

W780

WCR VOL 1

SEAHORSE-2

W 780

ESSO EXPLORATION AND PRODUCTION
AUSTRALIA INC.

1 of 53
+ T.O.C SHEET
+ RANGE CHART

WELL COMPLETION REPORT
SEAHORSE - 2 W780

VOLUME 1 12 APR 1983

OIL and GAS DIVISION

GIPPSLAND BASIN
VICTORIA

ESSO AUSTRALIA LIMITED

Compiled by: R. Key

Date: January 1983

SEAHORSE-2

WELL COMPLETION REPORT

VOLUME 1

CONTENTS

1. Well Data Record
2. Casing Data
3. Cement Data
4. Samples, Conventional Cores, Sidewall Cores
5. Wireline Logs and Surveys
6. Summary of Formation Test Program
7. Temperature Record
8. Operations Summary

FIGURES

1. Locality Map
2. Well Progress Curve
3. Abandonment Schematic
4. Horner Temperature Plot

APPENDICES

1. Lithological Descriptions
2. Core Descriptions
3. Sidewall Core Descriptions
4. Velocity Survey Report

ENCLOSURES

1. Sonic Calibration Curve
2. Time Depth Curve.

COMPLETION REPORT

1. WELL DATA RECORD

LOCATION

WELL NAME SEAHORSE - 2	STATE VIC	PERMIT or LICENCE VIC/P1	GEOLOGICAL BASIN GIPPSLAND	FIELD SEAHORSE
CO-ORDINATES LATITUDE 38°12'13.28"S LONGITUDE 147°39'20.17"E X 557,401mE Y 5,771,367mN		MAP PROJECTION Transverse Mercator Zone:55 Meridian:147° Datum: Aust. Geodetic	GEOGRAPHICAL LOCATION BASS STRAIT	
<u>ELEVATIONS & DEPTHS</u>				
ELEVATIONS KB 21m ASL RT	WATER DEPTH 42.6m	TOTAL DEPTH 2021m MEASURED DEPTH 2021m	Average Angle Vertical	
	PLUG BACK TYPE Cement retainer	REASONS FOR PLUGGING BACK Plug and Abandon		
<u>DATES</u>				
MOVE IN 10th July, 1982	RIG UP 10th July, 1982	SPUDED 11th July, 1982		
RIG DOWN COMPLETE 31st July, 1982	RIG RELEASED 31st July, 1982	PRODUCTION UNIT - RIG UP -		
PRODUCTION UNIT - RIG DOWN -		INITIAL PRODUCTION ESTABLISHED -		
<u>MISCELLANEOUS</u>				
OPERATOR ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.	PERMITTEE or LICENCEE Hematite Petroleum P/L	ESSO INTEREST 50% OTHER INTEREST 50%		
CONTRACTOR SOUTH SEAS DRILLING CO.	RIG NAME SOUTHERN CROSS	EQUIPMENT TYPE SEMI-SUBMERSIBLE		
TOTAL RIG DAYS 21	DRILLING AFE NO. 0100308232005	COMPLETION NO. -	TYPE COMPLETION P & A	
WELL CLASSIFICATION	Before Drilling	Outpost /extension test		
	After Drilling	Extension well		

CEMENT DATA

3. WELL Seahorse-2

DATE	DEPTH METRES	TYPE JOB	TYPE CEMENT	AMOUNT	ADDITIVES	REMARKS
12 Jul	200	20" Casing Primary-Lead	Aust. "N"	630SX	3.3% GEL 2% CaCl ₂ 0.5% CFR-2	Mixed with Freshwater
12 Jul	200	20" Casing Primary - Tail	Aust. "N"	350SX	2% CaCl ₂	Mixed with Freshwater
14 Jul	780	13-3/8" Casing Primary-Lead	Aust. "N"	728SX	None	Mixed with Freshwater
14 Jul	780	13-3/8" Casing Primary-Tail	Aust. "N"	250SX	None	Mixed with Seawater
27 Jul	1640 - 1500	P & A Open Hole Plug No.1A	Aust. "N"	349SX	0.5% HR6L	Mixed with Freshwater
27 Jul	1500 - 1356	P & A Open Hole Plug No.1B	Aust. "N"	349SX	0.5% HR6L	Mixed with Freshwater
27 Jul	832 - 732	P & A Plug No.2 Across 13-3/8" Shoe	Aust. "N"	256SX	None	Mixed with Seawater
28 Jul	145-95 (Casing) 225-145 (Annulus)	P & A Plug No.3 13-3/8"x20" Ann - 13-3/8" Casing	Aust. "N"	396SX	None	Mixed with Seawater

WELL : SEAHORSE-2

4. SAMPLES, CONVENTIONAL CORES, SIDEWALL CORES.			
INTERVAL	TYPE	INTERVAL	TYPE
780 - 2021m	5 washed and 1 unwashed bagged cuttings samples every 5m.		
780 - 2021m	Canned cuttings every 15m.		
1210 - 1414m	49 Sidewall Cores (attempted 51)		
1442 - 2006.9m	50 Sidewall Cores (attempted 51)		
1482 - 1496.2m	Conventional Core (recovered 12.8m)		
1496.2 - 1509.2m	Conventional Core (recovered 12m)		

5. WIRELINE LOGS AND SURVEYS					
Type & Scale	From	To	Type & Scale	From	To
<u>Suite 1</u>			<u>Suite 2 Cont'd</u>		
DIL-BHC-Cal-GR 1:200 & 1:500	785	62m	Took 11 segregated samples	1436	1603.2m
<u>Suite 2</u>			Velocity Survey 14 levels	2000	779m
LDL-CNL-GR 1:200 & 1:500	2021	780m			
BHC-GR-SP 1:200 & 1:500	2021	780m			
DLL-MSFL-GR-SP 1:200 & 1:500	2021	780m			
HDT 1:200	1868	1350m			
FDC-CNL-GR 1:200 & 1:500	2016	780m			
CST, Runs 1 & 2 1:200	2006.9	1210m			
RFT Runs 1-14 Attempted 73 pre- tests	1436	1785m			

6. SUMMARY OF FORMATION TEST PROGRAMME

SEAHORSE-2

TEST	SEAT	DEPTH (METRES) K.B.	CHAMBER ml	RECOVERY (LITRES)					HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		HORIZONTAL PERMEABILITY	REMARKS
				OIL ml	COND. ml	GAS m ³	FORMATION WATER ml	FILTRATE	MPaa	Psia	MPaa	Psia	millidarcies	
1	1	1436.5	Pretest						14.15	2052.5	17.20	2494		Valid
	2	1442.0	"						14.12	2047.9	17.25	2502		"
	3	1444.5	"						-	-	17.27	2505		No seal - invalid
	4	1444.3	"						-	-	17.33	2514		" "
	5	1444.7	"						-	-	17.28	2506		" "
	6	1450.5	"						14.25	2066.6	17.33	2513		Valid
	7	1454.5	"						14.22	2063.0	17.39	2522		"
	8	1456.5	"						14.23	2063.3	17.41	2525		"
	9	1466.5	"						14.32	2076.5	17.52	2541		"
	10	1468.0	"						14.33	2078.5	17.53	2543		"
	11	1471.0	"						14.36	2082.5	17.58	2549		"
	12	1474.0	"						14.39	2086.9	17.60	2553		"
	13	1487.0	"						14.55	2110.3	17.76	2576		"
	14	1496.5	"						-	-	17.88	2593		No seal - invalid
	15	1503.0	"						14.70	2132.4	17.95	2603		Valid
	16	1507.0	"						14.74	2138.1	17.99	2609		"
	17	1511.5	"						14.79	2144.6	18.03	2615		"
	18	1528.5	"						15.00	2175.6	18.24	2646		"
	19	1531.5	"						-	-	18.28	2651		No seal - invalid
	20	1531.0	"						15.02	2179.0	18.27	2650		Valid
	21	1564.0	"						15.34	2225.2	18.66	2707		"
	22	1565.0	"						-	-	18.68	2709		No seal - invalid
	23	1565.0	"						-	-	18.68	2709		" "
	24	1566.0	"						15.36	2228.0	18.69	2710		Valid
	25	1603.0	"						15.75	2284.0	19.13	2775		"
	26	1436.0	"						-	-	17.17	2490		No seal - invalid
	27	1441.0	"						-	-	17.22	2497		No seal - invalid
	28	1450.5	"						14.25	2066.6	17.33	2513		Valid
	29	1451.5	"						14.27	2069.9	17.33	2514		"
	30	1618.0	"						15.86	2299.7	19.32	2802		"
	31	1645.0	"						16.14	2340.9	19.64	2848		"
	32	1673.5	"						16.45	2385.7	19.98	2898		"

SUMMARY OF FORMATION TEST PROGRAMME

SEAHORSE-2

TEST	SEAT	DEPTH (METRES) K. B.	CHAMBER ml	RECOVERY (LITRES)					HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		HORIZONTAL PERMEABILITY	REMARKS
				OIL ml	COND. ml	GAS m ³	FORMATION WATER ml	FILTRATE	MPaa	Psia	MPaa	Psia	millidarcies	
1	33	1701.0	Pretest						16.71	2424.2	20.31	2945		Valid
1	34	1721.0	"						-	-	20.53	2978		No seal - invalid
1	35	1722.0	"						16.81	2453.3	20.55	2980		Valid
1	*	1785.0	"						-	-	- Not recorded on log -			Tight - invalid
2	36	1442.0	22,710	2,700	-	0.3115	-	17,400	14.12	2047.9	17.25	2502		Sampled
2	36	1442.0	10,410		Preserved				"	"	"	"		"
3	37	1456.0	22,710	-	-	-	-	1,500	14.22	2062.9	17.40	2524		Attempted Sample
3	37	1456.0	3,785	trace	-	-	-	3,000	"	"	"	"		But tool malfunctioned
4	38	1456.0							14.22	2062.9	17.38	2520		(Valid Pretest)
4	39	1454.5							-	-	17.35	2518		No seal - invalid
4	40	1454.0							14.21	2060.9	17.35	2517		Valid Pretest - Tool failure
5	41	1466.5							-	-	17.47	2534		No seal - invalid
5	42	1466.8							-	-	17.48	2535		" "
5	43	1467.9							14.33	2078.1	17.50	2538		Valid Pretest - Tool failure
5	44	1565.0							-	-	18.64	2704		No seal - invalid
5	45	1564.8							-	-	18.65	2705		No seal - invalid
6	46	1442.4							14.13	2049.3	17.24	2501		Valid
6	47	1451.0							14.27	2069.3	17.35	2517		"
6	48	1456.5	22,710	trace	-	0.0079	-	21,500	14.22	2062.9	17.42	2527		Sampled
6	48	1456.5	3,785	oil film	-	0.0009	-	3,500	14.22	2062.9	17.42	2527		"
7	49	1466.5	Pretest						-	-	17.49	2536		No seal - invalid
7	50	1466.8	"						-	-	17.49	2537		Tight - invalid
7	51	1467.5	"						-	-	17.50	2538		Lost Seal - invalid
7	52	1467.5	"						-	-	17.50	2538		No Seal - invalid
7	53	1467.2	"						-	-	17.50	2538		No Seal - invalid
7	54	1466.1	22,710	thin film	-	0.0074	-	21,250	14.31	2076.0	17.49	2536		Sampled
7	54	1466.1	3,785	" "	-	0.0007	-	3,700	"	"	17.49	2536		Sampled
8	55	1536.0	Pretest						15.07	2185.6	18.24	2645		Valid
8	56	1556.0	"						15.26	2212.8	18.47	2679		"
8	57	1559.5	"						-	-	18.51	2685		No Seal - invalid

* Seat No. not allocated

SUMMARY OF FORMATION TEST PROGRAMME

SEAHORSE-2

TEST	SEAT	DEPTH (METRES) K. B.	CHAMBER ml	RECOVERY (LITRES)					HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		HORIZONTAL PERMEABILITY	REMARKS
				OIL ml	COND. ml	GAS m ³	FORMATION WATER ml	FILTRATE	MPaa	Psia	MPaa	Psia	millidarcies	
8	58	1559.0	Pretest						15.29	2217.0	18.51	2685		Valid
8	59	1564.0	22,710	11,800	-	-	-	8,750	15.34	2224.9	18.57	2693		Sampled
8			3,785						"	"	"	"		"
9	60	1603.2	22,710	3,650		0.0258		16,750	15.74	2283.0	18.98	2753		Sampled
"			3,785						"	"	"	"		"
10	61	1567.0	Pretest						-	-	18.55	2690		No seal - invalid
"	62	1566.8	"						-	-	18.56	2692		"
"	63	1566.8	"						15.36	2228.0	18.56	2692		Valid
"	64	1566.0	"						15.36	2227.0	18.55	2691		"
"	65	1454.2	22,710	thin film	-	0.0062	-	21,300	14.18	2056.7	17.25	2503		Sampled
"			3,785	-	-	-	-	3,800	"	"	"	"		"
11	66	1496.0	Pretest						-	-	17.69	2566		Tight - invalid
"	67	1497.0	"						-	-	17.70	2567		Tight - invalid
"	68	1436.5	"						-	-	17.01	2467		"
"	69	1487.0	22,710	trace	-	-	-	21,300	14.55	2109.8	17.60	2552		Sampled
"			3,785	thin film	-	-	-	3,600	"	"	"	"		"
12	70	1451.0	22,710	trace	-	0.0028	-	22,500	14.31	2074.7	17.55	2545		"
"			3,785	thin film	-	-	-	3,750	"	"	"	"		"
13	71	1568.0	Pretest						-	-	18.82	2730		No seal - invalid
"	72	1566.8	22,710	thin film	-	-	-	21,000	16.05	2328.0	18.81	2728		Sampled
"			3,785	"	-	-	-	3,750	"	"	"	"		"
14	73	1508.0	22,710	trace	-	-	-	21,500	14.75	2139.0	18.06	2619		Sampled
"			3,785	thin film	-	-	-	3,700	"	"	"	"		"

7. SEAHORSE-2 TEMPERATURE RECORD

LOGGING RUN	THERMOMETER DEPTH (m)	MAX. RECORDED TEMPERATURE (C°)	CIRCULATION TIME (t_k) (hours)	TIME AFTER CIRCULATION STOPPED (t)	HORNER* TEMPERATURE (C°)	GEO THERMAL GRADIENT (C°/km)
Suite 1 DIL-BHC-Cal-GR	787	31.6		2-3/4 hrs		
Suite 2 LDL-CNL-GR BHC-GR-SP DLL-MSFL-GR-SP HDT	2120 2121 2121 1868	74.4 76.6 78.3 79.4	1 1/4 hrs 1 1/4 " 1 1/4 " 1 1/4 "	9 1/4 hrs 13-3/4 hrs 17 1/2 hrs 21-3/4 hrs	83.4	37.5
Suite 2 FDC-CNL-GR	2016	78.8	2 1/4 hrs	9-3/4 hrs		

8. OPERATIONS SUMMARY

SEAHORSE-2

Move and Moor

The semi-submersible Southern Cross departed the Yellowtail-2 location at 11:30 hours on 10th July, 1982 and arrived at the Seahorse-2 location at 22:00 hours the same day. The rig was towed 102km (55 nautical miles) by the workboat Atlas Dampier in 10-1/2 hours, at an average speed of 9.7 km/hr. (5.2 knots).

