WCR VOL 1

TERAKIHI-1

W1025

ESSO EXPLORATION AND PRODUCTION AUSTRALIA INC.

WELL COMPLETION REPORT
TERAKIHI-1
VOLUME 1

BASIC DATA

GIPPSLAND BASIN
VICTORIA

ESSO AUSTRALIA LIMITED

COMPILED BY: A.P. CLARE:

APRIL 1990

TERAKIHI-1

WELL COMPLETION REPORT

VOLUME 1: BASIC DATA

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04890121

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1. WELL DATA RECORD

TERAKIHI-1

LOCATION	:	Latitude : 38^0 30' 20.68" South Longitude : 148^0 32' 43.19" East X = 634743.5 mE Y = 5736921.0 mN Map Projection: UTM Zone 55 Geographical Location: Bass Strait, Victoria Field: TERAKIHI-1
PERMIT	:	Vic/P24
ELEVATION	:	21m
WATER DEPTH	:	403m
TOTAL DEPTH	:	3040m KB
PLUG BACK TYPE	:	Cement Plug
REASONS FOR PLUGGING BACK	:	Cased and suspended
MOVE IN	:	27/03/90 1015 hours
SPUDDED	:	30/03/90 0615 hours
REACHED T.D.	:	14/04/~~89~~90 2345 hours.
RIG RELEASED	:	01/05/~~89~~90 2100 hours.
OPERATOR	:	Esso Australia Resources Limited
PERMITTEE OR LICENCEE	:	Esso and BHP Petroleum (Victoria) Pty. Ltd.
ESSO INTEREST	:	50%
OTHER INTEREST	:	50%
CONTRACTOR	:	South Seas Drilling Company
RIG NAME	:	Southern Cross
EQUIPMENT TYPE	:	Semi-submersible
TOTAL RIG DAYS	:	36
DRILLING AFE NO.	:	230003 (Segment 35)
TYPE COMPLETION	:	Cased and suspended
WELL CLASSIFICATION	:	Before Drilling: Wildcat After Drilling: New Field Discovery

ESSO AUSTRALIA LTD.
TERAKIHI-1 FINAL WELL REPORT
Operations Summary

1. MOVING/MOORING

After abandoning Sawbelly-1, the Southern Cross was towed by the MV Lady Penelope to the Terakihi-1 location. The rig departed the Sawbelly-1 location at 2000 hours, March 26, 1990, and arrived at Terakihi-1 at 1015 hours, March 27, 1990. The No. 1 anchor was on bottom at 1045 hours.

MV's Torungen Supplier, Lady Penelope, and Lady Caroline ran and set the eight anchors in 17.25 hours although mooring operations were delayed 21.5 hours by weather. An additional 2.25 hours were required to re-set anchor no. 4 after too much wire was spooled in during initial pre-tensioning. All eight anchors were load tested to 250 kips. The rig position was 1.0m on a bearing of 309° from the called location. After ballasting down, the TGB was run and landed at a seafloor depth of 424m RKB. Because of the relatively steep slope of the seafloor at this location (approx 12:1), a cut-off joint of 13-3/8" casing was welded under the down-slope base of the TGB, to get it to sit level.

2. DRILLING OPERATIONS

a) 26" Hole/20" Casing

The 26" bit/26" hole opener BHA was made up and stabbed into the TGB. The well was spudded at 0615 hours March 30, 1990. The 26" hole was drilled from 424m to 551m at an average ROP of 24.2 mph, using seawater and high viscosity gel slugs to clean the hole. After pumping a high viscosity sweep, spotting 100 bbls of high viscosity mud, and dropping a Totco survey, the bit pulled to the seafloor. The Totco was recovered ($1/2°$) and the bit was run to bottom. No drag or fill was encountered. The drillstring was POOH to run casing.

Eight joints of 20", 94 ppf, X-56, RL-4S casing, plus a crossover joint (129 ppf, RL-4S x ALT-2), and the 24" pile joint/18 3/4" Vetco SG-5 wellhead assembly were run with the 20" shoe at 540m. The casing was cemented with a lead slurry of 750 sx Class "G" cement plus 2.2% prehydrated gel and a tail slurry of 600 sx Class "G" cement plus 1.15% $CaCl_2$.

The BOP stack was run and landed and the shear rams, wellhead connector and casing were tested to 500 psi.

b) 17 1/2" Hole/13 3/8" Casing

A 17 1/2" center jet bit and pendulum BHA were picked up and RIH to the TOC at 533m. After drilling the shoe, the 17-1/2" hole was drilled from 551m to 1141m at an average ROP of 29.9 mph using seawater/gel mud. After reaching TD, a Totco survey was dropped and a wiper trip made to the 20" shoe. The Totco was recovered ($1/4°$) and the hole circulated clean. The drillstring was tripped and a BHC/GR/CAL log was run.

After logging, 60 joints of 13 3/8", 54.5 ppf, K-55, BTC casing were run and landed with the shoe at 1124m. The casing was cemented in place with 1000 sx Class "G" neat cement. The TOC was calculated at 624m based on an 18" average hole diameter as per the caliper log. The plug was bumped and casing tested to 1500 psi. After circulating the riser and flushing the wellhead sealing area, the pack-off was energized and tested to 200/2000 psi. The stack was tested to 200/2000 psi. A Phase I PIT was run against the shear rams to 1500 psi and the choke manifold was tested to 200/1500 psi.

The wear bushing was pulled and 220 joints of $9^{5/8}$", 47 ppf, N-80, BTC casing were run and landed with the shoe at 3002m. While running in the hole with casing, a tight spot was hit at 2977m. The casing would not go down through the tight spot, and would not pull free with 100k overpull. Circulation was established and the casing was washed to 2992m where the cement head and cement kelly were picked up. Again, the pipe became stuck and circulation could not be established through the cement kelly. The cementing kelly and cementing head were layed out and a joint of drillpipe picked up. It was later found the inlet to the cementing head was cemented up. The casing was circulated down and landed in the hanger.

The casing was cemented in place with 700sx Class "G" cement mixed with freshwater and 1.67% HR6L. TOC was estimated at 2502m. The plug bumped with 1500 psi and the floats held. The pack-off assembly was energized and tested to 5000 psi. A Phase I PIT was run against the shear rams to 3500 psi. The wear bushing was run and an $8^{1/2}$" bit was RIH to tag the wiper plugs at 2977m, ensuring sufficient rathole below the completion zone. The mud was displaced with corrosion inhibited mud treated with 2500 ppm Corexit 2748.

3. TEMPORARY PLUG & ABANDONMENT

Open-ended drillpipe was RIH to 530m and a 65m balanced cement plug was set from 530-465m using 75sx of Class "G" neat cement mixed in seawater. After tagging the plug at 463m, weather conditions began to deteriorate. Operations were halted prior to pulling the wear bushing. While waiting on weather, anchor line No. 1 parted at 160 kips in the number five pear link connecting the swivel on the 2" chain to the Skagit wire/chain connector on the end of the $2^{1/2}$" wire. Weather at the time of failure: Wind - 38 knots, swell - 14/16 ft, and waves - 6 ft.

The BJA increased to 5 degrees and LMRP was unlatched. Winds up to 55kts and swells of 35ft caused tension in excess of 250 kips in the No. 2 anchor line causing it to part in the wire just downstream of the upper sheave on the rig. Weather at the time: Wind - 50 knots, swell - 28/35 ft, and waves 10/12 ft.

A weather window allowed the seas to subside and anchor No. 1 was reestablished. The rig was positioned over the wellhead. The LMRP was latched to the BOP stack and the stack pulled. The wear bushing was left in the wellhead (not locked in).

A corrosion cap was run and set and the guidelines cut by the ROV. A seabed survey was conducted by the ROV with negative results. No buoys were set at this location.

4. PULLING ANCHORS

The weather picked up again and 8.25 days were spent waiting on weather to pull anchors. Once the weather calmed, the rig was deballasted from drilling draft to transit draft. The MV Torungen Supplier and MV Canning Tide recovered the anchors in 13 hours. The M/V Lady Penelope was placed on the forward tow bridle. Well Terakihi-1 was finished and the Southern Cross went offhire at 2100 hours, May 1, 1990 when the last anchor was bolstered. The rig went directly onhire to BHP for two additional wells in the Bass Strait.

c) 12 1/4" Hole/9 5/8" Casing

A Hycalog DS40 bit tagged the TOC at 1099m. The plastic cement plugs and float collar/float shoe (designed to be drillable with the PDC bit) were drilled out and 3m of new hole drilled to 1144m. The Phase II PIT was conducted to leakoff at 1300 psi (16.0 ppg EMW).

The DS40 bit drilled from 1144m to 1214m at an average ROP of 9.7 mph, which was below expectations. Numerous combinations of RPM and WOB were tried without success to increase ROP. It appeared the formation was "softer" than exhibited in other wells drilled in this area, contributing to the "balling" effect and adversely affecting ROP. The bit was pulled and replaced by a Hughes ATJ-1, which drilled from 1214m to 1774m at an average ROP of 12.8 mph. Lithology through this section was the Gippsland Limestone. A decision was made to re-run the DS40 PDC bit once the formation became firmer. This proved to be the right decision as the DS40 readily drilled from 1774m to 2844m at an average ROP of 17.4mph.

The mud system was displaced with a 9.5 ppg, 6% KCl mud system once the Lakes Entrance formation was penetrated at about 2500m. Maximum formation gas of 800 units was recorded when the Latrobe was penetrated at 2840m. Tight hole was experienced while POOH from 2844m. Up to 100 kips of overpull was required from 2776m to 2498m. The DS40 PDC bit was graded 4-2-2-1-WC after running 61.5 hours. A survey from 2844m indicated a deviation of 2 3/4 degrees.

Two 18.5m cores were cut from 2844m to 2881m with an RC 476 core bit. Recoveries for the two cores were 68% (12.6m of 18.5m) and 53.5% (9.9m of 18.5m). A Smith F27D bit was then RIH to TD the well. It drilled from 2881m to 3040m at an average ROP of 7.6 mph.

The following electric logs were run:

Run No. 1 - DLL/LDL/CNL/GR/CAL
Run No. 2 - RFT
Run No. 3 - RFT
Run No. 4 - BHC/GR/CAL
Run No. 5 - SHDT
Run No. 6 - WST (32 levels)
Run No. 7 - SWC (recovered 27 of 30)

After evaluating the logs, it was decided to run 9 5/8" casing to cover a potential completion zone from 2844-2862m then temporarily abandon the well. A wiper trip was made prior to running casing. Upon reaching TD at 3040m, a 100 bbl hi-vis sweep was circulated bringing back an abnormal amount of cuttings. While POOH the drillpipe would not pass 3010m with 120k overpull. The drill string was stuck briefly and the hole packed-off. Circulation was re-established and a 200 bbl hi-vis sweep was circulated bringing up a large amount of shale cavings. The drillpipe was POOH to 2450m then run back to TD. At TD, a 90 bbl high density (15.3 ppg) sweep was circulated bringing up only minimum amount of cuttings. A slug was pumped and the drill pipe was POOH to run casing.

