abbreviation for compressor and B is abbreviation for booster.

RIG TIME DISTRIBUTION

WELL NAME PALM VALLEY NO. 1 OPERATOR MAGELLAN PETROLEUM (N.T.) PTY. LTD. CONTRACTOR RICHTER-BAWDEN DRLG. PTY. LTD.

DATE	DEPTH @ 12:00 A.M.	RIGGING UP RIGGING DOWN AND MOVING	DRILLING AND CORING	CLEANING OUT AND REAMING	PULLING OUT OF HOLE	GOING IN HOLE	OILING AND GREASING	CIRCULATING AND CONDITIONING MUD	NIPPLING UP CONNECTIONS AND B.O.P.'S	TESTS: DRY AND DEVIATION	TESTS: PRODUCTION	CEMENTING & WAITING ON CEMENT	RUNNING CASING	LOGGING AND PERFORATING	MISCELLANEOUS DEAD TIME	HOLIDAYS AND WEATHER	REPAIRING	EQUIPMENT	WAITING ON ORDERS(O) & MATERIALS(M)	WAITING ON SERVICE COMPANIES	FISHING	TOTAL HOURS
DEC. 26, 64		24																				24
DEC. 27, 64		24																				24
DEC. 28, 64		24																				24
DEC. 29, 64		24																				24
DEC. 30, 64		24																				24
DEC. 31, 64		24																				24
JAN. 1, 65		24																				24
JAN. 2, 65		24																				24
JAN. 3, 65		24																				24
JAN. 4, 65		24																				24
JAN. 5, 65		24																				24
JAN. 6, 65		24																				24
JAN. 7, 65	45	15-1/4	3-1/4	5			1/4			1/4												24
JAN. 8, 65	100	6	11-1/2				1/2			1/4							5-3/4					24
JAN. 9, 65	235		21-1/4		3/4	1/2	3/4			3/4												24
JAN. 10, 65	259	2-3/4	5-3/4	7-3/4	1/4	1/2	1/2										6-1/2					24
JAN. 11, 65	306		13-3/4		5	1	3/4			1/4							3-1/4					24
JAN. 12, 65	410	1-1/2	17-1/2	1-1/4	1-1/4		3/4			1/2							1-1/4					24
JAN. 13, 65	114			15-3/4	1	3-1/4	1-1/4										2-3/4					24
JAN. 14, 65	169			17-3/4	1-1/2	4	3/4															24
JAN. 15, 65	280	1/2		22			3/4		3/4													24
JAN. 16, 65	325	2-1/4		10	1/4	1/4	1/2										10-3/4					24
JAN. 17, 65	408	4-1/2		14	3/4	3/4	1/2						3		Fill Hole 1/2							24
JAN. 18, 65		1										23										24
JAN. 19, 65		4-1/2							17-1/2			2										24
JAN. 20, 65	366	1		1/4		3			12	4-3/4							3					24
JAN. 21, 65	514		7-1/2	6-3/4	2	2-1/2	3/4			1							3-1/2					24
JAN. 22, 65	702		19-3/4	3/4	1-1/4	1-1/2	3/4															24
JAN. 23, 65	860		15-1/2	2-1/2	2-1/2	2-1/2	1/2			1/2												24
JAN. 24, 65	1025		15	4-3/4	1	2-1/4	3/4			1/4												24
JAN. 25, 65	1167		18		2-3/4	2-1/4	3/4	1/4														24
TOTAL HOURS		327-1/4	148-3/4	108-1/2	20-1/4	24-1/4	10-3/4	1/4	30-1/4	8-1/2		25	3		1/2		36-3/4					744

RIG TIME DISTRIBUTION

WELL NAME PALM VALLEY NO. 1 OPERATOR MAGELLAN PETROLEUM (N.T.) PTY. LTD. CONTRACTOR RICHTER-BAWDEN DRLG. PTY. LTD.