Because of the proximity to the Seahorse-1 wellhead (1,675m at 063° from Seahorse-2 and 850m at 055° from Anchor No. 1), the positioning and surveillance vessel Victoria Tide was situated above Seahorse-1 wellhead. After dropping Anchor No. 8 from the rig, Anchor No. 1 was temporarily set 640m from the rig and the remaining anchors run by the workboats Bass Tide and Lady Vera in 5-1/2 hours. Upon daylight, the underwater TV was deployed from the Victoria Tide and Anchor No. 1 fully set.

The rig was located 24m at 305° from the called location and 54km at 100° from Sale, Victoria.

26" Hole for 20" Conductor Casing

The drilling template was landed on the seafloor at 63.6m RKB with a tilt angle of 3/4°. The 26" hole was drilled to 220m using seawater. The hole was displaced with high viscosity gel mud before and after a short trip to the seafloor. Hole deviation was 3/4°.

The 18-3/4" Cameron wellhead and 20" casing were then run to a shoe depth of 185m. The casing was successfully cemented with apparently full returns. The wellhead bullseye showed a tilt angle of 1°.

The BOP stack and riser were run and latched with a tilt of 1°. The 20" casing and collet were then successfully pressure tested to 500 psi.

17-1/2" Hole for 13-3/8" Surface Casing

The 17-1/2" hole was drilled down to 787m, where hole deviation was 1/2°. After logging the hole, 60 joints of 13-3/8" casing were run to 780m and cemented. The first attempt to set the 13-3/8" seal assembly was unsuccessful as the shear pins failed to shear. A new seal assembly was run and successfully tested along with the BOP stack and casing.

12-1/4" Hole

The 13-3/8" casing float equipment and 6m of new hole were drilled and a Phase II PIT run to 13.6 ppg EMW without leakoff. The hole was then drilled to 1482m, where the bit was pulled for coring. The weight of the seawater/bentonite/polymer mud system was increased to 9.7 ppg by 1234m (150m above the anticipated Top of Latrobe at 1384m) in order to provide a 2.1 MPa (300 psi) overbalance into the Latrobe. This overbalance was computed based on pore pressure data from Seahorse-1.

Two cores were cut from 1482m to 1509m. A stratapax corehead was used with recoveries of 90% and 100%. The 12-1/4" hole was then drilled down to T.D. at 2021m. Formation evaluation (including logs, velocity survey, dipmeters, 14 RFT's and sidewall cores) consumed roughly 6 days of rig time, during which 3 wiper trips and a stack test were made.

Hole deviation in the 12-1/4" hole was 1/2° at 1481m and 1-1/2° at 2021m. No abnormal pressure was detected; however, H2S was detected both in the RFT samples and in the mud. On RFT No. 2, 220 ppm were detected in the sample gas, with concentrations of 10, 6 and 40 ppm found in RFT's No. 12, 13 and 14 respectively. Also, 15 ppm H2S were detected at the shakers while circulating after the third wiper trip during logging. During circulation before setting the first open hole plug, an H2S concentration of 65 ppm was detected.

Plug and Abandonment

The first plug was set in the 12-1/4" open hole in two stages from 1640 to 1356m, across the hydrocarbon bearing sands at the top of Latrobe Formation. The plug was then weight tested with 10,000 lbs.

The second plug was set across the 13-3/8" casing shoe from 832 to 732m and tested to 10.3 MPa (1500 psi) for 15 min. A bridge plug was then set in the 13-3/8" casing at 360m.

The 13-3/8" casing was then perforated with a 4" casing gun at 145m and an injection rate into the 13-3/8" x 20" annulus was established. A cement retainer was set at 135m and cement squeezed below the retainer and dumped on top (calculated TOC at 95m). The plug was then tested to 6.9 MPa (1000 psi) for 15 min.

After displacing the riser with seawater, then the riser and stack were pulled and the rig deballasted. The 13-3/8" and 20" casing string were blown and recovered along with the wellhead.

Pulling Anchors

Adverse weather conditions (30-50 knot winds with up to 5m swells) delayed anchor pulling operations for 55 hours. During this time, the workboat Atlas Dampier was able to work on the lee side and installed a new chain on anchor No. 3. With the weather finally abated, anchor No. 1 was respotted and the remaining six anchors were retrieved by the workboat Bass Tide, Southern Tide and Lady Vera in 11-1/2 hours. During this time a new chain was installed on anchor No. 7, and the link connecting the swivel and chain on anchor No. 2 replaced after it was lost while retrieving the anchor. Anchor No. 1 was picked up by the rig and bolstered at 2045 hours on 31st July, 1982. At which time the rig was put under tow to the Bream-5 location.

FIGURES

LOCALITY MAP

SCALE 1:250 000

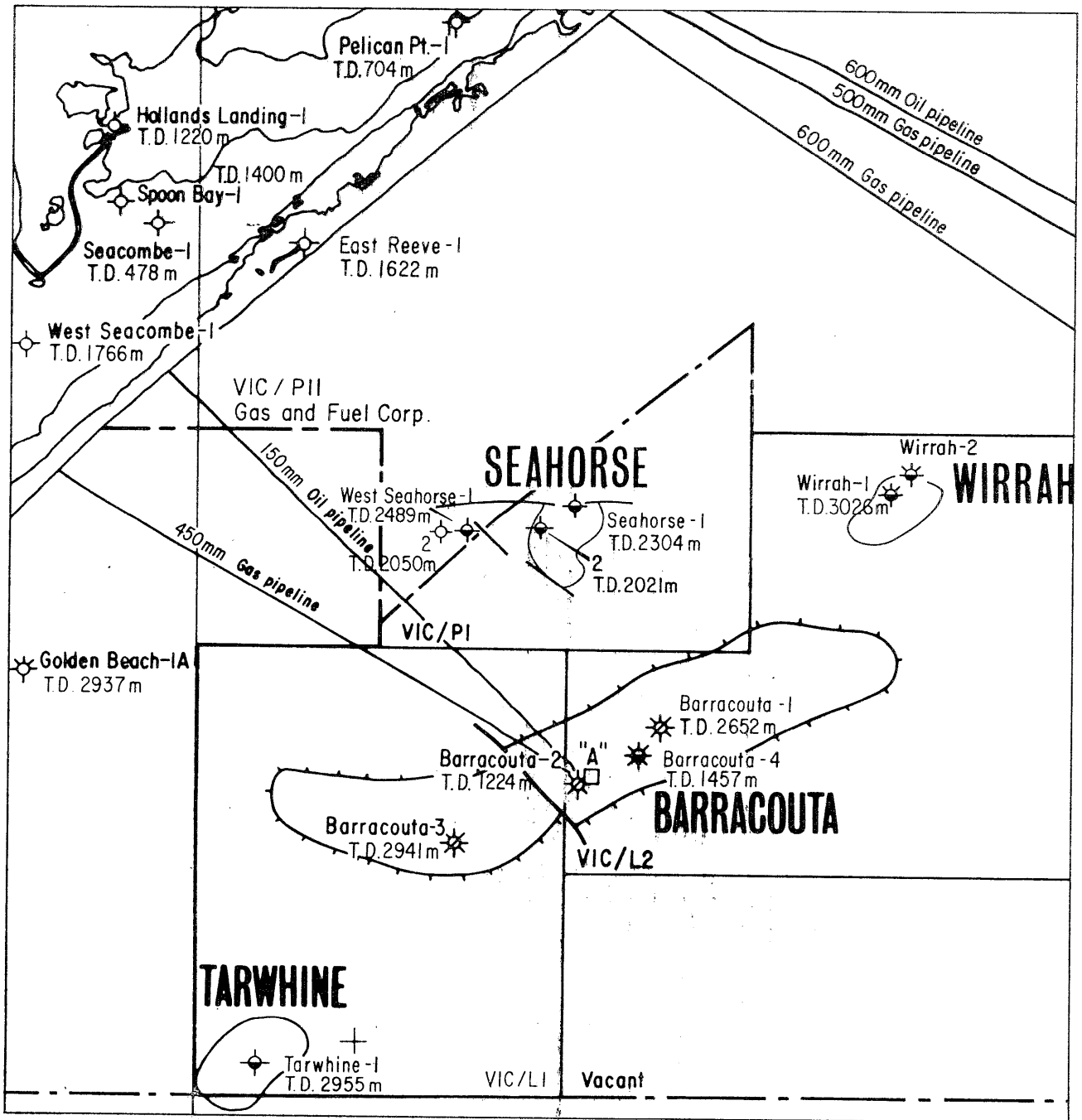


Figure 1

WELL PROGRESS CURVE

14/

WELL SEAHORSE-2 RIG SOUTHERN CROSS

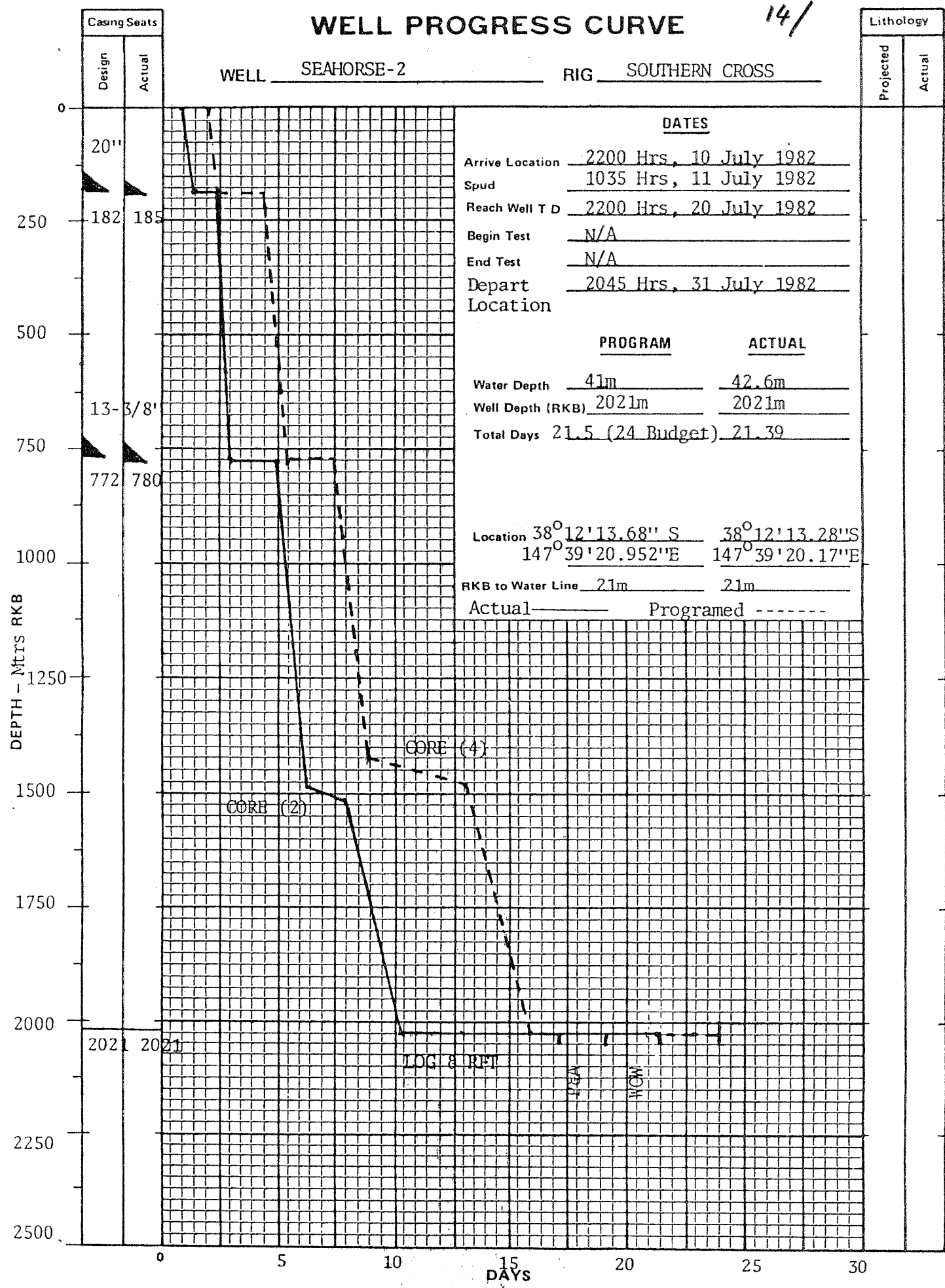
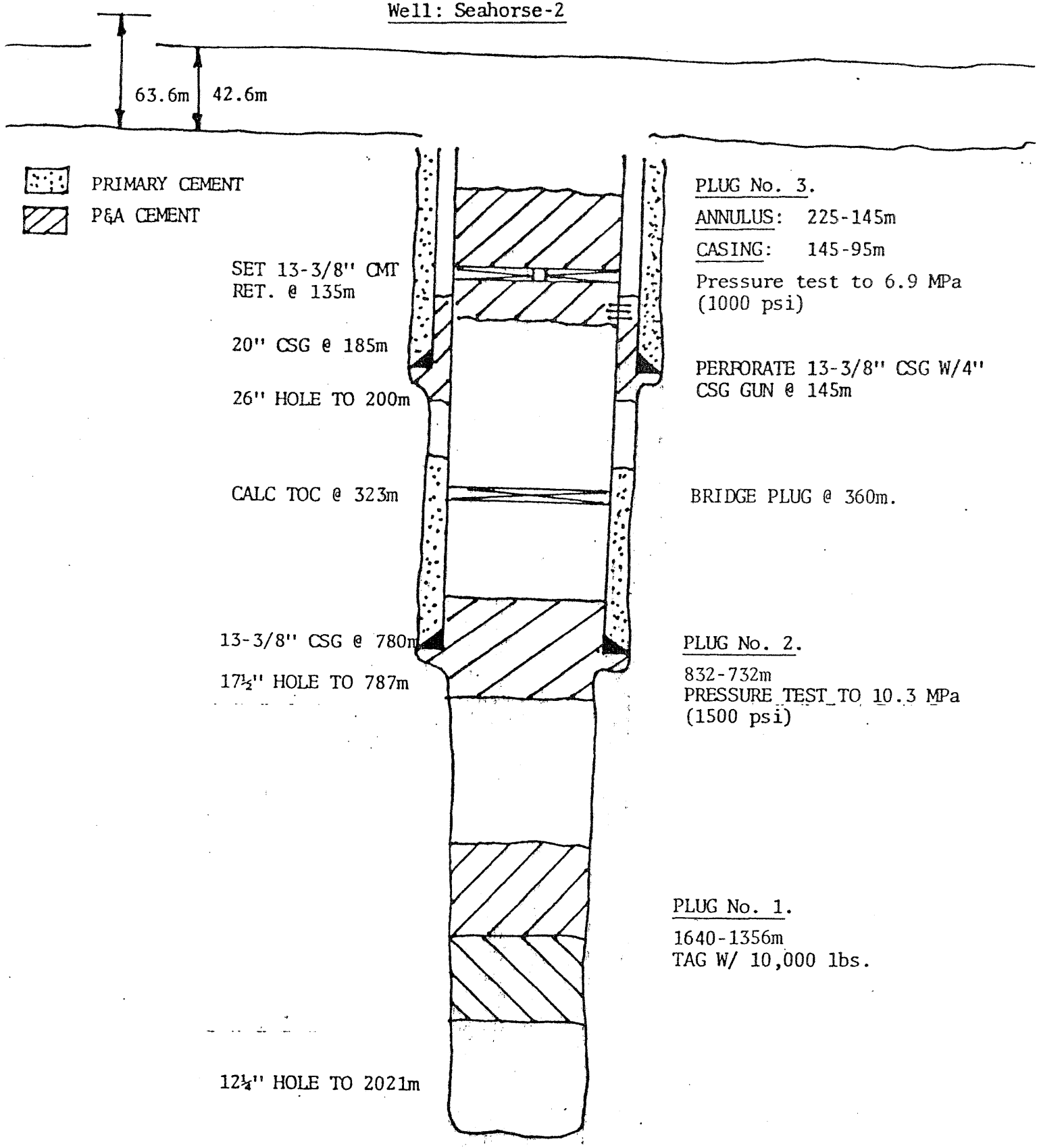


