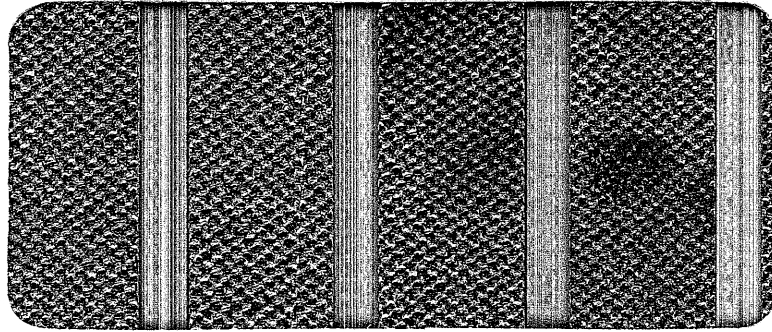


DEPT. NAT. RES & ENV



PE902420



WCR VOL 1

TURRUM-3

W899

ESSO EXPLORATION AND PRODUCTION
AUSTRALIA INC.

10/117

WELL COMPLETION REPORT
TURRUM-3 **W899**
BASIC VOLUME I 22 OCT 1985

OIL and GAS DIVISION

GIPPSLAND BASIN
VICTORIA

Dear Sir,

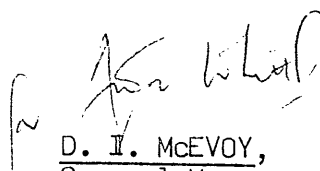
Enclosed are two copies of Volume I of the Turrum-3 Well Completion Report. The well was drilled in VIC/L3, spudded on March 8, 1985 and completed on April 22, 1985, as a successful extension.

The well reached a total depth of 2995 mKB however due to mechanical problems, wireline logs were only obtained to a depth of 2773 mKB. The primary L-1.4.2 objective yielded 12m of net gas sand and 6.25m of net oil sand between 2586.0 mKB and 2620.25 mKB.

The shallower "L" reservoirs were the secondary objective and yielded 63.50m of net gas sand and 2.5m of net oil sand between 2114 mKB and 2553 mKB.

Volume II of this Well Completion Report will follow in due course.

Yours faithfully,



D. I. McEVOY,
General Manager, Exploration.

Compiled by: W.MUDGE

AUGUST.1985

TURRUM-3
WELL COMPLETION REPORT
VOLUME 1
BASIC DATA

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2. Sidewall Core Descriptions and Gas Analyses
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1.

ESSO AUSTRALIA LTD

COMPLETION REPORT

WELL : TURRUM-3

LOCATION : Latitude : 38° 15' 41.05" S
Longitude : 148° 14' 58.96" E
X = 609,333mE
Y = 5,764,428mN
Map Projection: AMG Zone 55
Geographical Location: Bass Strait Victoria
Field: Turrum

PERMIT : VIC/L3

ELEVATION : 21 mKB

WATER DEPTH : 61m

TOTAL DEPTH : 2995 mDKB

PLUG BACK TYPE : Cement Plug

REASONS FOR PLUGGING BACK : Plug and Abandon

MOVE IN : 7th March 1985

SPUDED : 8th March 1985

REACHED T.D. : 11th April 1985

RIG RELEASED : 22nd April 1985

OPERATOR : Esso Exploration and Production Australia Inc.

PERMITTEE OR LICENCEE : BHP Petroleum Pty Ltd/EEPA

ESSO INTEREST : 50%

OTHER INTEREST : 50%

CONTRACTOR : South Seas Drilling Company

RIG NAME : Southern Cross

EQUIPMENT TYPE : Semi submersible

TOTAL RIG DAYS : 47

DRILLING AFE NO. : 234008

TYPE COMPLETION : Plug and Abandonment

WELL CLASSIFICATION : Before Drilling Outpost/Extension Test
After Drilling Successful Extension

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2.

OPERATIONS SUMMARY

TURRUM-3

Moving/Mooring

The Southern Cross departed the Perch-2 location at 1815 hours March 6, 1985 and arrived at the Turrum-3 location at 0800 hours March 7, 1985. The 48.5 nautical mile tow was completed in 13.75 hours at an average speed of 3.5 knots using the Atlas Dampier as the towboat.

An attempt by the rig to run Anchor No. 1 was aborted because its pendant wire was fouled on the flukes of Anchor No. 2. Anchor No. 8, which was disconnected at the completion of the Perch-2 well to enable repairs to No. 8 fairleader, was reconnected and dropped by the rig. The remaining anchors were run by the Torrens Tide, Swan Tide and Atlas Dampier. Due to the close proximity of the Halibut pipeline, the Flinders Tide was used to monitor the deployment of Anchors No. 3, 4, 5 and 6. An RCV was used to ensure that none of these anchors were within the 200m restricted zone adjacent to the pipeline. Anchor No. 7 was also checked with the RCV since it was within 1 km of pipeline. The RCV inspection revealed that Anchor No. 5 pendant wire was fouled on the anchor flukes and that Anchor No. 6 stabiliser bar was sheared off. Anchor No. 6 was replaced. Both anchors were rerun and checked with the RCV. All anchors were pretensioned to 200 kips.

Final rig location was: Latitude : 38° 15' 41.05" S
 Longitude : 148° 14' 58.96" E
 X : 609,333m E
 Y : 5,764,428m N

AMG Zone 55,
Universal Transverse Mercator Projection,
Australian Geodetic Datum.

The rig was located 2.24m at 207° from the called location and approximately 50 kms at 150° from Lakes Entrance.

Drill 26" Hole for 20" Casing

The drilling template was run and landed at a seafloor depth of 81m RKB. The 26" hole was drilled to 219m using seawater and high viscosity gel slugs to clean the hole. At TD the hole was displaced with high viscosity mud and a wiper trip was made to the seafloor.

The 18-3/4" wellhead/pile joint and 20" casing were run and cemented with the casing shoe at 203m. The BOP stack and riser were run and the casing and collet connector tested to 500 psi.

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

The cement and casing shoe were drilled out and the 17-1/2" hole was drilled to 806m using a seawater/gel mud system. A wiper trip was made to the 20" casing shoe and bottoms up was circulated prior to running a sonic log. Two attempts were made to run the sonic log but the tool malfunctioned on both occasions.

The 13-3/8" casing was run and cemented with the shoe at 791m. The plug was bumped with 1500 psi.

A Cameron 13-3/8" Lo Torque seal assembly was run, set and tested. The BOP stack was tested.

Drill 12-1/4" Hole

The float collar and cement were drilled out to 780m and the casing tested against the pipe rams to 1500 psi. The remaining cement, float shoe and 6m of new hole was drilled to 812m and a Phase II PIT was run to 1460 psi without leak-off (EMW 19.5 ppg at casing shoe).

The 12-1/4" hole was drilled to 1512m with a 9.1 ppg seawater/gel mud. At 1512m the mud weight was increased to 9.4 ppg in order to penetrate the Latrobe formation with a 300 psi overbalance.

Drilling continued to 1577m where a 9m, plastic liner core was cut. The corehole was reamed out and the 12-1/4" hole deepened to 2094m where a bit trip was made. At 2049m the mud weight was increased to 10.5 ppg, due to an increase in background gas units. Overpull of 50 to 100 kips was noted from 2066m to 1600m while pulling out of the hole. The bit and string stabiliser were found to be 1/4" undergauge. Approximately 12 hours was used to ream through undergauge hole from 2022m to 2094m with a new bit and stabiliser.

Drilling continued to 2597m where two cores were cut to 2601m. The corehole was reamed out and new hole drilled to 2618m where Core No. 4 was cut to 2623m.

Drilling continued to 2773m where one wireline log and eight RFT's were run. Drilling resumed to 2908m and Core No. 5 was cut to 2924m. A 3/8" undergauge stabiliser was changed out and approximately 18 hours were spent reaming back to bottom.

New hole was drilled to 2995m where control pressure to the BOP stack was lost. The divers were jumped and a leak was found on the yellow pod hose.

The drill string was hung off and while waiting on weather, preparations were made to release the lower marine riser package (LMRP). After the weather alert was lifted, the LMRP was disconnected and repairs were carried out to the pod hose. While attempting to retrieve the hang-off tool, the drill string was dropped to bottom when the 4-1/2" EUE connection between the doughnut and the hang-off joint failed. Although the entire fish was not recovered, fishing operations were successful in recovering the portion which extended across the hydrocarbon bearing hole section from 2620m to 2342m.

Plug and Abandonment

Plug No. 1 was set from 2769m to 2632m. The hole was circulated clean with no cement evident in the return. After waiting on cement (WOC) for six hours, an attempt was made to tag the plug. The cementing stinger was run to 2634m (2m past the calculated TOC) without locating the plug. After WOC for a further 3 hours the plug was tagged at 2649m with 15 kips and bottoms up was circulated. Plug No. 1 was tagged in order to ensure plug continuity through the hydrocarbon bearing interval from 2620m to 2342m. Bottoms up was circulated to check for possible gas migration through the cement.

Six more open hole plugs were set back to back from 2649m to 1495m. Bottoms up was circulated prior to setting each plug. Plug No. 8 was set across the 13-3/8" casing shoe from 830m to 735m and after making a gauge ring and junk basket run to 735m, the plug was pressure tested to 1300 psi. A 13-3/8" EZSV bridge plug was set at 666m and the 13-3/8" casing was explosively cut with a Pengo casing cutter at 180m. The 13-3/8" casing was recovered with a casing spear.

Plug No. 9 was set across the casing stub from 220m to 115m and pressure tested to 500 psi. The riser and BOP stack were pulled and the 20" casing was mechanically cut at 93m. The 20" casing could not be explosively cut because the hull to explosive charge depth was less than the 61m depth criteria required by South Seas Drilling. The drilling template, 4 post guide base and pile joint were recovered using the wellhead running tool.

Pulling Anchors

After waiting on boats to offload materials for the Whiting-2 well, all anchors were recovered in 11.75 hours. The divers monitored the bolstering of Anchor No. 2 to ensure it would not foul with Anchor No. 1.

The Southern Cross was taken under tow by the Lady Sally and departed the Turrum-3 location at 1300 hours April 22, 1985 enroute to the Whiting-2 location.

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4.

CEMENT DATA

WELL TURRUM-3

DATE 1985	DEPTH METRES	TYPE JOB	TYPE CEMENT	AMOUNT	ADDITIVES	REMARKS
March 09	203	Primary 20" Casing	Class "G"	750 sx	2.2% Gel mix water	Lead Slurry. Avg Slurry Density - 13.3ppg
March 09	203	Primary 20" Casing	Class "G"	350 sx		Tail Slurry Avg Slurry Density - 15.8 ppg
March 10	.791	Primary 13-3/8" Casing	Class "G"	1050 sx	Seawater	Avg. Slurry Density-15.8 ppg
April 16	2769 - 2649	P&A Plug #1	Class "G"	321 sx	0.8% HR6L w/ freshwater	Avg Slurry Density - 15.8ppg Tagged w/ 15 kips
April 17	2649- 2495	P&A Plug #2	Class "G"	400 sx	0.8% HR6L w/ freshwater	Avg Slurry Density - 15.8 ppg
April 17	2495 - 2358	P&A Plug #3	Class "G"	350 sx	0.8% HR6L w/ freshwater	Avg Slurry Density - 15.8 ppg
April 17	2358 - 2221	P&A Plug #4	Class "G"	360 sx	0.8% HR6L w/ freshwater	Avg Slurry Density - 15.8 ppg
April 17	2221 - 2084	P&A Plug #5	Class "G"	350 sx	0.8% HR6L w/ freshwater	Avg Slurry Density - 15.8 ppg
April 17	2084 - 1947	P&A Plug #6	Class "G"	350 sx	0.8% HR6L w/ freshwater	Avg Slurry Density - 15.8 ppg
April 17	1640 - 1505	P&A Plug #7	Class "G"	420 sx	freshwater	Avg Slurry Density-15.8 ppg Tagged w/ 15 kips @ 1495m
April 19	830 - 730	P&A Plug #8	Class "G"	300 sx	seawater	Avg Slurry Density-15.8 ppg Pressure tested to 1300 psi.

WELL: TURRUM-3

5. SAMPLES, CONVENTIONAL CORES, SIDEWALL CORES

<u>INTERVAL</u>	<u>TYPE</u>
210-2996m	Cuttings samples - 4 sets of washed and oven dried and 1 set of bagged and air dried cuttings. Sampled from 210-270m and 400-800m in 10m intervals Sampled from 270-400m; 800-1577m; 1586.3-2597.3m; 2601.5-2618.0m; 2623.3-2907.8m and 2924.3-2996m in 5m intervals
210-2996m	Unwashed canned samples for geochemistry collected at 15m intervals.
210-2996m	Washed and air dried cuttings canned in 30m intervals for fission track analysis.
1577-1586.3m	Core No.1, plastic sleeve, recovered 82.% (7.6m).
2597.3-2599.3m	Core No.2, recovered 58% (1.16m)
2599.3-2601.5m	Core No.3, recovered 77% (1.7m).
2618.0-2623.3m	Core No.4, recovered 94% (5.0m)
2907.8-2924.3m	Core No.5, recovered 100% (16.5m)
1460-2647m	Sidewall cores: Run No.1 shot 79, recovered 67.

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WELL: TURRUM-3

6.

WIRELINER LOGS AND SURVEYS

<u>Type and Scale</u>		<u>From</u>	<u>To</u>
<u>Suite 1</u>			
Sonic-GR	1:200 1:500	805.0	202.5m
<u>Suite 2</u>			
DLTE-MSFL-GR	1:200 1:500	2763.0	790.0m
LDTC-CNL-GR	1:200 1:500	2763.0	1515m
AMS	1:200	2760.0	779.0m
RFT-GR (Pressure Record)	Run 1		
RFT-HP (Pressure Record)	Run 1		
RFT-GR (Sample Record)	Runs 3-8		
RFT-HP (Sample Record)	Runs 3-8		
<u>Suite 3</u>			
BHC-GR	1:200 1:500	2688.0	791.0m
CST-GR	1:200	2647.0	1460.0m
RFT-GR (Sample Record)	Run 9		
RFT-HP (Sample Record)	Run 9		
WST Shot 12 levels		2695	600m

1571L/3

7.

SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - TURRUM-3

TEST	SEAT	DEPTH (METRES) K.B.	CHAMBER	RECOVERY (LITRES)			FORMATION WATER	MUD FILTRATE	HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS
				OIL	COND.	GAS			MPaa	Psia	MPaa	Psia	
			Litres	Litres	Litres m ³	Litres	Litres						
I	1	2695.2	Pretest						26.60	3857.9	33.24	4820.6	Valid
I	2	2644.3	Pretest						26.10	3785.6	32.66	4736.7	Valid
I	3	2635.0	Pretest						26.01	3772.4	32.54	4719.3	Valid
I	4	2621.5	Pretest						25.89	3755.1	32.36	4694.0	Valid
I	5	2609.5	Pretest						25.77	3737.8	32.22	4672.7	Valid
I	6	2595.2	Pretest						25.71	3729.1	32.01	4642.0	Valid
I	7	2587.7	Pretest						25.70	3727.6	31.89	4625.8	Valid
I	8	2551.5	Pretest						25.75	3734.1	31.44	4559.6	Valid
I	9	2547.5	Pretest						25.75	3734.4	31.41	4555.2	Valid
I	10	2526.2	Pretest						25.72	3731.0	31.14	4515.7	Valid
I	11	2518.0	Pretest						25.61	3713.8	31.06	4504.3	Valid
I	12	2502.8	Pretest						25.56	3707.3	30.86	4475.8	Valid
I	13	2491.5	Pretest						25.54	3704.9	30.71	4453.9	Valid
I	14	2475.5	Pretest						24.78	3594.4	30.51	4425.5	Valid
I	15	2442.0	Pretest						24.37	3534.2	30.10	4365.7	Valid
I	16	2435.9	Pretest						24.35	3531.7	30.04	4356.5	Valid
I	17	2423.2	Pretest						24.31	3526.2	29.88	4334.4	Valid
I	18	2377.0	Pretest						24.04	3486.8	29.29	4247.8	Valid
I	19	2350.4	Pretest						23.83	3456.5	28.97	4201.7	Valid
I	20	2343.9	Pretest						23.81	3454.0	28.90	4191.7	Valid
I	21	2331.1	Pretest						23.62	3425.2	28.74	4168.2	Valid
I	22	2320.0	Pretest						23.65	3429.8	28.63	4152.4	Valid
I	23	2301.3	Pretest						23.57	3417.9	28.38	4116.2	Valid
I	24	2266.8	Pretest						23.19	3363.1	27.97	4056.1	Valid
I	25	2201.0	Pretest						22.29	3233.6	27.17	3940.0	Valid
I	26	2189.9	Pretest						22.26	3227.9	27.04	3921.7	Valid
I	27	2181.2	Pretest						22.27	3230.7	26.93	3905.2	Valid
I	28	2162.5	Pretest						21.36	3097.3	26.70	3872.2	Valid
I	29	2156.5	Pretest						21.32	3092.5	26.62	3861.6	Valid
I	30	2152.5	Pretest						21.31	3091.3	26.60	3857.8	Valid

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SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - TURRUM-3

TEST SEAT	DEPTH (METRES) K.B.	CHAMBER	RECOVERY (LITRES)				HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS		
			OIL	COND.	GAS	FORMATION WATER	MUD FILTRATE	MPaa	Psia	MPaa		Psia	
			Litres	Litres	Litres m ³	Litres	Litres						
1	31	2114.0	Pretest					21.23	3079.2	26.10	3786.1	Valid	
1	32	2105.0	Pretest					21.15	3067.6	26.00	3771.7	Valid	
1	33	2021.0	Pretest					20.15	2922.1	24.97	3621.9	Valid	
1	34	2008.4	Pretest					20.09	2914.4	24.84	3602.9	Valid	
1	35	1971.4	Pretest					19.60	2843.1	24.38	3536.1	Valid	
1	36	1810.0	Pretest					17.75	2574.4	22.39	3246.7	Valid	
1	37	1694.5	Pretest					16.39	2377.2	20.98	3043.1	Valid	
1	38	1631.0	Pretest					15.64	2269.1	20.20	2929.9	Valid	
1	39	1585.0	Pretest					15.10	2190.7	19.65	2850.5	Valid	
1	40	1582.5	Pretest					15.08	2187.3	19.63	2847.2	Valid	
1	41	1579.0	Pretest					15.05	2182.6	19.58	2839.3	Valid	
1	42	1575.0	Pretest					15.01	2177.1	19.55	2834.8	Valid	
2		Terminated for wiper trip											
3	43	2606.5	Pretest					25.76	3736.2	32.42	4702.6	Valid pretest	
3	44	2609.5	22.7 3.8	5.25	0.71		13.5	25.77	3737.2	32.46	4708.3	Valid pretest sample taken Sample preserved	
4	45	2551.5	22.7 10.4		1.0	3.92		3.2	25.76	3736.1	31.72	4600.7	Valid pretest sample taken Sample preserved
5	46	2442.0	22.7 10.4		0.20 0.22	See Note* 1.23		6.0 1.0	24.34	3529.2	30.34	4400.8	Valid pretest sample taken *Gas reading lost; valve failure Sample taken
6	47	2331.0	Sampling abandoned						23.59	3420.8	28.95	4198.5	Tight
6	48	2330.7	Sampling abandoned						23.56	3416.5	28.94	4197.6	Tight
6	49	2331.2	Sampling abandoned						23.79	3450.0	28.94	4197.0	Tight

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SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - TURRUM-3

Page 3

TEST SEAT	DEPTH (METRES) K.B.	CHAMBER	RECOVERY (LITRES)			FORMATION WATER	MUD FILTRATE	HEWLETT-PACKARD FORMATION PRESSURE		HEWLETT-PACKARD HYDROSTATIC PRESSURE		REMARKS
			OIL	COND.	GAS			MPaa	Psia	MPaa	Psia	
		Litres	Litres	Litres m ³	Litres	Litres						
6	50	2319.5	Sampling abandoned					23.55	3415.8	28.80	4176.9	Tight
6	51	1579.0	22.7		0.63		18.0	15.04	2181.8	19.67	2852.4	Valid pretest, sample taken
			10.4		0.04		9.25					Sample taken (some gas lost)
7	52	2156.5	22.7		Film	0.41	19.40	21.32	3091.9	26.79	3884.9	Valid pretest. Sample taken
			10.4	1.00	0.52		6.00					Sample taken.
8	53	2618.4	Sampling abandoned					4.23	614	32.65	4735.2	Tight
8	54	2604.3	Sampling abandoned					25.82	3744.6	32.38	4682.4	Tight
8	55	2619.6	22.7	tr.	-	0.09	21.25	25.88	3753.3	32.47	4709.2	Valid pretest, sample taken
			10.4		0.25	0.04	9.25					Sample taken
9	56	2619.8	22.7	tr.	-	0.02	21.4	25.88	3753.5	32.42	4702.2	Valid pretest, sample taken
			10.4			tr	9.4					Sample taken

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8.

TEMPERATURE RECORD - TURRUM-3

LOGGING RUN	THERMOMETER DEPTH (m)	MAX. RECORDED TEMPERATURE (C°)	CIRCULATION TIME (t_k) (hours)	TIME AFTER CIRCULATION STOPPED (t)	HORNER TEMPERATURE (C°)	GEOHERMAL GRADIENT (C°/km)
<u>Suite 1</u>						
Sonic-GR	805.0	35.0	1.0	3.5 hrs		
<u>Suite 2</u>						
DLTE-MSFL-LDTC-CNL-GR (Combination Tool)	2763.0	94.4	2.0	7.5 hrs	104.8	35.21
RFT-GR (PRESSURE RECORD) Wiper Trip	2695.2	98.8	2.0	14.0 hrs		
RFT-GR (SAMPLES RECORD)	2606.5	107.0	2.0	27.0 hrs		
<u>Suite 3</u>						
BHC-GR	2688.0	83.3	2.75	5.0 hrs	112.2	35.06
RFT-GR (SAMPLES RECORD)	2619.8	97.0	2.75	10.5 hrs		
CST-GR	2647.0	97.7	2.75	22.0 hrs		

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FIGURES

LOCALITY MAP TURRUM - 3

SCALE 1:250 000

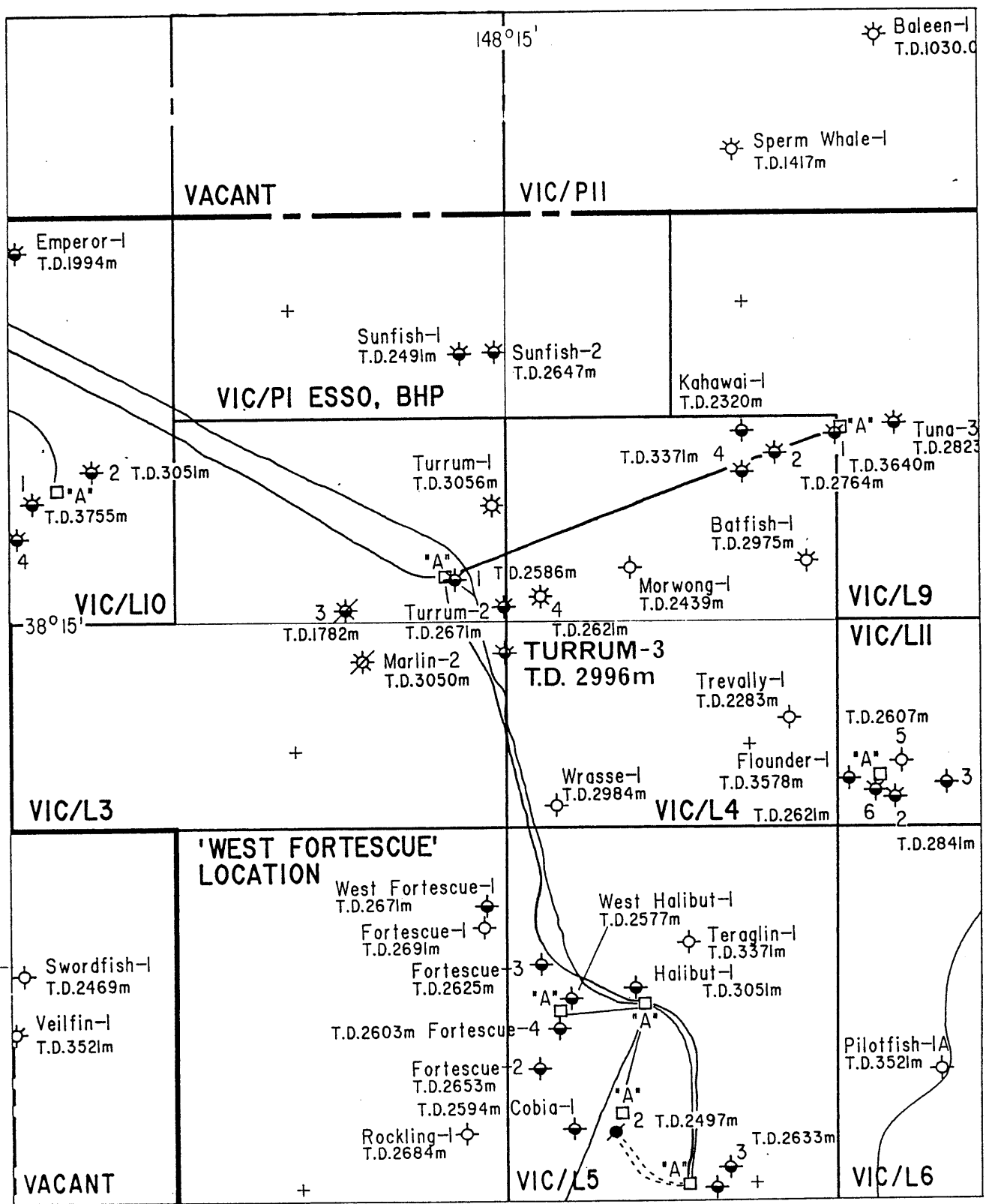


Figure 1

WELL PROGRESS CURVE

WELL: TURRUM-3

RIG: SOUTHERN CROSS

LITHOLOGY

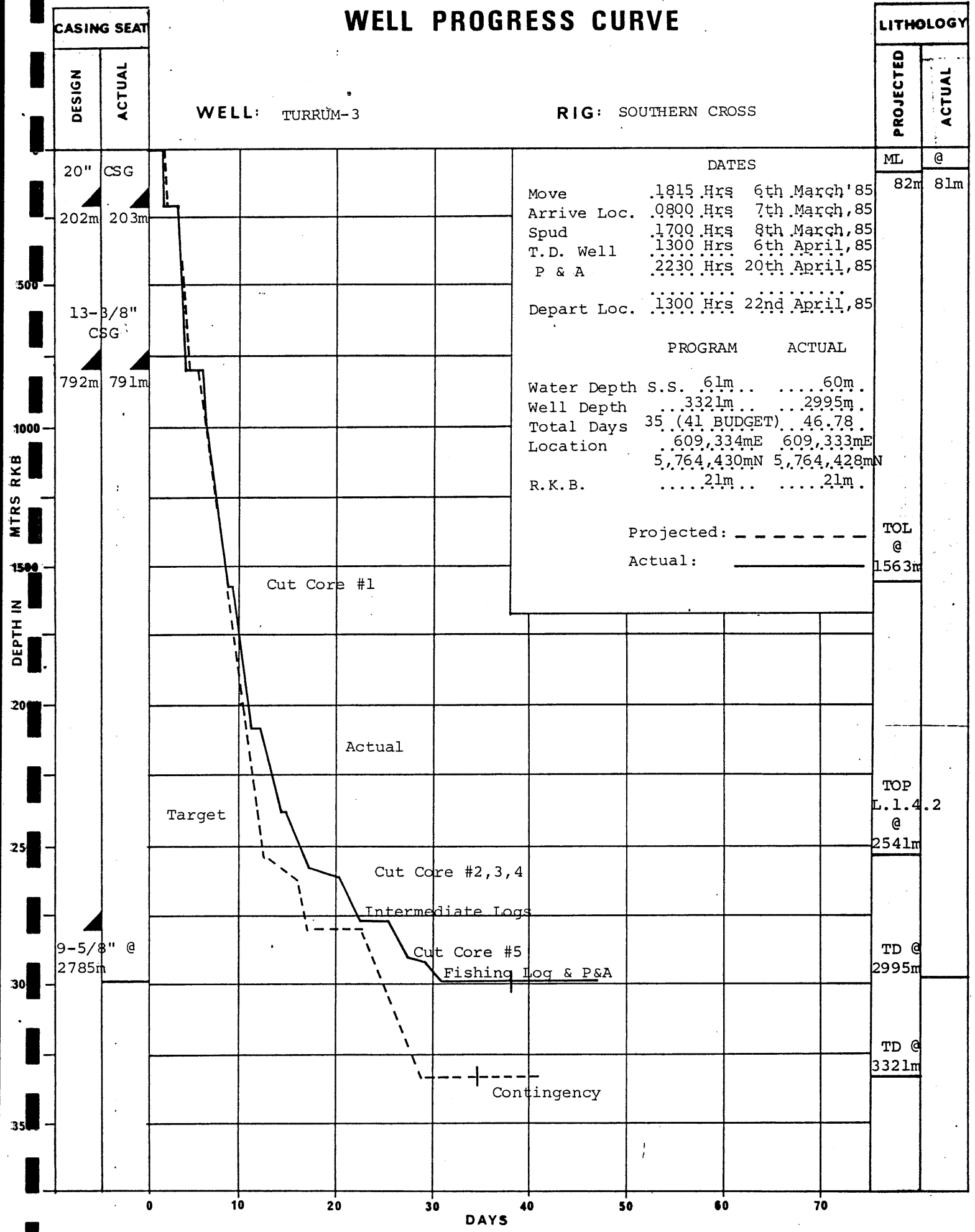
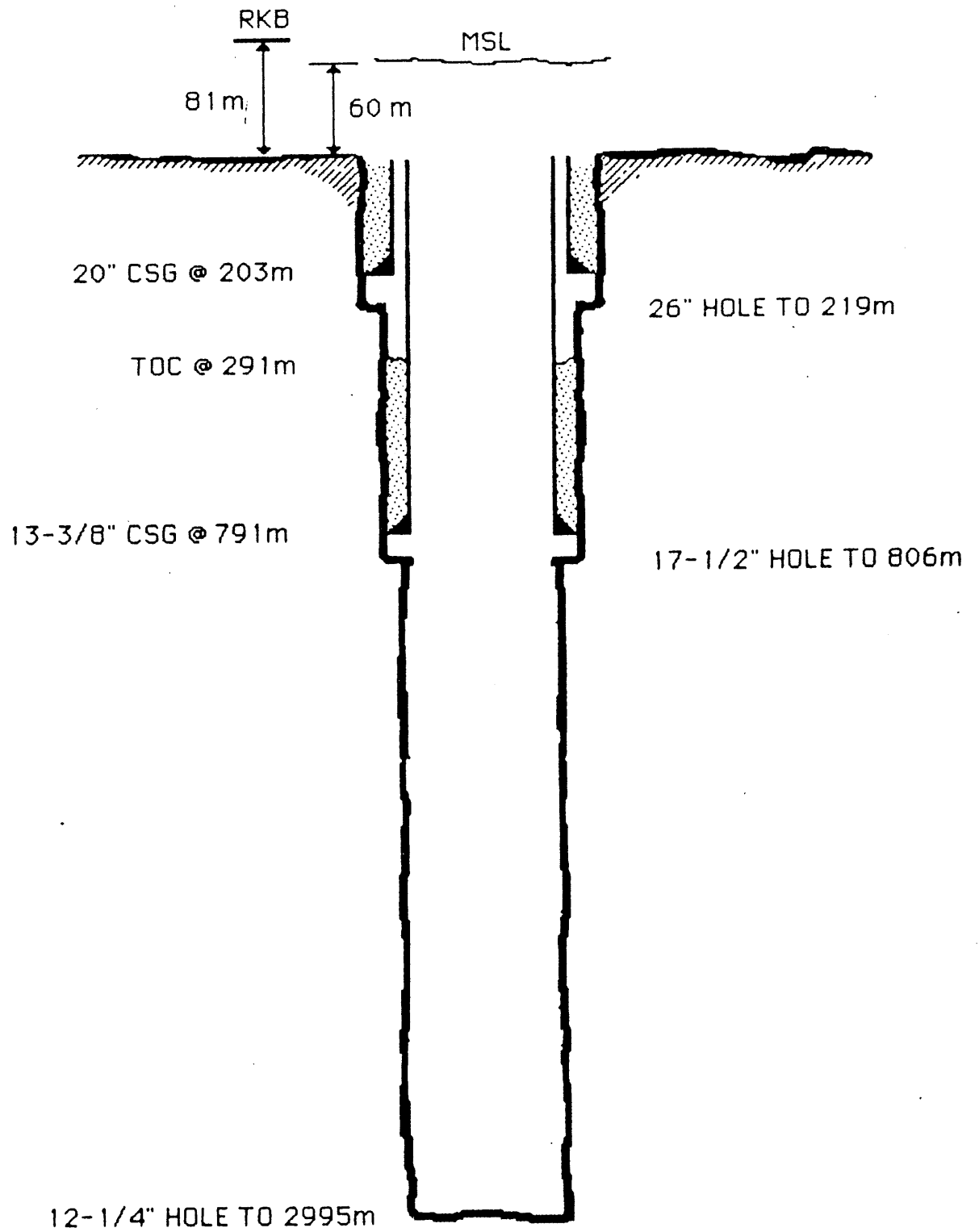


