

PETROLEUM DIVISION

15 DEC 1999



BHP
Petroleum

ERIC THE RED-1
VIC/P31
WELL COMPLETION REPORT
BASIC DATA (VOLUME 1)

900171 003

BA



DEPT. PRIMARY INDUSTRIES
PETROLEUM DEVELOPMENT
THIS DOCUMENT HAS BEEN
SCANNED
ON OR BEFORE MARCH 2003

BHP PETROLEUM PTY LTD
ACN 006 918 832

VIC/P31

ERIC THE RED-1

WELL COMPLETION REPORT

BASIC DATA

OCTOBER 1993

PETROLEUM DIVISION

15 DEC 1993

1. WELL SUMMARY SHEET

Well: Eric The Red-1

Permit: VIC/P31

District: Otway Basin

Well Path: Vertical

Planned Location: Lat. 39° 00' 45.40" South
Long. 143° 10' 51.30" East

Actual Location: Lat. 39° 00' 45.44" South
Long. 143° 10' 51.45" East

East: 688 829.7
North: 5 679 544.8
UTM 54, CM 141° East

Seismic Reference: Line OH91-186, SP 1188

Elevation: RT to MSL 25.3 m

Water Depth: 75.2 m (MSL to seabed)

Total Depth: 1875 mRT

Departed Last Location: 15 February 1993 15:30 hours

Spud Date: 17 February 1993 07:00 hours

Total Depth Date: 26 February 1993 06:00 hours

Days from Spud to TD: 8 days 23 hours

Rig Release Date: 06 March 1993 03:30 hours

Total Days on Well: 18 days 12.0 hours

Operator: BHP Petroleum Pty Ltd

Permit Interests: BHP Petroleum Pty Ltd 90.00%
BHP Petroleum Plaza
120 Collins Street
MELBOURNE VIC 3000

PETROLEUM DIVISION**15 DEC 1993**

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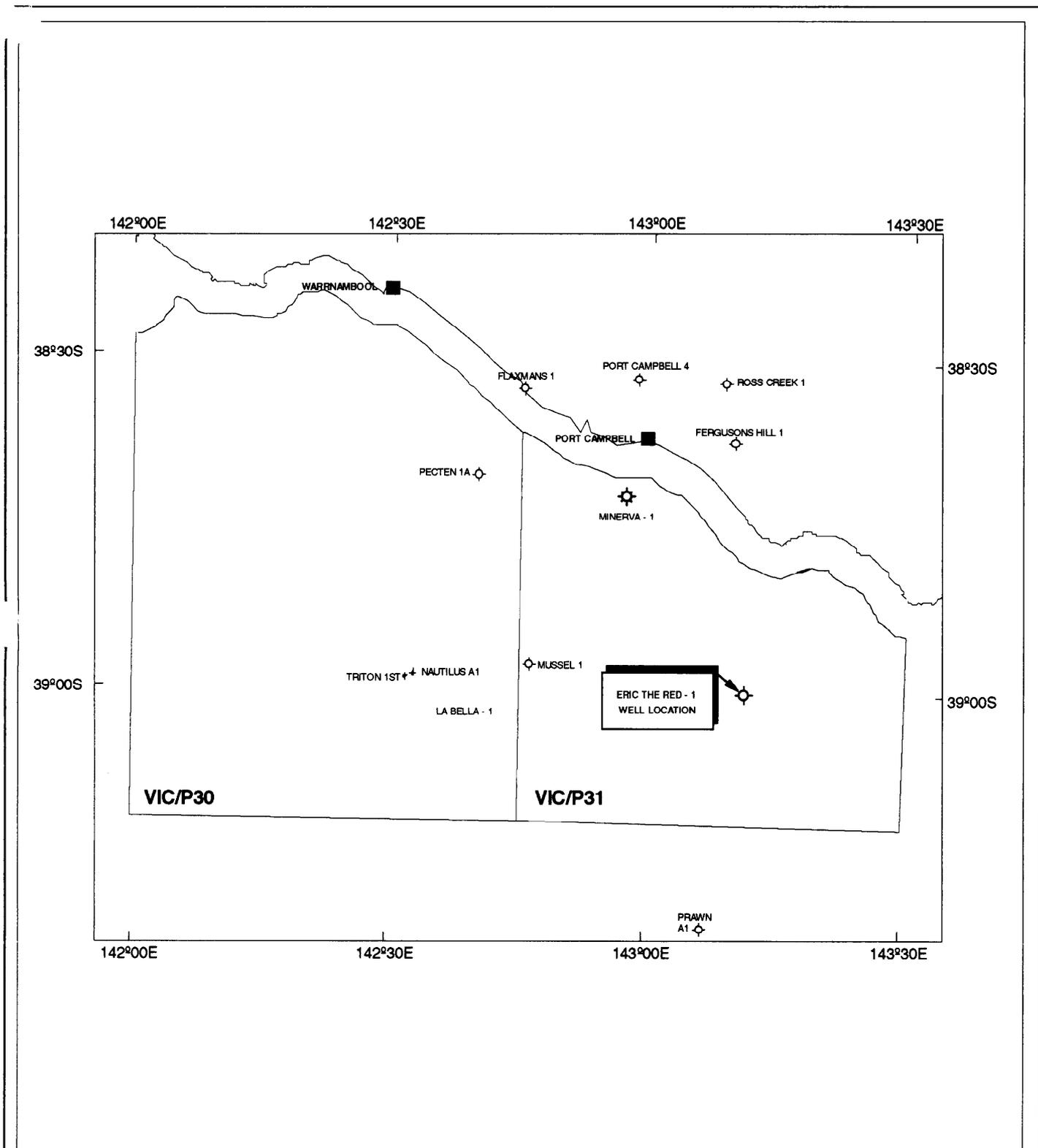
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ERIC THE RED _1 LOCATION MAP


BHP Petroleum
 OTWAY BASIN
 ERIC THE RED_1
 LOCATION MAP

<small>AUTHOR:</small>	<small>DATE:</small> 28/11/93
<small>DRAWN BY:</small> T.DELPHIN	<small>DWG NO:</small> C1_GB

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Otway Basin, Vic/P31
Eric The Red-1
Well Completion Report - Interpretative Volume

1

1 WELL INDEX SHEET

COMPANY: BHP Petroleum Pty Ltd WELL: Eric The Red - 1 TYPE: W/cat
 SPUDDED: 0700 hrs 17th Feb 1993 BASIN: Otway
 COMPLETED: 0330 hrs 6th Mar 1993 TENEMENT: VIC/P31
 TD: 1875 mRT ELEV. W. D.: 100 mRT K. B.: 25 m
 LOCATION: Lat. 39deg 00min 45.44sec South Long. 143deg 10min 51.45sec East
 STATUS: P & A 1st FLANGE: 30" @ 137 m

FORMATION/ LITHOLOGIC SUMMARY/ MARKER	TOPS(m)		SEISMIC	
	DRILL	SUB SEA	TWT	REMARKS
No returns	100-364			
tertiary	100	75		Fossiliferous calcarenite with interbedded marl.
Nirranda Group	370	345		Sandstones with minor siltstones.
Wangerrip Group	413	388		Sandstones with minor claystone and siltstones.
Sherbrook Group	537	512	545	Interbedded siltstones, sandstones and claystones with calcite cement, pyrite nodules and trace glauconite.
Shipwreck Group Upper	1043	1018	1000	Interbedded sandstones, siltstones and claystones with minor coal at base.
Lower	1436	1411	1080	Interbedded sandstones and claystones with minor coal. Conglomerate near the base.
Otway Group Eumeralla Formation	1747	1722	1310	Interbedded sandstones and claystones with minor siltstones.

LOGS:

SUITE 1

L-MSFL-SDT-GR-SP-CAL-AMS

VSP

CST-GR (30)

SUITE 2

DLL-MSFL-SDT-GR-CAL-SP-AMS

FMS-LDL-CNL-GR-AMS

VSP

RFT

CST-GR (60)

SWC: SHOT 90 REC 74

STORED: Kestrel Management, Mt. Waverley, Vic.

CORES: No cores cut.

DITCH SAMPLES: 370 - 1875 m

CASING/TUBING SIZE	30"	13.375"	9.625"
LANDED AT (m)	137	355	1007
CEMENT (sacks)	456	500	254

TEST RESULTS, FLUID ANALYSIS, LOST CIRCULATION (INTERVAL, CAUSES) PLUG TOPS, REMARKS

Plug No. 1 was set from 1100-900 m; 270 sacks cement

Plug No. 2 was set from 174-124 m; 120 sacks cement

Bridge Oil Ltd
255 Elizabeth Street
SYDNEY NSW 2000

10.00%

Drilling Contractor:

Dolphin Drilling

Rig:

"Byford Dolphin" Semi Submersible

Status:

Dry Hole - Plugged and abandoned

Cost:

\$ 3.73 M (from cost control)

2. FINAL DRILLING REPORT

FINAL DRILLING REPORT

BHP PETROLEUM PTY. LTD.

PERMIT: VIC/P31

ERIC THE RED-1

AUGUST 1993

PETROLEUM DIVISION

15 DEC 1993



DISTRIBUTION LIST

ERIC THE RED-1

Exploration	2 copies (1 copy unbound for distribution to partners and government)
Drilling - Well File	1 copy Original
Exploration Information Centre	1 copy

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ERIC THE RED-1

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SECTION 1

Well : ERIC THE RED-1

Permit : VIC/P31

Designation : EXPLORATION

Operator : BHPP

Rig : BYFORD DOLPHIN

Type : SEMISUBMERSIBLE

Drilling Contractor : DOLPHIN DRILLING

Water Depth : 75.2m

RT Elevation : 25.3m

Total Depth : 1875mMD
1875mTVD

Final Surface Location : Lat S 039° 00' 45.440"
Long E 143° 10' 51.450"
Easting 688 829.7
Northing 5 679 544.8

Location Reference Datum : AGD84, AMG ZONE 54 C.M. 141°E

Commencement Date : 1530 hrs, 15 February 1993

Rig on Location : 2236 hrs, 15 February 1993

Well Spudded : 0700 hrs, 17 February 1993

TD Date : 0600 hrs, 26 February 1993

Drilling Days to TD : 8 Days, 23 hours

Rig Released : 0330 hrs, 6 March 1993

Total Well Duration : 18 Days, 12 hours

Status : ABANDONED

SERVICE

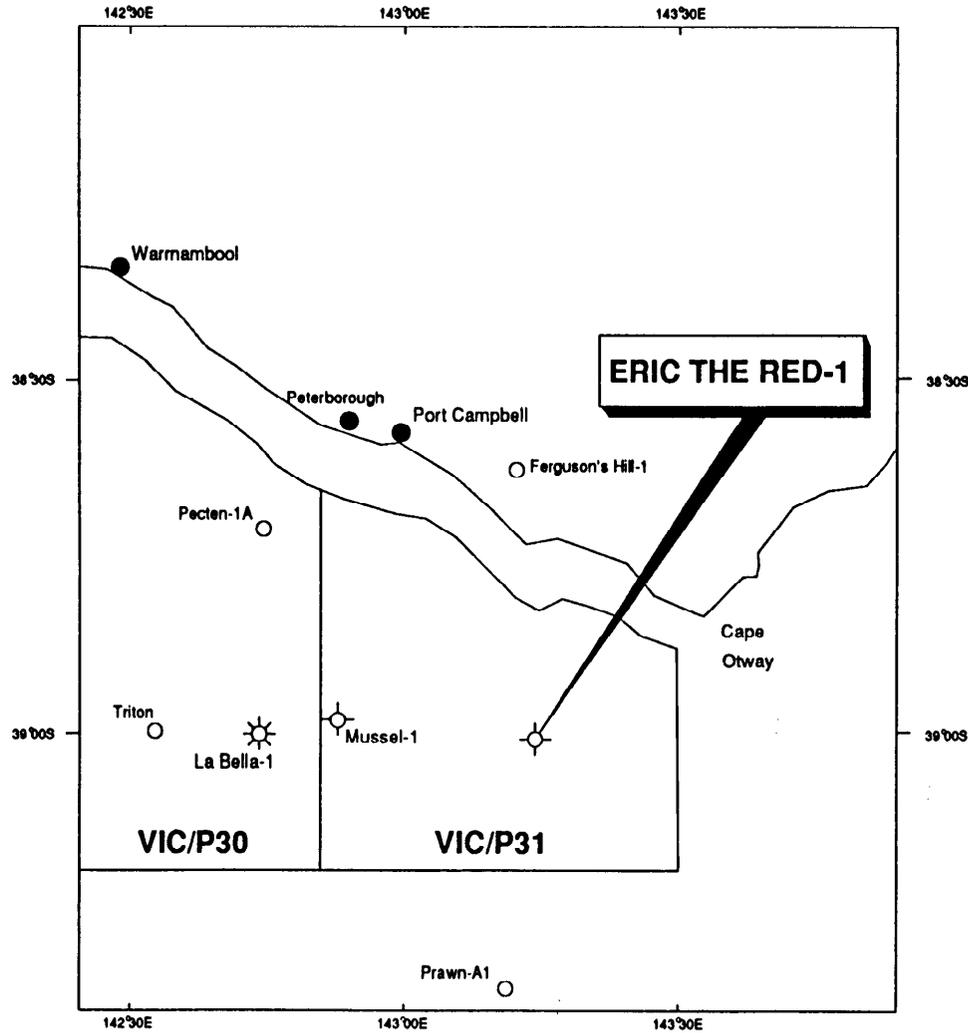
CEMENT SUPPLY
CEMENTING SERVICES
CORING SERVICES
DIRECTIONAL
DIVING/ROV
DRILLING FLUIDS
HELICOPTERS
LOGGING
MUD LOGGING
MWD
ROLLER REAMERS
SOLIDS CONTROL
STANDBY VESSEL
SUPPLY VESSEL
SUPPLY VESSEL
WEATHER
WELL TESTING
WELLHEAD
WELLHEAD SEVERANCE

CONTRACTOR

HALLIBURTON
HALLIBURTON
DIAMANT BOART
SMITH
DRILLSUPPORT
MILPARK
LLOYD HELICOPTERS
SCHLUMBERGER
EXLOG
EASTMAN TELECO
GEARHART UNITED
OILTOOLS
SWIRE: "MARLIN"
AOS: "FAR SWORD"
T.W.: "BONAVISTA"
OCEAN ROUTES
HRS
DRIL-QUIP
AUSTOIL

1.2 LOCATION MAP

WELL : ERIC THE RED-1



Permit No. : VIC/P31
Rig : BYFORD DOLPHIN
Latitude : 39° 0' 45.44" S
Longitude : 143° 10' 51.45" E



1.3 WELL SCHEMATIC

ERIC THE RED-1

ALL DEPTHS RT BYFORD DOLPHIN

Seabed at 100m

30" CASING AT 137m
36" HOLE TO 137m

13.375" CASING AT 355m
17.5" HOLE TO 364m

9.625" CASING AT 1007m
12.25" HOLE TO 1017m

8.5" HOLE TO 1875m

30 & 20" CASING CUT AT 102m
ABANDONMENT PLUG No.2: 175m TO 124m
13.375" BRIDGE PLUG AT 175m
9.625" CASING CUT AT 180m

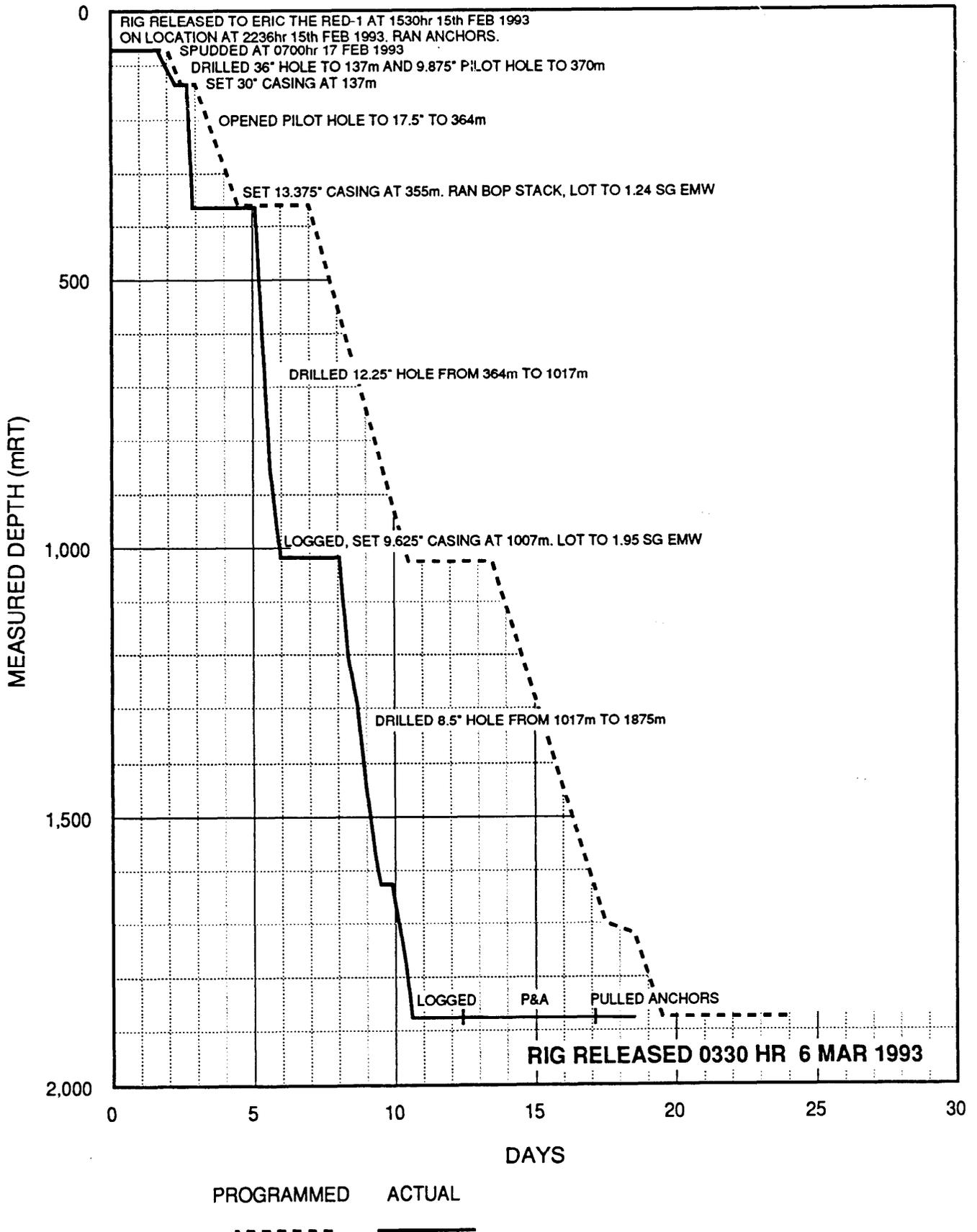
INHIBITED MUD (1.10 SG)

TOC AT 707m

ABANDONMENT PLUG No.1: 1100m TO 900m
TAGGED WITH 10000 lb AT 900m

1.4 TIME vs DEPTH CURVE

ERIC THE RED-1



SECTION 2

2.0 OPERATIONAL SUMMARY

ERIC THE RED-1

The Byford Dolphin was released from LaBella-1 at 1530hrs, 15th February, 1993 and arrived at the Eric the Red-1 location at 2236hrs. Eight anchors were run and pretensioned to 170t.

Eric the Red-1 was spudded at 0700hrs 17th February, 1993. The 36" hole was drilled from 100 to 116m and the 9.875" shallow gas test hole was drilled from 116 to 370m during daylight hours. No shallow gas was encountered. The 9.875" pilot hole was then opened to 36" from 116 to 137m. The 30" casing was run and cemented to a depth of 137m.

The pilot hole was opened to 17.5" to a depth of 364m. The 13.375" casing with crossover to the 18.75" wellhead was run and cemented to a depth of 355m.

The 18.75" BOP stack was run and tested and although the lower (variable) pipe ram could not be closed fully, dispensation was received from the regulatory authorities and operations continued. The 12.25" hole was drilled to 367m and a LOT to 1.24 SG EMW was conducted. The 12.25" hole was drilled to 1017m at which point Suite No.1 logs were run. The 9.625" casing was run and cemented at 1007m.

The BOP stack was tested and 8.5" hole drilled to 1020m. A LOT to 1.95 SG EMW was conducted at this depth. Drilling in 8.5" hole continued to a total depth of 1875m. Minor tight hole problems were encountered during a bit trip at 1625m as well as on a wiper trip prior to logging. Suite No.2 logs were run, including RFT's which indicated formation pressures of 1.00 SG EMW.

Difficulties were encountered in recovering the PGB, 30" housing and 18.75" wellhead during plug and abandonment operations. Explosives were utilised to successfully sever the subject casing strings and the equipment recovered. The Byford Dolphin rig was released on 6th March, 1993 at 0330hrs.

Date	Day No.	Days From	Spud From	To	Hours	Daily Operations
15/02/93	1	0	15:30	22:36	7.10	MOVED RIG TO LOCATION. #1 ON TOW BY FS. #12 ON TOW BY BV.
			22:36	00:00	1.40	#7 ANCHOR ON BOTTOM AT 2236HR. RIG MANOEUVERED TO LOCATION. FAR SWORD DISCONNECTED TOW WIRE AND INSTALLED ANCHOR.
16/02/93	2		00:00	16:34	16.57	RUN ANCHORS AS FOLLOWS: RIG: #7 DROP ANCHOR- ON BTM @ 2236HR FS: #1 ON BTM @ 0107HR BV: #12 ON BTM @ 1106HR FS: #6 ON BTM @ 0305HR FS: #11 ON BTM @ 0735HR FS: #4 ON BTM @ 1024HR FS: #3 ON BTM @ 1529HR FS: #9 ON BTM @ 1734HR
			16:34	18:15	1.68	ANCHOR HANDLING NON PRODUCTIVE TIME
			18:15	21:00	2.75	CROSS TENSIONED ANCHORS TO 170 TONNES.
			21:00	00:00	3.00	BALLASTED RIG DOWN.
17/02/93	3	1	00:00	03:30	3.50	COMPLETED BALLASTING
			03:30	07:00		PICKED UP 36" BHA AND RIH.
			07:00	09:15	2.25	TAGGED SEABED AT 100.5m AND DRILLED 36" HOLE FROM 100.5-116m. PUMPED 30bbl GUAR GUM/SINGLE
			09:15	10:00	0.75	POH AND RACKED 36" BHA IN DERRICK.
			10:00	12:00	2.00	PICKED UP 9 7/8" BHA ON HWDP AND RIH.
			12:00	18:00	6.00	DRILLED 9 7/8" HOLE FROM 116-370m. PUMPED 30 bbl GUAR GUM EVERY 1/2 STAND.
			18:00	18:15	0.25	SPOTTED 150 bbl KILL MUD ON BOTTOM.
			18:15	18:30		DROPPED SURVEY.
			18:30	19:30	1.00	POH AND RECOVERED SURVEY (1/2 DEG).
			19:30	20:15	0.75	RIH WITH 36" BHA.
			20:15	20:45	0.50	TAGGED AT 110m. WASHED AND REAMED TO BOTTOM.
			20:45	22:30	1.75	REAMED 9 7/8" HOLE TO 36" HOLE FROM 116-137m. PUMPED 30 bbl GUAR GUM EACH 1/2 SINGLE.
			22:30	22:45	0.25	PUMPED 150 bbl GUAR GUM AND SPOTTED 150 bbl KILL MUD ON BOTTOM.
			22:45	23:00	0.25	DROPPED SURVEY.
			23:00	00:00	1.00	POH AND RECOVERED SURVEY (1 DEG).
18/02/93	4	2	00:00	00:30	0.50	CONTINUED TO POH.MADE UP CIRCULATING HEAD AND 30" R/T ON STAND AND RACKED BACK.
			00:30	01:00	0.50	RIGGED UP TO RUN 30" CASING.
			01:00	03:15	2.25	RAN AND LANDED CASING AT 137m. PGB-0.5 DEG.
			03:15	03:30	0.25	RIGGED UP CEMENT LINE AND CIRCULATED 100 bbl SEAWATER.
			03:30	04:45	1.25	TESTED CEMENT LINE TO 1000 psi. MIXED AND PUMPED 456 SX 'G' CEMENT AT 1.9 SG WITH 2% CACL2. DISPLACED WITH 18 bbl SEAWATER.
			04:45	05:30	0.75	BACKED OUT 30" R/T AND POH.
			05:30	08:00	2.50	LAI D OUT 36" BHA. MADE UP 17 1/2" BHA. RIH.

2.1 DAILY OPERATIONS
ERIC THE RED-1

Date	Day No.	Days From	Spud From	To	Hours	Daily Operations			
18/02/93	4	2	08:00	08:30	0.50	TAGGED CEMENT AT 133.5m. DRILLED CEMENT/SHOE.			
			08:30	12:30	4.00	REAMED AND OPENED HOLE FROM 9 7/8" TO 17 1/2" FROM 137-364m.PUMPED 30/50bbl GUAR GUM/CONN.			
			12:30	13:00	0.50	SWEPT HOLE WITH 200 bbl HI-VIS AND SPOTTED 300 bbl KILL MUD.			
			13:00	13:15	0.25	DROPPED SURVEY.			
			13:15	14:15	1.00	POH.			
			14:15	14:30	0.25	STABILISER UNABLE TO PASS 30" SHOE DUE TO BALLING. WORKED THROUGH.			
			14:30	15:45	1.25	CONTINUED TO POH. RECOVERED SURVEY (1 DEG).			
			15:45	16:45	1.00	MADE UP CEMENT HEAD TO STAND. RIGGED UP TO RUN 13 3/8" CASING.			
			16:45	21:30	4.75	RAN 21 JOINTS 13 3/8" CASING PLUS X/O AND WELLHEAD. LANDED WELLHEAD AND MADE 50000LB O/P. SHOE AT 355m.			
			21:30	22:15	0.75	CIRCULATED CASING WITH 200 bbl SEAWATER.			
			22:15	00:00	1.75	SHEARED BOTTOM PLUG AT 800 psi. MIXED AND PUMPED CEMENT AS FOLLOWS: LEAD-300 SX 1.5 SG SLURRY WITH 0.55 GAL/SX ECONOLITE, TAIL-500 SX 1.9 SG SLURRY NEAT. NO SIGN OF TOP PLUG RELEASING. DISPLACED 118 bbl SEAWATER WITH HOWCO.			
			19/02/93	5	3	00:00	00:45	0.75	BACKED OUT W/H R/T AND WASHED WELLHEAD.
						00:45	01:45	1.00	POH AND LAID OUT R/T AND CEMENT HEAD.
01:45	02:45					RIGGED UP TO RUN RISER.			
02:45	04:30	1.75				PICKED UP 2X50 ft RISER AND MADE UP.			
04:30	08:15	3.75				PICKED UP BOP, CHANGED OUT AX/VX RING GASKETS AND LOWER ONTO BEAMS. PICKED UP LMRP AND LATCHED ONTO BOP. INSTALLED GUIDELINES AND FUNCTION TESTED BOP'S.			
08:15	10:45	2.50				MADE UP 2X50 ft RISER ONTO BOP'S. RE-SPOOLED BLUE POD REEL TUGGER: WIRE LOOSE ON DRUM.			
10:45	11:45	1.00				TESTED CHOKE/KILL LINES TO 500/10000 psi.			
11:45	14:00	2.25				MADE UP 3RD JOINT RISER, PUP, SLIP JOINT AND LANDING JOINT.			
14:00	17:15	3.25				HOOKED UP CHOKE/KILL LINES ONTO SLIP JOINT. ATTACHED AND RELEASED TENSIONER RING. RE-ADJUSTED MRT LINES AS RING NOT SUPPORTED PROPERLY.			
17:15	19:15	2.00				MANOEUVRED RIG AND LANDED BOP. NO SIGN OF ROD INDICATOR MOVEMENT BUT TOOK CORRECT FLUID VOLUME. MADE 50kip OVERPULL ON WELLHEAD.			
19:15	21:45	2.50				STROKED OUT SLIP JOINT. LAID OUT LANDING JOINT. PICKED UP AND INSTALLED DIVERTER. RIGGED DOWN RISER RUNNING EQUIPMENT			
21:45	00:00	2.25				MADE UP AND RIH WITH TEST TOOL (4 STAND HWDP BELOW). TESTED BOP'S 500/3500 psi.			

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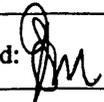
 Checked: 

Date: 20-Aug-93

Date	Day No.	Days From	Spud	From	To	Hours	Daily Operations
20/02/93	6	4	00:00	02:15	2.25	CONTINUED TO TEST BOP'S 500/3500 psi. UNABLE TO GET TEST ON LOWER PIPE RAM(VBR).	
			02:15	03:45	1.50	POH WITH TEST PLUG.PAINTED DP TO GET RAM IMPRESSION.RIH AND CLOSED LOWER PIPE RAM -STILL UNABLE TO TEST.POH-RAM NOT CLOSING	
			03:45	04:00	0.25	TESTED SHEAR RAM/CASING TO 500/1500 psi.	
			04:00	07:00	3.00	LAI D OUT 17 1/2" BHA. PICKED UP 12 1/4" BHA.	
			07:00	09:00	2.00	PREPARED TO PULL BOP'S DUE TO LOWER PIPE RAM PROBLEM. DECISION REVERSED.	
			09:00	09:30	0.50	RIH AND SET BORE PROTECTOR.	
			09:30	12:45	3.25	CONTINUED TO PICK UP 12 1/4" BHA AND RIH.	
			12:45	14:45	2.00	TAGGED FIRM CEMENT AT 319m.DRILLED CEMENT AND SHOETRACK TO 355m.	
			14:45	15:15	0.50	PUMPED 100 bbl GUAR GUM,100 bbl SEAWATER AND DISPLACED HOLE TO MUD.	
			15:15	15:30	0.25	REAMED RATHOLE TO 364m.	
			15:30	16:00	0.50	DRILLED 12 1/4" HOLE FROM 364-367m.	
			16:00	17:00	1.00	CIRCULATED HOLE CLEAN.	
			17:00	17:45	0.75	PULLED BACK INTO SHOE AND RAN LOT:EMW OF 1.24SG AT 100 psi WITH 1.07 SG MUD.	
			17:45	00:00	6.25	DRILLED 12 1/4" HOLE FROM 367-625m. HOLE CONDITION GOOD.	
			21/02/93	7	5	00:00	10:00
10:00	12:15	2.25				CIRCULATED HOLE CLEAN.	
12:15	14:15	2.00				POH.	
14:15	14:45	0.50				DUMPED MEMORY ON MWD.	
14:45	15:15					RIGGED UP FOR LOG SUITE #1.	
15:15	18:30	3.25				RUN #1 - DLL/MSFL/SDT/AMS/GR/CAL. TAGGED BOTTOM AT 1012.5m.	
22/02/93	8	6	18:30	00:00	5.50	RUN #2 - VSP.	
			00:00	04:00	4.00	CONTINUED RUN #2 - VSP.	
			04:00	08:00		RUN #3 CST. FIRED 30 SHOTS. 27 RECOVERED,6 MISFIRED,3 LOST.	
			08:00	09:00	1.00	WAIT ON DECISION TO RUN EXTRA CST.	
			09:00	09:15	0.25	RIGGED DOWN SCHLUMBERGER.	
			09:15	10:00	0.75	RECOVERED NOMINAL BORE PROTECTOR.	
			10:00	11:15	1.25	MADE UP CEMENT HEAD ON DP STAND AND RACKED BACK.MADE UP 9 5/8" HANGER/PLUGS ON DP STAND AND RACKED BACK.	
			11:15	12:00	0.75	RIGGED UP TO RUN CASING.	
			12:00	17:00	5.00	RAN 76 JOINTS 9 5/8" 47# P110 PLUS HANGER. RUN STRING: 2 JTS DP,2 STANDS 8"DC,1 STAND DP. HUNG UP AT 6m OFF BOTOM.	
			17:00	17:30	0.50	CIRCULATED CASING DOWN LAST 6m AND LANDED CASING AT 1007m.	
17:30	18:15	0.75	CIRCULATED CASING.				