FIGURE 2

Abandonment Schematic

Well: Seahorse-2



DEPTHS ARE IN METERS RKB

FIGURE 3

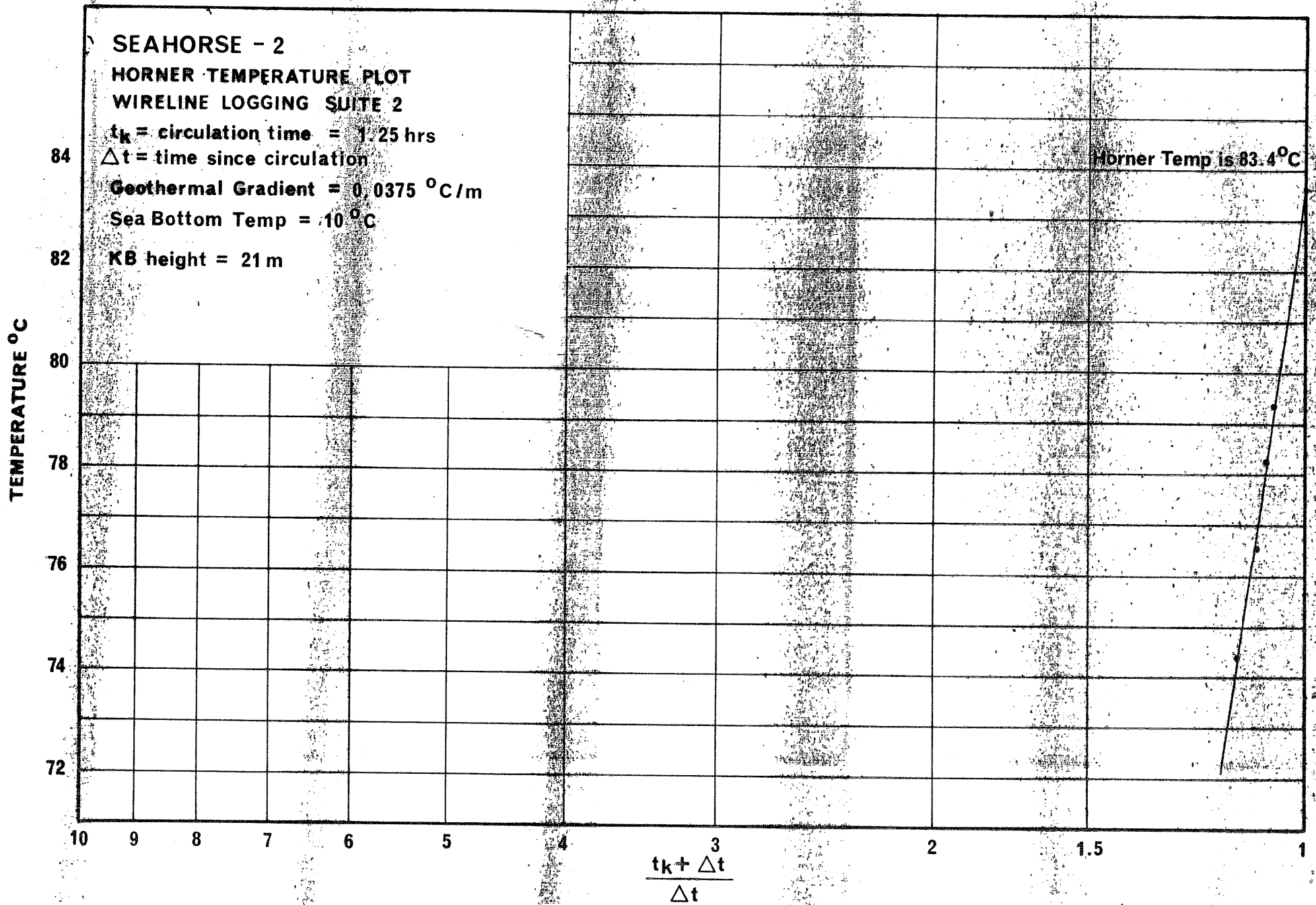


FIGURE 4

191

APPENDIX I

OIL and GAS DIVISION

1 2 APR 1983

APPENDIX 1

LITHOLOGICAL DESCRIPTIONS

SEAHORSE 2

LITHOLOGY DESCRIPTIONS

<u>Interval</u>	<u>%</u>	<u>Description</u>
780 - 785m	95	CEMENT
	5	SANDSTONE: quartzose, clear, white, medium to coarse grained, subangular to well rounded, poorly sorted, no shows.
785 - 790m	60	CEMENT
	35	CALCARENITE: white to light grey, fine to medium grained, firm to soft, carbonate grains with calcareous cement, occasional echinoid spines, abundant mineral fluorescence.
	5	SANDSTONE: as above.
790 - 795m	30	CEMENT
	65	CALCARENITE: as above.
	5	SANDSTONE: as above.
795 - 800m	65	CEMENT
	30	CALCARENITE: as above.
	5	SANDSTONE: as above.
800 - 805m	60	CEMENT
	30	CALCARENITE: white to light grey, fine to medium grained, firm, trace pyrite aggregates, trace echinoid spines, abundant mineral fluorescence.
	10	SANDSTONE: as above.
805 - 810m	20	CEMENT
	70	CALCARENITE: as above.
	10	SANDSTONE: as above.
810 - 815m	5	CEMENT
	85	CALCARENITE: light to medium grey, firm to hard, crystalline grains, trace pyrite aggregates, trace echinoid spines, abundant mineral fluorescence.
	10	SANDSTONE: quartzose, white to clear, occasionally yellow brown, fine to very coarse grained, occasionally very well rounded, poorly sorted, no shows.
815 - 820m	trace	CEMENT
	80	CALCARENITE: as above.
	20	SANDSTONE: as above.
820 - 825m	5	CEMENT
	75	CALCARENITE: as above, with common echinoid spines, abundant mineral fluorescence.
	20	SANDSTONE: quartzose, white to clear, friable, medium to very coarse grained, occasional fine grains, well rounded to subrounded, poorly sorted, no shows.
825 - 830m	90	CALCARENITE: as above.
	10	SANDSTONE: as above.
	trace	CEMENT
830 - 835m	5	CEMENT
	85	CALCARENITE: as above.
	10	SANDSTONE: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
835 - 840m	65	CALCARENITE: as above.
	20	CALCISILTITE: medium grey, soft, argillaceous, minor chlorite.
	15	SANDSTONE: as above.
840 - 845m	75	CALCARENITE: white, firm, medium grainsize, equidimensional crystalline calcite grains in a calcareous cement, trace to no echinoid spines, abundant mineral fluorescence.
	15	CALCISILTITE: as above.
	10	SANDSTONE: as above.
845 - 850m	75	CALCARENITE: as above.
	25	SANDSTONE: quartzose, friable, medium to coarse grained, predominantly medium; very well rounded, well sorted, no shows.
850 - 855m	85	CALCARENITE: white, brittle but fragile, fine to medium grained, equidimensional calcite crystals, trace pyrite, trace echinoid spines, mineral fluorescence.
	15	SANDSTONE: as above.
855 - 860m	85	CALCARENITE: as above.
	15	SANDSTONE: as above.
860 - 865m	85	CALCARENITE: as above.
	15	SANDSTONE: as above.
865 - 870m	90	CALCARENITE: white to light grey, brittle but fragile, fine to coarse calcite crystals, calcareous cement, minor echinoid spines, trace pyrite, abundant mineral fluorescence.
	10	SANDSTONE: quartzose, firm to friable, medium to coarse grained, poorly sorted, subangular to subrounded, occasionally well rounded, no shows.
870 - 875m	85	CALCARENITE: as above.
	15	SANDSTONE: as above.
	trace	CALCISILTITE: medium grey to medium light grey, soft to firm, calcareous, argillaceous, contains some chlorite.
875 - 880m	35	CALCARENITE: as above.
	65	SANDSTONE: quartzose, clear to white, friable to unconsolidated, medium to very coarse, dominantly very coarse, rounded to well rounded, good porosity is indicated, no shows.
880 - 885m	35	CALCARENITE: as above.
	65	SANDSTONE: as above, but not well sorted, dominantly medium grainsize.
885 - 890m	100	CALCISILTITE: light grey to medium dark grey, soft to firm, argillaceous, contains some echinoid spines.
890 - 895m	95	CALCISILTITE: as above, with trace forams.
	5	SANDSTONE: as above.
895 - 900m	90	CALCISILTITE: as above.
	10	SANDSTONE: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
900 - 905m	90	CALCISILTITE: grey to medium dark grey, firm to hard, argillaceous, trace forams, trace echinoid spines.
	10	SANDSTONE: quartzose, dominantly clear, occasionally milky white, fine to very coarse grained, dominantly medium grained, poorly sorted, well rounded, good to fair intergranular porosity is indicated, no shows.
905 - 910m	90	CALCISILTITE: as above.
	10	SANDSTONE: as above.
910 - 915m	100	CALCISILTITE: as above.
	trace	SANDSTONE: as above.
915 - 920m	90	CALCISILTITE: grey to medium light grey, soft to firm, argillaceous, minor mica, trace pyrite, echinoid spines.
	5	CALCARENITE: white, brittle, fragile, medium grained, equidimensional calcite grains, mineral fluorescence.
	5	SANDSTONE: quartzose, fine to coarse grained, generally medium grained, poorly sorted, rounded to subrounded, good intergranular porosity is indicated, no shows.
920 - 925m	100	CALCISILTITE: as above, with echinoid spines.
	trace	CALCARENITE: as above.
	trace	SANDSTONE: as above.
925 - 930m	100	CALCISILTITE: as above, with echinoid spines.
	trace	CALCARENITE: as above.
	trace	SANDSTONE: as above.
930 - 935m	90	CALCISILTITE: as above, trace crystalline pyrite aggregates.
	10	CALCARENITE: as above.
	trace	SANDSTONE: as above.
935 - 940m	75	CALCISILTITE: grey to medium light grey, firm to soft, argillaceous, slightly pyritic, slightly micaceous.
	20	CALCARENITE: as above.
	5	SANDSTONE: as above.
940 - 950m	55	CALCISILTITE: as above.
	40	CALCILUTITE: green grey, soft to firm, consists entirely of cryptocrystalline calcite.
	5	SANDSTONE: as above.
950 - 955m	80	CALCISILTITE: as above.
	20	CALCILUTITE: as above.
955 - 960m	100	CALCISILTITE: medium light grey to light grey, firm to hard, calcareous cement, minor finely dissociated pyrite, trace forams.
960 - 965m	95	CALCISILTITE: as above, with abundant cryptocrystalline pyrite clusters.
	5	SANDSTONE: quartzose, mainly clear, occasionally milky white, medium to coarse grained, well rounded, moderately sorted, good intergranular porosity is indicated, no shows.
965 - 970m	100	CALCISILTITE: medium light grey, occasionally creamy white, slightly argillaceous, firm to soft, trace forams, minor echinoid spines.

<u>Interval</u>	<u>%</u>	<u>Description</u>
970 - 975m	100	CALCISILTITE: off white and medium light grey, soft to firm, slightly argillaceous (white) to very argillaceous (grey cuttings), common echinoid spines, pyrite is also common in the form of cryptocrystalline to fine crystalline aggregates.
	trace	SANDSTONE: as above.
975 - 980m	100	CALCISILTITE: as above.
980 - 985m	40	CALCARENITE: white, soft to firm, friable.
	60	CALCISILTITE: medium light grey, firm to soft, slightly argillaceous, trace pyrite, moderate amount of fossil remains.
985 - 990m	100	CALCISILTITE: as above.
990 - 995m	100	CALCISILTITE: as above.
995 - 1000m	100	CALCISILTITE: medium grey, occasionally creamy white, friable, the grey fraction is argillaceous, pyrite clusters are common, common fossil fragments, eg. forams and echinoid spines and crinoid stems.
1000 - 1005m	100	CALCISILTITE: as above.
1005 - 1010m	100	CALCISILTITE: as above.
1010 - 1015m	100	CALCISILTITE: a mixture of off white, light grey and medium grey cuttings, firm to hard, argillaceous, minor pyrite content, trace forams and echinoid spines.
1015 - 1020m	100	CALCISILTITE: as above.
1020 - 1025m	100	CALCISILTITE: as above.
1025 - 1030m	100	CALCISILTITE: as above.
1030 - 1035m	100	CALCISILTITE: mostly light medium grey, occasionally off white and medium grey, soft to firm, argillaceous, minor fossil content, trace finely crystalline pyrite.
1035 - 1040m	100	CALCISILTITE: mostly medium light grey, occasionally off white and light grey, soft to firm, argillaceous, common crinoid stems and echinoid spines, trace forams, trace pyrite clusters.
1040 - 1045m	100	CALCISILTITE: as above.
1045 - 1050m	100	CALCISILTITE: as above.
1050 - 1055m	100	CALCISILTITE: as above.
1055 - 1060	100	CALCISILTITE: medium light grey to light grey, occasionally off white, soft to firm, argillaceous content, trace pyrite, minor fossil content including forams and echinoid spines.
1060 - 1065m	100	CALCISILTITE: as above.
1065 - 1070m	100	CALCISILTITE: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
1070 - 1075m	100	CALCISILTITE: medium light grey to medium grey, occasionally white, soft to firm, the non white cuttings are argillaceous, pyrite and fossil fragments occur in small quantities.
1075 - 1080m	100	CALCISILTITE: as above.
1080 - 1085m	100	SILTSTONE: medium light grey to grey, some cuttings are very light grey, soft to firm, quartzose, calcareous cement, rich in clay matter, minor amounts of pyrite and fossil fragments are present.
1085 - 1090m	100	SILTSTONE: as above, but lighter cuttings predominate.
1090 - 1095m	100	SILTSTONE: 2 types of cuttings: 1. medium light grey, firm, blocky, quartzose cuttings, calcareous cement, moderately argillaceous; 2. light grey to very light grey, soft, blocky, quartzose cuttings, calcareous cement, argillaceous; both types have minor fossil fragments - forams.
1095 - 1100m	100	SILTSTONE: as above, medium light grey to very light grey, firm to soft blocky cuttings.
1100 - 1105m	100	SILTSTONE: as above, trace fossils, trace micropyrite.
1105 - 1110m	100	SILTSTONE: as above, trace fossils (bryozoans, forams).
	trace	SANDSTONE: quartzose, very coarse grained, well rounded.
1110 - 1115m	100	SILTSTONE: as above, predominantly light grey, trace white, cryptocrystalline calcite, very hard, angular.
	trace	SANDSTONE: clear quartz, medium to very coarse grained, subangular to subrounded, trace fossils (forams, echinoid spines).
1115 - 1120m	100	SILTSTONE: as above, no loose quartz, trace pyrite, trace bryozoans.
1120 - 1125m	100	SILTSTONE: as above, no loose quartz, trace very coarse blocky pyrite, trace bryozoans, forams, trace carbonaceous material.
1125 - 1130m	100	SILTSTONE: as above, some very soft, very light grey, very argillaceous.
1130 - 1135m	100	SILTSTONE: as above, some very soft, very light grey, very argillaceous siltstone (gumbo).
1135 - 1140m	100	SILTSTONE: as above, predominantly very light grey, firm to very soft.
1140 - 1145m	100	SILTSTONE: medium light grey to very light grey, very soft to firm, blocky cuttings, quartzose, argillaceous, calcareous cement, rare white to clear carbonate grains.
1145 - 1150m	100	SILTSTONE: as above, trace bryozoans.
1150 - 1155m	100	SILTSTONE: as above, trace forams.
1155 - 1160m	100	SILTSTONE: as above, trace forams.