Figure 2

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TURRUM 3 WELLBORE SCHEMATIC



● PRIMARY CEMENT

ALL DEPTHS ARE MEASURED FROM RKB

Figure 3

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TURRUM 3 ABANDONMENT SCHEMATIC

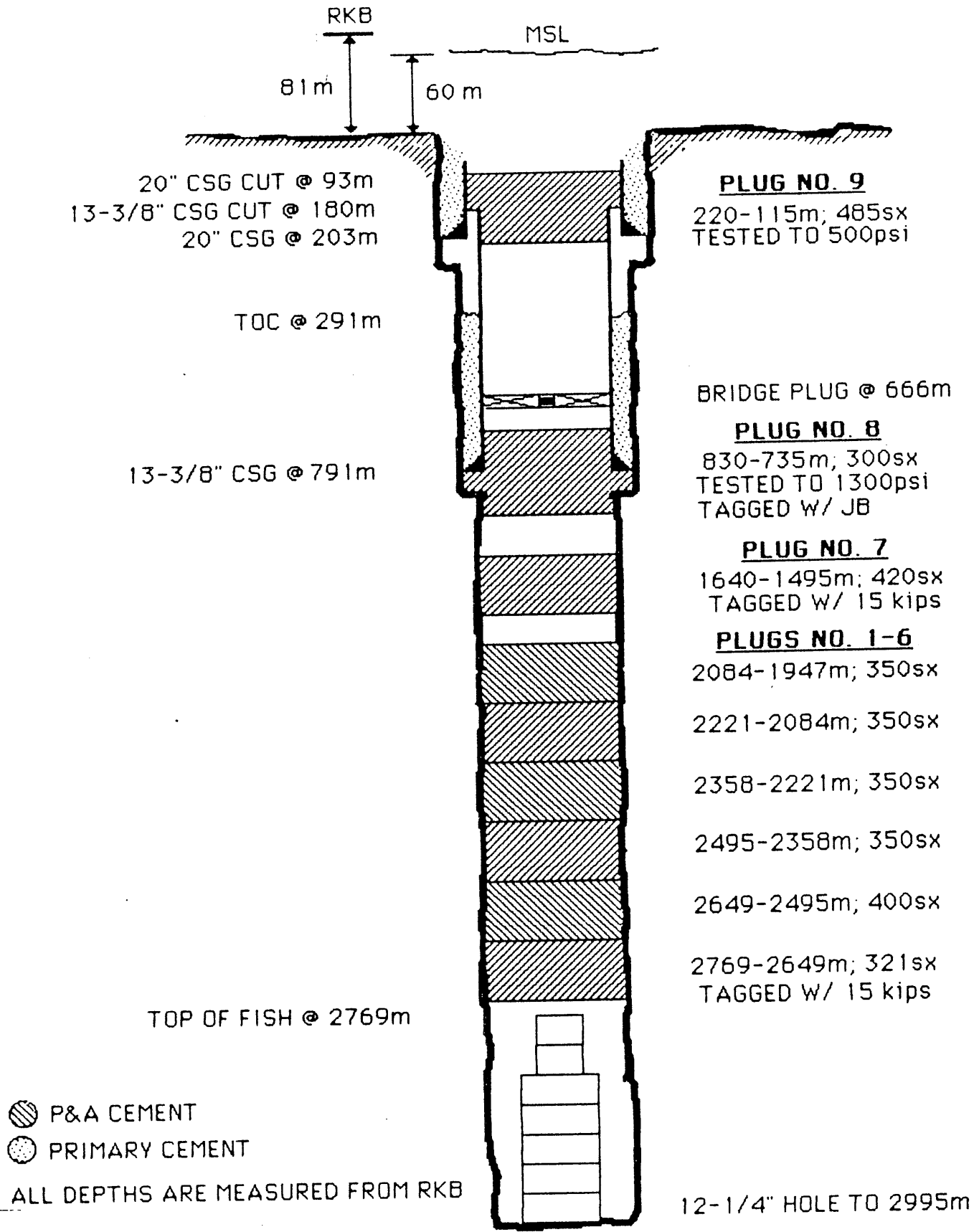


Figure 4

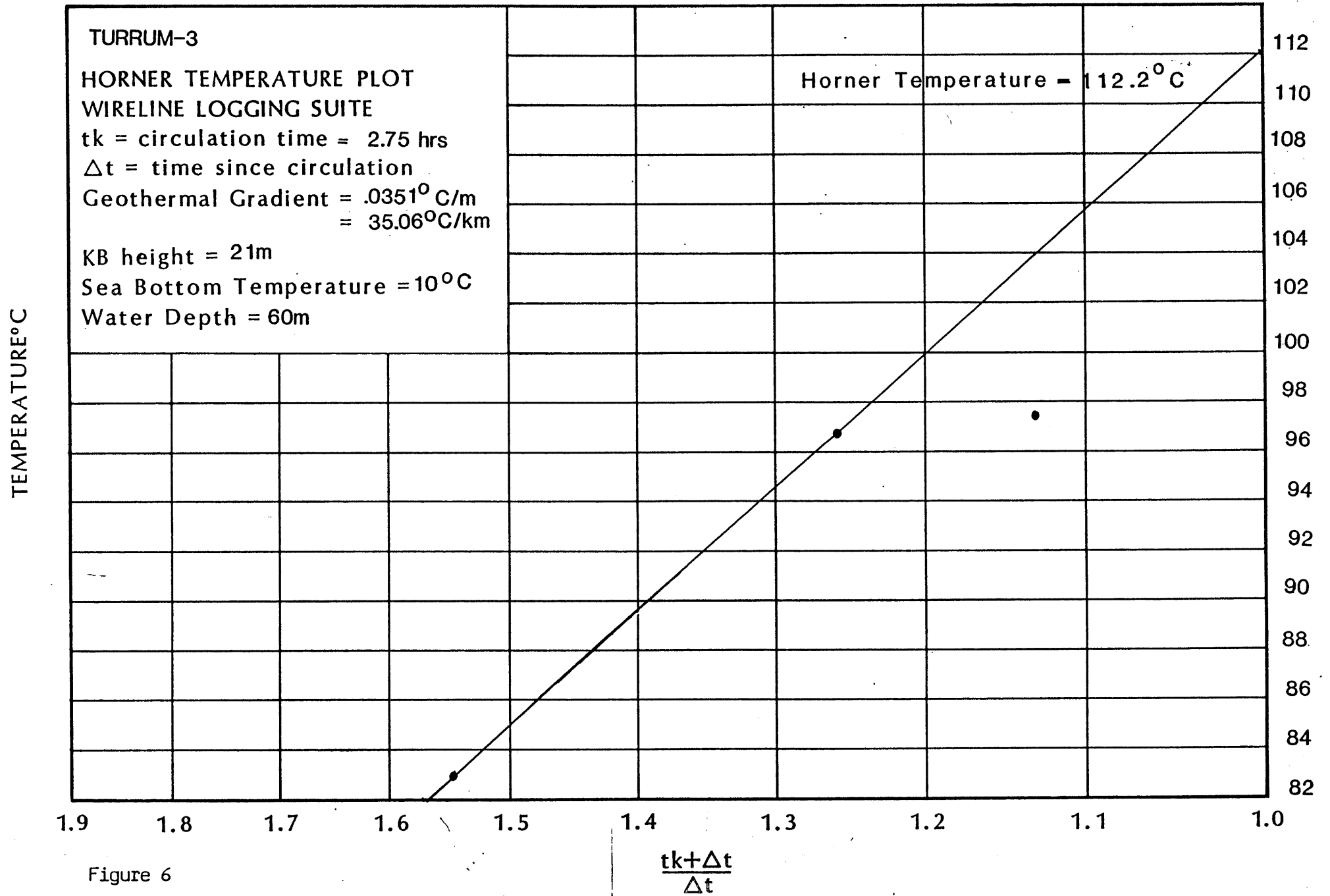


Figure 6

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APPENDIX 1

TURRUM-3

Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Descriptions</u>
210-220m	100	CEMENT.
	trace	CALCARENITE: light grey to yellow brown, fine to medium grained, firm, highly calcareous.
	trace	BRYOZOAN FRAGMENTS.
	trace	FORAMS.
220-230m	50	CEMENT.
	50	LIMESTONE: 3 types: Type (1) - Calcarenite - red brown to yellow grey, moderately hard to hard, fine to medium grained, subangular, moderately sorted, highly calcareous cement.
		Type (2) - Crystalline - white to red brown, hard.
		Type (3) - Fossil fragments - include bryozoans, forams, probable coral, dominated by unidentifiable fossil remains.
	trace	SANDSTONE.
230-240m	50	CEMENT.
	50	LIMESTONE: 3 types: dominated by Type (1) - light to dark grey, fine to medium grained, calcarenite, moderately hard to hard, otherwise as above.
		Type (2) - Crystalline, as above, less common.
		Type (3) - Fossiliferous: as above.
	trace	FORAMS: bryozoan, possible bivalve, corals.
240-250m	80	CALCARENITE: light to medium light grey, firm fine grained, moderately sorted, highly calcareous as above.
	20	CEMENT.
	trace	BRYOZOAN
	trace	SANDSTONE.
250-260m	100	CALCARENITE: 2 types: Type (1) - medium to light grey as above, highly calcareous.
		Type (2) - medium to dark grey, moderately hard, fine grained, moderately sorted and rounded, moderately to slightly calcareous; traces of glauconite.
	trace	FOSSIL FRAGMENTS: not identifiable.
	trace	CEMENT: (soft).
260-270m	100	CALCARENITE: as above, both types present.
	trace	CEMENT.
	trace	FOSSIL FRAGMENTS: unidentifiable.
270-275m	70	CALCARENITE: Type (1) - as above, highly calcareous.
	30	CEMENT.
	trace	FOSSIL FRAGMENTS: large shell fragments, possibly bivalves.
	trace	FORAMS.
	trace	CORAL: colonial, dark red brown.

275-280m	80	CALCARENITE: medium light grey, moderately hard to hard, fine grained, subrounded, moderately sorted, highly calcareous cement, occasionally glauconitic.
	20	CEMENT.
	trace	GLAUCONITE
280-285m	90	CALCARENITE: as above, except for occasional argillaceous matrix.
	10	CEMENT.
	trace	SHELL FRAGMENTS: large, unidentifiable.
	trace	FORAMS
285-290m	90	CALCARENITE: as above, fossil fragments, occasional glauconite.
	10	CEMENT.
	trace	SHELL FRAGMENTS
	trace	GLAUCONITE (one grain)
	trace	CRYSTALLINE LIMESTONE: white, structureless.
290-295m	90	CALCARENITE: medium light grey, moderately hard, fine grained, poorly sorted, strong calcareous cement and calcilutite matrix; occasional small fossil fragments included.
	10	CEMENT.
	trace	CALCILUTITE: medium light grey, soft, highly calcareous, sandy.
	trace	FORAMS
	trace	SHELL FRAGMENTS: bivalve fragments.
295-300m	95	CALCARENITE: as above, occasional pyrite cementation.
	5	CEMENT.
	trace	FORAMS
	trace	PYRITE: microcrystalline
	trace	SHELL FRAGMENTS: probably bivalves.
300-305m	80	CALCARENITE: as above, except softer, more argillaceous matrix.
	10	CALCILUTITE: light to medium grey, soft, sandy - grades to calcarenite, highly calcareous.
	10	CEMENT.
	trace	SHELL FRAGMENTS: not identifiable.
	trace	CORAL: colonial
305-310m	90	CALCARENITE: as above, argillaceous matrix.
	10	CEMENT:
	trace	GASTROPODS
	trace	FORAMS
	trace	SHELL FRAGMENT
	trace	CALCILUTITE
310-315m	70	CALCARENITE: as above, traces of glauconite.
	25	CALCILUTITE: light grey, soft, grades into calcarenite.
	5	CEMENT.
	trace	SHELL FRAGMENTS
	trace	BRYOZOAN
315-320	100	CALCARENITE: as above, no glauconite.
	trace	CALCILUTITE: as above.
	trace	CEMENT.
	trace	BRYOZOAN.
	trace	SHELL FRAGMENTS.
	trace	FORAMS.

320-325m	60	CALCARENITE: as above, grades into calcilutite.
	35	CALCILUTITE: as above, grade into calcarenite.
	5	CEMENT.
	trace	BRYOZOANS.
325-330m	60	CALCARENITE: as above.
	40	CALCILUTITE: as above.
	trace	GASTROPODS.
	trace	BRYOZOANS.
330-335m	100	CALCILUTITE: Light to medium grey, soft, sandy grading into calcarenite.
	trace	CALCARENITE.
	100	CALCARENITE: medium grey, friable, fine grained, argillaceous matrix and calcareous cement; grades into calcisiltite; occasional fossil fragments, occasionally glauconitic.
	trace	CEMENT.
335-340m	60	CALCILUTITE: as above.
	40	BRYOZOANS.
	trace	CEMENT.
	trace	BIVALVES.
340-345m	50	CALCARENITE: as above; extensive argillaceous matrix and calcareous cement.
	50	CALCILUTITE: light grey, soft, highly calcareous, grades into calcarenite (sandy); occasional fossil fragments and glauconite.
	trace	GLAUCONITE: with the above.
	trace	BRYOZOANS.
345-350m	50	FORAMS.
	50	CEMENT.
	trace	CALCARENITE: as above; occasionally glauconite, moderately hard.
	trace	CALCILUTITE: as above, soft.
350-355m	50	BRYOZOANS.
	trace	FORAMS.
	trace	GLAUCONITE.
	trace	SHELL FRAGMENTS.
355-360m	80	CALCILUTITE: light to medium grey, soft, as above.
	20	CALCARENITE: as above; moderately hard.
	trace	CALCISILTITE: brownish red to pale brown, soft, highly calcareous.
	trace	BRYOZOANS.
360-365m	90	FORAMS.
	10	CALCILUTITE: as above.
	trace	CALCARENITE: as above.
	trace	BRYOZOANS.
365-370m	90	SHELL FRAGMENTS.
	10	CALCILUTITE: as above.
	trace	CALCARENITE: as above.
	trace	BRYOZOANS.
370-375m	90	SHELL FRAGMENTS.
	10	CALCILUTITE: as above.
	trace	CALCARENITE: as above.
	trace	BRYOZOANS.
375-380m	90	FORAMS.
	10	CALCILUTITE: as above.
	trace	CALCARENITE: as above.
	trace	BRYOZOANS.

365-370m	70	CALCILUTITE: light to medium grey, soft, as above; occasional glauconite.
	30	CALCARENITE: as above.
	trace	BRYOZOANS.
	trace	FORAMS.
	trace	GLAUCONITE.
370-375m	60	CALCILUTITE: as above.
	40	CALCARENITE: 2 types: Type (1) - as above, i.e. medium grey, moderately hard, fine grained, poorly sorted, argillaceous matrix and calcareous cement.
		Type (2) - light brown to red brown, moderately hard to very hard, medium grained, calcareous cement.
	trace	BRYOZOANS.
	trace	FORAMS.
	trace	SHELL FRAGMENTS.
	trace	GASTROPODS.
375-380m	50	CALCARENITE: as above; 2 types: Type (1) - dominant; Type (2) - rare.
	50	CALCILUTITE: as above.
	trace	BRYOZOANS.
	trace	FORAMS.
	trace	SHELL FRAGMENTS.
380-385m	50	CALCILUTITE: as above.
	30	CALCARENITE: Type (1) only.
	20	CALCISILTITE: 2 types: Type (1) - olive brown, moderately hard, moderately calcareous.
		Type (2) - medium to light grey, moderately hard, coarser, grades into calcarenite, highly calcareous.
	trace	GASTROPODS: abundant.
	trace	BRYOZOANS.
	trace	FORAMS.
385-390m	60	CALCILUTITE: as above.
	40	CALCARENITE: Type (1) only - glauconitic in parts.
	trace	GASTROPODS: abundant.
	trace	PYRITE.
	trace	FORAMS.
390-395m	80	CALCILUTITE: light grey, glauconitic (pelletal), highly calcareous.
	20	CALCARENITE: glauconitic, otherwise as above.
	trace	GASTROPODS: abundant.
	trace	GLAUCONITE: becoming more abundant.
395-400m	70	CALCARENITE: light grey to medium grey, friable to moderately hard, fine to very fine grained, subangular to subrounded grains, abundant glauconite pellets associated with the finer grains, well cemented (calcareous). Glauconite becoming abundant within these calcarenites.

	30	CALCILUTITE: light grey to yellow grey, soft, highly calcareous.
	trace	BRYOZOANS: some calcified (white).
	trace	GASTROPODS: abundant, many types, most display some form of ornamentation although all are small.
	trace	CALCISILTITE: light grey to yellow grey, fissile to subfissile, extremely calcareous.
	trace	PYRITIZED FOSSILS: these include large gastropods and bryozoans.
	trace	GLAUCONITE: dark green to greeny black, becoming increasingly abundant, very fine grained; associated with calcarenites.
400-410m	50	CALCARENITE: as above; moderately hard to very hard.
	50	CALCILUTITE: as above.
	trace	PYRITE: including pyritized bryozoan fragments and gastropods.
	trace	GASTROPODS: at least 4 different species.
	trace	BRYOZOANS.
	trace	BRACHIOPOD.
410-420m	80	CALCILUTITE: light to medium grey, soft extremely calcareous, traces of glauconite.
	20	CALCARENITE: light grey to medium grey, friable to moderately hard, very fine grained, argillaceous/calcareous matrix and calcareous cement. Abundant fine grained pale green to dark green, black glauconite pellets. Grades into calcisiltite.
	trace	PYRITE: microcrystalline.
	trace	GASTROPODS; abundant, diverse species.
	trace	BRYOZOANS.
	trace	GLAUCONITE.
420-430m	90	CALCILUTITE: as above.
	10	CALCARENITE: light grey, friable, very fine grained, glauconite inclusions, strongly calcareous.
	trace	GASTROPODS.
	trace	BRYOZOANS.
	trace	GLAUCONITE.
430-440m	70	CALCILUTITE: as above.
	20	CALCARENITE: as above; glauconitic.
	10	CALCISILTITE: light to medium grey, small cuttings, friable to moderately hard, calcareous, occasionally glauconitic.
	trace	GASTROPODS.
	trace	BRYOZOANS.
	trace	GLAUCONITE.
440-450m	60	CALCISILTITE: light grey to medium grey, friable to firm, calcareous, occasionally glauconitic and sandy.
	30	CALCILUTITE: as above; light to medium grey, soft, calcareous.
	10	CALCARENITE: as above; very fine grained, occasionally fine grained. Occasional glauconite.
	trace	BRYOZOANS.
	trace	GASTROPODS.
	trace	PYRITE.

450-460m	80	CALCARENITE: as above; occasional glauconite.
	10	CALCISILTITE: as above.
	10	CALCILUTITE: as above.
	trace	BRYOZOANS.
	trace	GASTROPODS: often pyritized.
460-470m	trace	PYRITE.
	trace	GLAUCONITE.
	90	CALCARENITE: as above; very fine grained.
	10	CALCISILTITE: as above; grades into calcarenite.
	trace	CALCILUTITE: white to light grey.
470-480m	trace	PYRITE.
	trace	BRYOZOAN: fossils greatly diminished in number in this sample.
	90	CALCARENITE: light grey to pale brown, moderately hard, very fine to fine grained, angular, poorly sorted, extremely well cemented (calcite), common glauconite (dominantly dark green).
	10	CALCISILTITE: pale brown, moderately hard, calcareous cement.
	trace	GASTROPODS.
480-490m	trace	BRYOZOANS.
	trace	FORAMS.
	trace	PYRITE.
	60	CALCARENITE: as above; glauconite inclusions (common).
	20	CALCISILTITE: as above; pyrite inclusions (rare) and glauconite.
490-500m	20	CALCILUTITE; as above.
	trace	FORAMS
	70	CALCARENITE; as above, slightly coarser to dominantly fine grained, extremely well cemented.
	15	CALCISILTITE; as above.
	15	CALCILUTITE; as above; light grey to white.
500-510m	trace	GLAUCONITE: present with calcarenite however becoming less common and smaller grained.
	trace	BRYOZOANS.
	trace	FORAMS.
	100	CALCARENITE; as above.
	trace	CALCISILTITE; as above.
510-520m	trace	CALCILUTITE; as above.
	trace	GLAUCONITE.
	30	CALCARENITE; as above.
	trace	FORAMS.
	trace	CALCISILTITE; as above.
520-530m	trace	PYRITE: microcrystalline.
	90	CALCARENITE; as above.
	10	CALCILUTITE; as above.
	trace	BRYOZOANS.
	trace	PYRITE.
	trace	FORAMS.

530-540m	90	CALCARENITE: light grey to pale brown, friable to moderately hard, very calcareous.
	10	CALCILUTITE: light to medium grey to white, soft, calcareous.
	trace	FORAMS.
	trace	BRYOZOANS.
540-550m	trace	GLAUCONITE: (rare).
	60	CALCARENITE: as above.
	40	CALCILUTITE: as above.
	trace	FORAMS.
550-560m	trace	BRYOZOANS.
	trace	SHELL FRAGMENTS: (rare).
	trace	GLAUCONITE: mostly incorporated with the calcarenite.
	70	CALCILUTITE: as above.
560-570m	30	CALCARENITE: as above; glauconite inclusions.
	trace	PYRITE: microcrystalline.
	trace	BRYOZOANS.
	trace	FORAMS.
570-580m	70	CALCARENITE: as above.
	30	CALCILUTITE: as above.
	trace	PYRITE: pyritized fossil fragment.
	trace	FORAMS.
580-590m	60	CALCARENITE: as above; glauconite now rare.
	40	CALCILUTITE: as above.
	trace	FORAMS.
	trace	BRYOZOANS.
590-600m	50	CALCARENITE: as above except not as hard and contains more glauconite.
	40	CALCISILTITE: light grey to pale brown, friable to moderately hard (mostly friable), very calcareous.
	10	CALCILUTITE: as above.
	trace	BRYOZOANS.
	trace	SHELL FRAGMENTS: (rare).
600-610m	trace	GLAUCONITE: becoming more common.
	60	CALCARENITE: as above; friable often. Occasional black mineral (extremely small) in calcarenite cuttings.
	40	CALCISILTITE: as above.
	trace	CALCILUTITE: white to light grey, soft, uncommon.
	trace	FORAMS.
600-610m	trace	GASTROPODS.
	trace	GLAUCONITE: pale to dark green.
	60	CALCISILTITE: as above.
	20	CALCARENITE: as above.
	20	CALCILUTITE: as above.
600-610m	trace	Black and red oxidized mineral, perhaps carbonaceous (one cutting).
	trace	GLAUCONITE.
	trace	FORAMS.
	trace	BRYOZOANS.
	trace	GASTROPODS.

610-620m	50	CALCISILTITE: as above; friable.
	20	CALCILUTITE: as above.
	20	CALCARENITE: fine to very fine grained, moderately hard.
	10	DOLOMITIC LIMESTONE: pale brown, hard to much harder grained than anything else seen, cuttings are more angular and tabular, moderate reaction to HCL (not violent), not pure dolomite but probably a mixture of dolomite and calcite caused by dolomization. No mineral fluorescence however.
	trace	BRYOZOANS.
	trace	FORAMS.
	trace	GLAUCONITE: dark green, very fine grained.
620-630m	40	CALCISILTITE: as above.
	30	CALCARENITE: as above.
	20	DOLOMITE: displays more typical characteristics of true dolomite in this sample. As above.
	10	CALCILUTITE: light grey to white, soft highly calcareous.
	trace	BRYOZOAN.
	trace	GLAUCONITE: dark green, fine grained.
	trace	FORAMS.
630-640m	40	CALCISILTITE: as above.
	20	CALCILUTITE: as above.
	20	CALCARENITE: as above.
	20	DOLOMITE: reddish brown to pale brown, very hard grained, angular, tabular and flat cuttings, amorphous texture, dull yellow to orange mineral fluorescence.
	trace	BRYOZOANS.
	trace	GLAUCONITE.
640-650m	80	CALCARENITE: light to medium grey, friable, rounded cuttings, very fine to fine grained, common fine grained glauconitic inclusions, very calcareous to well cemented. Trace dull yellow mineral fluorescence.
	20	CALCILUTITE: light grey, very soft, highly calcareous.
	trace	DOLOMITE: brown, very hard grained, tabular and angular cuttings.
	trace	SHELL FRAGMENTS.
	trace	FORAMS.
650-660m	90	CALCARENITE: as above; glauconite inclusions.
	10	CALCILUTITE: as above.
	trace	DOLOMITE: as above.
	trace	GLAUCONITE.
	trace	FORAMS.
660-670m	100	CALCARENITE: as above, friable with argillaceous to calcareous cement. Minor calcilutite associated.
	trace	GLAUCONITE.
	trace	FORAMS.
670-680m	60	CALCARENITE: as above.
	40	CALCISILTITE: yellow brown to pale brown, moderately hard to friable, mostly hard, rounded cuttings, highly calcareous, strong reaction to HCl, calcareous cement.

	trace	CALCILUTITE: as above.
	trace	GLAUCONITE: pale to emerald green, mostly occurs as an accessory within calcisiltite and calcarenite.
	trace	DOLOMITE: as above.
680-690m	50	CALCARENITE: as above.
	50	CALCILUTITE: as above.
	trace	GLAUCONITE: becoming rare.
690-700m	90	CALCARENITE: as above.
	10	CALCILUTITE: light to medium grey, very soft, calcareous.
	trace	DOLOMITE: as above.
	trace	FORAMS.
	trace	GLAUCONITE: rare.
700-710m	70	CALCARENITE: light grey to medium grey, friable, as above.
	30	CALCILUTITE: as above.
	trace	DOLOMITE: reddish brown, very hard, tabular cuttings (possibly cavings).
	trace	FORAMS.
	trace	GASTROPODS.
710-720m	70	CALCARENITE: light to medium grey, friable to moderately hard, very fine grained, poorly sorted, calcareous matrix and cement; little glauconite.
	30	CALCILUTITE: light grey, very soft, highly calcareous.
	trace	DOLOMITE: reddish brown to pale brown, very hard, slow reaction in HCl. Probably cavings.
	trace	FORAMS.
720-730m	60	CALCARENITE: as above, almost a calcisiltite, i.e. very fine grained.
	40	CALCILUTITE: as above.
730-740m	60	CALCARENITE: as above.
	40	CALCILUTITE: as above.
	trace	PYRITE.
	trace	FORAMS.
	trace	DOLOMITE: as above.
740-750m	60	CALCILUTITE: as above.
	40	CALCARENITE: as above.
	trace	PYRITE: microcrystalline.
	trace	GLAUCONITE.
	trace	FORAMS.
750-760m	40	CALCARENITE: as above.
	30	CALCISILTITE: light grey to pale brown, soft to firm, calcareous. Grades into calcarenite.
	30	CALCILUTITE: light grey, very soft, very calcareous.
	trace	FORAMS.
760-770m	70	CALCARENITE: as above.
	15	CALCISILTITE: as above.
	10	CALCILUTITE: as above.
	5	DOLOMITE: pale brown to red brown, very hard, tabular and angular cuttings, slow reaction to HCl.

770-780m	80	CALCARENITE: as above.
	10	CALCISILTITE: as above.
	10	CALCILUTITE: as above.
	trace	DOLOMITE: as above.
780-790m	60	CALCARENITE: medium grey to pale brown, friable to moderately hard, fine to very fine grained, calcareous cement, occasionally glauconite inclusions.
	30	CALCISILTITE: as above.
	10	CALCILUTITE: white to light grey, very soft, very calcareous.
	trace	DOLOMITE: as above.
790-800m	50	CALCARENITE: as above.
	40	CALCISILTITE: as above.
	10	CALCILUTITE: as above.
800-805m	70	CALCARENITE: as above.
	20	CALCILUTITE: as above.
	10	CALCISILTITE: as above.
	trace	DOLOMITE: reddish brown to pale brown, very hard, angular cutting, slow reaction to HCl.
		POOH TO RUN TOPHOLE LOGS AT 806mKB.
805-810m	60	CALCARENITE: pale brown, friable to moderately hard, fine to very fine grained, highly calcareous.
	30	CEMENT.
	10	CALCILUTITE: white to light grey, very soft and highly calcareous.
	trace	DOLOMITE: pale brown to reddish brown, very hard, slow reaction to HCl, no reaction to alizarin red.
	trace	FORAMS.
	trace	IGNEOUS ROCK: possibly diorite or basalt, black to greeny black, extremely hard, very fine grained texture, probably igneous extrusive; fine to medium quartz grains included into texture. Not carbonaceous and not calcareous.
810-815m	60	SILTSTONE: medium grey, soft to friable, occasional quartz grains, poorly sorted, carbonaceous flecks, non calcareous.
	30	CALCARENITE: as above.
	10	DOLOMITE: as above.
	trace	IGNEOUS ROCK: probably extrusive, very fine texture, almost quenched (glassy shards), some fine to very fine quartz grains in matrix. No reaction to acid and extremely hard, otherwise as above. Sharp angular cuttings.
	trace	SHELL FRAGMENTS: possibly from a large pelecypod.
	trace	SAND AGGREGATES: orange to translucent. Orange may be evidence of high iron concentrations coming from igneous rock (i.e. oxidization).
	trace	CEMENT.

815-820m	60	SILTSTONE: as above.
	30	CALCARENITE: as above; traces of glauconite.
	10	DOLOMITE: pale brown, extremely hard.
	trace	IGNEOUS ROCK: black to greenish black, extremely hard, sharp angular cuttings, fine texture, otherwise as above.
820-825m	trace	QUARTZ: orange to white, resembles primary igneous quartz, orange ferruginous veining in translucent, angular quartz grains.
	trace	FORAMS.
	70	SILTSTONE: as above.
	25	CALCARENITE: as above.
825-830m	5	DOLOMITE: as above.
	trace	IGNEOUS ROCK: as above; occasionally orange coating.
	50	SILTSTONE: as above.
	40	CALCARENITE: as above.
830-835m	10	DOLOMITE: medium to light grey and pale brown, otherwise as above.
	trace	IGNEOUS ROCK: as above.
	trace	CALCITE: orange to white, occasionally displaying 60° cleavage, moderately hard to extremely hard.
	trace	MICROCRYSTALLINE PYRITE.
835-840m	50	SILTSTONE: as above
	45	CALCARENITE: as above; grades into calcareous siltstone.
	5	DOLOMITE: as above.
	trace	IGNEOUS ROCK: as above.
840-845m	trace	QUARTZ: translucent quartz grains in an amorphous white quartzose cement, extremely hard. Resembles primary quartz.
	60	CALCAREOUS SILTSTONE: pale brown, soft to moderately hard, silt sized, calcareous cement, becoming less calcareous, cuttings less rounded.
	35	SILTSTONE: medium grey, friable, silt sized, carbonaceous flecks, non calcareous.
	5	DOLOMITE: as above.
845-850m	50	CALCAREOUS SILTSTONE: as above.
	50	SILTSTONE: as above.
	trace	DOLOMITE: as above.
	trace	QUARTZ: milky white to orange tinge, conchoidal fracture, large single grained, i.e. not a sand grain, resembles primary quartz.
850-855m	60	SILTSTONE: as above.
	40	CALCAREOUS SILTSTONE: as above.
	trace	DOLOMITE: as above.
	trace	QUARTZ: as above, orange colour.
850-855m	50	SILTSTONE: as above.
	50	CALCAREOUS SILTSTONE: as above.
	trace	DOLOMITE: as above.
	trace	DOLOMITIC SANDSTONE: translucent, fine to medium grained, subangular to angular, moderately sorted, very hard, dolomitic cement.
850-855m	trace	FORAMS.
	trace	GASTROPODS.

855-860m	30	SILTSTONE: as above.
	60	CALCAREOUS SILTSTONE: as above.
	10	DOLOMITE: as above.
	trace	FORAMS.
	trace	GASTROPODS
	trace	SHELL FRAGMENTS.
860-865m	80	CALCAREOUS SILTSTONE: as above.
	15	SILTSTONE: as above.
	5	DOLOMITE: as above.
	trace	SHELL FRAGMENTS.
	trace	QUARTZ: white, loose quartz grains, medium grained, subangular.
	trace	PYRITE.
865-870m	80	CALCAREOUS SILTSTONE: as above.
	20	SANDSTONE: as above.
	trace	DOLOMITE: as above.
	trace	CALCILUTITE: white to light grey, very soft, highly calcareous.
	trace	CALCAREOUS SANDSTONE: a translucent aggregate, hard, subangular to angular, poorly sorted, very well cemented (calcareous).
870-875m	90	CALCAREOUS SILTSTONE: as above.
	10	SILTSTONE: friable, moderately hard, otherwise as above.
	trace	CALCILUTITE.
	trace	GASTROPODS.
	trace	CALCAREOUS SANDSTONE.
	trace	QUARTZ: loose grained translucent, as above.
875-880m	70	CALCAREOUS SILTSTONE: as above.
	30	SILTSTONE: as above.
	trace	CALCAREOUS SANDSTONE: as above, traces of glauconite.
	trace	DOLOMITE: becoming less common.
	trace	GASTROPODS.
	trace	FORAMS.
880-885m	80	CALCAREOUS SILTSTONE: as above.
	20	SILTSTONE: as above.
	trace	DOLOMITE: as above.
	trace	CALCAREOUS SANDSTONE: as above.
885-890m	100	CALCAREOUS SILTSTONE: as above.
	trace	SILTSTONE: as above.
	trace	CALCAREOUS SANDSTONE: as above.
	trace	QUARTZ: loose grained, as above.
890-895m	90	CALCAREOUS SILTSTONE: as above.
	5	CALCILUTITE: as above.
	5	DOLOMITE: as above, more common.
	trace	SILTSTONE: as above.
895-900m	100	CALCAREOUS SILTSTONE: as above.
	trace	DOLOMITE: as above.
	trace	CALCILUTITE: as above.
	trace	SILTSTONE: as above.
	trace	QUARTZ: loose grained as above.