Date	Day No.	Days From Spud	From To	Hours	Daily Operations
22/02/93	8	6	18:15 18:30	0.25	TESTED LINES TO 3500 psi.
			18:30 19:30	1.00	PUMPED 10 bbl SEAWATER (BOTTOM PLUG SHEARED AT 1100 psi). MIXED AND PUMPED 254 SX 1.9SG NEAT SLURRY. SHEARED TOP PLUG AT 2500psi. DISPLACED CASING WITH 223bbl MUD (6bb) OVER). PLUG DID NOT BUMP.
			19:30 19:45	0.25	SET SEAL ASSEMBLY.
			19:45 20:15	0.50	TESTED SEAL ASSEMBLY TO 3500 psi.
			20:15 00:00	3.75	TESTED BOP'S: UPPER PIPE RAM 500/10000 psi. ALL OTHERS 500/3500 psi.
			23/02/93	9	7	00:00 02:00	2.00	CONTINUED TO TEST BOP'S. LEAK IN BOTH ANNULARS-INCREASE CLOSING PRESURE TO 1800 psi TO GET TEST.
02:00 02:45	0.75	MADE 60000 lb O/P AND RECOVERED R/T.			
02:45 03:15	0.50	TESTED SHEAR RAM TO 500/3500 psi.			
03:15 03:45		SET 9 5/8" WEAR BUSHING.			
03:45 04:15		RIGGED DOWN CEMENTING EQUIPMENT.			
04:15 08:00	3.75	LAI D OUT 12 1/4" BHA. PICKED UP 8 1/2" BHA.			
08:00 08:30	0.50	DOWNLOADED MEMORY IN MWD AND TESTED.			
08:30 11:30	3.00	CONTINUED TO RIH WITH 8 1/2" BHA.			
11:30 11:45	0.25	TAGGED FIRM CEMENT AT 968m AND WASHED DOWN.			
11:45 15:00	3.25	TAGGED FLOAT AT 983m.DRILLED FIRM CEMENT. CLEANED OUT RATHOLE AND SURGED FOR JUNK.			
15:00 15:15	0.25	DRILLED 8 1/2" HOLE FROM 1017-1020m.			
15:15 15:30		CIRCULATED HOLE.			
15:30 16:45	1.25	PULLED INTO SHOE AND CARRIED OUT LOT TO 1.95SG EMW (1.08SG MUD,1257 psi PRESSURE)			
16:45 00:00	7.25	DRILLED 8 1/2" HOLE FROM 1020-1206m. HOLE CONDITION GOOD.			
24/02/93	10	8				00:00 03:00	3.00	DRILLED 8 1/2" HOLE FROM 1206-1238m.
			03:00 03:15	0.25	PIT INCREASE- FLOW CHECK. HOLE STATIC.
			03:15 00:00	20.75	DRILLED 8 1/2" HOLE FROM 1238-1593m. INCREASE IN TORQUE WHILE DRILLING SANDS FROM 1380m.
25/02/93	11	9	00:00 03:00	3.00	DRILLED 8 1/2" HOLE FROM 1593-1625m.
			03:00 07:30	4.50	PUMPED SLUG AND POH. TIGHT HOLE FROM 1518-1430m, 1390-1370m AND 1170-1160m AT 30-40kip OVERPULL,1160-1110m AT 90kip OVERPULL. 1110-1080m:40kip; 1080-1050m:80kip OVERPULL.
			07:30 08:00	0.50	DUMPED MWD MEMORY AND SURFACE TESTED SAME.
			08:00 09:15	1.25	BROKE OUT BIT #6 AND MADE UP BIT #7 - ATM22.
			09:15 09:45	0.50	SERVICED TDS.
			09:45 11:00	1.25	CONTINUED RIH.
			11:00 11:30	0.50	FILLED PIPE AND REAMED FROM 1567-1595m.
			11:30 12:00		REPAIRED LEAK IN WATER COOLING LINE ON TDS.
			12:00 12:45	0.75	WASHED AND REAMED FROM 1596-1625m.
			12:45 00:00	11.25	DRILLED 8 1/2" HOLE FROM 1625-1771m.
26/02/93	12	10	00:00 06:00	6.00	DRILLED 8 1/2" HOLE FROM 1771-1875m.SURVEYED.

File: ERI1_DAY

 Checked: 

Date: 20-Aug-93

Date	Day No.	Days From	Spud From	To	Hours	Daily Operations
26/02/93	12	10	06:00	07:00	1.00	CIRCULATED HOLE UNTIL SHAKERS CLEAN.
			07:00	09:30	2.50	PUMPED SLUG AND POH FOR 20 STAND WIPER TRIP. INTERMITTENT TIGHT HOLE FROM 1816-1352m. MAX OVERPULL 120kip AT 1643m, REMAINDER 60kip MAX
			09:30	10:15	0.75	CIRCULATED HOLE UNTIL SHAKERS CLEAN.
			10:15	13:45	3.50	PUMPED SLUG AND POH FOR LOGGING.
			13:45	14:15	0.50	RIGGED UP SCHLUMBERGER FOR SUITE #2 LOGS.
			14:15	18:00	3.75	RUN #1: DLL-MSFL-SDT-GR-SP-CAL-AMS.
			18:00	00:00	6.00	RUN #2 FMS-LDT-CNL-GR-AMS. TEMPORARILY STUCK AT 1867m. PULLED FREE WITH 5kip OVERPULL.
27/02/93	13	11	00:00	03:00	3.00	RUN#3-VSP. PROBLEM TRANSMITTING SIGNAL TO GUNS. POH.
			03:00	04:00	1.00	RIGGED DOWN VSP, RIGGED UP LOG #4-RFT.
			04:00	08:45	4.75	RUN #4-RFT'S. TOOK 6 PRETESTS.
			08:45	09:45	1.00	RIGGED DOWN RFT TOOL. RIGGED UP TO RERUN VSP.
			09:45	20:00	10.25	RE-RAN VSP.
			20:00	23:30	3.50	RUN #5-60 SHOT CST. 53 REC/4 LOST/3 MISSING
28/02/93	14	12	23:30	00:00	0.50	RIGGED DOWN SCHLUMBERGER.
			00:00	01:45	1.75	PICKED UP CEMENTING SUB. RIH TO 1100m.
			01:45	02:00	0.25	CIRCULATED HOLE CLEAN.
			02:00	02:30	0.50	SET ABANDONMENT PLUG #1 FROM 1100-900m WITH 55bbl, 1.9SG NEAT SLURRY. (270SX AND 32bbl MIXWATER). PUMPED 5bbl SPACER, 2bbl BEHIND.
			02:30	03:15	0.75	POH SLOWLY TO 800m.
			03:15	03:45	0.50	CIRCULATED BOTTOMS UP(ADD INHIBITOR TO MUD)
			03:45	08:00	4.25	LAI D OUT EXCESS HWDP AND BHA.
			08:00	09:30	1.50	RIH.TAGGED PLUG #1 AT 900m WITH 10kip. POH.
			09:30	11:00		MADE UP WEAR BUSHING RUNNING TOOL AND RIH. RETRIEVED 9 5/8" WEAR BUSHING.
			11:00	12:30	1.50	PICKED UP AND MADE UP C-9 CASING CUTTER ASSEMBLY. RAN SURFACE TEST AND RIH. COULD NOT PASS WELLHEAD.
			12:30	13:45	1.25	POH. RESECURED C-9 KNIVES AND RIH TO 180m.
			13:45	14:30	0.75	CUT 9-5/8" CASING AT 180m WITH 800psi AND 100RPM. AUDIBLE SEPARATION AND INCREASE IN TORQUE.
			14:30	15:30	1.00	POH AND LAID OUT C-9 CASING CUTTER ASSEMBLY.
			15:30	16:30		MADE UP CASING SPEAR AND RIH. PICKED UP 9-5/8" CASING WITH 40kip OVERPULL AND POH.
			16:30	17:30	1.00	LAI D OUT 9-5/8" HANGER, 6 JOINTS AND STUB.
17:30	18:30		RIGGED UP SCHLUMBERGER. RIH AND SET 13-3/8" BRIDGE PLUG AT 175m. POOH AND RIGGED DOWN.			
18:30	19:30	1.00	MADE UP CEMENTING SUB AND RIH TO 175m. TAGGED PLUG WITH 5kip. PULLED BACK TO 174m AND SET ABANDONMENT PLUG #2 FROM 174-124m WITH 24.5 bbl OF 1.9 NEAT 'G' SLURRY(120SX,14.3bbl MIXWATER).10bbl SPACER AHEAD, 6bbl BEHIND.			

Date	Day No.	Days From	Spud From	To	Hours	Daily Operations
28/02/93	14	12	19:30	20:00	0.50	POH TO 120m, REVERSE CIRCULATED 2xDP VOL., POH.
			20:00	20:15	0.25	RIH WITH JET SUB.
			20:15	21:00	0.75	FLUSHED/JETTED BOP AND CHOKE AND KILL LINES.
			21:00	21:15	0.25	POH WITH JET SUB AND LAID OUT SAME.
			21:15	23:00	1.75	RIGGED UP TO PULL BOP STACK.
01/03/93	15	13	23:00	00:00	1.00	LAID OUT DIVERTER.
			00:00	00:30	0.50	CONTINUED LAYING DOWN DIVERTER.
			00:30	11:30	11.00	MADE UP LANDING JOINT. CLOSED AND NIPPLED UP SLIP JOINT. DISCONNECTED BOP. RIGGED DOWN CHOKE AND KILL LINES. REALIGNED SUPPORT RING. LAID DOWN SLIP JOINT AND PULLED RISER. LANDED BOP'S ON MOONPOOL BEAMS.
			11:30	12:30	1.00	NIPPLED DOWN BOP'S.
			12:30	16:45	4.25	DISCONNECTED LMRP/BOP'S. SKIDDED ONTO STUMPS.
02/03/93	16	14	16:45	17:45	1.00	LAID OUT 2 BY 50ft RISER JOINTS.
			17:45	19:15	1.50	RIGGED DOWN RISER HANDLING EQUIPMENT.
			19:15	21:15	2.00	MADE UP C-13 CUTTER ASSEMBLY WITH 36" KNIVES. RIH TO 102m.
			21:15	00:00	2.75	CUT 20"/30" CASING WITH 60RPM AND 600psi.
			00:00	01:00	1.00	CONTINUED CUTTING 20"/30" CASING WITH 60RPM AND 600psi.
			01:00	01:15	0.25	ATTEMPTED TO PULL CASING.
			01:15	02:45	1.50	RECUT CASING AT 102m.
			02:45	03:15	0.50	ATTEMPTED TO PULL CASING.
			03:15	05:00	1.75	POH TO CHECK CUTTERS - FULL EXTENSION (35" MEASURED). MADE UP 52" KNIVES, RIH TO 102m.
			05:00	07:30	2.50	RIH TO 102m. RECUT WITH 60RPM AND 300psi MAX. TORQUE VARIABLE FROM 50-500AMPS.
			07:30	08:15	0.75	C-13 CASING CUTTER ASSEMBLY SHEARED AT MANDREL OF SWIVEL. POH. LENGTH OF FISH 5.08m. TOP OF FISH 1.74m INSIDE TOP OF WELLHEAD(99.24mRT).
			08:15	11:00	2.75	WAIT ON WEATHER. (UNABLE TO WORK ANCHORS) MADE UP 20" RUNNING TOOL AND RIH. RAN RIG S/S TV. VISIBILITY 0.5m - UNABLE TO STAB.
			11:00	13:30	2.50	WOW. JUMPED ROV INTO POSITION AND MONITORED VISIBILITY AND ATTEMPTED TO SEE WELLHEAD.
13:30	14:45	1.25	WOW. BROKEN HYDRAULIC LINE ON ROV. PULLED TO SURFACE. CONTINUED TO MONITOR VISIBILITY WITH RIG S/S TV.			
14:45	21:00	6.25	WOW. STABBED WELLHEAD RUNNING TOOL INTO 18 3/4" WELLHEAD. APPLIED 450kip MAX. OVERPULL AND CIRCULATED AT 400psi.			
21:00	00:00	3.00	WOW. POH WITH 18-3/4" W/H RUNNING TOOL. MADE UP FISHING TOOL AND RIH. STABBED INTO WELLHEAD AND SET DOWN ON FISH WITH 10kip. POH WITH FISH (18-3/4" GRAPPLE).			

Date	Day No.	Days From Spud	From	To	Hours	Daily Operations
03/03/93	17	15	00:00	01:30	1.50	DRESSED AND MADE UP 11-1/4" OVERSHOT AND 8-1/4" GRAPPLE. RIH.
			01:30	02:00	0.50	STABBED IN AND WORKED OVERSHOT. POH W/O FISH.
			02:00	03:30	1.50	RIH WORKED OVERSHOT AND POH.
			03:30	04:15	0.75	MODIFIED MILL CONTROL. MADE UP SAME.
			04:15	04:45	0.50	RIH TO WELLHEAD.
			04:45	06:15	1.50	ROV LOST CLUMP WEIGHT. RAN RIG S/S TV AND STABBED IN. WORKED OVERSHOT AND POH. RETRIEVED MANDREL SLEEVE.
			06:15	06:45	0.50	LAI D OUT 11-1/4" OVERSHOT. SERVICE BROKE AND LAI D OUT 9-5/8" CASING SPEAR.
			06:45	08:00	1.25	LAI D OUT 6 x 8" DRILL COLLARS AND MADE UP 8-1/8" OVERSHOT WITH 6-1/4" GRAPPLE.
			08:00	12:00	4.00	RIH TO WELLHEAD. STABBED IN WITH S/S TV AND RETRIEVED REMAINING FISH. (20"/30" CASING CUTTER-KNIVES OPENED TO 38")
			12:00	16:45	4.75	PREPARED AND RAN IN TO BLOW WELLHEAD. LANDED T-BAR IN WELLHEAD AND SECURED.
			16:45	21:15	4.50	DE-BALLASTED RIG.
			21:15	00:00	2.75	PREPARED AND MOVED RIG OFF LOCATION. 130m AFT - ALL STOP AT 2300HRS. CLAMPED #1 GUIDE LINE TO BLUE POD LINE (#1 GUIDE LINE TOO SHORT). PUT #2 AND #3 GUIDE LINES BACK ON SHEAVES.
			04/03/93	18	16	00:00
00:45	01:45	1.00				REPAIRED OIL LEAK ON #7 ANCHOR WINCH.
01:45	02:00	0.25				CONTINUED MOVING OFF LOCATION.
02:00	03:30	1.50				SURFACE INSTRUMENT INDICATED SHOT FIRED. MOVED BACK ON LOCATION.
03:30	04:00	0.50				RIGGED DOWN AND RECOVERED FIRING MECHANISM. DID NOT FIRE. BROKEN WIRE BETWEEN T-BAR AND CANISTERS.
04:00	06:30	2.50				REPAIRED BROKEN WIRE.
06:30	09:00					PREPARED AND RAN CANISTERS.
09:00	12:15	3.25				MOVED OFF LOCATION.
12:15	14:45	2.50				DETONATED CHARGE. GOOD SURFACE AND AUDIBLE INDICATION. MOVED BACK OVER LOCATION.
14:45	15:00	0.25				LAI D DOWN DETONATING CABLE AND PULLED T-BAR TO SURFACE.
15:00	16:15	1.25				MADE UP 18-3/4" WELLHEAD RUNNING TOOL. RIH.
16:15	18:15	2.00				LATCHED INTO WELLHEAD AND RETRIEVED 20"/30" CASING AND PGB WITH 15kip OVERPULL.
18:15	00:00	5.75				PASSED #3 PENNANT TO FS AT 1944HRS ANCHOR RACKED 2220HRS. PENNANT SECURED 2233HRS. PASSED #4 PENNANT TO MB AT 2005HRS. ANCHOR RACKED 2310HRS. PENNANT SECURED 2320HR. ANCHORS #2 & #5 LOWERED TO SEABED.
05/03/93	19	17	00:00	23:11	23.18	WORKED ANCHORS AS FOLLOWS:

Date	Day No.	Days From	Spud From	To	Hours	Daily Operations
05/03/93	19	17	00:00	23:11		PAID OUT 250M ANCHORS #2 AND #5. SKIDDED RIG 200M TO PORT FROM 0044-0115HRS. BV - #8 PENNANT PASSED @ 0145HRS. ANCHOR ON DECK @ 0215HRS. ANCHOR CHANGED OUT TO 0357HRS. RACKED @ 0430HRS. PENNANT SECURED @ 0445HRS. - #9 PENNANT PASSED @ 0450HRS. ANCHOR RACKED @ 0628HRS. PENNANT SECURED @ 0645HRS. - #10 PENNANT PASSED @ 1314HRS. ANCHOR RACKED @ 1518HRS AFTER FITTING ANCHOR, SWIVEL AND PENNANT. PENNANT SECURED AT 1527HRS. - #11 PENNANT PASSED @ 1535HRS. ANCHOR RACKED @ 1658HRS. PENNANT SECURED @ 1712HRS. - #12 J-HOOKED @ 1833HRS. ANCHOR DETACHED FOR TOWING @ 2348HRS. FS - J-HOOKED #2. ON DECK @ 0247HRS. FITTED SWIVEL AND PENNANT. COMPLETED @ 0842HRS. ANCHOR RACKED @ 0954HRS. PENNANT SECURED @ 1002HRS. - J-HOOKED #5. ON DECK @ 1122HRS. FITTED SWIVEL AND PENNANT. COMPLETED @ 1552HRS. ANCHOR RACKED @ 1619HRS. PENNANT SECURED @ 1625HRS. - #6 PENNANT PASSED @ 1907HRS. ANCHOR RACKED @ 2223HRS. PENNANT SECURED @ 2231HRS. - #1 PENNANT PASSED @ 2245HRS.
06/03/93	20	18	23:11	00:00	0.82	ANCHOR HANDLING NON PRODUCTIVE TIME
			00:00	03:30	3.50	PULLED ANCHORS AS FOLLOWS: FS - #1 PENNANT PASSED 2245HRS. DETACHED ANCHOR FOR TOWING @ 0150HRS. RIG - #7 PULLED @ 0205HRS. ANCHOR RACKED @ 0342HRS. RIG RELEASED TO MINERVA-1 AT 0330HR.

SECTION 3



FINAL DRILLING REPORT

3.0 MUD SUMMARY BY HOLE SECTION

ERIC THE RED-1

Hole Size (in)	Interval (mRT)	Type	Density (S.G.)		Viscosity (sec/L)		PV (cp)		YP (lbs/100ft ²)		Gels				KCl (%)	Fluid Loss (cc)
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.0	Max.0	Min. 10	Max. 10		
36"	137.0	SEAWATER+HI-VIS	1.03	1.03	100	100										
17.5"	370.0	SEAWATER+HI-VIS	1.03	1.03	100	100										
12.25"	1017.0	KCL PHPA	1.08	1.10	53	58	15	18	18	22	3	3	4	4	6.4	7
8.5"	1875.0	KCL PHPA	1.08	1.10	50	58	15	19	18	24	3	4	4	6	7.4	7

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Checked:

Date:

24-Aug-93



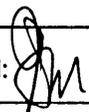
FINAL DRILLING REPORT

3.1 MUD PROPERTIES RECORD

ERIC THE RED-1

Date	Depth (m)	Temp. (degC)	Density (S.G.)	Viscosity (sec/l)	PV (Cp)	YP (lb/100 ft ²)	Gels		API W.L. (ml)	HTHP W.L. (ml)	Filter Cake (1/32 in)	MBT (lb/bbl)	pH	%Solid	%H2O	%Sand	MF	Ca+ (mg/L)	Cl- (mg/L)	K+ (mg/L)	%KCl	
							0	10														
17/02/93	370		1.03	100									9.5									
18/02/93	370		1.02	100									9.5									
19/02/93	370		1.03	88	25	40	8	9	20		1		9.3	1.8	98.2		0.80	140	23000	20000	4.0	
20/02/93	625	30	1.08	53	18	22	3	4	7		1	5.0	9.5	5.0	95	0.75	0.90	240	33000	33930	6.3	
21/02/93	1017	33	1.1	53	15	22	3	4	6		1	6.0	9.3	6.1	93.9	1.75	0.60	145	38000	33300	6.4	
22/02/93	1017		1.08	58	16	18	3	4	7		1	6.0	9.2	5.0	95	0.10	1.00	300	38000	33000	6.0	
23/02/93	1206	32	1.08	50	15	20	3	4	7		1	5.0	10.2	5.0	95	0.50	0.80	110	37000	31600	6.0	
24/02/93	1593	39	1.08	55	18	24	4	5	6		1	6.0	9.0	5.0	95	0.50	0.70	110	41000	36000	6.0	
25/02/93	1625	38	1.09	55	15	18	3	4	5		1	6.0	9.0	5.8	94.2	0.50	0.60	240	40000	38000	7.2	
25/02/93	1652	38	1.1	51	16	20	3	4	5		1	8.0	9.0	6.0	94	0.25	0.50	280	40000	38000	7.2	
25/02/93	1781	41	1.09	52	16	22	4	5	5.2		1	8.0	9.3	6.0	94	0.10	0.50	280	39000	38400	7.3	
26/02/93	1875	40	1.1	54	19	21	4	6	5.2		1	8.0	9.0	6.0	94	0.50	0.30	280	41000	39000	7.4	
27/02/93	1875		1.1	58	18	21	4	6	5.2		1	8.0	9.0	6.0	94	0.01	0.30	200	41000	39000	7.4	

File: ERII_MUD

Checked: 

Date: 20-Aug-93



PRODUCT	UNIT SIZE	QUANTITY
ALCOMER 120	25.00 KG	94
AMITEC	55.00 GAL	1
BIOLOSE	25.00 KG	40
CAUSTIC SODA	25.00 KG	9
CITRIC ACID	25.00 KG	2
KCL (bulk)	1.00 MT	41
LIME	25.00 KG	13
MILBAR BULK	100.00 LB	374
MILBIO	5.00 GAL	26
MILGEL	25.00 KG	2
MILGEL BULK	100.00 LB	392
MILGUAR	25.00 KG	108
MILGUAR-C	2.00 LB	34
MILPAC	25.00 KG	104
NOXYGEN	25.00 KG	46
POT HYDROXIDE	25.00 KG	23
SODA ASH	25.00 KG	14
SODIUM BICARB	25.00 KG	24
UNICAL	25.00 KG	2
WO DEFOAM	20.00 LT	4
XCD POLYMER	25.00 KG	35

36" HOLE

PRODUCT	UNIT SIZE	QUANTITY
CAUSTIC SODA	25.00 KG	2
MILBAR BULK	100.00 LB	265
MILBIO	5.00 GAL	3
MILGEL BULK	100.00 LB	243
MILGUAR	25.00 KG	78
MILGUAR-C	2.00 LB	24
SODA ASH	25.00 KG	4
UNICAL	25.00 KG	2
WO DEFOAM	20.00 LT	3



17.5" HOLE

PRODUCT	UNIT SIZE	QUANTITY
MILGEL BULK	100.00 LB	29
MILGUAR	25.00 KG	30
MILGUAR-C	2.00 LB	10
SODA ASH	25.00 KG	2

12.25" HOLE

PRODUCT	UNIT SIZE	QUANTITY
ALCOMER 120	25.00 KG	71
BIOLOSE	25.00 KG	40
CAUSTIC SODA	25.00 KG	2
KCL (bulk)	1.00 MT	33
MILBIO	5.00 GAL	23
MILGEL BULK	100.00 LB	60
MILPAC	25.00 KG	104
NOXYGEN	25.00 KG	16
POT HYDROXIDE	25.00 KG	23
SODA ASH	25.00 KG	5
SODIUM BICARB	25.00 KG	4
XCD POLYMER	25.00 KG	21

8.5" HOLE

PRODUCT	UNIT SIZE	QUANTITY
ALCOMER 120	25.00 KG	23
CAUSTIC SODA	25.00 KG	5
CITRIC ACID	25.00 KG	2
KCL (bulk)	1.00 MT	8
LIME	25.00 KG	13
MILBAR BULK	100.00 LB	109
MILGEL	25.00 KG	2
MILGEL BULK	100.00 LB	60
NOXYGEN	25.00 KG	25
SODA ASH	25.00 KG	3
SODIUM BICARB	25.00 KG	20
WO DEFOAM	20.00 LITRE	1
XCD POLYMER	25.00 KG	14

SECTION 4



FINAL DRILLING REPORT

4.0 BIT RECORD

ERIC THE RED-1

Bit No	Run No	Size	Bit Type	Jets						Depth	Total Metres	Total Hours	ROP (m/hr)	WOB (Kips)	RPM	Pump gpm / psi	IADC Bit Grading
		Make	Serial No.	TFA						In / Out							Comments
1	1	26	S3SJ	24	24	24	-	-	-	100	16.0	2.25	7.1	5.0 / 10.0	50 / 60	1000 / 300	1.1.NO.A.1.I.NO.TD
		SECURITY	595343	1.33						116							
2	2	9.875	S44GF	16	16	16	-	-	-	116	254.0	6.00	42.3	10.0 / 15.0	120 / 120	1166 / 1150	1.1.NO.A.1.I.NO.TD
		SEC	530370	0.59						370							
1RR	3	26	S3SJ	24	24	24	-	-	-	116	21.0	1.75	12.0	10.0 / 20.0	90 / 120	1060 / 1250	2.2.NO.A.E.I.NO.TD
		SECURITY	595343	1.33						137							
3	4	17.5	SS44G	18	18	18	-	-	-	137	227.0	4.00	56.8	10.0 / 40.0	60 / 160	1060 / 2900	1.1.NO.A.1.I.NO.TD
		SECURITY	500510	0.75						364							
4	5	12.25	ATM11H	18	16	13	-	-	-	364	653.0	16.75	39.0	5.0 / 25.0	120 / 140	670 / 1800	2.2.EC.G.E.1.FC.TD
		HUGHES	K18ES	0.57						1017							18,16 EXTENDED
5	6	8.5	ATM22	10	10	14	-	-	-	1017	608.0	34.25	17.8	0.0 / 30.0	/ 115	400 / 2250	4.8.PB.A.F.13.CI.TQ
		HUGHES	N25BD	0.3						1625							
6	7	8.5	ATM22	10	10	14	-	-	-	1625	250.0	17.25	14.5	30.0 / 30.0	/ 110	400 / 2150	4.8.BT.H.E.I.RG.LOG
		HUGHES	B06EN	0.3						1875							

File: ERI1_BIT		Checked:	Date: 23-Aug-93
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4.1 BHA SUMMARY
ERIC THE RED-1

BHA Name: 1:36"BHA Depth In: 100 m. Depth Out: 116 m.

Purpose: DRILL 36" HOLE

<u>Joins</u>	<u>BHA Item</u>	<u>O.D.</u>	<u>Length</u>
1	BIT	26.000	0.56
1	HO HOLE OPENER	9.000	1.89
1	FS FLOAT SUB	9.000	3.93
3	DC95 DRILL COLLAR 9.5IN	9.500	27.49
1	XO CROSS OVER	8.000	0.79
6	DC8 DRILL COLLAR 8IN	8.000	54.95
1	XO CROSS OVER	6.500	0.58
Total BHA Length :			<u>90.19</u>

BHA Name: 2:9.875"BHA Depth In: 116 m. Depth Out: 370 m.

Purpose: DRILL PILOT HOLE

<u>Joins</u>	<u>BHA Item</u>	<u>O.D.</u>	<u>Length</u>
1	BIT	9.875	0.26
1	FS FLOAT SUB	8.000	1.21
6	DC8 DRILL COLLAR 8IN	8.000	54.98
1	XO CROSS OVER	6.500	0.58
Total BHA Length :			<u>57.03</u>

BHA Name: 3: 36" BHA Depth In: 116 m. Depth Out: 137 m.

Purpose: OPEN 9 7/8" TO 36"

<u>Joins</u>	<u>BHA Item</u>	<u>O.D.</u>	<u>Length</u>
1	BIT	26.000	0.56
1	HO HOLE OPENER	9.000	1.89
1	FS FLOAT SUB	9.000	3.93
3	DC95 DRILL COLLAR 9.5IN	9.500	27.49
1	XO CROSS OVER	8.000	0.79
6	DC8 DRILL COLLAR 8IN	8.000	54.95
1	XO CROSS OVER	6.500	0.58
Total BHA Length :			<u>90.19</u>

BHA Name: 4: 17.5"BHA Depth In: 137 m. Depth Out: 364 m.

Purpose: REAM OUT 9 7/8"HOLE

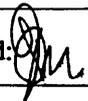
<u>Joins</u>	<u>BHA Item</u>	<u>O.D.</u>	<u>Length</u>
1	BIT	17.500	0.44
1	FS FLOAT SUB	9.000	1.48
2	DC95 DRILL COLLAR 9.5IN	9.500	18.26
1	SS STRING STABILIZER	9.000	1.80
1	DC95 DRILL COLLAR 9.5IN	9.500	9.23
1	XO CROSS OVER	8.000	0.79
9	DC8 DRILL COLLAR 8IN	8.000	83.12
1	XO CROSS OVER	6.500	0.58
Total BHA Length :			<u>115.70</u>

BHA Name: 5: 12.25"BHA Depth In: 364 m. Depth Out: 1017 m.