ESSO AUSTRALIA LTD.
TERAKIHI-1 FINAL WELL REPORT
CASING DATA

OD (In.)	WEIGHT (LB/FT)	GRADE	CONNECTION	LENGTH (M)	SHOE DEPTH (mMD-RKB)	CENTRALIZER POSITION	REMARKS
20	94	X-56	RL4S	12.37	540	NONE	FLOAT SHOE JOINT
	94	X-56	RL4S	83.90		NONE	7 INTERMEDIATE JOINTS
	129	X-52	RL4S x ALT-2	12.09		NONE	CROSSOVER JOINT
24	670	----	ALT-2	10.42		NONE	PILE JOINT: EP13
				118.78			
13-3/8	54.5	K-55	BTC	12.20	1124	1 W/ STOP RING	FLOAT SHOE JOINT
	54.5	K-55	BTC	10.32		1 ACROSS COLLAR	FLOAT JOINT
	54.5	K-55	BTC	12.25		1 W/ STOP RING	FLOAT COLLAR JOINT
	54.5	K-55	BTC	664.78		1 ACROSS FIRST FIVE COLLARS	57 INTERMEDIATE JOINTS
	68	K-55	BTC	2.50		NONE	CASING HANGER PUP JOINT
				702.05			

ESSO AUSTRALIA LTD.
TERAKIHI-1 FINAL WELL REPORT
CASING DATA

OD (In.)	WEIGHT (LB/FT)	GRADE	CONNECTION	LENGTH (M)	SHOE DEPTH (mMD-RKB)	CENTRALIZER POSITION	REMARKS
9-5/8	47	N-80	BTC	13.10	3002	NONE	FLOAT SHOE JOINT
	47	N-80	BTC	11.89		1 ACROSS COLLAR	FLOAT JOINT
	47	N-80	BTC	12.37		NONE	FLOAT COLLAR JOINT
	47	N-80	BTC	130.45		1 ACROSS COLLARS	11 INTERMEDIATE JOINTS
	47	N-80	BTC	3.00		1 ACROSS COLLAR	PUP JT @ 2831 M
	47	N-80	BTC	2405.57		1 ACROSS FIRST 17 COLLARS	206 INTERMEDIATE JOINTS TRACERS LOCATED @ 2737,2749,2760 M
	47	N-80	BTC	2.97		NONE	CASING HANGER PUP JOINT
				2579.35		30 CENTERALIIZERS	220 JOINTS
				421.39			RKB - WH
				1.00			TOP 9-5/8" BELOW WELLHEAD
				3001.74			SHOE DEPTH

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TERAKIHI-1 FINAL WELL REPORT
CEMENT DATA

DATE (1990)	TYPE JOB	INTERVAL (mMD-RKB)	TYPE CEMENT	VOLUME (SX)	SLURRY WEIGHT (PPG)	ADDITIVES	MIX WATER	REMARKS
31-Mar	20" PRIMARY LEAD	540-403	CLASS "G"	750	13.2	2.2% PHG (WT CMT)	FW	CEMENT THROUGH DP STINGER. CMT VOLUME CALCULATED TO PROVIDE 250% EXCESS ABOVE GAUGE HOLE VOLUME WITH TOC @ SEAFLOOR.
31-Mar	20" PRIMARY TAIL		CLASS "G"	600	15.8	1.5%CaCl2 (WT CMT)	SW	
04-Apr	13-3/8" PRIMARY	1124-624	CLASS "G"	1000	15.8	----	SW	CMT VOLUME BASED ON 18" AVG. HOLE DIAMETER PER THE CALIPER LOG. BUMPED PLUG W/ 1500 PSI.
19-Apr	9-5/8" PRIMARY	3002-2502	CLASS "G"	700	15.8	1.67% HR6L	FW	HOLE DIAMETER PER THE CALIPER LOG. BUMPED PLUG W/ 1500 PSI.
21-Apr	P & A PLUG No.1	530-465	CLASS "G"	75	15.8	---	SW	SET SURFACE PLUG AS PER DIEP REGULATIONS. TOC WAS TAGGED @ 463M. 39M BELOW SEAFLOOR.

5. SAMPLES, SIDEWALL CORES

TERAKIHI-1

INTERVAL (m)	TYPE
1150 - 3040	Cutting samples - 3 sets of washed and oven dried and 1 set of bagged air dried cuttings. Samples from 1150 - 2600m at 10m intervals. Samples from 2600 - 3040m at 5m intervals.
1150 - 3040	Unwashed composite tinned samples for geochemistry Samples from 1150 - 2600m at 30m intervals. Samples from 2600 - 3040m at 15m intervals.
2844.0 - 2862.5 2862.5 - 2881.0	Core number 1 - cut 18.5m, recovered 12.6m Core number 2 - cut 18.5m, recovered 9.9m
2820.5 - 3008.5	CST, 30 Shot, Recovered and Brought 27.

6. WIRELINE LOGS AND SURVEYS
TERAKIHI-1

TYPE AND SCALE		FROM	TO
	SUITE 1		
BHC-CAL-GR	1:200 1:500	1139.0 -	424.0
	SUITE 2		
DLL-MSFL-SP-GR	1:200 1:500	3020.8 -	1125.0
LDL-CNL-GR	1:500 1:200	3020.8 -	2700.0
RFT	(9 pretests/ 2 samples)	2868.5 -	2841.0
BHC-GR	1:500 1:200	3020.8 -	1125.0
SHDT	1:500 1:200	3011.5 -	2541.0
WSS	32 Levels	2980.0 -	1120.0
CST-GR	(30 Shot/27 Recovered)	3008.5 -	2820.5

7. SUMMARY OF WIRELINE FORMATION TEST PROGRAMME - TERAKIHI-1

TEST & SEAT NO.	DEPTH (METRES) K.B.	RECOVERY (LITRES) CHAMBER	OIL	COND.	GAS	FORMATION WATER	MUD FILTRATE	HEWLETT-PACKARD FORMATION PRESSURE MPaa	Psia	HEWLETT-PACKARD HYDROSTATIC PRESSURE MPaa	Psia	REMARKS
		Litres	Litres	Litres	m^3	Litres	Litres					
1/1	2841.0	Pretest						27.72	4017.55	32.64	4729.90	Good
1/2	2847.0	Pretest						27.75	4022.15	32.70	4738.60	Good
1/3	2851.0	Pretest						27.78	4025.70	32.76	4745.70	Good
1/4	2854.5	Pretest						27.80	4029.26	32.79	4752.00	Good
1/5	2857.0	Pretest						27.82	4031.98	32.82	4756.20	Good
1/6	2860.0	Pretest						27.85	4036.38	32.86	4762.00	Good
1/7	2864.0	Pretest						27.89	4041.78	32.90	4768.00	Good
1/8	2868.5	Pretest						27.93	4048.50	32.95	4775.00	Good
1/9	2841.0	27.28	17.7	-	3.1	-	-	27.72	4017.65	32.63	4729.10	Good
		4.55	(API=53°)			(PRESERVED $S/_n$ = RFS AD1116)						
1/10	2842.5	Pretest						27.73	4018.92	32.64	4731.00	Good
2/1	2851.0	27.28	17.7	-	3.1	-	-	27.78	4026.30	32.73	4743.60	Good
		4.55	(API=52.5°)			(PRESERVED $S/_n$ = RFS AD1131)						

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8. TEMPERATURE RECORD - TERAKIHI-1

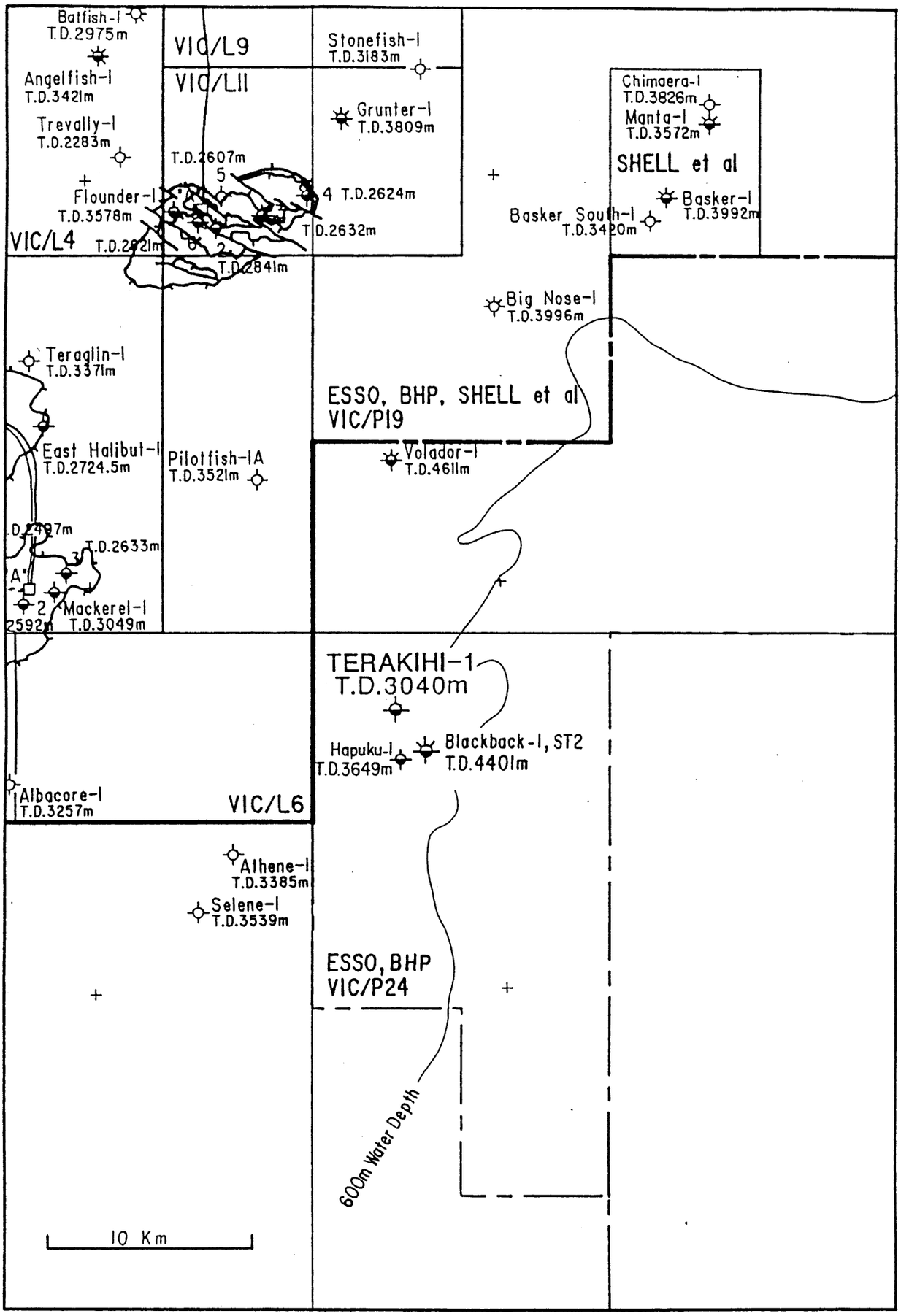
LOGGING RUN	THERMOMETER DEPTH (m)	MAX. RECORDED TEMPERATURE (C°)	CIRCULATION TIME (t_k) (hours)	TIME AFTER CIRCULATION STOPPED (t)	HORNER TEMPERATURE (C°)	GEOTHERMAL GRADIENT (C°/km)
Suite 1						
BHC-CAL-GR	1139	48.0	1H 15M (1.25)	7H 44M(7.73)		
Suite 2						
DLL-MSFL-LDL-CNL-GR-SP-CAL	3020.8	60.1 }	2H 10M (2.17)	7H 50M (7.83) }		
RFT-GR	2868.5	63.3 }	2H 10M (2.17)	14H 50M(14.83) }	68.95	22.53
BHC-GR-CAL	3020.8	65.0 }	2H 10M (2.17)	23H 50M(23.83) }		