900-905m	70 15 15 trace	CALCAREOUS SILTSTONE: as above. SILTSTONE: as above. CALCILUTITE: as above. CALCAREOUS SILTSTONE: aggregates as above with a trace of glauconite.
905-910m	50 40 10	CALCAREOUS SILTSTONE: as above. CALCILUTITE: as above. SILTSTONE: as above.
910-915m	80 20	CALCAREOUS SILTSTONE: as above. SILTSTONE: as above.
915-920m	90 5 5 trace	CALCAREOUS SILTSTONE: as above. SILTSTONE: as above. CALCILUTITE: as above. SHELL FRAGMENTS.
920-925m	90 10 trace trace	CALCAREOUS SILTSTONE: as above. CALCILUTITE: as above. SILTSTONE: as above. MICROCRYSTALLINE PYRITE.
925-930m	90 10 trace	CALCAREOUS SILTSTONE: as above. CALCILUTITE: as above. FOSSIL: probable gastropod, formation is not highly fossiliferous.
930-935m	90 10 trace	CALCAREOUS SILTSTONE: as above. CALCILUTITE: as above. FORAMS: only one.
935-940m	80 20 trace	CALCAREOUS SILTSTONE: as above. CALCILUTITE: as above. FOSSIL FRAGMENTS: unidentifiable.
940-945m	80 20 trace trace	CALCAREOUS SILTSTONE: as above, formation unfossiliferous. CALCILUTITE: as above. CALCAREOUS SANDSTONE: translucent, very hard, angular sand, fine to medium grained, poorly sorted, heavy calcareous cement. FORAMS: only fossil - generally unfossiliferous.
945-950m	80 20 trace	CALCAREOUS SILTSTONE: as above, becoming slightly coarser, i.e. grading into a very fine grained calcareous sandstone or calcarenite. CALCILUTITE: as above. DOLOMITE: as above.
950-955m	60 40	CALCAREOUS SILTSTONE: as above. CALCILUTITE: as above.
955-960m	70 30	CALCAREOUS SILTSTONE: as above. CALCILUTITE: as above
960-965m	80 20	CALCAREOUS SILTSTONE: as above. CALCILUTITE: as above.
965-970m	80 20	CALCAREOUS SILTSTONE: as above. CALCILUTITE: as above.
970-975m	70 30 trace	CALCAREOUS SILTSTONE: as above. CALCILUTITE: as above. FOSSIL FRAGMENT: not identifiable.

975-980m	70 30	CALCAREOUS SILTSTONE: as above, no fossils. CALCILUTITE: as above.
980-985m	80 20 trace	CALCAREOUS SILTSTONE: as above. CALCILUTITE: as above. FOSSIL FRAGMENTS.
985-990m	90 10 trace	CALCAREOUS SILTSTONE: as above, traces of glauconite. CALCILUTITE: as above. DOLOMITE: as above, possible cavings.
990-995m	60 40	CALCAREOUS SILTSTONE: as above, grades into calcareous sandstone. CALCILUTITE: as above.
995-1000m.	80 20	CALCAREOUS SILTSTONE: medium light to medium grey, soft to firm, subangular blocky cuttings, very calcareous. CALCILUTITE grading to a very calcareous claystone, light grey to medium light grey, very soft to soft, sticky, blocky rounded cuttings, very calcareous.
1000-1005m	60 40	CALCAREOUS SILTSTONE: as above. CALCILUTITE grading to CALCAREOUS CLAYSTONE: as above.
1005-1010m	80 20 trace	CALCAREOUS SILTSTONE: as above. CALCILUTITE/CALCAREOUS CLAYSTONE: as above. FORAM FRAGMENTS.
1010-1015m	80 20	CALCAREOUS SILTSTONE: moderately hard in parts, otherwise as above. CALCILUTITE/CALCAREOUS CLAYSTONE: as above.
1015-1020m	70 30	CALCAREOUS SILTSTONE: as above. CALCILUTITE/CALCAREOUS CLAYSTONE: as above.
1020-1025m	80 20	CALCAREOUS SILTSTONE: as above. CALCAREOUS CLAYSTONE grades from CALCILUTITE: as above.
1025-1030m	90 10	CALCAREOUS SILTSTONE: as above. CALCAREOUS CLAYSTONE grades from CALCILUTITE: as above.
1030-1035m	90 10	CALCAREOUS SILTSTONE: as above with grains up to very fine sand size in parts. CALCAREOUS CLAYSTONE and grading from CALCILUTITE: as above.
1035-1040m	90 10	CALCAREOUS SILTSTONE: moderately hard in parts otherwise as above. CALCAREOUS CLAYSTONE: as above.
1040-1045m	80 20	CALCAREOUS SILTSTONE: as above. CALCAREOUS CLAYSTONE: as above.

1045-1050m	60	CALCAREOUS SILTSTONE: medium light to medium grey, firm to moderately hard in parts, predominantly firm, subrounded blocky cuttings, calcareous.
	40	CALCAREOUS CLAYSTONE: light to medium light grey, very soft to soft, predominantly very soft, sticky, well rounded blocky cuttings, very calcareous, commonly with silt sized quartz grains.
	trace	FORAMS.
1050-1055m	80	CALCAREOUS SILTSTONE: as above.
	20	CALCAREOUS CLAYSTONE: silty in parts, otherwise as above.
	trace	FORAMS.
1055-1060m	90	CALCAREOUS SILTSTONE: as above.
	10	CALCAREOUS CLAYSTONE: as above.
1060-1065m	90	CALCAREOUS SILTSTONE: as above.
	10	CALCAREOUS CLAYSTONE: as above.
1065-1070m	100	CALCAREOUS SILTSTONE: as above.
	trace	CALCAREOUS CLAYSTONE: as above.
1070-1075m	80	CALCAREOUS SILTSTONE: as above.
	20	CALCAREOUS CLAYSTONE: as above.
1075-1080m	70	CALCAREOUS SILTSTONE: as above.
	30	CALCAREOUS CLAYSTONE: as above.
1080-1085m	80	CALCAREOUS SILTSTONE: as above.
	20	CALCAREOUS CLAYSTONE: as above.
1085-1090m	90	CALCAREOUS SILTSTONE: as above.
	10	CALCAREOUS CLAYSTONE: as above.
1090-1095m	90	SILTSTONE: light to medium grey, firm to moderately hard, subangular to subrounded blocky cuttings, calcareous, carbonaceous flecking.
	10	CALCAREOUS CLAYSTONE: as above.
	trace	FORAMS.
1095-1100m	90	SILTSTONE: as above.
	10	CALCAREOUS CLAYSTONE: as above.
	trace	FORAMS.
1100-1105m	100	SILTSTONE: as above and occasionally grading to a very fine to fine grained, friable calcareous sandstone.
	trace	CALCAREOUS CLAYSTONE: as above.
	trace	FORAMS: becoming more common.
	trace	SANDSTONE: loose quartz fragments, translucent, coarse to granule sized, angular.
1105-1110m	100	SILTSTONE: as above.
	trace	CALCARENITE: light grey, very friable, glauconite inclusions.
	common	FOSSIL FRAGMENTS: predominantly forams.

1110-1115m	100 trace trace trace	SILTSTONE: as above. CALCARENITE: as above. SANDSTONE: quartz grains/fragments, as above. FOSSIL FRAGMENTS: especially forams.
1115-1120m	100 trace	SILTSTONE: as above. FORAMS.
1120-1125m	100	SILTSTONE: with occasional sponge spicules (?), otherwise as above.
1125-1130m	90 10 trace	SILTSTONE: as above. CALCAREOUS CLAYSTONE: as above. FORAMS.
1130-1135m	90 10	SILTSTONE: as above. CALCAREOUS CLAYSTONE: light to medium light grey, very soft, sticky, well rounded blocky cuttings, very calcareous.
1135-1140m	80 20 trace	SILTSTONE: with occasional glauconite inclusions. CALCAREOUS CLAYSTONE: as above. FORAMS.
1140-1145m	90 10 trace	SILTSTONE: as above. CALCAREOUS CLAYSTONE: as above. FORAMS.
1145-1150m	70 30 trace	SILTSTONE: as above. CALCAREOUS CLAYSTONE: silty, otherwise as above. FORAMS.
1150-1155m	90 10	SILTSTONE: as above. CALCAREOUS CLAYSTONE: silty, otherwise as above.
1155-1160m	80 20	SILTSTONE: as above. CALCAREOUS CLAYSTONE: as above.
1160-1165m	90 10 trace	SILTSTONE: light grey to medium grey, firm to moderately hard, subangular to subrounded cuttings, calcareous, small carbonaceous inclusions. CLAYSTONE: calcareous as above. FORAMS.
1165-1170m	90 10	SILTSTONE: as above. CLAYSTONE: calcareous as above.
1170-1175m	90 10 trace	SILTSTONE: as above. CLAYSTONE: calcareous as above. FORAMS.
1175-1180m	80 20	SILTSTONE: as above. CLAYSTONE: calcareous as above.
1180-1185m	90 10	SILTSTONE: as above. CLAYSTONE: calcareous as above.
1185-1190m	100 trace trace	SILTSTONE: as above. CLAYSTONE: calcareous as above. FORAMS.

1190-1195m	90 10 trace	SILTSTONE: calcareous siltstone, as above. CLAYSTONE: as above. FORAMS.
1195-1200m	60 20 20	SILTSTONE: calcareous, becoming coarser. CALCAREOUS SILTSTONE: recrystallized white moderately hard to very hard, common sand grains, calcareous cement, occasional glauconitic inclusions. CLAYSTONE: as above.
1200-1205m	80 20 trace trace	SILTSTONE: as above. CLAYSTONE: as above. CALCAREOUS SILTSTONE: as above, grades into a very hard, extremely well cemented calcareous sandstone, very fine grained, probably recrystallised. FORAMS.
1205-1210m	60 40 trace	SILTSTONE: as above. CLAYSTONE: as above. CALCAREOUS SILTSTONE: as above; white to dominantly light grey to pale brown, extremely well cemented with crystalline calcareous cement. Grades into calcareous sandstone. Contains likely carbonaceous flecks.
1210-1215m	70 30 trace	SILTSTONE: as above, occasional glauconite inclusions. CLAYSTONE: as above. CALCAREOUS SANDSTONE: predominantly pale brown to light grey, fine grained, argillaceous matrix and crystalline calcareous cement, contains common glauconitic inclusions.
1215-1220m	50 50	SILTSTONE: as above. CLAYSTONE: as above.
1220-1225m	50 50	SILTSTONE: as above. CLAYSTONE: as above.
1225-1230m	60 40	SILTSTONE: as above. CLAYSTONE: as above.
1230-1235m	50 50	SILTSTONE: as above. CLAYSTONE: as above.
1235-1240m	50 50 trace	SILTSTONE: as above. CLAYSTONE: as above. FORAMS.
1240-1245m	50 50 trace	SILTSTONE: as above. CLAYSTONE: as above. FORAMS.
1245-1250m	60 40	CLAYSTONE: as above. SILTSTONE: as above, trace of glauconite.
1250-1255m	60 40 trace trace	SILTSTONE: as above, becoming coarser. CLAYSTONE: as above. FORAMS. GLAUCONITE

1255-1260m	60 40	CLAYSTONE: as above. SILTSTONE: as above
1260-1265m	70 30 trace	CLAYSTONE: as above. SILTSTONE: as above. SAND GRAINS: loose, medium to coarse, subangular.
1265-1270m	60 40	CLAYSTONE: as above. SILTSTONE: as above.
1270-1275m	50 50 trace	CLAYSTONE: light grey to red brown, otherwise as above. SILTSTONE: as above. CALCAREOUS SILTSTONE: as above.
1275-1280m	50 50	CLAYSTONE: as above. SILTSTONE: as above.
1280-1285m	60 40 trace trace	CLAYSTONE: as above. SILTSTONE: as above. SAND GRAINS: loose, as above. FORAMS.
1285-1290m	80 20	CLAYSTONE: as above. SILTSTONE: as above.
1290-1295m	50 50 trace	CLAYSTONE: as above. SILTSTONE. FORAMS.
1295-1300m	40 30 30	CLAYSTONE: as above. SILTSTONE: as above. CALCAREOUS SANDSTONE: light grey to pale brown, moderately hard to very hard, very fine to medium grained, very fine dominates, common glauconite inclusions, extremely well cemented (calcareous). Similar to that described above.
1300-1305m	80 10 10	CLAYSTONE: as above. SILTSTONE: as above. CALCAREOUS SANDSTONE: as above.
1305-1310m	70 20 10	CLAYSTONE: as above. CALCAREOUS SANDSTONE: as above; common glauconite. SILTSTONE.
1310-1315m	50 30 20 trace trace	CLAYSTONE: as above. CALCAREOUS SANDSTONE: as above; common glauconite. SILTSTONE: as above. DOLOMITE: one cutting, extremely fine grained. GLAUCONITE.
1315-1320m	60 20 20 trace trace	CLAYSTONE: as above. CALCAREOUS SANDSTONE: as above. SILTSTONE: as above. GLAUCONITE. FORAMS.

1320-1325m	80 20 trace trace	CLAYSTONE: as above. SILTSTONE: as above, often glauconitic. CALCAREOUS SANDSTONE: as above. GLAUCONITE: common, becoming more prevalent.
1325-1330m	80 10 10 trace trace	SILTSTONE: as above; often glauconitic. CLAYSTONE: as above. CALCAREOUS SANDSTONE: as above. FORAMS. GASTROPODS: very small.
1330-1335m	80 20 trace trace	SILTSTONE: as above; often glauconitic. CLAYSTONE: as above. CALCAREOUS SANDSTONE: as above. FORAMS.
1335-1340m	90 10 trace trace trace	SILTSTONE: as above. CLAYSTONE: as above. CALCAREOUS SANDSTONE: as above. FORAMS. GLAUCONITE.
1340-1345m	100 trace trace trace trace	SILTSTONE: medium grey to pale brown, medium grey dominant, soft to moderately hard, occasional sand grains as inclusions, very calcareous. CLAYSTONE. PYRITIZED FOSSIL FRAGMENT: microcrystalline, becoming abundant, associated with a change in colour of siltstone to more grey colour. DOLOMITE: one cutting. CALCAREOUS SANDSTONE: as above.
1345-1350m	100 trace trace trace trace	SILTSTONE: as above. PYRITIZED FORAM. CLAYSTONE: as above. CALCAREOUS SANDSTONE: as above. GLAUCONITE.
1350-1355m	95 5 trace trace	SILTSTONE: as above, becoming slightly less calcareous. CLAYSTONE: as above. PYRITE: microcrystalline. FORAMS: becoming more fossiliferous.
1355-1360m	100 trace trace trace trace trace	SILTSTONE: as above. CLAYSTONE: as above. CALCAREOUS SANDSTONE: as above. FORAMS. PYRITE. GLAUCONITE.
1360-1365m	100 trace trace trace trace	SILTSTONE: as above. CLAYSTONE: as above. PYRITIZED FOSSIL FRAGMENTS. FORAMS. CALCAREOUS SANDSTONE.
1365-1370m	100 trace trace	SILTSTONE: calcareous, as above. FOSSIL FRAGMENTS: especially forams. PYRITIZED FOSSIL FRAGMENTS.

1370-1375m	100 trace	SILTSTONE: with occasional small glauconite inclusions. Common forams, also trace of other fossil fragments.
1375-1380m	100 trace	SILTSTONE: as above. FOSSIL FRAGMENTS: common forams.
1380-1385m	100 trace	SILTSTONE: containing very fine grained quartz grains in parts, otherwise as above. FOSSIL FRAGMENTS: especially forams.
1385-1390m	100 trace	SILTSTONE: as above. FOSSIL FRAGMENTS: especially forams.
1390-1395m	100 trace trace	SILTSTONE: medium light grey to medium grey, firm, subangular to subrounded blocky cuttings, calcareous, occasional small carbonaceous and glauconite inclusions, also occasional pyrite inclusions (possible pyritized fossil fragments?), very fine quartz grains, sandy in parts. FOSSIL FRAGMENTS: especially forams. PYRITIZED FOSSIL FRAGMENTS.
1395-1400m	100 trace	SILTSTONE: as above. FOSSIL FRAGMENTS: especially forams.
1400-1405m	100 trace	SILTSTONE: occasionally moderately hard, otherwise as above. FOSSIL FRAGMENTS: as above.
1405-1410m	100 trace trace	SILTSTONE: as above and occasionally moderately hard. FOSSIL FRAGMENTS: as above. RARE CALCITE: clear to translucent to light brown, moderately hard, subangular to angular cuttings.
1410-1415m	100 trace	SILTSTONE: as above. FOSSIL FRAGMENTS: as above.
1415-1420m	100 trace	SILTSTONE: becoming sandier, grading occasionally to a very fine grained sandstone, otherwise as above. FOSSIL FRAGMENTS: as above.
1420-1425m	100 trace trace	SILTSTONE: predominantly firm, as above. FOSSIL FRAGMENTS: as above. CALCITE: subcrystalline
1425-1430m	100 trace	SILTSTONE: occasionally pyritic in parts, argillaceous in parts, otherwise as above. FOSSIL FRAGMENTS: as above.
1430-1435m	90 10 Trace	SILTSTONE: as above, grading to claystone in parts. CLAYSTONE: light grey to medium light grey, soft to very soft, sticky, well rounded, blocky cuttings. FOSSIL FRAGMENTS: as above.

1435-1440m	100 trace trace	SILTSTONE: as above. CLAYSTONE: as above. FOSSIL FRAGMENTS: as above.
1440-1445m	100 trace	SILTSTONE: as above. FOSSIL FRAGMENTS: as above.
1445-1450m	100 trace	SILTSTONE: as above. FOSSIL FRAGMENTS: mostly forams as above.
1450-1455m	100 trace	SILTSTONE: as above. FOSSIL FRAGMENTS: as above.
1455-1460m	100 trace	SILTSTONE: as above. FOSSIL FRAGMENTS: as above.
1460-1465m	90 10 trace	SILTSTONE: as above. CLAYSTONE: as above. FOSSIL FRAGMENTS.
1465-1470m	100 trace trace trace	SILTSTONE: as above. CLAYSTONE: as above. FOSSIL FRAGMENTS. PYRITE.
1470-1475m	100 trace trace	SILTSTONE: as above. CLAYSTONE: as above. FOSSIL FRAGMENTS.
1475-1480m	100 trace trace	SILTSTONE: light to medium grey, firm, subrounded blocky cuttings, calcareous, glauconite inclusions. CLAYSTONE: as above. FOSSIL FRAGMENTS: becoming less common.
1480-1485m	100 trace	SILTSTONE: as above. FOSSIL FRAGMENTS
1485-1490m	100 trace trace	SILTSTONE: as above. CLAYSTONE: as above. PYRITE. Occasional fossil fragments.
1490-1495m	100 trace trace	SILTSTONE: predominantly medium grey, otherwise as above. CLAYSTONE: as above. FOSSIL FRAGMENTS.
1495-1500m	90 10 trace	SILTSTONE: as above. CLAYSTONE: light grey to medium light grey, predominantly light grey, very soft, sticky, well rounded blocky cuttings calcareous. Occasional fossil fragments. PYRITE.
1500-1505m	60 40	SILTSTONE: as above, and occasionally with common glauconite. CLAYSTONE: as above.
1505-1510m	60 40 trace	CLAYSTONE: as above. SILTSTONE: as above. PYRITE.

1510-1515m	50	SILTSTONE: as above.
	50	CLAYSTONE: as above.
1515-1520m	60	SILTSTONE: as above.
	40	CLAYSTONE: as above.
1520-1525m	50	SILTSTONE: as above.
	50	CLAYSTONE: as above.
	trace	PYRITE.
1525-1530m	60	CLAYSTONE: as above.
	40	SILTSTONE: as above.
	trace	PYRITE.
1530-1535m	50	SILTSTONE: as above.
	50	CLAYSTONE: as above.
1535-1540m	60	SILTSTONE: as above.
	40	CLAYSTONE: as above.
	trace	PYRITE.
1540-1545m	60	SILTSTONE: as above.
	40	CLAYSTONE: as above.
	trace	PYRITE.
1545-1550m	50	SILTSTONE: medium light to medium light grey, firm, subrounded cuttings, calcareous.
	50	CLAYSTONE: as above, dispersive, sticky.
	rare	GLAUCONITE: dark green.
1550-1555m	50	SILTSTONE: as above.
	50	CLAYSTONE: as above.
	trace	GLAUCONITE.
	rare	SANDSTONE: clear, medium to coarse grained, rounded, loose quartz grains.
1555-1560m	60	CLAYSTONE: light to medium light grey, very soft to dispersive, sticky, well rounded cuttings, calcareous.
	40	SILTSTONE: as above.
	trace	GLAUCONITE.
	trace	SANDSTONE: medium to very coarse grained, subrounded to rounded, otherwise as above.
1560-1565m	60	CLAYSTONE: as above.
	40	SILTSTONE: as above.
	trace	GLAUCONITE.
	trace	SANDSTONE: loose grained, as above.
	trace	PYRITE.
1565-1570m	60	CLAYSTONE: as above.
	40	SILTSTONE: sandy and glauconite in parts, otherwise as above.
	trace	SANDSTONE: loose grained, as above.
	trace	GLAUCONITE.
	trace	PYRITE

CBU AND POOH FOR BIT CHANGE @ 1572M.

BOTTOMS UP SAMPLE

1570-1572m	70	CLAYSTONE: white to light grey, as above.
	30	SILTSTONE: as above.
	trace	SANDSTONE: loose grained, medium to coarse, subangular to subrounded, trace glauconite; no shows.
	trace	DOLOMITE: light grey, extremely hard, slow reaction to warm HCl, dull yellow mineral fluorescence.
	trace	GLAUCONITE.
1572-1575m	trace	PYRITE: microcrystalline.
	80	SILTSTONE: light grey to pale brown, firm to moderately hard, angular to subrounded blocky cuttings, occasional sandy inclusions, moderately calcareous (less than that above).
	20	SANDSTONE: translucent to clear, loose grains, no aggregates, medium coarse to very coarse, angular, well rounded, moderately sorted, good inferred porosity, 5% dull to moderately bright yellow hydrocarbon fluorescence, instant, streaming to diffuse, yellow cut.
	trace	CARBONACEOUS SILTSTONE: dark reddish brown to black, angular to subrounded cuttings, firm to moderately hard.
	trace	GLAUCONITE: dark green, large cuttings.
	trace	PYRITE: common, microcrystalline and crystalline.
	trace	FOSSIL FRAGMENTS: possible cavings.
Bottoms Up Sample		
1575-1576m	80	SANDSTONE: loose quartz grained, clear to translucent, medium to very coarse grained, angular to well rounded, predominantly subrounded to well rounded, moderately well sorted, occasional grains with moderately bright white fluorescence, no cut.
	20	SILTSTONE: as above with glauconite inclusions.
	trace	CARBONACEOUS SILTSTONE: as above and coaly in parts.
	trace	PYRITE: microcrystalline.
	trace	GLAUCONITE.
POOH TO RUN CORE BARREL		
Cut core No. 1 from 1577-1586.3m		
(N.B.: Depth correction from end drilling to start coring).		
Reamed cored interval.		
1586.3-1590m	90	SILTSTONE: light grey to medium grey, occasional greyish, medium to firm to moderately hard, subangular to subrounded cuttings, calcareous in parts, glauconite inclusions, occasional carbonaceous inclusions, sandy in parts. Some cuttings very glauconitic, may be cavings.
	10	SANDSTONE: loose quartz grains/fragments, translucent, medium to granule sized, predominantly coarse to very coarse grained, predominantly angular to subangular, occasionally subrounded, poor to moderately well sorted; no shows.

	trace	PYRITE: microcrystalline and crystalline.
	trace	COAL: black, brittle, vitreous grades in parts to a brownish grey to dark grey, firm, very carbonaceous siltstone. Two very carbonaceous cuttings had bright white fluorescence and instant to fast, bright, strong to diffuse white cut.
1590-1595m	80	COAL: black, brittle, angular to subangular cuttings, vitreous to subvitreous, conchoidal fracture common.
	20	SILTSTONE: also pale brown and soft, otherwise as above.
	trace	SANDSTONE: loose quartz grains/fragments; as above; no shows.
	trace	PYRITE: microcrystalline.
1595-1600m	80	COAL: less commonly vitreous, otherwise as above.
	10	SILTSTONE: as above.
	10	SANDSTONE: loose quartz grains; as above; no shows.
	trace	PYRITE: microcrystalline.
1600-1605m	50	SILTSTONE: grading to soft pale brown claystone in parts, otherwise as above.
	40	COAL: as above, occasional cuttings with patchy white fluorescence and cut.
	10	SANDSTONE: loose quartz grains, as above; no shows.
	trace	PYRITE: microcrystalline.
1605-1610m	70	SANDSTONE: loose quartz grains, clear to translucent, medium to very coarse grained, predominantly coarse to very coarse, subangular to rounded, moderately well sorted; no shows.
	30	SILTSTONE: as above.
	trace	COAL: as above.
	trace	PYRITE: microcrystalline.
1610-1615m	90	SANDSTONE: loose quartz grains; predominantly subrounded otherwise as above. Also trace quartzose aggregates; light grey, friable to moderately hard, medium to occasionally very coarse, predominantly medium grained, subrounded, moderately well sorted, dolomitic cement, poor visible porosity, dull yellow mineral fluorescence; no shows.
	10	SILTSTONE: as above.
	trace	PYRITE: microcrystalline.
	trace	COAL: as above
1615-1620m	60	SANDSTONE: loose quartz grains; as above. Also minor aggregates; with carbonaceous inclusions, otherwise as above, with patchy dull yellow mineral fluorescence; no shows.
	30	SILTSTONE: firm, otherwise as above.
	10	COAL: as above.
1620-1625m	80	SILTSTONE: predominantly greyish red, also medium light to medium dark grey, soft to firm, subrounded blocky cuttings, non calcareous, carbonaceous, grades to soft claystone in parts.
	20	SANDSTONE: loose quartz grains, predominantly subrounded to rounded, otherwise as above; no shows.
	trace	PYRITE: microcrystalline.

1625-1630m	80	SANDSTONE: loose quartz grains, predominantly subrounded to rounded, sometimes well rounded, otherwise as above. Also minor aggregates; very fine to medium grained, moderately well sorted to well sorted in parts, otherwise as above, with mineral fluorescence; as above.
	20	SILTSTONE: as above.
	trace	PYRITE: as above.
1630-1635m	95	SANDSTONE: loose quartz grains, translucent, medium to granule sized, predominantly coarse to very coarse, subrounded to rounded, occasionally well rounded, moderately well sorted, very good inferred porosity, no shows; trace aggregates with dull whitish mineral fluorescence as above.
	5	COAL: dark grey to black, firm, earthy to occasionally vitreous.
	trace	SILTSTONE: as above.
1635-1640m	95	SANDSTONE: loose quartz grains; as above, trace aggregates as above.
	5	COAL: as above.
	trace	SILTSTONE: as above.
1640-1645m	90	SANDSTONE: predominantly loose quartz grains; as above. Occasional aggregates as above; no shows.
	10	SILTSTONE: as above and grading to Claystone in parts.
	trace	PYRITE: as above.
1645-1650m	60	CLAYSTONE: light grey to pale brown; very soft to dispersive, non calcareous, carbonaceous inclusions, very carbonaceous in parts, occasional pyrite inclusions.
	30	SANDSTONE: loose grains as above; no shows.
	10	SILTSTONE: as above.
	trace	PYRITE.
1650-1655m	40	CLAYSTONE: as above.
	30	SILTSTONE: as above; couple of carbonaceous cuttings have bright white fluorescence and slow moderately strong white streaming cut.
	10	COAL: as above.
	10	PYRITE: microcrystalline aggregates, sometimes as cement between sandstone grains also associated with siltstone.
	10	SANDSTONE: loose quartz grains; as above; no shows.
1655-1660m	40	CLAYSTONE: as above.
	30	COAL: black, brittle, subangular cuttings, vitreous to earthy lustre.
	20	SILTSTONE: as above.
	10	SANDSTONE: loose quartz grains; as above; no shows.
	trace	PYRITE: as above.

1660-1665m	70	SANDSTONE: loose quartz grains; as above; no shows.
	20	SILTSTONE: very carbonaceous in parts, otherwise as above.
	10	CLAYSTONE: as above.
	trace	PYRITE: as above.
1665-1670m	60	SANDSTONE: loose quartz grains; as above; no shows.
	30	SILTSTONE: as above.
	10	CLAYSTONE: as above.
	trace	PYRITE: as above.
	trace	COAL: as above.
1670-1675m	40	COAL: as above.
	30	SILTSTONE: pale brown to medium dark grey, firm to soft in parts, carbonaceous in parts (paler grey cuttings only), carbonaceous to very carbonaceous in parts, grades to carbonaceous shale in parts:
	10	CLAYSTONE: pale brown to light grey, soft to very soft, carbonaceous flecking to very carbonaceous in parts.
	20	SANDSTONE: loose quartz grains; as above.
1675-1680m	20	CLAYSTONE: as above.
	50	SILTSTONE: as above
	20	COAL: as above.
	10	SANDSTONE: loose quartz grains; as above.
	trace	PYRITE.
1680-1685m	20	CLAYSTONE: as above.
	60	SILTSTONE: as above.
	10	COAL: grading to a very carbonaceous shale and or siltstone.
	10	SANDSTONE: loose quartz grains as above. Also trace quartzose aggregates; very light grey, friable, very fine grained, well sorted, weak calcareous cement, occasional carbonaceous inclusions, silty in parts; no shows.
1685-1690m	10	CLAYSTONE: as above.
	trace	SILTSTONE: as above.
	90	SANDSTONE: loose quartz grains (50%); translucent, medium to very coarse grained, predominantly coarse grained, subangular to subrounded, moderately well sorted; no shows; also quartzose aggregates, very light grey to translucent, friable to moderately hard, very fine grained and medium grained, subrounded, well sorted, trace calcareous cement, poor to moderate visual porosity; no shows.
1690-1695m	100	SANDSTONE: predominantly loose quartz grains; translucent, medium to very coarse grained, predominantly coarse, angular to subrounded, predominantly subangular, moderately well sorted; no shows; minor aggregates, predominantly medium grained, otherwise as above; no shows.
	trace	SILTSTONE: as above.
	trace	COAL: as above.

1695-1700m	100	SANDSTONE: predominantly loose quartz grains, predominantly subangular to subrounded otherwise as above; no shows; trace aggregates, as above; no shows.
	trace	SILTSTONE: as above.
1700-1705m	70	COAL: dark grey to black, firm to brittle, angular to subangular cuttings, earthy to occasionally vitreous lustre, conchoidal fracture in parts.
	20	SANDSTONE: loose quartz grains; as above; aggregates moderately hard, better cemented, poor visible porosity; no shows.
	10	SILTSTONE: grading to Claystone, otherwise as above.
	trace	PYRITE: microcrystalline.
1705-1710m	40	SANDSTONE: loose quartz grains; as above, also aggregates; as above; no shows.
	30	SILTSTONE: as above.
	20	COAL: as above.
	10	CLAYSTONE: as above.
	trace	PYRITE
1710-1715m	60	SILTSTONE: as above.
	20	CLAYSTONE: predominantly pale brown to greyish red, occasionally medium light grey, soft to very soft, sticky in parts, carbonaceous.
	20	SANDSTONE: loose quartz grains, subangular to rounded, as above; aggregates as above.
1715-1720m	60	COAL: earthy to vitreous, otherwise as above.
	30	SILTSTONE: as above.
	10	CLAYSTONE: as above.
	trace	SANDSTONE: loose quartz and aggregates as above.
1720-1725m	80	SILTSTONE: light brown to brownish grey, medium light grey to medium grey, firm, blocky to subfissile, non-calcareous, carbonaceous to very carbonaceous in parts.
	20	COAL: as above.
	trace	CLAYSTONE: as above.
	trace	SANDSTONE: aggregates as above; no shows.
1725-1730m	90	SANDSTONE: quartzose aggregates; translucent to very light grey, friable to moderately hard, very fine to fine grained, well sorted, calcareous cement, occasional small carbonaceous inclusions, poor visible porosity; no shows.
	10	SILTSTONE: as above and grading to carbonaceous shale in parts.
1730-1735m	70	SILTSTONE: as above.
	30	SANDSTONE: predominantly aggregates as above, also loose quartz grains as above.
1735-1740m	70	SILTSTONE: light brown, red brown to brownish grey, medium light grey to medium grey, firm, blocky cuttings, calcareous, carbonaceous in parts to very carbonaceous in parts.
	30	SANDSTONE: loose quartz grains and aggregates; as above; no shows.

	trace	COAL: as above.
	trace	PYRITE: as above microcrystalline aggregates.
1740-1745m	95	SILTSTONE: 3 types: Type (1) - red brown to pale brown, blocky cuttings, friable to moderately hard, occasional glauconite, non-calcareous. Type (2) - greenish grey to olive grey, predominantly soft to firm, tabular blocky cuttings, occasional glauconite, calcareous. Type (3) - dark brown to black, moderately hard, blocky to angular cuttings, highly carbonaceous.
	5	COAL: as above; exinite gives bright white fluorescence.
	trace	SANDSTONE: translucent, predominantly loose grains; medium to coarse, occasional aggregates fine grained, subangular to subrounded, moderately sorted, siliceous cement; no shows.
	trace	DOLOMITE: predominantly red brown to light brown, quite common, approaching 5%, extremely hard, slow reaction to HCl, no reaction to alizarin red.
	trace	PYRITE: large blocky cuttings, predominantly microcrystalline.
1745-1750m	70	COAL: as above; not highly vitrinitic, occasional conchoidal fracture, grades into carbonaceous siltstone.
	20	SILTSTONE: all types as above.
	10	GLAUCONITIC SANDSTONE: dark green glauconitic, translucent sandstone grains, friable, very fine grained, well sorted, approximately 30-40% glauconite content; no shows.
	trace	PYRITE: as above.
	trace	SANDSTONE: mostly milky white; as above.
	trace	DOLOMITE: as above; less common.
1750-1755m	80	COAL: as above.
	20	SILTSTONE: all three types; as above.
	trace	GLAUCONITIC SANDSTONE: as above.
	trace	PYRITE.
	trace	SANDSTONE: as above.
	trace	DOLOMITE: as above - less common
1755-1760m	60	SILTSTONE: mostly type (3); carbonaceous siltstone as above; grades into coal, occasional coal lamellae.
	40	COAL: as above; microcrystalline pyrite present when grading into siltstone.
	trace	PYRITE: as above.
	trace	SANDSTONE: as above.
1760-1765m	80	SILTSTONE: 80% type (3) and 20% type (2) and type (3).
	20	COAL: as above, grades into carbonaceous siltstone type (3).
	trace	PYRITE: as above.
	trace	SANDSTONE: as above.
	trace	GLAUCONITIC SANDSTONE: as above.
	trace	DOLOMITIC SANDSTONE: light grey to pale brown, fine grained sandstone, poorly sorted with extremely hard dolomitic cement.