DATE	DEPTH @ 12:00 A.M.	RIGGING UP RIGGING DOWN AND MOVING	DRILLING AND CORING	CLEANING OUT AND REAMING	PULLING OUT OF HOLE	GOING IN HOLE	OILING AND GREASING	CIRCULATING AND CONDITIONING MUD	NIPPLING UP CONNECTIONS AND B.O.P.'S	TESTS: DRY AND DEVIATION	TESTS: PRODUCTION	CEMENTING & WAITING ON CEMENT	RUNNING CASING	LOGGING AND PERFORATING	MISCELLANEOUS DEAD TIME	HOLIDAYS AND WEATHER	REPAIRING	EQUIPMENT	WAITING ON ORDERS(O) & MATERIALS(M)	WAITING ON SERVICE COMPANIES	FISHING	TOTAL HOURS
JAN. 26, 65	1341		20·1/2	3/4	3/4		3/4		1/4	1/4							3/4				24
JAN. 27, 65	1621		19·1/2	1/4	3/4	1·1/2	3/4			3/4							1/2				24
JAN. 28, 65	1717		11·1/4	4	3·1/2	3·3/4	3/4			3/4											24
JAN. 29, 65	1871		16·1/2	1/4	2·1/2	1	1/2			1/4							3				24
JAN. 30, 65	1963	3·3/4	12	1	1·1/4	3	1/2			1/4							2·1/4				24
JAN. 31, 65	2219		20	3/4	1		3/4	1/4		1·1/4											24
FEB. 1, 65	2046		1·1/2	14·1/2	3·1/4	3·1/2	3/4	1/2													24
FEB. 2, 65	2105			6		1	1/2													(2) TW. Off 16·1/2	24
FEB. 3, 65	2351		10	9·3/4	1·1/2	1·1/4	3/4	1/4		1/2											24
FEB. 4, 65	2546		16	1/2			3/4	1/4		3/4										TW. Off 5·3/4	24
FEB. 5, 65	2780		16·1/4		1·1/4	4·1/4	3/4	1/4		1·1/4											24
FEB. 6, 65	2803		7	5	5	4	3/4	2·1/4													24
FEB. 7, 65	2883		15·1/4		2·1/2	3·1/2	3/4	1/2		1							1/2				24
FEB. 8, 65	2959		16·1/2		2·3/4	2	3/4	1		1/2							1/2				24
FEB. 9, 65	3023	3·1/4	11·1/2		2·1/2	1·1/4	3/4	1/4		1/2							1·1/2	2·1/2 (o)			24
FEB. 10, 65	3108		16·1/4		1·1/4	2·3/4	3/4	1		1/2							1·1/2				24
FEB. 11, 65	3181		15·1/4		3	2·1/4	3/4	1·1/4		1							1/2				24
FEB. 12, 65	3189		1·1/2		2		1/2												Lost pipe & D.C.	20	24
FEB. 13, 65	3189																	24 (M)			24
FEB. 14, 65	3189																			24	24
FEB. 15, 65	3189																			24	24
FEB. 16, 65	3189																			24	24
FEB. 17, 65	3189																			24	24
FEB. 18, 65	3189																			24	24
FEB. 19, 65	3189						1/2													23·1/2	24
FEB. 20, 65	3189			13	4·1/2	4·3/4	3/4	1													24
FEB. 21, 65	3192	2·1/2	3/4		2	1·1/4	1/4	2·1/2					6	8·3/4							24
FEB. 22, 65	3192											1 CMT 21 W.O.C.	2								24
FEB. 23, 65	3192					2·3/4	1/2	1/2	11·1/4			3 W.O.C.					6				24
FEB. 24, 65	3193		1/4	14·1/2	1·1/4	1·1/2	3/4			1·1/4							4·1/2				24
FEB. 25, 65	3313		9	5·1/4	3·3/4	3·3/4	3/4	1		1/2											24
TOTAL HOURS		9·1/2	236·3/4	75·1/2	46·1/4	49	16	12·3/4	11·1/2	11·1/4		25	8	8·3/4			21·1/2	26·1/2		185·3/4	744

RIG TIME DISTRIBUTION

WELL NAME PALM VALLEY NO. 1 OPERATOR MAGELLAN PETROLEUM (N.T.) PTY. LTD. CONTRACTOR RICHTER-BAWDEN DRLG. PTY. LTD.