04890125

FIGURES

TERAKIHI-1

LOCALITY MAP



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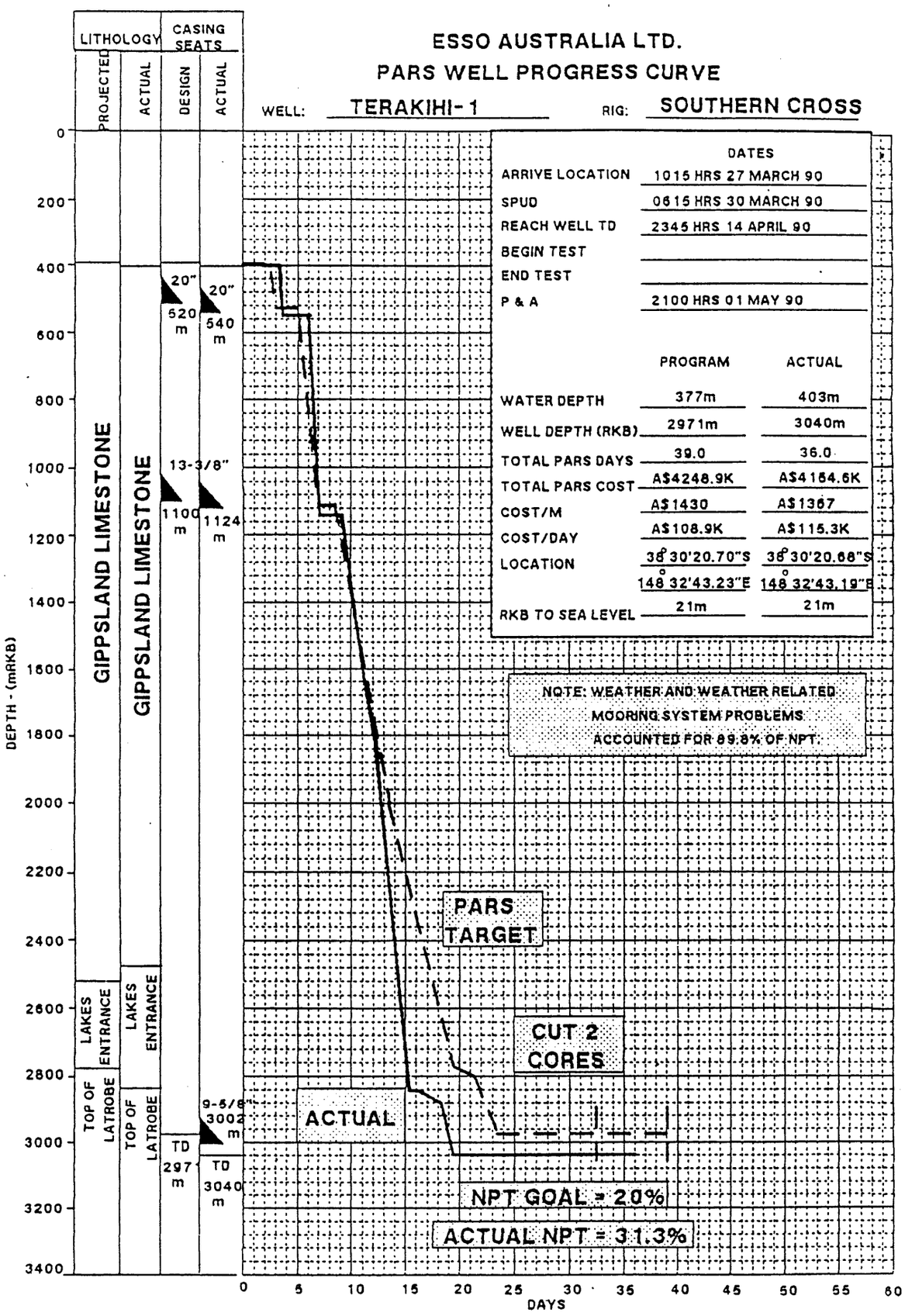
PARS WELL PROGRESS CURVE

WELL: TERAKIHI-1 RIG: SOUTHERN CROSS

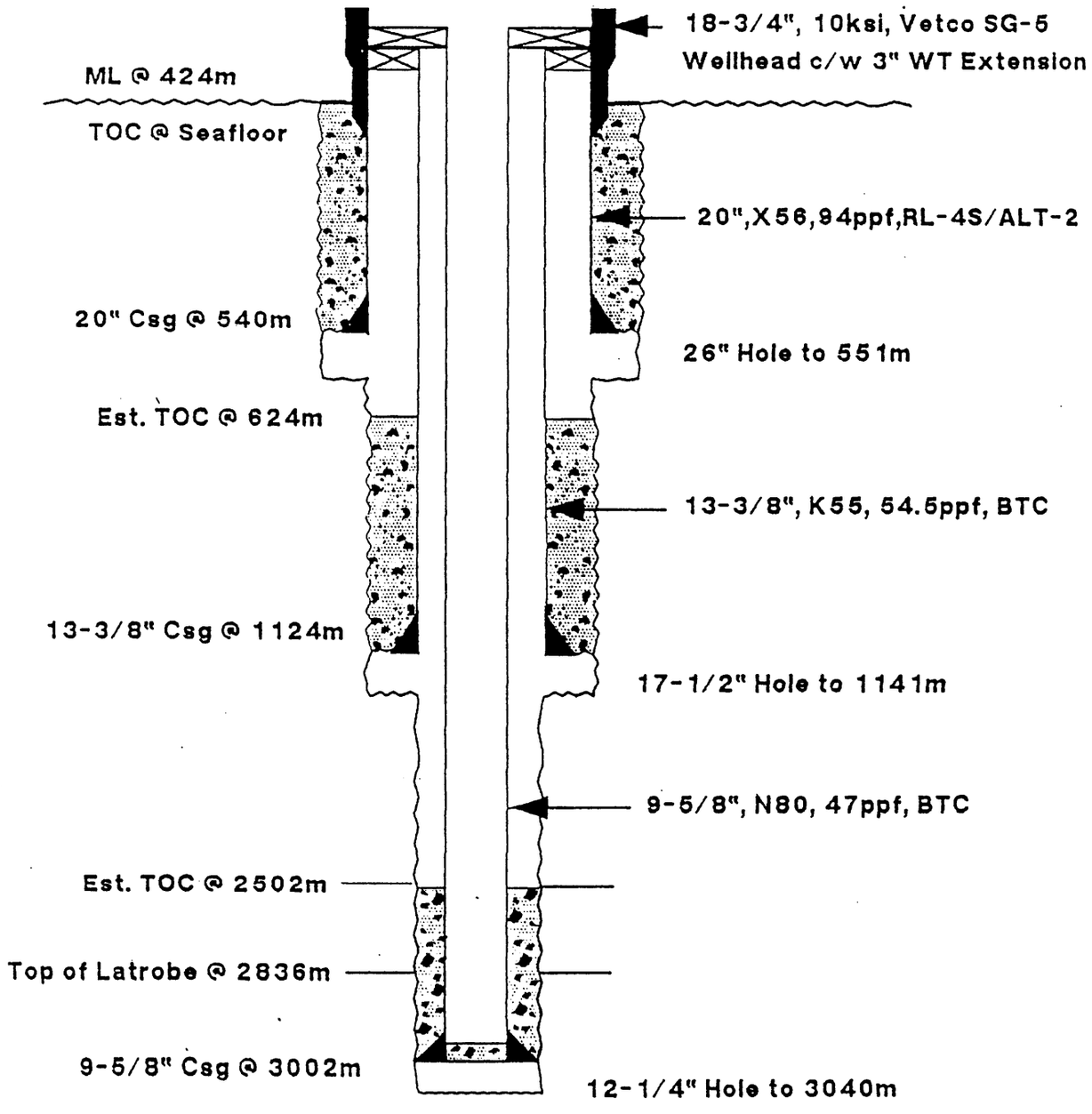


	DATES
ARRIVE LOCATION	1015 HRS 27 MARCH 90
SPUD	0615 HRS 30 MARCH 90
REACH WELL TD	2345 HRS 14 APRIL 90
BEGIN TEST	
END TEST	
P & A	2100 HRS 01 MAY 90

	PROGRAM	ACTUAL
WATER DEPTH	377m	403m
WELL DEPTH (RKB)	2971m	3040m
TOTAL PARS DAYS	39.0	36.0
TOTAL PARS COST	A$4248.9K	A$4154.6K
COST/M	A$1430	A$1367
COST/DAY	A$108.9K	A$115.3K
LOCATION	38° 30'20.70"S 148° 32'43.23"E	38° 30'20.68"S 148° 32'43.19"E
RKB TO SEA LEVEL	21m	21m

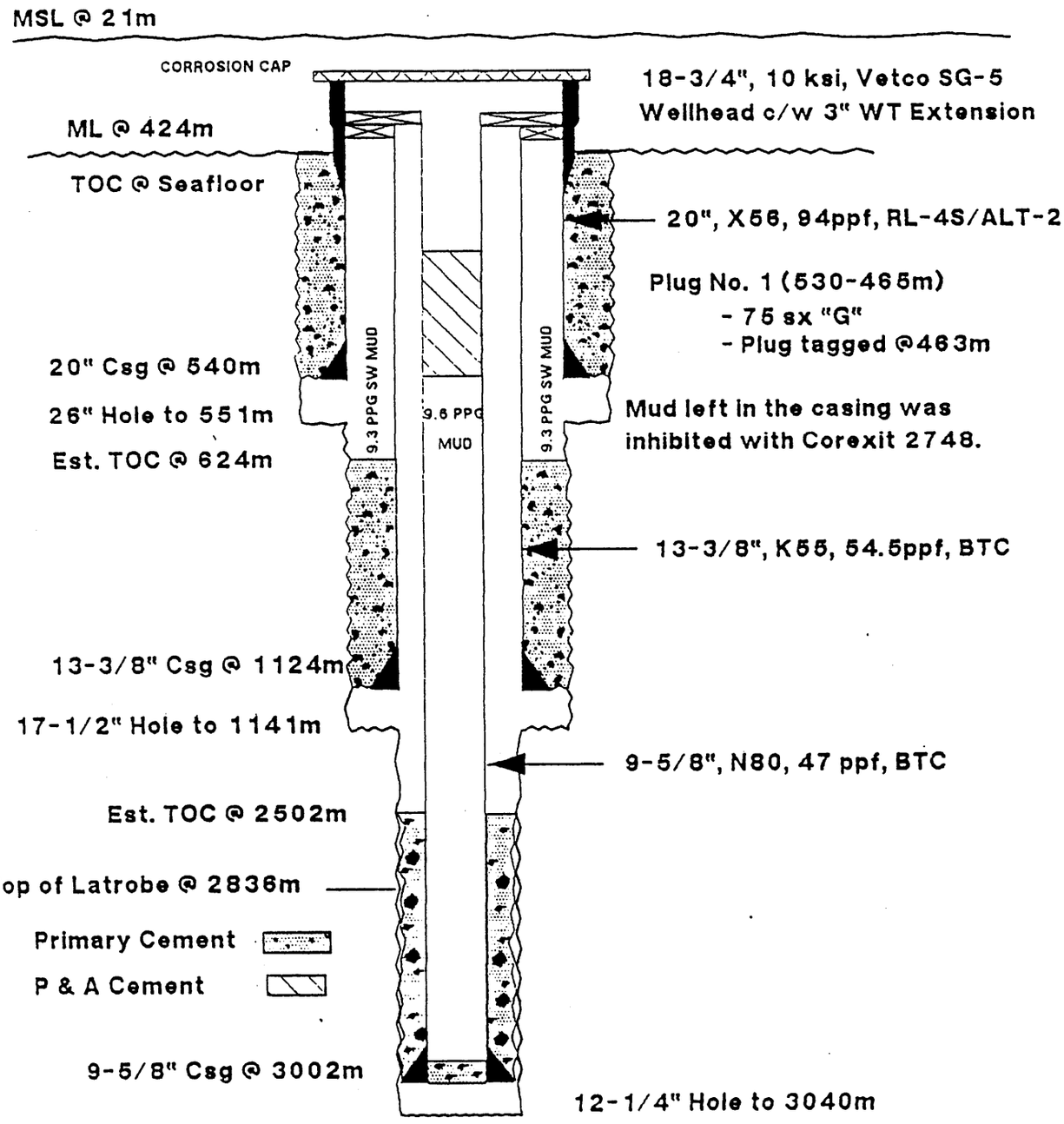
NOTE: WEATHER AND WEATHER RELATED MOORING SYSTEM PROBLEMS ACCOUNTED FOR 89.8% OF NPT.