Purpose: DRILL 12.25"BHA

<u>Joins</u>	<u>BHA Item</u>	<u>O.D.</u>	<u>Length</u>
--------------	-----------------	-------------	---------------

File: ERI1_BHA

Checked: 

Date: 20-Aug-93

4.1 BHA SUMMARY
ERIC THE RED-1

1	BIT	12.250	0.30
1	NBR NB ROLLER REAMER	8.000	2.46
1	ST SHOCK TOOL	8.000	3.85
1	SRR STRING ROLLER REAMR	8.000	2.36
1	XO CROSS OVER	8.000	0.50
1	MWD TOOL	8.750	12.38
1	SS STRING STABILIZER	8.000	1.41
9	DC8 DRILL COLLAR 8IN	8.000	83.12
1	PONY COLLAR	8.000	2.74
1	DJAR DRILLING JARS	8.063	5.61
2	DC8 DRILL COLLAR	7.875	18.42
1	XO CROSS OVER	8.125	0.58
1	HWDP HEVI-WATE DRL PIPE	5.000	8.84
1	DIDS DROP-IN DART SUB	6.438	0.69
11	HWDP HEVI-WATE DRL PIPE	5.000	125.12
Total BHA Length:			268.38

BHA Name: 6:8.5" BHA

Depth In: 1017 m.

Depth Out: 1625 m.

Purpose: DRILL 8.5" HOLE

<u>Joins</u>	<u>BHA Item</u>	<u>O.D.</u>	<u>Length</u>
1	BIT	8.500	0.24
1	JS JUNK SUB	6.500	0.79
1	NBR NB ROLLER REAMER	6.500	1.84
1	XO CROSS OVER	6.500	0.35
1	MWD TOOL	6.750	12.83
1	SS STRING STABILIZER	6.500	1.77
15	DC65 DRILL COLLAR 6.5IN	6.500	138.07
1	PONY COLLAR	8.000	3.07
1	DJAR DRILLING JARS	6.563	5.40
2	DC65 DRILL COLLAR 6.5IN	6.500	18.35
1	HWDP HEVI-WATE DRL PIPE	5.000	8.84
1	DIDS DROP-IN DART SUB	6.438	0.69
14	HWDP HEVI-WATE DRL PIPE	5.000	125.12
Total BHA Length:			317.36

BHA Name: 7. 8.5" BHA

Depth In: 1625 m.

Depth Out: 1875 m.

Purpose: DRILL 8.5" HOLE

<u>Joins</u>	<u>BHA Item</u>	<u>O.D.</u>	<u>Length</u>
1	BIT	8.500	0.24
1	JS JUNK SUB	6.500	0.79
1	NBR NB ROLLER REAMER	6.500	1.84
1	XO CROSS OVER	6.750	0.35
1	MWD TOOL	6.500	12.83
1	SS STRING STABILIZER	6.500	1.77
15	DC65 DRILL COLLAR 6.5IN	6.500	138.07
1	PONY COLLAR	5.000	3.07
1	DJAR DRILLING JAR	6.563	5.40
2	DC65 DRILL COLLAR 6.5IN	6.500	18.35
1	HWDP HEVI-WATE DRL PIPE	5.000	8.84
1	DIDS DROP-IN DART SUB	6.438	0.69
14	HWDP HEVI-WATE DRL PIPE	5.000	125.12
Total BHA Length:			317.36



4.2 DEVIATION SURVEYS

ERIC THE RED-1

Depth	Angle	Azimuth	Method	Missrun
137	1	0	Totco Punch	
364	1	0	Totco Punch	
370	0.5	0	Totco Punch	
397	1.1	309	MWD	
542	1.3	273	MWD	
718	0.8	302	MWD	
891	0.4	210	MWD	
1001	0.4	221.2	MWD	
1150	0.1	115.4	MWD	
1292	0.3	110.2	MWD	
1439	0.4	355.2	MWD	
1584	0.7	145	MWD	
1728	0.4	203	MWD	
1867	1.1	229.7	MWD	

SECTION 5



5.0 CASING REPORT - 30" CASING

ERIC THE RED-1

Hole Size	: 36 in	Total Depth	: 137 m	Casing Flange / Wellhead	
Weight in Slips	: 39000 lbs	Time Landed	: 03:15 hrs	Type	: W/H
R.T. to Wellhead	: 98.55 m	Casing Shoe at	: 137 m	Manufacturer	: DRILQUIP
R.T. to Mudline	: 100.5 m	Top of Casing	: 98.55 m	Model	: SS10
Water Depth	: 75.1 m	Casing Cut-Off	: 0 m	Size	: 18.75 in
Air Gap	: 25.4 m	Liner Overlap	: 0 m	Rating	: 10000 psi

PIPE INFORMATION

Description	Manufacturer	Size	Weight	Grade	Cnd	Threads	Joints	Length	Interval
CASING SHOE	DRILQUIP	30	310	B	1	SF60	1	12.96	137 - 124.04
CASING JOINT	DRILQUIP	30	310	B	1	SF60	1	12.58	124.04 - 111.46
HOUSING	DRILQUIP	30	450	B	1	SF60	1	12.91	111.46 - 98.55

Mud Type	: SEAWATER+HI-VIS	Avg. Make Up Torque	: 0 ft.lbs.	Avg. Drag	: 0 kips
Density	: 1.03 S.G.	Movement	:	Max. Drag	: 0 kips
Viscosity	: 100	RPM	: 0	Fluid Lost	: No
PV / YP	: 0 / 90	Avg. Torque Rot.	: 0 ft.lbs.	Percent Lost	: 0 %.
API W.L	: 0	Max. Torque Rot.	: 0 ft.lbs.	Volume Lost	: 0 bbl
Filled Each	: 3 jts	Moved until Bumped	: No		
Cementer	: D.WINN				
Remarks	: RAN 2 JT DP STINGER BELOW R/T.				

5.0 CASING REPORT - 13.375" CASING
ERIC THE RED-1

Hole Size	: 17.5 in	Total Depth	: 364 m	Casing Flange / Wellhead	
Weight in Slips	: 51000 lbs	Time Landed	: 21:30 hrs	Type	: W/H
R.T. to Wellhead	: 97.68 m	Casing Shoe at	: 355.37 m	Manufacturer	: DRILQUIP
R.T. to Mudline	: 100.5 m	Top of Casing	: 97.68 m	Model	: SS10
Water Depth	: 75.1 m	Casing Cut-Off	: 0 m	Size	: 18.75 in
Air Gap	: 25.4 m	Liner Overlap	: 0 m	Rating	: 10000 psi

PIPE INFORMATION

Description	Manufacturer	Size	Weight	Grade	Cnd	Threads	Joints	Length	Interval
CASING SHOE	SUMITOMO	13.375	68	N-80	111	BTC	1	12.3	355.37 - 343.07
BAKERLOK	SUMITOMO	13.375	68	N-80	1	BTC	1	11.7	343.07 - 331.34
FLOAT	SUMITOMO	13.375	68	N-80	1	BTC	1	12.15	331.34 - 319.19
BAKERLOK	SUMITOMO	13.375	68	N-80	1	BTC	2	23.6	319.19 - 295.59
CASING JOINT	SUMITOMO	13.375	68	N-80	1	BTC	16	190.88	295.59 - 104.71
CASING CROSS OVER	DRILQUIP	13.375	68	X-56	1	BTCHD90	1	0.56	104.71 - 104.15
HOUSING	DRILQUIP	18.75	130	X-56	1	HD90	1	6.47	104.15 - 97.68

ACCESSORIES INFORMATION

Item	Type	Manufacturer	Number	Spacing	Interval
CENTRALIZER	BOWSPRING CENT.	HOWCO	3	6	355.37 - 337

Mud Type : SEAWATER+HI-VIS Avg. Make Up Torque : 9000 ft.lbs. Avg. Drag : 0 kips
 Density : 1.02 S.G. Movement : Max. Drag : 0 kips
 Viscosity : 100 RPM : 0 Fluid Lost : No
 PV / YP : 0 / 90 Avg. Torque Rot. : 0 ft.lbs. Percent Lost : 0 %
 API W.L. : 0 Max. Torque Rot. : 0 ft.lbs. Volume Lost : 0 bbl
 Filled Each : 5 jts Moved until Bumped : No
 Cementer : D. WINN
 Remarks : NON-ROTATING FLOAT COLLAR USED.PLUG DID NOT BUMP.
 NO SIGN OF TOP PLUG SHEARING-DART DISPLACED AT 3.6 BBL/MIN.
 POSSIBILITY THAT THIS RATE IS HIGH.



5.0 CASING REPORT - 9.625" CASING

ERIC THE RED-1

Hole Size	: 12.25 in	Total Depth	: 1017 m	Casing Flange / Wellhead	
Weight in Slips	: 120000 lbs	Time Landed	: 17:30 hrs	Type	: W/H
R.T. to Wellhead	: 97.68 m	Casing Shoe at	: 1007.2 m	Manufacturer	: DRILQUIP
R.T. to Mudline	: 100.5 m	Top of Casing	: 98.28 m	Model	: SS10
Water Depth	: 75.1 m	Casing Cut-Off	: 0 m	Size	: 18.75 in
Air Gap	: 25.4 m	Liner Overlap	: 0 m	Rating	: 10000 psi

PIPE INFORMATION

Description	Manufacturer	Size	Weight	Grade	Cnd	Threads	Joints	Length	Interval
SHOE	SUMITOMO	9.625	47	N-80	1	NEW VAM	1	12.45	1007.2 - 994.75
BAKERLOK	SUMITOMO	9.625	47	N-80	1	NEW VAM	1	11.94	994.75 - 982.81
FLOAT	SUMITOMO	9.625	47	N-80	1	NEW VAM	1	12.2	982.81 - 970.61
BAKERLOK	SUMITOMO	9.625	47	N-80	1	NEW VAM	1	11.98	970.61 - 958.63
BAKERLOK	SUMITOMO	9.625	47	N-80	1	NEW VAM	1	11.99	958.63 - 946.64
CASING JOINT	SUMITOMO	9.625	47	N-80	1	NEW VAM	71	843.53	946.64 - 103.11
CASING HANGER	DRILQUIP	9.625	53.5	N-80	1	NEW VAM	1	4.83	103.11 - 98.28

ACCESSORIES INFORMATION

Item	Type	Manufacturer	Number	Spacing	Interval
CENTRALIZER	BOWSPRING CENT.	HOWCO	6	12	1007 - 935

Mud Type	: KCL PHPA	Avg. Make Up Torque	: 15000 ft.lbs.	Avg. Drag	: 0 kips
Density	: 1.1 S.G.	Movement	:	Max. Drag	: 0 kips
Viscosity	: 53	RPM	: 0	Fluid Lost	: Yes
PV / YP	: 15 / 22	Avg. Torque Rot.	: 0 ft.lbs.	Percent Lost	: 0 %.
API W.L	: 6	Max. Torque Rot.	: 0 ft.lbs.	Volume Lost	: 25 bbl
Filled Each	: 10 jts	Moved until Bumped	: No		
Ccmenter	: D. WINN				
Remarks	: TOP PLUG SHEARED AT 1100 PSI. BOTTOM PLUG SHEARED AT 2500 PSI. PLUG DID NOT BUMP. OVERDISPLACED BY SHOETRACK AMOUNT. RUN STRING:R/T,2 JTS DP,2 STANDS 8"DC,1 STAND DP.				

5.1 CEMENTING REPORT - 30" CASING
ERIC THE RED-1

Job Type : 30" CASING	Started : 04:05 Hrs, 18/02/93	Completed : 04:30 Hrs, 18/02/93
Cementer : DAVID WINN	CBL Log : No	Returns : Yes
Cemented	CET Run : No	Total No. of Stages : 01
Interval : 100 - 137 m.	BHT Log : No	Time WOC : 0hrs, 0

HOLE DESCRIPTION					LEAK OFF INFORMATION	
FROM	TO	SIZE	% OVER	DISP. EFF.		
100	137	36	10		Casing Test : 0 psi.	For : 0 min.
					Drilled : 0 m.	of New : 0 in. hole
					Leak Off Test : 0 psi.	with : 0 S.G. mud
					at a depth of : 0 m.	Equivalent Fluid : 0 S.G.
						Density
						Pressure at Test : 0 psi.
						Depth

STAGE INFORMATION							
Stage Number : 001 of 01	Stage Type : 30" CASING	Planned Interval : 100 to 137 m.					
Drill String : 137 m.	Tool Depth : m.	Drill String Pressure Initial : psi.	Final : psi.				
Depth		Annular Pressure Initial : psi.	Final : psi.				
Started Mixing : 04:05 Hrs.	Completed : 04:30 Hrs.	Mixing Rate : 210 gpm.	Mixing Pressure : 270 psi.				
Break Pressure : psi.	Time Circ. at Btm. : 0 Hrs.	Circulat. Rate : 510 gpm.	Circulating Pressure : 150 psi.				
Displaced with : 18 bbls of SEAWATER	Fluid Wt. : 1.03 S.G.	Top Plug : No	Bottom Plug : No				
Plug Down : 04:30 Hrs, 18/02/93	Bumped : No	Bled Off to : psi.					
Disp Rate Initial : 227	Final : 227	Min :	Max :	gpm			
Disp Press Initial : 110	Final : 110	Min :	Max :	psi.			
Lost Cir. : No	% Lost : 0	Volume : 0 bbl.	Foam Cmt : No	N2 : 0	Start : 0	End : 0 scfn/bt	Tot : 0 scf
Fluid Vol. Total : 211	Fluid Vol. Returned :	Slurry Vol. Total : 93.4	Slurry Vol. Returned :				
First Preflush Used : 100 bbls of SEAWATER	Fluid Wt. : 1.03 S.G.	Additives :					
Second Preflush Used : bbls of	Fluid Wt. : S.G.	Additives :					
Time stage Started :	Time stage Completed :	Hours Before Open :	Circ. Btwn Stages :				
Time Broke Cir. :	Time Pipe Move Start :	Time Pipe Move End :	Time Release Plug :				

COMMENTS
ADDED 2% BWOC CALCIUM CHLORIDE

Stage Number	001
Fluid Number	001
Fluid Description	TAIL SLURRY
Fluid Type	LOW WATER LOSS
Fluid Class	CLASS G
Amount (sacks)	456
Volume (bbl)	93.4
Yield (ft ³ /sx)	1.15
Excess (%)	100
Caliper / Open Hole	0
From / To (m)	100 / 137
Designed Top (m)	100
Density	1.9
Thickening Time (hrs)	
Water Req'd (bbl)	54
Water Used (gal/sack)	5
Water Source	SEAWATER
Total Vol. Mixed (bbl)	93.4
Volume Pumped (bbl)	93.4
Volume in Well (bbl)	
Comp. Strength (lbs)	
Time (hrs)	
Temp (°C)	
Comp. Strength (lbs)	0
Time (hrs)	
Temp (°C)	
BHST (°C)	
BHCT (°C)	
Outside Temp (°C)	
Additives	0 of 2 % CALCIUM CHLOR.

**5.1 CEMENTING REPORT - 13-3/8" CASING****ERIC THE RED-1**

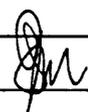
Job Type : 13-3/8" CASING Started : 22:38 Hrs, 18/02/93 Completed : 23:15 Hrs, 18/02/93
Cementer : D. WINN CBL Log : No Returns : Yes
Cemented CET Run : No Total No. of Stages : 01
Interval : 100 - 355 m. BHT Log : No Time WOC : 0hrs, 0

HOLE DESCRIPTION					LEAK OFF INFORMATION	
FROM	TO	SIZE	% OVER	DISP. EFF.		
100	355	17.5	50		Casing Test : 500 psi.	For : 10 min.
					Drilled : 3 m.	of New : 12.25 in. hole
					Leak Off Test : 92 psi.	with : 1.06 S.G. mud
					at a depth of : 355 m.	Equivalent Fluid : 1.24 S.G.
						Density
						Pressure at Test : 622 psi.
						Depth

STAGE INFORMATION							
Stage Number	: 001 of 01	Stage Type	: 13.375" TAIL	Planned Interval	: 100 to 355 m.		
Drill String Depth	: 364 m.	Tool Depth	: m.	Drill String Pressure Initial	: psi.	Final	: psi.
				Annular Pressure Initial	: psi.	Final	: psi.
Started Mixing	: 22:58 Hrs.	Completed	: 23:15 Hrs.	Mixing Rate	: 300 gpm.	Mixing Pressure	: 500 psi.
Break Pressure	: psi.	Time Circ. at Btm.	: .5 Hrs.	Circulat. Rate	: 370 gpm.	Circulating Pressure	: 400 psi.
Displaced with	: 118 bbls of SEAWATER	Fluid Wt.	: 1.03 S.G.	Top Plug	: Yes	Bottom Plug	: Yes
Plug Down	: 00:00 Hrs, 18/02/93	Bumped	: No	Bled Off to	: psi.		
Disp Rate Initial	: 300	Final	:	Min	:	Max	: gpm
Disp Press Initial	: 700	Final	:	Min	:	Max	: psi.
Lost Cir.	: No	% Lost	: 0	Volume	: 0 bbl.	Foam Cmt	: No
				N2	: 0	Start	: 0
				End	: 0 scfn/bt	Tot	: 0 scf
Fluid Vol. Total	: 333	Fluid Vol. Returned	:	Slurry Vol. Total	: 102	Slurry Vol. Returned	:
First Preflush Used	: 113 bbls of LEAD SLURRY	Fluid Wt.	: 1.5 S.G.	Additives	: 0.55gal/sx ECONOLI		
Second Preflush Used	: bbls of	Fluid Wt.	: S.G.	Additives	:		
Time stage Started	:	Time stage Completed	:	Hours Before Open	:	Circ. Btwn Stages	:
Time Broke Cir.	:	Time Pipe Move Start	:	Time Pipe Move End	:	Time Release Plug	:

COMMENTS

50% EXCESS ON TAIL SLURRY VOLUME

File: ERI1_CSG	Checked: 	Date: 20-Aug-93
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Stage Number	001
Fluid Number	001
Fluid Description	TAIL SLURRY
Fluid Type	LOW WATER LOSS
Fluid Class	CLASS G
Amount (sacks)	500
Volume (bbl)	102
Yield (ft ³ /sx)	1.15
Excess (%)	50
Caliper / Open Hole	0
From / To (m)	100 / 355
Designed Top (m)	100
Density	1.9
Thickening Time (hrs)	
Water Req'd (bbl)	59.5
Water Used (gal/sack)	5
Water Source	SEAWATER
Total Vol. Mixed (bbl)	102
Volume Pumped (bbl)	102
Volume in Well (bbl)	102
Comp. Strength (lbs)	
Time (hrs)	
Temp (°C)	
Comp. Strength (lbs)	
Time (hrs)	
Temp (°C)	
BHST (°C)	
BHCT (°C)	
Outside Temp (°C)	
Additives	of



5.1 CEMENTING REPORT - 9-5/8" CASING

ERIC THE RED-1

Job Type : 9-5/8" CASING Started : 18:38 Hrs, 22/02/93 Completed : 18:50 Hrs, 22/02/93
 Cementer : D. WINN CBL Log : No Returns : Yes
 Cemented CET Run : No Total No. of Stages : 01
 Interval : 807 - 1007 m BHT Log : No Time WOC : 0hrs, 0

HOLE DESCRIPTION					LEAK OFF INFORMATION	
FROM	TO	SIZE	% OVER	DISP. EFF.		
807	1007	12.25	20		Casing Test : 3500 psi.	For : 5 min.
					Drilled : 3 m.	of New : 8.5 in. hole
					Leak Off Test : 1257 psi.	with : 1.08 S.G. mud
					at a depth of : 1007 m.	Equivalent Fluid : 1.95 S.G. Density
						Pressure at Test : 2789 psi. Depth

STAGE INFORMATION							
Stage Number :	001 of 01	Stage Type :	9 5/8" CASING	Planned Interval :	807 to 1007 m.		
Drill String Depth :	m.	Tool Depth :	m.	Drill String Pressure Initial :	psi.	Final :	psi.
				Annular Pressure Initial :	psi.	Final :	psi.
Started Mixing :	18:38 Hrs.	Completed :	18:50 Hrs.	Mixing Rate :	250 gpm.	Mixing Pressure :	400 psi.
Break Pressure :	psi.	Time Circ. at Btm. :	.5 Hrs.	Circulat. Rate :	380 gpm.	Circulating Pressure :	400 psi.
Displaced with :	223 bbls of MUD	Fluid Wt. :	1.07 S.G.	Top Plug :	Yes	Bottom Plug :	Yes
Plug Down :	19:30 Hrs, 22/02/93	Bumped :	No	Bled Off to :	psi.		
Disp Rate Initial :	336	Final :		Min :		Max :	gpm
Disp Press Initial :	270	Final :		Min :		Max :	psi.
Lost Cir. :	No	% Lost :	0	Volume :	0 bbl.	Foam Cmt :	No
				N2 :	0	Start :	0
				End :	0 scfn/bt	Tot :	0 scf
Fluid Vol. Total :	285	Fluid Vol. Returned :	285	Slurry Vol. Total :	52	Slurry Vol. Returned :	
First Preflush Used :	10 bbls of seawater	Fluid Wt. :	1.03 S.G.	Additives :			
Second Preflush Used :	bbls of	Fluid Wt. :	S.G.	Additives :			
Time stage Started :		Time stage Completed :		Hours Before Open :		Circ. Btwn Stages :	
Time Broke Cir. :		Time Pipe Move Start :		Time Pipe Move End :		Time Release Plug :	

Stage Number	001
Fluid Number	001
Fluid Description	TAIL SLURRY
Fluid Type	NEAT
Fluid Class	CLASS G
Amount (sacks)	254
Volume (bbl)	52
Yield (ft ³ /sx)	1.15
Excess (%)	20
Caliper / Open Hole	C
From / To (m)	807 / 1007
Designed Top (m)	807
Density	1.9
Thickening Time (hrs)	3
Water Req'd (bbl)	30
Water Used (gal/sack)	30
Water Source	SEAWATER
Total Vol. Mixed (bbl)	52
Volume Pumped (bbl)	52
Volume in Well (bbl)	
Comp. Strength (lbs)	
Time (hrs)	
Temp (°C)	
Comp. Strength (lbs)	
Time (hrs)	
Temp (°C)	
BHST (°C)	
BHCT (°C)	
Outside Temp (°C)	
Additives	of

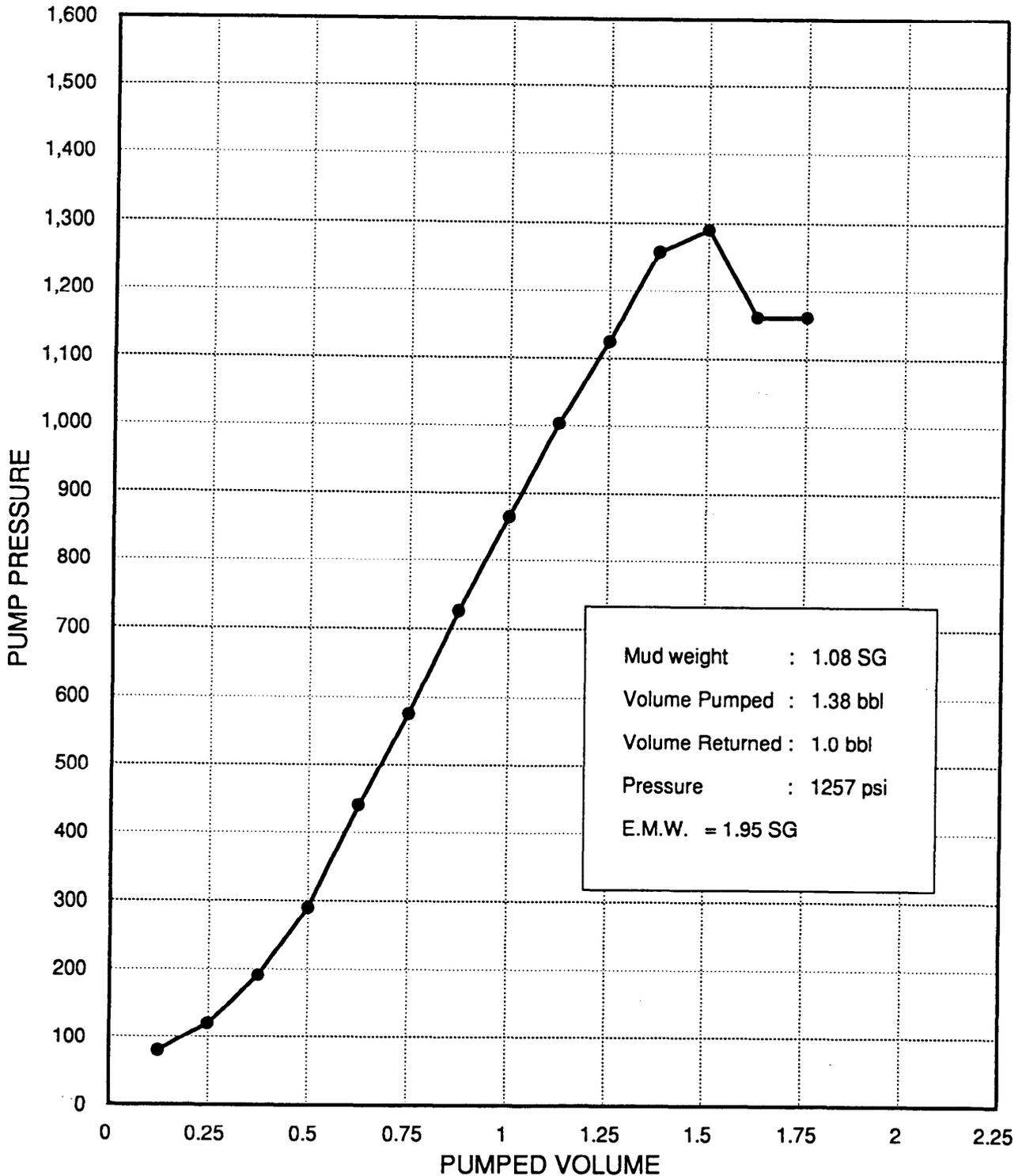
5.2.1 LEAK OFF TEST DIAGRAM

ERIC THE RED-1

Measured Depth : 1020m

Casing Diameter : 9.625" 47 lb/ft

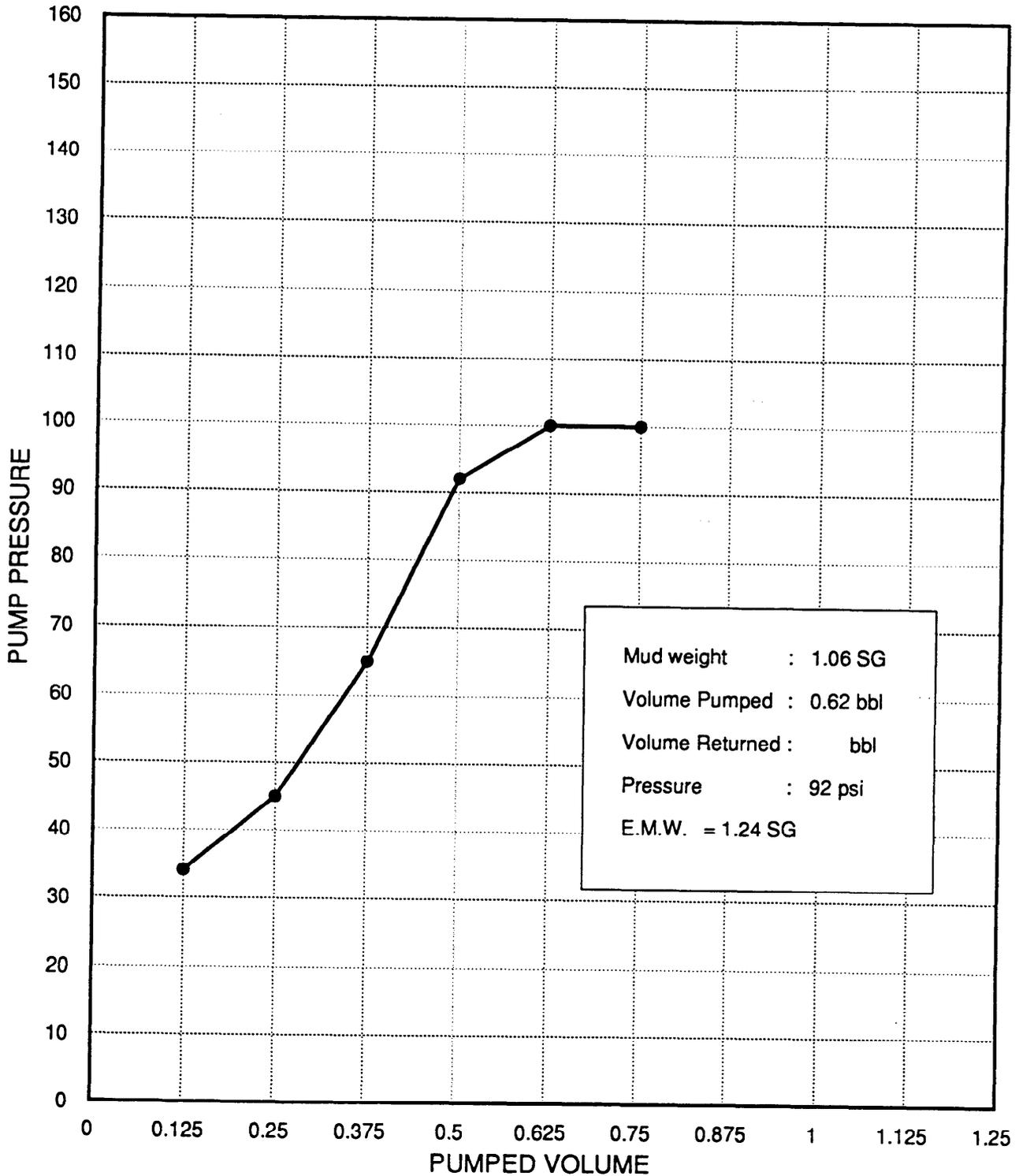
Shoe Measured Depth : 1007m



5.2.2 LEAK OFF TEST DIAGRAM

ERIC THE RED-1

Measured Depth : 367m
Casing Diameter : 13.375 68 lb/ft
Shoe Measured Depth : 355m