DATE	DEPTH @ 12.00 A.M.	RIGGING UP RIGGING DOWN AND MOVING	DRILLING AND CORING	CLEANING OUT AND REAMING	PULLING OUT OF HOLE	GOING IN HOLE	OILING AND GREASING	CIRCULATING AND CONDITIONING MUD	NIPPLING UP CONNECTIONS AND B.O.P.'s	TESTS: DRY AND DEVIATION	TESTS: PRODUCTION	CEMENTING & WAITING ON CEMENT	RUNNING CASING	LOGGING AND PERFORATING	MISCELLANEOUS DEAD TIME	HOLIDAYS AND WEATHER	REPAIRING	EQUIPMENT	WAITING ON ORDERS(O) & MATERIALS(M)	WAITING ON SERVICE COMPANIES	FISHING	TOTAL HOURS
FEB. 26, 65	3567		15·1/4	1	1·1/4	2·1/4	3/4	3/4		1·1/2							1·1/4					24
FEB. 27, 65	3695		10	3/4	4·3/4	4·3/4	3/4	1/2		2·1/2												24
FEB. 28, 65	3909		12·1/2	1/2	3·1/2	3	3/4	3/4		3												24
MAR. 1, 65	4130		11		1·1/2	2·3/4	3/4	1/2		3							4·1/2					24
MAR. 2, 65	4275		9·3/4	1/2	4·1/4	3·1/4	3/4	2·1/4		1							2·1/4					24
MAR. 3, 65	4364		16·1/4	1·3/4	1·3/4	2	3/4	1		1/2												24
MAR. 4, 65	4611		18·1/4	1/4	2·1/2		3/4	1/4		2												24
MAR. 5, 65	4328		2	7·3/4	4·1/2	5·3/4	3/4	1·3/4									1·1/2					24
MAR. 6, 65	4584			18·1/2	1·1/2	1·1/2	3/4	1/4									1·1/2					24
MAR. 7, 65	4640		2·1/2	11·1/4	4·1/2	4·1/2	3/4	1/2														24
MAR. 8, 65	4911		17	1/4			3/4	1/4		1·1/4							4·1/2	Work on wtr/line				24
MAR. 9, 65	4970		7	1·3/4	6	6	3/4	2		1/2												24
MAR. 10, 65	5197		17·3/4		1/2		1/2			1·3/4	Gas Flow 3·1/2											24
MAR. 11, 65	5213		6	1·1/2	5·3/4	4·1/2	1/2	1									4·3/4					24
MAR. 12, 65	5435		13·1/2	1/2	3	2·1/4	1/2	1/2		1	Gas Flow 2·3/4											24
MAR. 13, 65	5570		8·3/4	1/2	2·3/4	3·1/2	1/2	6		1/2	Gas Flow 1						1/2					24
MAR. 14, 65	5573				1·1/4			20·1/4	WELL SHUT-IN, PUMPED MUD TO KILL WELL								2·1/2					24
MAR. 15, 65	5573				3·3/4	1·3/4		18·1/4							Fill Pipe 1/4							24
MAR. 16, 65	5573						1/4	15·3/4	WELL KICKING - SHUT-IN - KILLED WELL									8 (M)				24
MAR. 17, 65	5580		2·1/2	9·3/4	2·1/4	1/2	1/2	4·1/2										4 (M)				24
MAR. 18, 65	5611	5	6·1/2		2·1/2	1·3/4	1/2	1·1/2		1/4							6					24
MAR. 19, 65	5610		8	6·3/4	4·1/4	2	1/2										2·1/2					24
MAR. 20, 65	5640	1	1/2	4·3/4	2		1/4	3/4						14·3/4								24
MAR. 21, 65	5640	1/2		1/4	3·1/4	4·1/4	1/4				DST NO. 1 9·3/4			5·1/2				1/4 (O)				24
MAR. 22, 65	5680		11		4·1/4	1·1/2	3/4			1/4	6·1/4											24
MAR. 23, 65	5730		11·3/4		1·3/4	4·1/2	3/4	1·1/4			4											24
MAR. 24, 65	5784		14·1/4		3·1/2	1·1/2	1/2				4·1/4											24
MAR. 25, 65	5791		3	13·1/2	1	3	3/4	1·1/4			1·1/2											24
MAR. 26, 65	5835		12·3/4	1/2	3·3/4	3	3/4	1·3/4		3/4							3/4					24
MAR. 27, 65	5894		17·1/4		1	3/4	3/4	1		1/4							3					24
MAR. 28, 65	5924		11		3·3/4	3·3/4	1/2	3/4			4·1/4											24
TOTAL HOURS		6·1/2	266	82·1/4	86·1/4	74·1/4	18	85·1/4		20	37·1/4			20·1/4	1/4		35·1/2	12 (M) 1/4 (O)				744

RIG TIME DISTRIBUTION

WELL NAME PALM VALLEY NO. 1 OPERATOR MAGELLAN PETROLEUM (N.T.) PTY. LTD. CONTRACTOR RICHTER-BAWDEN DRLG. PTY. LTD.