ESSO AUSTRALIA LTD.
TERAKIHI-1 DRILLING PROGRAM
WELLBORE SCHEMATIC



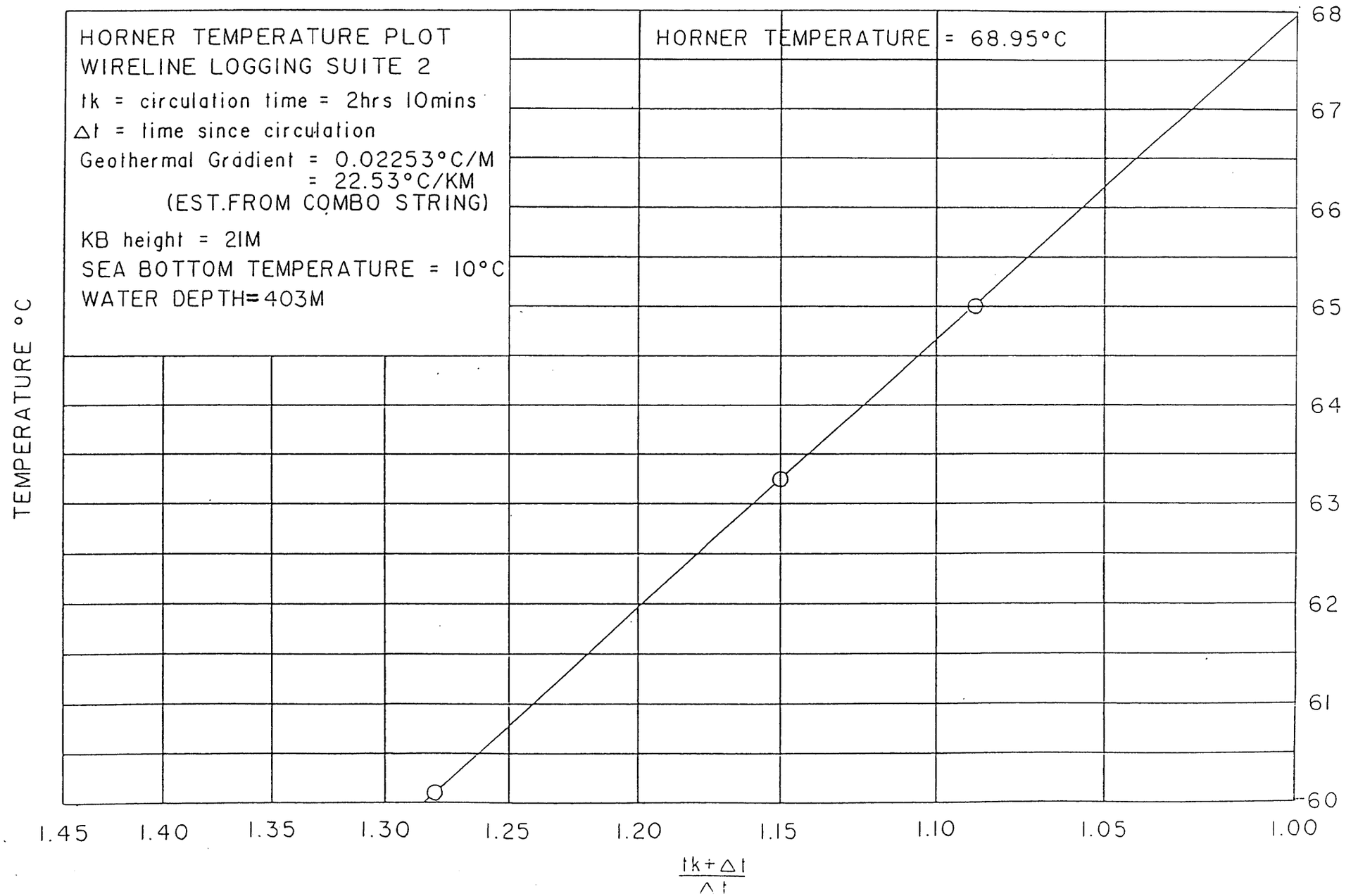
All depths are meters RKB

ESSO AUSTRALIA LTD.
TERAKIHI-1 TEMP. P & A PROGRAM
WELLBORE ABANDONMENT SCHEMATIC



All depths are meters RKB

TERAKIHI-1


HORNER TEMPERATURE PLOT
WIRELINE LOGGING SUITE 2
tk = circulation time = 2hrs 10mins
Δt = time since circulation
Geothermal Gradient = 0.02253°C/M
= 22.53°C/KM
(EST.FROM COMBO STRING)
KB height = 21M
SEA BOTTOM TEMPERATURE = 10°C
WATER DEPTH=403M
HORNER TEMPERATURE = 68.95°C
TEMPERATURE °C
68
67
66
65
64
63
62
61
60
1.45
1.40
1.35
1.30
1.25
1.20
1.15
1.10
1.05
1.00
tk+Δt / Δt

APPENDIX 1

TERAKIHI-1

Lithology Descriptions

(MUDLOGGERS COLLECTED SAMPLES 1150m TO 2310m GEOLOGIST ONBOARD AT 2310m)

Depth	%	Description
2310	100	LIMESTONE: Medium grey to occasional grey/brown, calc' arenite, calc' siltite (wackestone), calc' arenite (very fine to fine, occasional medium, moderately sorted, subangular to subrounded), trace to very rare fossil fragments and fragment forams, firm, blocky.
2320	100	LIMESTONE: As above, very rare carbonaceous flecks, firm, blocky.
2330	100	LIMESTONE: As above, rare carbonaceous flecks, very rare pyrite, very rare forams, firm, blocky.
2340	100	LIMESTONE: As above, calc' siltite to occasional calc' arenite, trace forams, trace fossil fragments, firm to occasionally hard, slightly sticky in part, blocky.
2350	100	LIMESTONE: As above, calc' siltite to calc' arenite, rare forams, trace to rare carbonaceous flecks, firm to hard, blocky.
2360	100	LIMESTONE: As above, predominantly calc' arenite, rare forams, rare carbonaceous flecks, firm to hard, blocky.

TERAKIHI-1

Lithology Descriptions

Depth	%	Description
2370	100	LIMESTONE: As above, calc' arenite to calc' siltite, firm, blocky.
2380	100	LIMESTONE: As above, calc' siltite, grading in part to calc' arenite, blocky.
2390	100	LIMESTONE: As above, predominantly calc' siltite, minor calc' arenite, blocky, firm.
2400	100	LIMESTONE: As above, calc' siltite, grading in part to calc' arenite, blocky.
2410	100	LIMESTONE: As above, predominantly calc' siltite and minor calc' arenite, trace carbonaceous flecks, very rare forams, firm, occasional slightly sticky, blocky.
2420	100	LIMESTONE: As above, calc' siltite, trace forams, firm, blocky.
2430	100	LIMESTONE: As above, calc' siltite to calc' lutite, firm to occasionally soft, slightly sticky in part, blocky.
	Trace	CLAYSTONE: Medium grey, calc' lutite, very rare carbonaceous flecks, soft, sticky, blocky.

TERAKIHI-1

Lithology Descriptions

Depth	%	Description
2440	100	LIMESTONE: As above.
	Trace	CLAYSTONE: As above.
2450	100	LIMESTONE: Light to dominantly medium grey, occasionally light brown grey, firm to moderately hard, calcisiltite, moderate to occasionally very argillaceous, trace calc' arenite, trace forams and carbonaceous flecks, grades in part to calcareous claystone.
	Trace	CLAYSTONE: Light to medium grey, firm to moderately hard, very calcareous, trace forams and carbonaceous flecks.
2460	100	LIMESTONE: As above.
	Trace	CALCAREOUS CLAYSTONE: As above.
2470	100	LIMESTONE: As above.
	Trace	CALCAREOUS CLAYSTONE: As above.
2480	100	LIMESTONE: As above, dominantly calcisiltite, trace calc' arenite.
	Trace	CALCAREOUS CLAYSTONE: As above.
2490	100	LIMESTONE: As above.
	Trace	CALCAREOUS CLAYSTONE: As above.

< 2490-2520 No returns, by-passing shakers >

(T.O. Lakes Entrance @ estimated 2500mKB)

TERAKIHI-1

Lithology Descriptions

Depth	%	Description
2520	50	CLAYSTONE: Medium to occasional light grey, calc' lutite, trace forams (showing some dissolution), firm to soft, rare carbonaceous flecks, subblocky
	50	LIMESTONE: As above, predominantly calc' siltite to calc' lutite, firm, blocky.
2530	65	CLAYSTONE: As above, trace to common forams, trace glauconite (flaky), subblocky.
	35	LIMESTONE: As above, calcareous siltite, firm, blocky.
2540	60	CLAYSTONE: As above, trace to common forams, firm to soft, subblocky.
	40	LIMESTONE: As above.
2550	70	CLAYSTONE: As above, trace to common forams, very rare well rounded quartz grains, blocky.
	30	LIMESTONE: As above.
2560	60	CLAYSTONE: As above, trace to common forams, trace grey/green calc' lutite (glauconite) very rare well rounded quartz grains, soft to firm, sticky, blocky.
	40	LIMESTONE: As above, firm, blocky.
2570	70	CLAYSTONE: As above, grading in part to calc' siltite, trace to common forams, trace

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Lithology Descriptions

Depth	%	Description
2570 cont.		calcareous, very rare very fine well rounded quartz grains.
	30	LIMESTONE: As above, calc' siltite.
2580	75	CLAYSTONE: As above, occasional medium to light green/grey, calc' lutite, trace forams.
	25	LIMESTONE: As above.
2590	80	CLAYSTONE: As above, trace to common green/grey calc' lutite, trace glauconite (flecks), trace forams, trace to rare fossil fragments, subblocky.
	20	LIMESTONE: As above.
2600	90	CLAYSTONE: As above, trace fine well rounded quartz grains, subblocky.
	10	LIMESTONE: As above.
2605	95	CLAYSTONE: As above, rare glauconite flecks, rare quartz grains, subblocky.
	5	LIMESTONE: As above.
2610	100	CLAYSTONE: As above, trace glauconite, subblocky.
	Trace	LIMESTONE: As above.