SECTION 6



6.0 ABANDONMENT/SUSPENSION CEMENTING REPORT

ERIC THE RED-1

Job Type : P&A PLUG Started : 02:00 Hrs, 28/02/93 Completed : 02:30 Hrs, 28/02/93
 Cementer : R.STRANGE CBL Log : No Returns : Yes
 Cemented CET Run : No Total No. of Stages : 01
 Interval : 900 - 1100 m. BHT Log : No Time WOC : 0hrs, 0

HOLE DESCRIPTION					LEAK OFF INFORMATION	
FROM	TO	SIZE	% OVER	DISP. EFF.		
1007	1875	8.5	20	97	Casing Test : 0 psi.	For : 0 min.
100	1007	8.681	0	97	Drilled : 0 m.	of New : 0 in. hole
					Leak Off Test : 0 psi.	with : 0 S.G. mud
					at a depth of : 0 m.	Equivalent Fluid : 0 S.G.
						Density
					Pressure at Test : 0 psi.	Depth

STAGE INFORMATION							
Stage Number :	001 of 01	Stage Type :	ABANDONMENT	Planned Interval :	900 to 1100 m.		
Drill String Depth :	1100 m.	Tool Depth :	m.	Drill String Pressure Initial :	psi.	Final :	psi.
				Annular Pressure Initial :	psi.	Final :	psi.
Started Mixing :	02:00 Hrs.	Completed :	02:30 Hrs.	Mixing Rate :	100 gpm.	Mixing Pressure :	150 psi.
Break Pressure :	psi.	Time Circ. at Btm. :	.25 Hrs.	Circulat. Rate :	gpm.	Circulating Pressure :	psi.
Displaced with :	50 bbls of MUD	Fluid Wt. :	1.1 S.G.	Top Plug :	No	Bottom Plug :	No
Plug Down :	: Hrs,	Bumped :	No	Bled Off to :	psi.		
Disp Rate Initial :	190	Final :	300	Min :	120	Max :	300 gpm
Disp.Press Initial :	50	Final :	200	Min :	50	Max :	200 psi.
Lost Cir. :	No	% Lost :	0	Volume :	0 bbl.	Foam Cmt :	No
		N2 :	0	Start :	0	End :	0 scfn/bt Tot : 0 scf
Fluid Vol. Total :	105	Fluid Vol. Returned :	105	Slurry Vol. Total :	55	Slurry Vol. Returned :	55
First Preflush Used :	5 bbls of seawater	Fluid Wt. :	1.03 S.G.	Additives :			
Second Preflush Used :	bbls of	Fluid Wt. :	S.G.	Additives :			
Time stage Started :		Time stage Completed :		Hours Before Open :		Circ. Btwn Stages :	
Time Broke Cir. :		Time Pipe Move Start :		Time Pipe Move End :		Time Release Plug :	

File: ERI1_CSG	Checked:	Date: 23-Aug-93
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Stage Number	001
Fluid Number	001
Fluid Description	ABANDONMENT PLUG
Fluid Type	
Fluid Class	CLASS G
Amount (sacks)	270
Volume (bbl)	55
Yield (ft ³ /sx)	1.15
Excess (%)	20
Caliper / Open Hole	C
From / To (m)	900 / 1100
Designed Top (m)	900
Density	1.9
Thickening Time (hrs)	
Water Req'd (bbl)	32
Water Used (gal/sack)	5
Water Source	FRESH
Total Vol. Mixed (bbl)	55
Volume Pumped (bbl)	55
Volume in Well (bbl)	55
Comp. Strength (lbs)	
Time (hrs)	
Temp (°C)	
Comp. Strength (lbs)	
Time (hrs)	
Temp (°C)	
BHST (°C)	
BHCT (°C)	
Outside Temp (°C)	15
Additives	of

Stage Number	001
Fluid Number	002
Fluid Description	ABANDONMENT PLUG
Fluid Type	
Fluid Class	CLASS G
Amount (sacks)	120
Volume (bbl)	25
Yield (ft ³ /sx)	1.15
Excess (%)	20
Caliper / Open Hole	C
From / To (m)	124 / 174
Designed Top (m)	124
Density	1.9
Thickening Time (hrs)	
Water Req'd (bbl)	14
Water Used (gal/sack)	5
Water Source	FRESH
Total Vol. Mixed (bbl)	25
Volume Pumped (bbl)	25
Volume in Well (bbl)	25
Comp. Strength (lbs)	
Time (hrs)	
Temp (°C)	
Comp. Strength (lbs)	
Time (hrs)	
Temp (°C)	
BHST (°C)	
BHCT (°C)	
Outside Temp (°C)	15
Additives	of



SECTION 7



FINAL DRILLING REPORT

7.0 WEATHER DATA

ERIC THE RED-1

Date	Day	Wind Vel (Knots)	Wind Dir	Temp High (degC)	Visibility (Nm)	Weather State	Swell Height (m)	Swell Per (sec)	Swell Dir	Wave Height (m)	Wave Per (sec)	Wave Dir	Heave (m)	Pitch (deg)	Roll (deg)	Bar Pressure (HPa)
15/02/93	1	18	290	26	10	CLOUDY	1.5	10	230	0.5	3	290	1	1	1.3	1012
16/02/93	2	15	120	20	10	CLOUDY	1.5	10	230	0.5	3	120	0.9	1	0.6	1017
17/02/93	3	18	120	21	10	OVERCAST	1.3	10	230	0.5	3	120	1.4	0.5	0.3	1018
18/02/93	4	25	90	22	10	CLOUDY	1.3	10	230	0.8	3	90	0.7	0.4	0.2	1017
19/02/93	5	28	340	29	10	OVERCAST	2.5	8	240	1.2	3	340	0.7	0.9	0.3	1008
20/02/93	6	30	270	25	10	CLOUDY	4	8	240	1.5	3	270	2	0.8	0.4	1006
21/02/93	7	16	220	24	6	CLOUDY	3	9	220	0.5	3	220	1	0.6	0.3	1010
22/02/93	8	28	260	23	6	OVERCAST	3	9	220	1.8	3	250	1	0.4	0.4	1005
23/02/93	9	28	250	12	6	OVERCAST	4	9	230	2	3	250	1.3	1	1.3	1004
24/02/93	10	22	250	22	10	OVERCAST	3.5	9	230	2	3	250	1.3	1	1	1010
25/02/93	11	44	320	20	15	FINE	3	10	230	2.3	3	320	1.2	1.4	1.2	997
26/02/93	12	30	300	18	12	OVERCAST	4	3	310	2.5	3	300	1.4	0.6	0.7	1000
27/02/93	13	20	310	20	15	FINE	2	9	230	1.5	3	310	1	0.4	0.3	1003
28/02/93	14	16	210	18	10	OVERCAST	2	9	210	1.3	3	210	1	0.2	0.3	1004
01/03/93	15	30	220	20	10	FINE	3.5	8	230	2	4	220	1.4	1	0.6	1010
02/03/93	16	20	200	20	15	OVERCAST	3	9	230	1.4	3	200	1.9	0.8	0.6	1018
03/03/93	17	14	140	22	15	FINE	2	10	240	0.6	3	140	1	3	1	1022
04/03/93	18	8	180	22	15	FINE	1.6	11	240	0.3	3	180	1	1.5	1	1021
05/03/93	19	10	130	29	15	FINE	1.5	11	240	0.2	3	130	1	1.5	1	1020

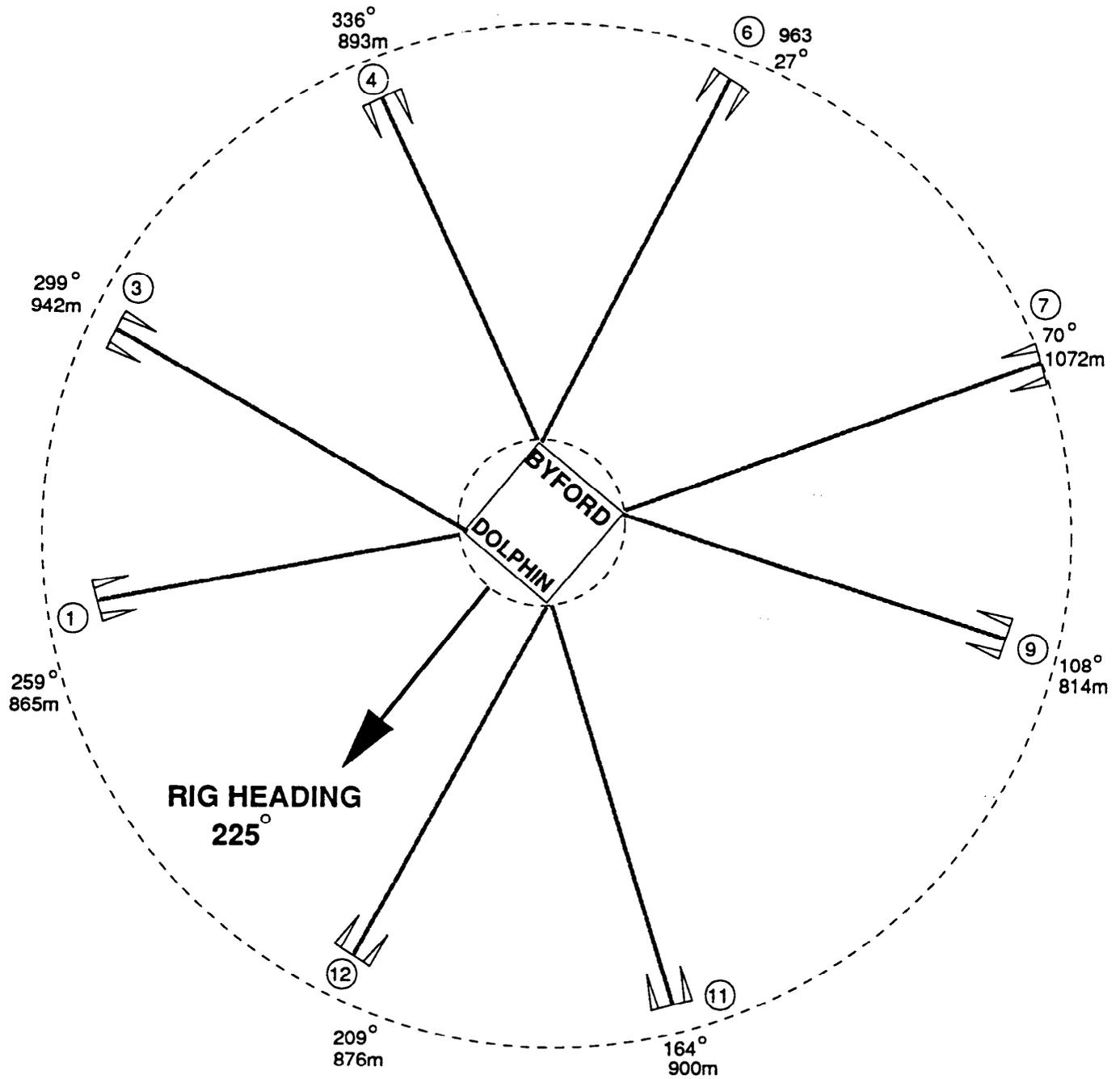
File: ERI1_WTR

Checked: 

Date: 20-Aug-93

7.1 MOORING DIAGRAM

ERIC THE RED-1



Note: Anchors Nos. 2, 5, 8 and 10 not run

ERIC THE RED-1

Compiled By:



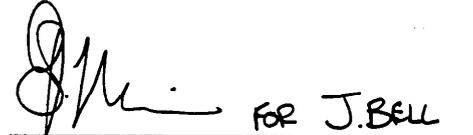
Technical Assistant

Date

Reviewed By:


_____24/08/93
Date

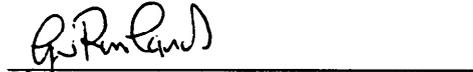
Senior Drilling Engineer


_____24/08/93
Date

Drilling Superintendent

FOR J.BELL

Approved By:


_____24-08-93
Date

Manager Drilling

3. FORMATION SAMPLING

PETROLEUM DIVISION

15 DEC 1993

3.1 Ditch Cuttings

Cuttings were returned to the sea floor above 364 m. The 12.25" hole was drilled from 364 m to 1017 m. Ditch cuttings were collected from the shakers at 5 m intervals below 364 m except where high ROP necessitated increasing the sample interval to 10 m.

The 8.5" hole was drilled from 1017 m to 1875 m (TD). Cuttings were collected at 3 m interval over this hole section.

Circulation times were checked periodically with carbide-acetylene gas samples and pump stroke counters. Calculated lag times were refined accordingly.

Table 1 presents the sampling program used in the drilling of Eric The Red-1. Washed and dried cuttings samples were prepared in five sample splits, one each being sent to Bridge Oil and the government bodies: the Bureau of Resource Sciences, Canberra, and the Victorian Department of Energy and Minerals, Melbourne. The two remaining splits were sent to BHP Petroleum, Melbourne. Two sets of unwashed samples and one set of Petrocraft sample vials were also sent to BHP Petroleum, Melbourne.

Table 1
Ditch Cuttings Samples

Treatment	Collection Interval	Distribution	Purpose of Sample
Washed	No samples: 100.5 m - 364 m	BHPP (2)* Bridge Oil (1) Vic DEM (1)	100g split samples *1 for geochemistry
	5 m samples: 364 m - 1017 m	BRS (1)	
	Except: 395, 415, 440, 450, 465, 485, 495, 505, 520, 530, 595, 600, 615, 625, 630, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 770, 780, 805, 815, 825, 855, 925, 940		
	3 m samples: 1017 m - 1875 m		
	Except: 1170.		
Collection Treatment	Interval	Purpose Distribution	of Sample
Unwashed and possible palynological	as above	BHPP (2)	1 for bulk storage palaeontological/ analysis. 1 for possible fission-track analysis.

3.1.1 Cuttings Description Summary

All depths are referenced to the rotary table (RT) which is 25.3 m above Mean Sea Level. Depths were determined by reference to lag time, ROP and MWD data.

Depth mRT	Description
100.5 - 364	Returns to seafloor
370 - 413	<p><u>SANDSTONE INTERBEDDED WITH MINOR CLAYSTONE</u></p> <p><u>SANDSTONE:</u> (70-100%) greyish brown to light grey, brownish black in part, friable with abundant loose grains, medium to coarse grains, occasionally fine and very coarse grains, subrounded to rounded, poorly sorted quartz, dominantly iron stained, trace to occasionally common greyish brown argillaceous matrix, trace to common iron oxide pellets, rare mica, good to very good visual porosity. No shows. Interbedded minor:</p> <p><u>CLAYSTONE:</u> (0-30%) medium dark grey, becoming brownish grey to olive black, soft to firm, blocky where firm, dispersive in part, trace silt, trace very fine grained quartz, trace carbonaceous flecks, trace micromica, non calcareous.</p>
413 - 466	<p><u>SANDSTONE INTERBEDDED WITH CLAYSTONE</u></p> <p><u>SANDSTONE:</u> (70-100%) greyish brown to light grey, occasionally brownish grey, friable with abundant loose grains, medium to coarse, occasional to abundant fine and very coarse grains, subrounded to rounded, occasionally subangular, moderately to well sorted quartz, occasionally iron stained in part, trace to occasional greyish brown argillaceous matrix, trace to common iron oxide pellets at depth, trace mica, good to occasionally very good visual porosity. No shows. Interbedded with:</p> <p><u>CLAYSTONE:</u> (0-30%) brownish grey to olive black, becoming dusky brown with depth, soft to very soft, dispersive, slightly to commonly silty, trace very fine sand grains, trace carbonaceous flecks, trace micromica, rare pyrite, non calcareous.</p>
466 - 537	<p><u>SANDSTONE INTERBEDDED WITH MINOR CLAYSTONE</u></p> <p><u>SANDSTONE:</u> (70-100%) very light grey to light brownish grey, friable with abundant loose grains,</p>

<u>Depth mRT</u>	<u>Description</u>
	<p>brownish grey, friable with abundant loose grains, medium to coarse, occasionally very coarse, rarely fine grained, subrounded to rounded, occasionally subangular, poorly to occasionally moderately sorted quartz, rarely iron stained, trace brownish grey argillaceous matrix, trace pyrite, rare mica, good to very good visual porosity. No shows. Interbedded with minor:</p> <p><u>CLAYSTONE</u>: (0-30%) light brownish grey to dusky brown, soft, dispersive, slightly silty, trace very fine quartz sand grains, trace micromica, non calcareous.</p>
537 - 570	<p><u>SANDSTONE GRADING TO CLAYSTONE</u></p> <p><u>SANDSTONE</u> (0-100%): generally as above, grading to:</p> <p><u>CLAYSTONE</u>: (0-100%) dusky brown to greyish brown, occasionally light brown, soft, dispersive, slightly silty, trace very fine quartz sand grains, non calcareous.</p>
570 - 600	<p><u>CONGLOMERATIC CLAYSTONE GRADING TO ARGILLACEOUS CONGLOMERATE</u></p> <p><u>CONGLOMERATIC CLAYSTONE</u>: (0-100%) medium to dark brownish grey and grey, occasionally medium to dark greenish grey, soft, dispersive, abundant very coarse to granule, occasionally coarse, subrounded to rounded quartz and lithic pebbles, iron stained in part, trace fine to medium grained glauconite pellets, rare fine carbonaceous detritus, rare medium to coarse iron oxide pellets, rare mica, rare weathered limonitic clay/cement, with depth grading to:</p> <p><u>ARGILLACEOUS CONGLOMERATE</u>: (0-100%) generally as above, friable with abundant loose grains, poorly sorted, poor visual porosity. No show</p>
600 - 795	<p><u>SANDSTONE INTERBEDDED WITH MINOR CLAYSTONE</u></p> <p><u>SANDSTONE</u>: (30-100%) light grey to translucent, clear in part, friable with common to abundant loose grains, occasionally hard, fine to very coarse, occasionally granule, subangular to subrounded, rarely rounded, poorly sorted quartz and common grey, green and brown</p>

<u>Depth mRT</u>	<u>Description</u>
	metamorphic(?) lithics and chert, common light grey to light brownish grey dispersive argillaceous matrix(washed away), trace to rare pyrite cement and nodules, rare mica, poor to fair visual porosity. No shows. Interbedded with minor: <u>CLAYSTONE</u> : (0-70%) medium dark grey and greenish grey, soft, dispersive, common glauconite, slightly silty, trace dispersed organic matter, occasional fragments of calcite cemented very fine quartz, rare pyrite.
795 - 845	<u>CLAYSTONE INTERBEDDED WITH MINOR SANDSTONE</u> <u>CLAYSTONE</u> : (80-100%) medium to dark brownish grey to medium to dark greenish grey, soft, occasionally firm to hard, occasionally dispersive, moderately silty, trace fine carbonaceous flecks, trace very fine quartz sand grains, rare glauconite, rare mica, non calcareous. Interbedded with minor: <u>SANDSTONE</u> : (0-20%) light grey to translucent and commonly opaque, friable with abundant loose grains, fine to very coarse grained, angular to subrounded, moderately sorted quartz, common dispersive medium grey argillaceous matrix, common moderately weak calcareous cement, rare pyrite cement, trace mica, poor visual porosity. No shows.
845 - 877	<u>SANDSTONE WITH INTERBEDDED CLAYSTONE</u> <u>SANDSTONE</u> : (80-100%) medium greenish grey, medium grey in part, friable with abundant loose grains, fine to medium, subangular to dominantly subrounded, moderately to well sorted quartz, trace to common dispersive medium grey to green argillaceous matrix, rare weak calcareous cement, rare moderately strong pyrite cement, rare lithics, rare mica, good visual porosity. No shows. Interbedded with: <u>CLAYSTONE</u> : (0-20%) medium to dark brownish grey to medium to dark greenish grey, soft, occasionally firm to hard, occasionally dispersive, moderately silty, trace fine carbonaceous flecks, trace very fine quartz sand grains, rare glauconite, rare mica, non calcareous.

Depth mRT	Description
877 - 967	<p><u>SANDSTONE WITH MINOR INTERBEDDED CLAYSTONE</u></p> <p><u>SANDSTONE:</u> (80-100%) light greenish grey, clear in part, friable with abundant loose grains, medium to very coarse, dominantly coarse, subangular to rounded, dominantly subrounded, moderately sorted quartz, trace to occasionally common very dispersive light greenish grey to light grey argillaceous matrix (washed away), trace to rare grey, green and light brown lithics, rare glauconite pellets, rare to occasionally trace coarse to very coarse quartz overgrowths, good to very good visual porosity. No shows.</p> <p><u>CLAYSTONE:</u> (0-20%) medium to dark brownish grey to medium to dark greenish grey, soft, occasionally firm to hard, occasionally dispersive, moderately silty, trace fine carbonaceous flecks, trace very fine quartz sand grains, rare glauconite, rare mica, non calcareous.</p>
967 - 1043	<p><u>CLAYSTONE INTERBEDDED WITH MINOR SANDSTONE</u></p> <p><u>SANDSTONE:</u> (10-90%) light greenish grey to light grey, clear in part, friable with abundant loose grains, predominantly medium grained, medium to coarse grained in part with occasional very coarse grains, subangular to rounded, dominantly subrounded, moderately to well sorted quartz, weak calcite cement throughout, trace to common light greenish grey to light grey dispersive argillaceous matrix (washed away in part), rare grey green and light brown lithics, rare glauconite pellet, trace to occasional quartz overgrowth, moderate to good visual porosity. No shows.</p> <p><u>CLAYSTONE:</u> (10-90%) brownish grey to medium dark grey, occasionally light grey and greenish grey, soft, slightly dispersive, moderately firm in part, trace silt to very fine quartz, rare disseminated organic matter, non calcareous.</p>
1043 - 1146	<p><u>SANDSTONE INTERBEDDED WITH CLAYSTONE</u></p> <p><u>SANDSTONE:</u> (10-100%) very light grey to light grey, friable with abundant loose grains, medium to coarse grained, occasional fine and very coarse grains, subangular to subrounded, moderately</p>

Depth mRT	Description
	sorted quartz, trace light grey dispersive argillaceous matrix, trace moderately weak calcareous cement, occasional greyish black lithics, trace glauconite, good visual porosity. No shows.
	<u>CLAYSTONE</u> : (0-90%) medium grey to medium dark grey, soft to moderately firm, dispersive, trace glauconite, trace very fine quartz sand, trace coaly fragments, rare mica, non calcareous.
1146 - 1158	<u>SANDSTONE</u> <u>SANDSTONE</u> : (100%) very light grey to light grey, clear to translucent, friable with abundant loose grains, fine to very coarse grained, predominantly fine to medium, angular to subrounded, poorly sorted quartz, trace medium dark grey argillaceous matrix, trace weak calcareous cement, trace greyish black lithics, good visual porosity. No shows.
1158 - 1330	<u>CLAYSTONE INTERBEDDED WITH MINOR SANDSTONE</u> <u>CLAYSTONE</u> : (60-100%) medium light grey to medium grey, light to medium brownish grey in part, soft, dispersive, trace to occasional carbonaceous flecks and coal fragments, trace silt, non calcareous. <u>SANDSTONE</u> : (0-40%) very light grey, very fine, friable with abundant loose grains, subangular to subrounded, well sorted quartz, no apparent matrix, fair to good visual porosity. No shows.
1330 - 1412	<u>SANDSTONE WITH MINOR CLAYSTONE</u> <u>SANDSTONE</u> : (50-100%) clear to light grey, friable with abundant loose grains, medium to very coarse, dominantly medium to coarse, subangular to subrounded, occasionally angular (fresh angular grains appear to be the product of bit), poorly to moderately sorted quartz, common light grey to off-white dispersive argillaceous matrix (almost all washed away), trace to rare medium to dark grey lithics, common coal fragments, rare mica, rare pyrite nodules, rare to occasional quartz overgrowths, trace to rare rock flour, good to occasionally very good visual porosity. No shows.

<u>Depth mRT</u>	<u>Description</u>
	<p><u>CLAYSTONE</u>: (0-50%) light grey to light brownish grey, rarely off-white in part, slightly silty in part, trace to common fine carbonaceous flecks and minor laminae, trace coal fragments, non calcareous.</p>
1412 - 1436	<p><u>CLAYSTONE INTERBEDDED WITH MINOR SANDSTONE</u></p> <p><u>CLAYSTONE</u>: (50-100%) predominantly medium grey to medium dark grey, light grey to light brownish grey in part, soft to moderately firm, trace dispersed carbonaceous matter and coal fragments, trace silt, non calcareous.</p> <p><u>SANDSTONE</u>: (0-50%) clear to light grey, friable with abundant loose grains, moderately hard in part, medium to very coarse, dominantly medium to coarse, subangular to subrounded, poorly to moderately sorted quartz, common light grey to off-white dispersive argillaceous matrix, trace to rare medium to dark grey lithics, common coal fragments, rare mica, rare pyrite nodules, rare to occasional quartz overgrowths, good to occasionally very good visual porosity. No shows.</p>
1436 - 1509	<p><u>SANDSTONE</u></p> <p><u>SANDSTONE</u>: (100%) clear to light grey, friable with abundant loose grains, medium to very coarse, dominantly medium to coarse, subangular to subrounded, occasionally angular (fresh angular grains appear to be the product of bit), moderately sorted quartz, common light grey to off-white dispersive argillaceous matrix (almost all washed away), trace to rare medium to dark grey lithics, rare coal fragments, rare mica, rare to occasional quartz overgrowths, trace to rare rock flour, good to occasionally very good visual porosity. No shows.</p>
1509 - 1543	<p><u>CLAYSTONE</u></p> <p><u>CLAYSTONE</u>: (100%) medium grey to brownish grey, soft, occasional to common coal fragments, trace very fine quartz grains, non calcareous</p>

Depth mRT	Description
1543 - 1665	<p><u>SANDSTONE WITH MINOR CLAYSTONE</u></p> <p><u>SANDSTONE:</u> (60-100%) very light grey to light grey, clear to translucent grains, friable with abundant loose grains, medium to very coarse grained, occasional granule sized grains, medium to coarse grains subangular to subrounded, larger grains predominantly very angular (possibly due to bit action), poorly sorted quartz, trace very light grey argillaceous matrix (Washed away), trace to rare moderately strong pyrite cement, common medium dark grey, light green, moderate reddish orange metamorphic(?) and cherty lithics, trace quartz overgrowths, trace coal fragments, fair visual porosity. No shows.</p> <p><u>CLAYSTONE:</u> (0-40%) medium light grey to medium grey, soft, dispersive in part, trace to occasional carbonaceous laminae, non calcareous.</p>
1665 - 1695	<p><u>ARGILLACEOUS LITHIC SANDSTONE</u></p> <p><u>ARGILLACEOUS LITHIC SANDSTONE:</u> (50-90%) off-white to light grey, speckled, friable, fine to dominantly medium, subangular to subrounded, well sorted grey with occasional green and brown lithics and quartz, abundant off-white to light grey argillaceous matrix, in part grading to Arenaceous Claystone, rare to occasionally trace partially altered feldspar, trace to rare carbonaceous detritus, poor visual porosity. No shows.</p>
1695 - 1710	<p><u>CLAYSTONE</u></p> <p><u>CLAYSTONE:</u> (90-100%) medium grey to medium dark grey, occasionally light brownish grey, soft to moderately firm, trace silt, trace carbonaceous flecks, non calcareous.</p>
1710 - 1748	<p><u>INTERBEDDED ARGILLACEOUS LITHIC SANDSTONE AND SANDSTONE</u></p> <p><u>ARGILLACEOUS LITHIC SANDSTONE:</u> (20-90%) off-white to light grey, speckled, friable, fine to dominantly medium, subangular to subrounded, well sorted grey with occasional green and brown lithics and quartz, abundant off-white to light grey argillaceous matrix, in part grading to Arenaceous</p>

Depth mRT Description

Claystone, rare to occasionally trace partially altered feldspar, trace to rare carbonaceous detritus, poor visual porosity. No shows. With interbedded:

SANDSTONE: (10-70%) light grey to very light grey, friable with abundant loose grains, medium to coarse grained, common very coarse to granule sized light green, dark grey, moderate pink, reddish orange and clear lithic and quartz grains, subangular to subrounded, larger grains very angular, common light grey argillaceous matrix, trace to occasional strong silica and moderately strong pyrite cement, occasional pyrite nodule, good visual porosity. No shows

1748 - 1875 ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE AND CLAYSTONE

ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE: (80-100%) very light grey to light grey, friable, fine to medium grained, subangular to subrounded, moderately to well sorted black, light green and white lithic and feldspathic grains, clear to translucent quartz grains, abundant very light grey argillaceous matrix, occasional to common weak calcareous cement, grading to arenaceous claystone in part, poor visual porosity. No shows

CLAYSTONE: (0-20%) medium light grey to light grey, soft, trace silt, trace to rare carbonaceous flecks, non calcareous

3.1.2 Cuttings Descriptions

The following detailed cuttings descriptions were prepared at the wellsite.