<u>Interval</u>	<u>%</u>	<u>Description</u>
1160 - 1165m	100	SILTSTONE: as above.
1165 - 1170m	100	SILTSTONE: as above.
1170 - 1175m	100	SILTSTONE: as above.
1175 - 1180m	100	SILTSTONE: as above, trace echinoid spines.
1180 - 1185m	100	SILTSTONE: as above, trace echinoid spines, some siltstone chips slightly greenish grey.
1185 - 1190m	100	SILTSTONE: predominantly medium grey, occasional dark carbonaceous flecking, firm to hard, blocky cuttings, quartzose, argillaceous, calcareous cement, rare very light grey to white soft cuttings, very argillaceous.
1190 - 1195m	100	SILTSTONE: as above.
1195 - 1200m	100	SILTSTONE: as above.
1200 - 1205m	100	SILTSTONE: as above.
1205 - 1210m	100	SILTSTONE: as above, trace glauconite.
1210 - 1215m	100	SILTSTONE: as above.
1215 - 1220m	100	SILTSTONE: as above, some cuttings becoming subfissile.
1220 - 1225m	100	SILTSTONE: as above, trace glauconite.
1225 - 1230m	100	SILTSTONE: as above, trace glauconite.
1230 - 1235m	100	SILTSTONE: medium light grey to rare very light grey, firm to soft, blocky cuttings, quartzose, carbonate cement; trace very light grey, very argillaceous claystone cuttings.
1235 - 1240m	100	SILTSTONE: as above, with very light grey claystone up to 10%.
1240 - 1245m	90 10	SILTSTONE: as above. CLAYSTONE: very light grey, very soft, argillaceous.
1245 - 1250m	90 10	SILTSTONE: as above. CLAYSTONE: as above.
1250 - 1255m	80 20	SILTSTONE: as above. CLAYSTONE: as above.
1255 - 1260m	90 10	SILTSTONE: as above. CLAYSTONE: as above.
1264m B.U.	70 30	SILTSTONE: as above. CLAYSTONE: as above.
1265m	100	SILTSTONE: as above, with some very light grey firm cuttings, trace bryozoans.
1265 - 1270m	100	SILTSTONE: medium grey to medium light grey, rare very light grey, relatively hard and subfissile, friable to soft, quartzose, calcareous cement, trace echinoid spines, forams and bryozoans. SANDSTONE: very fine grained, very calcareous.
	trace	

<u>Interval</u>	<u>%</u>	<u>Description</u>
1270 - 1275m	100 trace	SILTSTONE: as above. CLAYSTONE: very light grey, very soft, hygroscopic; trace pyrite, fine crystalline aggregates.
1275 - 1280m	90 10	SILTSTONE: as above. CLAYSTONE: as above; trace pyrite, forams, echinoid spines, coarse crystalline carbonate.
1280 - 1285m	100	SILTSTONE: as above.
1285 - 1290m	100 trace	SILTSTONE: blocky to subfissile, as above. SANDSTONE: very fine grained, as above, trace bryozoans.
1290 - 1295m	100 trace	SILTSTONE: as above. SANDSTONE: very fine grained, very calcareous, trace forams.
1295 - 1300m	100	SILTSTONE: medium light grey to light grey, rare light brown pieces, hard to firm, generally blocky, rarely subfissile, quartzose, argillaceous in places, trace echinoid spines, forams, pyrite, echinoderm fragments, glauconite (?).
1300 - 1305m	100 trace	SILTSTONE: as above, trace echinoid spines, pyrite, forams. SANDSTONE: very fine grained, some quartzose, some skeletal carbonate.
1305 - 1310m	100	SILTSTONE: medium light grey to light grey, rare greenish grey, hard to soft, blocky to subfissile, grading to very fine sand, quartzose, friable, calcareous cemented and some clear carbonate grains. Trace forams, echinoid spines, ostracods, bryozoans.
1310 - 1315m	100	SILTSTONE: as above, but becoming more fissile, trace forams.
1315 - 1320m	100	SILTSTONE: as above.
1320 - 1325m	100	SILTSTONE: as above, trace echinoid spines.
1325 - 1330m	100	SILTSTONE: grading to very fine grained calcareous cemented quartzose sandstone; trace cephalopod remains, trace glauconite(?).
1330 - 1335m	100	SILTSTONE: as above.
1335 - 1340m	100	SILTSTONE: predominantly medium light grey, quartzose, hard, blocky to subfissile, calcareous cement.
1340 - 1345m	100 trace	SILTSTONE: as above. CLAYSTONE: very light grey, very soft and hygroscopic; trace forams, bryozoans.
1345 - 1350m	100 trace	SILTSTONE: as above. CLAYSTONE: as above; trace forams, bryozoans.
1350 - 1355m	100 trace	SILTSTONE: as above. CLAYSTONE: as above.
1355 - 1360m	100 trace	SILTSTONE: light grey to medium light grey, occasionally off white, soft to firm, fissile to subfissile, calcareous, argillaceous, trace forams, trace pyrite. CLAYSTONE