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Lithology Descriptions

Depth	%	Description
2615	100	CLAYSTONE: As above, very rare glauconite, subblocky.
	Trace	LIMESTONE: As above.
2620	100	CLAYSTONE: As above, trace very fine quartz grains, subblocky.
	Trace	LIMESTONE: As above.
2625	100	CLAYSTONE: As above, trace glauconite.
	Trace	LIMESTONE: As above.
2630	100	CLAYSTONE: As above.
	Trace	LIMESTONE: As above.
2635	100	CLAYSTONE: As above, trace very fine slightly oxide coated quartz grains.
	Trace	LIMESTONE: As above.
2640	100	CLAYSTONE: Medium grey, occasional green/grey, calc' lutite (mudstone), trace forams, very rare well rounded quartz grains, soft to firm, blocky.
	Trace	LIMESTONE: As above.
2645	100	CLAYSTONE: As above, very rare flecky glauconite, soft, slightly sticky, uneven.
	Trace	LIMESTONE: As above..
2650	100	CLAYSTONE: As above, soft, slightly sticky, uneven.
	trace	LIMESTONE: As above.

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Lithology Descriptions

Depth	%	Description
2655	100	CLAYSTONE: As above, soft, trace forams, slightly sticky, subblocky.
	Trace	LIMESTONE: As above.
2660	100	CLAYSTONE: As above, soft to firm, grading in part to calc' siltite, sticky, subblocky.
2665	100	CLAYSTONE: As above, trace fossil fragments, sticky, subblocky.
2670	100	CLAYSTONE: As above, trace disseminated and rare nodular pyrite, trace forams, subblocky.
2675	100	CLAYSTONE: As above, rare pyrite, rare orange oxide coated quartz grains, trace forams, soft to firm, subblocky.
2680	100	CLAYSTONE: As above, trace forams, subblocky.
2685	100	CLAYSTONE: As above, trace fossil fragments, sticky, subblocky.
2690	100	CLAYSTONE: As above, subblocky.
2695	100	CLAYSTONE: As above, trace disseminated and nodular pyrite, subblocky.
2700	100	CLAYSTONE: As above, very rare carbonaceous flecks, subblocky.

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Lithology Descriptions

Depth	%	Description
2705	100	CLAYSTONE: As above, trace forams, soft, sticky.
2710	100	CLAYSTONE: As above, trace forams, trace pyrite (disseminated and rare nodules) and some rare pyritic replacement of fossil fragments, sticky.
2715	100	CLAYSTONE: As above, rare forams, sticky.
2720	100	CLAYSTONE: As above, trace pyrite (as above), trace forams, sticky, blocky.
2725	100	CLAYSTONE: As above, trace forams, subblocky.
2730	100	CLAYSTONE: As above, trace to occasionally common pyrite (disseminated), slightly sticky, subblocky.
2735	100	CLAYSTONE: As above, trace to very rare slightly oxide coated quartz grains, sticky.
2740	100	CLAYSTONE: As above, trace pyrite, very rare flaky glauconite, subblocky.
2745	100	CLAYSTONE: As above, trace pyrite, trace forams, subblocky.
2750	100	CLAYSTONE: As above, trace forams, sticky.

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Lithology Descriptions

Depth	%	Description
2755	100	CLAYSTONE: As above, trace to very rare forams, trace disseminated pyrite, trace carbonaceous flecks, sticky.
2760	100	CLAYSTONE: As above, trace disseminated pyrite, trace green/grey calc' lutite (glauconitic), firm to soft, slightly sticky.
2765	100	CLAYSTONE: As above, trace disseminated pyrite, grading in part to calc' siltite, very rare glauconite.
	Trace	SILTSTONE: medium to light grey, occasional green/white/grey, trace to occasional common glauconite, blocky.
2770	100	CLAYSTONE: As above, trace forams.
2775	95	CLAYSTONE: Medium grey, occasional light grey/white and medium grey/green, calc' lutite grading in part to calc' siltite, trace to rare forams, trace pyrite, trace carbonaceous flecks, very rare quartz grains.
	5	SILTSTONE: Medium to light grey, calc' siltite grading in part to calc' lutite, trace calc' arenite, very rare pyrite, blocky.
2780	100	CLAYSTONE: As above, trace forams, grading in part to calc' siltite.
	Trace	SILTSTONE: As above.

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Lithology Descriptions

Depth	%	Description
2785	100	CLAYSTONE: As above, rare carbonaceous flecks.
	Trace	SILTSTONE: As above.
2790	100	CLAYSTONE: As above, rare carbonaceous flecks, trace pyrite.
	Trace	SILTSTONE: As above, rare grading to calc' arenite, blocky, firm.
2795	100	CLAYSTONE: As above, trace to occasional common fine carbonaceous flecks.
2800	100	CLAYSTONE: As above, rare coal fragments, blocky, soft to firm.
2805	100	CLAYSTONE: As above, trace disseminated pyrite, trace forams.
2810	100	CLAYSTONE: As above, trace pyrite, very rare quartz grains, trace fine carbonaceous flecks.
	Trace	SILTSTONE: As above, calc' siltite grading to calc' lutite, trace carbonaceous flecks.
2815	100	CLAYSTONE: As above, trace to occasional common green/grey calc' lutite, trace pyrite.
2820	100	CLAYSTONE: As above, grading in part to calc' siltite, trace to rare pyrite.

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Lithology Descriptions

Depth	%	Description
2825	100	CLAYSTONE: As above, trace forams, trace carbonaceous flecks, trace pyrite, rare medium to coarse chert grains.
2830	100	CLAYSTONE: As above, trace glauconite, trace chert.
2835	100	CLAYSTONE: As above.
2840	95	CLAYSTONE: As above, trace pyrite, trace quartz grains, trace glauconite.
	5	SANDSTONE: Clear to white, clear to translucent grains, moderate to loosely consolidated, clean, coarse to very coarse, occasional very fine (bit fractured), moderately sorted, subrounded, trace dolomite cement, trace pyrite, trace carbonaceous flecks, good inferred porosity, no fluorescence.
2842	70	CLAYSTONE: As above, trace pyrite, trace glauconite.
	20	SANDSTONE: (Type 1): As above, moderately sorted, subrounded to rounded, trace dolomite cement, trace pyrite, good inferred porosity, no fluorescence.
	10	SANDSTONE: (Type 2):. White to off white, occasional buff, fine to very fine, moderately sorted, subangular to subrounded,

Lithology Descriptions

Depth	%	Description
2842 cont.		trace calcareous cement, dolomite cement, hard, trace pyrite, trace glauconite, poor visual porosity, no fluorescence, trace to common dull orange mineral fluorescence.
	Trace	SILTSTONE: Medium brown, argillaceous/arenaceous, trace dolomite cement, argillaceous matrix, trace pyrite, trace glauconite, trace mica, hard, blocky.
2843.8	70	CLAYSTONE: As above.
	10	SANDSTONE: (Type 1): As above, trace pyrite, trace oxidised coating, good inferred porosity, no fluorescence.
	20	SANDSTONE: (Type 2): As above, moderately loose and clean, trace calcareous cement, trace to common dolomite cement, hard in part, trace pyrite, trace glauconite, trace carbonaceous flecks, moderate visual porosity, no fluorescence, trace to common dull orange mineral fluorescence.

(BEGINNING OF CORE CHIP SAMPLE DESCRIPTIONS)

2844	100	SANDSTONE: Off white to light grey, clear to light grey grains, fine and very coarse (bimodal), very poorly sorted, fine grains are subangular, coarse are rounded, trace silica cement, very rare argillaceous and arenaceous matrix (very patchy), trace lithics, very rare pyrite, friable, good visual porosity, FLUORESCENCE: 60-70%

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Lithology Descriptions

Depth	%	Description
2844 cont.		moderately bright to bright yellow/white to yellow/gold solid to patchy fluorescence, moderately fast streaming moderately bright yellow/white cut, bright yellow/white crush cut, hydrocarbon odour, thin bright yellow/gold ring residue, no white light residue.
2845	100	SANDSTONE: Off white, clear to off white, fine to very coarse, very poorly sorted, subangular to well rounded (again bimodal), no observed cement, no observed matrix, trace carbonaceous flecks, trace lithics, common frosting on well rounded very coarse grains, very friable, excellent visual porosity, FLUORESCENCE = 50% moderately bright yellow/white patchy fluorescence, very fast to instant streaming yellow/white moderately bright cut, moderately bright yellow/white crush cut, hydrocarbon odour, thin bright yellow/white ring residue, no white light residue.
2846.2	100	SANDSTONE: Off white to light grey, clear to medium grey (smokey) grains, medium to very coarse (occasionally fine), predominantly coarse, poorly sorted, subangular to rounded, predominantly subrounded, no observed cement or matrix, trace to common smokey quartz grains, trace lithics, firm, excellent to

Lithology Descriptions

Depth	%	Description
2846.2 cont.		very good visual porosity, FLUORESCENCE: 70-90% bright yellow/white solid to patchy fluorescence, moderately bright fast streaming yellow/white cut, bright yellow/white crush cut, hydrocarbon odour, thin bright yellow/white ring residue, no white light residue.
2847.2	100	SANDSTONE: As above, again bimodal distribution of grain size (fine subangular grains and coarse well rounded frosted grains), excellent visual porosity, FLUORESCENCE: 70-80% bright yellow/white solid to patchy fluorescence, instant yellow/white bright cut, bright yellow/white crush cut, moderate to strong hydrocarbon odour, thin to medium bright yellow/white ring residue, no white light residue.
2848.4	100	SANDSTONE: As above, medium to conglomeratic (predominantly very coarse), subangular to rounded, predominantly subangular, no cement or matrix, trace to common mud invasion, trace glauconite and biotite, trace lithics, very friable, excellent visual porosity, FLUORESCENCE: 40% moderately bright yellow/white patchy fluorescence, instant moderately bright yellow/white cut,

Lithology Descriptions

Depth	%	Description
2848.4 cont.		moderately bright crush cut, thin moderately bright to bright yellow/white ring residue, no white light residue.
2849.8	100	SANDSTONE: As above, medium to conglomeratic (predominantly very coarse), subangular to subrounded medium to coarse grains and rounded to well rounded very coarse to conglomeratic grains, no cement/no matrix, common mud invasion, trace glauconite, trace mica, trace lithics, extremely friable, excellent visual porosity, FLUORESCENCE: 30-40% moderately bright to occasionally dull patchy to spotty yellow/gold to yellow/white fluorescence, instant moderately bright yellow/white cut, moderately bright yellow/white crush cut, hydrocarbon odour, thin moderately bright yellow/white ring residue, no white light residue.
2851.2	100	SANDSTONE: White to very light grey, clear to grey, medium to conglomeratic, predominantly very coarse, poorly sorted, subrounded to well rounded, no cement/matrix, abundant mud invasion, trace to common lithics, common frosted conglomeratic very well rounded quartz grains, trace biotite, extremely friable, excellent visual porosity, FLUORESCENCE: 5-10% dull to

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Lithology Descriptions

Depth	%	Description
2851.2		moderately bright yellow/white spotty fluorescence, instant dull yellow/white cut, dull yellow white crush cut, slight hydrocarbon odour, dull thin yellow/white ring residue, no white light residue.
2852.4	100	SANDSTONE: As above, predominantly very coarse to conglomeratic, moderately sorted, subrounded to rounded, abundant frosted grains, trace lithics, trace pyrite, extremely friable, abundant mud invasion, excellent visual porosity, FLUORESCENCE: 5-10% dull yellow/white spotty fluorescence, instant dull yellow/white cut, dull yellow/white crush cut, no hydrocarbon odour, dull very thin yellow/white ring residue, no white light residue.
2853.8	100	SANDSTONE: As above, very coarse to conglomeratic, well sorted, rounded to well rounded, abundant frosted grains, no cement/matrix, abundant mud invasion, trace lithics and pyrite and mica, extremely friable, excellent visual porosity, FLUORESCENCE: Trace to 5% dull yellow/gold fluorescence very spotty, very dull slow yellow/gold cut, dull yellow/gold crush cut, slight hydrocarbon odour, very thin dull yellow/gold ring residue, no white light residue.