1765-1770m	90	SILTSTONE: predominantly type (3) carbonaceous siltstone as above; other two types present and total - 20%.
	10	COAL: as above; grades into carbonaceous siltstone.
	trace	PYRITE: as above.
	trace	DOLOMITE: as above.
	trace	GLAUCONITIC SANDSTONE: as above.
1770-1775m	90	SILTSTONE: all three types: type (2) now rare, type (1) most common.
	5	COAL: as above.
	5	SANDSTONE: loose quartz and aggregates as above; no shows.
	trace	PYRITE.
	trace	GLAUCONITIC SANDSTONE: as above.
1775-1780m	60	SILTSTONE: all three types as above.
	20	SANDSTONE: mostly fine grained, friable, moderately hard aggregates, weak siliceous cement; no shows.
	20	COAL: as above.
	trace	PYRITE.
	trace	DOLOMITIC SANDSTONE.
1780-1785m	40	SILTSTONE: predominantly type (3) carbonaceous siltstone, type (1) and type (2) total 10%.
	40	COAL: as above; vitrinitic.
	20	SANDSTONE: translucent, light grey, mostly friable, moderately hard aggregates, minor loose grains, fine to very fine grained, subangular, moderately well sorted, weak siliceous cement, poor inferred visual porosity; no shows.
	trace	PYRITE.
	1785-1790m	50
1790-1795m	40	SANDSTONE: as above, occasional calcareous cemented aggregates.
	10	SILTSTONE: as above, all three types present.
	trace	PYRITE.
	trace	CLAYSTONE: white to rusty brown, very soft, not calcareous, occasional carbonaceous flecks.
	1795-1800m	70
1795-1800m	20	SILTSTONE: all three types present, type (2) rare.
	10	SANDSTONE: as above.
	trace	PYRITE.
	trace	DOLOMITE
	80	SILTSTONE: all three types present, very carbonaceous.
1795-1800m	10	COAL: as above.
	10	SANDSTONE: as above, loose grains and aggregates.
	trace	PYRITE: very common.
	trace	GLAUCONITE.

1800-1805m	100	SILTSTONE: as above, carbonaceous siltstone type (3) grades into coal.
	trace	COAL: as above.
	trace	SANDSTONE: as above.
	trace	DOLOMITE.
1805-1810m	trace	PYRITE: abundant.
	50	CLAYSTONE: white to pale brown, very soft, sticky, non calcareous.
	40	SILTSTONE: all three types, as above.
	10	SANDSTONE: as above; no shows.
1810-1815m	trace	PYRITE.
	trace	COAL: as above.
	70	SILTSTONE: as above, highly carbonaceous in general. All three types present, type (3) dominant.
	30	CLAYSTONE: as above.
1815-1820m	trace	SANDSTONE: as above; no shows.
	trace	PYRITE.
	trace	COAL.
	60	COAL: as above.
1820-1825m	30	SILTSTONE: predominance of carbonaceous siltstone type (3).
	10	SANDSTONE: mostly aggregates as above.
	trace	PYRITE.
	70	SILTSTONE: as above; all three types dominant.
1825-1830m	20	SANDSTONE: as above; no shows, fine grained aggregates.
	10	COAL: as above.
	trace	DOLOMITE.
	trace	PYRITE.
1830-1835m	90	SILTSTONE: as above.
	5	SANDSTONE: as above; no shows.
	5	COAL: as above.
	trace	DOLOMITE.
1835-1840m	trace	PYRITE.
	60	SILTSTONE: as above.
	40	COAL: as above; high in vitrinite.
	trace	DOLOMITE.
1840-1845m	trace	SANDSTONE: as above; no shows.
	trace	PYRITE.
	90	SILTSTONE: as above.
	10	COAL: as above.
1840-1845m	trace	SANDSTONE: as above.
	5	DOLOMITE: red brown to pale brown, angular to tabular cuttings, extremely hard, slow reaction to HCl.
	5	PYRITE.
	70	SILTSTONE: as above,, all three types present.

1845-1850m	90 10 trace trace trace trace	SILTSTONE: as above; carbonaceous, all 3 types. COAL: as above. CLAYSTONE: as above. SANDSTONE: as above. DOLOMITE. PYRITE.
1850-1855m	90 5 5 trace trace	COAL: as above. SILTSTONE: only type (1) and type (3) as above. SANDSTONE: as above. PYRITE. DOLOMITE: dolomitic sandstone aggregates.
1855-1860m	70 30 trace trace trace	COAL: as above. SILTSTONE: all 3 types present. SANDSTONE: as above. PYRITE. DOLOMITE.
1860-1865m	40 30 30 trace trace	SANDSTONE: translucent to light grey, dominantly fine grained aggregates, poorly sorted, moderately hard, occasionally very hard, occasionally calcareous cement; no shows. COAL: as above. SILTSTONE: as above; all 3 types present. PYRITE. CLAYSTONE.
1865-1870m	60 40 trace trace trace	SILTSTONE: type (1) and type (3) as above; soft, red brown to rust brown, carbonaceous. CLAYSTONE: white to rust brown, very soft, non calcareous. COAL: as above. SANDSTONE: as above. PYRITE.
1870-1875m	80 10 10 trace trace	SILTSTONE: pale brown to dark brown, very soft to soft, carbonaceous. All 3 types described above are present, type (1) and (3) are most common, (2) is rare. CLAYSTONE: white to light grey, very soft, non calcareous. COAL: as above. SANDSTONE: fine to very fine grained, poorly sorted aggregates, friable, weak dolomitic or calcitic cement. PYRITE.
1875-1880m	80 20 trace trace trace	SILTSTONE: as above. CLAYSTONE: white to red brown as above. PYRITE. COAL. GLAUCONITE: possible cavings (in sandstone seen above).
1880-1885m	80 20 trace trace	SILTSTONE: as above; all 3 types. CLAYSTONE: as above. COAL: as above. PYRITE.
1885-1890m	70 30 trace trace trace	SILTSTONE: as above CLAYSTONE: as above. SANDSTONE: as above. PYRITE. COAL.

1890-1895m	90 10 trace trace	SILTSTONE: as above. CLAYSTONE: as above. PYRITE. COAL.
1895-1900m	80 20 trace trace	SILTSTONE: as above. CLAYSTONE. COAL. PYRITE.
1900-1905m	80 20 trace trace trace	SILTSTONE: predominantly pale brown to dark brown, soft, blocky cuttings, occasionally highly carbonaceous, occasionally type (2) siltstones are calcareous, otherwise non calcareous. CLAYSTONE: brownish grey to white, very soft, non calcareous. COAL. DOLOMITE. CALCAREOUS SILTSTONE: white to light grey, friable, fine grained, moderately sorted, calcareous cement; no shows.
1905-1910m	trace 50 50 trace trace	PYRITE. SILTSTONE: as above. CLAYSTONE: as above. COAL. SANDSTONE: large loose grains, milky white, angular.
1910-1915m	60 30 10 trace trace trace	SANDSTONE: as above. CLAYSTONE: as above, weakly calcareous. SANDSTONE: as above, translucent to light grey, friable to moderately hard, fine grained, weak calcareous cement. DOLOMITE. COAL. PYRITE.
1915-1920m	60 40	SANDSTONE: quartzose aggregates; light grey, friable to moderately hard, very fine grained, very well sorted, dolomitic cement, carbonaceous and mica inclusions, very poor visible porosity; no shows. SILTSTONE: brownish grey to greyish red, medium light grey, firm, blocky cuttings, tending to subfissile in parts, carbonaceous, occasionally light grey cuttings are calcareous, very carbonaceous in parts, pyritic in parts.
1920-1925m	80 20 trace	SILTSTONE: soft to firm, argillaceous in parts, otherwise as above. SANDSTONE: aggregates as above. DOLOMITE.
1925-1930m	100 trace	SILTSTONE: predominantly brownish grey, otherwise as above. SANDSTONE: 2 types: Type (1) - aggregates: as above; also very occasional type (2) - very fine grained, well sorted, dolomite cemented aggregates with poor visible porosity and moderately bright white fluorescence, very slow faint diffuse white cut and instant moderately strong diffuse, white crush cut.

1930-1935m	90 10	SILTSTONE: as above. COAL: black, firm to brittle, vitreous to subvitreous, occasionally earthy, angular to subangular, blocky cuttings, conchoidal fracture in parts.
1935-1940m	100 trace trace trace	SILTSTONE: as above. DOLOMITE: tan to pale red brown, hard, angular cuttings. COAL: as above and grading to very carbonaceous siltstone. SANDSTONE: aggregates: Types (1) and (2) as above; occasional aggregates with very weak whitish yellow fluorescence and slow to instant occasional moderate to weak diffuse white cut, very faint white crush cut.
1940-1945m	90 10 trace	SILTSTONE: as above. COAL: predominantly vitreous to subvitreous, as above. SANDSTONE: aggregates types (1) and (2) with shows as above.
1945-1950m	100 trace trace	SILTSTONE: argillaceous in parts, non calcareous as above. COAL: as above. SANDSTONE: aggregates types (1) and (2) as above; 2 cuttings - type (2) have patchy blue yellowish fluorescence and cut as above.
1950-1955m	100	SILTSTONE: as above and grading to claystone in parts.
1955-1960m	100 trace	SILTSTONE: as above. SANDSTONE: aggregates; type (2) as above with 1 cutting with moderately bright white fluorescence and fast diffuse white cut.
1960-1965m	100 trace	SILTSTONE: as above and grading to claystone in parts. SANDSTONE: aggregates; type (2) light grey, very friable, very fine grained, very well sorted, weak dolomitic cement, poor to moderate visible porosity; no shows.
1965-1970m	90 10 trace trace	SILTSTONE: brownish grey (predominantly) to medium dark grey, soft to firm, blocky, subrounded to rounded cuttings, slightly calcareous in parts (the grey cuttings), carbonaceous to very carbonaceous in parts, argillaceous in parts; grading to claystone in parts. CLAYSTONE: very light to brownish grey, very soft to soft, sticky, blocky, well rounded cuttings, carbonaceous. DOLOMITE: as above. SANDSTONE: Type (2) - aggregates as above; no shows.

1970-1975m	80	SILTSTONE: as above.
	15	CLAYSTONE: as above.
	5	SANDSTONE: Type (2) - aggregates as above; cuttings have very weak whitish fluorescence and fast weak streaming white cut.
1975-1980m	40	SILTSTONE: as above.
	40	SANDSTONE: 20% loose quartz grains, translucent, coarse to very coarse grained, subangular to rounded cuttings, poor to moderately sorted; no shows; 80% aggregates Type (1) and Type (2): as above; no shows.
	20	COAL: black, brittle to firm, subvitreous to earthy, predominantly subangular cuttings, conchoidal fracture in parts.
1980-1985m	70	SILTSTONE: less argillaceous, otherwise as above.
	30	SANDSTONE: 40% loose quartz grains, translucent, medium to very coarse grained, subangular to rounded, predominantly subrounded, poorly sorted; no shows. 60% type (1) aggregates: as above with faint very dull yellowish mineral fluorescence; no shows.
	trace	COAL: as above.
1985-1990m	80	SILTSTONE: as above.
	20	SANDSTONE: 40% loose quartz grains, predominantly medium to coarse grained otherwise as above. 60% aggregates - type (1) and type (2) as above; no shows.
1990-1995m	95	SILTSTONE: as above.
	5	SANDSTONE: loose quartz grains and aggregates type (1) and type (2) as above; no shows.
1995-2000m	90	SILTSTONE: as above.
	10	SANDSTONE: occasional loose quartz grains/fragments as above; predominantly aggregates - type (1) and type (2) as above.
	trace	DOLOMITE.
2000-2005m	100	SILTSTONE: as above.
	trace	SANDSTONE: aggregates - type (2) as above.
2005-2010m	80	SILTSTONE: greyish red to brownish grey, occasionally predominantly grey, blocky to subrounded cuttings, soft to firm, carbonaceous to very carbonaceous, medium grey cuttings are slightly calcareous, micromicaceous (sericite).
	20	SANDSTONE: occasional loose quartz grains; as above; predominantly aggregates - type (2) as above with very faint to very dull yellowish fluorescence and extremely faint white crush cut.
	trace	PYRITE: microcrystalline and crystalline aggregates.
2010-2015m	90	SILTSTONE: as above.
	10	SANDSTONE: type (2) aggregates: as above, with very dull to very faint yellowish fluorescence and very faint white crush cut.
	trace	DOLOMITE: light brown to tan, hard, angular cuttings.

2015-2020m	85	SILTSTONE: as above.
	15	SANDSTONE: minor loose quartz grains, as above; predominantly aggregates - type (2) as above; no shows.
	trace	DOLOMITE: as above.
2020-2025m	60	SILTSTONE: as above.
	40	SANDSTONE: loose quartz grains and fragments; translucent, medium to very coarse grained, predominantly coarse grained, subangular to rounded, poorly to moderately well sorted; no shows; type (2) aggregates: as above; no shows.
	trace	DOLOMITE: as above.
2025-2030m	60	SANDSTONE: predominantly coarse quartz grains/fragments; coarse to granule sized, otherwise as above; no shows; also aggregates: light grey, very friable to occasionally moderately hard, predominantly friable, very fine to fine grained, predominantly very fine grained, very well sorted, dolomite cement to poorly cemented, very fine grain sized carbonaceous inclusions grade into fine carbonaceous laminations, poor visible porosity, no shows; patchy, very dull, very weak yellowish mineral fluorescence.
	40	SILTSTONE: as above.
	trace	DOLOMITE: as above.
	trace	PYRITE: as above.
2030-2035m	60	SILTSTONE: as above.
	40	SANDSTONE: 50% loose quartz grains; as above; no shows. 50% aggregates; as above; trace aggregates have very dull to weak yellowish fluorescence with fast weak white cut and crush cut.
2035-2040m	60	SANDSTONE: 30% loose quartz grains, as above; no shows; 70% aggregates, predominantly fine grained otherwise as above; no shows.
	40	SILTSTONE: as above.
2040-2045m	70	SILTSTONE: as above.
	30	SANDSTONE: loose quartz grains as above; also aggregates predominantly friable to moderately hard and fine grained, otherwise as above with fluorescence as above and very faint to weak white crush cut.
	trace	COAL: as above.
	trace	PYRITE: as above.
2045-2050m	trace	DOLOMITE: as thin layers and inclusions within siltstone.
	90	SILTSTONE: as above.
	10	SANDSTONE: occasional loose quartz grains; as above; predominantly quartzose aggregates; both very fine grained and fine grained, very well sorted, carbonaceous cement, otherwise as above; no shows; mineral fluorescence as above.
	trace	COAL: as above and grading to very carbonaceous siltstone in parts.
	trace	PYRITE: microcrystalline aggregates.
	trace	DOLOMITE: as above.

2050-2055m	90	SILTSTONE: as above.
	10	SANDSTONE: occasional loose quartz grains; as above, predominantly quartzose aggregates; as above; poor fluorescence; as above with slow, weak white diffuse cut and crush cut.
	trace	COAL: as above.
2055-2060m	90	SILTSTONE: as above.
	10	SANDSTONE: occasional quartz grains/fragments, as above, predominantly aggregates; as above, with poor weak fluorescence as above and weak, very slow diffuse white cut and weak white crush cut.
	trace	COAL: as above.
	trace	PYRITE: as above.
2060-2065m	60	SILTSTONE: as above.
	40	SANDSTONE: aggregates; as above with shows as above.
2065-2070m	60	SILTSTONE: as above.
	40	SANDSTONE: aggregates; as above; no shows.
2070-2075m	100	SILTSTONE: as above; carbonaceous.
	trace	SANDSTONE: very fine grained aggregates dominate, friable, no fluorescence, no cut, no crush cut.
	trace	CLAYSTONE: white, very soft, sticky, non calcareous.
	trace	PYRITE.
2075-2080m	90	SILTSTONE: as above.
	10	CLAYSTONE: white to pale brown, very soft, sticky, non calcareous.
	trace	SANDSTONE: as above; no shows.
	trace	COAL: laminae of microcrystalline pyrite.
2080-2085m	80	SILTSTONE: as above.
	10	CLAYSTONE: as above.
	10	SANDSTONE: as above; no fluorescence, no cut, extremely slow, diffuse dull yellow to white crush cut, occasional dolomitic cement.
	trace	PYRITE.
	trace	COAL.
2085-2090m	80	SILTSTONE: as above.
	10	CLAYSTONE: as above.
	10	SANDSTONE: as above; weak, dull yellow, extremely slow and diffuse crush cut.
	trace	PYRITE.
2090-2094m (Bottoms Up Sample)	80	SILTSTONE: as above.
	10	CLAYSTONE: as above.
	10	SANDSTONE: weak crush cut as above.
	trace	PYRITE.
		Pulled out of hole for bit change - RIH, reamed from 2022-2094m.
2094-2100m	95	SILTSTONE: as above.
	5	COAL: as above.
	trace	SANDSTONE: loose grains and aggregates; as above; no shows.

2100-2105m	100	SILTSTONE: brownish grey to pale brown, medium light to medium grey, firm to soft, blocky, rounded to subrounded cuttings, calcareous in parts, (generally the medium light grey cuttings), carbonaceous to very carbonaceous in parts, argillaceous in parts, grades to claystone in parts.
	trace	SANDSTONE: quartzose aggregates; light grey, very friable to friable, very fine to fine grained, very well sorted, occasional small carbonaceous inclusions, weak dolomitic cement, poor visible porosity; no shows.
2105-2110m	100	SILTSTONE: as above.
	trace	SANDSTONE: friable with occasional moderately hard dolomite cemented aggregates; no shows.
	trace	CLAYSTONE: white to pale brown, very soft, sticky, non calcareous.
	trace	GLAUCONITE: probably cavings.
2110-2115m	90	SILTSTONE: as above.
	10	SANDSTONE: light grey to buff, aggregates, friable to occasionally moderately hard, very fine grained, subangular, moderately well sorted, occasionally dolomite cemented aggregates, occasionally mica, occasionally carbonaceous, poor visible porosity; no shows.
2115-2120m	100	SILTSTONE: as above.
	trace	SANDSTONE: as above; no shows.
	trace	COAL.
	trace	GLAUCONITE: possible cavings.
	trace	CLAYSTONE: as above.
2120-2125m	90	SILTSTONE: as above; highly carbonaceous in parts.
	10	CLAYSTONE: as above.
	trace	SANDSTONE: as above; no shows.
	trace	COAL.
	trace	PYRITE.
2125-2130m	90	SILTSTONE: as above.
	5	COAL: black, vitreous, brittle, angular cuttings, grades into carbonaceous siltstone.
	5	SANDSTONE: fine grained friable aggregates as above, occasionally very hard dolomitic aggregates; no shows.
	trace	CLAYSTONE: white, very soft, sticky, non calcareous.
2130-2135m	50	COAL: as above.
	40	SILTSTONE: as above.
	10	CLAYSTONE: as above.
	trace	SANDSTONE: as above, trace weak bright white crush cut (extremely slow).
	trace	PYRITE.
2135-2140m	85	SILTSTONE: as above.
	10	SANDSTONE: as above, more loose quartz grains; no shows.
	5	COAL: as above.
	trace	CLAYSTONE: as above.
	trace	PYRITE.

2140-2145m	70	SILTSTONE: as above.
	30	SANDSTONE: 2 types: Type (1) - loose quartz grains, light grey to milky white, coarse to very coarse, angular to subrounded, moderately sorted; no shows. Type (2) - fine to very fine grained aggregates, light grey to buff, friable to moderately hard, subangular, well sorted, becoming more carbonaceous, dolomite cement in hardest aggregates (becoming more common); no shows.
	trace	COAL.
	trace	PYRITE.
2145-2150m	50	SILTSTONE: as above.
	50	SANDSTONE: as above; no shows; 50% loose quartz, 50% aggregates.
	trace	DOLOMITE: buff to pale brown, extremely hard, angular to tabular cuttings, dull yellow mineral fluorescence.
	trace	PYRITE.
2150-2155m	100	SANDSTONE: 2 types: Type (1) - loose quartz grains, medium to very coarse grained, subangular to subrounded, moderately well sorted, good inferred porosity; no shows. Type (2) - occasional dolomitic aggregates, medium to fine, very hard to extremely hard, subangular to angular, well sorted, no inferred visible porosity; dull yellow dolomite mineral fluorescence; no shows.
	trace	SILTSTONE: as above.
	trace	PYRITE.
	trace	DOLOMITE: as above.
	trace	COAL.
2155-2160m	100	SANDSTONE: as above; 60% loose quartz grains; 40% dolomitic aggregates; 5% dull yellow dolomite mineral fluorescence; no shows; Type (1) dominant.
	trace	SILTSTONE: as above.
	trace	COAL: as above.
	trace	DOLOMITE: as above.
	trace	PYRITE.
2160-2165m	80	SANDSTONE: as above; predominantly loose quartz grains, occasional dolomitic aggregates; no shows.
	20	SILTSTONE: as above; highly carbonaceous.
	trace	PYRITE: becoming common.
	trace	DOLOMITE: buff to red brown; as above.
	trace	COAL: as above.
2165-2170m	70	SANDSTONE: as above; approximately 60% loose quartz grains, 40% fine grained aggregates, dolomitic and slightly silty matrix; no shows.
	30	SILTSTONE: as above; carbonaceous.
	trace	PYRITE.
	trace	DOLOMITE: as above.
	trace	COAL: as above.
2170-2175m	50	SANDSTONE: as above; no shows.
	30	SILTSTONE: as above; highly carbonaceous.
	20	COAL: as above.
	trace	DOLOMITE: relatively common, dominantly red brown to extremely hard.
	trace	PYRITE.

2175-2180m	80	SILTSTONE: as above, occasionally olive green and calcareous.
	10	SANDSTONE: as above; no shows.
	10	COAL: as above.
	trace trace	DOLOMITE: as above. PYRITE.
2180-2185m	50	SILTSTONE: as above.
	40	SANDSTONE: as above; dolomite cemented aggregates; no shows.
	10	COAL: as above.
	trace trace	PYRITE. DOLOMITE: as above.
2185-2190m	60	SANDSTONE: dolomite cemented aggregates; as above.
	40	SILTSTONE: as above.
	trace	COAL: as above.
	trace trace	PYRITE. DOLOMITE.
2190-2195m	50	SILTSTONE: as above; very carbonaceous in part with carbonaceous laminations.
	30	SANDSTONE: fine grained aggregates in a dolomitic cement, commonly also in a white silty matrix; dolomitic fluorescence; as above.
	20	SANDSTONE: loose grains, medium to coarse grained, predominantly medium, subangular to subrounded, moderately sorted; as above.
	trace trace	COAL. PYRITE.
2195-2200m	70	SILTSTONE: greyish red and grey, carbonaceous, rounded to blocky cuttings, firm, occasional thin carbonaceous laminations.
	15	SANDSTONE: Type (1) - loose grains, translucent to milky, medium to coarse, predominantly coarse, rounded to subrounded, predominantly subrounded, moderately sorted; no shows.
	15	SANDSTONE: Type (2) - fine to very fine aggregates, dolomitic cement, silty matrix (dolomite) in places, excellently sorted, dolomite fluorescence, hard.
	trace	COAL: blocky cuttings, angular and occasionally subrounded (possible cavings), vitreous, conchoidal fracture.
	trace	PYRITE
	trace	DOLOMITE: blue grey to red brown.
2200-2205m	60	SILTSTONE: as above; firm to hard.
	15	DOLOMITE: thin wedges, long, creamy white to buff, pale yellow fluorescence.
	10	SANDSTONE: Type (2) - dolomitic cement, calcite cement in places; as above.
	5	COAL: as above.
	10 trace	SANDSTONE: Type (1); as above. PYRITE.
2205-2210m	40	COAL: angular, conchoidal fracture.
	30	SILTSTONE: as above.
	25	SANDSTONE: Type (2) - as above; dolomite cement only.
	5	DOLOMITE: as above.
	trace trace	PYRITE. SANDSTONE: Type (1): as above.

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2210-2215m	40	SANDSTONE: Type (2) - as above; dolomitic cement only.
	30	SILTSTONE: as above.
	20	SANDSTONE: Type (1) - as above.
	10	COAL: grading to carbonaceous siltstone otherwise as above.
	trace trace	PYRITE. DOLOMITE.
2215-2220m	95	SILTSTONE: greyish red, soft to firm, carbonaceous, occasional carbonaceous laminations.
	5	SANDSTONE: Type (2) - as above.
	trace	COAL.
	trace trace	SANDSTONE: Type (1) - as above. PYRITE.
2220-2225m	100	SILTSTONE: as above.
	trace	SANDSTONE: Type (2) - as above.
	trace	PYRITE.
	trace	COAL.
2225-2230m	100	SILTSTONE: as above.
	trace	SANDSTONE: Type (2) - as above.
	trace	SANDSTONE: Type (1) - as above.
	trace	PYRITE.
2230-2235m	80	SILTSTONE: pale brown to greyish brown, greyish red and occasionally medium dark grey, soft to firm, blocky cuttings, carbonaceous to very carbonaceous in parts, argillaceous, grades to claystone in parts.
	20	COAL: black, brittle, angular cuttings, vitreous, conchoidal fracture.
	trace	SANDSTONE: quartzose aggregates: 2 types: Type (1) - light grey, moderately hard, very fine to fine grained, well sorted, calcite and possible dolomite cement, occasional carbonaceous inclusions, very poor visible porosity, very dull, faint gold mineral fluorescence; no shows. Type (2) - light to medium light grey, very friable, very fine grained, very well sorted, argillaceous matrix, carbonaceous inclusions, poor visible porosity; no shows.
2235-2240m	90	SILTSTONE: becoming very argillaceous in parts and grading to claystone below, otherwise as above.
	10	CLAYSTONE: white/very light grey to brownish grey, very soft, sticky, blocky well rounded cuttings, carbonaceous in parts.
	trace	SANDSTONE: aggregates: type (1) and type (2) as above; no shows.
	trace	COAL: as above.
2240-2245m	90	SILTSTONE: as above.
	10	CLAYSTONE: as above.
	trace	SANDSTONE: aggregates: type (1) and type (2) as above; no shows.
2245-2250m	70	SILTSTONE: as above.
	20	CLAYSTONE: as above.
	10	COAL: as above.
	trace	SANDSTONE: aggregates: type (1) and type (2) as above; no shows.

2250-2255m	95	SILTSTONE: less argillaceous, otherwise as above.
	5	SANDSTONE: aggregates: type (1) and type (2) as above, type (1) occasionally medium grained, moderately bright to bright whitish fluorescence and very slow, very weak diffuse white cut and crush cut.
2255-2260m	80	SILTSTONE: as above.
	10	COAL: as above.
	10	CLAYSTONE: as above.
	trace	SANDSTONE: aggregates: type (1) and type (2) as above, with shows as for 2250-2255 sample.
2260-2265m	65	SILTSTONE: as above.
	30	SANDSTONE: aggregates: predominantly type (1), also minor type (2) as above with shows as for 2250-2255 above; also minor loose quartz grains; translucent to occasionally clear, angular to subrounded, predominantly subangular, medium to very coarse, moderately well sorted; no shows.
	5	COAL: as above.
2265-2270m	90	SILTSTONE: as above.
	10	SANDSTONE: trace loose quartz grains; as above; predominantly aggregates predominantly type (1) as above, with shows as for 2250-2255 sample.
	trace	COAL: coals grading to very carbonaceous siltstone.
2270-2275m	80	SILTSTONE: as above.
	trace	COAL: as above, grading to siltstone in parts.
	20	SANDSTONE: loose quartz grains; as above; also aggregates; predominantly type (1) also type (2) as above; no shows, moderately bright mineral fluorescence.
2275-2280m	95	SILTSTONE: as above.
	5	SANDSTONE: occasional loose quartz grains, as above; aggregates: as above, type (1) mineral fluorescence; no shows.
	trace	PYRITE: microcrystalline aggregates.
	trace	DOLOMITE: light brown to red brown, hard, angular cuttings.
2280-2285m	95	SILTSTONE: as above; carbonaceous laminations in parts.
	5	SANDSTONE: Type (1) - fine to very fine quartz aggregates in a silty dolomitic matrix, light grey to reddish grey, very well sorted.
	trace	CALCITE: crystalline, dull yellow fluorescence.
2285-2290m	trace	PYRITE: as above.
	60	COAL: as above; grading to very carbonaceous siltstone.
	35	SILTSTONE: as above; with carbonaceous laminations.
	5	SANDSTONE: very fine to fine quartz aggregates, light grey, partly dolomitic, grading to siltstone; no shows.
	trace	PYRITE.

2290-2295m	55	SILTSTONE: as above; carbonaceous laminations common.
	40	COAL: as above.
	5	SANDSTONE: Type (1) - as above.
	trace	PYRITE.
2295-2300m	90	SILTSTONE: light grey to dark grey occasionally grey-brown, carbonaceous, commonly with carbonaceous laminations, firm to moderately hard.
	5	COAL: as above.
	5	SANDSTONE: Type (1) - as above; no shows; dull yellow mineral fluorescence.
2300-2305m	60	SILTSTONE: as above.
	40	SANDSTONE: Type (1) - as above; calcareous cement in part.
	trace	COAL: as above.
	trace	PYRITE.
2305-2310m	90	SILTSTONE: as above.
	10	SANDSTONE: Type (1) - as above.
	trace	COAL: as above.
	trace	PYRITE.
	trace	DOLOMITE: with ooidal glauconite growths?
2310-2315m	60	SILTSTONE: as above.
	40	COAL: as above.
	trace	SANDSTONE: as above; no shows; occasionally dolomitic.
	trace	PYRITE.
2315-2320m	60	SILTSTONE: as above.
	30	COAL: as above.
	10	SANDSTONE: as above; no shows.
	trace	DOLOMITE.
2320-2325m	60	SILTSTONE: as above; carbonaceous.
	30	SANDSTONE: as above; extremely fine, grades into siltstone; no shows.
	10	COAL: as above.
	trace	DOLOMITE: red brown, traces of glauconite, becoming more common.
	trace	PYRITE: rare.
2325-2330m	50	SILTSTONE: as above.
	40	SANDSTONE: as above; no shows.
	10	COAL: as above.
	trace	DOLOMITE: as above; common.
	trace	PYRITE.
2330-2335m	100	COAL: high in vitrinite, conchoidal fracture, brittle.
	trace	SILTSTONE: as above.
	trace	SANDSTONE: as above; no shows.
	trace	DOLOMITE: as above.
2335-2340m	40	SILTSTONE: as above.
	30	COAL: as above.
	30	SANDSTONE: as above; but now 50% loose quartz grains as well as fine grained aggregates; no shows.
	trace	DOLOMITE.
	trace	PYRITE.