<u>Interval</u>	<u>%</u>	<u>Description</u>
1360 - 1365m	100 trace	SILTSTONE: as above. CLAYSTONE: as above.
1365 - 1370m	95 5	SILTSTONE: as above. CLAYSTONE: as above.
1370 - 1375m	95 5	SILTSTONE: as above. CLAYSTONE: medium light grey, soft, soluble, water sensitive, rounded cuttings, calcareous.
1375 - 1380m	95 5	SILTSTONE: as above. CLAYSTONE: as above.
1380 - 1385m	90 10	SILTSTONE: as above, trace glauconite. CLAYSTONE: as above.
1385 - 1390m	90 5 5	SILTSTONE: medium light grey, firm to hard, slightly quartzose, calcareous cement, trace glauconite, minor amount of well rounded black coal grains, trace pyrite, trace glauconite, trace fossil fragments. SANDSTONE: clear, very fine to medium grained, generally fine, rounded to subrounded, no shows. CLAYSTONE: as above.
1390 - 1395m	70 25 5	SILTSTONE: as above, common black reworked coal grains. CLAYSTONE: as above. SANDSTONE: as above.
1395 - 1400m	60 35 5	SILTSTONE: as above. CLAYSTONE: as above. SANDSTONE: as above, no shows.
1400 - 1405m	60 35 5	SILTSTONE: as above. CLAYSTONE: as above. SANDSTONE: as above.
1405 - 1410m	70 25 5 trace	SILTSTONE: slightly quartzose, medium light grey, occasionally light grey, soft to firm to slightly brittle, very calcareous matrix, silt is slightly quartzose, trace glauconite, trace pyrite, reworked coal fragments, well rounded very fine to medium, fossil fragments common. CLAYSTONE: as above. SANDSTONE: as above, no shows. LIMESTONE: white to off white, hard, mineral fluorescence.
1410 - 1415m	60 40 trace	SILTSTONE: as above, with increasing amount of reworked coal. CLAYSTONE: medium light grey, soft, water sensitive, tends to form gumbo, contains small amounts of reworked coal and pyrite crystals. SANDSTONE: as above, no shows.
1415 - 1420m	55 30 15	SILTSTONE: as above. CLAYSTONE: as above. SANDSTONE: clear, white, loose quartz grains, fine to coarse grained, poorly sorted, subangular to subrounded, fair intergranular porosity is indicated, no shows.
1420 - 1425m	55 40 5	SILTSTONE: medium light grey, occasionally reddish brown, quartzose, some cuttings are subfissile, others are non fissile and rounded, soft to firm, calcareous, with up to 5% reworked coal, trace glauconite, minor pyrite clusters, trace fossil fragments. CLAYSTONE: as above. SANDSTONE: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
1425 - 1430m	30	SILTSTONE: as above.
	65	COAL: dark brown, blocky, hard, brittle, trace pyrite, some cuttings have white fluorescence and give a strong yellow - white crush cut.
	5	SANDSTONE: clear to white, occasionally light grey, fine to coarse grained, rounded to subrounded, others are angular, fractured by bit?, poorly sorted, moderate porosity is indicated, no shows.
1430 - 1435m	25	SILTSTONE: as above.
	70	COAL: as above.
	5	SANDSTONE: as above.
1435 - 1440m	20	SILTSTONE: light green grey, quartzose, firm, brittle, subfissile, calcareous matrix, trace glauconite, trace pyrite, not fossiliferous.
	10	SILTSTONE: reddish brown, firm to soft, subfissile to non fissile, non calcareous, clay matrix, contains iron oxides, and trace of carbonaceous matter, trace pyrite, trace muscovite.
	70	COAL: as above.
	trace	SANDSTONE
1440 - 1444m	40	SILTSTONE: light green grey, calcareous, as above.
	40	SILTSTONE: reddish brown, non calcareous, as above.
	20	COAL: as above.
1444 - 1446m	10	SILTSTONE: light green grey, calcareous, as above.
	10	SILTSTONE: reddish brown, non calcareous, as above.
	80	COAL: as above.
1446 - 1448m	5	SILTSTONE: as above.
	95	COAL: dark brown.
1448 - 1450	30	SILTSTONE: grey green, calcareous.
	70	COAL: as above.
1450 - 1455m	40	SILTSTONE: as above.
	60	SANDSTONE: clear, occasionally white, loose, fine to coarse grained, generally medium, rounded to subrounded, poorly sorted, fair porosity, no shows.
1455 - 1460m	50	SILTSTONE: as above.
	25	COAL: as above.
	25	SANDSTONE: clear, occasionally white, friable, fine to coarse grained, dominantly medium, poorly sorted, no shows.
1460 - 1465m	80	SILTSTONE: as above.
	15	COAL: as above.
	5	SANDSTONE: as above.
1465 - 1470m	30	SILTSTONE: as above.
	60	SANDSTONE: quartzose, clear, occasionally white to light grey, loose to friable, medium to very coarse grained, predominantly very coarse, well sorted, subrounded to very well rounded, fair to good porosity is indicated, no shows.
	10	COAL: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
1470 - 1475m	10	SILTSTONE: as above.
	65	SANDSTONE: as above, slightly coarser grains, some unbroken granule sized particles, well rounded to subrounded, no shows.
	25	COAL: as above.
1475 - 1480m	70	SILTSTONE: medium grey to dark grey, also light grey, medium red brown, carbonaceous in part, soft to firm, trace pyrite, trace mica, very argillaceous, grading to coal.
	30	SANDSTONE: as above.
1480 - 1482m	90	SILTSTONE: as above.
	10	SANDSTONE: as above.
		Core No. 1 1482 - 1496.2m Core No. 2 1496.2 - 1509.2m
1508.2 - 1510m	60	SANDSTONE: predominantly very coarse grained, white to clear loose quartz grains, subrounded to rounded, moderately sorted, some medium and fine grains, rare very fine to medium grain dolomite cemented sands showing mineral fluorescence, no shows, no cut.
	40	COAL: shiny black, brittle, hard, subfissile.
	trace	SILTSTONE: light grey to brown, carbonaceous flecking, rare glauconite pellets, soft to firm and brittle, subfissile, trace pyrite.
1510 - 1515m	70	SANDSTONE: as above, no shows.
	30	COAL: as above.
	trace	SILTSTONE: as above.
1515 - 1519.8		Bottoms up for drill break.
	50	SANDSTONE: as above, but grains subangular to subrounded, trace of dolomitized very fine grained sandstone with dull yellow mineral fluorescence.
	45	COAL: as above.
	5	SILTSTONE: as above, with more light brown chips with dark carbonaceous flecking.
1519.8 - 1520	50	SANDSTONE: as above.
	40	COAL: as above.
	10	SILTSTONE: light grey to greenish grey, soft to firm, blocky, argillaceous, slightly calcareous, rare dark carbonaceous flecks and glauconite.
1520 - 1525m	60	SANDSTONE: as above, still trace of dolomitized very fine grained angular sandstone.
	10	COAL: as above.
	10	SILTSTONE: as above.
	20	CLAYSTONE: very light grey to white with black coal flecks, very soft, water sensitive (gumbo) slightly calcareous.
1525 - 1530m	80	CLAYSTONE: as above, slightly calcareous.
	5	COAL: as above.
	5	SANDSTONE: as above.
	10	SILTSTONE: as above.
1530 - 1532.4m		Bottoms Up.
	90	CLAYSTONE: as above.
	10	COAL: as above.
	trace	SILTSTONE: as above.
	trace	SANDSTONE: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
1532.4 - 1535m	80	SANDSTONE: white to milky loose quartz, coarse to very coarse grained sand, angular to rounded, some medium grained, moderately sorted, rare very fine grain angular quartz sandstone with slightly calcareous cement.
	10	COAL: black, shiny, brittle, subfissile to blocky.
	10	SILTSTONE: medium light grey to very light grey, grading to white claystone, rare brown and greenish grey, firm to very soft (white claystone), slightly calcareous, blocky to subfissile.
1535 - 1540m	40	SANDSTONE: as above.
	60	COAL: as above.
1540 - 1545m	60	SANDSTONE: as above.
	30	COAL: as above.
	10	SILTSTONE: as above.
1545 - 1550m	80	SILTSTONE: dominantly medium light grey to greenish grey, some pale brown to light brown, soft to firm, blocky to subfissile, trace pyrite, trace green glauconite pellets.
	20	COAL: as above.
	trace	SANDSTONE
1550 - 1555m	90	SILTSTONE: predominantly greenish grey, soft to firm, slightly calcareous cement, rare pale brown, soft and brittle pieces, cuttings blocky to subfissile, trace green glauconite pellets.
	10	COAL: black, brittle, hard, conchoidal fracture, trace pyrite, trace quartz.
1555 - 1560m	20	SILTSTONE: as above.
	20	COAL: as above.
	60	SANDSTONE: white to clear, medium to very coarse grained, angular to subrounded, poorly sorted, trace pyrite.
1560 - 1565m	10	SILTSTONE: as above.
	30	COAL: as above.
	60	SANDSTONE: as above.
1565 - 1570m	5	SILTSTONE: as above.
	5	COAL: as above.
	90	SANDSTONE: predominantly milky white, some clear, loose quartz, very coarse to medium grained, angular to rounded, poorly sorted, no shows, no mineral fluorescence.
1570 - 1575m	5	SILTSTONE: as above.
	5	COAL: as above.
	90	SANDSTONE: as above.
1576m	80	SPOT SAMPLE SILTSTONE: light medium grey, off white, reddish brown, dark grey varieties interbedded, quartzose, calcareous, argillaceous, trace pyrite, trace forams, carbonaceous in part, grading into black coal.
	20	SANDSTONE: as above.
1575 - 1580m	95	SANDSTONE: as above.
	5	SILTSTONE/COAL: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
1580 - 1585m	95	SANDSTONE: quartzose, clear to grey white, hard, medium to very coarse grained, dominantly coarse, well sorted, angular to subrounded, dominantly subrounded, silicic cement, poor porosity is indicated, no shows.
	5	SILTSTONE/COAL: as above.
1585 - 1590m	100	SANDSTONE: as above.
	trace	SILTSTONE/COAL: as above.
1590 - 1595m	100	SANDSTONE: as above.
1595 - 1600m	95	SANDSTONE: as above.
	5	COAL: as above.
	trace	SILTSTONE: as above.
1600 - 1605m	100	SANDSTONE: as above.
	trace	SILTSTONE/COAL: as above.
1605 - 1610m	15	SANDSTONE: quartzose, as above.
	50	SILTSTONE: quartzose, interbedded multicoloured varieties, pale grey, reddish brown, dark grey, firm to hard, calcareous in part, otherwise argillaceous and non calcareous, trace pyrite, micromicaceous.
	35	COAL: black to dark brown, subfissile to conchoidal fracture, earthy to shiny, firm to hard and brittle.
1610 - 1615m	15	SANDSTONE: as above.
	85	SILTSTONE: as above.
	trace	COAL: as above.
1615 - 1620m	95	SANDSTONE: clear, blue grey, loose quartz grains, friable to unconsolidated, medium to coarse grained, dominantly medium, well sorted, angular to subangular, poorly cemented, good porosity and permeability is indicated, no shows.
	5	SILTSTONE/COAL: as above.
1620 - 1625m	95	SANDSTONE: as above, becoming slightly finer, no shows.
	5	SILTSTONE: as above.
1625 - 1630m	100	SANDSTONE: clear to pale grey, friable, medium to very coarse grained, dominantly coarse, well sorted, angular to subangular, poorly cemented, excellent porosity and permeability implied, no shows.
1630 - 1635m	100	SANDSTONE: as above, grains becoming subrounded to subangular.
	trace	COAL: as above.
1635 - 1640m	80	SANDSTONE: as above, no shows.
	20	CLAYSTONE: pale grey, gumbo, sticky, soluble.
	trace	COAL: as above.
1640 - 1645m	100	SANDSTONE: pale yellow-white, clear to white quartz grains, friable, coarse to very coarse grained, well sorted, subangular to subrounded, poorly cemented, minor amounts of lithic fragments, excellent intergranular porosity and permeability is indicated, no shows.
1645 - 1650m	100	SANDSTONE: as above.
1650 - 1655m	100	SANDSTONE: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
1655 - 1660m	100	SANDSTONE: clear, white to pale grey quartz grains, friable, coarse to very coarse grained, well sorted, subangular to subrounded, minor white clay matrix, trace pyrite aggregates and as encrustations on some of the quartz grains, excellent porosity and permeability is indicated, no fluorescence, no cut.
1660 - 1665m	90	SANDSTONE: as above.
	10	COAL: as above.
1665 - 1670m	70	SANDSTONE: as above, becoming finer and less well sorted.
	30	COAL: dark brown to shiny black, conchoidal fracture, part of sample consists of subfissile fragments which are earthy, trace pyrite.
1670 - 1675m	95	SANDSTONE: loose, clear, white to very light grey quartz, predominantly coarse to very coarse grained, subangular to subrounded, trace pyrite aggregates and microcrystalline encrustations on quartz grains, excellent porosity indicated, no cut, no fluorescence; trace pyrite.
	trace	COAL: as above.
	5	CLAYSTONE: white to light grey, very soft (gumbo) water sensitive, grading to rare firm siltstone.
1675 - 1680m	100	SANDSTONE: as above, trace pyrite
	trace	COAL: as above.
	trace	CLAYSTONE: as above.
1680 - 1685m	100	SANDSTONE: as above, trace pyrite.
	trace	COAL: as above.
	trace	CLAYSTONE: as above.
1685 - 1690m	100	SANDSTONE: clear to white to light grey, loose quartz, coarse to very coarse grained, predominantly very coarse, angular to subrounded, trace of pyrite aggregates associated with quartz grains.
	trace	COAL: black, brittle, blocky.
1690 - 1695m	90	SANDSTONE: as above, but predominantly coarse grained, abundant trace pyrite, very fine grained to very coarse microcrystalline pieces associated with quartz.
	10	MUDSTONE: white to very light grey, very soft water sensitive claystone; associated with medium grey to very light grey to greenish grey siltstone; soft to firm, blocky, predominantly claystone.
	trace	COAL
1695 - 1700	60	SANDSTONE: clear to milky white, predominantly coarse grained, ranges from medium to very coarse grained, loose quartz, angular to subrounded, rare very fine grains, weakly cemented, friable sandstone grading to coarse siltstone, still abundant trace of pyrite aggregates, no fluorescence.
	40	CLAYSTONE/SILTSTONE: predominantly claystone, as above; Siltstone ranging from very light grey to pale brown to medium grey, soft to firm, blocky to subfissile, grading into very fine grained sandstone in places, some harder light brown pieces show fine laminae and carbonaceous flecks and fragments.
	trace	COAL: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
1700 - 1705m	100	SANDSTONE: as above, but predominantly medium to coarse grained, and well sorted, no pyrite.
1705 - 1710m	100	SANDSTONE: as above.
1710 - 1715m	100	SANDSTONE: clear to milky white, rare medium dark grey, loose quartz grains, medium to very coarse, predominantly coarse grained, moderately sorted, angular to rare subrounded, mainly subangular, trace pyrite, no fluorescence, no shows.
	trace	CLAYSTONE: white to very light grey, soft to firm, blocky, slightly calcareous cement.
	trace	COAL
1715 - 1720m	95	SANDSTONE: as above.
	5	SILTSTONE/CLAYSTONE: as above, but also some pale brown grading to very fine grained sandstone, some very dark grey carbonaceous siltstone, trace pyrite.
1720 - 1725m	100	SANDSTONE: as above, but medium grained is dominant size, abundant traces of pyrite.
	trace	SILTSTONE: as above.
1725 - 1730m	100	SANDSTONE: as above, but angular to subrounded, trace pyrite.
	trace	COAL
1730 - 1735m	100	SANDSTONE: as above, abundant trace of pyrite.
	trace	SILTSTONE: as above.
	trace	COAL
1735 - 1740m	60	SANDSTONE: clear to milky white, loose quartz, coarse to very coarse grained, subangular to well rounded, poorly sorted, very common pyritic aggregates.
	40	MUDSTONE: very soft white water sensitive claystone, grading into medium light grey siltstone. Siltstone is firm, blocky to subfissile, rare light brown pieces with dark carbonaceous flecks. Trace echinoid spines.
1740 - 1745m	50	SANDSTONE: as above, very common coarse pyrite aggregates.
	50	MUDSTONE: as above.
1745 - 1750m	90	SANDSTONE: clear to milky white quartz, loose, medium to very coarse grained, dominantly coarse grained, angular to subrounded, well sorted, common pyrite and pyrite/quartz aggregates, some quartz has angular, shattered appearance.
	10	MUDSTONE: as above, (may be higher percentage, but flow over shakers was so high sample washed very clean).
1750 - 1755m	100	SANDSTONE: as above, medium to very coarse grained but poorly sorted, common pyrite, no fluorescence.
	trace	MUDSTONE: interlaminated white and medium light grey siltstone and claystone in some blocky cuttings, very soft.
1755 - 1760m	100	SANDSTONE: clear to milky white loose quartz, medium to very coarse grained, dominantly coarse grained, angular to rounded, dominantly subrounded, common pyrite.
	trace	MUDSTONE: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
1760 - 1765m	100 trace trace	SANDSTONE: as above, trace pyrite. COAL: black, brittle, blocky to subfissile. MUDSTONE: as above.
1765 - 1770m	80 10 10	SANDSTONE: as above. MUDSTONE: grading to very fine grained carbonaceous sandstone. COAL: as above.
1770 - 1775m	60 40 trace	SANDSTONE: as above. MUDSTONE: as above. COAL
1775 - 1780m	40 60 trace	SANDSTONE: clear to milky white loose quartz, medium to very coarse grained, angular to subangular, poorly sorted, some very fine to medium grained sandstone, friable and firm, interlaminated with very coarse, very light grey siltstone, trace pyrite, no fluorescence, no shows. MUDSTONE: white to very light grey claystone, very soft and water sensitive, in some cuttings grades into a siltstone, siltstone is very light grey to medium light grey, firm and subfissile, becomes darker in places and medium dark grey siltstone shows fine interlamination with more carbonaceous material and rare coal. Very light grey siltstone grades into very fine to medium sandstone of the same colour, very argillaceous, soft and friable, very slightly calcareous; interpretation: interbedded siltstone, claystone, coal and sandstone. COAL: dirty, dull black, blocky and brittle in places (interlaminated) with siltstone.
1780 - 1785m	100 trace trace	SANDSTONE: as above, but medium to coarse grained and very well sorted, rare very coarse grains, angular to subangular, trace pyrite and pyrite/quartz aggregates, no fluorescence, no shows. SILTSTONE: greenish grey, firm and subfissile. COAL: as above.
1785 - 1790m	90 10 trace	SANDSTONE: as above, trace pyrite. SILTSTONE: as above. COAL: as above.
1790 - 1795m	80 20 trace	SANDSTONE: as above. SILTSTONE: slightly calcareous. COAL: as above.
1795 - 1800m	90 trace 10	SANDSTONE: milky white, loose quartz, medium to coarse grained, angular to subangular, well sorted, trace pyrite and quartz/pyrite aggregates, some fine grained sandstone with mica and interlaminated with carbonaceous material. MUDSTONE: as above. COAL: dirty, dull, black, brittle, firm.
1800 - 1805m	90 5 5	SANDSTONE: as above. MUDSTONE: as above. COAL: as above.
1805 - 1810m	trace 5 95	SANDSTONE: as above. MUDSTONE: as above. COAL: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
1810 - 1815m	trace 60 40	SANDSTONE: as above. MUDSTONE: as above. COAL: as above.
1815 - 1820m	10 90 trace	SANDSTONE: as above. MUDSTONE: as above, but predominantly white to very light grey, very soft, claystone, very water sensitive, grading to firmer siltstone, as above, trace mica. COAL: as above.
1820 - 1825m	90 10	SANDSTONE: as above. MUDSTONE: as above.
1825 - 1830m	95 5 trace	SANDSTONE: milky white to rare clear quartz, medium to coarse grained, predominantly medium grained, subangular to subrounded, well sorted, some fine to medium aggregates with argillaceous cement, associated with microcrystalline pyrite. COAL: dull, dirty, black, blocky, and brittle, hard. SILTSTONE: very light grey to medium grey, otherwise as above.
1830 - 1835m	30 65 5	SANDSTONE: as above. SILTSTONE: pale grey to medium light grey, soft to firm, quartzose, clay rich, pyrite common. COAL: as above.
1835 - 1840m	20 70 10	SANDSTONE: as above. SILTSTONE: as above. COAL: as above.
1840 - 1845m	25 75	SANDSTONE: as above. SILTSTONE: pale grey to medium grey, quartzose, firm to hard, calcareous cement in part, argillaceous in part, up to a quarter of the sample consists of finely crystalline pyrite, trace muscovite.
1845 - 1850m	100	SANDSTONE: medium light grey overall, clear, pale grey to white quartz grains, hard, fine to coarse grained, dominantly medium grained, reasonably well sorted, angular to subangular, trace porosity, no shows.
1850 - 1855m	100 trace	SANDSTONE: as above. SILTSTONE: as above, very pyritic.
1855 - 1860m	95 5	SANDSTONE: as above. SILTSTONE: as above.
1860 - 1865m	95 5	SANDSTONE: as above. SILTSTONE: as above.
1865 - 1870m	90 10	SANDSTONE: quartzose, clear, white to pale grey, firm to hard, fine to coarse grained, dominantly medium grained, poorly sorted, angular to subangular, moderate porosity, no shows. SILTSTONE: as above.
1870 - 1875m	90 10	SANDSTONE: as above. SILTSTONE: as above.
1875 - 1880m	90 10	SANDSTONE: as above. SILTSTONE: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
1880 - 1885m	80	SANDSTONE: clear, white to pale grey, fine to very coarse grained, dominantly medium grained, angular to subangular, well sorted, contains clay matrix, trace pyrite, no shows.
	20	SILTSTONE: as above.
1885 - 1890m	20	SANDSTONE: as above.
	80	SILTSTONE: pale grey, soft, soluble, sticky, slightly quartzose, also a light grey calcareous component, firm, brittle, very argillaceous, trace pyrite.
1890 - 1895m	10	SANDSTONE: as above.
	90	SILTSTONE: as above, contains carbonaceous fragments.
1895 - 1900m	35	SANDSTONE: as above.
	65	SILTSTONE: as above, with abundant pyrite.
1900 - 1905m	90	SANDSTONE: quartzose, clear, white to pale grey, friable, medium to very coarse grained, perhaps conglomerate, angular to subangular, moderately sorted, clay matrix, trace pyrite, fair intergranular porosity, no shows.
	10	SILTSTONE: as above, trace carbonaceous matter.
1905 - 1910m	90	SANDSTONE: as above.
	10	SILTSTONE: as above.
1910 - 1915m	50	SANDSTONE: quartzose, clear, white to pale grey, friable, medium to very coarse grained, predominantly medium, subrounded to angular, moderately well sorted, clay matrix, trace pyrite, fair intergranular porosity, no shows.
	50	SILTSTONE: pale grey, light brown, soft, sticky, pale grey fraction is calcareous, firm, brittle, trace pyrite.
1915 - 1920m	50	SANDSTONE: quartzose, clear, white to pale grey, firm, medium to coarse grained, subrounded to angular, moderately well sorted, clay matrix, trace pyrite, fair intergranular porosity, no shows.
	50	SILTSTONE: as above, trace forams.
1920 - 1925m	70	SANDSTONE: quartzose, clear, white to pale grey, firm, medium to very coarse grained, predominantly medium, subrounded to angular, poorly sorted, clay matrix, trace pyrite, fair intergranular porosity, no shows.
	30	SILTSTONE: as above.
1925 - 1930m	80	SANDSTONE: quartzose, clear, white to pale grey, firm, medium to coarse grained, subrounded to angular, moderately well sorted, clay matrix, trace pyrite, fair intergranular porosity, no shows.
	20	SILTSTONE: as above.
1930 - 1935m	70	SANDSTONE: quartzose, clear, white to pale grey, firm, medium to coarse grained, occasionally very coarse, subrounded to angular, moderately well sorted clay matrix, trace pyrite, fair intergranular porosity, no shows.
	30	SILTSTONE: as above.
1935 - 1940m	100	SANDSTONE: as above.
	trace	SILTSTONE