DATE	DEPTH @12:00 A.M.	RIGGING UP RIGGING DOWN AND MOVING	DRILLING AND CORING	CLEANING OUT AND REAMING	PULLING OUT OF HOLE	GOING IN HOLE	OILING AND GREASING	CIRCULATING AND CONDITIONING MUD	NIPPLING UP CONNECTIONS AND B.O.P.'S	TESTS: DRY AND DEVIATION	TESTS: PRODUCTION	CEMENTING & WAITING ON CEMENT	RUNNING CASING	LOGGING AND PERFORATING	MISCELLANEOUS DEAD TIME	HOLIDAYS AND WEATHER	REPAIRING	EQUIPMENT	WAITING ON ORDERS(O) & MATERIALS(M)	WAITING ON SERVICE COMPANIES	FISHING	TOTAL HOURS
MAR. 29,65	5940		4·3/4	7·1/2	2	2	3/4	1·1/2			3·1/4						2·1/4					24
MAR.30,65	5940					2											22					24
MAR.31,65	6005		16·3/4	1	2	2	3/4	3/4		1/4							1/2					24
APR. 1, 65	6110		22·1/2				3/4	3/4														24
APR. 2, 65	6129		8		5·1/4	6	1/2	1·3/4			2·1/2											24
APR. 3, 65	6165		9·3/4		2·1/4	2·1/4	1/2	9·1/4	Lost Circ. at 6164'													24
APR. 4, 65	6168		2·3/4		3	2·1/4	3/4	15·1/4	Lost Circ.													24
APR. 5, 65	6168	1		1/2	2·1/4		1/4	7·1/4						8·1/2				3·1/2(o)	3/4			24
APR. 6, 65	6168	1/2			2·3/4	5·3/4		2·1/4				1·1/4 (Plug back)	11·1/2									24
APR. 7, 65	6168, 47			3/4	5·3/4	5·3/4	1/2	7·1/4				4										24
APR. 8, 65	6132, 30			1/2	3	1·1/4	1/4	11·1/2				1·1/2					6					24
APR. 9, 65	6132	1·1/2		1/2		1·1/2	1/4	1·3/4	3				10·1/2		4·1/2	Laid drl. pipe	1/2					24
APR.10, 65	6132								1/2	3	7" CSG. at 6134'	7·3/4	1·3/4					11 (M)	Crossover Flange			24
APR.11, 65	6132																8	16				24
APR.12, 65	6095			4·1/4			1/4		2	1					11·1/2	Pick up D.C. & tbg., kelly	5					24
APR.13, 65	6167			18·1/2	2·1/2		3/4	2·1/4														24
APR.14, 65	6167						1/4								1·1/4	Lay down D.C.& Cut D-Line		3·1/2"Drill pipe 22 1/2 (M)				24
APR.15, 65	6167																	24 (M)				24
APR.16, 65	6167																	24 (M)				24
APR.17, 65	6167														Run D.P. 5			19 (M)				24
APR.18, 65	6215		13·3/4		2·1/4	2	3/4	2·1/4							Run D.P.& Kelly 2·1/4		3/4					24
APR.19, 65	6318		13·1/4		2	2	3/4	1		1/2	Under test 4				1/4		1/4					24
APR.20,65	6322		2·1/2		1·3/4	2·3/4	1/2	13·3/4	Kill well		2·3/4											24
APR.21,65	6346		7·3/4		3·1/4	6·1/2	3/4	4		1/4					1·1/2 (ToTco)							24
APR.22,65	6393		10		3	2·1/2	1/2	6									2					24
APR.23,65	6456		10·1/4	1/2			1/4										C.M.P.D. Clutch 13					24
APR. 24,65	6471		5·1/4		4·3/4	4	1/4	8·1/2		1/4								1 (O)				24
APR.25,65	6476		5·3/4		7·3/4	5·3/4	1/2	1·1/4			3											24
APR.26,65	6476				3·3/4	2·3/4		5·1/4	7·1/2								4·3/4					24
APR.27,65	6516		18·1/4	1/4	2	2·1/4	3/4	1/4		1/4												24
APR.28,65	6564		18·1/4		2	2·3/4	1/2	1/4		1/4												24
TOTAL HOURS		3	169·1/2	34·1/4	63·1/4	64	12	104	13	5·3/4	15·1/2	14·1/2	12·1/4	20	26·1/4		65	121	3/4			744