2340-2345m	70	SANDSTONE: predominantly loose quartz grains, medium to very coarse, angular to subangular, moderately well sorted; no shows; occasional aggregates, friable to moderately hard, very fine grained, subangular, well sorted; no shows.
	20	SILTSTONE: as above.
	10	COAL: as above.
	trace trace	DOLOMITE. PYRITE.
2345-2350m	70	COAL: as above.
	30	SANDSTONE: as above; 80% loose quartz grains, 20% aggregates; no shows.
	trace	SILTSTONE: as above.
	trace trace	PYRITE. DOLOMITE.
2350-2355m	80	SILTSTONE; as above, highly carbonaceous.
	10	COAL: as above; grades into carbonaceous siltstone.
	10 trace	SANDSTONE: as above; no shows. DOLOMITE.
2355-2360m	100	SILTSTONE: as above; extremely carbonaceous grades into coal.
	trace	COAL: as above; exinite fluorescence.
	trace	SANDSTONE: aggregates as above dominate over loose grains. Friable, medium to fine grained, subangular, well sorted, moderate inferred porosity; no shows.
	trace	PYRITE.
	trace	DOLOMITE: as above; red brown, extremely hard, dull yellow mineral fluorescence.
2360-2365m	70	SILTSTONE: as above; highly carbonaceous, grades into coal.
	20	COAL: as above.
	10	SANDSTONE.
2365-2370m	50	SILTSTONE: as above; highly carbonaceous.
	30	COAL: as above.
	20	SANDSTONE: as above, carbonaceous; no shows.
2370-2375m	90	COAL: as above
	10	SILTSTONE: as above.
	trace	SANDSTONE: as above; no shows.
	trace	PYRITE.
2375-2380m	60	SILTSTONE: as above.
	30	COAL: as above.
	10	SANDSTONE: as above; no shows.
	trace	PYRITE.
		POOH FOR N.B.
2380-2385m	90	SILTSTONE: many types, cavings.
	10	SANDSTONE: aggregates, occasionally highly dolomitic.
	trace	COAL.
	trace	DOLOMITE.
	trace	PYRITE.

2385-2390m	70	SILTSTONE: still cavings; main type consists of greyish red angular to rounded blocky cuttings, carbonaceous, commonly with carbonaceous laminations, firm to moderately hard, occasionally grading into coal.
	30	SANDSTONE: aggregates of quartz, light grey to red brown, commonly containing carbonaceous matter, fine to very fine, well sorted, sometimes in a silty (white) matrix, otherwise with silica cement, poor visible porosity.
	trace trace	PYRITE. COAL: (possible cavings).
2390-2395m	80	SILTSTONE: as above; grading into shale.
	20	SANDSTONE: as above; dolomitic in part.
	trace	COAL.
	trace	PYRITE.
2395-2400m	95	SILTSTONE: as above; grading into shale, also brownish grey.
	5	SANDSTONE: Type (1) - as above.
	trace	SANDSTONE: Type (2) - translucent to milky quartz, coarse to very coarse, subrounded, moderately sorted, free grains; no shows.
	trace	PYRITE.
	trace	COAL: some splintery, angular, others rounded (cavings).
2403m Spot Sample	100	COAL: coarse to granule size, angular, conchoidal fracture, occasionally silty.
2400-2405m	50	SILTSTONE: light grey to grey red, otherwise as above.
	40	COAL: coarse to very coarse cuttings, angular, blocky, conchoidal fracture, vitreous, brittle, grading to carbonaceous shale in parts.
	10	SANDSTONE: Type (1) - as above.
	trace	SANDSTONE: Type (2) - no shows.
	trace	PYRITE: commonly as aggregates surrounding quartz from sandstone type (2).
2405-2410m	trace	DOLOMITE: translucent to very light brown.
	70	SILTSTONE: light grey to grey red, otherwise as above.
	20	COAL: as above.
	10	SANDSTONE: Type (1) - as above.
	trace	SANDSTONE: Type (2) - as above.
	trace	PYRITE: occasionally with carbonaceous aggregates.
2410-2415m	85	SILTSTONE: greyish red to light grey, subrounded cuttings, firm to moderately hard, carbonaceous.
	10	SANDSTONE: Type (1) - fine to very fine grained; aggregates of quartz, angular to subangular, well sorted, silty matrix in places, 5% dull white fluorescence, slow white cut.
	5	COAL: as above.
	trace	SANDSTONE: Type (2) - as sandstone (2) above.

2415-2420m	90	SILTSTONE: occasionally very hard.
	10	SANDSTONE: Type (1) - as above; 5% bright white fluorescence, fast streaming white cut.
	trace	COAL: as above.
	trace	PYRITE: as above.
2422m (Spot Sample)	90	SILTSTONE: as above.
	5	SANDSTONE: Type (1) - as above; no shows.
	5	SANDSTONE: Type (2) - as above.
	trace	PYRITE.
2426m (Desander Sample)	100	SANDSTONE: very fine to fine grained, no shows; (maybe because of excessive washing), subangular to subrounded, excellently sorted.
2420-2425m	80	SILTSTONE: as above.
	10	SANDSTONE: Type (1) - as above; very dull yellow fluorescence, diffuse milky white cut.
	10	SANDSTONE: Type (2) - as above.
	trace	COAL: splintery, otherwise as above.
	trace	PYRITE.
2425-2430m	70	SANDSTONE: 2 types: Type (1) - as above; dull yellow fluorescence (5%), slow white cut. Type (2) - loose grains, translucent to milky white, medium to coarse, predominantly coarse, subangular to subrounded, poorly sorted; no shows.
	30	SILTSTONE: as above.
	trace	COAL: as above.
	trace	PYRITE.
2430-2435m	70	SANDSTONE: 2 types: Type (1) - as above, 10% dull yellow fluorescence, very slow diffuse milky white cut. Type (2) - as above; occasional aggregates give a very pale white fluorescence and a very slow diffuse white cut.
	30	SILTSTONE: as above.
	trace	PYRITE.
2435-2440m	70	SANDSTONE: 2 types: Type (1) - as above; 15% dull yellow to white fluorescence, bright blue to white streaming cut (fast). Type (2) - as above.
	30	SILTSTONE: as above.
	trace	PYRITE.
2440-2445m	90	COAL: angular cuttings, conchoidal fracture, vitreous, brittle, coarse to very coarse sized cuttings.
	5	SANDSTONE: mainly type (2) as above.
	5	SILTSTONE: as above.
2445-2450m	80	COAL: black, brittle, angular cuttings, vitreous, conchoidal fracture.
	10	SILTSTONE: medium grey to medium dark grey, firm, blocky to subfissile cuttings, common carbonaceous inclusions, dolomitic in parts.

	10	SANDSTONE: 2 types: Type (1) - aggregates: very light to light grey, friable to moderately hard, very fine to medium grained, predominantly very fine to fine grained, subrounded, well to moderately well sorted, dolomitic cement and silty matrix, occasional carbonaceous inclusions, poor visible porosity, dull to moderately bright yellow to whitish mineral fluorescence; no shows. Also Type (2) loose quartz; as above.
2450-2455m	50	SILTSTONE: medium light to medium dark grey, otherwise as above.
	30	COAL: as above.
	20	SANDSTONE: Type (1) - aggregates; with trace yellow mineral fluorescence and trace bright to moderately bright white fluorescence with fast to moderately fast, weak streaming to diffuse white cut and moderately strong white crush cut.
2455-2460m	50	SILTSTONE: as above.
	30	SANDSTONE: 2 types: Type (1) - loose quartz grains, clear to translucent, medium to coarse grained, subangular to subrounded, moderately well sorted. Type (2) - aggregates; as above, with 5% gold mineral fluorescence and occasional cuttings with weak diffuse white cut.
	20	COAL: as above.
	trace	DOLOMITE: light brown to red brown, hard to very hard, angular cuttings.
	trace	PYRITE: microcrystalline aggregates.
2460-2465m	50	SILTSTONE: as above and firm to moderately hard.
	45	SANDSTONE: 2 types: Type (1) - loose quartz grains; as above. Type (2) - aggregates; as above, with mineral fluorescence as above (10%) and occasional cuttings with weak white diffuse cut.
	5 trace	COAL: as above. DOLOMITE: as above.
2465-2470m	90	SILTSTONE: as above.
	10	SANDSTONE: 2 types: Type (2) - aggregates mainly with trace mineral fluorescence and occasional cuttings with whitish fluorescence and weak diffuse white cut. Occasional type (1) loose quartz grains; as above.
2470-2475m	70	SILTSTONE: as above and grading to fissile carbonaceous shale in parts.
	25	SANDSTONE: occasional type (1) loose grains; as above, predominantly type (2) aggregates; as above (includes estimate from de-sander sample), with trace dull gold mineral fluorescence; no shows.
	5	COAL: as above.
*2475-2480m	100 trace trace	COAL: black, brittle, angular cuttings, vitreous lustre, conchoidal fracture in parts. SILTSTONE: as above. SANDSTONE: type (1) loose quartz and type (2) aggregates as above; no shows.

2480-2485m	50	SHALE: brownish grey to medium dark grey, firm, subfissile to fissile, carbonaceous to very carbonaceous.
	40	SILTSTONE: brownish grey, medium light grey to medium dark grey, firm, moderately hard and dolomitic in parts, blocky to subfissile, carbonaceous.
	10	SANDSTONE: type (2) - aggregates; as above, with dull gold to yellow mineral fluorescence.
	trace	COAL: as above.
2485-2490m	70	SILTSTONE: as above.
	20	SHALE: as above, very carbonaceous.
	10	SANDSTONE: occasional type (1) loose quartz grains; as above, aggregates, type (2) as above with dull gold mineral fluorescence.
	trace	COAL: as above.
2490-2495m	40	SILTSTONE: sandy in parts, otherwise as above.
	30	SANDSTONE: loose quartz grains; as above, predominantly quartz aggregates; type (1) as above, predominantly type (2); translucent, light grey, friable, fine to medium grained, predominantly medium grained, subrounded to rounded, poor to moderately sorted, dolomite cement, carbonaceous inclusions, poor visible porosity, approximately 20% bright white uneven mineral fluorescence; no shows.
	20	COAL: as above.
	10	SHALE: as above.
2495-2500m	40	SILTSTONE: as above.
	40	SANDSTONE: trace loose quartz; as above, predominantly quartz aggregates, minor type (1) as above, predominantly type (2) as above, with approximately 20% dull to bright white mineral fluorescence.
	20	COAL: as above.
	trace	SHALE: as above.
2500-2505m	70	SANDSTONE: minor loose quartz; as above, predominantly quartz aggregates; minor type (1) as above, predominantly type (2), as above with approximately 30% dull to bright white mineral fluorescence; no cut; no shows.
	30	SILTSTONE: as above and sandy in parts.
	trace	COAL: as above.
2505-2510m	80	SANDSTONE: loose quartz grains, translucent to occasionally milky white, medium to coarse grained, subangular to subrounded, moderately well sorted; type (1), aggregates; as above, predominantly type (2) aggregates; occasionally with coarse grains, otherwise as above, with approximately 20% dull to bright white mineral fluorescence.
	20	SILTSTONE: as above.
	trace	PYRITE: microcrystalline aggregates.

2510-2515m	80	SANDSTONE: 3 types: Type (1) - aggregates; translucent to milky white quartz, fine to medium grained, predominantly medium, moderately hard to hard, predominantly hard, subangular to subrounded, well sorted, dolomitic cement giving mineral fluorescence (pale yellow), poor visible porosity, trace pyrite. Type (2) - aggregates, as type (1) except colour is very light grey to medium light grey, pale white dolomitic fluorescence, poor visible porosity. Type (3) - loose grains, translucent to milky quartz, coarse to very coarse, predominantly coarse, subangular to subrounded, predominantly subrounded, well sorted. NOTE: type (1) and (2) predominant.
	15	SILTSTONE: dark grey, light grey, brown, firm to hard, predominantly hard, slightly dolomitic in parts, blocky, subfissile, occasionally pyritic, commonly carbonaceous.
	5	SHALE: dark brown, firm to hard, predominantly firm, carbonaceous, fissile.
	trace trace	COAL: as above. PYRITE.
2515-2520m	80	SANDSTONE: Types (1) to (3) present, all as above, mineral fluorescence is due to dolomite.
	10	SILTSTONE: as above.
	5	COAL: as above.
	5 trace	SHALE: as above. PYRITE.
2520-2525m	60	SANDSTONE: Types (1) and (3): as above.
	40	COAL: subfissile, brittle, vitreous, conchoidal fracture in places, angular, blocky cuttings, grading to carbonaceous siltstone.
	trace trace	SILTSTONE: as above. PYRITE.
2525-2530m	70	COAL: as above; grading into carbonaceous siltstone.
	20	SANDSTONE: Type (1) - aggregates are platy, i.e. there is a preferred orientation to fracturing, this was observed in all type (1) sands from 2515 on. Also Type (3) as above. Type (1) predominant.
	10 trace	SILTSTONE: as above. PYRITE.
2530-2535m	50	SANDSTONE: Type (1) - as above, commonly contains coal clasts, platy aggregates.
	25	COAL: as above, but grading to carbonaceous siltstone.
	25 trace	SILTSTONE: as above, (dominantly grey red). PYRITE.
2535-2540m	40	COAL: as above, grading into carbonaceous claystone and siltstone.
	40	SILTSTONE: as above.
	20	SANDSTONE: Type (1) and Type (2) - type (1) reacts more slowly in HCl, type (2) may contain more calcite in cement than type (1), otherwise as above.

2540-2545m	70	SILTSTONE: as above grading into carbonaceous shale.
	20	SANDSTONE: Type (1) as above.
	10	COAL: as above.
	trace	PYRITE.
2546.6m Spot Sample	90	CARBONACEOUS SILTSTONE: as above.
	5	COAL: as above.
	5	SANDSTONE: Type (1), as above.
2545-2550m	75	SILTSTONE: as above.
	20	SANDSTONE: dominantly type (1), minor type (2), as above.
	5	COAL.
2550-2555m	100	COAL: occasionally grading to carbonaceous siltstone, as above.
	trace	SANDSTONE: type (1), as above.
2555-2560m	50	SILTSTONE: carbonaceous laminations common, predominantly grey to red, otherwise as above.
	30	COAL: as above.
	20	SANDSTONE: predominantly type (1), occasional type (3).
	trace	PYRITE.
2560-2565m	90	SILTSTONE: as above, predominantly firm.
	10	SANDSTONE: Type (1).
	trace	COAL: as above, grading to carbonaceous shale in part.
	trace	PYRITE.
2565-2570m	80	SILTSTONE: as above.
	10	COAL: as above.
	10	SANDSTONE: Type (1), as above.
2572.1m		BOTTOMS UP SAMPLE.
	90	COAL: as above.
	10	SILTSTONE: as above.
2570-2575m	50	COAL: as above.
	40	SILTSTONE: as above, soft to firm.
	10	SANDSTONE: Type (1), as above.
2575-2580m	100	SILTSTONE: brownish grey to medium dark grey, occasionally medium light to medium grey, firm to moderately hard in parts, predominantly blocky subrounded cuttings occasionally subfissile, carbonaceous, micaceous, sandy in parts.
	trace	COAL: as above.
	trace	SANDSTONE: quartzose aggregates: translucent to light grey, predominantly friable and occasionally moderately hard, very fine to medium grained, predominantly very fine to fine grained, subrounded, well to moderately well sorted, dolomitic cement, occasional carbonaceous inclusions, poor visible porosity., dull to moderately bright yellowish/gold mineral fluorescence.
	PYRITE:	microcrystalline aggregates

2580-2585m Bottoms up	60	COAL: black, brittle, angular to subangular cuttings, vitreous to subvitreous lustre, conchoidal fracture in parts, silty in parts grading to a very carbonaceous siltstone.
	40	SILTSTONE: as above.
2585-2590m	100	SILTSTONE: as above.
	trace	COAL: as above.
	trace	SANDSTONE: aggregates; as above, also occasional loose quartz grains, predominantly coarse grained, subangular.
	trace	PYRITE: as above (more common).
2590-2595m	50	SILTSTONE: as above.
	40	SANDSTONE: 2 types: Type (1) - predominantly loose quartz grains/fragments; translucent to occasionally milky white, medium to very coarse grained, predominantly medium to coarse, angular to rounded, predominantly subrounded, moderately well sorted; no shows. Type (2) - aggregates; translucent to very light grey, friable to moderately hard, very fine to medium and occasionally coarse grained, predominantly fine to medium, subrounded, generally moderately well sorted, dolomite cement, occasionally carbonaceous inclusions, poor visible porosity, trace dull whitish fluorescence and extremely faint, extremely slow faint diffuse white cut.
	10	CLAYSTONE: white to very light grey, soft, slightly calcareous, carbonaceous.
	trace	PYRITE: as above.
	trace	COAL: as above.
2595-2597m Bottoms Up Sample	50	SANDSTONE: predominantly loose quartz grains; predominantly coarse to very coarse and subrounded, otherwise as above; also minor aggregates; as above, with no shows.
	50	SILTSTONE: as above.
	trace	COAL: as above.
	trace	PYRITE: as above.
		POOH TO CUT CORE NO. 2 (from 2597.3-2599.3m) CORE No. 3 (from 2599.3-2601.5m)
2601.5-2605m	80	SANDSTONE: loose grains and fragments; translucent, medium to granule sized, predominantly coarse to very coarse grained, angular to subrounded, predominantly angular to subangular, poor to moderately well sorted. NOTE: these grains and fragments are interpreted to have been broken from the hard dolomite cemented aggregates below.
		Aggregates; translucent, medium to very coarse, friable to hard, subrounded to subangular, predominantly subrounded, poor to moderately sorted, abundant dolomite cement, carbonaceous inclusions, poor to very poor visible porosity, approximately 10% bright whitish yellow fluorescence and extremely faint white crush cut.
	20	SILTSTONE: medium light grey to medium dark grey, occasionally pale brown, firm, blocky cuttings, carbonaceous (probably cavings).

2605-2610m	90	SANDSTONE: loose quartz grains and fragments broken from dolomite cemented aggregates as above; also aggregates; well cemented with dolomite as above, trace yellow fluorescence, with faint to extremely faint slow white cut and crush cut.
	10	SILTSTONE: as above.
2610-2615m	90	SANDSTONE: 2 types: Type (1) - as above. Type (2) - very fine to fine quartz aggregates, friable to moderately hard, well sorted, commonly in silty (dolomitic) matrix/cement, no fluorescence but with a very faint, very weak, very slow diffuse milky cut, poor to moderately visible porosity, predominantly poor porosity. Type (1) is slightly more predominant than type (2).
	10	SILTSTONE: as above.
2618m Bottoms Up Sample	100	SANDSTONE: 2 types: Type (1) - as above. Type (2) - as above. NOTE: Roughly equal amounts of both types.
2618-2623.3m		CUT CORE No. 4
2623.3-2625m	100	SANDSTONE: 2 types: Type (1) - loose quartz grains, translucent to milky, coarse to granule, predominantly very coarse, subrounded, well sorted, pyritic. Type (2) - fine to medium grained, predominantly medium grained, subangular, well sorted, dolomitic cement. No shows for either type. Approximately proportion: Type (1) - 90%; Type (2); 10%.
2626m Spot Sample	60	COAL: angular, blocky cuttings, vitreous, conchoidal fracture.
	20	SILTSTONE: greyish red, abundant carbonaceous laminae, grading into coal.
	20	SANDSTONE: Types (1) and (2); as above.
2625-2630m		Comment: shakers inadvertently washed by worker. Sample will not be truly representative.
	100	SANDSTONE: dominantly type (1), as above; no shows; minor type (2).
	trace	SILTSTONE/COAL: as above; this fraction is probably understated for the reasons above.
2630-2635m	100	SANDSTONE: clear to translucent; predominantly coarse to very coarse, angular to subrounded loose grains, well sorted, no shows; common medium grained and subrounded quartz aggregates in a mainly siliceous to partly dolomitic matrix/cement, tight to traces of intergranular porosity; no shows; common scattered pyrite.
2635-2640m	80	SANDSTONE: grading to predominantly quartz aggregates, otherwise as above.
	20	SILTSTONE: as above.
2640-2645m	80	SANDSTONE: as above.
	20	SILTSTONE: as above.

2645-2650m	60	SILTSTONE: greyish brown, abundant carbonaceous laminae scattered throughout, grading in part to coal.
	30	COAL: black vitreous, blocky, angular.
	10	SANDSTONE: as above; no shows.
2650-2655m	80	SILTSTONE: as above.
	10	SANDSTONE: as above.
	10	COAL: as above.
2655-2660m	60	SANDSTONE: 2 types: Type (1) - clear, translucent, milky, bimodal quartz sandstone, predominantly coarse to very coarse, angular, loose quartz grains, no shows; common medium to coarse grains, subrounded to subangular.
	40	Type (2) - quartz aggregates, in a dominant siliceous partly dolomitic matrix/cement, tight, no shows; scattered pyrite.
		SILTSTONE: light to dark brown with abundant carbonaceous laminae scattered throughout, grading in part to carbonaceous coal, commonly sandy.
2660-2665m	80	SANDSTONE: as above.
	20	SILTSTONE: as above.
2665-2670m	80	SANDSTONE: as above.
	20	SILTSTONE: as above.
2670-2675m	90	SANDSTONE: 2 types: Type (1) - as above, occasionally in aggregates (rare). Type (2) - as above.
	10	SILTSTONE: as above.
2675-2680m	100	SANDSTONE: 2 types: Type (1) - coarse to granule, predominantly very coarse, otherwise as above; no shows. Type (2) - as above. Calcimetry: 2% dolomite.
2680-2685m	100	SANDSTONE: 2 types: 70% Type (1) - coarse to granule, predominantly very coarse, no shows; as above. 30% Type (2) as above, no pyrite.
2685-2690m	100	SANDSTONE: Type (1) - as above. Type (2) - as above.
2690-2695m	100	SANDSTONE: Type (1) - as above. Type (2) - quite dolomitic, as above.
2695.5m	100	Grab sample (gas peak) COAL: angular cuttings, vitreous, conchoidal fracture, moderately hard, but not brittle.
2698m	100	Grab sample (gas peak). COAL: as above, grading to carbonaceous siltstone, grey brown, firm.
2695-2700	70	COAL: as above.
	20	SILTSTONE: as above.
	10	SANDSTONE: Types (1) and (2) as above. Type 2 perhaps more silty.
2701m	100	Grab sample (gas peak). COAL: as for 2698.0m.

2703.6m	70	Grab sample (gas peak)
	20	CARBONACEOUS SILTSTONE: as above.
		SANDSTONE: dominantly type (2); very fine to fine grained, grey, carbonaceous flecks, trace dull white fluorescence with slow streaming milky cut.
	10	COAL: as above.
2700-2705m	70	CARBONACEOUS SILTSTONE: as above.
	20	SANDSTONE: as above.
	10	COAL: as above.
2705-2710m	70	SILTSTONE: as above.
	20	SANDSTONE: as above.
	10	COAL: as above.
2710-2715m	70	SILTSTONE: becoming increasingly cleaner, otherwise as above.
	30	SANDSTONE: very fine to fine grained, clean with occasional carbonaceous flecks, dominant siliceous matrix, tight; no shows.
2715-2720m	70	SILTSTONE: as above.
	30	SANDSTONE: as above.
2720-2725m	70	SILTSTONE: dark brown, very argillaceous, common carbonaceous flecks throughout, grading in parts to very fine sandstone, occasional coal.
	30	SANDSTONE: clear, white, very fine to fine, subangular to subrounded, strong siliceous cement in sandstone aggregates, tight; no shows.
2725-2730m	100	SILTSTONE: as above.
2730-2735m	100	SILTSTONE: grading in part to very fine to fine sandstone otherwise as above.
2735-2740m	70	SANDSTONE: white to dark grey, bimodal, poorly sorted, subrounded to subangular, siliceous cemented quartz aggregates with occasional carbonaceous flecks, tight; no shows; grading to fine to very fine sucrosic, commonly carbonaceous grading in parts to siltstone; no shows.
	30	SILTSTONE: as above.
2740-2745m	80	SANDSTONE: light grey to dark grey, very fine to fine, grading to carbonaceous siltstone. Commonly with carbonaceous flecks and occasional carbonaceous laminations, no shows.
	20	SILTSTONE: as above.
2745-2750m	50	SANDSTONE: light grey to dark grey, very fine to fine, grading to carbonaceous siltstone, commonly with carbonaceous flecks and carbonaceous laminations, as above; no shows.
	40	SILTSTONE: medium dark grey to dark grey, carbonaceous, commonly in laminations, firm.
	10	COAL: moderately hard, often cuttings are platy, grading to carbonaceous siltstone.

2750-2755m	60	SILTSTONE: dark grey, grey red, firm to moderately hard, carbonaceous, commonly in laminations, dark grey variety commonly with fine to very fine quartz grains.
	40	SANDSTONE: commonly in a silty matrix, predominantly light grey, otherwise as above, occasional carbonaceous laminations, rarely dolomitic.
	trace trace	PYRITE. DOLOMITE: grey to red.
2755-2760m	70	SILTSTONE: as above.
	30	SANDSTONE: as above, trace (i.e. a few grains) dull white fluorescence, with very slow, dull white, diffuse cut; the show may be cavings?
2762m Grab sample	60	SILTSTONE: as above.
	40	SANDSTONE: light brown light grey to dark grey, otherwise above. Note: light brown has dull yellow fluorescence (15%), this is dolomite cement, no cut, tight.
2760-2765m	60	SANDSTONE: as above, pyritic, no shows; grading to medium grained in parts.
	40	SILTSTONE: as above.
	trace	SANDSTONE: loose grains, translucent to milky quartz, subangular, coarse to very coarse, poorly sorted.
2765-2770m	60	SANDSTONE: as above.
	40	SILTSTONE: as above.
2770-2775m	50	SANDSTONE: clear translucent, bimodal, ranging from fine siliceous cement quartz aggregates to occasional medium grained to coarse grained, subrounded to subangular quartz aggregates in a dominant white kaolinitic matrix, poorly sorted, tight; no shows.
	40	SILTSTONE: grey brown very carbonaceous, with occasional coal laminae scattered throughout.
	10	COAL.
2775-2780m	50	SANDSTONE: as above.
	40	SILTSTONE: as above.
	10	COAL: as above.
2780-2785m	50	SANDSTONE: as above.
	50	SILTSTONE: as above.
2785-2790m	50	SANDSTONE: as above.
	50	SILTSTONE: as above.
2790-2795m	50	SANDSTONE: as above.
	40	SILTSTONE: as above.
	10	COAL.
2795-2798m		Grab sample, maximum gas units = 131.
	50	SANDSTONE: white, sucrosic, very fine to fine grained quartz aggregates in a predominantly siliceous/dolomitic matrix, common discrete lenticular coal fragments scattered throughout, very tight, no shows; grey brown, very carbonaceous laminae common; poorly sorted, tight, no shows, trace mineral fluorescence.
	40	SILTSTONE: becoming increasingly carbonaceous otherwise as above.
	10	COAL.

2798-2801m	80	Grab sample; due to drilling break.
		SANDSTONE: becoming increasingly carbonaceous and tending towards a slightly fine texture, otherwise as above.
	20	SILTSTONE: as above.
2801-2805m	90	SANDSTONE: as above.
	10	SILTSTONE: as above.
2805-2810m	60	SANDSTONE: as above.
	30	SILTSTONE: as above.
	10	COAL: as above.
2810-2815m	60	SILTSTONE: as above.
	30	SANDSTONE: as above.
	20	COAL: as above.
2815-2820m	50	SANDSTONE: as above.
	40	SILTSTONE: as above.
	10	COAL.
2820-2825m	80	SILTSTONE: becoming increasingly argillaceous otherwise as above.
	20	SANDSTONE: as above.
2825-2830m	80	SILTSTONE: light grey, argillaceous to slightly carbonaceous, firm, blocky, occasional pyrite, becoming subfissile.
	20	SANDSTONE: white to light grey, sucrosic, fine grained, siliceous to slightly dolomitic cement, poorly sorted, tight, 10% dull gold yellow mineral fluorescence, 10% relative bright blue white fluorescence with no crush cut.
2830-2835m	50	SILTSTONE: as above.
	40	SANDSTONE: white, light grey brown, medium grained with scattered coarse coal fragments, with increasing blue white fluorescence, otherwise as above.
	10	COAL: black, partly conchoidal, brittle but hard.
2835-2840m	80	SILTSTONE: as above.
	20	SANDSTONE - as above.
2840-2845m	70	SILTSTONE: grey, brown grey, carbonaceous, arenaceous, argillaceous, fissile to subfissile, blocky, firm to occasionally friable; no shows.
	30	SANDSTONE: tan, white, light brown, translucent, argillaceous/dolomite matrix, fine to very fine to occasionally medium grained subrounded to subangular quartz, poorly sorted, 10% dull gold mineral fluorescence, 10% white to blue fluorescence with very slow crush cut.
2845-2850m	70	SILTSTONE: grey, brown-grey, arenaceous, argillaceous, subfissile, blocky, firm to moderately hard.
	30	SANDSTONE: white to clear translucent, argillaceous matrix, fine to very fine grained, subrounded to subangular quartz, poorly sorted, 20% white to blue fluorescence, slow crush cut.

2850-2855m	50	SILTSTONE: grey brown, arenaceous, argillaceous, fissile to subfissile, blocky, firm occasionally hard.
	50	SANDSTONE: translucent, occasionally milky white, poorly sorted, fine to medium grained, moderate porosity, angular to subangular dull yellow mineral fluorescence, white blue fluorescence, slow crush cut.
2855-2860m	60	SILTSTONE: grey brown to grey tan, arenaceous, argillaceous, subfissile to fissile, occasionally blocky, occasionally carbonaceous, firm to moderately hard.
	40	SANDSTONE: translucent to milky white, argillaceous dolomite matrix, firm to very firm, grains are subangular to subrounded, poorly sorted, 20-30% white blue fluorescence, occasionally dull yellow mineral fluorescence (very slow crush cut).
2860-2865m	70	SILTSTONE: as above.
	30	SANDSTONE: as above.
2865-2870m	60	SILTSTONE: as above.
	40	SANDSTONE: as above.
2870-2875m	70	SILTSTONE: as above.
	30	SANDSTONE: as above.
2875-2880m	70	SILTSTONE: as above.
	30	SANDSTONE: as above.
2880-2885m	90	SILTSTONE: as above
	10	SANDSTONE: as above.
2885-2890m	70	SILTSTONE: dark grey brown, arenaceous, carbonaceous, predominantly firm to occasionally soft, grading to very argillaceous, very fine grained sandstone in parts.
	30	SANDSTONE: tan, light brown grey, mainly fine to occasionally medium grained, subrounded to subangular quartz aggregates in a dominantly siliceous argillaceous matrix, slightly dolomitic cement, very argillaceous with coal laminae scattered throughout, poorly sorted, tight, dull yellow gold mineral fluorescence with 5% blue white fluorescence with very slow diffuse white cut.
2890-2895m	70	SILTSTONE: as above.
	30	SANDSTONE: as above.
2895-2898m	90	Grab sample - maximum 48 units gas. Drill break maximum 12 m/hr for 1m SANDSTONE: buff, white, sucrosic, predominantly fine to occasionally medium grained, subrounded to subangular quartz aggregates in a dominant siliceous cement, with common kaolinite matrix, common carbonaceous flecks, firm to friable, 50% blue white fluorescence with slow diffuse, milky white cut.
	10	SILTSTONE: as above.
2898-2900m	60	SANDSTONE: as above, 30% fluorescence and cut.
	40	SILTSTONE: as above.
		Grab sample

2900-2903m	50 30 20	SANDSTONE: as above 10% fluorescence and cut. SILTSTONE: as above. COAL.
2903-2905m	50 50	SANDSTONE: as above - 5% fluorescence. SILTSTONE: as above.
2905-2907m Bottoms Up Sample	70 30 trace	SANDSTONE: buff, white, very fine to fine grained, subangular to subrounded quartz aggregates in a siliceous to water sensitive kaolinitic clay matrix, commonly argillaceous, predominantly friable/soft, 50% blue white fluorescence with slow diffuse milky white cut. SILTSTONE: grey brown, tan, carbonaceous, blocky, firm, grading in part to very fine quartzose sandstone. COAL.
		POOH AND CUT CORE NO.5 FROM 2907.8-2924.3m
2924-2930m	100 trace trace	SILTSTONE: light grey, subfissile, hard, brittle, scattered, very fine to fine black carbonaceous matter throughout, tight; no shows. SANDSTONE. COAL.
2930-2935m	80 10 10	SANDSTONE: clear, translucent, medium grained to coarse grained, subangular quartz aggregates, predominantly coarse to occasionally granular, well faceted, as though quartz is fused, i.e. quartz overgrowths, tight, 50% relatively bright white yellow fluorescence, instant white crush cut, but very slow diffuse milky white cut. Type 2:20% buff, light brown white, fine to medium grained, subrounded to subangular, siliceous cemented quartz aggregates with trace carbonaceous matter, blue yellow fluorescence with slow diffuse yellow cut. SILTSTONE: grading to very fine sandstone otherwise as above. COAL.
2935-2940m	60 30 10	SILTSTONE: as above. SANDSTONE: as above. COAL.
2940-2945m	60 30	SILTSTONE: becoming increasingly carbonaceous, otherwise as above. COAL.
2945-2950m	10 80 10 10	SANDSTONE: as above. SILTSTONE: as above. SANDSTONE: as above. COAL.
2950-2955m	100	SILTSTONE as above.
2955-2960m	100	SILTSTONE: as above.
2960-2965m	100 trace	SILTSTONE: as above. COAL.

2965-2970m	100	SILTSTONE: light grey, carbonaceous, predominantly argillaceous, blocky grading in parts to very fine siliceous cemented sandstone, hard, tight; no shows.
	trace	COAL.
2970-2975m	100	SILTSTONE: as above.
	trace	COAL.
2975-2980m	100	SILTSTONE: subfissile in places, otherwise as above.
2980-2985m	90	COAL: black, vitreous, conchoidal, brittle.
	10	SILTSTONE: as above.
2985-2990m	40	SANDSTONE: brittle, pale yellow brown, bimodal quartz ranging from coarse, angular overgrowths to fine to medium grained, subrounded to subangular quartz aggregates in a dominant siliceous matrix, tight; no shows.
	40	SILTSTONE: as above.
	20	COAL.
2990-2995m	40	SILTSTONE: as above.
	30	SANDSTONE: as above.
	30	COAL: as above.