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Lithology Descriptions

Depth	%	Description
2855.2	100	SANDSTONE: As above, no cement/matrix, abundant mud invasion, trace lithics, trace pyrite, trace mica, extremely friable, excellent visual porosity, FLUORESCENCE: trace to 5% dull yellow/white very spotty fluorescence, dull moderately fast yellow/white cut, dull yellow/white crush cut, slight to moderate hydrocarbon odour, very thin dull yellow/white ring residue, no white light residue.
2855.6	100	SANDSTONE: As above, no cement or matrix, common to abundant mud invasion, trace lithics, rare mica, firm to friable, very good to excellent visual porosity, FLUORESCENCE: 20-40% moderately bright to dull yellow/white spotty to patchy fluorescence, moderately fast moderately bright yellow/white streaming cut, moderately bright yellow/white crush cut, thin dull to moderately bright yellow/white ring residue, slight to moderate hydrocarbon odour, no white light residue.
2856.6	100	SANDSTONE: Off white to grey, clear to grey grains, quartzose and lithic fragments, well consolidated, medium to conglomeratic (predominantly very coarse), moderately sorted, subrounded to rounded, occasional

Lithology Descriptions

Depth	%	Description
2856.6 cont.		very well rounded, rare dolomite cement, trace to common silica cement, very rare silty matrix, trace mud invasion, hard to very hard, moderate porosity, FLUORESCENCE: 30-40% moderately bright yellow/white fluorescence (patchy), fast streaming moderately bright yellow/white cut, moderately bright, yellow/white crush cut, moderate hydrocarbon odour, thin moderately bright yellow/white ring residue, no white light residue.
2862.5	100	SANDSTONE: Off white to light grey, clear to medium grey, fine to conglomeratic, predominantly very coarse, very poorly sorted, subangular to well rounded, no observed cement, no matrix, trace muscovite, trace lithic fragments, trace pyrite, very friable, excellent visual porosity, FLUORESCENCE: trace to 10% dull yellow/white spotty fluorescence, very slow pluming yellow/white dull cut, dull yellow/white crush cut, dull to moderately bright very thin ring residue, no white light residue, slight hydrocarbon odour.
2863	100	SANDSTONE: As above, trace to common lithics, trace mica, trace pyrite, common mud invasion, very friable, excellent visual porosity, FLUORESCENCE: trace dull

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Lithology Descriptions

Depth	%	Description
2863 cont.		yellow/gold very spotty fluorescence, extremely slow diffuse yellow/gold dull cut, slight hydrocarbon odour, very dull yellow/gold crush cut, very dull thin discontinuous ring residue, no white light residue.
2864.1	100	SANDSTONE: As above, common lithics, abundant mud invasion, common frosted coarse quartz grains, very friable, excellent visual porosity, FLUORESCENCE: trace dull yellow/white spotty fluorescence, very slow dull diffuse to pluming yellow/white cut, dull yellow/white to milky crush cut, trace hydrocarbon odour, dull thin ring residue, no white light residue.
2865.5	100	SANDSTONE: As above, common to abundant lithics, common mica, trace pyrite, abundant very coarse frosted well rounded grains, common mud invasion, very friable, excellent visual porosity, FLUORESCENCE: trace dull yellow/gold very spotty (isolated grains), extremely slow yellow/gold dull cut, dull yellow/gold crush cut, trace hydrocarbon odour, very dull thin yellow/gold ring residue, no white light residue.

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Lithology Descriptions

Depth	%	Description
2866.8	100	SANDSTONE: Off white to medium grey, occasional brown/grey, clear to dark grey grains, fine to conglomeratic, predominantly conglomeratic, very poorly sorted, subangular to well rounded, trace calcite and dolomite cement, trace silica cement and very rare quartz overgrowths, trace brown/grey argillaceous matrix, trace mud invasion, common lithics, trace glauconite, trace pyrite, trace mica, moderately friable, good to very good visual porosity, FLUORESCENCE: trace dull yellow/milky white very spotty fluorescence, slow even yellow/milky white dull cut, dull yellow/white crush cut, trace to moderate hydrocarbon odour, dull thin yellow/white ring residue, no white light residue.
2868.25	100	SANDSTONE: Medium grey, clear to medium grey grains, fine to conglomeratic, bimodal of fine and conglomeratic predominantly poorly sorted, subangular to subrounded, conglomeratic very well rounded, trace calcareous, common to abundant dolomite cement, trace to common silica cement, trace arenaceous matrix, common lithics, trace carbonaceous flecks, trace mica, very hard, very poor porosity, FLUORESCENCE: trace dull orange mineral fluorescence.

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Lithology Descriptions

Depth	%	Description
2869.7	100	SANDSTONE: Medium grey, clear to medium grey grains, occasional brown/grey, fine to medium and conglomeratic (bimodal), moderately sorted (fine to medium), subangular to subrounded (conglomeratic is very well rounded), trace dolomite cement, trace silica cement, trace argillaceous matrix, common lithics, trace carbonaceous flecks, trace mica, hard, moderate to poor porosity, FLUORESCENCE: trace dull yellow/gold spotty fluorescence, no cut, very weak dull yellow/gold crush cut, very minor dull yellow/gold ring residue, no white light residue.
2871.1	100	SANDSTONE: Medium to light grey, clear to light grey, fine to medium and conglomeratic (bimodal), moderate to well sorted (fine to medium), subangular to subrounded (conglomeratic is rounded), trace dolomite and silica cement, trace grey argillaceous matrix, trace muscovite, trace pyrite, trace to common lithics, hard, moderate to good porosity, FLUORESCENCE: trace dull yellow/gold very spotty fluorescence, dull very slow diffuse very faint yellow/gold cut, very dull yellow/gold crush cut, trace dull yellow/gold ring residue, no white light residue.

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Lithology Descriptions

Depth	%	Description
2872.4	100	SANDSTONE: As above, fine to conglomeratic (range), predominantly coarse, poorly sorted, subangular to rounded, trace dolomite and very minor silica cement, trace grey argillaceous matrix, very minor mud invasion, trace muscovite, rare glauconite, trace pyrite, trace lithics, moderately hard to subfriable, good to excellent porosity, FLUORESCENCE: trace to 5% dull yellow/gold to occasional yellow/white, very spotty, no cut, very dull yellow/gold crush cut, minor hydrocarbon odour, no ring residue in fluorescence or white light.

(END OF CORE CHIP SAMPLE DESCRIPTIONS)

2885	95	CLAYSTONE: Medium grey, calc' lutite to calc' siltite, common forams, trace glauconite, trace pyrite, moderately hard, blocky (cavings).
	5	SANDSTONE: As above, friable, good porosity, trace dull yellow/gold fluorescence (few grains), no cut, no crush cut, no residue, trace dull orange mineral fluorescence.
2890	80	CLAYSTONE: As above.
	20	SANDSTONE: As above, friable, good to excellent inferred porosity, no fluorescence.
2895	80	CLAYSTONE: As above.
	20	SANDSTONE: As above, no fluorescence.

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Lithology Descriptions

Depth	%	Description
2900	70	CLAYSTONE: As above, cavings.
	30	SANDSTONE: As above, excellent inferred porosity, trace dolomite orange mineral fluorescence.
2905	60	SANDSTONE: As above, excellent inferred porosity, no fluorescence.
	40	CLAYSTONE: As above, cavings.
2910	90	SANDSTONE: (Type 1): As above, very friable, excellent inferred porosity, no fluorescence.
	10	CLAYSTONE: As above, cavings.
	Trace	SANDSTONE: (Type 2): Clear to off white, clear to translucent, very fine to medium, predominantly fine, moderately sorted, subangular, trace dolomite cement, trace silica cement, trace pyrite to occasionally common, trace muscovite, trace lithics, hard, moderate to poor porosity, no fluorescence.
2915	90	SANDSTONE: (Type 1): As above, excellent inferred porosity, no fluorescence.
	10	CLAYSTONE: As above, cavings.
	Trace	SANDSTONE: (Type 2): As above, fine to coarse, predominantly medium, moderate to poorly sorted, subangular to subrounded, trace dolomite cement, common silica cement, common pyrite cement, hard, poor porosity, (probably well cemented streaks of sandstone (i)), no fluorescence.

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Lithology Descriptions

Depth	%	Description
2920	90	SANDSTONE: (Type 1): As above, possible trace oil staining on grains, excellent inferred porosity, no fluorescence.
	10	SANDSTONE: (Type 2): As above, in part bimodal in grain size, poorly sorted, subangular to subrounded, common to abundant silica cement, trace dolomite cement, hard, trace pyrite, very poor porosity, no fluorescence.
	Trace	CLAYSTONE: As above, cavings.
2925	90	SANDSTONE: (Type 1): As above, no fluorescence.
	10	SANDSTONE: (Type 2): As above, no fluorescence.
	Trace	CLAYSTONE: As above.
2930	95	SANDSTONE: (Type 1): As above, no fluorescence.
	5	SANDSTONE: (Type 2): As above, no fluorescence.
	Trace	CLAYSTONE: As above.
2935	95	SANDSTONE: (Type 1): As above, trace pyrite, no fluorescence.
	5	SANDSTONE: (Type 2): As above, very hard, very poor porosity, no fluorescence.
	Trace	CLAYSTONE: As above, cavings.

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Lithology Descriptions

Depth	%	Description
2955 cont.	10	SANDSTONE: (Type 2): As above, no fluorescence.
	5	SILTSTONE: As above.
	Trace	CLAYSTONE:
2960	85	SANDSTONE: (Type 1): As above, no fluorescence.
	10	SANDSTONE: (Type 2): As above, no fluorescence.
	5	SILTSTONE: As above.
	Trace	CLAYSTONE: As above.
2965	85	SANDSTONE: (Type 1): Off white to light grey, clear to off white, loose and moderately clean, medium to conglomeratic, predominantly coarse, moderate to poorly sorted, subrounded to rounded, trace pyritic cement, very friable, trace lithics, trace pyrite, trace mica, common frosting on very coarse to conglomeratic grains, excellent inferred porosity, no fluorescence.
	10	SANDSTONE: (Type 2): Off white to light grey, clear to off white, well consolidated, fine to medium, predominantly fine, moderately sorted, subangular, common dolomite cement, abundant silica and pyrite cement, abundant pyrite, trace mica, very hard, very poor to no porosity, no fluorescence.

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Lithology Descriptions

Depth	%	Description
2940	95	SANDSTONE: (Type 1): As above, trace pyrite, no fluorescence.
	5	SANDSTONE: (Type 2): As above, no fluorescence.
	Trace	SILTSTONE: Medium grey to grey/brown, argillaceous to arenaceous, trace dolomite cement, trace silica cement, argillaceous matrix, trace pyrite, trace to common carbonaceous flecks, grading in part to very fine sandstone, hard, blocky.
	Trace	CLAYSTONE: As above.
2945	95	SANDSTONE: (Type 1): As above, no fluorescence.
	5	SANDSTONE: (Type 2): As above, trace dull orange mineral fluorescence.
	Trace	SILTSTONE: As above.
	Trace	CLAYSTONE: As above.
2950	95	SANDSTONE: (Type 1): As above, no fluorescence, trace possible brown oil staining.
	5	SANDSTONE: (Type 2): As above, no fluorescence.
	Trace	SILTSTONE: As above.
	Trace	CLAYSTONE: As above.
2955	85	SANDSTONE: (Type 1): As above, no fluorescence.