Depth (mRT)	Lithology (%)	% Fluor	Glauconite	Carb Matter	 <p>SAMPLE DESCRIPTION SHEET</p> <p>Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt</p>
First sample 370mRT, sample interval 5m. Casing shoe at 355mRT					
370	100	-	-	-	<p>SANDSTONE: greyish brown, friable, abundant loose grains, medium to coarse grained, occasional very coarse grains, subrounded to occasionally subangular, well sorted iron stained quartz, trace greyish brown matrix, excellent inferred porosity. No shows. Note: sample heavily cement contaminated.</p>
375	100	-	-	-	<p>SANDSTONE: greyish brown to brownish black, friable, abundant loose grains, medium to coarse grained, occasional very coarse grain, subrounded to rounded, well sorted quartz, trace greyish brown matrix, common iron oxide grains (oolites and pisolites), trace medium dark grey claystone, excellent inferred porosity. No shows.</p>
380	100	-	-	-	<p>SANDSTONE: as above</p>
385	90	-	-	-	<p>SANDSTONE: greyish brown to light grey, friable, abundant loose grains, medium to coarse grained, common fine and very coarse grains, subrounded to rounded, moderately to poorly sorted iron stained quartz, occasional greyish brown matrix, occasional iron oxide grains (oolites and pisolites), occasional mica, good inferred porosity. No shows.</p>
	10	-	-	-	<p>CLAYSTONE: medium dark grey, firm, blocky, non calcareous.</p>

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
390	100	-	-	-	SANDSTONE: light grey, occasionally brownish grey, friable, abundant loose grains, medium to coarse with abundant fine and very coarse grains, subrounded to rounded, poorly sorted, occasionally iron stained quartz, trace greyish brown matrix, occasional iron oxide grain, occasional mica, trace medium dark grey claystone, good inferred porosity. No shows.
395					Missed
400	90	-	-	-	SANDSTONE: light grey, occasionally brownish grey, friable, abundant loose grains, medium to coarse with occasional fine and very coarse grains, subrounded to rounded, moderately to well sorted, occasionally iron stained quartz, trace greyish brown matrix, occasional laterite grain, occasional mica, good inferred porosity. No shows.
	10	-	-	-	CLAYSTONE: brownish grey to olive black, soft dispersive, slightly silty, trace very fine quartz sand, non calcareous.
405	90	-	-	-	SANDSTONE: light grey, occasionally brownish grey, friable, abundant loose grains, medium to coarse with occasional fine and very coarse grains, subrounded to rounded, moderately to well sorted, occasionally iron stained quartz, trace greyish brown matrix, occasional laterite grain, occasional mica, good inferred porosity. No shows.
	10	-	-	-	CLAYSTONE: brownish grey to olive black, soft, dispersive, slightly silty, trace very fine quartz sand, non calcareous.
410	70	-	-	-	SANDSTONE: as above
	30	-	-	-	CLAYSTONE: as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
415					missed
420	80	-	-	-	<u>SANDSTONE</u> : greyish brown to very light grey, friable, abundant loose grains, fine to medium grained, occasional coarse grains, subrounded to rounded, occasionally subangular, moderately to well sorted quartz, occasional greyish brown matrix, occasional mica, good inferred porosity. No shows.
	20	-	-	-	<u>CLAYSTONE</u> : as above
425	90	-	-	-	<u>SANDSTONE</u> : as above
	10	-	-	-	<u>CLAYSTONE</u> : as above
430	100	-	-	-	<u>SANDSTONE</u> : very light grey to light grey, friable, abundant loose grains, medium to coarse grained, common fine and occasional very coarse grains, subrounded to rounded, well sorted quartz, occasional greyish brown matrix, trace medium to medium dark grey claystone, good inferred porosity. No shows.
435	100	-	-	-	<u>SANDSTONE</u> : as above
440					missed
445	100	-	-	-	<u>SANDSTONE</u> : as above
450					missed
455	100	-	-	-	<u>SANDSTONE</u> : as above
460	100	-	-	-	<u>SANDSTONE</u> : as above
465					missed

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
470	70	-	-	tr	CLAYSTONE: dusky brown, very soft, dispersive, commonly silty, occasional very fine sand, trace greyish black carbonaceous matter, trace micromicaceous, rare pyrite, non calcareous.
	30	-	-	-	SANDSTONE: very light grey to light grey, friable, abundant loose grains, medium to coarse grained, common fine and occasional very coarse grains, subrounded to rounded, well sorted quartz, occasional greyish brown matrix, trace medium to medium dark grey claystone, good inferred porosity. No shows.
475	100	-	-	-	SANDSTONE: very light grey and greyish black, friable, abundant loose grains, predominantly medium to coarse grained, occasional very coarse grains, subrounded to rounded, well sorted quartz, up to 20% of grains are iron oxide pellets (oolites and pisolites), trace brownish grey argillaceous matrix, excellent inferred porosity. No shows.
480	90	-	-	-	SANDSTONE: light grey to pale brown, friable, abundant loose grains, medium to coarse grained, occasional fine and very coarse grains, subrounded to rounded, moderately sorted quartz, occasionally iron stained, trace brownish grey argillaceous matrix, rare calcite cement, trace to occasional pyrite, rare mica, good inferred porosity. No shows.
	10	-	-	-	CLAYSTONE: brownish grey to light brownish grey, soft, dispersive, possibly chloritic in parts, slightly silty, trace very fine quartz, non calcareous.
485					missed
490	100	-	-	-	SANDSTONE: as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
495					missed
500	100	-	-	-	SANDSTONE: very light grey to light grey, friable, abundant loose grains, coarse to very coarse grained, abundant fine to occasionally very fine grains, subrounded to rounded, poorly to moderately sorted quartz, trace medium grey to brownish grey argillaceous matrix, trace medium grey claystone, good inferred porosity. No shows.
505					missed
510	100	-	-	-	SANDSTONE: as above
515	90	-	-	-	SANDSTONE: very light grey to light grey, friable, abundant loose grains, coarse to very coarse grained, abundant fine to occasionally very fine grains, subrounded to rounded, poor to moderately sorted quartz, trace medium grey to brownish grey argillaceous matrix, trace medium grey claystone, good inferred porosity. No shows.
	10	-	-	-	CLAYSTONE: greyish brown to dusky brown, soft dispersive, slightly silty, trace very fine grained quartz, micromicaceous, non calcareous.
520					missed
525	100	-	-	-	SANDSTONE: as above
530					missed
535	100	-	-	-	SANDSTONE: very light grey to light brownish grey, friable, abundant loose grains, medium to coarse grained, occasional fine and very coarse grains, subangular to subrounded, moderately sorted quartz, trace brownish grey argillaceous matrix, rare pyrite, excellent inferred porosity. No shows.

Depth (mRT)	Lithology (%)	% Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
540	70	-	-	-	<u>SANDSTONE</u> : as above
	30	-	-	-	<u>CLAYSTONE</u> : as above
545	90	-	-	-	<u>SANDSTONE</u> : as above
	10	-	-	-	<u>CLAYSTONE</u> : as above
550	80	-	-	-	<u>CLAYSTONE</u> : dusky brown to greyish brown, occasionally light brown soft, dispersive, silty, trace very fine grained quartz, non calcarous.
	20	-	-	-	<u>SANDSTONE</u> : as above
555	100	-	-	-	<u>CLAYSTONE</u> : as above
560	100	-	-	-	<u>CLAYSTONE</u> : as above
565	100	-	-	-	<u>CLAYSTONE</u> : as above
570	100	-	-	-	<u>CLAYSTONE</u> : as above
575	100	-	tr	r	<u>CONGLOMERATIC CLAYSTONE</u> : medium to dark brownish grey and grey, occasionally medium to dark greenish grey, soft, dispersive, abundant very coarse to granule, occasionally coarse subrounded to rounded quartz and lithic pebbles, iron-stained in part, trace fine to medium, occasionally coarse glauconite pellets, rare disseminated fine carbonaceous detritus, rare medium to coarse iron oxide oolite and pisolite, rare mica, rare weathered limonitic cement/clay, grading to Argillaceous Conglomerate.
580	100	-	tr	r	<u>CONGLOMERATIC CLAYSTONE</u> : as above, grading to Argillaceous Conglomerate.
585	100	-	tr	r	<u>ARGILLACEOUS CONGLOMERATE</u> : as above, friable with abundant loose grains, poorly sorted, poor visual porosity. No shows.
590	100	-	tr	r	<u>ARGILLACEOUS CONGLOMERATE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
595					missed
600					missed
605	100	-	r	r	<u>CONGLOMERATIC CLAYSTONE</u> : as above
610	100	-	-	-	<u>SANDSTONE</u> : light grey to translucent, clear in part, friable with common to abundant loose grains, occasionally hard, medium to very coarse, occasionally granule, subangular to subrounded, rarely rounded, poorly sorted quartz and common grey, green and brown metamorphic(?) lithics and chert, common light grey to light brownish grey dispersive argillaceous matrix (washed away), trace to rare pyrite cement and nodules, rare mica, poor to fair visual porosity. No shows.
615					missed
620	100	-	-	-	<u>SANDSTONE</u> : as above
625					missed
630					missed
635	100	-	-	-	<u>SANDSTONE</u> : as above
640	100	-	-	-	<u>SANDSTONE</u> : as above
645	100	-	-	-	<u>SANDSTONE</u> : as above
650					missed
655	100	-	-	-	<u>SANDSTONE</u> : generally as above, occasionally fine in part, common to occasionally abundant light to medium brown argillaceous matrix, poor visual porosity. No shows. Note: Due to hole being approximately 40% overgauge the lag is considered inaccurate. Further, because of the loosely consolidated lithology and high ROP the sample may contain abundant cavings.

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
660					missed
665	100	-	-	-	<u>SANDSTONE</u> : as above
670					missed
675	80 20	- -	- -	- r	<u>SANDSTONE</u> : as above, interbedded with: <u>CLAYSTONE</u> : light brownish grey, soft, dispersive in part, trace to rare micromica, rare carbonaceous flecks, non calcareous.
680					missed
685	100	-	-	-	<u>SANDSTONE</u> : as above
690					missed
695	100	-	-	-	<u>SANDSTONE</u> : light grey to translucent, clear in part, friable, abundant loose grains, medium to coarse grained, occasional to common very coarse grains, angular to subangular, occasionally subrounded, moderately sorted quartz with occasional greenish grey lithics (metamorphics?) and chert, common silica cement and quartz overgrowths, occasional pyrite cement, trace medium grey dispersive argillaceous matrix, common medium grey claystone, poor visual porosity. No shows.
700					missed
705	50 50	- -	- -	- tr	<u>SANDSTONE</u> : as above <u>CLAYSTONE</u> : medium grey to medium dark grey, soft, dispersive, trace dispersed organic matter, commonly silty, common fine grained quartz, slightly calcareous.
710					missed

Depth (mRT)	Lithology (%)	% Fluor	Glaucouite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
					715	90	-	tr	tr	CLAYSTONE: as above with trace glauconite.
	10	-	-	-	<u>SANDSTONE</u> : as above
720					missed
725	100	-	tr	tr	<u>CLAYSTONE</u> : medium grey to medium dark grey, soft, dispersive, trace dispersed organic matter, commonly silty, common fine grained quartz, slightly calcareous.
730					missed
735	100	-	co	tr	<u>CLAYSTONE</u> : medium dark grey and greenish grey, soft, dispersive, common glauconite, slightly silty, trace dispersed organic matter, occasional fragments of calcite cemented very fine quartz, rare pyrite.
740					missed
745	100	-	co	tr	<u>CLAYSTONE</u> : as above with common very coarse quartz grains.
750					missed
755	70	-	co	tr	<u>CLAYSTONE</u> : medium grey to dark grey, generally soft and dispersive, occasionally hard, occasional to common pyrite, framboidal in part, trace disseminated organic material, common glauconite, non calcareous.
	30	-	-	tr	<u>SANDSTONE</u> : light grey to translucent and commonly opaque, friable with abundant loose grains, fine to very coarse grained, angular to subrounded, moderately sorted quartz, common dispersive medium grey argillaceous matrix common moderately weak calcareous cement, rare pyrite cement, trace mica, poor visual porosity. No shows.

Depth (mRT)	Lithology (%)	% Fluor	Glaucoune	Carb Matter	
760	70	-	tr	tr	<u>CLAYSTONE</u> : as above with decreasing glauconite.
	30	-	tr	tr	<u>SANDSTONE</u> : as above.
765	70	-	tr	tr	<u>CLAYSTONE</u> : as above.
	30	-	tr	tr	<u>SANDSTONE</u> : as above.
770					missed
775	70	-	tr	tr	<u>CLAYSTONE</u> : as above
	30	-	tr	tr	<u>SANDSTONE</u> : as above
780					missed
785	60	-	tr	tr	<u>CLAYSTONE</u> : as above, becoming medium to dark greenish grey in part.
	40	-	r	r	<u>SANDSTONE</u> : as above
790	60	-	tr	tr	<u>CLAYSTONE</u> : medium grey to dark grey, generally soft and dispersive, occasionally hard, occasional to common pyrite, framboidal in parts, trace disseminated organic material, common glauconite, non calcareous.
	40	-	r	r	<u>SANDSTONE</u> : light grey to translucent, commonly opaque, friable with abundant loose grains, fine to very coarse grained, angular to subrounded, moderately sorted quartz, common dispersive medium grey argillaceous matrix, common moderately weak calcareous cement, rare pyrite cement, trace mica, poor visual porosity. No shows.
795	60	-	tr	tr	<u>CLAYSTONE</u> : as above
	40	-	r	r	<u>SANDSTONE</u> : as above

Depth (mRT)	Lithology (%)	% Fluor	Glaucanite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
800	90	-	r	r	<u>CLAYSTONE</u> : generally as above, medium to dark brownish grey to medium to dark greenish grey, soft, occasionally firm to hard, occasionally dispersive, moderately silty, trace fine carbonaceous flecks, trace very fine quartz sand grains, rare glauconite, rare mica, non calcareous.
	10	-	r	r	<u>SANDSTONE</u> : as above
805					missed
810	100	-	r	r	<u>CLAYSTONE</u> : as above
815					missed
820	100	-	r	r	<u>CLAYSTONE</u> : as above
825					missed
830	80	-	r	r	<u>CLAYSTONE</u> : as above
	20	-	-	-	<u>SANDSTONE</u> : as above
835	90	-	r	r	<u>CLAYSTONE</u> : as above
	10	-	-	-	<u>SANDSTONE</u> : as above
840	90	-	r	r	<u>CLAYSTONE</u> : as above
	10	-	-	-	<u>SANDSTONE</u> : as above
845	80	-	r	r	<u>CLAYSTONE</u> : as above
	20	-	-	-	<u>SANDSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
850	90	-	-	-	<u>SANDSTONE</u> : medium greenish grey, medium grey in part, friable with abundant loose grains, fine to medium, subangular to dominantly subrounded, moderately to well sorted quartz, trace to common dispersive medium grey to green argillaceous matrix (washed out), rare weak calcareous and moderately strong pyrite cement, rare lithics, rare mica, good visual porosity. No shows. Interbedded with minor:
	10	-	r	r	<u>CLAYSTONE</u> : generally as above, medium to dark brownish grey to medium to dark greenish grey, soft, occasionally firm to hard, occasionally dispersive, moderately silty, trace fine carbonaceous flecks, trace very fine quartz sand grains, rare glauconite, rare mica, non calcareous.
855					missed
860	100	-	r	-	<u>SANDSTONE</u> : as above
865	90	-	r	-	<u>SANDSTONE</u> : as above
	10	-	r	r	<u>CLAYSTONE</u> : as above
870	80	-	r	-	<u>SANDSTONE</u> : as above
	20	-	r	r	<u>CLAYSTONE</u> : as above
875	80	-	r	-	<u>SANDSTONE</u> : as above, dominantly medium grained.
	20	-	r	r	<u>CLAYSTONE</u> : as above
880	80	-	r	-	<u>SANDSTONE</u> : as above, becoming coarse grained with depth.
	20	-	r	r	<u>CLAYSTONE</u> : as above

Depth (mRT)	Lithology (%)	% Fluor	Glaucanite	Carb Matter	 <p>SAMPLE DESCRIPTION SHEET</p> <p>Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt</p>
885	100	-	r	-	<p>SANDSTONE: light greenish grey, clear in part, friable with abundant loose grains, medium to very coarse, dominantly coarse, subangular to rounded, dominantly subrounded, moderately sorted quartz, trace to occasionally common very dispersive light greenish grey to light grey argillaceous matrix (washed away), trace to rare grey, green and light brown lithics, rare glauconite pellets, rare to occasionally trace coarse to very coarse quartz overgrowths, good to very good visual porosity. No shows.</p>
890	100	-	r	-	<p>SANDSTONE: as above</p>
895	100	-	r	-	<p>SANDSTONE: as above, becoming dominantly coarse to very coarse.</p>
900	95	-	r	-	<p>SANDSTONE: as above</p>
	5	-	r	r	<p>CLAYSTONE: as above</p>
905	95	-	r	-	<p>SANDSTONE: light greenish grey, clear in part, friable with abundant loose grains, medium to very coarse, dominantly coarse, subangular to rounded, dominantly subrounded, moderately sorted quartz, trace to occasionally common very dispersive light greenish grey to light grey argillaceous matrix (washed away), trace to rare grey, green and light brown lithics, rare glauconite pellets, rare to occasionally trace coarse to very coarse quartz overgrowths, good to very good visual porosity. No shows.</p>
	5	-	r	r	<p>CLAYSTONE: generally as above, medium to dark brownish grey to medium to dark greenish grey, soft, occasionally firm to hard, occasionally dispersive, moderately silty, trace fine carbonaceous flecks, trace very fine quartz sand grains, rare glauconite, rare mica, non calcareous.</p>

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
910	100	0	r	-	<u>SANDSTONE</u> : as above
915	100	0	r	-	<u>SANDSTONE</u> : as above
920	100	0	r	-	<u>SANDSTONE</u> : as above
925					missed
930	100	0	r	-	<u>SANDSTONE</u> : as above, dominantly medium grained.
935	90	0	r	-	<u>SANDSTONE</u> : as above, moderately hard in part.
	10	0	r	r	<u>CLAYSTONE</u> : as above
940					missed
945	100	0	r	-	<u>SANDSTONE</u> : light greenish grey, clear in part, friable with abundant loose grains, medium to coarse grained, subangular to rounded, predominantly subrounded, moderately sorted quartz, trace to occasionally common very dispersive light greenish grey to light grey argillaceous matrix (washed away), trace to rare greyish green and light brown lithics, rare glauconite pellets, trace quartz overgrowths, good to very good visual porosity. No shows.
950	80	-	tr	-	<u>SANDSTONE</u> : as above, occasional very coarse grained.
	20	-	r	r	<u>CLAYSTONE</u> : as above
955	100	0	tr	-	<u>SANDSTONE</u> : as above
960	90	0	r	-	<u>SANDSTONE</u> : as above
	10	0	r	r	<u>CLAYSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
965	80	-	r	-	<p>SANDSTONE: light greenish grey to light grey, clear in part, friable with abundant loose grains, predominantly medium grained, medium to coarse grained in part with occasional very coarse grains, subangular to rounded, dominantly subrounded, moderately to well sorted quartz, weak calcite cement throughout, trace to common light greenish grey to light grey dispersive argillaceous matrix (washed away in parts), rare greyish green and light brown lithics, rare glauconite pellet, trace to occasional quartz overgrowth, moderate to good visual porosity. No shows.</p>
	20	-	-	r	<p>CLAYSTONE: brownish grey to medium dark grey, occasionally light grey and greenish grey, soft, slightly dispersive, moderately firm in parts, trace silt to very fine quartz, rare disseminated organic matter, non calcareous.</p>
970	60	-	-	r	CLAYSTONE: as above
	40	-	r	-	SANDSTONE: as above
975	70	-	r	-	SANDSTONE: as above
	30	-	-	r	CLAYSTONE: as above
980	90	-	-	r	CLAYSTONE: as above
	10	-	r	-	SANDSTONE: as above
985	90	-	-	r	CLAYSTONE: as above
	10	-	r	-	SANDSTONE: as above
990	90	-	-	r	CLAYSTONE: as above
	10	-	r	-	SANDSTONE: as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
995	100	-	r	r	CLAYSTONE: medium dark grey to brownish grey, soft, dispersive, trace silt to very fine quartz grains, trace medium quartz sand, rare glauconite, trace to rare dispersed organic matter, non calcareous.
1000	90	-	r	tr	CLAYSTONE: as above
	10	-	r	-	SANDSTONE: as above
1005	100	-	r	tr	CLAYSTONE: as above
1010	70	-	r	tr	CLAYSTONE: as above
	30	-	r	-	SANDSTONE: as above
1015	90	-	r	tr	CLAYSTONE: as above
	10	-	r	-	SANDSTONE: as above
1017	90	-	r	tr	CLAYSTONE: medium dark grey to brownish grey, soft, becoming moderately firm, dispersive, trace silt to very fine quartz grains, trace medium quartz sand, rare glauconite, trace to rare dispersed organic matter, non calcareous.
	10	-	r	-	SANDSTONE: light greenish grey to light grey, clear in part, friable with abundant loose grains, predominantly medium grained, medium to coarse grained in part, occasional very coarse grains, subangular to rounded, dominantly subrounded, moderately to well sorted quartz, weak calcite cement throughout, trace to common light greenish grey to light grey dispersive argillaceous matrix (washed away in parts), rare grey green and light brown lithics, rare glauconite pellets, trace to occasional quartz overgrowths, moderate to good visual porosity. No shows.

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
					Casing point of 1017.0m was reached at 10.00 hrs on 21-02-93 Casing shoe was set at 1007.42m. Leak off test at 1020.0m = 1.96 SG
1020	90	-	-	tr	<u>CLAYSTONE</u> : medium grey to medium dark grey, soft to moderately firm, trace silt, trace carbonaceous and coaly flecks, trace very fine quartz sand, trace calcite.
	10	-	-	-	<u>SANDSTONE</u> : very light grey to light grey, friable, fine to medium grained, subangular to subrounded, well sorted quartz, trace medium grey dispersive argillaceous matrix, trace greyish black lithics, trace pyrite, good visual porosity. No shows.
1023	90	-	-	tr	<u>CLAYSTONE</u> : as above.
	10	-	-	-	<u>SANDSTONE</u> : as above.
1026	90	-	-	tr	<u>CLAYSTONE</u> : as above.
	10	-	-	-	<u>SANDSTONE</u> : as above.
1026	90	-	-	tr	<u>CLAYSTONE</u> : as above.
	10	-	-	-	<u>SANDSTONE</u> : as above.
1029	80	-	-	tr	<u>CLAYSTONE</u> : as above.
	20	-	-	-	<u>SANDSTONE</u> : as above:
1032	60	-	-	tr	<u>CLAYSTONE</u> : as above.
	40	-	-	-	<u>SANDSTONE</u> : as above.
1035	80	-	-	tr	<u>CLAYSTONE</u> : as above.
	20	-	-	-	<u>SANDSTONE</u> : as above.

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1038	90	-	-	tr	<u>CLAYSTONE</u> : medium grey to medium dark grey, soft to moderately firm, trace silt, trace carbonaceous and coaly flecks, trace very fine quartz sand, trace calcite.
	10	-	-	-	<u>SANDSTONE</u> : very light grey to light grey, friable, fine to medium grained, subangular to subrounded, well sorted quartz, trace medium grey dispersive argillaceous matrix, trace greyish black lithics, trace pyrite, good visual porosity. No shows.
1041	90	-	-	tr	<u>CLAYSTONE</u> : as above.
	10	-	-	-	<u>SANDSTONE</u> : as above, trace dull yellowish white mineral fluorescence.
1044	80	-	-	-	<u>SANDSTONE</u> : light grey to very light grey, friable with abundant loose grains, medium to coarse grained, abundant fine grains, occasional very coarse grains, angular to subrounded, moderately sorted quartz, trace medium light grey dispersive argillaceous matrix, occasional calcareous cement, common greyish black lithic grains, good visual porosity, trace dull yellowish white mineral fluorescence.
	20	-	-	tr	<u>CLAYSTONE</u> : as above.
1047	80	-	-	-	<u>SANDSTONE</u> : as above.
	20	-	-	tr	<u>CLAYSTONE</u> : as above.
1050	90	-	-	-	<u>SANDSTONE</u> : as above.
	10	-	-	tr	<u>CLAYSTONE</u> : as above.
1053	80	-	-	-	<u>SANDSTONE</u> : as above.
	20	-	-	tr	<u>CLAYSTONE</u> : as above.

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1056	90	-	-	-	<u>SANDSTONE</u> : as above.
	10	-	-	tr	<u>CLAYSTONE</u> : as above.
1059	80	-	tr	-	<u>SANDSTONE</u> : very light grey to light grey, friable with abundant loose grains, medium to coarse grained, occasional fine and very coarse grains, subangular to subrounded, moderately sorted quartz, trace light grey dispersive argillaceous matrix, trace moderately weak calcareous cement, occasional greyish black lithics, trace glauconite, good visual porosity. No shows.
	20	-	tr	tr	<u>CLAYSTONE</u> : medium grey to medium dark grey, soft to moderately firm, dispersive, trace glauconite, trace very fine quartz sand, trace coaly fragments, rare mica, non calcareous.
1062	80	-	tr	-	<u>SANDSTONE</u> : as above.
	20	-	tr	tr	<u>CLAYSTONE</u> : as above.
1065	80	-	tr	tr	<u>CLAYSTONE</u> : as above.
	20	-	tr	-	<u>SANDSTONE</u> : as above.
1068	90	-	tr	tr	<u>CLAYSTONE</u> : as above.
	10	-	tr	-	<u>SANDSTONE</u> : as above.
1071	80	-	tr	tr	<u>CLAYSTONE</u> : as above.
	20	-	tr	-	<u>SANDSTONE</u> : as above.
1074	100	-	tr	tr	<u>CLAYSTONE</u> : as above.
1077	100	-	tr	tr	<u>CLAYSTONE</u> : as above.

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1080	60	-	-	-	SANDSTONE: very light grey to light grey, fine to medium grained, occasional coarse grains, friable with abundant loose grains, subangular to subrounded, moderately sorted quartz, trace to common medium grey argillaceous matrix, trace moderately weak calcareous cement, common greyish black lithic grains, fair visual porosity. No shows.
	40	-	tr	tr	CLAYSTONE: as above.
1083	60	-	-	-	SANDSTONE: as above.
	40	-	tr	tr	CLAYSTONE: as above.
1086	90	-	-	-	SANDSTONE: as above.
	10	-	tr	tr	CLAYSTONE: as above.
1089	80	-	-	-	SANDSTONE: as above.
	20	-	tr	tr	CLAYSTONE: as above
1092	80	-	-	-	SANDSTONE: very light grey to light grey, fine to medium grained, occasional coarse grains, friable with abundant loose grains, subangular to subrounded, moderately sorted quartz, trace to common medium grey argillaceous matrix, trace moderately weak calcareous cement, common greyish black lithic grains, fair visual porosity. No shows.
	20	-	tr	tr	CLAYSTONE: medium grey to medium dark grey, soft to moderately firm, dispersive, trace glauconite, trace very fine quartz sand, trace coaly fragments, rare mica, non calcareous.

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1095	90	-	-	tr	<u>CLAYSTONE</u> : medium grey to medium dark grey, soft, dispersive, common carbonaceous flecks, occasional coaly fragments, non calcareous.
	10	-	-	-	<u>SANDSTONE</u> : as above.
1098	80	-	-	tr	<u>CLAYSTONE</u> : as above
	20	-	-	-	<u>SANDSTONE</u> : as above
1101	70	-	-	tr	<u>CLAYSTONE</u> : as above
	30	-	-	-	<u>SANDSTONE</u> : as above
1104	70	-	-	-	<u>SANDSTONE</u> : as above
	30	-	-	tr	<u>CLAYSTONE</u> : as above
1107	100	-	-	-	<u>SANDSTONE</u> : as above, dominantly medium to coarse.
1110	50	-	-	-	<u>SANDSTONE</u> : as above
	50	-	-	tr	<u>CLAYSTONE</u> : as above
1113	70	-	-	tr	<u>CLAYSTONE</u> : as above, light grey in part.
	30	-	-	-	<u>SANDSTONE</u> : as above
1116	70	-	-	tr	<u>CLAYSTONE</u> : as above
	30	-	-	-	<u>SANDSTONE</u> : as above
1119	70	-	-	tr	<u>CLAYSTONE</u> : as above
	30	-	-	-	<u>SANDSTONE</u> : as above
1122	70	-	-	tr	<u>CLAYSTONE</u> : as above
	30	-	-	-	<u>SANDSTONE</u> : as above

Depth (mRT)	Lithology (%)	% Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
					1125	60	-	-	tr	CLAYSTONE: as above
	40	-	-	-	<u>SANDSTONE</u> : as above
1128	60	-	-	tr	<u>CLAYSTONE</u> : medium grey to medium dark grey, soft, dispersive, common carbonaceous flecks, occasional coaly fragments, non calcareous.
	40	-	-	-	<u>SANDSTONE</u> : very light grey to light grey, fine to medium grained, occasional coarse grains, friable with abundant loose grains, subangular to subrounded, moderately sorted quartz, trace to common medium grey argillaceous matrix, trace moderately weak calcareous cement, common greyish black lithic grains, in part interbedded with minor very fine sandstone, fair visual porosity. No shows.
1131	50	-	-	tr	<u>CLAYSTONE</u> : as above
	50	-	-	r	<u>SANDSTONE</u> : light grey, friable, very fine, occasionally very silty and grading to Arenaceous Siltstone, subrounded, well sorted quartz, abundant light grey argillaceous matrix, rare very fine lithics, rare carbonaceous detritus, very poor visual porosity. No shows.
1134	60	-	-	r	<u>SANDSTONE</u> : as above
	40	-	-	tr	<u>CLAYSTONE</u> : as above
1137	50	-	-	r	<u>SANDSTONE</u> : as above
	50	-	-	tr	<u>CLAYSTONE</u> : as above
1140	50	-	-	r	<u>SANDSTONE</u> : as above, becoming extremely argillaceous, in part grading to Arenaceous Claystone.
	50	-	-	tr	<u>CLAYSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1143	50	-	-	r	<u>SANDSTONE</u> : as above
	50	-	-	tr	<u>CLAYSTONE</u> : as above
1146	60	-	-	r	<u>SANDSTONE</u> : as above
	40	-	-	tr	<u>CLAYSTONE</u> : as above
1149	50	-	-	r	<u>SANDSTONE</u> : as above
	50	-	-	tr	<u>CLAYSTONE</u> : as above
1152	50	-	-	r	<u>SANDSTONE</u> : as above
	50	-	-	tr	<u>CLAYSTONE</u> : as above
1155	70	-	-	r	<u>SANDSTONE</u> : very light grey to light grey, clear to translucent, friable with abundant loose grains, fine to very coarse grained, predominantly fine to medium, angular to subrounded, poorly sorted quartz, trace medium dark grey argillaceous matrix, trace weak calcareous cement, trace greyish black lithics, good visual porosity. No shows.
	30	-	-	tr	<u>CLAYSTONE</u> : medium grey to medium dark grey, soft, dispersive, common carbonaceous flecks, occasional coaly fragments, non calcareous.
1158	60	-	-	r	<u>SANDSTONE</u> : as above, becoming predominantly medium to coarse grained.
	40	-	-	tr	<u>CLAYSTONE</u> : as above
1161	80	-	-	r	<u>SANDSTONE</u> : as above
	20	-	-	tr	<u>CLAYSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1164	60	-	-	r	<u>SANDSTONE</u> : as above with trace moderately strong pyrite cement on very coarse grains.
	40	-	-	tr	<u>CLAYSTONE</u> : as above
1167	70	-	-	tr	<u>CLAYSTONE</u> : as above
	30	-	-	r	<u>SANDSTONE</u> : as above
1170					missed
1173	90	-	-	tr	<u>CLAYSTONE</u> : medium light grey to medium grey, light to medium brownish grey in part, soft, dispersive, trace to occasional carbonaceous flecks and coal fragments, trace silt, non calcareous.
	10	-	-	r	<u>SANDSTONE</u> : as above
1176	100	-	-	tr	<u>CLAYSTONE</u> : as above
1179	90	-	-	tr	<u>CLAYSTONE</u> : as above
	10	-	-	-	<u>SANDSTONE</u> : as above, becoming predominantly fine to medium grained.
1182	100	-	-	tr	<u>CLAYSTONE</u> : as above
1185	100	-	-	tr	<u>CLAYSTONE</u> : as above
1188	100	-	-	tr	<u>CLAYSTONE</u> : as above
1191	100	-	-	tr	<u>CLAYSTONE</u> : as above with abundant loose fine quartz sand grains.
1194	100	-	-	tr	<u>CLAYSTONE</u> : as above
1197	100	-	-	tr	<u>CLAYSTONE</u> : as above
1200	100	-	-	tr	<u>CLAYSTONE</u> : medium light grey to medium grey, light to medium brownish grey in part, soft, dispersive, trace to occasional carbonaceous flecks and coal fragments, trace silt, non calcareous.