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APPENDIX 2

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TURRUM-3

SIDEWALL CORE DESCRIPTIONS

<u>No.</u>	<u>Depth</u> (mKB)	<u>Rec.</u> (mm)	<u>Rock</u> <u>Type</u>	<u>Description</u>
1	2747			Below safety limit of 2695m established during wiper trip. Tool may possibly engage fish.
2	2723.5			
3	2713.5			
4.	2647	29	SILTSTONE	dark grey, very fine grained, soft, moderately calcareous, slightly dolomitic; very slight reaction to HCl
5	2614	24	SILTSTONE	dark grey, very fine grained, well sorted, well rounded, soft, moderately calcareous, quartzose and carbonaceous, very slight reaction to HCl.
6	2604	25	SANDSTONE	light grey, fine grained, well sorted, well rounded, soft, moderately calcareous, argillaceous and dolomitic; 50% even, bright white fluorescence; streaming white cut; L-1.4.2 sand, calcareous.
7	2604	0		EMPTY
8	2602	0		EMPTY
9	2576.9	16	SILTSTONE	dark grey, very fine grained, well sorted, well rounded, soft, moderately calcareous, quartzose, carbonaceous and dolomitic; very slight reaction to HCl.
10	2571.9	35	COAL	black, hard to friable; deepest coal.
11	2562.9	24	SILTSTONE	dark grey, very fine grained, soft, weak calcareous, quartzose, carbonaceous and dolomitic; very slight reaction to HCl.
12	2528.9	12	SANDSTONE	light grey, fine grained, well sorted, well rounded, friable, weakly calcareous, argillaceous dolomitic; 5% patchy, moderate yellow fluorescence; reacts sparingly with HCl.
13	2485.9	23	SILTSTONE	light brownish grey, very fine grained, friable, weakly calcareous, dolomitic; very slight reaction to HCl.
14	2444	10	SILTSTONE	light grey, very fine grained, friable, moderately calcareous, quartzose dolomitic; 10% patchy, moderate yellow fluorescence; moderate reaction with HCl.
15	2399	31	COAL	black, hard to friable.

16	2397	13	SILTSTONE	light grey, very fine grained, soft, moderately calcareous, dolomitic; moderate reaction with HCl.
17	2357	0		LOST
18	2327.3	20	SANDSTONE	light grey, fine grained to very fine grained, well sorted, well rounded, soft to friable, moderately calcareous, argillaceous, carbonaceous dolomitic; moderate reaction with HCl.
19	2323	25	SILTSTONE	light grey, very fine grained, soft to friable, weakly calcareous, quartzose, carbonaceous; very weak reaction to HCl.
20	2301	20	SANDSTONE	light grey, very fine grained, well sorted, well rounded, soft, weakly calcareous, argillaceous, dolomitic; 5% disseminated, dull white fluorescence, slow white cut.
21	2261.9	21	SHALE	dark brown, very fine grained, soft, weakly calcareous, quartzose, carbonaceous,; reacts slowly with HCl.
22	2225.5	17	SILTSTONE	dark brown, very fine grained, soft, weakly calcareous, quartzose, carbonaceous,; reacts slowly with HCl.
23	2194.9	15	SHALE	very dark brown, very fine grained, soft, carbonaceous; no apparent reaction with HCl.
24	2166	30	SANDSTONE	white, fine to medium grained, well sorted, well rounded, soft to friable, weakly calcareous, dolomitic; 5% disseminated, weak white fluorescence; very slow white cut.
25	2162	25	SANDSTONE	white, fine grained, well sorted, well rounded, soft to friable, weakly calcareous, argillaceous, dolomitic; 15% disseminated, weak white fluorescence; slow white cut.
26	2160.5	17	SANDSTONE	white, fine grained, well sorted, well rounded, soft to friable, weakly calcareous, argillaceous, dolomitic; 20% patchy, moderate white fluorescence; moderate to slow white cut.
27	2158.4	22	SILTSTONE	dark brown, very fine grained, friable, quartzose; no apparent reaction with HCl.
28	2157	30	SANDSTONE	white, fine grained, well sorted, well rounded, friable; 35% disseminated to even, strong white to yellow fluorescence; moderate to slow white cut.
29	2127	30	SHALE	dark brown, very fine grained, friable, moderately calcareous, carbonaceous, dolomitic; moderate reaction in HCl.

30	2090	30	SHALE	dark brown, very fine grained, friable, moderately calcareous, carbonaceous dolomitic; moderate reaction in HCl.
31	2061	25	SHALE	dark brown, very fine grained, friable, moderately calcareous, quartzose, carbonaceous, dolomitic; moderate reaction in HCl.
32	2034	17	SHALE	very dark brown, very fine grained, friable, moderately calcareous, carbonaceous, dolomitic; moderate reaction in HCl.
33	1995	15	SHALE	dark brown to grey, very fine grained, friable, moderately calcareous, carbonaceous, dolomitic; moderate reaction in HCl.
34	1963.5	12	SHALE	dark brown, very fine grained, friable, carbonaceous; no apparent reaction to HCl.
35	1926	11	SHALE	dark brown, very fine grained, friable, weakly calcareous, carbonaceous, dolomitic; very weak reaction to HCl.
36	1888.9	17	SHALE	dark brown to grey, very fine grained, friable, moderately calcareous, quartzose carbonaceous, dolomitic; moderate reaction to HCl.
37	1868	27	SHALE	dark brown, very fine grained, soft, weakly calcareous, carbonaceous, dolomitic; weak reaction to HCl.
38	1837	25	SHALE	dark brown, very fine grained, soft to friable, very weakly calcareous, carbonaceous, dolomitic; very weak reaction to HCl.
39	1813	22	SHALE	dark brown, very fine grained, soft to friable, very weakly calcareous, carbonaceous, dolomitic; very weak reaction to HCl.
40	1796.5	25	SILTSTONE	white, fine to very fine grained, well sorted, well rounded, soft, minor argillaceous content.
41	1785	20	COAL	black, soft and friable.
42	1777	26	SHALE	brown, very fine grained, soft, moderately calcareous, carbonaceous, dolomitic; moderate reaction to HCl.
43	1768.4	34	SHALE	dark brown, very fine grained, friable, weakly calcareous, very carbonaceous, dolomitic; weak reaction to HCl.
44	1750.5	32	SHALE	dark brown, very fine grained, soft, weakly calcareous, carbonaceous, dolomitic; very weak reaction to HCl.

45	1736.9	25	SILTSTONE	light grey, very fine grained, well sorted, well rounded, friable, moderately calcareous, carbonaceous, dolomitic; moderate reaction to HCl.
46	1718.5	40	SHALE	light brown, very fine grained, friable.
47	1703.4	28	SANDSTONE	white, fine to very fine grained, well sorted, well rounded, friable, pyrite; very clean sandstone.
48	1686	27	SANDSTONE	white to pink, very fine grained, well sorted, well rounded, friable, argillaceous, micaceous; banded shaley sand.
49	1675.5	35	SHALE	dark brown, very fine grained, friable, weakly calcareous, carbonaceous, dolomitic; moderate to poor reaction with HCl.
50	1660.7	22	SHALE	dark brown, very fine grained, friable, weakly calcareous, carbonaceous, dolomitic; moderate to poor reaction with HCl.
51	1642	38	SHALE	very dark brown, very fine grained, friable to soft, weakly calcareous, very carbonaceous, trace dolomitic; poor reaction with HCl.
52	1623.4	34	SILTSTONE	dark brown, very fine grained, friable to soft, carbonaceous.
53	1611.5	28	SHALE	dark brown, very fine grained, friable, carbonaceous.
54	1604.5	31	SILTSTONE	dark grey, very fine grained, well sorted, well rounded, friable, very calcareous, quartzose, carbonaceous dolomitic; very strong reaction with HCl.
55	1596	50	COAL	black, friable.
56	1586.9	0		LOST
57	1576.5	45	SHALE	light brown, very fine grained, firm, weakly calcareous, dolomitic; weak reaction to HCl.
58	1573.5	35	SILTSTONE	brown, very fine grained, firm, weak to moderately calcareous, carbonaceous, dolomitic; moderate to weak reaction with HCl.
59	1572	0		LOST
60	1570.1	0		LOST
61	1569	0		LOST
62	1567.4	30	SILTSTONE	grey, very fine grained, soft, very calcareous, limestone (possibly dolomitic); strong HCl reaction.

63	1565	37	SILTSTONE	light grey, very fine grained, soft to firm, very calcareous; strong HCl reaction.
64	1563	0		LOST
65	1561	46	SHALE	dark grey, very fine grained, soft to firm, very calcareous; strong HCl reaction.
66	1558.9	45	CLAYSTONE	brown, very fine grained, soft to firm, very calcareous, strong HCl reaction.
67	1557	55	SHALE	grey, very fine grained, firm, very calcareous; strong HCl reaction.
68	1554.9	0		LOST.
69	1552.9	46	SILTSTONE	grey, very fine grained, firm, very calcareous; strong HCl reaction.
70	1551.0	0		LOST
71	1548.4	0		LOST
72	1545	52	SILTSTONE	grey, very fine grained, firm, very calcareous; strong HCl reaction.
73	1537.9	40	SHALE	grey, very fine grained, firm, very calcareous; strong HCl reaction.
74	1530	47	SHALE	grey, very fine grained, firm, very calcareous; strong HCl reaction.
75	1520	32	SILTSTONE	grey, very fine grained, firm, very calcareous; strong HCl reaction.
76	1510	33	SHALE	light grey, very fine grained, firm, very calcareous; strong HCl reaction.
77	1500	0		LOST
78	1489.9	28	SHALE	grey, very fine grained, firm, very calcareous; strong HCl reaction.
79	1479.9	30	SILTSTONE	grey, very fine grained, firm, very calcareous; strong HCl reaction.
80	1470	18	SILTSTONE	grey, very fine grained, firm, very calcareous; strong HCl reaction.
81	1460	33	SILTSTONE	grey, very fine grained, firm, very calcareous; strong HCl reaction.

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TURRUM-3

SIDEWALL CORE GAS ANALYSIS

NO.	DEPTH	C1	C2	C3	C4	C5	C6
6	2604	637	352	624	440	243	207
20	2301	849	13171	10649	5120	2598	1420
28	2157	1699	1088	3244	4320	2969	1930
24	2166	212	106	176	298	359	325
25	2162	212	121	145	195	209	214
26	2160.5	247	105	130	192	168	148
57	1576.5	25676	19084	11648	4800	1577	592

1571L/72

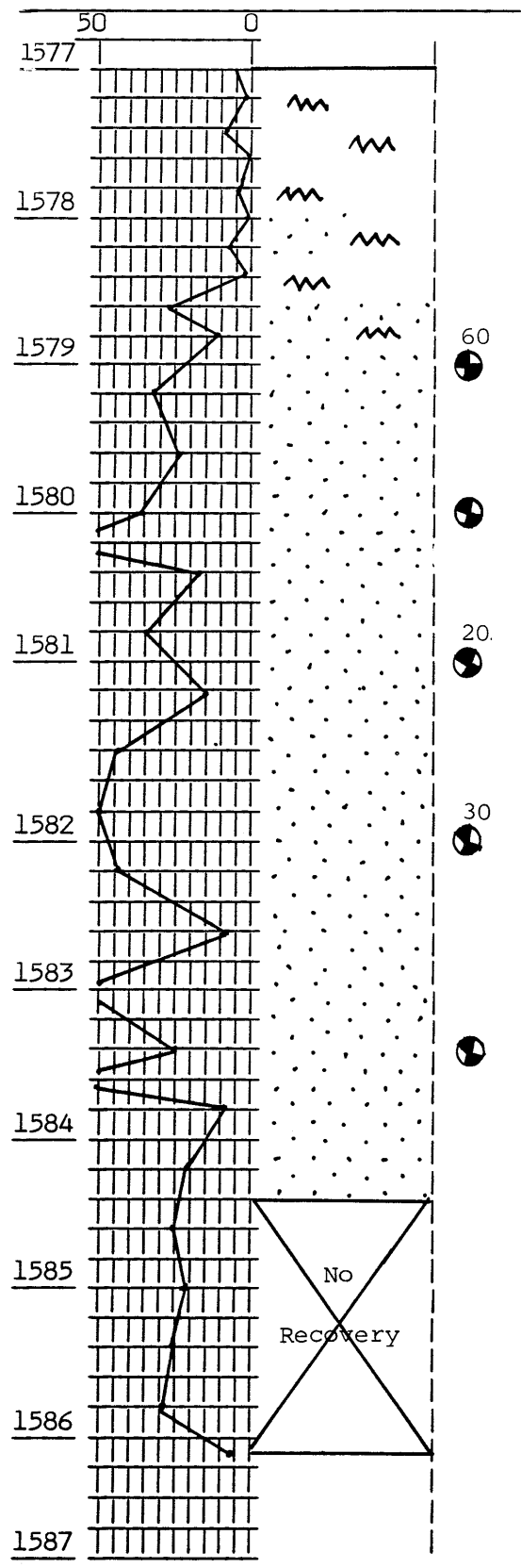
APPENDIX 3

Core No. 1
 Interval Cored : 1577-1586.3m
 Cut : 9.3m
 Bit Type : RC-4
 Described by : S.Watts
 P. Priest

Well : TURRUM-3
 Recovered : 7.6m (81.72%)
 Bit Size : 9 7/8"
 Date : 15/3/85

Depth & Int. ROP Graphic Shows
 (m) (m/hr) (interpreted)

Descriptive Lithology



*NB: Plastic Sleeve Core, core described at each exposed metre end.

1577.0m SILTSTONE - red brown to brownish grey, firm to moderately hard, occasional glauconite and pyrite, slightly calcareous in places, predominantly non-calcareous. Gurnard Formation (very likely).

1578.0m SILTY SANDSTONE - pale brown to red brown, moderately hard, fine to very fine, poorly sorted, angular to subangular, occasional glauconite, mica, pyrite, non-calcareous, silty matrix; no shows. No hydrocarbon odour.

1579.0m SANDSTONE - translucent to milky white, mostly loose quartz grains, medium to granule sized grains, poorly sorted, angular to subrounded, occasional siliceous cement, good inferred porosity, 60% dull yellow, occasionally bright even hydrocarbon fluorescence, moderate to fast streaming cut (yellow to white), no stain, strong hydrocarbon odour.

1580.0m SANDSTONE - translucent, mostly loose quartz grains, occasional siliceous cemented aggregates, angular to subrounded, moderate to well sorted, occasional glauconitic inclusions and dark grey siltstone, moderate to good inferred visible porosity, trace dull yellow, spotty fluorescence, very slow diffuse cut, slow diffuse crush cut, strong hydrocarbon odour.

1581.0m SANDSTONE - translucent, mostly loose quartz grains, occasional siliceous cemented aggregates (very hard), coarse to very coarse, subangular to subrounded, moderate sorted, argillaceous matrix, trace pyrite, trace siltstone, moderate inferred visible porosity, 20% dull yellow, occasionally bright white hydrocarbon fluorescence, instant diffuse occasionally streaming bright white cut, no stain; strong hydrocarbon odour.

Core No. 1

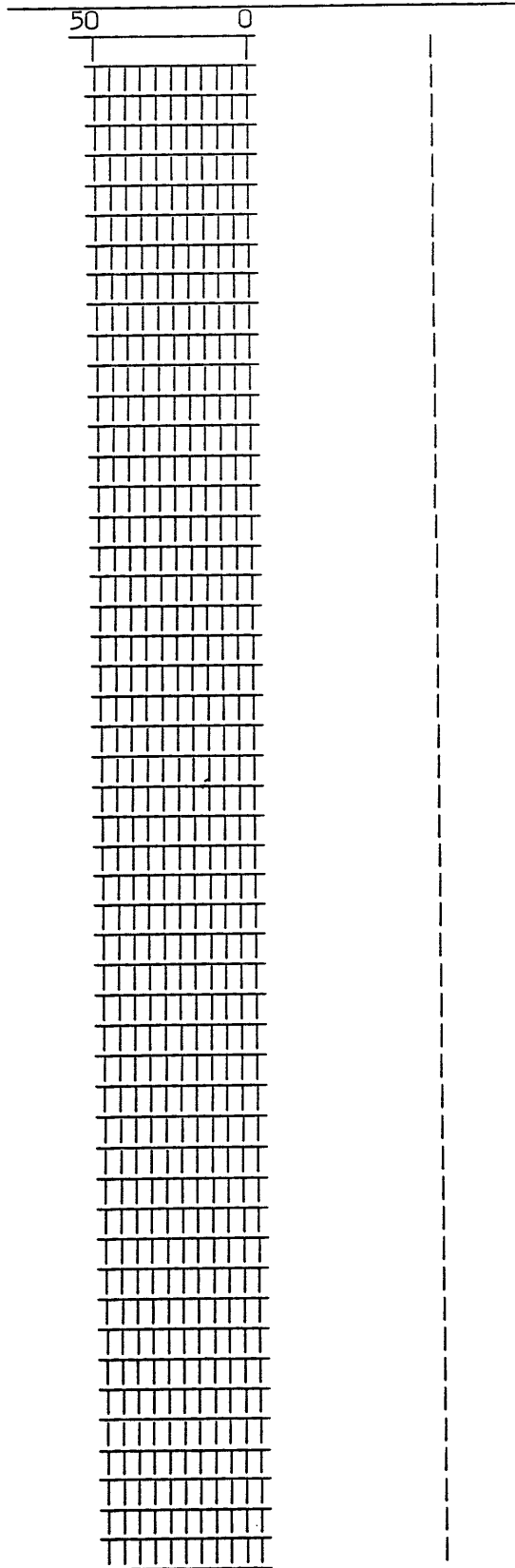
Well : TURRUM-3

Interval Cored : 1577-1586.3m
Cut : 9.3m
Bit Type : RC-4
Described by : S.Watts
P. Priest

Recovered : 7.6m (81.72%)
Bit Size : 9 7/8"
Date : 15/3/85

Depth &
Int. ROP Graphic Shows
(m) (m/hr) (interpreted)

Descriptive Lithology



1582.0m SANDSTONE - translucent to medium light grey, medium to granule sized quartz grains, predominantly very coarse to granule sized, moderately well to poorly sorted, subrounded to rounded, moderately well compacted, good visible porosity, patchy dull to medium bright white fluorescence, (30%) and fast streaming white cut; strong hydrocarbon odour, very friable.

1583.0m SANDSTONE - translucent to light grey, fine to medium grained, subrounded, well sorted, calcareous and dolomitic cement to poorly cemented, good visible porosity; no shows; weak hydrocarbon odour, very friable.

1584.0m SANDSTONE - translucent, medium grained, subrounded, well sorted, trace calcareous/dolomitic cement, good visible porosity; no shows, friable.

1584.4m SANDSTONE - translucent, fine to coarse grained, subangular to subrounded, moderately well sorted, trace calcareous cement to poorly cemented, good visible porosity, very friable; no shows.

NO RECOVERY FROM -1584.4-1586.3.

Core No. 2

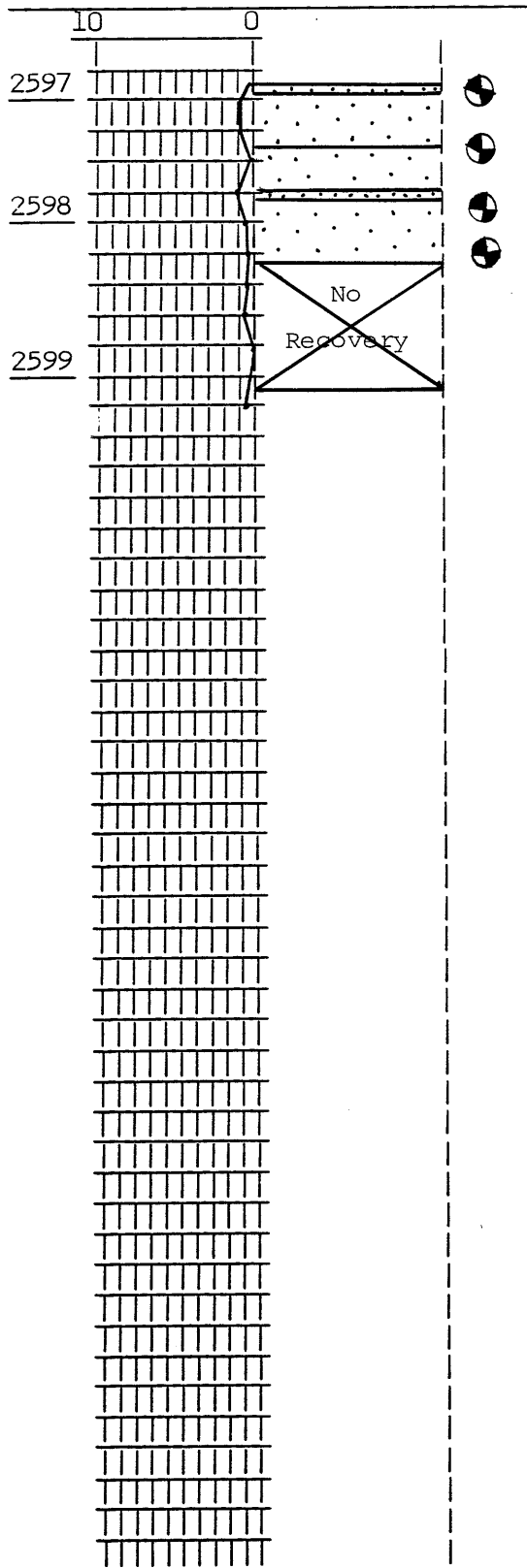
Well : TURRUM-3

Interval Cored : 2597.3-2599.3m
 Cut : 2m
 Bit Type : C23
 Described by : P. Fell

Recovered : 1.16m (58%)
 Bit Size : 9 7/8"
 Date : 24/3/85

Int. (m) Depth & ROP (m/hr) Graphic Shows

Descriptive Lithology



SAMPLE 1: coarse to very coarse, hydrocarbon odour, 30% patchy dull yellow fluorescence with fast but weak milky diffuse cut, hydrocarbon odour.

SAMPLE 2: medium to coarse, predominantly coarse, 60% patchy dull yellow fluorescence, with fast but weak milky diffuse cut, hydrocarbon odour.

SAMPLE 3: 20% patchy very dull yellow fluorescence, very slow, very weak, diffuse milky crush cut, very faint hydrocarbon odour.

SAMPLE 4: 40% patchy very dull yellow fluorescence, very slow, very weak, diffuse milky crush cut, very faint hydrocarbon odour.

GENERAL LITHOLOGY

2597.3-2598.46m SANDSTONE - translucent to milky quartz grains, coarse to very coarse, very hard, subrounded to subangular, predominantly subangular, poorly sorted, dolomite cement, very poor visible porosity, common pyrite.

CALCIMETRY - 23% of Sample 1 is dolomite.

SAMPLE DEPTHS

1. 2597.30m
2. 2597.76m
3. 2598.27m
4. 2598.46m

NO RECOVERY FROM 2598.46 - 2599.3

Core No. 3

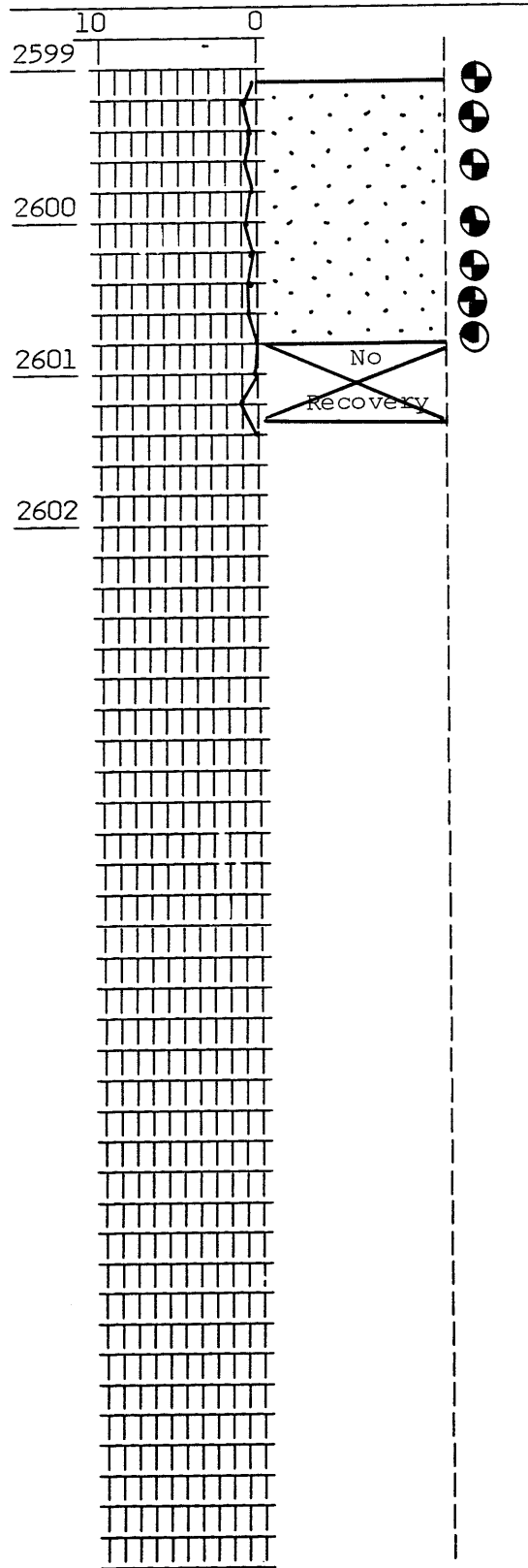
Well : TURRUM-3

Interval Cored : 2599.3-2601.5m
 Cut : 2.2m
 Bit Type : C20
 Described by : P. Fell

Recovered : 1.7m (77.3%)
 Bit Size : 9 7/8"
 Date : 25/3/85

Int. (m) Depth & ROP (m/hr) Graphic Shows

Descriptive Lithology



SAMPLES 1 & 2: very dull yellow (30%) to bright yellow (10%), fluorescence dull yellow gives very slow, weak, diffuse milky white cut, no cut for bright yellow (mineral fluorescence), occasional good porosity.
 SAMPLE 3: 40% dull yellow fluorescence, with very weak, dull, yellow diffuse cut.
 SAMPLE 4: coarse to very coarse, predominantly coarse, subangular to subrounded, predominantly subangular, 20% dull yellow fluorescence, cut as for Sample 1.
 SAMPLE 5: medium to granule sized, predominantly coarse, subangular to subrounded, predominantly subangular, 10% bright yellow dolomite fluorescence, 30% dull yellow fluorescence, cut as for Sample 1.
 SAMPLE 6: 20% dull yellow fluorescence, cut as for Sample 1.
 SAMPLE 7: 20% dull to bright yellow fluorescence, no cut.

GENERAL LITHOLOGY

SANDSTONE - translucent to milky quartz, very hard, coarse to granule sized, predominantly very coarse, subrounded to rounded, predominantly subrounded, poorly sorted, dolomite cement, pyritic, very poor visible porosity, no hydrocarbon odour.

SAMPLE DEPTHS

1. 2599.30m
2. 2599.43m
3. 2599.66m
4. 2600.08m
5. 2600.54m
6. 2600.77m
7. 2601.00m

NO RECOVERY FROM INTERVAL 2601.0m TO 2601.5m.

Interval: 2599.30-2599.43m is probable core No. 2 left in hole.

Core No. 4

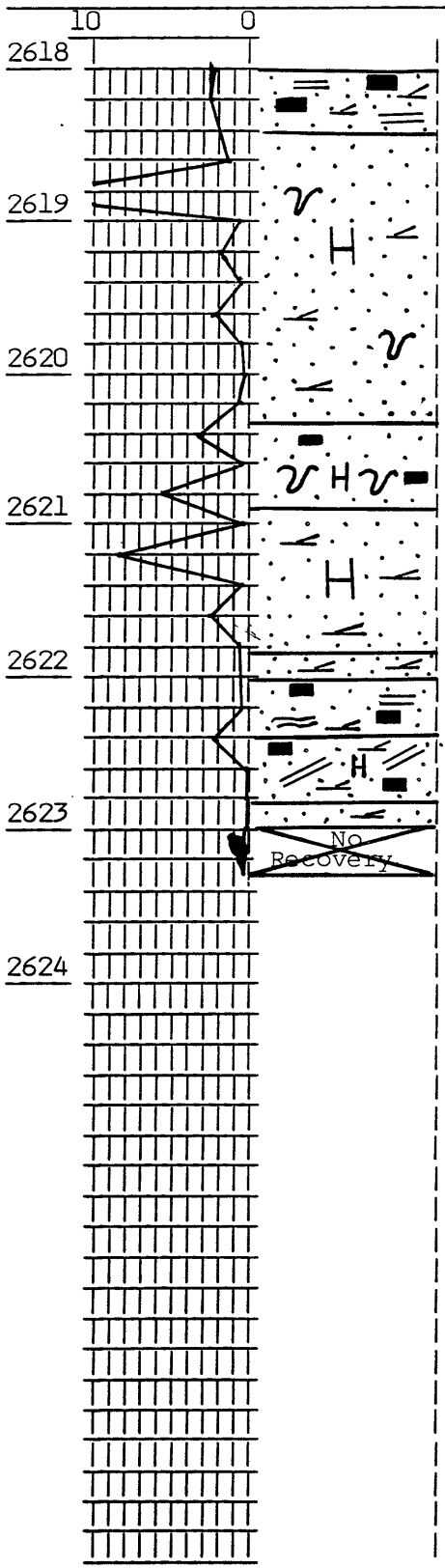
Well : TURRUM-3

Interval Cored : 2618.0-2623.3m
 Cut : 5.3m
 Bit Type : C23
 Described by : P.Fell/J.Roche

Recovered : 5.0m (94%)
 Bit Size : 9 7/8"
 Date : 26/3/85

Depth & Int. ROP (m) (m/hr) Graphic Shows

Descriptive Lithology



Interval 2618.0-2618.40 displays subhorizontal to slightly inclined carbonaceous laminae, more dolomitic than interval below.

5. SANDSTONE - milky to translucent quartz, hard, coarse to granule size, predominantly coarse, subangular to subrounded, predominantly subangular, poorly sorted, slightly dolomitic, uniform blue to white fluorescence (30%) with instantaneous diffuse bright blue to white cut.

4. SANDSTONE - milky to translucent quartz grains, moderately hard to hard, medium to granule size, bimodal angularity distribution - medium sized grains are subangular, granule sized are subrounded, dolomitic in parts, silty in parts; no shows.

Interval 2620.5-2620.8 is extensively bioturbated (ophiomorpha), fine to medium grained and carbonaceous.

3. SANDSTONE - predominantly translucent quartz, moderately hard to hard, medium grained, subangular, well sorted, slightly dolomitic, moderate visible porosity; no shows.

2. SANDSTONE - translucent to milky quartz, friable to moderately hard, medium to granule sized, bimodal as above, mediums are subangular, very coarse to granule sized are subrounded, poorly sorted, dolomitic in parts; no shows, moderate visible porosity, subhorizontal carbonaceous laminae.

1. SANDSTONE - translucent to milky quartz, friable coarse to very coarse, predominantly coarse, subangular to subrounded, predominantly subrounded, well sorted, silty matrix in parts, slightly dolomitic; no shows, good visible porosity.

Sample Depth Representative Intervals

1. 2623	2622.85-2623.0
2. 2622.05	2622.05-2622.85
3. 2621.4	2620.90-2621.85
4. 2620.3	2620.20-2620.30
5. 2618.9	2618.00-2620.20

NO RECOVERY OVER INTERVAL 2623.0-2623.3.

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Core No. 5

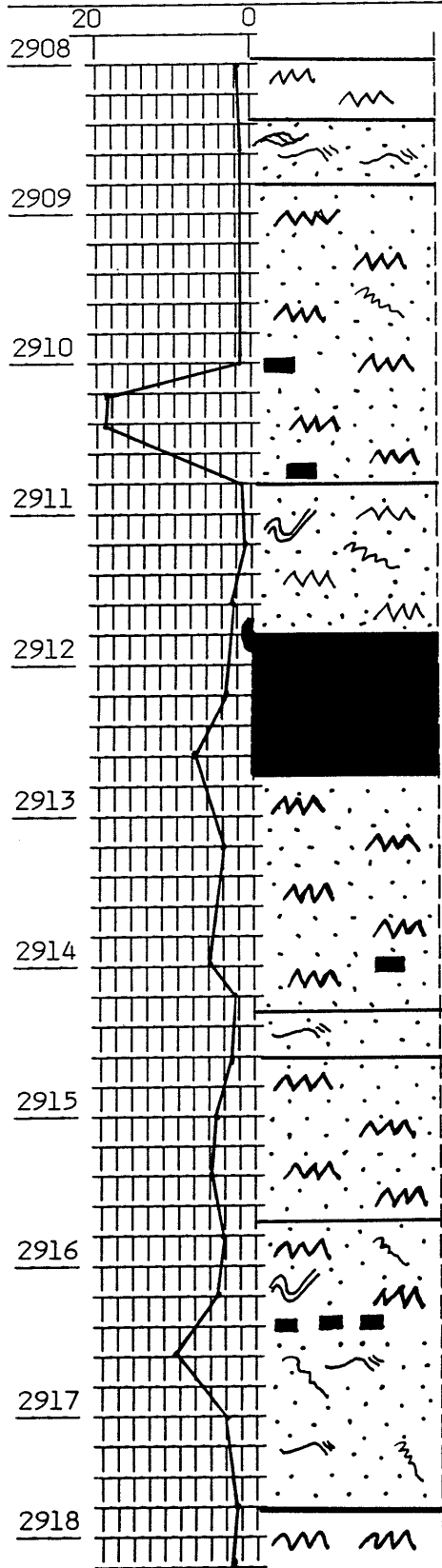
Well : TURRUM-3

Interval Cored : 2907.8-2924.3m
 Cut : 16.5m
 Bit Type : RC4
 Described by : J. Roche

Recovered : 16.5m (100%)
 Bit Size : 9 7/8"
 Date : 4.4.85

Int. (m) Depth & ROP (m/hr) Graphic Shows

Descriptive Lithology



2907.8-2908.38 SILTSTONE - light grey, very argillaceous, slightly carbonaceous, subfissile, firm, hard, brittle in places, grading to very fine white clean sandstone; no shows.