Lithology Descriptions

Depth	%	Description
2965 cont.	5	SILTSTONE: Grey to grey/brown, argillaceous to arenaceous, trace dolomite and silica cement, argillaceous matrix, trace to common pyrite, grading to fine sandstone, hard, blocky.
	Trace	CLAYSTONE: As above, cavings.
2970	65	SANDSTONE: (Type 1): As above, no fluorescence.
	25	SANDSTONE: (Type 2): As above, trace very dull orange mineral fluorescence.
	10	SILTSTONE: As above.
	Trace	CLAYSTONE: As above.
2975	65	SANDSTONE: (Type 1): As above, no fluorescence.
	25	SANDSTONE: (Type 2): As above, trace very dull orange mineral fluorescence.
	10	SILTSTONE: As above.
2980	50	SANDSTONE: (Type 1): As above, no fluorescence.
	40	SANDSTONE: (Type 2): As above, common pyrite, very hard, no fluorescence.
	10	SILTSTONE: As above.
2985	40	SANDSTONE: (Type 1): As above, no fluorescence.

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Lithology Descriptions

Depth	%	Description
2985 cont.	40	SANDSTONE: (Type 2): As above, no fluorescence.
	20	SILTSTONE: As above.
2990	40	SANDSTONE: (Type 1): As above, trace to common glauconite, trace pyrite, excellent inferred porosity, no fluorescence.
	40	SANDSTONE: (Type 2): As above, abundant pyrite, common to trace glauconite, very hard, very poor porosity, no fluorescence.
	20	SILTSTONE: As above, trace glauconite, common pyrite, hard, blocky.
2995	40	SANDSTONE: (Type 1): As above, no fluorescence.
	40	SANDSTONE: (Type 2): As above, common to occasional abundant glauconite, hard, very poor porosity, no fluorescence.
	20	SILTSTONE: As above.
3000	60	SANDSTONE: (Type 1): As above, no fluorescence.
	20	SANDSTONE: (Type 2): As above, no fluorescence.
	20	SILTSTONE: As above, trace to common carbonaceous flecks, common glauconite, hard, blocky.

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Lithology Descriptions

Depth	%	Description
3005	80	SANDSTONE: (Type 1): As above, no fluorescence.
	10	SANDSTONE: (Type 2): As above, no fluorescence.
	10	SILTSTONE: As above.
3010	90	SANDSTONE: (Type 1): As above, no fluorescence.
	5	SANDSTONE: (Type 2): As above, no fluorescence.
	5	SILTSTONE: As above.
3015	60	SANDSTONE: (Type 1): clear to off white, clear to translucent, moderately loose and clean, medium to conglomeratic, predominantly very coarse, moderately sorted, subrounded to rounded, trace silica cement, friable, trace pyrite, trace glauconite, trace mica, excellent inferred porosity, no fluorescence.
	30	SILTSTONE: Medium grey to medium brown/grey, occasional buff to brown, argillaceous to arenaceous, trace dolomite cement, common silica cement, trace pyrite cement, occasional abundant nodules pyrite, trace to common carbonaceous flecks, trace glauconite, hard, blocky.
	10	SANDSTONE: (Type 2): Off white to medium brown/grey, clear to buff, well consolidated, fine to medium, predominantly fine, moderately sorted, subangular to subrounded,

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Lithology Descriptions

Depth	%	Description
3015 cont.		common silica cement, trace dolomite cement, common to abundant pyrite, trace glauconite, grading in part to siltstone, hard, very poor to no porosity, no fluorescence.
3020	40	SANDSTONE: (Type 1): As above, no fluorescence.
	30	SANDSTONE: (Type 2): As above, no fluorescence.
	30	SILTSTONE: As above.
3025	60	SANDSTONE: (Type 1): As above, no fluorescence.
	20	SANDSTONE: (Type 2): As above, no fluorescence.
	20	SILTSTONE: As above.
3030	70	SANDSTONE: (Type 1): As above, no fluorescence.
	20	SANDSTONE: (Type 2): As above, no fluorescence.
	10	SILTSTONE: As above.
3035	60	SANDSTONE: (Type 1): As above, no fluorescence.
	10	SANDSTONE: (Type 2): As above, no fluorescence.
	20	SILTSTONE: As above.

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Lithology Descriptions

Depth	%	Description
	10	CLAYSTONE: Medium grey, calc' lutite to calc' siltite, trace glauconite, rare pyrite, rare forams, firm, sticky, blocky (?cavings?).
3040	40	SANDSTONE: (Type 1): As above, no fluorescence.
	20	SILTSTONE: As above.
	40	SANDSTONE: (Type 2): As above, no fluorescence.
	Trace	CLAYSTONE: As above.

APPENDIX 2

TERAKIHI-1

SIDEWALL CORE DESCRIPTIONS

NO.	Depth (m)	Rec. (mm)	B/R	Description
30	2820.5	25	B	CLAYSTONE: Light to medium grey, argillaceous to calcareous (calc' lutite), trace mica flecks, very rare carbonaceous flecks, very rare glauconite, blocky, soft to firm, slightly sticky, no fluorescence. (-/-/-/-/-)
29	2826.5	50	B	CLAYSTONE: As above, very rare pyrite, blocky, firm, slightly sticky, no fluorescence. (-/-/Tr/Tr/-)
28	2834	38	B	CLAYSTONE: As above, common to abundant micromicaceous, blocky, firm, sticky in part, no fluorescence. (.0019/.0036/.008/.0148/.0048)
27	2837	27	B	SILTSTONE: Medium grey, argillaceous to arenaceous, grading in part to very fine sandstone, calcareous (calc' siltite), trace calcareous cement, abundant argillaceous matrix (moderate swelling claystone), common to abundant disseminated pyrite, trace glauconite, common micromicaceous, common very fine disseminated quartz grains, trace to common coarse well rounded disseminated quartz grains, firm, blocky, no fluorescence. (Tr/.0036/.0231/.0437/.0336)

N.B. B=BOUGHT/R=REJECTED, GAS BREAK DOWN = ($C_1/C_2/C_3/C_4/C_5$) IN % VOLUME

TERAKIHI-1

SIDEWALL CORE DESCRIPTIONS

NO.	Depth (m)	Rec. (mm)	B/R	Description
26	2839.5	32	B	SANDSTONE: Light to medium grey, clear to grey grains, moderate to well consolidated, very fine to fine, grading in part to arenaceous siltstone, well sorted, subangular to subrounded, predominantly subangular, trace calcareous cement, abundant argillaceous matrix, firm, abundant pyrite, trace very fine laminae, trace mica flecks and micromicaceous, poor visual porosity. Fluorescence: trace-10% dull patchy yellow to gold fluorescence, very weak dull yellow to gold slow diffuse cut, dull yellow to gold crush cut, very thin yellow to gold ring residue, no white light residue. (Tr/Tr/.0062/.0238/.0107)
25	2845.9	-	R	Missing Bullet - Not Recovered.
24	2872	30	B	SANDSTONE: Medium grey, clear to grey, moderately consolidated, very fine to coarse, predominantly medium, poorly sorted, subangular to subrounded, trace dolomite cement, abundant argillaceous matrix, firm, trace pyrite, trace lithic fragments, trace mica, trace carbonaceous flecks, moderate to good visual porosity. Fluorescence: No hydrocarbon fluorescence, trace-10% dull orange mineral fluorescence. (Tr/Tr/.0173/.0438/.0240)

TERAKIHI-1

SIDEWALL CORE DESCRIPTIONS

NO.	Depth (m)	Rec. (mm)	B/R	Description
23	2875.5	20	B	SILTSTONE: Medium to dark grey brown, argillaceous and arenaceous, trace calcareous cement, abundant argillaceous matrix, firm, common very coarse well rounded quartz, trace pyrite, trace mica, trace carbonaceous flecks, blocky, no fluorescence. (.001/.0059/.0125/.0113/.0033)
22	2886.2	40	B	SANDSTONE: Light to medium grey, clear to light grey grains, moderately consolidated, very fine to very coarse grained, bimodal grain size, poorly sorted, subangular to subrounded (coarse grains well rounded), argillaceous matrix, trace carbonaceous flecks, poor visual porosity, trace dull orange mineral fluorescence. (.0019/.0036/.032/.0545/.0362)
21	2891	40	B	SANDSTONE: Medium to dark grey brown, clear to medium brown grey, moderately consolidated, very fine to fine grains, well sorted, subangular, trace calcareous cement, abundant argillaceous matrix, firm, trace micromicaceous, very poor porosity, no fluorescence. (.001/.0071/.0125/.0084/.0029)
20	2892.9	25	B	SILTSTONE: Dark grey brown, argillaceous to arenaceous in part, abundant argillaceous

TERAKIHI-1

SIDEWALL CORE DESCRIPTIONS

NO.	Depth (m)	Rec. (mm)	B/R	Description
				matrix, trace to common mica, trace very coarse well rounded quartz grains, firm to moderately hard, blocky, no fluorescence. (.0029/.0101/.0071/.0074/.0021)
19	2894.1	30	B	SANDSTONE: Medium grey, clear to medium grey, well consolidated, very fine to fine, well sorted, subangular, abundant argillaceous matrix, moderately hard, trace to common mica, trace very coarse quartz grains, grades in part to arenaceous siltstone, trace fine laminae, very poor to poor porosity, no fluorescence. (.0458/.0107/.0125/.0067/.0016)
18	2897	25	B	SANDSTONE: Medium grey, clear to light grey, moderately consolidated, firm to medium, occasionally coarse, poorly sorted, subangular to subrounded, abundant argillaceous matrix, moderate swelling clays, moderately hard, trace mica, trace to common quartz grains, poor porosity, no fluorescence. (-/-/-/-/-)
17	2904.7	-	R	Missing Bullet - Not Recovered.
16	2908.8	25	B	SILTSTONE: Medium grey, arenaceous, abundant argillaceous matrix, abundant well rounded coarse quartz, hard, blocky, grading in part to

TERAKIHI-1

SIDEWALL CORE DESCRIPTIONS

NO.	Depth (m)	Rec. (mm)	B/R	Description
				very fine sandstone, no fluorescence. (-/-/.001/.0014/Tr)
15	2915.3	25	B	SILTSTONE: Dark grey brown, as above, trace carbonaceous flecks, no fluorescence. (Tr/.0006/.0009/-/-)
14	2942.8	30	B	SANDSTONE: White to light grey, clear to off white, well consolidated, medium to very coarse, moderate to poorly sorted, predominantly subrounded, trace calcareous cement, trace light grey argillaceous matrix, moderately hard, trace mica, trace lithics, moderate porosity, no fluorescence. (-/-/-/-/-)
13	2947	20	B	SANDSTONE: Medium grey, well consolidated, very fine to fine, grading in part to arenaceous siltstone, well sorted, subangular to subrounded, abundant argillaceous matrix, calcareous cement (trace), moderately hard, trace micromicaceous, poor porosity, no fluorescence. (.001/.0018/.0036/.0034/Tr)
12	2951.5	20	B	SILTSTONE: Dark brown/grey, arenaceous, abundant argillaceous matrix, common coarse well rounded quartz, firm, blocky, no

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SIDEWALL CORE DESCRIPTIONS

NO.	Depth (m)	Rec. (mm)	B/R	Description
				fluorescence. (.0019/.003/.0036/.0022/Tr)
11	2954.5	25	B	SILTSTONE: Dark grey/brown, arenaceous, abundant argillaceous matrix, mica, trace quartz, moderately hard, blocky, no fluorescence. (.0029/.0053/.0049/.0022/Tr)
10	2956	25	B	SILTSTONE: Dark grey/brown, arenaceous, grades to very fine sandstone, abundant argillaceous matrix, carbonaceous flecks, moderately hard, blocky, no fluorescence. (.0012/.0031/.0037/.0016/Tr)
9	2959	30	B	SILTSTONE: As above, no fluorescence. (.0005/.001/.0013/.001/-)
8	2969.5	35	B	SANDSTONE: Light to medium grey, clear to light grey, well consolidated, very fine to fine, grading in part to arenaceous siltstone, well sorted, subangular to subrounded, abundant argillaceous matrix, moderately hard to hard, trace mica, very poor porosity, no fluorescence. (.0005/.001/.0013/.0012/-)
7	2971.5	30	B	SILTSTONE: As above, no fluorescence. (Tr/.0005/.0009/.0006/-)

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SIDEWALL CORE DESCRIPTIONS

NO.	Depth (m)	Rec. (mm)	B/R	Description
				no fluorescence. (-/-/-/-/-)
2	3005	20	B	SANDSTONE: Light to medium grey brown, clear to light brown, well consolidated, very fine to fine, well sorted, subangular, abundant argillaceous matrix, moderately hard, trace mica, trace glauconite, trace carbonaceous flecks, moderate to poor porosity, no fluorescence. (.0057/.0031/.0012/.0049/-)
1	3008.5	-	R	Missing Bullet - Not Recovered.