RIG TIME DISTRIBUTION

WELL NAME PALM VALLEY NO. 1 OPERATOR MAGELLAN PETROLEUM (N.T.) PTY. LTD. CONTRACTOR RICHTER-BAWDEN DRLG. PTY. LTD.

DATE	DEPTH @ 12.00 A.M.	RIGGING UP RIGGING DOWN AND MOVING	DRILLING AND CORING	CLEANING OUT AND REAMING	PULLING OUT OF HOLE	GOING IN HOLE	OILING AND GREASING	CIRCULATING AND CONDITIONING MUD	NIPPLING UP CONNECTIONS AND B.O.P.'S	TESTS: DRY AND DEVIATION	TESTS: PRODUCTION	CEMENTING & WAITING ON CEMENT	RUNNING CASING	LOGGING AND PERFORATING	MISCELLANEOUS DEAD TIME	HOLIDAYS AND WEATHER	REPAIRING	EQUIPMENT	WAITING ON ORDERS(O) & MATERIALS(M)	WAITING ON SERVICE COMPANIES	FISHING	TOTAL HOURS
APR. 29, 65	6632		19-1/4		2	2	3/4															24
APR. 30, 65	6651		10-1/2		6	4	3/4	2-1/2		1/4												24
MAY 1, 65	6658		5-1/2	1/4	6-1/2	4-3/4	1/2	3/4						5-3/4								24
MAY 2, 65	6658 TD				3	3-1/2					2-1/4			10-1/2	4-3/4	Pickup pipe &		D.C.				24
MAY 3, 65	6154 at plug				4-1/2	4	1/4	4-1/2				5		3	3/4 Rig to bump plug							22
TOTAL HOURS			35-1/4	1/4	22	18-1/4	2-1/4	7-3/4		1/4	2-1/4	5		19-1/4	5-1/2							118
TOTAL DRLG. HOURS		346-1/4	856-1/4	300-3/4	238	229-3/4	59	210	54-3/4	45-3/4	55	69-1/2	23-1/4	68-1/4	32-1/2		158-3/4	7-1/4 (O) 152-1/2 (M)	3/4	185-3/4	3094	
TESTING																						
MAY 3, 65	6154													2								2
MAY 4, 65	6066-32				3	3-1/2	1/4				2-3/4			2-1/2							12	24
MAY 5, 65	6067-77						1/4														23-3/4	24
MAY 6, 65					1-1/2	1-1/2	1/2	3-1/4						3/4							16-1/2	24
MAY 7, 65						3-1/2					9-1/2			8				3 (M)				24
MAY 8, 65					3-1/2	3	1/4	1-1/2			13-3/4						2					24
MAY 9, 65											24 (Pumped Acid)											24
MAY 10, 65											24											24
MAY 11, 65					3-3/4			1-1/2			10			5-3/4	3 Plug back							24
MAY 12, 65					3	6	1/4				7-1/4			7-1/2								24
MAY 13, 65											24											24
MAY 14, 65											24											24
MAY 15, 65					1/2			9			14-1/2											24
MAY 16, 65					6-3/4	2-3/4	1/4	14-1/4														24
MAY 17, 65					3/4	5-1/2	1/2		5-3/4		1-1/2			10								24
MAY 18, 65											24											24
MAY 19, 65											24											24
MAY 20, 65		16									8											24
MAY 21, 65		16 (RIG RELEASED AT 4:00 P.M)																				16
TOTAL HOURS		32			22-3/4	25-3/4	2-1/4	29-1/2	5-3/4		211-1/4			36-1/2	3		2	3			52-1/4	426