2908.38-2908.8 SANDSTONE AND MINOR SILTSTONE SANDSTONE - white, sucrosic, fine grained, subangular to subrounded in a dominantly siliceous matrix with dolomitic cement, well sorted, tight, even dull gold yellow mineral fluorescence; suggestions of both current and climbing rippling near the top of the sandstone unit, with dewatering and slump type structures in the bottom sandstone portion. Grades into siltstone unit below.

2908.8-2910.8 SILTSTONE - dark grey, carbonaceous with abundant black coarse biotite flecks evenly scattered throughout; cleavage planes easily recognisable, hard, laminated with interbeds (less than 1cm thick) of very fine carbonaceous sandstone with random scattering of small (1 cm) lenses of silty sandstone. Grades into very fine sandstone unit below with scattered horizontal black carbonaceous stringers.

2910.8-2911.8 INTERBEDDED SANDSTONE AND SILTSTONE: SANDSTONE - buff, very fine to fine grained, subangular to subrounded in a dominantly siliceous matrix with dolomitic cement; dull yellow mineral fluorescence, tight; no shows; evidence of convolute type bedding, entire interval is highly contorted with slump and churned structures; grades in part and is laminated with thin bands (less than 1cm) of carbonaceous siltstone.

2911.8-2912.7 COAL - black vitreous, hard, conchoidal fractures; sharp contact with underlying sandstone.

2912.7-2914.5 INTERBEDDED SILTSTONE AND SANDSTONE: SILTSTONE - dark grey, carbonaceous grading to light grey argillaceous siltstone, tending to very fine sandstone in places, hard, tight; no shows.

Core No. 5

Well : TURRUM-3

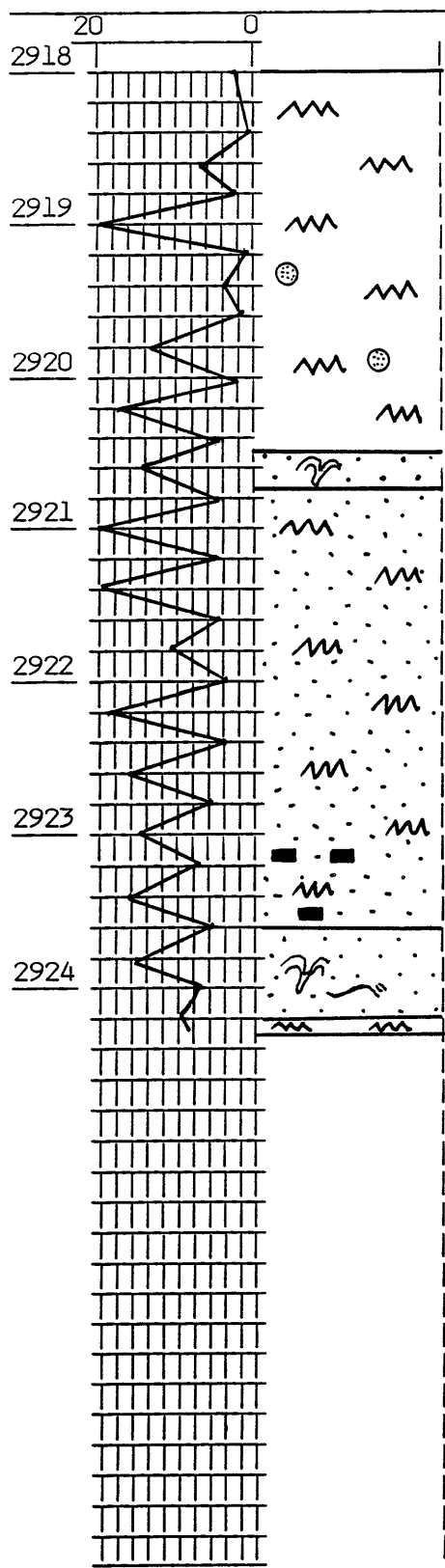
Page 2

Interval Cored : 2907.8-2924.3m
 Cut : 16.5m
 Bit Type : RC4
 Described by : J. Roche

Recovered : 16.5m (100%)
 Bit Size : 9 7/8"
 Date : 4/4/85

Int. (m) Depth & ROP (m/hr) Graphic Shows

Descriptive Lithology



2914.3-2914.6 SANDSTONE - buff, fine grained, subrounded to subangular quartz in a dominantly dolomite cement, relatively clean with minor black carbonaceous stringers and scattered coal clasts, poorly sorted, tight with even dull gold mineral fluorescence; no shows. Suggestion of current ripple laminae, grades into siltstone unit below.

2914.6-2915.7 SANDSTONE - with minor siltstone, buff, cream to brownish white, predominantly medium grained, subangular to subrounded quartz in a dominantly kaolinitic matrix, grading to and interlaminated with predominantly black to greyish brown carbonaceous siltstone, with scattered biotite flecks, poorly sorted, tight; no shows.

2915.7-2916.4 SANDSTONE - buff, cream to clear, translucent, bimodal sandstone, fine to medium grained subangular to subrounded quartz in a siliceous matrix, grades in parts to a light grey argillaceous siltstone with minor black carbonaceous stringers, poorly sorted, relatively tight with blueish white fluorescence with diffuse milky white cut; interval is contorted possibly due to dewatering/slumping overall chaotic with no preservation of laminae.

2916.4-2917.6 SANDSTONE - buff clear to translucent, bimodal sandstone as above; however appears to have no shows, tight, interval is contorted and churned with suggestions of current rippling below a thin coal at 2916.4 and at 2917.2. Dull gold mineral fluorescence; coal break occurs at 2917.6-2917.62 before a siltstone sequence below.

2917.6-2920.5 SILTSTONE -light to dark grey, argillaceous, carbonaceous, with minor very fine argillaceous sandstone interbeds (less than 1cm thick), with randomly scattered very fine sandstone lenses (1cm), hard, firm, tight with no shows.

2920.5-2920.7 SANDSTONE -as per interval 2916.4-2917.6.

Core No. 5

Well : TURRUM-3

Page 3

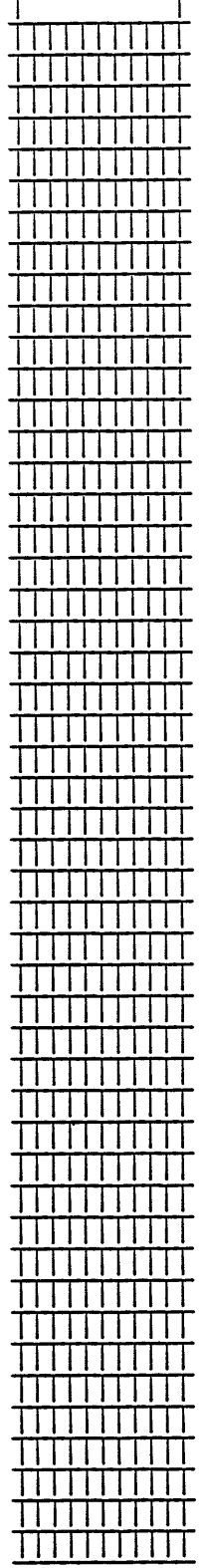
Interval Cored : 2907.3-2924.3m
Cut : 16.5m
Bit Type : RC4
Described by : J. Roche

Recovered : 16.5m (100%)
Bit Size : 9 7/8"
Date : 4/4/85

Int. (m) Depth & ROP (m/hr) Graphic Shows (interpreted)

Descriptive Lithology

10 0



2920.7-2923.6 SILTSTONE - with minor sandstone and coal towards the base of the unit, otherwise as per interval 2917.6-2920.5.

2923.6-2924.2 SANDSTONE - as per interval
2916.4-2917.6

2924.2-2924.3 SILTSTONE - as per interval
2917.6-2920.5.

APPENDIX 4

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RFT SAMPLE TEST REPORT

Well :Turrum-3

OBSERVER :P.Ettema

DATE : 30/3/85

RUN NO. : 3

	CHAMBER 1 (22.7 lit)	CHAMBER 2 (3.8 lit.)
SEAT NO.	3/44	3/44
DEPTH	2609.5	2609.5
A. RECORDING TIMES		
Tool Set	2212	
Pretest Open	2212	
Time Open	2218	2234
Chamber Open	2218	2234
Chamber Full	2226	2236
Fill Time	8	2
Start Build Up	2226	2236
Finish Build Up	2231	2238
Build Up Time	5	2
Seal Chamber	2231	2238
Tool Retract		2241
Total Time		29 mins.
B. SAMPLE PRESSURE		
IHP	4708.3 psia	
ISIP	3737.2 psia	3734.4 psia
Initial Flowing Press.	261.4 psia	1362.4 psia
Final Flowing Press.	1442.4 psia	1272.3 psia
Sampling Press Range	261-1442.4 psia	1362.4-1272.3 psia
FSIP	3734.4 psia	3734.5 psia
FHP		4705.5 psia
C. TEMPERATURE		
Depth Tool Reached	2665 m	2665 m
Max. Rec. Temp		deg C
Time Circ. Stopped	March 30/85: 1530 hrs	March 30/85: 1530 hrs
Time since Circ.	7 hrs	7 hrs
D. SAMPLE RECOVERY		
Surface Pressure	1500 psig	psig
Amt Gas	25.2 cu ft	cu ft
Amt Oil	5250 cc	lit
Amt Water (filtrate)	13500 cc	lit
Amt Others Emulsion		lit
E. SAMPLE PROPERTIES		
Gas Composition		
C1	624640 ppm	ppm
C2	93180 ppm	ppm
C3	37270 ppm	ppm
1C4/nC4	13110 ppm	ppm
C5	26110 ppm	ppm
C6+	16700 ppm	ppm
CO2/H2S	5%/tr ppm	
Oil Properties		
	38 deg API @ 15 deg C	
Colour	Dark Brown	
Fluorescence	Blue-white/yellow	
GOR	760 SCF/STB	
Water Properties		
Resistivity	0.208 @ 25.5 deg C	
NaCl Equivalent	30000 ppm	ppm
Cl-titrated	16500 ppm	ppm
Est. Water Type/Tritium	Filtrate/2680 DPM	
Mud Filtrate Properties		
Resistivity (Rmf)	0.170 @ deg C 21 deg C	0.170 @ deg C. 21 deg C
NaCl Equivalent	40000 ppm	40000 ppm
Cl-titrated	20000 ppm	20000 ppm
General Calibration		
Mud Weight	10.4+ ppg	10.4+ ppg
Hewlett Packard	746	746
Calc. Hydrostatic	10.5 ppg	10.5 ppg
RFT chokesize	1 x 0.03	1 x 0.03
REMARKS		Preserved RFS-AD1116

RFT SAMPLE TEST REPORT

Well : Turrum-3

OBSERVER : P.Ettema

DATE : 31/3/85

RUN NO. : 4

	CHAMBER 1 (22.7 lit)	CHAMBER 2 (10.4 lit.)
SEAT NO.	4/45	4/45
DEPTH	2551.5	2551.5
A. RECORDING TIMES		
Tool Set	0131	
Pretest Open	0131	
Time Open	0134	0154
Chamber Open	0134	0154
Chamber Full	0141	0157
Fill Time	7	3
Start Build Up	0141	0157
Finish Build Up	0152	0203
Build Up Time	11	6
Seal Chamber	0152	0203
Tool Retract		0209
Total Time		0034 mins.
B. SAMPLE PRESSURE		
IHP	4600.7 psia	
ISIP	3736.1 psia	3734.4
Initial Flowing Press.	1456.1 psia	2465.5 psia
Final Flowing Press.	2321.7 psia	2494.2 psia
Sampling Press Range	2321.7-1456.1 psia	2465.5-2494.2 psia
FSIP	3734.3 psia	3734.1 psia
FHP		4599.0 psia
C. TEMPERATURE		
Depth Tool Reached	2580 m	2580 m
Max. Rec. Temp		deg C
Time Circ. Stopped	30/3/85 : 1530 hrs	30/3/85 : 1530 hrs
Time since Circ.	10 hrs	10 hrs
D. SAMPLE RECOVERY		
Surface Pressure	2150 psig	psig
Amt Gas	138.5 cu ft	cu ft
Amt Oil	0 lit	lit
Amt Water (filtrate)	3200 cc	lit
Amt Others (cond.)	1000 cc	lit
E. SAMPLE PROPERTIES		
Gas Composition		
C1	574669 ppm	ppm
C2	81536 ppm	ppm
C3	50176 ppm	ppm
1C4/nC4	16384 ppm	ppm
C5	5222 ppm	ppm
C6+	1670 ppm	ppm
CO2/H2S	9%/tr ppm	
Oil Properties	58.3 deg API @ 24 deg C	
Colour	Straw Yellow	
Fluorescence	Bright White	
GOR		
Water Properties		
Resistivity	0.216 @ 23.5 deg C	
NaCl Equivalent	30000 ppm	ppm
Cl-titrated	18500 ppm	ppm
Est. Water Type/Tritium	Filtrate/2186 DPM	
Mud Filtrate Properties		
Resistivity (Rmf)	0.170 @ deg C 21 deg C	0.170 @ deg C. 21 dec C.
NaCl Equivalent	40000 ppm	ppm
Cl-titrated	20000 ppm	ppm
General Calibration		
Hewlett Packard No.	746 ppg	746 ppg
Mud Weight	10.4	10.4
Calc. Hydrostatic	10.6 ppg	10.6 ppg
RFT chokesize	1 x 0.03	1 x 0.03
REMARKS	Slow build-up; sealed chamber early	Save as possible gas sample.

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RFT SAMPLE TEST REPORT

Well :Turrum-3

OBSERVER :P.Ettema

DATE : 31/3/85

RUN NO. : 5

	CHAMBER 1 (22.7 lit)	CHAMBER 2 (10.4 lit.)
SEAT NO.	5/46	5/46
DEPTH	2442.0	2442.0
A. RECORDING TIMES		
Tool Set	0502	
Pretest Open	0502	
Time Open	0506	0555
Chamber Open	0506	0555
Chamber Full	Slow fill; chambers	Same again
Fill Time	did not fill. Seal	Seal after 24
Start Build Up	after 45 mins.	mins
Finish Build Up		
Build Up Time		
Seal Chamber	0551	0619
Tool Retract		0622
Total Time		1hr 20 mins.
B. SAMPLE PRESSURE		
IHP	4400.8 psia	
ISIP	3533.0 psia	3529.2
Initial Flowing Press.	60.3 psia	1299.4 psia
Final Flowing Press.	1836.3 psia	2309.3 psia
Sampling Press Range	60.3-1836.3 psia	1299.4-2309.3 psia
FSIP	3529.2 psia	3527.9 psia
FHP		4399.7 psia
C. TEMPERATURE		
Depth Tool Reached	2510 m	2510 m
Max. Rec. Temp	200 deg F	200 deg F
Time Circ. Stopped	30/3/85 : 1530 hrs	30/3/85 : 1530 hrs
Time since Circ.	13 1/2 hrs	13 1/2 hrs
D. SAMPLE RECOVERY		
Surface Pressure	1250 psig	1500 psig
Amt Gas	Lost; valve fail	43.4 cu ft
Amt Oil	0 lit	0 lit
Amt Water (filtrate)	6000 cc	1000 cc
Amt Others (cond)	200 cc	220 cc
E. SAMPLE PROPERTIES		
Gas Composition		
C1	612147 ppm	687104 ppm
C2	86912 ppm	93184 ppm
C3	50176 ppm	52326 ppm
1C4/nC4	15565 ppm	15564 ppm
C5	5875 ppm	5548 ppm
C6+	1670 ppm	1949 ppm
CO2/H2S	11%/0 ppm	12%/0 ppm
Oil Properties (Cond)	55.8 deg API @ 24 deg C	63.6 deg API @ 24 deg C
Colour	Straw Yellow	Straw Yellow
Fluorescence	Bright White	Bright White
GOR	760 SCF/STB	
Water Properties		
Resistivity	0.214 @ 25 deg C	0.224 @ 23.5 deg C
NaCl Equivalent	30000 ppm	30000 ppm
Cl-titrated	16800 ppm	18200 ppm
Est. Water Type/Tritium	Filtrate/2764 DPM	Filtrate/2298 DPM
Mud Filtrate Properties		
Resistivity (Rmf)	0.170 @ 21 deg C.	0.170 @ 21 deg C.
NaCl Equivalent	40000 ppm	40000 ppm
Cl-titrated	20000 ppm	20000 ppm
General Calibration		
Hewlett Packard No.	746 ppg	746 ppg
Mud Weight	10.4	10.4
Calc. Hydrostatic		
RFT chokesize	1 x 0.03	1 x 0.03
REMARKS	Slow fill; seal chamber early after 45 mins.	

RFT SAMPLE TEST REPORT

Well : Turrum-3

OBSERVER : P.Ettema

DATE : 31/3/85

RUN NO. : 6

	CHAMBER 1 (22.7 lit)			CHAMBER 2 (10.4 lit.)	
SEAT NO.	6/47	6/48	6/49	6/50	
DEPTH	2331.0	2330.7	2331.2	2319.5	
A. RECORDING TIMES					
Tool Set	0908	0951	1013	1020	
Pretest Open	0908	0951	1013	1020	
Time Open	0912	0954	N/A	1023	
Chamber Open	0912	0954	N/A	1023	
Chamber Full	ABAN.	ABAN.	ABAN.	ABAN.	
Fill Time					
Start Build Up					
Finish Build Up					
Build Up Time					
Seal Chamber	0045	1004		1051	
Tool Retract	0046	1005	1015	1055	
Total Time					
B. SAMPLE PRESSURE					
IHP	4198.5	4197.6	4197.0	4176.9	
ISIP	3420.8	3516.5	N/A	3415.8	
Initial Flowing Press.	54.7	46.9	N/A	67.3 psia	
Final Flowing Press.	57.3	56.8	N/A	884.4 psia	
Sampling Press Range	ABAN.	ABAN.	N/A	ABAN. psia	
FSIP	N/A	N/A	N/A	3404 psia	
FHP	N/A	N/A	N/A	4176 psia	
C. TEMPERATURE					
Depth Tool Reached		2386	m		2386 m
Max. Rec. Temp			deg F		deg F
Time Circ. Stopped		30/3/85 : 1530	hrs		30/3/85 : 1530 hrs
Time since Circ.		17 1/2	hrs		17 1/2 hrs
D. SAMPLE RECOVERY					
Surface Pressure			psig		psig
Amt Gas					cu ft
Amt Oil			lit		lit
Amt Water (filtrate)			cc		cc
Amt Others (cond)			cc		cc
E. SAMPLE PROPERTIES					
Gas Composition					
C1			ppm		ppm
C2			ppm		ppm
C3			ppm		ppm
1C4/nC4			ppm		ppm
C5			ppm		ppm
C6+			ppm		ppm
CO2/H2S			ppm		ppm
Oil Properties					
Colour					
Fluorescence					
GOR					
Water Properties					
Resistivity					
NaCl Equivalent			ppm		ppm
Cl-titrated			ppm		ppm
Est. Water					
Mud Filtrate Properties					
Resistivity (Rmp)	0.170 @ deg C 21			0.170 @ deg C. 21	
NaCl Equivalent	40000		ppm	40000	ppm
Cl-titrated	20000		ppm	20000	ppm
General Calibration					
Hewlett Packard No.	746		ppg	746	ppg
Mud Weight	10.4			10.4	
Calc. Hydrostatic			ppg		ppg
RFT chokesize	1 x 0.03			1 x 0.03	
REMARKS	Unsuccessful sample attempt around 2331m.				

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RFT SAMPLE TEST REPORT

Well : Turrum-3

OBSERVER : P.Ettema

DATE : 31/3/85

RUN NO. : 6

	CHAMBER 1 (22.7 lit)	CHAMBER 2 (10.4 lit.)
SEAT NO.	6/51	6/51
DEPTH	1579.0	1579.0
A. RECORDING TIMES		
Tool Set	1119	
Pretest Open	1119	
Time Open	1122	
Chamber Open	1122	1127
Chamber Full	1124	1130
Fill Time	2	3
Start Build Up	1124	1130
Finish Build Up	1125	1131
Build Up Time	1	1
Seal Chamber	1126	1132
Tool Retract		1133
Total Time		14 mins.
B. SAMPLE PRESSURE		
IHP	2852.4 psia	
ISIP	2179.6 psia	2181.8 psia
Initial Flowing Press.	840.1 psia	2091.2 psia
Final Flowing Press.	2181.6 psia	2094.5 psia
Sampling Press Range	840.6-2181.6 psia	2091.2-2094.5
FSIP	2181.8 psia	2182.4 psia
FHP		2856.4 psia
C. TEMPERATURE		
Depth Tool Reached	N/A m	N/A m
Max. Rec. Temp	N/A deg F	N/A deg F
Time Circ. Stopped	30/3/85 : 1530 hrs	30/3/85 : 1530 hrs
Time since Circ.	19 1/2 hrs	19 1/2 hrs
D. SAMPLE RECOVERY		
Surface Pressure	1450 psig	less than 100 psig
Amt Gas	22.4 cu ft	(lost) 1.4 cu ft
Amt Oil	0 lit	0 lit
Amt Water (filtrate)	filtrate 18000 cc	water 9250 cc
Amt Others		cc
E. SAMPLE PROPERTIES		
Gas Composition		
C1	637133 ppm	ppm
C2	86016 ppm	ppm
C3	54477 ppm	ppm
1C4/nC4	16384 ppm	ppm
C5	6528 ppm	ppm
C6+	2237 ppm	ppm
CO2/H2S	7%/tr ppm	12%/0 ppm
Oil Properties		
Colour		
Fluorescence		
GOR		
Water Properties		
Resistivity	0.218 @ 24 deg C	0.392 @ 24 deg C
NaCl Equivalent	30000 ppm	ppm
Cl-titrated	18200 ppm	11500 ppm
Est. Water Type/Tritium	Filtrate/2654 DPM	Formation Water/1226 DPM
Mud Filtrate Properties		
Resistivity (Rmp)	0.170 @ deg C 21	0.170 @ deg C. 21
NaCl Equivalent	40000 ppm	40000 ppm
Cl-titrated	20000 ppm	20000 ppm
General Calibration		
Hewlett Packard No.	746 ppg	746 ppg
Mud Weight	10.4	10.4
Calc. Hydrostatic	ppg	ppg
RFT chokesize	1 x 0.03	1 x 0.03
REMARKS	Part of sample from zone at 2331.0m	Gas sample lost to atmosphere

RFT SAMPLE TEST REPORT

Well : Turrum-3

OBSERVER : P.Ettema

DATE : 31/3/85

RUN NO. : 7

	CHAMBER 1 (22.7 lit)	CHAMBER 2 (10.4 lit.)
SEAT NO.	7752	7752
DEPTH	2156.5	2156.5
A. RECORDING TIMES		
Tool Set	1426	
Pretest Open	1426	
Time Open	1428	
Chamber Open	1428	1448
Chamber Full	1438	1452
Fill Time	10	4
Start Build Up	1438	1452
Finish Build Up	1446	1508
Build Up Time	8	16
Seal Chamber	1447	1508
Tool Retract		1509
Total Time		43 mins.
B. SAMPLE PRESSURE		
IHP	3884.9 psia	
ISIP	3092.9 psia	3091.9 psia
Initial Flowing Press.	329.6 psia	840.3 psia
Final Flowing Press.	1179.0 psia	1109.9 psia
Sampling Press Range	329.6-1179.0	840.3-1109.9
FSIP	3091.9 psia	3091.9 psia
FHP		3884.8 psia
C. TEMPERATURE		
Depth Tool Reached	2220 m	2220 m
Max. Rec. Temp	198 deg F	198 deg F
Time Circ. Stopped	30/3/85 : 1530 hrs	30/3/85 : 1530 hrs
Time since Circ.	25 hrs	25 hrs
D. SAMPLE RECOVERY		
Surface Pressure	1400 psig	1600 psig
Amt Gas	14.5 cu ft	18.4 cu ft
Amt Oil	0 cc	1000 cc
Amt Water (filtrate)	19400 cc	6000 cc
Amt Others (cond)	Film cc	cc
E. SAMPLE PROPERTIES		
Gas Composition		
C1	32481 ppm	45969 ppm
C2	28672 ppm	32789 ppm
C3	14336 ppm	18396 ppm
1C4/nC4	6553 ppm	9462 ppm
C5	3427 ppm	3826 ppm
C6+	1949 ppm	2016 ppm
CO2/H2S	5%/tr ppm	7%/tr
Oil Properties		
Colour		45.3 deg API @ 24 deg C
Fluorescence		Pale yellow/brown
GOR		White/yellow
Water Properties		
Resistivity	0.209 @ 20 deg C	0.197 @ 20 deg C
NaCl Equivalent		
Cl-titrated	20000 ppm	20000 ppm
Est. Water Type/Tritium	Filtrate/3037 DPM	Filtrate/3087 DPM
Mud Filtrate Properties		
Resistivity (Rmp)	0.170 @ deg C 21	0.170 @ deg C. 21
NaCl Equivalent	40000 ppm	40000 ppm
Cl-titrated	20000 ppm	20000 ppm
General Calibration		
Hewlett Packard No.	746 ppg	746 ppg
Mud Weight	10.4	10.4
Calc. Hydrostatic	10.6 ppg	10.6 ppg
RFT chokesize	1 x 0.03	1 x 0.03
REMARKS		Pour PT 16.8 deg C

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RFT SAMPLE TEST REPORT

Well : Turrum-3

OBSERVER : P.Ettema

DATE : 31/3/85

RUN NO. : 8

	CHAMBER 1 (22.7 lit)			CHAMBER 2 (10.4 lit.)	
SEAT NO.	8/53	8/54	8/55	8/55	
DEPTH	2618.4	2604.3	2619.6	2619.6	
A. RECORDING TIMES					
Tool Set	1815	1825	1840		
Pretest Open	1815	1825	1840		
Time Open		1829	1842		
Chamber Open	ABAN.	1829	1842	1850	
Chamber FULL			1848	1855	
Fill Time	TIGHT	ABAN.	6	5	
Start Build Up			1848	1855	
Finish Build Up		TIGHT	1849	1856	
Build Up Time			1	1	
Seal Chamber		1834	1849	1857	
Tool Retract	1820	1835		1858	
Total Time	5	6		18 mins.	
B. SAMPLE PRESSURE					
IHP	4735.2	4682.4	4709.2	psia	
ISIP		3744.6	3757.1	3753.3 psia	
Initial Flowing Press.		80.9	1957.7	3639.2 psia	
Final Flowing Press.		55.8	3325.3	3637.6 psia	
Sampling Press Range				3639.2-3637.6	
FSIP		169.8	3753.3	3752.8 psia	
FHP	4709.0	4684.0		4707.0 psia	
C. TEMPERATURE					
Depth Tool Reached		2625	m	2625 m	
Max. Rec. Temp			deg F	deg F	
Time Circ. Stopped	30/3/85 : 1530 hrs			30/3/85 : 1530 hrs	
Time since Circ.	26 1/2 hrs			26 1/2 hrs	
D. SAMPLE RECOVERY					
Surface Pressure		500	psig	400 psig	
Amt Gas		3.2	cu ft	1.3 cu ft	
Amt Oil		scum	lit	0 lit	
Amt Water		21250	cc	9250 cc	
Amt Others (cond)			cc	(cond) 250 cc	
E. SAMPLE PROPERTIES					
Gas Composition					
C1	343552		ppm	487219 ppm	
C2	64512		ppm	78848 ppm	
C3	68813		ppm	45875 ppm	
1C4/nC4	32768		ppm	22937 ppm	
C5	9792		ppm	7507 ppm	
C6+	3340		ppm	2784 ppm	
CO2/H2S	2%/7 ppm		ppm	2%/5 ppm	
Oil Properties					
Colour					
Fluorescence					
GOR					
Water Properties					
Resistivity	0.200 @ 20 deg C			0.197 @ 20 deg C	
NaCl Equivalent	ppm			ppm	
Cl-titrated	20000 ppm			20000 ppm	
Est. Water Type/Tritium	Water/Filtrate 3168 DPM			Water/Filtrate/3226 DPM	
Mud Filtrate Properties					
Resistivity (Rmp)	0.170 @ deg C 21			0.170 @ deg C. 21	
NaCl Equivalent	40000 ppm			40000 ppm	
Cl-titrated	20000 ppm			20000 ppm	
General Calibration					
Hewlett Packard No.	746		ppg	746 ppg	
Mud Weight	10.4			10.4	
Calc. Hydrostatic	10.5		ppg	10.5 ppg	
RFT chokesize	1 x 0.03			1 x 0.03	
REMARKS					

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RFT SAMPLE TEST REPORT

Well : Turrum-3

OBSERVER : Richard Newport DATE : 15/4/85 RUN NO. : 9

	CHAMBER 1 (22.7 lit)	CHAMBER 2 (10.4 lit.)
SEAT NO.	9/56	56
DEPTH	2619.8	2619.8
A. RECORDING TIMES		
Tool Set	1548	
Pretest Open	1548	
Time Open	1554	
Chamber Open	1554	1603
Chamber Full	1600	1606
Fill Time	6	3
Start Build Up	1600	1606
Finish Build Up	1602	1607
Build Up Time	2	1
Seal Chamber	1602	1608
Tool Retract		1609
Total Time		21 mins.
B. SAMPLE PRESSURE		
IHP	4702.2 psia	
ISIP	3753.5 psia	3751.9 psia
Initial Flowing Press.	254.9 psia	3019.6 psia
Final Flowing Press.	2938.7 psia	
Sampling Press Range	254.9-2938.7 psia	
FSIP	3751.8 psia	3752.3 psia
FHP		4698.8 psia
C. TEMPERATURE		
Depth Tool Reached	2619.8 m	2619.8 m
Max. Rec. Temp	91 deg C	91 deg C
Time Circ. Stopped	15/4/85 : 0545 hrs	15/4/85 : 0545 hrs
Time since Circ.	10 hrs	10 hrs
D. SAMPLE RECOVERY		
Surface Pressure	300 psig	250 psig
Ant Gas	0.55 cu ft	tr cu ft
Ant Oil	Yellow waxy scum	tr yellow waxy scum
Ant Water (filtrate)	21400 cc	9400 cc
Ant Others (cond)		cc
E. SAMPLE PROPERTIES		
Gas Composition		
C1	Not enough to test	
C2		
C3		
1C4/nC4		
C5		
C6+		
CO2/H2S		
Oil Properties	38-39 deg API @ 25 deg C	
Colour	Yellow Waxy	
Fluorescence	Bright White	
GOR		
Water Properties		
Resistivity	0.23 @ 20 deg C	0.225 @ 20 deg C
NaCl Equivalent	30000 ppm	30000 ppm
Cl-titrated		ppm
Tritium	3084 DPM	3153 DPM
Est. Water Type	filtrate ppm	filtrate
Mud Filtrate Properties		
Resistivity (Rmf)	0.192 @ deg C 16.0 deg C	0.192 @ 16.0 deg C
NaCl Equivalent	22500 ppm	23000 ppm
Ph	8.6	8.6
General Calibration		
Mud Weight	10.3	10.3
Calc. Hydrostatic		
RFT chokesize		
REMARKS	(Water affect on A.P.I.)	

APPENDIX 5

VELOCITY SURVEY REPORT

1. Marine Velocity Survey Report.
2. Turrum-3 Location Map.
3. Schlumberger Velocity Report.
 1. Summary
 2. Data acquisition
 3. Processing parameters
 4. Shot data
 5. Sonic calibration
 6. Processing
 7. Sonic calibration results
4. Schlumberger Field Report.
5. Check Shot Data Observed and Corrected.

FIGURES

1. Stacked Check Shot Data.
2. Gun geometry sketch.

1. MARINE VELOCITY SURVEY REPORT

CONTRACTOR : SCHLUMBERGER

BASIN : GIPPSLAND

WELL : TURRUM-3

LEASE : VIC/L3

CO-ORDINATES : 38 DEG. 15' 41.05" S
148 DEG. 14' 58.96" E

RIG : SOUTHERN CROSS

ELEVATIONS : GROUND LEVEL AT -60.0M AMSL
DERRICK FLOOR AT 20.7M AMSL
KELLY BUSHING AT 21.0m AMSL

DATE OF SURVEY : APRIL 15, 1985

CASING DEPTHS : 20" @ 219mKB, 13 3/8" @ 806mKB

TD AT SHOOTING : 2996 mKB

NO OF SHOOTING
LEVELS : 12

RECORDED BY: D. J. DAWSON

WITNESSED BY: D. LEE

SUMMARY

A velocity check shot survey was conducted in the Turrum-3 well on April 15, 1985. Twelve levels were shot using an airgun source and the results from these shots have been used in the calibration of the sonic log.