<u>Interval</u>	<u>%</u>	<u>Description</u>
1940 - 1945m	100	SANDSTONE: white to clear to pale grey quartz, loose grains, coarse to rarely very coarse, dominantly coarse, subangular to rounded, well sorted, trace pyrite.
	trace	SILTSTONE
1945 - 1950m	95	SANDSTONE: medium dark grey to white to occasionally clear, loose quartz grains, coarse to very coarse grained, predominantly coarse, angular to subrounded, well sorted, rare very fine to medium grained quartz aggregates with argillaceous matrix, no fluorescence, no shows.
	5	MUDSTONE: composed of two fraction; <u>claystone</u> white to very light grey, very soft, water sensitive to soluble, sometimes interlaminated with dark carbonaceous material; <u>siltstone</u> brown to light grey, soft to firm and blocky to subfissile respectively, grades occasionally into friable, very fine to medium quartzose sandstone with argillaceous matrix.
	trace	COAL: dull, dirty black to brown, grading into a dark carbonaceous siltstone, black pieces harder and more brittle than the soft friable siltstone.
1950 - 1955m	70	SANDSTONE: as above.
	30	MUDSTONE: greater proportion of subfissile to fissile medium light grey to greenish grey siltstone, otherwise as above.
	trace	COAL: as above.
1955 - 1960m	95	SANDSTONE: predominantly coarse but more medium grain size, otherwise as above.
	5	MUDSTONE: as above, but less subfissile to fissile siltstone.
	trace	COAL: as above.
1960 - 1965m	100	SANDSTONE: as above.
	trace	MUDSTONE: as above.
1965 - 1970m	100	SANDSTONE: as above.
	trace	MUDSTONE: as above.
	trace	COAL: as above.
1970 - 1975m	40	SANDSTONE: as above.
	60	MUDSTONE: predominantly white to very light grey or buff, water sensitive claystone, occasionally grading to very fine grain sandstone with carbonaceous flecks; siltstone: greenish grey to very light grey or pale brown, soft to firm, blocky to subfissile, very slightly calcareous.
	trace	COAL: black and shiny to dull and dirty, firm, brittle, blocky.
1975 - 1980m	30	SANDSTONE: quartzose, clear, white to light grey, medium to very coarse grained, subrounded to angular, moderately well sorted, common argillaceous matrix, no fluorescence, no shows, trace pyrite.
	70	MUDSTONE: claystone, white to light grey, water sensitive, non calcareous, soft; siltstone, greenish grey to pale grey to light brown, soft to firm, blocky to subfissile, slightly calcareous, grading to very fine grained sandstone with carbonaceous flecks.
	trace	COAL: as above.

<u>Interval</u>	<u>%</u>	<u>Description</u>
1980- 1985m	70	SANDSTONE: quartzose, clear, white to very pale grey, medium to coarse grained, predominantly coarse, subrounded to angular, moderately sorted, quartz/pyrite aggregates, trace pyrite, no shows.
	30	MUDSTONE: as above, except larger pieces, very coarse, predominantly siltstone and very fine grained sandstone.
	trace	COAL: as above.
1985 - 1990m	70	SANDSTONE: as above.
	30	MUDSTONE: as above.
	trace	COAL: as above.
1990 - 1995m	70	SANDSTONE: quartzose, clear, white to very pale grey, medium to very coarse grained, predominantly coarse, subrounded to angular, moderately sorted, trace pyrite, no shows.
	30	MUDSTONE: siltstone as above, but grading to very fine grained sandstone with carbonaceous flecks, rare claystone, as above.
	trace	COAL: as above.
1995 - 2000m	45	SANDSTONE: as above.
	45	MUDSTONE: as above.
	10	COAL: as above.
2000 - 2005m	5	SANDSTONE: as above.
	95	SILTSTONE: variety of colours, white to very light grey, greenish grey, light brown, medium dark grey, - all quartzose. Lighter colours more argillaceous, grading to very fine grain sandstone, common carbonaceous flecks, soft to firm, water sensitive to friable and subfissile.
2005 - 2010m	90	SANDSTONE: as above.
	10	SILTSTONE: as above.
2010 - 2015m	100	SANDSTONE: as above, trace pyrite.
	trace	SILTSTONE: as above.
2015 - 2020m	100	SANDSTONE: as above, trace pyrite.
	trace	SILTSTONE: as above.
	trace	COAL: as above.
2021.0	100	SANDSTONE: as above.
Bottoms Up	trace	SILTSTONE: as above.
T.D.	trace	COAL: as above.

APPENDIX 2

OIL and GAS DIVISION

1 2 APR 1983

APPENDIX 2

CORE DESCRIPTIONS

ESSO AUSTRALIA LTD. CORE DESCRIPTION

Core No. 1 (Page 1)

Well SEAHORSE 2

Interval Cored 1482.0-1496.2 m, Cut 14.2 m, Recovered 12.8 m, (.90 %) Fm. Latrobe

Bit Type Chris RC4 Bit Size 8 1/2 in. Desc by Lindsay/Davidson Date 17/7/82

Depth & Coring Rate (m/hr)	Graphic	Shows	Interval (m)	Descriptive Lithology
20			1482	1482.0-1482.38, 1482.50-1484.80m CARBONACEOUS SILTSTONE: medium to dark grey brown, hard, brittle, slightly quartzose, very clay rich, contains carbonaceous matter, non calcareous, trace muscovite, subfissile.
			1483	1482.38-1482.50 BLACK COAL: dark brown to black, shiny, hard, brittle, conchoidal fracture.
			1484	1484.80-1484.95m SILTSTONE: medium grey, non carbonaceous, non calcareous.
			1485	1484.95-1485.36m BLACK COAL: shiny, black, hard, brittle, conchoidal fracture.
			1486	1485.36-1486.92m SANDSTONE: quartzose, olive grey, hard, brittle, fine to coarse grained, completely dolomitized, common muscovite flakes, has 80-90% bright yellow-gold fluorescence, no cut, no visual porosity.
			1487	1486.92-1488.20m SANDSTONE: quartzose, very light grey brown, unconsolidated, fine to coarse grained, dominantly medium; fair to good sorting, slightly calcareous cement, trace black opaque minerals, very good porosity, no fluorescence, no cut.
			1488	1488.20-1488.57, 1488.79-1489.17m SILTSTONE: dark brown to black interlaminated with light grey siltstone
			1489	quartzose, firm to hard, trace mica, trace pyrite, fissile.
			1490	1488.57-1488.79, 1489.17-1491.75m BLACK COAL: dark brown to shiny black, finely interlaminated, firm, brittle, subfissile, conchoidal fracture in parts.
			1491	1491.75-1492.61m SILTSTONE: dark grey to brown, very carbonaceous, very hard, well sorted, subfissile, finely laminated, with rare thin white very fine quartzose sands.

ESSO AUSTRALIA LTD CORE DESCRIPTION

Core No. 1 (Page 2)

Well SEAHORSE 2

Interval Cored 1482.0 - 1496.2 m, Cut 14.2 m, Recovered 12.8 m, (.90 %) Fm. Latrobe
 Bit Type Chris RC4 Bit Size 8½ in. Desc by Lindsay/Davidson Date 17/7/82

Depth & Coring Rate (m/hr)	Graphic	Shows	Interval (m)	Descriptive Lithology												
20 0 x10			1492	<u>1492.61-1493.51m</u> BLACK COAL: dark brown to shiny black, finely interlaminated, firm, brittle, subfissile to partly conchoidal fracture.												
			1493	<u>1493.51-1494.72m</u> CARBONACEOUS SILTSTONE: dark grey to brown, very carbonaceous, hard, well sorted, gradin to mudstone, subfissile to partly conchoidal fracture, finely laminated.												
			1494	<u>1494.72-1494.80m</u> SANDSTONE: dark grey to brown, to white, friable, very fine to medium grained quartz, finely interbedded, angular to subangular, no fluorescence, no shows.												
			1495	<u>1494.80 - 1496.20</u> No Recovery.												
			1496													
			1497	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Note:</td> <td style="width: 25%;">Driller</td> <td style="width: 25%;">Corelab</td> </tr> <tr> <td>Started Coring</td> <td>1482.0m</td> <td>1482.0m</td> </tr> <tr> <td>Finished Coring</td> <td>1497.0m</td> <td>1496.2m</td> </tr> <tr> <td>Cored</td> <td>15.0m</td> <td>14.2m</td> </tr> </table> <p>The two parties were not able to come to an agreement over the discrepancy.</p>	Note:	Driller	Corelab	Started Coring	1482.0m	1482.0m	Finished Coring	1497.0m	1496.2m	Cored	15.0m	14.2m
Note:	Driller	Corelab														
Started Coring	1482.0m	1482.0m														
Finished Coring	1497.0m	1496.2m														
Cored	15.0m	14.2m														

ESSO AUSTRALIA LTD.
CORE DESCRIPTION

Core No. 2 (Page 1)

Well SEAHORSE 2

Interval Cored 1496.2-1509.2 m, Cut 13.00 m, Recovered 12.00 m, (92.3%) Fm. Latrobe

Bit Type Chris. RC-4 Bit Size 8-1/2 in. Desc by LINDSAY/DAVIDSON Date 17/7/82

Depth & Coring Rate (m/hr)	Graphic	Shows	Interval (m)	Descriptive Lithology
20			1496	1496.2-1497.52m SILTSTONE: medium light grey, firm and friable, well sorted silt, very calcareous cement finely laminated and subfissile, rare forams and ostracods, grading to SILTSTONE/SANDSTONE, non calcareous, fine to medium sandstone and carbonaceous siltstone.
			1497	1497.52-1497.68m COAL
			1498	1497.68-1498.0m SANDSTONE: medium grey to medium dark grey, quartzose, firm to friable, medium to very coarse angular to subangular grains, slightly calcareous cement.
			1499	1498.0-1499.65m CARBONACEOUS SILTSTONE: dark grey to brown, very carbonaceous, firm, subfissile, quartzose, trace mica, trace coal, slightly calcareous cement.
			1500	1499.65-1499.75, 1500.02-1501.55 BLACK COAL: dark brown to black, earthy to shiny, subfissile to conchoidal fracture.
			1501	1499.73-1500.02, 1501.55-1502.42m CARBONACEOUS SILTSTONE: brown to dark grey, interbedded with shiny black coal. The siltstone is quartzose, micaceous and firm to hard
			1502	1502.42-1503.6m SANDSTONE: quartzose, clear to white-grey, coarse at top of section and medium at base, reasonably well sorted, rounded to subrounded, abundant muddy grey clay matrix, good porosity, no shows.
			1503	1503.6-1504.27m SILTSTONE: quartzose, medium grey brown, soft to firm, minor amounts of fine to medium grained sand in an abundant muddy clay/silt matrix.
			1504	1504.27-1508.2m SANDSTONE: quartzose, very light grey brown to dark grey brown, clear to translucent quartz grains, firm to friable, fine to very coarse coarsening downwards, rounded to subangular, poor to moderately well sorted, moderate amount of muddy clay matrix, trace muscovite flakes, trace black opaque minerals, fair to good intergranular porosity and permeability, no fluorescence, no cut.
			1505	

41/

ESSO AUSTRALIA LTD. CORE DESCRIPTION

Core No. 2 (Page 2)

Well SEAHORSE 2

Interval Cored 1496.2-1509.2 m, Cut 13.00 m, Recovered 12.00 m, (.92.3%) Fm. Latrobe
Bit Type Chris. RC-4 Bit Size 8-1/2 in. Desc by LINDSAY/DAVIDSON Date 17/7/82

Depth & Coring Rate (m/hr)	Graphic	Shows	Interval (m)	Descriptive Lithology
20 0			1506	1508.2-1509.2m No Recovery
x10	[Dotted pattern]		1507	
x10	[Dotted pattern]		1508	
x10	[Cross-hatched pattern]		1509	

APPENDIX 3

OIL and GAS DIVISION

12 APR 1983

APPENDIX 3

SIDEWALL CORE DESCRIPTIONS

SEAHORSE 2

Sidewall Core Descriptions				
No.	Depth (m)	Rec. (mm)	Lithology	Description
1	2006.9	17	Sandstone	White, grey, to dark grey, fine to silty grained, subrounded, poorly sorted, friable, quartzose, argillaceous, silty, carbonaceous, micaceous, no shows, 0.5 units total gas.
2	2004.0	28	Siltstone	Dark grey to brown, clay rich, firm, carbonaceous, pyritic, micaceous, silty, 0.7 units total gas.
3	1967.0	21	Sandstone	White to grey, medium grained to fine grained, silty, subrounded to subangular, poorly sorted, friable, trace calcareous material, quartzose, argillaceous, mica, pyritic, no shows, 0.3 units total gas.
4	1964.0	22	Sandstone	White to grey, medium grained, subangular to subrounded, moderately sorted, friable, quartzose, argillaceous, silty, micaceous, pyritic, no shows, 0.4 units total gas.
5	1953.0			Misfired.
6	1915.0	21	Sandstone	Light grey, fine grained, subangular to subrounded, well sorted, firm, quartzose, argillaceous, silty, micaceous, pyritic, no shows, 0.2 units total gas.
7	1895.0	24	Sandstone	Light grey to dark grey, fine grained, silty, subangular to subrounded, poorly sorted, firm, quartzose, argillaceous, pyritic, micaceous, no shows, 0.3 units total gas.
8	1887.0	40	Siltstone	White to light grey, fine grained, poorly sorted, firm, quartzose, argillaceous, slightly carbonaceous, trace calcareous, 0.3 units total gas.
9	1868.0	18	Sandstone	Light grey, fine to coarse grained, subangular to subrounded, moderately sorted, firm to friable, quartzose, trace argillaceous, no shows, 0.3 units total gas.
10	1841.0	34	Siltstone	White to light grey, fine to silty, subangular, poorly sorted, firm, slightly calcareous, quartzose, very argillaceous, 0.7 units total gas.
11	1834.0	33	Siltstone	Medium dark grey, silty, firm to hard, quartzose, clayey, pyritic, 0.8 units total gas.
12	1813.0	40	Claystone	White to buff, soft, slightly calcareous, quartzose, micaceous, 0.9 units total gas.
13	1803.0	24	Siltstone	Dark brown, silty, hard, carbonaceous, quartzose, clayey, 1.2 units total gas, trace coal.