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1203	100	-	-	tr	<u>CLAYSTONE</u> : as above, rare black coaly particles.
1206	100	-	-	tr	<u>CLAYSTONE</u> : as above
1209	100	-	-	tr	<u>CLAYSTONE</u> : as above
1212	100	-	-	tr	<u>CLAYSTONE</u> : as above
1215	100	-	-	tr	<u>CLAYSTONE</u> : as above
1218	100	-	-	tr	<u>CLAYSTONE</u> : as above
1221	100	-	-	tr	<u>CLAYSTONE</u> : as above
1224	100	-	-	tr	<u>CLAYSTONE</u> : as above
1227	100	-	-	tr	<u>CLAYSTONE</u> : as above
1230	100	-	-	tr	<u>CLAYSTONE</u> : as above
1233	100	-	-	tr	<u>CLAYSTONE</u> : as above
1236	100	-	-	tr	<u>CLAYSTONE</u> : as above
1239	100	-	-	tr	<u>CLAYSTONE</u> : as above
1242	100	-	-	tr	<u>CLAYSTONE</u> : as above
1245	100	-	-	tr	<u>CLAYSTONE</u> : as above
1248	100	-	-	tr	<u>CLAYSTONE</u> : as above
1251	100	-	-	tr	<u>CLAYSTONE</u> : as above
1254	100	-	-	tr	<u>CLAYSTONE</u> : as above
1257	100	-	-	tr	<u>CLAYSTONE</u> : as above
1260	100	-	-	tr	<u>CLAYSTONE</u> : as above
1263	100	-	-	tr	<u>CLAYSTONE</u> : generally as above, light grey to medium grey, light to medium brownish grey in part, soft, dispersive, trace to occasional carbonaceous flecks and coal fragments, trace silt, non calcareous.
1266	100	-	-	tr	<u>CLAYSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1269	100	-	-	tr	<u>CLAYSTONE</u> : as above
1272	100	-	-	tr	<u>CLAYSTONE</u> : as above
1275	100	-	-	tr	<u>CLAYSTONE</u> : as above, dominantly medium brownish grey.
1278	100	-	-	c	<u>CLAYSTONE</u> : as above, trace to occasionally common coaly particles.
1281	100	-	-	c	<u>CLAYSTONE</u> : generally as above, light grey to medium grey, light to medium brownish grey in part, soft, dispersive, trace to occasional carbonaceous flecks, trace to occasionally common coaly particles, trace silt, non calcareous.
1284	100	-	-	c	<u>CLAYSTONE</u> : as above
1287	100	-	-	c	<u>CLAYSTONE</u> : as above
1290	100	-	-	c	<u>CLAYSTONE</u> : as above
1293	100	-	-	c	<u>CLAYSTONE</u> : as above
1296	80	-	-	tr	<u>CLAYSTONE</u> : as above
	20	-	-	-	<u>SANDSTONE</u> : very light grey, very fine, friable with abundant loose grains, subangular to subrounded, well sorted quartz, no apparant matrix, fair to good visual porosity. No shows.
1299	80	-	-	tr	<u>CLAYSTONE</u> : as above
	20	-	-	-	<u>SANDSTONE</u> : as above
1302	80	-	-	tr	<u>CLAYSTONE</u> : as above
	20	-	-	-	<u>SANDSTONE</u> : as above
1305	80	-	-	tr	<u>CLAYSTONE</u> : as above
	20	-	-	-	<u>SANDSTONE</u> : as above

Depth (mRT)	Lithology (%)	% Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1308	100	-	-	tr	<u>CLAYSTONE</u> : as above
	tr	-	-	-	<u>SANDSTONE</u> : as above
1311	100	-	-	tr	<u>CLAYSTONE</u> : as above, becoming dominantly medium brownish grey.
1314	100	-	-	tr	<u>CLAYSTONE</u> : as above
1317	100	-	-	tr	<u>CLAYSTONE</u> : as above
1320	90	-	-	tr	<u>CLAYSTONE</u> : as above
	10	-	-	-	<u>SANDSTONE</u> : as above
1323	90	-	-	tr	<u>CLAYSTONE</u> : generally as above, light grey to medium grey, becoming dominantly medium brownish grey in part, soft, dispersive, trace to occasional carbonaceous flecks, trace to occasionally common coaly particles, trace silt, non calcareous.
	10	-	-	-	<u>SANDSTONE</u> : very light grey, very fine, friable with abundant loose grains, subangular to subrounded, well sorted quartz, no apparant matrix, fair to good visual porosity. No shows.
	tr	-	-	ab	<u>COAL</u> : very dark brown to black, firm, occasionally soft(?), blocky in part, subconchoidal fractures in part, rare cryptocrystalline pyrite in part. No shows.
1326	90	-	-	tr	<u>CLAYSTONE</u> : as above
	10	-	-	-	<u>SANDSTONE</u> : as above
	tr	-	-	ab	<u>COAL</u> : as above
1329	100	-	-	tr	<u>CLAYSTONE</u> : as above
	tr	-	-	ab	<u>COAL</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1332	60	-	-	tr	SANDSTONE: clear to light grey, friable with abundant loose grains, medium to very coarse, dominantly medium to coarse, subangular to subrounded, occasionally angular (fresh angular grains appear to be the product of bit), poorly to moderately sorted quartz, common light grey to off-white dispersive argillaceous matrix (almost all washed away), trace to rare medium to dark grey lithics, rare coal fragments, rare mica, rare pyrite nodules, rare to occasional quartz overgrowths, trace to rare rock flour, good to occasionally very good visual porosity. No shows.
	40	-	-	tr	CLAYSTONE: as above
	tr	-	-	ab	COAL: as above
1335	50	-	-	tr	SANDSTONE: as above
	50	-	-	tr	CLAYSTONE: as above
1338	100	-	-	tr	CLAYSTONE: as above
1341	100	-	-	tr	SANDSTONE: as above
1344	100	-	-	tr	SANDSTONE: as above
1347	100	-	-	tr	SANDSTONE: as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1350	100	-	-	c	SANDSTONE: clear to light grey, friable with abundant loose grains, medium to very coarse, dominantly medium to coarse, subangular to subrounded, occasionally angular (fresh angular grains appear to be the product of bit), poorly to moderately sorted quartz, common light grey to off-white dispersive argillaceous matrix (almost all washed away), trace to rare medium to dark grey lithics, common coal fragments, rare mica, rare pyrite nodules, rare to occasional quartz overgrowths, trace to rare rock flour, good to occasionally very good visual porosity. No shows.
1353	100	-	-	tr	SANDSTONE as above, becoming dominantly coarse grained.
1356	100	-	-	tr	SANDSTONE: as above
1359	100	-	-	tr	SANDSTONE: as above
1362	100	-	-	tr	SANDSTONE: as above
1365	100	-	-	tr	SANDSTONE: as above
1368	100	-	-	tr	SANDSTONE: as above
1371	100	-	-	tr	SANDSTONE: as above
1374	90	-	-	tr	SANDSTONE: as above, moderately hard in part, rare pyrite nodules/moderately strong pyrite cement.
	10	-	-	tr	CLAYSTONE: light grey to light brownish grey, rarely off-white in part, slightly silty in part, trace to common fine carbonaceous flecks and minor laminae, trace coal fragments, non calcareous.
1377	100	-	-	tr	SANDSTONE: as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1380	100	-	-	tr	SANDSTONE: as above, moderately hard in part, trace strong pyrite cement, good visual porosity. No shows.
1383	100	-	-	tr	SANDSTONE: as above, dominantly medium to coarse grained.
1386	100	-	-	tr	SANDSTONE: as above
1389	100	-	-	tr	SANDSTONE: as above
1392	100	-	-	tr	SANDSTONE: as above
1395	100	-	-	tr	SANDSTONE: as above
1398	30	-	-	tr	SANDSTONE: as above
	70	-	-	tr	CLAYSTONE: as above
1401	50	-	-	tr	SANDSTONE: clear to light grey, friable with abundant loose grains, moderately hard in part, medium to very coarse, dominantly medium to coarse, subangular to subrounded, occasionally angular (fresh angular grains appear to be the product of bit), poorly to moderately sorted quartz, common light grey to off-white dispersive argillaceous matrix (almost all washed away), trace to rare medium to dark grey lithics, common coal fragments, rare mica, rare pyrite nodules, rare to occasional quartz overgrowths, trace to rare rock flour, good to occasionally very good visual porosity. No shows.
	50	-	-	tr	CLAYSTONE: light grey to light brownish grey, rarely off-white in part, slightly silty in part, trace to common fine carbonaceous flecks and minor laminae, trace coal fragments, non calcareous.

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1404	30	-	-	tr	<u>SANDSTONE</u> : as above
	70	-	-	tr	<u>CLAYSTONE</u> : as above
	tr	-	-	ab	<u>COAL</u> : very dark brown to black, firm, soft (?) in part, subconchoidal fractures in part. No shows.
1407	70	-	-	tr	<u>SANDSTONE</u> : as above
	30	-	-	tr	<u>CLAYSTONE</u> : as above
	tr	-	-	ab	<u>COAL</u> : as above
1410	50	-	-	tr	<u>SANDSTONE</u> : as above
	50	-	-	tr	<u>CLAYSTONE</u> : predominantly medium grey to medium dark grey, light grey to light brownish grey in part, soft to moderately firm, trace dispersed carbonaceous matter and coal fragments, trace silt, non calcareous.
1413	50	-	-	tr	<u>SANDSTONE</u> : as above
	50	-	-	tr	<u>CLAYSTONE</u> : as above
1416	70	-	-	tr	<u>SANDSTONE</u> : as above
	30	-	-	tr	<u>CLAYSTONE</u> : as above
1419	90	-	-	tr	<u>CLAYSTONE</u> : as above
	10	-	-	tr	<u>SANDSTONE</u> : as above
1422	80	-	-	tr	<u>CLAYSTONE</u> : as above
	20	-	-	tr	<u>SANDSTONE</u> : as above

Depth (mRT)	Lithology (%)	% Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1425	60	-	-	tr	SANDSTONE: clear to light grey, friable with abundant loose grains, moderately hard in part, medium to very coarse, dominantly medium to coarse, subangular to subrounded, poorly to moderately sorted quartz, common light grey to off-white dispersive argillaceous matrix, trace to rare medium to dark grey lithics, common coal fragments, rare mica, rare pyrite nodules, rare to occasional quartz overgrowths, good to occasionally very good visual porosity. No shows.
	40	-	-	tr	CLAYSTONE: predominantly medium grey to medium dark grey, light grey to light brownish grey in part, soft to moderately firm, trace dispersed carbonaceous matter and coal fragments, trace silt, non calcareous.
1428	90	-	-	tr	SANDSTONE: as above
	10	-	-	tr	CLAYSTONE: as above, becoming blocky in part.
1431	90	-	-	tr	SANDSTONE: generally as above, occasional fine grains
	10	-	-	tr	CLAYSTONE: as above
1434	90	-	-	tr	SANDSTONE: as above
	10	-	-	tr	CLAYSTONE: as above
1437	90	-	-	tr	SANDSTONE: as above
	10	-	-	tr	CLAYSTONE: as above
1440	80	-	-	tr	CLAYSTONE: as above
	20	-	-	tr	SANDSTONE: as above

Depth (mRT)	Lithology (%)	% Fluor	Glanconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
					1443	100	-	-	tr	CLAYSTONE: medium grey to medium dark grey, soft to moderately firm, trace silt, occasional carbonaceous and coaly flecks, subblocky, non calcareous.
1446	100	-	-	tr	CLAYSTONE: as above
1449	100	-	-	tr	CLAYSTONE: as above
1452	100	-	-	tr	CLAYSTONE: as above
1455	100	-	-	tr	CLAYSTONE: as above
1458	100	-	-	tr	CLAYSTONE: as above
1461	90	-	-	tr	CLAYSTONE: as above
	10	-	-	tr	SANDSTONE: as above
1464	80	-	-	tr	SANDSTONE: as above
	20	-	-	tr	CLAYSTONE: as above
1467	100	-	-	tr	SANDSTONE: clear to light grey, friable with abundant loose grains, medium to very coarse, dominantly medium to coarse, subangular to subrounded, occasionally angular (fresh angular grains appear to be the product of bit), moderately sorted quartz, common light grey to off-white dispersive argillaceous matrix (almost all washed away), trace to rare medium to dark grey lithics, rare coal fragments, rare mica, rare to occasional quartz overgrowths, trace to rare rock flour, good to occasionally very good visual porosity. No shows.
1470	100	-	-	tr	SANDSTONE: as above
1473	100	-	-	tr	SANDSTONE: as above
1476	100	-	-	tr	SANDSTONE: as above
1479	100	-	-	tr	SANDSTONE: as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1482	100	-	-	tr	<u>SANDSTONE</u> : as above
1485	100	-	-	tr	<u>SANDSTONE</u> : as above
1488	100	-	-	tr	<u>SANDSTONE</u> : as above
1491	100	-	-	tr	<u>SANDSTONE</u> : as above
1494	90	-	-	tr	<u>SANDSTONE</u> : as above, with occasionally moderately strong siliceous cement
	10	-	-	tr	<u>CLAYSTONE</u> : as above
1497	100	-	-	tr	<u>SANDSTONE</u> : as above
1500	90	-	-	tr	<u>SANDSTONE</u> : as above
	10	-	-	tr	<u>CLAYSTONE</u> : as above
1503	80	-	-	tr	<u>SANDSTONE</u> : as above
	20	-	-	tr	<u>CLAYSTONE</u> : as above
1506	80	-	-	tr	<u>SANDSTONE</u> : as above
	20	-	-	tr	<u>CLAYSTONE</u> : as above
1509	80	-	-	tr	<u>CLAYSTONE</u> : medium grey to brownish grey, soft, occasional to common coal fragments, trace very fine quartz grains, non calcareous
	20	-	-	tr	<u>SANDSTONE</u> : as above
	tr	-	-	tr	<u>COAL</u> : greyish black to black, bright, soft to moderately firm, subconchoidal fracture. No shows
1512	100	-	-	tr	<u>CLAYSTONE</u> : as above
1515	100	-	-	tr	<u>CLAYSTONE</u> : as above
1518	100	-	-	tr	<u>CLAYSTONE</u> : medium grey to brownish grey, soft, occasional to common coal fragments, trace very fine quartz grains, non calcareous

Depth (mRT)	Lithology (%)	% Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1521	100	-	-	tr	<u>CLAYSTONE</u> : as above
1524	100	-	-	tr	<u>CLAYSTONE</u> : as above
1527	100	-	-	tr	<u>CLAYSTONE</u> : medium light grey to medium grey, soft, occasional coal fragments, trace silt, non calcareous
1530	100	-	-	tr	<u>CLAYSTONE</u> : as above
1533	100	-	-	tr	<u>CLAYSTONE</u> : as above
1536	100	-	-	tr	<u>CLAYSTONE</u> : as above
1539	100	-	-	tr	<u>CLAYSTONE</u> : generally as above with trace medium grained quartz.
1542	100	-	-	tr	<u>CLAYSTONE</u> : as above
1545	60	-	-	tr	<u>SANDSTONE</u> : very light grey to light grey, clear to translucent grains, friable with abundant loose grains, medium to very coarse grained, occasional granule sized grains, medium to coarse grains subangular to subrounded, larger grains predominantly very angular (possibly due to bit action), poorly sorted quartz, trace very light grey argillaceous matrix (washed away), trace to rare moderately strong pyrite cement, common medium dark grey, light green, moderate reddish orange metamorphic(?) and cherty lithics, trace quartz overgrowth, fair visual porosity. No shows.
	40	-	-	tr	<u>CLAYSTONE</u> : as above
1548	90	-	-	tr	<u>SANDSTONE</u> : generally as above with occasional fragments of light grey to pale brown, fine to medium grained, strongly silica cemented quartz/lithic sandstone.
	10	-	-	tr	<u>CLAYSTONE</u> : as above

Depth (mRT)	Lithology (%)	% Fluor	Glauconite	Carb Matter	 <p>SAMPLE DESCRIPTION SHEET</p> <p>Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt</p>
1551	100	-	-	tr	<p>SANDSTONE: very light grey to light grey, clear to translucent grains, friable with abundant loose grains, medium to very coarse grained, occasional granule sized grains, medium to coarse grains subangular to subrounded, larger grains predominantly very angular (possibly due to bit action), poorly sorted quartz, trace very light grey argillaceous matrix (washed away), trace to rare moderately strong pyrite cement, common medium dark grey, light green, moderate reddish orange metamorphic(?) and cherty lithics, trace quartz overgrowth, fair visual porosity. No shows.</p>
1554	100	-	-	tr	<p>SANDSTONE: generally as above, becoming predominantly medium to coarse grained, moderately sorted quartz.</p>
1557	100	-	-	tr	<p>SANDSTONE: as above</p>
1560	100	-	-	tr	<p>SANDSTONE: as above</p>
1563	100	-	-	tr	<p>SANDSTONE: as above</p>
1569	100	-	-	tr	<p>SANDSTONE: as above</p>
1572	100	-	-	tr	<p>SANDSTONE: as above</p>
1575	100	-	-	tr	<p>SANDSTONE: very light grey to light grey, clear to translucent grains, friable with abundant loose grains, medium to very coarse grained, occasional granule sized grains, medium to coarse grains subangular to subrounded, larger grains predominantly very angular (possibly due to bit action), poorly sorted quartz, trace very light grey argillaceous matrix (washed away), trace to rare moderately strong pyrite cement, common medium dark grey, light green, moderate reddish orange metamorphic(?) and cherty lithics, trace quartz overgrowth, fair visual porosity. No shows.</p>

Depth (mRT)	Lithology (%)	% Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
					1578	100	-	-	tr	SANDSTONE: as above
1581	100	-	-	tr	<u>SANDSTONE</u> : as above
1584	100	-	-	tr	<u>SANDSTONE</u> : generally as above, predominantly coarse to very coarse grained
1587	100	-	-	r	<u>SANDSTONE</u> : as above
1590	100	-	-	r	<u>SANDSTONE</u> : as above
1593	90	-	-	t	<u>SANDSTONE</u> : very light grey to light grey, clear to translucent grains, friable with abundant loose grains, medium to very coarse grained, occasional granule sized grains, medium to coarse grains subangular to subrounded, larger grains predominantly very angular (possibly due to bit action), poorly sorted quartz, trace very light grey argillaceous matrix (washed away), trace to rare moderately strong pyrite cement, common medium dark grey, light green, moderate reddish orange metamorphic(?) and cherty lithics, trace quartz overgrowths, trace coal fragments, fair visual porosity. No shows.
	10	-	-	tr	<u>CLAYSTONE</u> : medium light grey to medium grey, soft, dispersive in part, trace to occasional carbonaceous laminae, non calcareous.
1596	100	-	-	tr	<u>SANDSTONE</u> : as above
1599	100	-	-	tr	<u>SANDSTONE</u> : as above
1602	100	-	-	tr	<u>SANDSTONE</u> : as above
1605	90	-	-	tr	<u>SANDSTONE</u> : as above
	10	-	-	tr	<u>CLAYSTONE</u> : as above
1608	100	-	-	tr	<u>SANDSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 <p>SAMPLE DESCRIPTION SHEET</p> <p>Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt</p>
1611	90	-	-	tr	<p>SANDSTONE: very light grey to light grey, clear to translucent grains, friable with abundant loose grains, medium to very coarse grained, occasional granule sized grains, medium to coarse grains subangular to subrounded, larger grains predominantly very angular (possibly due to bit action), poorly sorted quartz, trace very light grey argillaceous matrix (washed away), trace to rare moderately strong pyrite cement, common medium dark grey, light green, moderate reddish orange metamorphic(?) and cherty lithics, trace quartz overgrowths, trace coal fragments, fair visual porosity. No shows.</p>
	10	-	-	tr	<p>CLAYSTONE: medium light grey to medium grey, soft, dispersive in part, trace to occasional carbonaceous laminae, non calcareous.</p>
1614	100	-	-	tr	<p>SANDSTONE: as above</p>
1617	100	-	-	tr	<p>SANDSTONE: as above</p>
1620	100	-	-	tr	<p>SANDSTONE: as above</p>
1623	100	-	-	tr	<p>SANDSTONE: as above</p>
Trip for bit at 1625 mRT					
1626	100	-	-	tr	<p>SANDSTONE: very light grey to light grey, clear to translucent grains, friable with abundant loose grains, medium to very coarse grained, occasional granule sized grains, medium to coarse grains subangular to subrounded, larger grains predominantly very angular (possibly due to bit action), poorly sorted quartz, trace very light grey argillaceous matrix (washed away), trace to rare moderately strong pyrite cement, common medium dark grey, light green, moderate reddish orange metamorphic(?) and cherty lithics, trace quartz overgrowths, trace coal fragments, fair visual porosity. No shows.</p>

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
					1629	90	-	-	tr	SANDSTONE: as above, rarely fine to medium.
	10	-	-	tr	<u>CLAYSTONE</u> : light grey, light to medium brownish grey, rarely off-white in part, dominantly soft, occasionally firm and blocky, moderately silty, trace carbonaceous flecks and laminae, rare fine quartz sand grains in part, non calcareous.
1632	100	-	-	tr	<u>SANDSTONE</u> : as above
1635	100	-	-	tr	<u>SANDSTONE</u> : as above
1638	90	-	-	tr	<u>SANDSTONE</u> : as above
	10	-	-	tr	<u>CLAYSTONE</u> : as above, dominantly light grey to off-white.
1641	90	-	-	tr	<u>SANDSTONE</u> : as above, moderately hard in part, rare moderately strong siliceous cement, fair visual porosity. No shows.
	10	-	-	tr	<u>CLAYSTONE</u> : as above
1644	60	-	-	tr	<u>SANDSTONE</u> : as above
	40	-	-	tr	<u>CLAYSTONE</u> : as above

Depth (mRT)	Lithology (%)	% Fluor	Glauconite	Carb Matter	 <p>SAMPLE DESCRIPTION SHEET</p> <p>Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt</p>
1647	60	-	-	tr	<p>SANDSTONE: very light grey to light grey, clear to translucent grains, friable with abundant loose grains, medium to very coarse grained, occasional granule sized grains, medium to coarse grains subangular to subrounded, larger grains predominantly very angular (possibly due to bit action), poorly sorted quartz, trace very light grey argillaceous matrix (washed away), trace to rare moderately strong pyrite cement, common medium dark grey, light green, moderate reddish orange metamorphic(?) and cherty lithics, trace quartz overgrowths, trace coal fragments, fair visual porosity. No shows.</p>
	40	-	-	tr	<p>CLAYSTONE: light grey, light to medium brownish grey, rarely off-white in part, dominantly soft, occasionally firm and blocky, moderately silty, trace carbonaceous flecks and laminae, rare fine quartz sand grains in part, non calcareous.</p>
1650	100	-	-	tr	<p>SANDSTONE: generally as above, abundant granule grained multi-coloured metamorphic(?) lithics as above, poor to fair visual porosity. No shows.</p>
1653	100	-	-	tr	<p>SANDSTONE: as above</p>
1656	100	-	-	tr	<p>SANDSTONE: as above</p>

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1659	50	-	-	tr	<u>SANDSTONE</u> : as above
	50	-	-	tr	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : off-white to light grey, speckled, friable, fine to dominantly medium, subangular to subrounded, well sorted grey with occasional green and brown lithics and quartz, abundant off-white to light grey argillaceous matrix, in part grading to Arenaceous Claystone, rare to occasionally trace partially altered feldspar, trace to rare carbonaceous detritus, poor visual porosity. No shows.
1662	50	-	-	tr	<u>SANDSTONE</u> : as above
	50	-	-	tr	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
1665	70	-	-	tr	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	30	-	-	r	<u>CLAYSTONE</u> : light grey and light to medium brownish grey, soft, sticky in part, slightly silty, rare carbonaceous flecks, non calcareous.
1668	70	-	-	tr	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	30	-	-	r	<u>CLAYSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 <p>SAMPLE DESCRIPTION SHEET</p> <p>Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt</p>
1671	90	-	-	tr	<p>ARGILLACEOUS LITHIC SANDSTONE: off-white to light grey, speckled, friable, fine to dominantly medium, subangular to subrounded, well sorted grey with occasional green and brown lithics and quartz, abundant off-white to light grey argillaceous matrix, in part grading to Arenaceous Claystone, rare to occasionally trace partially altered feldspar, trace to rare carbonaceous detritus, poor visual porosity. No shows.</p>
	10	-	-	r	<p>CLAYSTONE: light grey and light to medium brownish grey, soft, sticky in part, slightly silty, rare carbonaceous flecks, non calcareous.</p>
1674	90	-	-	tr	<p>ARGILLACEOUS LITHIC SANDSTONE: as above</p>
	10	-	-	r	<p>CLAYSTONE: as above</p>
1677	90	-	-	tr	<p>ARGILLACEOUS LITHIC SANDSTONE: as above</p>
	10	-	-	r	<p>CLAYSTONE: as above</p>
1680	80	-	-	tr	<p>ARGILLACEOUS LITHIC SANDSTONE: off-white to light grey, speckled, friable, fine to dominantly medium, subangular to subrounded, well sorted grey with occasional green and brown lithics and quartz, abundant off-white to light grey argillaceous matrix, in part grading to Arenaceous Claystone, rare to occasionally trace partially altered feldspar, trace to rare carbonaceous detritus, poor visual porosity. No shows.</p>
	20	-	-	r	<p>CLAYSTONE: light grey and light to medium brownish grey, soft, sticky in part, slightly silty, rare carbonaceous flecks, non calcareous.</p>

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
					1680	80	-	-	tr	ARGILLACEOUS LITHIC SANDSTONE: as above
	20	-	-	r	<u>CLAYSTONE</u> : as above
1680	90	-	-	tr	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	10	-	-	r	<u>CLAYSTONE</u> : as above
1683	80	-	-	tr	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above, becoming more quartzose
	20	-	-	r	<u>CLAYSTONE</u> : as above, becoming predominantly light brown
1686	90	-	-	tr	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	10	-	-	r	<u>CLAYSTONE</u> : as above
1689	90	-	-	tr	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	10	-	-	r	<u>CLAYSTONE</u> : as above
1692	90	-	-	tr	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	10	-	-	r	<u>CLAYSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET
					Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1695	80	-	-	tr	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : off-white to light grey, speckled, friable, fine to dominantly medium, subangular to subrounded, well sorted grey with occasional green and brown lithics and quartz, abundant off-white to light grey argillaceous matrix, in part grading to Arenaceous Claystone, rare to occasionally trace partially altered feldspar, trace to rare carbonaceous detritus, poor visual porosity. No shows.
	20	-	-	-	<u>CLAYSTONE</u> : light grey and light to medium brownish grey, soft, sticky in part, slightly silty, rare carbonaceous flecks, non calcareous.
1698	70	-	-	tr	<u>CLAYSTONE</u> : medium grey to medium dark grey, occasionally light brownish grey, soft to moderately firm, trace silt, trace carbonaceous flecks, non calcareous
	30	-	-	-	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : off-white to light grey, speckled, friable, fine to dominantly medium, subangular to subrounded, well sorted grey with occasional green and brown lithics and quartz, abundant off-white to light grey argillaceous matrix, in part grading to Arenaceous Claystone, rare to occasionally trace partially altered feldspar, trace to rare carbonaceous detritus, poor visual porosity. No shows.
1701	90	-	-	tr	<u>CLAYSTONE</u> : generally as above with rare coaly laminae
	10	-	-	-	<u>SANDSTONE</u> : as above
1704	90	-	-	tr	<u>CLAYSTONE</u> : as above
	10	-	-	-	<u>SANDSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 BHP Petroleum
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1707	90	-	-	tr	<u>CLAYSTONE</u> : as above
	10	-	-	-	<u>SANDSTONE</u> : as above
1710	90	-	-	tr	<u>CLAYSTONE</u> : as above
	10	-	-	-	<u>SANDSTONE</u> : as above
1713	70	-	-	tr	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : off-white to light grey, speckled, friable, fine to dominantly medium, subangular to subrounded, well sorted grey with occasional green and brown lithics and quartz, abundant off-white to light grey argillaceous matrix, in part grading to Arenaceous Claystone, rare to occasionally trace partially altered feldspar, trace to rare carbonaceous detritus, poor visual porosity. No shows. With interbedded:
	30	-	-	tr	<u>SANDSTONE</u> : light grey to very light grey, friable with abundant loose grains, medium to coarse grained, common very coarse to granule sized light green, dark grey, moderate pink, reddish orange and clear lithic and quartz grains, subangular to subround, larger grains very angular, common light grey argillaceous matrix, trace to occasional strong silica and moderately strong pyrite cement, occasional pyrite nodule, good visual porosity. No shows
	tr	-	-	tr	<u>CLAYSTONE</u> : medium grey to medium dark grey, occasionally light brownish grey, soft to moderately firm, trace silt, trace carbonaceous flecks, non calcareous