(05900328)

APPENDIX 3

Core No. 1

Interval Cored : 2844m - 2862.5m
Cut : 18.5m
Bit Type : RC 476
Described by : A. Clare

Well : Terakihi-1

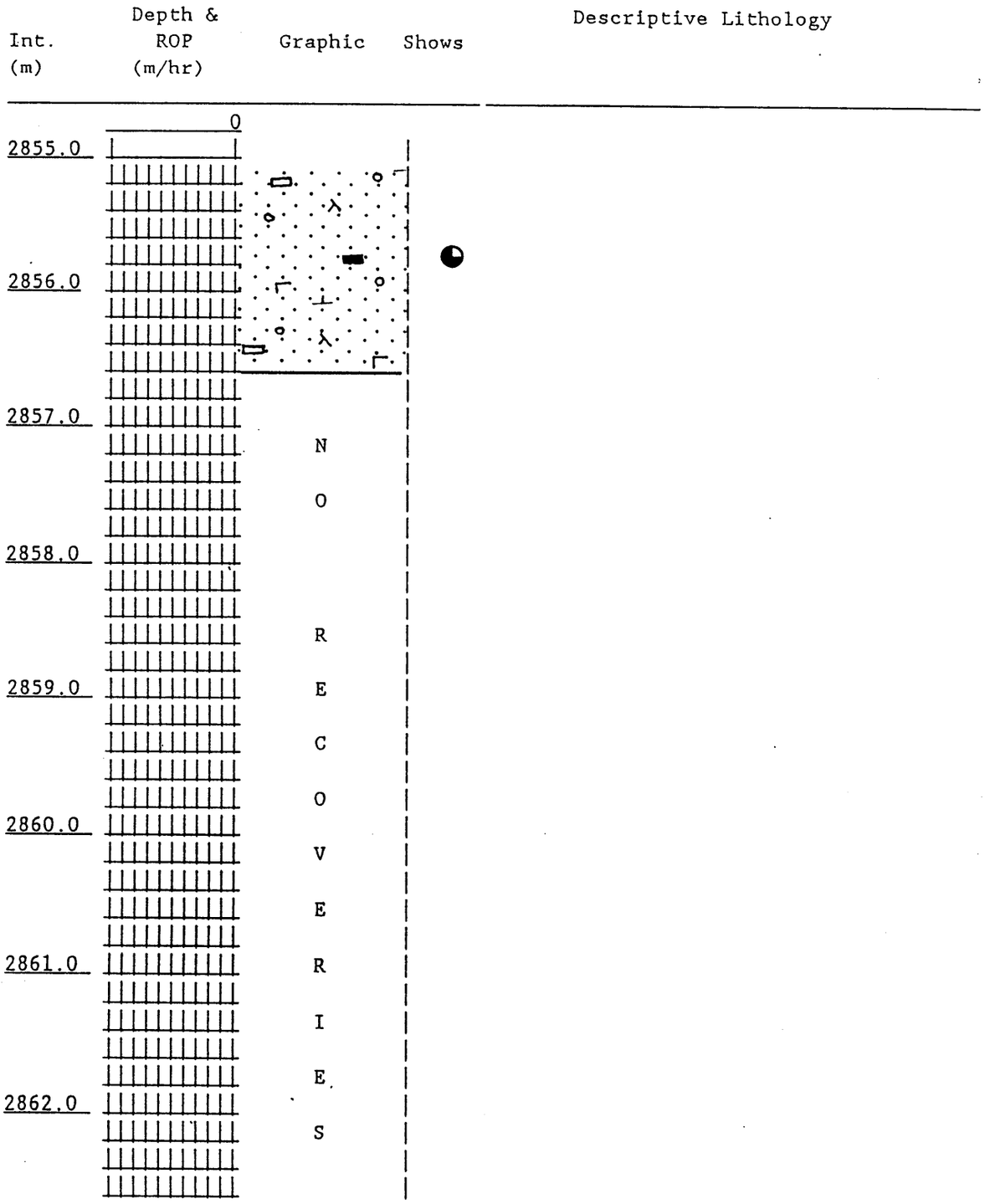
Recovered : 12.60m (68%)
Bit Size : 12 1/4"
Date : 13.4.90

Int. (m)	Depth & ROP (m/hr)	Graphic	Shows	Descriptive Lithology
2844.0	0			2844-2845.31 100% SANDSTONE: Off white, clear to off white, fine to very coarse, very poorly sorted, subangular to well rounded (again bimodal), no observed cement, no observed matrix, trace carbonaceous flecks, trace lithics, common frosting on well rounded very coarse grains, very friable, excellent visual porosity, FLUORESCENCE = 50% moderately bright yellow/white patchy fluorescence, very fast to instant streaming yellow/white moderately bright cut, moderately bright yellow/white crush cut, hydrocarbon odour, thin bright yellow/white ring residue, no white light residue.
2845.0				
2846.0				2845.31-2846.2 100% SANDSTONE: Off white to light grey, clear to medium grey (smokey) grains, medium to very coarse (occasionally fine), predominantly coarse, poorly sorted, subangular to rounded, predominantly subrounded, no observed cement or matrix, trace to common smokey quartz grains, trace lithics, firm, excellent to very good visual porosity, FLUORESCENCE: 70-90% bright yellow/white solid to patchy fluorescence, moderately bright fast streaming yellow/white cut, bright yellow/white crush cut, hydrocarbon odour, thin bright yellow/white ring residue, no white light residue.
2847.0				
2848.0				2846.2-2656.6 100% SANDSTONE: As for description in interval 2844-2845.31, again bimodal distribution of grain size (fine subangular grains and coarse well rounded frosted grains), excellent visual porosity, FLUORESCENCE: (2846.2-2849.8) 30-80% bright yellow/white solid to patchy fluorescence, instant yellow/white bright cut, bright yellow/white crush cut, moderate to strong hydrocarbon odour, thin to medium bright yellow/white ring residue, no white light residue. FLUORESCENCE: (2849.8-2855.6) 5-10% dull to moderately bright yellow/white spotty fluorescence, instant dull yellow/white cut, dull yellow white crush cut, slight hydrocarbon odour, dull thin yellow/white ring residue, no white light residue. FLUORESCENCE: (2855.6-2856.6) 20-40% moderately bright to dull yellow/white spotty to patchy fluorescence, moderately fast moderately bright yellow/white streaming cut, moderately bright yellow/white crush cut, thin dull to moderately bright yellow/white ring residue, slight to moderate hydrocarbon odour, no white light residue.
2849.0				
2850.0				
2851.0				
2852.0				
2853.0				
2854.0				

Well : Terakihi-1

Interval Cored : 2844m - 2862.5m
Cut : 18.5m
Bit Type : RC 476
Described by : A. Clare

Recovered : 12.60m (68%)
Bit Size : 12 1/4"
Date : 13.4.90



Well : Terakihi-1

Interval Cored : 2862.5m - 2881.0m
Cut : 18.5m
Bit Type : RC 476
Described by : A. Clare

Recovered : 9.9m (53.5%)
Bit Size : 12 1/4"
Date : 13.4.90

Int. (m)	Depth & ROP (m/hr)	Graphic	Shows	Descriptive Lithology
2862.0	0			2862.5-2867.0 100% SANDSTONE: Off white to light grey, clear to medium grey, fine to conglomeratic, predominantly very coarse, very poorly sorted, subangular to well rounded, no observed cement, no matrix, trace muscovite, trace lithic fragments, trace pyrite, very friable, excellent visual porosity, FLUORESCENCE: trace to 10% dull yellow/white spotty fluorescence, very slow pluming yellow/white dull cut, dull yellow/white crush cut, dull to moderately bright very thin ring residue, no white light residue, slight hydrocarbon odour.
2863.0				
2864.0			◒	2867.0-2868.4 100% SANDSTONE: Medium grey, clear to medium grey grains, fine to conglomeratic, bimodal of fine and conglomeratic predominantly poorly sorted, subangular to subrounded, conglomeratic very well rounded, trace calcareous, common dolomite cement, common to abundant silica cement, trace arenaceous matrix, common lithics, trace carbonaceous flecks, trace mica, very hard, very poor porosity, FLUORESCENCE: trace dull orange mineral fluorescence.
2865.0				
2866.0			◒	2868.4-2871.2 100% SANDSTONE: Medium grey, clear to medium grey grains, occasional brown/grey, fine to medium and conglomeratic (bimodal), moderately sorted (fine to medium), subangular to subrounded (conglomeratic is very well rounded), trace dolomite cement, trace silica cement, trace argillaceous matrix, common lithics, trace carbonaceous flecks, trace mica, hard, moderate to poor porosity, FLUORESCENCE: trace dull yellow/gold spotty fluorescence, no cut, very weak dull yellow/gold crush cut, very minor dull yellow/gold ring residue, no white light residue.
2867.0				
2868.0				2871.2-2872.4 100% SANDSTONE: As above, fine to conglomeratic (range), predominantly coarse, poorly sorted, subangular to rounded, trace dolomite and very minor silica cement, trace grey argillaceous matrix, very minor mud invasion, trace muscovite, rare glauconite, trace pyrite, trace lithics, moderately hard to subfriable, good to excellent porosity, FLUORESCENCE: trace to 5% dull yellow/gold to occasional yellow/white, very spotty, no cut, very dull yellow/gold crush cut, minor hydrocarbon odour, no ring residue in fluorescence or white light.
2869.0			◒	
2870.0				
2871.0			◒	

Well : Terakihi-1

Interval Cored : 2862.5m - 2881.0m
Recovered : 9.9m (53.5%)
Cut : 18.5m
Bit Size : 12 1/4"
Bit Type : RC 476
Date : 13.4.90
Described by : A. Clare

Int. (m)	Depth & ROP (m/hr)	Graphic	Shows	Descriptive Lithology
	0			
2872.0				
		N		
2873.0				
		O		
2874.0				
		R		
2875.0				
		E		
2876.0		C		
		O		
2877.0				
		V		
		E		
2878.0				
		R		
2879.0				
		I		
2880.0				
		E		
2881.0		S		