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Lithology</u>	<u>Description</u>
14	1791.5	18	Siltstone Sandstone	Dark brown, silty, firm, carbonaceous, quartzose, clayey, 0.8 units total gas. Light grey, fine grained, moderately sorted, subangular to subrounded, friable, quartzose, silty, clayey, no shows.
15	1766.0	25	Sandstone	Medium light grey, fine to silty grained, moderately sorted, subangular to subrounded, firm, quartzose, silty, clayey, no shows, 0.5 units total gas.
16	1750.0	35	Sandstone	Medium light grey, fine to very coarse grained, subangular, poorly sorted, friable to hard, quartzose, silty, clayey, no shows, 0.5 units total gas.
17	1745.9	18	Siltstone	Grey brown, silty, clayey, firm to hard, quartzose, carbonaceous, 0.5 units total gas.
18	1741.0	30	Claystone Sandstone	Grey brown, firm, clayey, 0.5 units total gas. Light medium grey, fine to very fine grained, moderately sorted, subangular to subrounded, friable, slightly calcareous, quartzose, clayey, no shows.
19	1738.0	24	Sandstone Claystone	Light grey, fine to very fine grained, well sorted, subangular to subrounded, very hard, quartzose, no shows, 0.7 units total has, silica cement? Brown grey, soft, carbonaceous.
20	1732.9	28	Sandstone	Light grey, fine to medium grained, well sorted, subangular to subrounded, hard, quartzose, micaceous, no shows, 0.7 units total gas.
21	1722.5	40	Sandstone	Light grey, medium grained, well sorted, subangular to subrounded, very friable, slightly calcareous, quartzose, micaceous, no shows, 0.5 units total gas.
22	1717.0	30	Claystone	Very light grey, firm, slightly calcareous, trace mica, 0.5 units total gas.
23	1698.0	42	Sandstone	Very light grey, medium grained, well sorted, subangular to subrounded, firm to friable, quartzose, no shows, 0.5 units total gas.
24	1695.0	22	Siltstone	Medium grey, silty, firm, quartzose, clayey, 0.3 units total gas.
25	1673.0	42	Sandstone	Very light grey, medium to coarse grained, well sorted, subangular to subrounded, firm to friable, slightly calcareous, quartzose, opaques, 0.8 units total gas.
26	1670.0	25	Claystone	Very pale grey, clayey, firm, 0.5 units total gas.

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Lithology</u>	<u>Description</u>
27	1655.0	42	Sandstone	Very light grey, medium to coarse grained, moderately sorted, angular to subrounded, friable, slightly calcareous, quartzose opaques, no shows, 0.4 units total gas.
28	1645.0	25	Conglomerate	Very light grey, medium grained, poorly sorted, subangular to subrounded, firm, quartzose, no shows, 0.8 units total gas.
29	1643.0	40	Sandy Claystone	Medium light grey, medium grained and clayey, bimodal, subangular to subrounded, firm, quartzose, pyritic, 0.4 units total gas.
30	1639.0	41	Sandy Claystone	Medium light grey to brown, coarse grained and clayey, bimodal, angular to subangular, firm, quartzose, pyritic, 0.5 units total gas.
31	1619.0	32	Sandstone	Light grey, medium grained, moderately sorted, subrounded to subangular, firm, slightly calcareous, quartzose, trace opaques, 100% even bright blue white fluorescence, bright blue white cut, light, clear residue, 0.8 units total, trace C ₅ .
32	1615.0	32	Claystone	Pale grey, clayey, firm, 0.5 units total gas.
33	1609.0	40	Claystone	Light grey, clayey, firm, slightly calcareous, 0.2 units total gas.
34	1603.0	15	Sandstone	Light grey to black, fine grained, well sorted, subangular to subrounded, firm, quartzose, carbonaceous, 10% spotty dull blue white fluorescence, bright blue white cut, light, clear residue, 1.7 units total gas, C ₆ .
35	1580.0	18	Conglomerate	Grey brown, granular, poorly sorted, subangular to subrounded, friable, very calcareous, quartzose, clayey, trace spotty dull blue white fluorescence, faint blue white cut, 1 unit total gas, C ₆ .
36	1571.0	15	Claystone	Light grey to brown, clayey, soft, slightly calcareous, quartzose, 0.6 units total gas.
37	1567.0	12	Siltstone	Light grey to brown, firm to hard, silty, quartzose, clayey, 0.8 units total gas.
38	1564.0	28	Sandstone	Light grey to brown, fine to very coarse grained, moderately sorted, subangular to subrounded, friable, quartzose, clayey, moderately calcareous, trace pinpoint bright blue white fluorescence, 0.4 units total gas, trace C ₃ only.

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Lithology</u>	<u>Description</u>
39	1562.5	25	Sandstone	Pale grey, medium grained, very well sorted, subangular to subrounded, hard to friable, quartzose, clayey, opaques, moderately calcareous, 60% even bright blue white fluorescence, bright blue white cut, trace clear residue, 1.5 units total gas, trace C ₃ only.
40	1549.5	23	Sandstone	Light grey, medium grained, rounded to subrounded, very well sorted, friable, quartzose, clayey, moderately calcareous, 40% even dull blue white fluorescence, bright blue white cut, trace clear residue, 1.5 units total gas, trace C ₄ only.
41	1526.9	14	Sandstone	Pale grey, fine to very fine grained, rounded to subrounded, very well sorted, hard to friable, quartzose, clayey, carbonaceous, no shows, 0.3 units total gas, C ₁ only.
42	1523.0	37	Claystone	Grey white, clayey, soft, 0.5 units total gas.
43	1511.4	30	Sandstone	Grey, fine to very coarse grained, moderately sorted, subangular to subrounded, friable, quartzose, opaque, 0.6 units total gas, no shows.
44	1480.9	22	Claystone	Dark brown, clayey, firm, carbonaceous, silty, 1.3 units total gas.
45	1462.5	25	Claystone	Very dark brown, firm, clayey, carbonaceous, 220 units total gas.
46	1455.5	23	Sandstone	Medium grey, fine to very coarse grained, poorly sorted, subangular to subrounded, friable, moderately calcareous, quartzose, 40% even dull blue white fluorescence, faint blue white cut, 158 units total gas, trace C ₅ .
47	1454.4	30	Sandstone	Medium grey, very fine grained, well sorted, subangular to subrounded, firm, quartzose, no shows, 324 units total gas, trace C ₆ .
48	1452.0	24	Siltstone	Medium dark grey, silty, firm, quartzose, clayey, 320 units total gas, trace C ₆ .
49	1451.0	26	Siltstone	Medium dark grey, firm, silty, clayey, quartzose, trace calcareous, 322 units total gas.
50	1444.5	34	Claystone/ Coal	Dark brown, hard, 60 units total gas.
51	1442.0	30	Sandstone	Light grey, fine to very fine grained, well sorted, subangular to subrounded, hard, quartzose, pyritic, clayey, 190 units total gas.
52	1441.0	35	Claystone	Medium dark grey, firm, clayey, carbonaceous, 149 units total gas.

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Lithology</u>	<u>Description</u>
53	1437.0	40	Siltstone	Dark grey, firm, silty, slightly calcareous, carbonaceous, quartzose, 132 units total gas.
54	1436.5			Pulled off, no recovery.
55	1436.0	35	Claystone	Light grey to dark grey, firm, clayey, carbonaceous, quartzose, 100 units total gas.
56	1425.0	42	Claystone	Dark grey, hard, clayey, 26 units total gas.
57	1422.0	30	Siltstone	Dark grey, silty to very fine grained, well sorted, carbonaceous, quartzose, micaceous, 50 units total gas.
58	1415.0	38	Siltstone	Brown to medium dark grey, silty to very fine grained, well sorted, firm to friable, moderately calcareous, carbonaceous, quartzose, glauconite, pyritic, very common green glauconite and very fine grained pyritic agglomerates.
59	1413.0	48	Siltstone	Dark grey, silty, firm to friable, moderately calcareous, glauconite, quartzose, micaceous, very common green glauconite, soft.
60	1409.9	45	Siltstone	Dark grey, silty to clayey, firm, moderately calcareous, glauconitic, argillaceous, micaceous, quartzose, very common green glauconite, soft.
61	1406.9	52	Siltstone	Dark grey, firm, silty, glauconitic, micaceous, quartzose, very calcareous, green glauconite common but less than above.
62	1405.0	58	Siltstone	Medium dark grey, silty, firm, glauconitic, micaceous, quartzose, very calcareous, 0.3 units total gas.
63	1402.0	39	Siltstone	Dark grey with green pellets, firm, silty, glauconitic, micaceous, quartzose, pyritic, very calcareous, very very common (more than 50%) green glauconite, micropyrrite aggregates.
64	1399.0	47	Siltstone	Dark grey with green pellets, firm, silty, glauconitic, micaceous, quartzose, pyritic, very calcareous, very common (approx 30%) green glauconite.
65	1396.0	50	Siltstone	Medium dark grey, firm, silty, glauconitic, micaceous, quartzose, pyritic, very calcareous.
66	1393.0			Pulled off, no recovery.
67	1390.0	57	Siltstone	Medium dark grey, silty, firm, glauconitic, micaceous, quartzose, argillaceous, common green glauconite (30%).

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Lithology</u>	<u>Description</u>
68	1386.9	47	Siltstone/ Claystone	Medium grey, silty to clayey, subfissile to firm, quartzose, micaceous, argillaceous, very calcareous.
69	1384.0	43	Claystone/ Siltstone	Medium grey, silty, clayey, firm, trace glauconite, quartzose, argillaceous, very very calcareous, trace of fossils, forams.
70	1381.0	25	Claystone	Medium grey, soft, clayey, very argillaceous, very calcareous, very soft and sticky clay.
71	1378.0	45	Siltstone/ Claystone	Medium light grey, silty, clayey, firm, argillaceous, quartzose, micaceous, very calcareous, subfissile.
72	1375.0	56	Siltstone/ Claystone	Medium light grey, clayey, silty, soft to firm, argillaceous, quartzose, very calcareous.
73	1372.0	40	Siltstone/ Claystone	Medium light grey, clayey, silty, firm, very argillaceous, very calcareous.
74	1369.0	58	Siltstone/ Claystone	Medium light grey, clayey, silty, firm, very argillaceous, very calcareous.
75	1366.0	60	Claystone	Medium grey, clayey, silty, firm, very argillaceous, very calcareous.
76	1362.9	50	Siltstone	Medium grey, silty to very fine grained, firm to friable, quartzose, very calcareous.
77	1360.0	52	Siltstone	Medium grey, silty to very fine grained, firm to friable, very argillaceous, very calcareous, dark medium grain unknown.
78	1354.0	52	Siltstone	Medium dark grey, silty, firm to friable, quartzose, micaceous, pyritic, argillaceous, very calcareous.
79	1348.0	45	Siltstone	Medium grey, silty, firm, forams.
80	1342.0	60	Claystone/ Siltstone	Medium grey, clayey, firm to soft, very argillaceous, very calcareous.
81	1336.0	35	Siltstone	Medium grey, firm, silty, very calcareous.
82	1330.0	45	Siltstone/ Claystone	Medium dark grey, silty, firm, very argillaceous, micaceous, quartzose, very calcareous.
83	1324.0	20	Claystone	Medium dark grey, soft, clayey, very argillaceous, very calcareous.
84	1318.0	35	Claystone/ Siltstone	Medium light grey, silty to clayey, soft to firm, very argillaceous, very calcareous.
85	1312.0	43	Claystone	Medium dark grey, clayey, soft to firm, very argillaceous, forams.
86	1306.0	45	Claystone/ Siltstone	Medium grey, silty, soft to firm, very argillaceous, very calcareous.

<u>No.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Lithology</u>	<u>Description</u>
87	1300.0	45	Claystone/ Siltstone	Medium grey, silty, firm, very argillaceous, very calcareous.
88	1294.0	44	Claystone	Medium dark grey, clayey, soft to firm, very argillaceous, very calcareous.
89	1288.0	39	Claystone	Medium dark grey, soft to firm, clayey, very argillaceous, very calcareous.
90	1282.0	48	Claystone	Medium grey, clayey, soft to firm, moderately argillaceous, very calcareous.
91	1276.0	40	Claystone	Medium grey, clayey, soft to firm, very argillaceous, moderately calcareous.
92	1269.9	45	Claystone	Medium dark grey, clayey, soft to firm, very argillaceous, quartzose, moderately calcareous, forams
93	1264.0	38	Claystone	Medium dark grey, clayey, firm to hard, very calcareous, pyritic, very argillaceous.
94	1258.0	45	Claystone	Medium light grey, clayey to silty, firm, very calcareous, very argillaceous, forams, ostracods.
95	1252.0	40	Claystone	Medium dark grey, clayey to silty, firm, very calcareous, very argillaceous.
96	1246.0	40	Claystone	Medium dark grey, clayey to silty, firm, very calcareous, very argillaceous.
97	1240.0	40	Claystone	Medium grey, clayey, soft to firm, very calcareous, very argillaceous.
98	1234.0	44	Claystone	Medium grey, clayey, soft to firm, very calcareous, very argillaceous.
99	1228.0	48	Claystone	Medium dark grey, clayey, soft to firm, very argillaceous, very calcareous.
100	1222.0	55	Claystone	Medium dark grey, clayey, firm, very argillaceous, very calcareous.
101	1216.0	45	Siltstone/ Sandstone	Medium dark grey, silty to very fine grained sandstone, firm, very argillaceous, very calcareous, forams.
102	1210.0	4	Siltstone/ Claystone	Medium dark grey, silty to clayey, firm, very calcareous, very argillaceous.