Depth (mRT)	Lithology (%)	% Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1716	90	-	-	tr	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : off-white to light grey, speckled, friable, fine to dominantly medium, subangular to subrounded, well sorted grey with occasional green and brown lithics and quartz, abundant off-white to light grey argillaceous matrix, in part grading to Arenaceous Claystone, rare to occasionally trace partially altered feldspar, trace to rare carbonaceous detritus, poor visual porosity. No shows. With interbedded:
	10	-	-	tr	<u>CLAYSTONE</u> : medium grey to medium dark grey, occasionally light brownish grey, soft to moderately firm, trace silt, trace carbonaceous flecks, non calcareous
1719	90	-	-	r	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	10	-	-	tr	<u>CLAYSTONE</u> : as above
1722	90	-	-	r	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	10	-	-	tr	<u>CLAYSTONE</u> : as above
1725	50	-	-	r	<u>SANDSTONE</u> : as above
	40	-	-	r	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	10	-	-	tr	<u>CLAYSTONE</u> : as above
1728	60	-	-	r	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	20	-	-	-	<u>SANDSTONE</u> : as above
	20	-	-	tr	<u>CLAYSTONE</u> : as above

Depth (mRT)	Lithology (%)	% Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1731	70	-	-	r	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	20	-	-	-	<u>SANDSTONE</u> : as above
	10	-	-	tr	<u>CLAYSTONE</u> : as above
1734	80	-	-	r	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : off-white to light grey, speckled, friable, fine to dominantly medium, subangular to subrounded, well sorted grey with occasional green and brown lithics and quartz, abundant off-white to light grey argillaceous matrix, in part grading to Arenaceous Claystone, rare to occasionally trace partially altered feldspar, trace to rare carbonaceous detritus, poor visual porosity. No shows. With interbedded:
	10	-	-	-	<u>SANDSTONE</u> : light grey to very light grey, friable with abundant loose grains, medium to coarse grained, common very coarse to granule sized light green, dark grey, moderate pink, reddish orange and clear lithic and quartz grains, subangular to subround, larger grains very angular, common light grey argillaceous matrix, trace to occasional strong silica and moderately strong pyrite cement, occasional pyrite nodule, good visual porosity. No shows
	10	-	-	tr	<u>CLAYSTONE</u> : medium grey to medium dark grey, occasionally light brownish grey, soft to moderately firm, trace silt, trace carbonaceous flecks, non calcareous
1737	70	-	-	-	<u>SANDSTONE</u> : as above
	20	-	-	r	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	10	-	-	tr	<u>CLAYSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
					1740	80	-	-	r	ARGILLACEOUS LITHIC SANDSTONE: as above
	10	-	-	-	<u>SANDSTONE</u> : as above
	10	-	-	tr	<u>CLAYSTONE</u> : as above
1743	90	-	-	r	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	10	-	-	tr	<u>CLAYSTONE</u> : as above
1745	90	-	-	r	<u>ARGILLACEOUS LITHIC SANDSTONE</u> : as above
	10	-	-	tr	<u>CLAYSTONE</u> : as above
1748	80	-	-	-	<u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u> : very light grey to light grey, friable, fine to medium grained, subangular to subrounded, moderately to well sorted black, light green and white lithic and feldspathic grains, clear to translucent quartz grains, abundant very light grey argillaceous matrix, occasional to common weak calcareous cement, grading to arenaceous claystone in part, poor visual porosity. No shows
	20	-	-	tr	<u>CLAYSTONE</u> : medium light grey to light grey, soft, trace silt, trace to rare carbonaceous flecks, non calcareous
1752	80	-	-	-	<u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u> : as above
	20	-	-	tr	<u>CLAYSTONE</u> : as above
1755	90	-	-	-	<u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u> : as above
	10	-	-	tr	<u>CLAYSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1758	100	-	-	r	<u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u> : as above, with rare coal laminae
1761	100	-	-	tr	<u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u> : as above
1764	100	-	-	tr	<u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u> : as above, rare moderately weak pyrite cement
1767	100	-	-	tr	<u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u> : as above, trace greyish black to black coal fragments.
1770	100	-	-	tr	<u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u> : as above
1773	100	-	-	tr	<u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u> : as above
1776	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above, becoming more quartzose
1779	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1782	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1785	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1788	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1791	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glaucinite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1794	100	-	-	tr	<u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u> : very light grey to light grey, friable, fine to medium grained, subangular to subrounded, moderately to well sorted black, light green and white lithic and feldspathic grains, clear to translucent quartz grains, abundant very light grey argillaceous matrix, occasional to common weak calcareous cement, grading to arenaceous claystone in part, poor visual porosity. No shows
1797	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1800	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : very light grey to light grey, friable, fine to medium grained, subangular to subrounded, moderately to well sorted clear to translucent quartz, black, light green and white lithic and feldspathic grains, abundant very light grey argillaceous matrix, occasional to common weak calcareous cement, grading to arenaceous claystone in part, poor visual porosity. No shows
1803	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1806	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1809	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above, trace to rare moderately weak pyrite cement
1812	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1815	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1818	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above

Depth (mRT)	Lithology (%)	% Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1821	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1824	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1827	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : very light grey to light grey, friable, fine to medium grained, subangular to subrounded, moderately to well sorted clear to translucent quartz and black, light green and white lithic and feldspathic grains, abundant very light grey argillaceous matrix, occasional to common weak calcareous cement, rare mica, grading to Arenaceous Claystone in part, poor visual porosity. No shows
1830	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1833	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1836	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1839	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1842	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1845	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	
					SAMPLE DESCRIPTION SHEET Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt
1848	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : very light grey to light grey, friable, fine to medium grained, subangular to subrounded, moderately to well sorted clear to translucent quartz and black, light green and white lithic and feldspathic grains, abundant very light grey argillaceous matrix, occasional to common weak calcareous cement, rare mica, grading to Arenaceous Claystone in part, poor visual porosity. No shows
1851	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1854	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1857	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1860	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above
1863	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above, occasionally coarse grained in part.
1866	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above. Note: There are common coarse to very coarse angular (freshly broken by bit) multi-coloured metamorphic(?) lithics (as describe at 1713m) in this sample which may be caving only.
1869	100	-	-	tr	<u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u> : as above. Note: trace to common lithics (caving) as above.

3.2 Sidewall Cores

3.2.1 CST

One 30 shot CST run was performed in Eric The Red-1 within the 12-1/4" section of the hole between 1010.0 m and 373.5 m. One 60 shot CST run was performed in Eric The Red-1 within the 8-1/2" hole section between 1813.5 m and 1029.0 m. Detailed wellsite descriptions of the recovered sidewall cores appear on the following pages.

Table 2 contains a summary of the CST runs.

The remains of the sidewall cores subsequent to palynological, geochemical and petrological analysis are stored by BHP Petroleum at Kestrel Management (Australia) Pty Ltd, Unit 58, Slough Estate, 170 Forster Road, Mt Waverley, Victoria, 3149.

Table 2
Sidewall Core Summary

Ste No.	Run No.	Bullets in Gun	Bullets Fired	Misfires	Bullets Lost	Bullets Empty	Rec. Cores	Int. (mRT)
1	1	30	24	6	3	-	21	1010.5 - 373.5
2	2	60	60	0	4	3	53	1813.5 - 1029.0
Total		90	84	6	7	3	74	1813.5 - 355.0

The following CST descriptions were prepared at the wellsite.

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED 1 Permit: VIC/P 31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt Logging Suite No: 1</p> <p style="text-align: right;">Date: 22-2-93</p>
1	1010	50	<p><u>MASSIVE CLAYSTONE WITH MINOR SANDSTONE INTERBED</u></p> <p><u>CLAYSTONE</u>: medium dark grey, firm, trace of very fine quartz sand grading to silt, trace to common very finely disseminated carbonaceous flecks, non calcareous, slightly dispersive, micromicaceous, with an interbed of:</p> <p><u>SANDSTONE</u>: light grey to medium light grey, friable, very fine to occasionally fine grained, subangular to subrounded, well sorted quartz, abundant very light grey argillaceous matrix, common greyish black lithics, rare pyrite, occasional carbonaceous flecks, poor visual porosity. No shows.</p>
2	990		<p><u>NO RECOVERY</u>. Bullet lost.</p>
3	970	50	<p><u>SANDY CLAYSTONE/ARGILLACEOUS SANDSTONE</u></p> <p><u>SANDY CLAYSTONE</u>: medium light grey to medium grey, moderately firm to firm, dispersive, abundant very fine to fine grained quartz sand, (as per SWC #1) throughout, occasional greyish black lithics, common carbonaceous flecks, trace to rare pyrite, slightly micromicaceous, grading in part to:</p> <p><u>ARGILLACEOUS SANDSTONE</u>: medium light grey to light grey, friable, very fine to fine grained, subangular to subrounded, well sorted quartz, abundant very light grey argillaceous matrix, occasional greyish black lithics, occasional carbonaceous flecks, poor visual porosity. No shows.</p>
4	942		<p><u>NO RECOVERY</u>. Misfire.</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED 1 Permit: VIC/P 31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt Logging Suite No: 1</p> <p style="text-align: right;">Date: 22-2-93</p>
5	893.5	50	<p><u>SANDY CLAYSTONE/ARGILLACEOUS SANDSTONE</u></p> <p><u>SANDY CLAYSTONE</u>: dark greenish grey to greenish black, moderately firm, slightly dispersive, abundant very fine to fine grained quartz, trace medium grains, rare pyrite, slightly micromicaceous, non calcareous, occasionally interlaminated with and grading to:</p> <p><u>ARGILLACEOUS SANDSTONE</u>: medium light grey to light grey, friable, very fine to fine grained, occasional medium grains, subangular to subrounded, well sorted quartz, abundant very light grey to light greenish grey argillaceous matrix, rare pyrite, poor visual porosity. No shows.</p>
6	876	50	<p><u>SANDY CLAYSTONE/ARGILLACEOUS SANDSTONE</u></p> <p><u>SANDY CLAYSTONE/ARGILLACEOUS SANDSTONE</u>: as per SWC 5 with laminae more defined.</p>
7	836		<u>NO RECOVERY</u> . Misfire.
8	812.5	50	<p><u>MASSIVE CLAYSTONE</u></p> <p><u>CLAYSTONE</u>: medium grey to medium dark grey, firm, slightly dispersive, trace to occasional very fine to fine grained quartz, rare medium grains, trace pyrite, trace to occasional disseminated carbonaceous material, slightly micromicaceous, moderately calcareous.</p>
9	797		<u>NO RECOVERY</u> . Bullet lost.
10	778.5	50	<p><u>ARGILLACEOUS SANDSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE</u>: medium grey to medium dark grey, friable, predominantly fine to very fine grained, subangular to subrounded and occasionally rounded, well sorted quartz, abundant medium grey to medium dark grey dispersive argillaceous matrix, occasional greyish black lithic grains, slightly micromicaceous, trace carbonaceous flecks, rare biotite, rare pyrite, poor visual porosity. No shows.</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED 1 Permit: VIC/P 31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt Logging Suite No: 1</p> <p style="text-align: right;">Date: 22-2-93</p>
11	746	45	<p><u>CLAYSTONE WITH MINOR INTERLAMINATED SANDSTONE</u></p> <p><u>CLAYSTONE</u>: medium grey to medium dark grey, moderately firm, rare carbonaceous flecks, trace very fine grained quartz, slightly micromicaceous, slightly calcareous, with minor interlaminae of:</p> <p><u>SANDSTONE</u>: very light grey to light grey, friable, fine to very fine grained, grading to silt in part, subangular to subrounded, well sorted quartz, abundant argillaceous matrix, occasional carbonaceous flecks, trace greyish black lithic grains, rare pyrite, poor visual porosity. No shows.</p>
12	720.5	50	<p><u>SANDY CLAYSTONE/ARGILLACEOUS SANDSTONE</u></p> <p><u>SANDY CLAYSTONE</u>: medium grey to medium dark grey, moderately firm, abundant fine to very fine grained quartz sand, slightly micromicaceous, trace to rare carbonaceous flecks, trace pyrite, non calcareous, grading in part to:</p> <p><u>ARGILLACEOUS SANDSTONE</u>: very light grey to light grey, fine to very fine grained, subangular to subrounded, well sorted quartz, abundant argillaceous matrix, occasional greyish black lithic grain, rare carbonaceous flecks, very poor visual porosity. No shows.</p>
13	689.5	35	<p><u>CLAYSTONE WITH INTERBEDDED SANDSTONE</u></p> <p><u>CLAYSTONE</u>: medium dark grey to dark grey, firm, rare very fine grained quartz sand, occasional carbonaceous flecks, slightly micromicaceous, non calcareous, with interbeds of:</p> <p><u>SANDSTONE</u>: very light grey to light grey, very friable with abundant loose grains, fine to occasionally very fine grained, subangular to subrounded, well sorted quartz, trace very light grey argillaceous matrix, occasional greyish black lithic grain, rare pyrite, good visual porosity.</p> <p><u>FLUORESCENCE</u>: No direct, no cut, weak dull yellowish white crush cut, no apparent residual ring.</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED 1 Permit: VIC/P 31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt Logging Suite No: 1</p> <p style="text-align: right;">Date: 22-2-93</p>
14	664.5	50	<p><u>CLAYSTONE WITH INTERBEDDED QUARTZOSE/LITHIC SANDSTONE</u></p> <p><u>CLAYSTONE</u>: as for SWC 13. Interbedded with:</p> <p><u>QUARTZOSE/LITHIC SANDSTONE</u>: light grey, friable with abundant loose grains, predominantly fine grained with common granule sized grains, subangular to subrounded, well sorted quartz, granule sized angular to subrounded cherty lithic grains, trace light grey and patchy light greenish grey (chloritic?) matrix, rare very coarse quartz grains, trace carbonaceous flecks, rare coaly fragment, moderate to good visual porosity. No shows.</p>
15	642	50	<p><u>CLAYSTONE WITH INTERBEDDED QUARTZOSE SANDSTONE</u></p> <p><u>CLAYSTONE</u>: as for SWC 13 with occasional pyrite nodules. Interbedded with:</p> <p><u>SANDSTONE</u>: light grey to very light grey, friable, very fine to fine grained, angular to subangular and occasionally subrounded, well sorted quartz, trace to common very light grey argillaceous matrix, rare pyrite, rare coaly fragments, rare weathered white lithic grains, good visual porosity. No shows.</p>
16	612.5	50	<p><u>ARGILLACEOUS SANDSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE</u>: medium light grey to medium grey, friable, predominantly fine to occasionally very fine grained, subangular to subrounded, well sorted quartz, abundant light grey to medium light grey argillaceous matrix, occasional greyish black lithic grains, occasional light greenish grey (chloritic?) grains, trace pyrite, poor visual porosity. No shows.</p>
17	608		<u>NO RECOVERY</u> . Misfire.
18	599	50	<p><u>ARGILLACEOUS SANDSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE</u>: as for SWC 16.</p>
19	588.5		<u>NO RECOVERY</u> . Misfire.

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED 1 Permit: VIC/P 31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt Logging Suite No: 1</p> <p style="text-align: right;">Date: 22-2-93</p>
20	569	50	<p><u>ARGILLACEOUS SANDSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE</u>: medium light grey to medium grey, friable, predominantly fine to occasionally very fine grained, subangular to subrounded, well sorted quartz, common to abundant medium light grey argillaceous matrix, trace to common mica, rare pyrite, poor to fair visual porosity. No shows.</p>
21	562	50	<p><u>ARGILLACEOUS SANDSTONE WITH INTERBEDDED/INTERLAMINATED CLAYSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE</u>: as for SWC 20. Interbedded/interlaminated with:</p> <p><u>CLAYSTONE</u>: medium dark grey to dark grey, moderately firm to firm, trace very fine quartz sand, occasional carbonaceous flecks and coaly fragments, trace silt, non calcareous.</p>
22	553.5	50	<p><u>ARENACEOUS CLAYSTONE</u></p> <p><u>ARENACEOUS CLAYSTONE</u>: medium dark grey to dark grey, moderately firm, dispersive, common to abundant very fine to fine grained quartz sand, abundant disseminated pyrite and weathered pyrite, rare carbonaceous flecks, rare lithic grains, trace weathered mica, non calcareous, grading in part to argillaceous sandstone.</p>
23	471.5	0	<p><u>NO RECOVERY</u>. Misfire</p>
24	467	50	<p><u>ARGILLACEOUS SANDSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE</u>: dark grey to dusky brown, friable, predominantly very fine to occasionally fine grained, subangular to subrounded, well sorted quartz, iron stained in part, abundant dark grey to dusky brown argillaceous matrix, occasional cleaner sand laminae, fair to good visual porosity. No shows.</p>
25	429	50	<p><u>ARGILLACEOUS SANDSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE</u>: as for SWC 24.</p>
26	411	0	<p><u>NO RECOVERY</u>. Bullet lost.</p>
27	398.5	0	<p><u>NO RECOVERY</u>. Misfire.</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED 1 Permit: VIC/P 31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt Logging Suite No: 1</p> <p style="text-align: right;">Date: 22-2-93</p>
28	388	45	<p><u>ARGILLACEOUS SANDSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE</u>: dark grey to dusky brown, friable, fine to very fine grained, well sorted quartz, common to abundant dark grey to dusky brown dispersive argillaceous matrix, trace mica, rare carbonaceous flecks, poor visual porosity. No shows.</p>
29	378.5	50	<p><u>ARGILLACEOUS SANDSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE</u>: as for SWC 28.</p>
30	373.5	50	<p><u>ARGILLACEOUS SANDSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE</u>: as for SWC 28.</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
31	1831.5	40	<p><u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u></p> <p><u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE:</u> light grey to light greenish grey, speckled, friable, rarely moderately firm in part, fine to dominantly medium, subangular to dominantly subrounded, moderate to well sorted grey, green, black, minor brown volcanogenic lithics and clear to translucent quartz, abundant light grey to light greenish grey, dominantly dispersive argillaceous matrix, trace partially altered feldspar, rare off-white altered feldspar/kaolinite, rare mica, poor to fair visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p> <p>Note: 1- The partially altered and altered feldspar/kaolinite appear to be structural grains, rather than matrix. 2- Visual porosity decreases once water added to the sample (reactive argillaceous matrix?).</p>
32	1790.0	35	<p><u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u></p> <p><u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE:</u> as per SWC No. 31.</p> <p><u>FLUORESCENCE:</u> Nil</p>
33	1776.5	0	<p><u>NO RECOVERY</u> (Bullet Lost)</p>
34	1754.5	45	<p><u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u></p> <p><u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE:</u> as per SWC No. 31, dominantly fine grained, in part grading to Arenaceous Claystone.</p> <p><u>FLUORESCENCE:</u> Nil</p>
35	1749.5	40	<p><u>MASSIVE CLAYSTONE</u></p> <p><u>MASSIVE CLAYSTONE:</u> light to medium greenish grey, firm, dominantly blocky, rare silt, trace to rare carbonaceous laminae and flecks, rare micromica, non calcareous.</p> <p><u>FLUORESCENCE:</u> Nil</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
36	1736.5	0	<u>NO RECOVERY (Bullet Lost)</u>
37	1719.0	40	<p><u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u></p> <p><u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE:</u> dominantly light grey, occasionally light greenish grey, friable, dominantly fine, occasionally medium, subangular to dominantly subrounded, moderate to well sorted grey, brown, black, and minor green volcanogenic(?) lithics, partially altered feldspar and clear quartz, abundant light grey to occasionally yellowish white argillaceous matrix, rare very weak calcareous cement, trace to rare coaly fragments and carbonaceous flecks, rare mica, poor visual porosity.</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, very thin dull bluish white residual ring.</p>
38	1703.0	50	<p><u>MASSIVE CLAYSTONE</u></p> <p><u>MASSIVE CLAYSTONE:</u> medium to dark grey and greenish grey, firm to moderately hard, blocky, rare silt and very fine quartz sand grains, very rare carbonaceous flecks, non calcareous.</p> <p><u>FLUORESCENCE:</u> Nil</p>
39	1682.0	40	<p><u>INTERLAMINATED ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u></p> <p><u>INTERLAMINATED ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE:</u> light grey interlaminated with medium grey and medium brownish grey, friable to rarely moderately hard in part, dominantly fine, occasionally medium, dominantly subrounded, well sorted quartz and grey, minor green and brown lithics, abundant light grey argillaceous matrix, trace mica, rare carbonaceous flecks and laminae, trace to rare partially altered feldspar, poor visual porosity.</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, thin dull bluish white residual ring.</p>

Depth (mRT)	Lithology (%)	%Fluor	Glauconite	Carb Matter	 <p style="text-align: center;">SAMPLE DESCRIPTION SHEET</p> <p>Well: Eric The Red - 1 Permit: VIC/P31 Geologist(s): Ahmad Tabassi/Cliff Menhennitt</p>
1872	100	-	-	tr	<p><u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u>: very light grey to light grey, friable, fine to medium grained, subangular to subrounded, moderately to well sorted clear to translucent quartz and black, light green and white lithic and feldspathic grains, abundant very light grey argillaceous matrix, occasional to common weak calcareous cement, rare mica, grading to Arenaceous Claystone in part, poor visual porosity. No shows</p> <p>Note: trace lithics (caving) as above.</p>
1875	100	-	-	tr	<p><u>ARGILLACEOUS QUARTZOSE/LITHIC SANDSTONE</u>: as above.</p> <p>Note: trace to rare lithics (caving) as above</p>
<p>Total Depth of 1875 mRt was reached at 0600 hours on 26 Feb 1993.</p>					