All shot times and the calibrated sonic times have been corrected to SRD.

DATA ACQUISITION

Field Equipment

Energy Source : Bolt airgun (model 1900B)
120 cu. in.

Source Offset : 37.3 metres

Source Depth : 29.7 metres below DF (9.0 metres below MSL)

Source Azimuth : 80 deg.

Reference Sensor : Accelerometer

Sensor Offset : 37.3 metres

Sensor Depth : 29.7 metres below DF (9.0 metres below MSL)

Downhole Geophone : Geospace HS-1
High temperature (350 Deg. F), Coil Resistance
225 + 10%, Natural Frequency 8-12 Hz, Sensitivity
0.45 V/in/sec. Maximum tilt angle 60 Deg. Min.

Recording Instrument

Recording was made with the Schlumberger Computerised Service Unit (CSU) using LIS tape format.

PROCESSING PARAMETERS

Seismic Reference Datum (SRD) : Mean sea level

Elevation SRD : Mean sea level

Elevation Kelly Bushing : 21.0 metres AMSL

Elevation Derrick Floor : 20.7 metres AMSL

Elevation Ground Level : -60.0 metres AMSL

Max Well Deviation : Nil

Total Depth : 2996 metres DF

Sonic Log Interval : 202.5 - 2695 metres below DF

Density Log Interval : 1515 - 2763 metres below DF

SHOT DATA

Level Depth (m below DF)	Stacked Shots	Rejected Shots	Quality	Comment
2695	3	0	Good	
2585	4	1	Good	
2421	3	0	Good	
2340	4	0	Good	
2175	4	1	Good	
1873	5	1	Good	
1550	6	2	Good	
1400	3	0	Good	
1200	4	0	Good	
1000	7	2	Good	
785	4	3	Good	
600	3	0	Good	
29.7	5	2	Good	

A total of 12 check levels were shot with the number of stacked and rejected shots for each level being shown in the table above. A moon pool shot was recorded at 9 metres below MSL to establish the distance from the gun to the well.

The general data quality was good and a plot of the stacked check shot data is displayed at Fig. 1.

GUN OFFSET

The shot at 29.7 metres below DF (9 metres below SRD) was used to calculate the gun offset and has not been used in any further calculations. The gun offset distance was calculated using the following data:

water velocity = 1480 metres/sec

gun position = 9 metres below SRD, azimuth approx 80 degrees

hydrophone posn = 9 metres below SRD and 6.25 metres NE of well

sonic transit time from gun to hydrophone = 21 millisecs

distance from gun to hydrophone = $1480 \times 0.021 = 31.08$ metres

distance from gun to well = $31.08 + 6.25 = 37.33$ metres

SONIC CALIBRATION

Purpose: To adjust the sonic log using the vertical times obtained at each check level.

Method: A "drift" curve is obtained using the sonic log and the vertical check level times. The term "drift" is defined as seismic time (from check shots) minus sonic time (from integration of edited sonic). Commonly the word "drift" is used to identify the above difference, or to identify the gradient of drift versus increasing depth, or to identify a difference of drift between two levels.

The gradient of drift, that is the slope of the drift curve, can be negative or positive.

For a negative drift $\frac{\Delta \text{drift}}{\Delta \text{depth}} < 0$, and the sonic time is greater than the seismic time over a certain section of log.

For a positive drift $\frac{\Delta \text{drift}}{\Delta \text{depth}} > 0$, and the sonic time is smaller than the seismic time over that section of log.

The drift curve, between two levels, is then an indication of the error on the integrated sonic or an indication of the amount of correction required on the sonic to have the TTI of the corrected sonic match the check shot times.

Two methods of correction to the sonic log are used.

(a) Uniform or block shift.

This method applies a uniform correction to all sonic values over the interval. This uniform correction is applied in the case of positive drift and is the average correction represented by the drift curve gradient expressed in $\mu\text{s}/\text{ft}$.

(b) ΔT Minimum

In the case of negative drift a second method is used, called Δt minimum. This applies a differential correction to the sonic log, where it is assumed that the greatest amount of transit time error is caused by the lower velocity sections of log. Over a given interval the method will correct only Δt values which are higher than a threshold, the Δt minimum. Values of Δt which are lower than the threshold are not corrected. The correction is a reduction of the excess of Δt over Δt minimum, $\Delta t - \Delta t \text{ min}$.

$\Delta t - \Delta t$ minimum is reduced through multiplication by a reduction coefficient which remains constant over the interval. This reduction coefficient, named G, can be defined as:

$$G = 1 + \frac{\text{Drift}}{\int (\Delta t - \Delta t \text{ minimum}) dZ}$$

Where drift is the drift over the interval to be corrected and the value $\int (\Delta t - \Delta t \text{ minimum}) dZ$ is the time difference between the integrals of the two curves Δt and Δt minimum, only over the intervals where $\Delta t > \Delta t \text{ min}$.

Hence the corrected sonic: $\Delta t = G(\Delta t - \Delta t \text{ min}) + \Delta t \text{ min}$.

PROCESSING

OPEN HOLE LOGS

Both the sonic and density logs used in this report have been edited prior to input into the WST chain. Two sonic logs were run, from 2695 to 1515 metres below DF and from 1515 to 202.5 metres below DF. The density log was run from 2763 to 1515 metres below DF.

Sonic data quality was good and has been patched from 263 metres below DF to the surface at a constant sonic velocity of 550 us/metre. The casing is at 202 metres below DF.

The density curve has been patched from 1515 metres to the surface at a constant density of 2.40 gm/cc. Patching has been applied to the density curve in zones of bad hole conditions.

CORRECTION TO DATUM

Seismic reference Datum (SRD) is at Mean Sea Level. The airgun was positioned 9 metres below SRD and using a water velocity of 1480m/s a correction of 6.08 millisecs was calculated between gun and SRD.

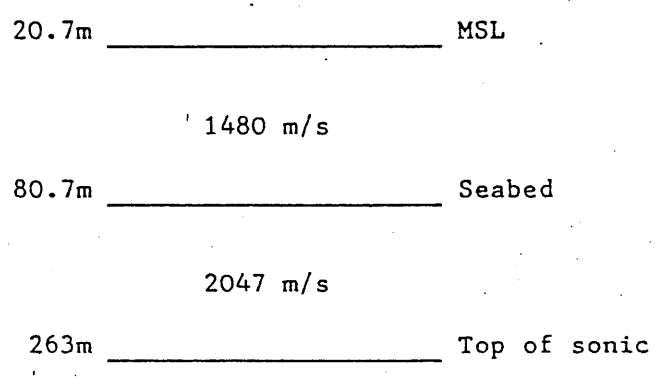
IMPOSED SHOTS

An imposed shot was placed at the top of the usable sonic (263 metres below DF) and a shot time was selected to maintain a linear drift curve. An additional shot has been imposed at seabed using a velocity of 1480 metres/sec between SRD and this depth.

VELOCITY MODELLING

An interval velocity of 2047 metres/sec between the sea floor and the sonic log was calculated using the check shot time at 263 metres below DF and a water velocity of 1480 metres/sec.

Depths stated are referenced to Derrick Floor.



SONIC CALIBRATION RESULTS

The imposed shot at 263 metres below DF is chosen as the origin for the calibration drift curve. All drift measurements are relative to this point.

The drift curve indicates the corrections to be made to the sonic log. A list of shifts used on the sonic data is given below.

DEPTH INTERVAL metres below DF	BLOCK SHIFT us/m	DELTA-T MIN us/m	EQUIV BLOCK SHIFT us/m	BLOCK SHIFT (us/ft)
0-263	0.0	-	0.0	(0.0)
263-1323	13.12	-	13.12	(4.0)
1323-1563	0.0	-	0.0	(0.0)
1563-2174	8.50	-	8.5	(2.59)
2174-2591	18.47	-	18.47	(5.63)
2591-2695	7.68	-	7.68	(2.34)

The adjusted sonic curve is considered to be the best result using the available data.

GEOGRAM PROCESSING

Geograms were generated using the following wavelets:

1. Minimum phase ricker wavelet (centre frequencies 20, 25, 30 & 35 Hz)
2. Zero phase ricker wavelet (centre frequencies 20, 25, 30 & 35 Hz)

The presentations include both normal and reverse polarity at a time scale of 3.75 in/sec.

Geogram processing produces synthetic seismic traces based on reflection coefficients generated from sonic and density measurements in the well-bore. The steps in the processing chain are the following:

- Time to depth conversion
- Generate reflection coefficients
- Generate attenuation coefficients
- Choose a suitable wavelet
- Convolution
- Output

TIME TO DEPTH CONVERSION

Open hole logs are recorded from bottom to top with a depth index. This data is converted to a two-way time index and flipped to read from top to bottom in order to match the seismic section.

REFLECTION COEFFICIENTS - ATTENUATION COEFFICIENTS

Primaries:

Sonic and density data are averaged over chosen time intervals (normally 2 or 4ms intervals). Reflection coefficients are then computed using:

$$R = \frac{\rho_2 v_2 - \rho_1 v_1}{\rho_2 v_2 + \rho_1 v_1}$$

- where ρ_1 = density of the layer above the reflection interface
- ρ_2 = density of the layer below the reflection interface
- v_1 = compressional wave velocity of the layer above the reflection interface
- v_2 = compressional wave velocity of the layer below the reflection interface

This computation is done for each time interval to generate a set of primary reflection coefficients without transmission losses.

PRIMARIES WITH TRANSMISSION LOSS;

Transmission loss on two-way attenuation coefficients are computed using:

$$\Lambda_n = (1-R_1^2)(1-R_2^2)(1-R_3^2)...(1-R_n^2)$$

A set of primary reflection coefficients with transmission losses is generated using:

$$\text{Primary}_n = R_n \Lambda_{n-1}$$

PRIMARIES PLUS MULTIPLES:

Multiples are computed from these input reflection coefficients using the transform technique from the top of the well to obtain the impulse response of the earth. The transform outputs primaries + multiples.

MULTIPLES ONLY:

By subtracting previously calculated primaries from the above result we obtain multiples only.

WAVELET

A theoretical wavelet is chosen to use for convolution with the reflection coefficients previously generated.

Choices available include:

- Klauder wavelet
- Ricker zero phase wavelet
- Ricker minimum phase wavelet
- User defined wavelet

All wavelets can be chosen with or without butterworth filtering and with user defined centre frequencies. Polarity conventions are shown in Figure 2. Geograms were generated using minimum phase and zero phase ricker wavelets.

CONVOLUTION

Standard procedure of convolution of wavelet with reflection coefficients. The output is the synthetic seismic data.

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WELL SEISMIC SERVICE FIELD REPORT

Schlumberger

COMPANY	WELL	DATE	LOCATION	ENGINEER	WITNESSED BY
ESSO AUST. LTD	TURRUM #3	15.4.85	SEA	D. DAWSON	D. LEE
FEET <input type="checkbox"/> METRES <input checked="" type="checkbox"/>	JACK UP <input type="checkbox"/> PLATFORM <input type="checkbox"/>	SHIP <input type="checkbox"/> SEMI-SUB <input checked="" type="checkbox"/>	WEATHER: VERY ROUGH HIGH WINDS		

SCHLUMBERGER ZERO	DF	AT ELEVATION	20.7m	RELATIVE TO MEAN SEA LEVEL (M.S.L.)
LOG MEASURED FROM	DF	AT ELEVATION	0.0m	RELATIVE TO SCHLUMBERGER ZERO
DRILLING MEASURED FROM	DF	AT ELEVATION	0.0m	RELATIVE TO SCHLUMBERGER ZERO

SOURCE		TIDEL INFORMATION		DISTANCE	HOUR	DATE
GUN TYPE	WATER <input type="checkbox"/> AIR <input checked="" type="checkbox"/>	TIDE LEVEL TO M.S.L.				
VOLUME	120 x 1 CU INCHES	(RECORD IF LEVEL VARIES MORE THAN 2 METRES DURING SURVEY)				
PRESSURE	115 BARS	CSU SOFTWARE VERSION: 26.4		MAX. HOLE DEV: 0deg. AZIM: -		
VIBRATOR TYPE						
SWEEP LENGTH	SECONDS					
FROM	HZ TO HZ					

NOTE: SHOTS HIGHLY RECOMMENDED AT TD, TOP EACH SONIC, ABOVE AND BELOW BAD HOLE INTERVALS

UNCORRECTED RESULTS Quality: G = Good, P = Poor, U = Unsatisfactor

SHOT NO.	DEPTH	GUN PRESSURE	FILTERS	TRANSIT TIME	HOUR SHOT	FILE	STACK	STACKED SHOTS	QUALITY / REMARKS
1	29.7	115 Bar							TEST
2	"								TEST
3	"			21.0		1	1		OK
4	"			19.8			1		OK
5	"			19.7			1		OK
6	"			19.9			1		OK
7	"			20.5			1		OK
8	1000.0			401.5		3	2		OK
9	"			401.5	1839		2		OK
10	"			401.8			2		OK
11	"			402.1			2		OK
12	"			401.6	1843		2		OK
13	2695			935.8	1929	5	3		OK
14	"			935.7			3		OK
15	"			936.5	1932		3		OK
16	2585				1940		4		NOISY
17	"			910.0	1942		4		OK
18	"			910.0	1944		4		OK
19	"			909.6			4		OK
20	"			910.2	1946		4		OK
21	2421			860.0	1953		5		OK
22	"			860.0			5		OK
23	"			859.9	1955		5		OK
24	2340			834.4	2000		6		OK
25	"			833.9			6		OK
26	"			834.1			6		OK
27	"			834.5			6		OK
28	2175						NOT STACKED		NO SIGNAL
29	"			784.7			7		LITTLE NOISY
30	"			783.2			7		OK
31	"			783.7			7		OK
32	"			784.0			7		OK
33	1873			695.2			8		OK
34	"			695.4			8		OK

Distribution: White = company office; Green = District; Pink = Location



WELL SEISMIC SERVICE FIELD REPORT

COMPANY	WELL	DATE	LOCATION	ENGINEER	WITNESSED BY
ESSO AUST LTD	TURRUM #3	15.4.85	SEA	D. DAWSON	D. LEE
FEET <input type="checkbox"/> METRES <input checked="" type="checkbox"/>	JACK UP <input type="checkbox"/> PLATFORM <input type="checkbox"/>	SHIP <input type="checkbox"/> SEMI-SUB <input checked="" type="checkbox"/>	WEATHER: VERY ROUGH HIGH WINDS		

SCHLUMBERGER ZERO	DF	AT ELEVATION	20.7m	RELATIVE TO MEAN SEA LEVEL (M.S.L.)
LOG MEASURED FROM	DF	AT ELEVATION	0.0m	RELATIVE TO SCHLUMBERGER ZERO
DRILLING MEASURED FROM	DF	AT ELEVATION	0.0m	RELATIVE TO SCHLUMBERGER ZERO

SOURCE		TIDEL INFORMATION	DISTANCE	HOURL	DATE
GUN TYPE	WATER <input type="checkbox"/> AIR <input checked="" type="checkbox"/>	TIDE LEVEL TO M.S.L.			
VOLUME	120 ¹ CU INCHES	(RECORD IF LEVEL VARIES MORE THAN 2 METRES DURING SURVEY)			
PRESSURE	115 BARS				
VIBRATOR TYPE					
SWEEP LENGTH	SECONDS				
FROM	HZ TO HZ				
		CSU SOFTWARE VERSION: 26.4	MAX. HOLE DEV: 0deg.	AZIM: -	

NOTE: SHOTS HIGHLY RECOMMENDED AT TD, TOP EACH SONIC, ABOVE AND BELOW BAD HOLE INTERVALS

UNCORRECTED RESULTS Quality: G = Good, P = Poor, U = Unsatisfactor

SHOT NO.	DEPTH	GUN PRESSURE	FILTERS	TRANSIT TIME	HOURL SHOT	FILE	STACK	STACKED SHOTS	QUALITY / REMARKS
35	1873	115 BAR		695.6	2031	5	8		OK
36	"			695.7			8		OK
37	"			695.8			8		NOISE AT BASE
38	"			696.0			8		OK
39	1550				2049		9	10,11	VERY NOISY
40	"			582.7			9		OK
41	"			583.5			9		OK
42	"			582.3			9		OK
43	"			582.5			9		OK
44	"			577.7			9)LOW FREQ.
45	"			582.9			9) NOISE
46	"			584.7			9)
47	1400			531.1			12		OK
48	"			531.7			12		OK
49	"			531.2			12		OK
50	1200			468.2	2130		13		OK
51	"			467.1			13		OK
52	"			468.0			13		OK
53	"			468.1			13		OK
54	1000						14		NOISY
55	"			401.4			14		OK
56	"			401.3			14		OK
57	"			401.5			14		OK
58	785				2159		NOT STACKED		NOISY
59	"			329.6	2202		15		OK
60	"			330.0			15		OK
61	"			330.2			15		OK
62	"						15		NOISY
63	"						15		NOISY
64	"			329.2			15		OK
65	600			266.8	2218		16		OK
66	"			265.3			16		OK
67	"			266.0	2222		16		OK

Distribution: White = computing centre, Green = District, Pink = Location

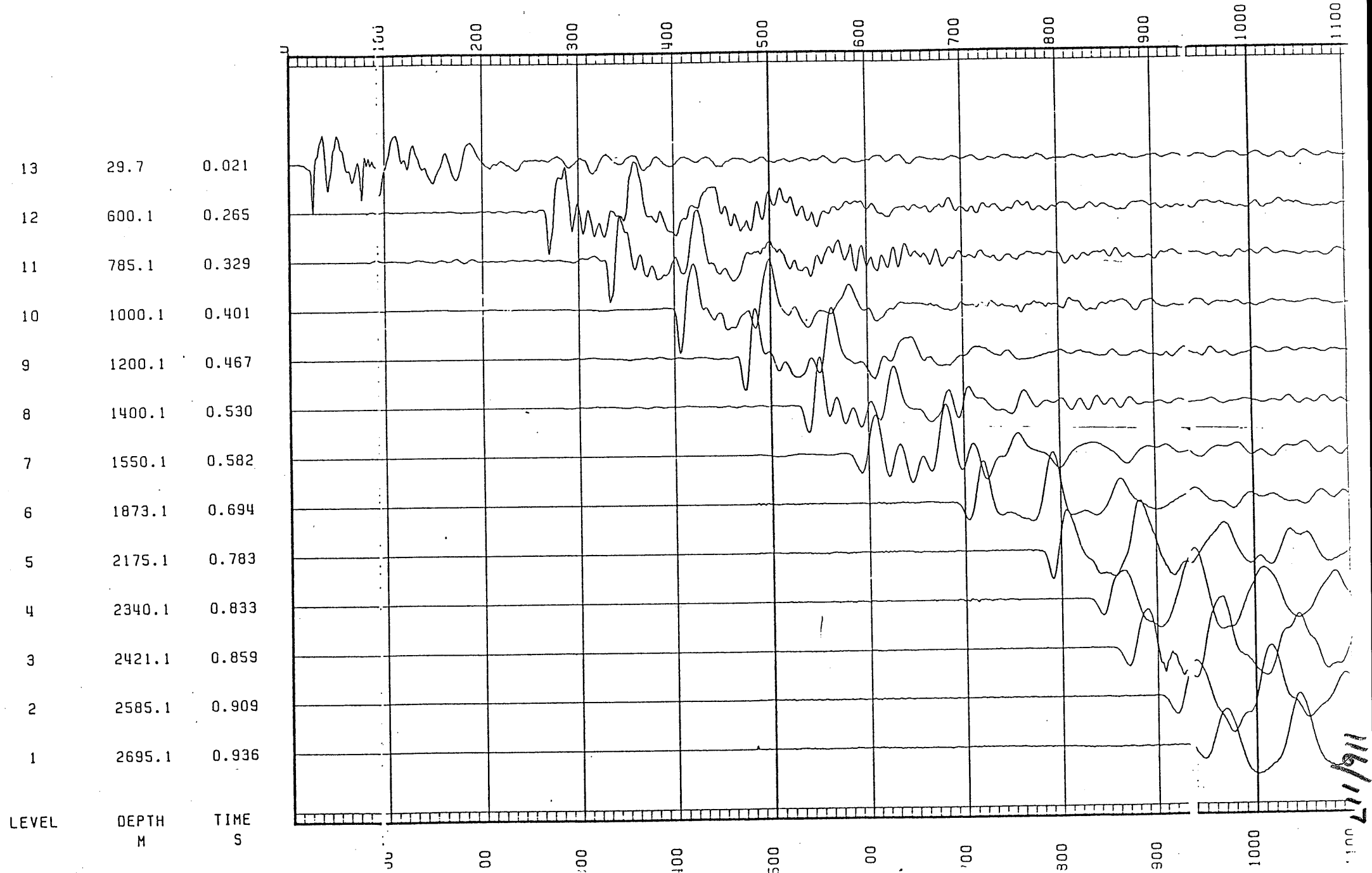
TURRUM-3 VELOCITY SURVEY

<u>LEVEL NUMBER</u>	<u>MEASURED DEPTH FROM KB</u> (m)	<u>VERTICAL DEPTH FROM MSL</u> (m)	<u>VERTICAL TRAVEL TIME MSL/ GEOPHONE</u> (ms)	<u>INTEGRATED ADJUSTED SONIC TIME</u> (ms)	<u>AVERAGE VELOCITY MSL/GEOPHONE</u> (m/s)	<u>INTERVAL VELOCITY BETWEEN SHOTS</u> (m/s)
SEA FLOOR	80.70	60.00	40.55	40.55	1480	1480
IMPOSED SHOT	263.00	242.30	129.62	129.61	1869	2047
3.	600.00	579.30	270.52	270.30	2141	2395
4.	785.00	764.30	334.68	334.60	2284	2877
5.	1000.00	979.30	406.79	406.58	2407	2987
6.	1200.00	1179.30	472.84	472.16	2494	3050
7.	1400.00	1379.30	535.88	535.76	2574	3145
8.	1550.00	1529.30	587.91	587.98	2601	2872
9.	1873.00	1852.30	699.94	698.78	2646	2915
10.	2175.00	2154.30	788.96	788.98	2731	3348
11.	2340.00	2319.30	838.97	839.27	2765	3281
12.	2421.00	2400.30	864.98	864.51	2775	3209
13.	2585.00	2564.30	914.98	914.89	2803	3255
14.	2695.00	2674.30	941.99	941.97	2839	4062

115/117

STACKED CHECK SHOT DATA

Fig. 1



11/17/91

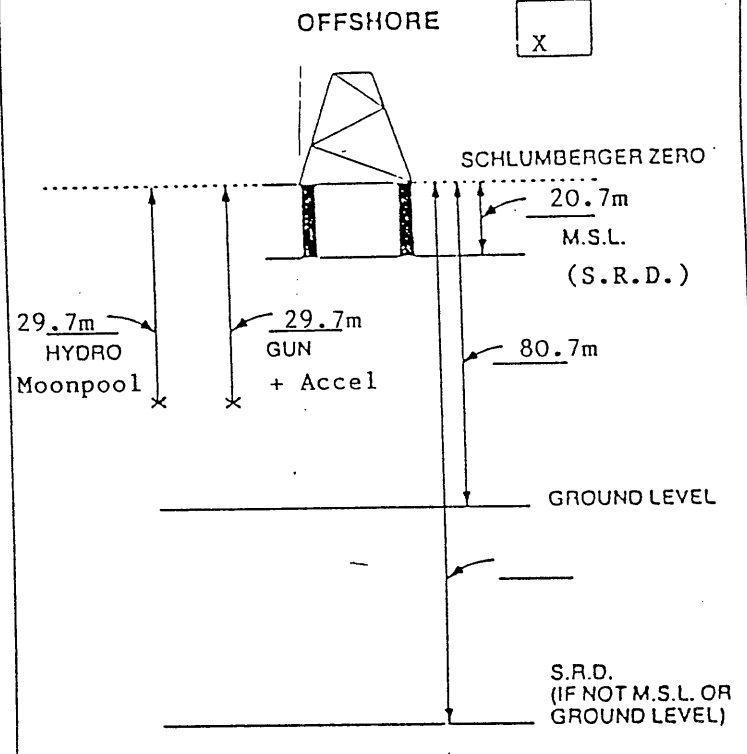
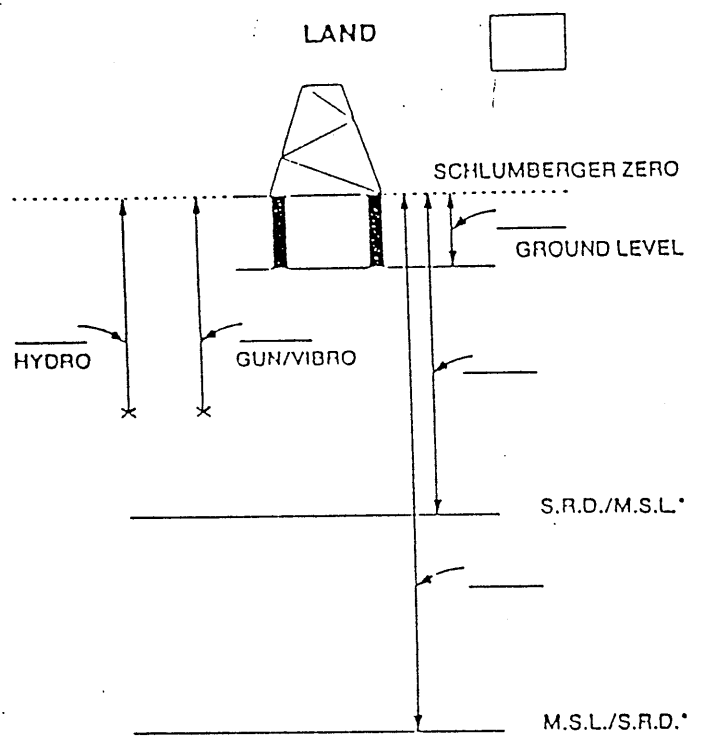
GUN GEOMETRY SKETCH



CLIENT: ESSO AUST. LTD.

WELL: TURRUM #3

DATE: APRIL 85

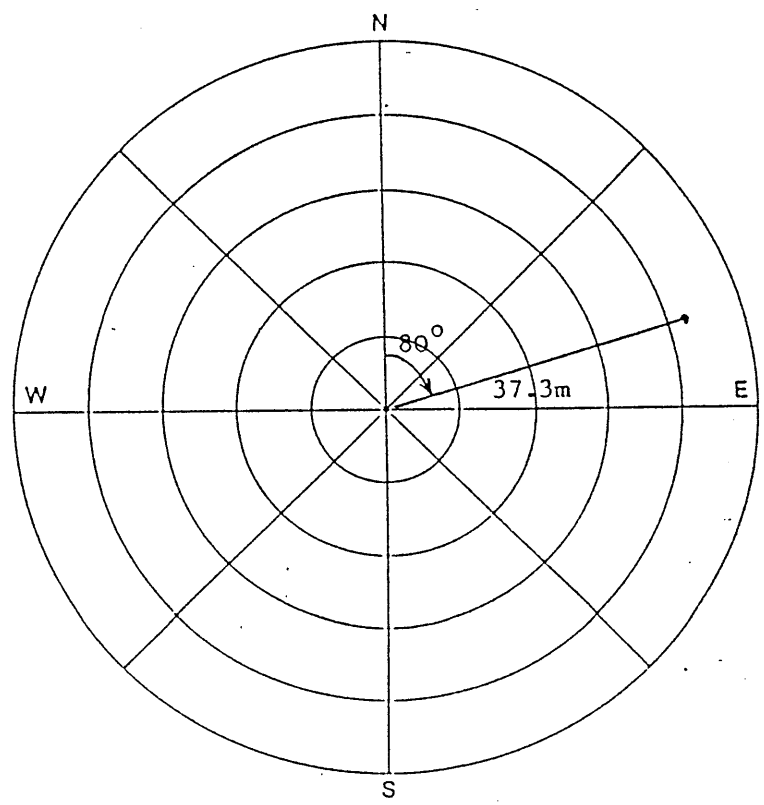


INDICATE ALL DISTANCES RELATIVE TO SCHLUMBERGER ZERO

INDICATE ALL DISTANCES RELATIVE TO SCHLUMBERGER ZERO

* DELETE AS APPLICABLE

SHOT POS'N	GUN OFFSET	HYDRO OFFSET	GUN DEPTH	HYDRO DEPTH
1	37.3m	37.3m	9m	9m
2				
3				
4				
5				
6				
7				



NB: MOONPOOL HYDROPHONE
 LOCATED 6.25 METRES NE
 OF WELL AND 9 METERS BELOW
 MSL

INDICATE GUN/VIBRO AND HYDROPHONE OFFSET AND AZIMUTH RELATIVE TO NORTH

PE601181

This is an enclosure indicator page.
The enclosure PE601181 is enclosed within the
container PE902420 at this location in this
document.

The enclosure PE601181 has the following characteristics:

ITEM_BARCODE = PE601181
CONTAINER_BARCODE = PE902420
NAME = Seismic Calibration Log -adjusted
continuous Velocity
BASIN = GIPPSLAND
PERMIT = VIC/L3
TYPE = WELL
SUBTYPE = VELOCITY_CHART
DESCRIPTION = Seismic Calibration Log -average and
interval velocities (enclosure from
WCR) for Turrum-3
REMARKS =
DATE_CREATED = 24/04/85
DATE_RECEIVED = 22/10/85
W_NO = W899
WELL_NAME = Turrum-3
CONTRACTOR = SCHLUMBERGER
CLIENT_OP_CO = ESSO AUSTRALIA LTD

(Inserted by DNRE - Vic Govt Mines Dept)

PE601182

This is an enclosure indicator page.
The enclosure PE601182 is enclosed within the
container PE902420 at this location in this
document.

The enclosure PE601182 has the following characteristics:

ITEM_BARCODE = PE601182
CONTAINER_BARCODE = PE902420
NAME = Seismic Calibration Log -adjusted
continuous Velocity
BASIN = GIPPSLAND
PERMIT = VIC/L3
TYPE = WELL
SUBTYPE = VELOCITY_CHART
DESCRIPTION = Seismic Calibration Log -CPI Drift
Curve (enclosure from WCR) for Turrum-3
REMARKS =
DATE_CREATED = 24/04/85
DATE_RECEIVED = 22/10/85
W_NO = W899
WELL_NAME = Turrum-3
CONTRACTOR = SCHLUMBERGER
CLIENT_OP_CO = ESSO AUSTRALIA LTD

(Inserted by DNRE - Vic Govt Mines Dept)

PE902421

This is an enclosure indicator page.
The enclosure PE902421 is enclosed within the
container PE902420 at this location in this
document.

The enclosure PE902421 has the following characteristics:

ITEM_BARCODE = PE902421
CONTAINER_BARCODE = PE902420
NAME = Raw and Stacked Shots - Velocity
checkshot survey
BASIN = GIPPSLAND
PERMIT = VIC/L3
TYPE = WELL
SUBTYPE = VELOCITY_CHART
DESCRIPTION = Raw and Stacked Shots - Velocity
checkshot survey (enclosure from WCR)
for Turrum-3
REMARKS =
DATE_CREATED = 24/04/85
DATE_RECEIVED = 22/10/85
W_NO = W899
WELL_NAME = Turrum-3
CONTRACTOR = SCHLUMBERGER
CLIENT_OP_CO = ESSO AUSTRALIA LTD

(Inserted by DNRE - Vic Govt Mines Dept)

PE902422

This is an enclosure indicator page.
The enclosure PE902422 is enclosed within the
container PE902420 at this location in this
document.

The enclosure PE902422 has the following characteristics:

ITEM_BARCODE = PE902422
CONTAINER_BARCODE = PE902420
NAME = Synthetic Seismogram- Geogram
BASIN = GIPPSLAND
PERMIT = VIC/L3
TYPE = WELL
SUBTYPE = SYNTH_SEISMOGRAM
DESCRIPTION = Synthetic Seismogram- Geogram
(enclosure from WCR) for Turrum-3
REMARKS =
DATE_CREATED = 24/04/85
DATE_RECEIVED = 22/10/85
W_NO = W899
WELL_NAME = Turrum-3
CONTRACTOR = SCHLUMBERGER
CLIENT_OP_CO = ESSO AUSTRALIA LTD

(Inserted by DNRE - Vic Govt Mines Dept)

PE902423

This is an enclosure indicator page.
The enclosure PE902423 is enclosed within the
container PE902420 at this location in this
document.

The enclosure PE902423 has the following characteristics:

ITEM_BARCODE = PE902423
CONTAINER_BARCODE = PE902420
NAME = Time Depth Curve
BASIN = GIPPSLAND
PERMIT = VIC/L3
TYPE = WELL
SUBTYPE = VELOCITY_CHART
DESCRIPTION = Time Depth Curve (enclosure from WCR)
for Turrum-3
REMARKS =
DATE_CREATED = 29/05/85
DATE_RECEIVED = 22/10/85
W_NO = W899
WELL_NAME = Turrum-3
CONTRACTOR = ESSO EXPLORATION AND PRODUCTION
AUSTRALIA INC.
CLIENT_OP_CO = ESSO EXPLORATION AND PRODUCTION
AUSTRALIA INC.

(Inserted by DNRE - Vic Govt Mines Dept)