APPENDIX 4

OIL and GAS DIVISION

12 APR 1983

APPENDIX 4

VELOCITY SURVEY REPORT

MARINE VELOCITY SURVEY

Well SEAHORSE-2
Basin GIPPSLAND

INTRODUCTION

Esso Personnel Brett Hardiman
Contractor Velocity Data Pty Ltd

Supplied (1) Instruments.
(2) Personnel

Seismic Observer..... T. Pooley
Marine Shooter M. O'Driscoll
Navigation..... N/A

(3) Licenced Shooting Boat

Name..... N/A
Date Loaded.....
Date Released.....
Agent.....

(4) Seismic Source

Gas Gun
Gas Pressures..... 25 sec fill
Oxygen..... 90psi
Propane..... 45psi

Personnel and Instruments

assembled at Sale Date 21.7.82
Boarded (rig) .. Southern Cross Date 21.7.82
Date of survey 22.7.82
Casing Depth .13 3/8" @ 780 m RKB
.....
T.D. when shot 2021m RKB
water depth 42.6metres

SURVEY PROCEDURE

Weather: Wind 15 → 20 Gusting 30
Swell Low
Sea 1 - 1m N.E. up to 3m
Rig Movement Low
Rig Noise Moderate

Hydrophones: Number..... Two
 Depth below sea level 9.14.....metres
 Position . One at top of gun and one in
 . moonpool.....
 Gas Gun: number of shots per level ... Variable.....
 gun depth 12.2.....metres
 Well phone positioning:
 No of depths 14.....
 Time: first shot 0545.....
 last shot 0748.....
 Total rig time 3 hrs.....

RESULTS

Quality of results (good 22.....
 (fair 10.....
 (poor 1.....
 (not used 1.....

Comparison of Interval Times with Sonic Log
 / / average 15.5.....microsec/metre
 / / max 40.0.....microsec/metre

CONCLUSION

Reliability of T-D curve Fair.....

COMMENTS

VELOCITY SURVEY ERROR CHECK

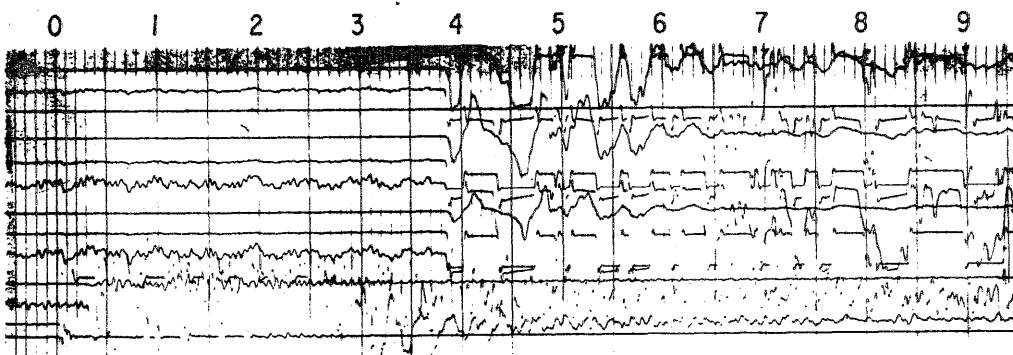
Depth I.S.L. (m)	Av. Vertical Travel Time (check shots)	Ti Check Shots (sec.)	Ti Sonic Log (sec.)	Δ (Milliseecs.) Ti - Ti Check Sonic	Depth Interval (m.)	Error (Microsec. per m.)
779	0.3335	.0511	.0498	1.3	150	8.7
929	0.3846					
929	0.3846	.0467	.0497	-3.0	150	20.0
1079	0.4313					
1079	0.4313	.0587	.0578	0.9	150	6.0
1229	0.490					
1229	0.490	.068	.0618	6.2	155	40.0
1384	0.558					
1384	0.558	.023	.0229	0.1	60	1.7
1444	0.581					
1444	0.581	.033	.0306	2.4	87	27.6
1531	0.614					
1531	0.614	.019	.0192	-0.2	60	3.3
1591	0.633					
1591	0.633	.020	.0188	1.2	60	20.0
1651	0.653					
1651	0.653	.023	.0237	-0.7	78	9.0
1729	0.676					
1729	0.676	.024	.0224	1.6	75	21.3
1804	0.700					
1804	0.700	.021	.0208	0.2	75	2.7
1879	0.721					
1879	0.721	.021	.0231	-2.1	80	26.3
1959	0.742					
1959	0.742	.0075	-	-	41	-
2000	0.7495					

SEAHORSE - 2

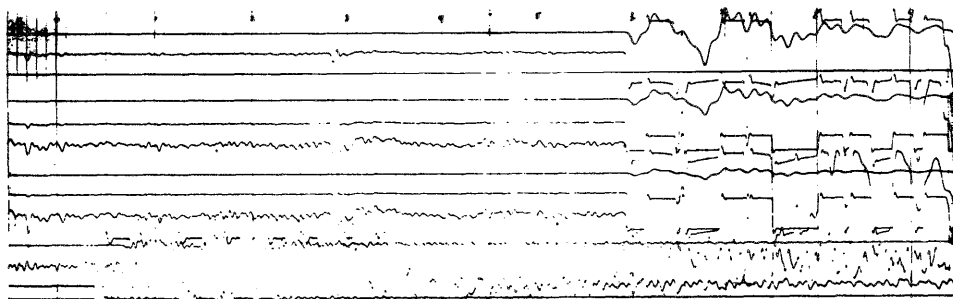
WELL VELOCITY RECORD

22/7/82

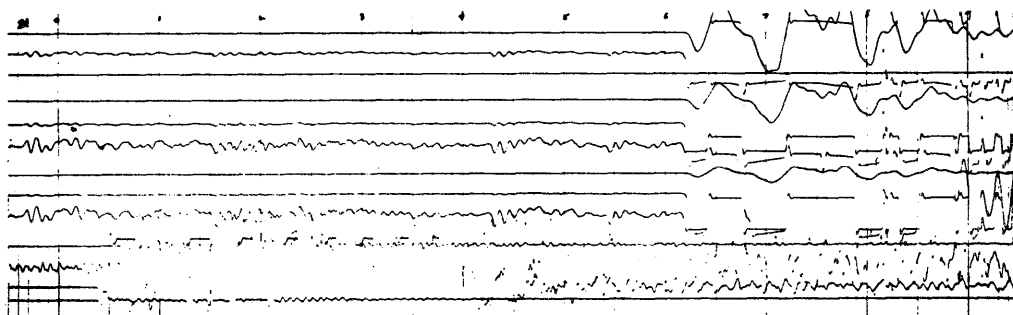
Rec. No. 32
950 m RKB



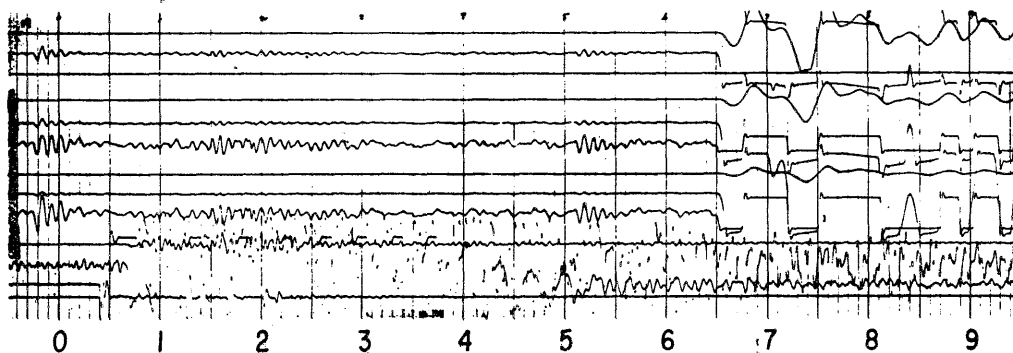
Rec. No. 2
1405 m RKB



Rec. No. 21
1465 m RKB



Rec. No. 19
1552 m RKB

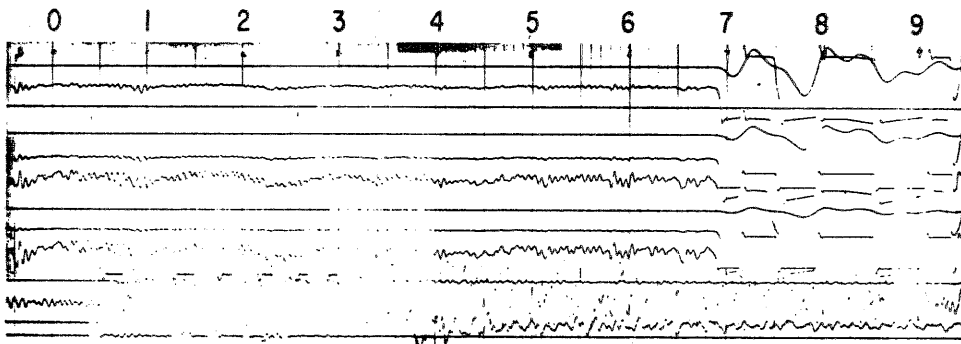


SEAHORSE - 2

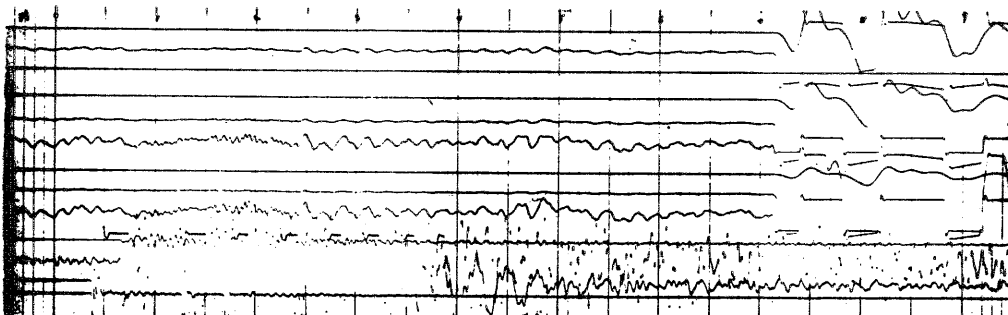
WELL VELOCITY RECORD

22/7/82

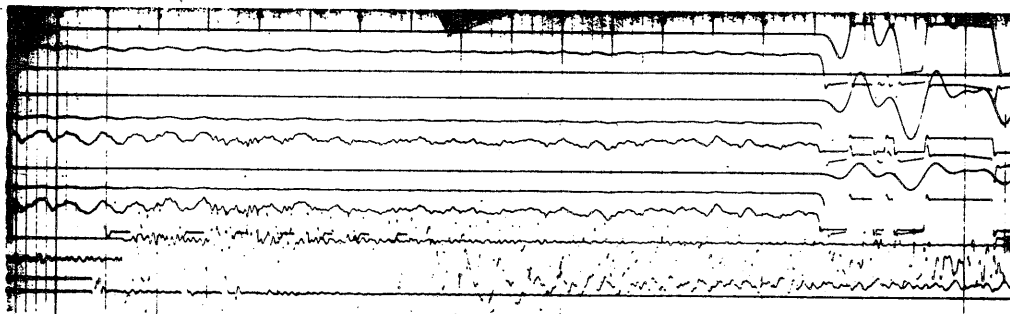
Rec. No. 3
1672 m RKB



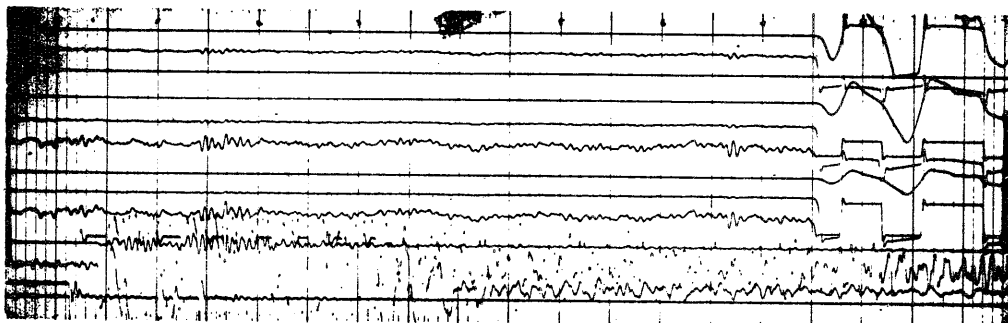
Rec. No. 14
1750 m RKB



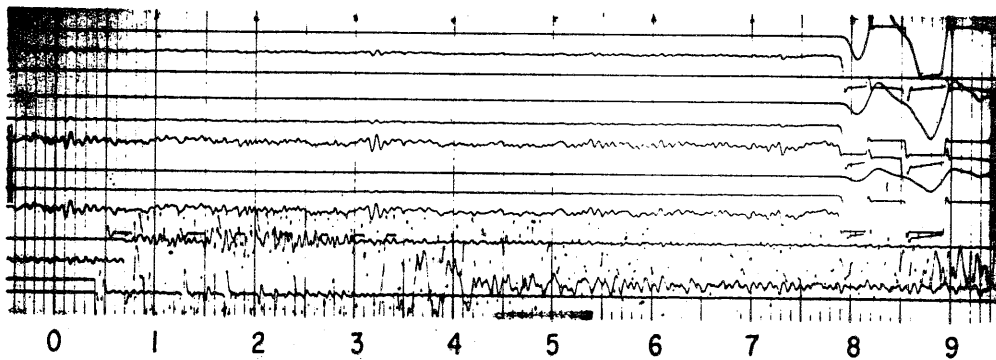
Rec. No. 10
1900 m RKB



Rec. No. 7
1980 m RKB



Rec. No. 6
2021 m RKB



ENCLOSURES

PE902639

This is an enclosure indicator page.
The enclosure PE902639 is enclosed within the
container PE902635 at this location in this
document.

The enclosure PE902639 has the following characteristics:

ITEM_BARCODE = PE902639
CONTAINER_BARCODE = PE902635
NAME = Sonic Callibration Curve
BASIN = GIPPSLAND
PERMIT =
TYPE = WELL
SUBTYPE = VELOCITY_CHART
DESCRIPTION = Sonic Callibration Curve
REMARKS =
DATE_CREATED = 22/07/82
DATE_RECEIVED = 12/04/83
W_NO = W780
WELL_NAME = Seahorse-2
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)

PE902636

This is an enclosure indicator page.
The enclosure PE902636 is enclosed within the
container PE902635 at this location in this
document.

The enclosure PE902636 has the following characteristics:

ITEM_BARCODE = PE902636
CONTAINER_BARCODE = PE902635
NAME = Time Depth Curve
BASIN = GIPPSLAND
PERMIT =
TYPE = WELL
SUBTYPE = VELOCITY_CHART
DESCRIPTION = Time Depth curve
REMARKS =
DATE_CREATED = 1/10/82
DATE_RECEIVED = 12/04/83
W_NO = W780
WELL_NAME = Seahorse-2
CONTRACTOR = ESSO
CLIENT_OP_CO = ESSO

(Inserted by DNRE - Vic Govt Mines Dept)