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
40	1678.0	25	<p><u>MASSIVE CLAYSTONE</u></p> <p><u>MASSIVE CLAYSTONE:</u> medium to dark grey to greenish grey, firm to hard, blocky, rare carbonaceous micro-laminae, non calcareous.</p> <p><u>FLUORESCENCE:</u> Nil</p>
41	1674.0	0	<p><u>NO RECOVERY</u> (Bullet Empty)</p>
42	1667.0	35	<p><u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u></p> <p><u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE:</u> light greenish grey to light grey, speckled, friable to very rarely moderately hard, dominantly fine to occasionally medium, dominantly subrounded, well sorted grey, green, brown lithics and clear quartz, abundant light grey argillaceous matrix, trace partially altered feldspar, rare mica, rare carbonaceous detritus, poor to occasionally fair visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
43	1650.0	0	<p><u>NO RECOVERY</u> (Bullet Empty)</p>
44	1645.0	35	<p><u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE</u></p> <p><u>ARGILLACEOUS LITHIC/QUARTZOSE SANDSTONE:</u> as per SWC No. 42, dominantly medium, rare very coarse to granule quartz and light brown metamorphic(?) lithics, poor to occasionally fair visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
45	1630.0	18	<p><u>MASSIVE CLAYSTONE</u></p> <p><u>MASSIVE CLAYSTONE:</u> very dark grey, firm to moderately hard, blocky to occasionally subfissile, common to abundant carbonaceous flecks and micro-laminae, non calcareous.</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, thin moderately dull bluish white residual ring.</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
46	1602.0	35	<p><u>MASSIVE CLAYSTONE</u></p> <p><u>MASSIVE CLAYSTONE:</u> light brownish grey to light grey, firm, occasionally moderately hard in part, blocky, rarely silty, rare carbonaceous flecks, rare mica, non calcareous.</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, very thin dull yellowish white residual ring.</p>
47	1598.5	55	<p><u>MASSIVE SANDSTONE</u></p> <p><u>MASSIVE SANDSTONE:</u> light grey to translucent, friable, medium to coarse, subangular to subrounded, moderately sorted quartz, common light grey to off-white argillaceous matrix, trace green, grey, rare black and red lithics, rare coaly fragments, fair to good visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
48	1586.5	30	<p><u>QUARTZOSE/LITHIC SANDSTONE INTERBEDDED WITH QUARTZOSE SANDSTONE</u></p> <p><u>QUARTZOSE/LITHIC SANDSTONE:</u> light greenish grey, speckled, friable to rarely moderately hard, fine to medium, subangular to subrounded, moderately to well sorted quartz and grey, green, brown and occasionally red lithics, common light grey argillaceous matrix, trace partially altered feldspar, rare coaly fragments, fair visual porosity. Interbedded with:</p> <p><u>QUARTZOSE SANDSTONE:</u> off-white to clear, friable, medium to coarse, occasionally fine, subangular to subrounded, poorly to moderately sorted quartz, trace to rare off-white kaolinitic argillaceous matrix, trace granule size quartz and medium grey metamorphic(?) lithics, fair to good visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
49	1575.0	35	<p><u>ARGILLACEOUS SANDSTONE INTERLAMINATED WITH COAL</u></p> <p><u>ARGILLACEOUS SANDSTONE:</u> light grey, friable, very fine to fine, dominantly subrounded, well sorted quartz, abundant light grey argillaceous matrix, in part grading to Arenaceous Claystone, rare partially altered feldspar, rare lithics, rare carbonaceous detritus, very poor to poor visual porosity. Interlaminated (on mm scale) with:</p> <p><u>COAL:</u> very dark brown to black, soft to occasionally firm, commonly argillaceous, in part grading to Carbonaceous Claystone, dull lustre.</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, Coal has moderately thick, moderately dull bluish white residual ring.</p>
50	1552.5	25	<p><u>PEBBLY SANDSTONE</u></p> <p><u>PEBBLY SANDSTONE:</u> light grey to off-white, speckled in part, friable to occasionally moderately hard in part, fine to very coarse, occasional large pebble, subangular to rounded, dominantly subrounded, very poorly sorted quartz, common to abundant light grey to off-white argillaceous matrix, trace to rare lithics, rare partially altered feldspar, rare coaly fragments, poor visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p> <p>Note: The sample contains one large rounded quartz pebble, partly shattered by bullet.</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
51	1543.5	30	<p><u>PEBBLY CLAYSTONE/PEBBLY SANDSTONE</u></p> <p><u>PEBBLY CLAYSTONE/PEBBLY SANDSTONE:</u> light grey, medium grey, medium green to medium greenish grey, soft, friable in part (in the sandstone portions), moderately hard to hard in part, common to abundant fine quartz and minor lithics grains, in part grading to Sandstone, common to abundant light grey, off-white, green and grey metamorphic(?) pebbles in the groundmass of Claystone/Sandstone, very poor visual porosity in sandstone.</p> <p><u>FLUORESCENCE:</u> Nil</p>
52	1520.0	35	<p><u>MASSIVE CLAYSTONE</u></p> <p><u>MASSIVE CLAYSTONE:</u> medium to dark grey to slightly brownish grey, firm, blocky to subfissile, trace to common carbonaceous and coaly laminae, trace carbonaceous flecks, common micromica, non calcareous.</p> <p><u>FLUORESCENCE:</u> Nil</p>
53	1507.0	50	<p><u>MASSIVE SANDSTONE</u></p> <p><u>MASSIVE SANDSTONE:</u> clear to light grey, friable, coarse, rarely medium, rare off-white argillaceous matrix, rare partially altered feldspar, rare coaly detritus, rare lithics, rare mica, very good visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
54	1464.5	50	<p><u>MASSIVE SANDSTONE</u></p> <p><u>MASSIVE SANDSTONE:</u> light grey, friable, fine to medium, occasionally coarse, subangular to subrounded, moderately to poorly sorted quartz, common to abundant light grey to off-white argillaceous matrix, rare mica, rare partially altered feldspar, rare coaly detritus, fair visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
55	1455.0	40	<p><u>MASSIVE CLAYSTONE</u></p> <p><u>MASSIVE CLAYSTONE:</u> dark grey to dark brownish grey, firm to rarely moderately hard, blocky, common to occasionally abundant carbonaceous flecks and micro-laminae, common micromica, non calcareous.</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, very thin dull bluish white residual ring.</p>
56	1437.0	40	<p><u>CLAYSTONE INTERLAMINATED WITH MINOR SANDSTONE</u></p> <p><u>CLAYSTONE:</u> medium to dark grey, medium brownish grey in part, firm to moderately hard in part, trace to common micromica, common carbonaceous flecks, commonly to abundantly silty, in part grading to Argillaceous Siltstone, common very fine quartz sand grains, in part interlaminated with minor:</p> <p><u>SANDSTONE:</u> very light grey, occasionally off-white, friable, very fine to silt size in part, dominantly subrounded, well sorted quartz, abundant light grey silty argillaceous matrix, very poor to nil visual porosity.</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, very thin dull bluish white residual ring in Claystone portions.</p>
57	1416.5	0	<p><u>NO RECOVERY</u> (Bullet Lost)</p>
58	1395.0	40	<p><u>ARGILLACEOUS SANDSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE:</u> light grey, friable, dominantly medium, occasionally fine, subangular to subrounded, well sorted quartz, common to occasionally abundant in part light grey argillaceous matrix, rare lithics, rare coaly detritus and laminae, rare partially altered feldspar, fair to occasionally good visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
59	1375.5	0	<p><u>NO RECOVERY</u> (Bullet Empty)</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
60	1364.5	40	<p><u>CARBONACEOUS CLAYSTONE INTERLAMINATED WITH MINOR SANDSTONE</u></p> <p><u>CARBONACEOUS CLAYSTONE:</u> black to very dark brown, firm, moderately soft in part, blocky in part, moderately silty and arenaceous in part, grading to/interlaminated with minor;</p> <p><u>SANDSTONE:</u> very light grey, friable, very fine to occasionally silt size, dominantly subrounded, well sorted quartz, common light grey argillaceous matrix, grading to Siltstone in part, very poor to nil visual porosity.</p> <p><u>FLUORESCENCE:</u> No direct no cut, no crush cut, Carbonaceous Claystone has a thin dull bluish white residual ring.</p>
61	1340.0	40	<p><u>MASSIVE SANDSTONE</u></p> <p><u>MASSIVE SANDSTONE:</u> clear to translucent, friable, dominantly coarse, rarely very coarse to granule, dominantly subrounded, moderate to well sorted quartz, very rare off-white kaolinitic argillaceous matrix, very rare black soft carbonaceous(?) material (bitumen like substance with no direct, no cut, no crush cut or residual ring), very good visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
62	1336.0	30	<p><u>MASSIVE CLAYSTONE</u></p> <p><u>MASSIVE CLAYSTONE:</u> medium to dominantly dark brownish grey and grey, firm, blocky, common micromica, non calcareous, common to abundant carbonaceous flecks and micro-laminae, slightly to occasionally moderately silty, in part grading to/interlaminated with very minor Siltstone.</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, moderately thick dull bluish white residual ring.</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
63	1334.0	45	<p><u>CLAYSTONE INTERLAMINATED WITH MINOR COAL</u></p> <p><u>CLAYSTONE:</u> medium brownish grey, firm to moderately hard, dominantly blocky, rarely subfissile, common micromica and carbonaceous flecks, non calcareous, interlaminated with minor:</p> <p><u>COAL:</u> black, dominantly soft, firm in part, dull luster, moderately argillaceous in part.</p> <p><u>FLUORESCENCE:</u> Nil</p>
64	1332.0	40	<p><u>MASSIVE SANDSTONE</u></p> <p><u>MASSIVE SANDSTONE:</u> light to occasionally medium brownish grey, friable, coarse to very coarse, occasionally medium and granule size, rarely fine, dominantly subrounded, poorly sorted quartz, trace light brownish grey argillaceous matrix, rare carbonaceous detritus, fair to good visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
65	1328.5	40	<p><u>MASSIVE CLAYSTONE</u></p> <p><u>MASSIVE CLAYSTONE:</u> medium to dark grey to brownish grey, firm, dominantly blocky, rarely subfissile, common micromica, common carbonaceous flecks, rarely silty, non calcareous.</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, thin, dull, bluish white residual ring.</p>
66	1324.5	0	<p><u>NO RECOVERY</u> (Bullet Lost)</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
67	1316.0	30	<p><u>CLAYSTONE INTERLAMINATED WITH MINOR SILTSTONE</u></p> <p><u>CLAYSTONE</u>: medium brownish grey, firm, rarely moderately hard, blocky, common micromica, common carbonaceous flecks and micro-laminae, non calcareous, commonly silty, in part grading to/interlaminated with minor:</p> <p><u>SILTSTONE</u>: light grey, firm, abundantly argillaceous, common very fine quartz sand grains.</p> <p><u>FLUORESCENCE</u>: Nil</p>
68	1306.0	25	<p><u>CLAYSTONE INTERLAMINATED WITH MINOR SILTSTONE</u></p> <p><u>CLAYSTONE</u>: as per SWC No.67, interlaminated with minor:</p> <p><u>SILTSTONE</u>: as per SWC No. 67.</p> <p><u>FLUORESCENCE</u>: No direct, no cut, no crush cut, moderately thick dull bluish white residual ring.</p>
69	1297.5	20	<p><u>ARGILLACEOUS SANDSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE</u>: off-white to light grey, friable, occasionally moderately hard in part, fine to dominantly medium, subangular to subrounded, moderately to well sorted quartz, common to abundant light grey argillaceous matrix, trace moderately weak calcareous cement, trace to common grey, and minor red and black lithics, rare carbonaceous detritus, poor to fair visual porosity.</p> <p><u>FLUORESCENCE</u>: Nil</p>
70	1297.0	20	<p><u>ARGILLACEOUS SANDSTONE</u></p> <p><u>ARGILLACEOUS SANDSTONE</u>: as per SWC No. 69.</p> <p><u>FLUORESCENCE</u>: Nil</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
71	1292.5	35	<p><u>SILTY CLAYSTONE INTERLAMINATED WITH MINOR SILTSTONE</u></p> <p><u>SILTY CLAYSTONE</u>: light to medium brownish grey, firm to occasionally moderately hard, dominantly blocky, common carbonaceous flecks and rare micro-laminae, trace micromica, non calcareous, commonly to occasionally abundantly silty, in part grading to/interlaminated with minor:</p> <p><u>SILTSTONE</u>: light grey, firm, abundantly argillaceous, abundantly finely arenaceous, rare lithics, non calcareous.</p> <p><u>FLUORESCENCE</u>: Nil</p>
72	1275.0	15	<p><u>COAL</u></p> <p><u>COAL</u>: black, occasionally very dark brown, dominantly firm, rarely moderately hard in part, slightly argillaceous in part, rarely subconchoidal fractures, dull lustre in part,</p>
73	1271.0	30	<p><u>MASSIVE CLAYSTONE</u></p> <p><u>MASSIVE CLAYSTONE</u>: medium brownish grey, firm, soft in part, dispersive in part, commonly silty, trace carbonaceous flecks, trace micromica, non calcareous.</p> <p><u>FLUORESCENCE</u>: No direct, no cut, no crush cut, thin to moderately thick dull to moderately bright bluish white residual ring.</p>
74	1250.5	40	<p><u>INTERLAMINATED ARGILLACEOUS SILTSTONE</u></p> <p><u>ARGILLACEOUS SILTSTONE</u>: medium brownish grey interlaminated with light brownish grey, firm, dominantly blocky, trace micromica, trace to common carbonaceous flecks and laminae, non calcareous, abundantly argillaceous, in part grading to Silty Claystone.</p> <p><u>FLUORESCENCE</u>: No direct, no cut, no crush cut, thin to moderately thick moderately bright bluish white residual ring.</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
75	1219.5	35	<p><u>MASSIVE ARGILLACEOUS SILTSTONE</u></p> <p><u>MASSIVE ARGILLACEOUS SILTSTONE:</u> light brownish grey, moderately hard, abundantly argillaceous, in part grading to Silty Claystone, trace fine carbonaceous flecks, rare micromica, non calcareous.</p> <p><u>FLUORESCENCE:</u> Nil</p>
76	1186.0	35	<p><u>SILTSTONE INTERLAMINATED WITH MINOR SANDSTONE</u></p> <p><u>SILTSTONE:</u> medium grey to medium brownish grey, firm to moderately hard, dominantly blocky, commonly argillaceous, trace to occasionally common carbonaceous flecks and micro-laminae, non calcareous, interlaminated with minor:</p> <p><u>SANDSTONE:</u> light grey, friable, very fine to occasionally silt size, subrounded, well sorted quartz, common light grey argillaceous matrix, rare lithics and partially altered feldspar, nil visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
77	1177.0	39	<p><u>SANDSTONE INTERLAMINATED WITH MINOR CARBONACEOUS CLAYSTONE</u></p> <p><u>SANDSTONE:</u> light to medium grey, speckled in part, friable to moderately hard, dominantly fine, dominantly subrounded, well sorted quartz, trace light brownish grey argillaceous matrix, rare lithics, trace carbonaceous laminae, fair visual porosity, interlaminated with minor:</p> <p><u>CARBONACEOUS CLAYSTONE:</u> dark brownish grey, soft to rarely firm in part, rarely silty, non calcareous.</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, Carbonaceous Claystone has thin dull bluish white residual ring.</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
78	1162.0	55	<p><u>MASSIVE SANDSTONE</u></p> <p><u>MASSIVE SANDSTONE:</u> light to occasionally medium greenish grey, friable to rarely moderately hard in part, very fine to dominantly fine, subrounded, well sorted quartz, common light greenish grey argillaceous matrix, rare to occasionally trace moderately weak calcareous cement, rare lithics, very rare partially altered feldspar, rare mica, rare fine carbonaceous flecks, poor visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
79	1158.5	51	<p><u>INTERLAMINATED SANDSTONE</u></p> <p><u>INTERLAMINATED SANDSTONE:</u> light grey and light greenish grey, friable, very fine to dominantly fine, dominantly subrounded, well sorted quartz, trace light grey to greenish grey argillaceous matrix, trace partially altered feldspar, rare lithics, rare fine carbonaceous detritus, fair visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
80	1151.0	45	<p><u>SANDSTONE INTERLAMINATED WITH MINOR COAL</u></p> <p><u>SANDSTONE:</u> light grey to clear, friable, medium to very coarse, dominantly medium to coarse, rarely fine, subangular to rounded, dominantly subrounded, poorly sorted quartz, trace to rare light grey dispersive argillaceous matrix, rare mica, good to occasionally very good visual porosity, interlaminated with minor:</p> <p><u>COAL:</u> black to very dark brown, soft to firm, moderately to occasionally abundantly argillaceous, in part grading to Carbonaceous Claystone, trace pyritised woody fragments(?).</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, Coal has thin to moderately thick dull yellowish green residual ring.</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date:28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
81	1146.0	37	<p><u>MASSIVE SANDSTONE</u></p> <p><u>MASSIVE SANDSTONE:</u> light grey to clear, friable, fine, subrounded, very well sorted quartz, trace to rare light grey argillaceous matrix, rare mica, rare very fine carbonaceous detritus, fair to good visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
82	1129.5	40	<p><u>MASSIVE SANDSTONE</u></p> <p><u>MASSIVE SANDSTONE:</u> as per SWC No. 81, trace to occasionally common light grey argillaceous matrix, fair visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
83	1121.0	35	<p><u>MASSIVE SANDSTONE</u></p> <p><u>MASSIVE SANDSTONE:</u> clear to light grey to very light brownish grey, friable to rarely moderately hard in part, dominantly medium to coarse, occasionally very coarse to granule, subangular to subrounded, poorly sorted quartz, trace to rare dispersive light brownish grey argillaceous matrix, good to very good visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p> <p>Note: The light brownish colour may be due to mud filtrate.</p>
84	1113.0	40	<p><u>MASSIVE SANDSTONE</u></p> <p><u>MASSIVE SANDSTONE:</u> as per SWC No. 81, common black and rare green lithics, fair to good visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
85	1102.0	55	<p><u>MASSIVE SANDSTONE</u></p> <p><u>MASSIVE SANDSTONE:</u> clear to light grey, friable, fine to dominantly medium, subrounded, well sorted quartz, rare light grey argillaceous matrix, rare greyish green and black lithics, rare carbonaceous detritus, good to occasionally very good visual porosity.</p> <p><u>FLUORESCENCE:</u> Nil</p>
86	1097.0	40	<p><u>SANDSTONE INTERLAMINATED WITH SILTSTONE</u></p> <p><u>SANDSTONE:</u> light grey, friable to occasionally moderately hard, very fine to dominantly fine, subrounded, well sorted quartz, trace to common light grey argillaceous matrix, rare very fine partially altered feldspar, rare lithics, trace fine carbonaceous detritus, very poor visual porosity, interlaminated with:</p> <p><u>SILTSTONE:</u> light grey, occasionally light brownish grey, firm, commonly argillaceous, commonly arenaceous, trace to common carbonaceous flecks and minor laminae, non calcareous.</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, Siltstone has thin dull greenish yellow residual ring.</p>
87	1071.0	45	<p><u>MASSIVE CLAYSTONE</u></p> <p><u>MASSIVE CLAYSTONE:</u> dark grey, firm to moderately hard, blocky, common micromica, trace fine carbonaceous flecks, moderately silty in part, very slightly calcareous.</p> <p><u>FLUORESCENCE:</u> No direct, no cut, no crush cut, thin, dull, greenish yellow residual ring.</p>

Core No.	Depth (mRT)	Recovery (mm)	 <p style="text-align: center;">SIDEWALL CORE DESCRIPTION SHEET</p> <p>Well: ERIC THE RED Permit: VIC/P 31 Date: 28-02-93</p> <p>Geologist(s): Ahmad Tabassi Logging Suite No: 2</p>
88	1044.0	35	<p><u>MASSIVE SANDSTONE</u></p> <p>MASSIVE SANDSTONE: clear to very light grey, friable, dominantly medium to coarse, occasionally very coarse and granule, subangular to dominantly subrounded, moderately to poorly sorted quartz, in part yellow stained, trace light grey argillaceous matrix, trace green (glauconite?), yellow and redish brown lithics, rare coaly fragments, good visual porosity.</p> <p>FLUORESCENCE: Nil</p>
89	1040.5	65	<p><u>SILTSTONE INTERLAMINATED WITH SANDSTONE</u></p> <p>SILTSTONE: medium grey, firm to moderately hard, blocky, commonly argillaceous, trace to common carbonaceous flecks and laminae, common very fine quartz sand grains, in part grading to/interlaminated with:</p> <p>SANDSTONE: light grey to light greenish grey, friable, very fine to fine, subrounded, well sorted quartz, trace to common light grey argillaceous matrix, trace fine green (glauconite?), grey, black, and minor yellow lithics, rare partially altered feldspar, rare mica, very poor to nil visual porosity.</p> <p>FLUORESCENCE: Nil</p>
90	1029.0	50	<p><u>ARENACEOUS CLAYSTONE</u></p> <p>ARENACEOUS CLAYSTONE: medium grey to medium brownish grey, firm, abundant very fine grained quartz sand, trace fine glauconite, rare mica, trace to rare carbonaceous flecks and laminae, in part grading to Argillaceous Sandstone.</p> <p>FLUORESCENCE: No direct, no cut, no crush cut, thin dull greenish yellow residual ring.</p>

3.2.2 MSCT

No MSCTs were cut in Eric The Red-1

3.3 Conventional Cores

No conventional cores were cut in Eric The Red-1.

3.4 HYDROCARBON INDICATIONS

3.4.1 Cuttings Gas Summary

GAS READINGS (%):

DEPTH	mRT	TG	C ₁	C ₂	C ₃	iC ₄	nC ₄	C ₅
Background Gas								
580-830		0.020-	0.015-	tr	0.000-	0.000-	0.000-	0.000-
830-1017		0.010-	0.002-	0.001-	0.000-	0.000-	0.000-	0.000-
		0.050	0.012	0.003	0.000	0.000	0.000	0.000
1017-1042		0.007-	0.007-	0.000-	0.000-	0.000-	0.000-	0.000-
		0.007	0.007	0.000	0.000	0.000	0.000	0.000
1042-1145		0.012-	0.012-	0.000-	0.000-	0.000-	0.000-	0.000-
		0.013	0.013	0.000	0.000	0.000	0.000	0.000
1145-1160		0.033-	0.033	0.000-	0.000-	0.000-	0.000-	0.000-
		0.033	0.033	0.000	0.000	0.000	0.000	0.000
1160-1260		0.020-	0.020-	0.000-	0.000-	0.000-	0.000-	0.000-
		0.020	0.020	0.000	0.000	0.000	0.000	0.000
1260-1334		0.040-	0.019-	0.006-	0.002-	0.000-	0.000-	0.000-
		0.040	0.019	0.006	0.002	0.000	0.000	0.000
1334-1419		0.060-	0.009-	0.002-	0.009-	0.000-	0.000-	0.000-
		0.060	0.009	0.002	0.009	0.000	0.000	0.000
1419-1464		0.040-	0.010-	0.002-	0.001-	0.000-	0.000-	0.000-
		0.040	0.010	0.002	0.001	0.000	0.000	0.000
1464-1509		0.040-	0.010-	0.002-	0.001-	0.000-	0.000-	0.000-
		0.040	0.010	0.002	0.001	0.000	0.000	0.000
1545-1620		0.060-	0.012-	0.003-	0.001-	0.000-	0.000-	0.000-
		0.060	0.012	0.003	0.001	0.000	0.000	0.000
1625-1695		0.070-	0.031-	0.001-	tr	0.000-	0.000-	0.000-
1695-1710		0.030-	0.021-	0.001-	tr	0.000-	0.000-	0.000-
1710-1745		0.040-	0.027-	0.001-	tr	0.000-	0.000-	0.000-
1745-1875		0.060-	0.042-	0.001	tr	0.000-	0.000-	0.000-

GAS READINGS (%):

DEPTH	mRT	TG	C₁	C₂	C₃	iC₄	nC₄	C₅
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Peaks

1255		0.08	0.064	0.0009	0.0008	0.000	0.000	0.000
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Wiper Trip Gas

nil

Connection Gas

nil

3.4.2 Cuttings Hydrocarbon Fluorescence

No fluorescence was detected in the cuttings and sidewall cores from Eric The Red-1.

4. LOGGING AND SURVEYS

PETROLEUM DIVISION

15 DEC 1993

4.1 Mudlogging

Exlog provided conventional mudlogging services in conjunction with a computerised data logging and processing system (Drillbyte).

Gas detection equipment consisted of :

- Flame Ionisation Total Hydrocarbon Ditch Gas Detector.
- Flame Ionisation Chromatograph (continuous cycle-hydrocarbon detection C₁ through to C₅).
- Hydrogen Sulphide detector (continuous monitoring sensitive to 1 ppm).
- Infra red CO₂ detector.

The Exlog 'Drillbyte' monitoring system was utilised to measure, display and record conventional drilling data. Permanent storage of drilling data was made onto 3.5" floppy diskette. On-line and off-line plots of engineering parameters were made available when necessary.

Surveillance for potential abnormal pressure while drilling was assisted by the continuous computation of the D-Exponent and Pressure Logs.

The Exlog unit was operated continuously throughout the well. Once returns were achieved, routine analyses for fluorescence and cut in organic solvent were carried out on all ditch samples.

The Mudlog is included in this volume as Enclosure 1 and the Exlog End of Well Report appears as Appendix 2.

4.2 Wireline Logs

Two suites of wireline logs were run in Eric The Red-1. A list of the logs run in the well is included in Table 3.

Table 3
Wireline Logs

Suite No.	Run No.	Log Type	Depth Interval mRT	Date Run
1	1	DLL-MSFL-SDT-GR-SP-CAL-AMS	1010.5-355 (GR to seafloor)	21/02/93
1	1	Zero Offset VSP	1005-175	21/02/93
1	1	CST-GR (30 shots)	1010-373.5	30/01/93
2	1	DLL-MSFL-SDT-GR-SP-CAL-AMS	1871-1007	08/02/93
2	1	LDL-CNL-FMS-GR-AMS	1825-1007	08/02/93
2	1	RFT-GR-HP	1790-1058.5	09/02/93
2	1	CST-GR (60 shots)	1813.5-1029	10/02/93
2	2	Zero Offset VSP	1820-900	11/02/93

4.3 Measurement While Drilling

Eastman Teleco Measurement While Drilling Services were utilised by BHP Petroleum during the drilling of Eric The Red-1. A dual propagation resistivity (DPR) log in both real time and recorded modes and directional surveys were provided in the 12-1/4" hole section from a bit depth of 364 m to 1017 m. Reliable DPR and directional data were provided in real time throughout this hole section and a DPR memory log was produced at the end of the hole section. One MWD tool was required for the single tool run in the 12-1/4" hole section.

A DPR log in both real time and recorded modes and directional surveys were provided in the 8-1/2" hole section from a bit depth of 1017 m to 1875 m (TD). Reliable DPR and directional data were provided in real time throughout this hole section and a DPR memory log was produced at the end of each tool run. One MWD tool was required for the two tool runs in the 8-1/2" hole section.

The tools acquired a total of 81 circulating hours of data.

The MWD logs are provided in this volume as Enclosure 2 and the Eastman Teleco End of Well Report appears as Appendix 3.

4.4 Velocity Surveys

Schlumberger Seaco Inc conducted a Zero Offset Vertical Seismic Profile Survey in the 12.25" hole section on Eric The Red-1 using a Combinable Seismic Imager (CSI). Three sleeve air guns were used as the energy source for the survey. The guns were suspended from the rig and located 10 m below mean water level and offset 47 m from the wellhead on an azimuth of 053°. The survey was acquired on 21 and 22 February 1993 and obtained VSP data from a depth of 1005 to 175 mRT. A total of 36 VSP levels were recorded at approximately 20 m shot spacing.

Schlumberger Seaco Inc conducted a second VSP Survey in the 8.5" hole section at TD. Three sleeve air guns were used as the energy source for the survey. The guns were suspended from the rig and located 10 m below mean water level and offset 47 m from the wellhead on an azimuth of 053°. The survey was acquired on 27 February 1993 and obtained VSP data from a depth of 1820 to 900 mRT. A total of 43 VSP levels were recorded at approximately 20 m shot spacing.

No VSP Quicklook processing was applied at the wellsite.

The Schlumberger Well Seismic Processing Report appears as Appendix 7 (Volume 2) of this report.

5

5. RESERVOIR AND FLUID ANALYSIS

PETROLEUM DIVISION

15 DEC 1993

5.1 RFT

One RFT run was made in Eric The Red-1 on 27 February 1993. Ten pretests were attempted (of which 6 were successful) over the interval 1785.0 m to 1058.5 mRT. Pretest data are presented below.

No fluid samples were collected.

ERIC THE RED - 1: RFT DATA SHEET

Test No.	Depth		Time hh:mm	Initial Hydrostatic Pressure psig	Formation Pressure psig	Temperature Deg C		Final Hydrostatic Pressure psig	Mobility mD/cp	Permeability* mD	Comments
	mRT	mTVDSS				AMS	Strain				
1	1058.5	1033.5	05:20	1679.2	1496.8	50.2	51.8	1677.8	3164	1600	Good Test
2	1154.0	1129.0	05:35	1820.0	-----	-----	-----	-----	-----	-----	Lost Seal
3	1343.5	1318.5	06:05	2129.5	1897.8	57.7	59.3	2123.5	340	170	Good Test
4	1378.5	1353.5	06:17	2178.0	1947.2	58.3	60.1	2178.2	60	30	Good Test
5	1478.5	1453.5	06:30	2334.0	2088.8	60.4	61.8	2339.7	8	10 **	Good Test
6	1631.5	1606.5	06:55	2573.4	2306.6	65.1	66.8	2573.7	7	10 **	Good Test
7	1781.0	1756.0	07:25	2806.5	-----	70.0	71.4	-----	-----	-----	Tight
8											
9	1154.5	1129.5	05:40	1820.3	1631.1	52.4	54.4	1820.2	1095	550	Good Test
10	1781.5	1756.5	07:30	2807.0	-----	-----	-----	-----	-----	-----	Tight
11	1785.0	1760.0	07:35	2812.7	-----	-----	-----	-----	-----	-----	Tight

Witness: James Boorman

Well KB: 25.0 m above MSL

Date: 27th January 1993

Rllg: Byford Dolphin

* Permeabilities rounded to nearest 10 mD for <1000 mD, and nearest 100 mD for >1000 mD.

** Qualitative log inspection indicates permeabilities far greater than those indicated here.

Fillrate Viscosity = 0.5 cP

k(rw) = 1.0

k(v)/k(h)=1.0

Table 4
RFT Data Sheet

5.2 DST

No DSTs were performed in Eric The Red-1.

6. APPENDICES

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Appendix 1 Core Analysis Report

No cores were cut in Eric The Red-1.

Appendix 2 Exlog End of Well Report (Mudlogging)

PETROLEUM DIVISION

15 DEC 1993

FINAL WELL REPORT

BHP Petroleum Pty Ltd

Eric the Red-1

Otway Basin, Victoria

February - March 1993

by

EXLOG Australia

The information, interpretations, recommendations, or opinions contained herein are advisory only and may be rejected. Consultant does not warrant their accuracy or correctness. Nothing contained herein shall be deemed to be inconsistent with, nor expand, modify or alter Consultant's obligation of performance as provided for in a written agreement between the parties, or, if none, in Consultant's most recent price list.

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1. INTRODUCTION

a. Well & Rig Data

Company : BHP Petroleum Pty Ltd
Well Name : Eric the Red-1
Location : Otway Basin, Victoria
Permit : VIC/P31
Latitude : 39° 00' 45.44" South
Longitude : 143° 10' 51.45" East
Field : Exploration
Rig : "Byford Dolphin"
Semi-submersible
RT - MSL : 25.3 metres
RT - Seabed : 100.5 metres
Spud Date : 17th February 1993
Total Depth : 1875 metres
Total Depth Date : 26th February 1993
Completion Status : Plugged and abandoned.
Exlog Unit No : 503
Crew, DrillByte : M. Sale, A. Thangam, K. Clarke,
S. Ong
Crew, Logging : S. Alexander, V. Surla, D. Alsop
R. Tadiar

b. Prognosis

The proposed location for Eric the Red-1 was in the southeastern part of VIC/P31, in the eastern Otway Basin, approximately 35 km east of Mussel-1. The well was designed to test a fault dependent closure mapped at the Top Upper Shipwreck Group.

At Top Upper Shipwreck Group level, the Eric the Red structure is an elongate northeast-southwest faulted anticline. Both older east-west and younger north-south orientated faults cross cut and bound the structure with no fault independent closure mapped.

The primary target is sealed by overlying claystones and siltstones of the Sherbrook Group with potential closure of 200 metres at the most likely closing contour at 1310 mSS. Closure is mapped from within the mid Sherbrook Group, until Total Depth of the well with the potential for accumulations if intra-formational seals exist.

Exploration Logging provided a DrillByte Service on Eric the Red-1 from spud to a Total Depth of 1875 metres. In addition to formation evaluation and conventional mud logging, real time data monitoring and recording as well as pressure and drilling analyses were carried out. Continuous evaluation of pressures and drilling progress provided an aid in optimizing drilling costs and ensuring that drilling continued with maximum safety to personnel, the well, and equipment. The operator was continuously advised as to the status of these analyses, with data and results stored on floppy disks for post-well evaluation. The printouts and plots of the results of these services are contained in the appendices to this report.

c. Sample Distribution

Formation evaluation services were provided from 370 metres to 1875 metres TD.

Two sets of unwashed cuttings, five sets of washed and dried cuttings samples and one set of Petrocraft sample vials were prepared for distribution as follows:

2 sets 200g unwashed
2 sets 200g washed and dried
Petrocraft sample vials
To: BHP Petroleum Pty Ltd
BHP Core Store
C/- Kestrel Management
Unit 58
Slough Estate
170 Forester Road
Mt Waverley
Victoria

1 set 100g washed and dried samples
To: Officer-in-Charge
BMR Core and Cuttings Laboratory
80 Collins Street
Fyshwick ACT 2609

1 set 100g washed and dried samples
To: VIC DEM
DMID Corelab
196 Turner Street
Port Melbourne
VIC 3207

1 set 100g washed and dried samples
To: Bridge Oil Officer-in-Charge
255 Elizabeth Street
NSW 2000
Attn. Mr G. Roder

1 set mud samples comprising of:
2 x 200g composite unwashed 100m samples
1 x 1Kg tin unwashed 100m samples
To: BHPP Melbourne
Attn. R. Craddock

Samples were collected and processed from the 13.375" casing shoe
ver the following intervals:

370m - 1017m : 5m samples 1017m- 1875m : 3m samples

Samples not collected due to excessively high ROP and/or the highly
dispersive nature of clay formations:

395
415, 440, 450, 465, 485, 495
505, 520, 530, 595
600, 615, 625, 630, 650, 660, 670, 680, 690
700, 710, 720, 730, 740, 750, 770, 780, 795
805, 815, 825, 855
925, 940
1170.

2. DRILLING AND ENGINEERING

a. Well History

The rig "Byford Dolphin" arrived at the Eric the Red-1 location on the 17th January 1993. The drill floor was 25.3 metres above sea level, and 100.5 metres above the sea-bed (water depth 75.2 metres).

36.00" Hole Section: 100 to 116 metres

After securing anchors and ballasting down, Eric the Red-1 was spudded at 07:00 hrs on the 17th February 1993.

NB#1, a 26.0" Security S3J (3x24 jets), run in tandem with a 36" hole-opener, spudded the well and drilled to a depth of 116 metres in 0.63 hrs (on-bottom) at an average rate of penetration of 25.4 m/hr and was graded 1-1-NO-A-E-I-NO-TD. Hi-vis pills were spotted at every stand down and all returns were to the sea floor. At 116 metres, the bit was pulled out for a BHA and bit change. Typical drilling parameters used on this bit run were: WOB 0-5 klbs, RPM 30-80 and pump pressure 300 psi at 970 gpm.

9.875" Pilot Hole Section: 116 to 370 metres

Due to the possibility of encountering shallow gas, a small (9.875") diameter hole section was first penetrated prior to being opened up to 36" and 17.5". This was completed during daylight hours so that any gas could easily be seen.

NB#2, a 9.875" Security S44GF (3x16 jets), was made up on a new BHA and run into the hole to drill from 116 metres, using seawater and guar gum hi-vis sweeps as the drilling fluid with returns were to the sea floor. At 370 metres, a survey was dropped (Dev = 0.5° @ 370 metres), the hole circulated and conditioned and the bit pulled out of the hole for a BHA and bit change. This bit drilled to 254 metres in 3.85 hrs (on-bottom) at an average rate of penetration of 65.9 m/hr and was graded 1-1-NO-A-1-I-NO-TD. Typical drilling parameters used on this bit run were: WOB 0-15 klbs, RPM 110-120 and pump pressure 1150 psi at 1185 gpm.

36.00" Hole-opening Section: 116 to 137 metres

RR#1.1, a 26.0" Security S3J (3x24 jets), run in tandem with a 36" hole-opener, opened up the 9.875" hole from 116 to 137 metres, with hi-vis sweeps at each half stand. At 137 metres, 150 bbls of spud mud was pumped and then displaced by 150 bbls of kill mud. A survey was dropped (Dev = 1.0° at 137 metres) before the bit was pulled to run 30.0" casing. This bit drilled 21.0 metres in 1.8 hrs at an average penetration rate of 12.0 m/hr and was graded 2-2-NO-A-E-I-NO-TD. The drilling parameters used were: WOB 20 klbs, RPM 120 and pump pressure 1250 psi at 1075 gpm.

Three joints of 30.0" casing (310 lb/ft, R3) were then run with the shoe set at 136 metres. The casing was cemented with 456 sx class "G" cement at 1.90 sg (15.9 ppg), with 2% CaCl₂, and displaced with 18 bbls seawater.

17.5" Hole-opening Section: 137 to 364 metres

NB#3, a 17.5" Security SS44G (3x18 jets), was made up with a new BHA and run into the hole. The cement and casing shoe were drilled out and the 9.875" pilot open hole section was then opened up to 17.5" from 137 metres to 364 metres. Hi-vis pills were pumped (30 -50 bbls) at every connection. At 364 metres, 200 bbls of hi-vis mud and 300 bbls of kill mud was pumped before a survey was dropped (Dev = 1.0° at 364 metres) and the bit pulled out of the hole for the 13.375" casing run. This bit drilled 227 metres in 4.5 hrs (on-bottom) at an average rate of penetration of 50.4 m/hr and was graded 1-1-NO-A-1-1-NO-TD. The drilling parameters used on this bit run were: WOB 10-30 klbs, RPM 155 and pump pressure 2900 psi at 1075 gpm.

Twenty one joints of 13.375" casing (68 lb/ft, Sumiton, BTC, N80) was then run with the shoe set at 355 metres. The casing was cemented with a lead of 300 sacks class "G" cement at 1.50 sg (12.5 ppg) with 0.55 gal per sack, and a tail slurry of 500 sacks of class "G" cement at 1.90 sg (15.8 ppg), and displaced with 118 bbls of drillwater.

The BOPs and riser were rigged up and run to the seafloor. The BOPs were then tested to BHP's specifications.

12.25" Hole Section: 370 to 1017 metres

NB#4, a 12.25" Hughes ATM11H (13x16x18 jets), was made up on a MWD assembly and run into the hole, tagging cement at 319 metres. This was subsequently drilled, together with the shoe at 355 metres. At 355 metres, 100 bbls of guar gum and 100 bbls of seawater was pumped prior to displacing the hole and riser with KCL/PHPA mud. The bit then reamed and cleaned out the 17.5" rathole at 364 metres and was pulled back to the shoe to perform a Formation Integrity Test. The results were as follows.

Depth (m)	Casing Shoe (m)	Hole Size (inches)	Mud σ (sg)	Fracture Press (sg EMD)
364	355.0	12.25	1.07	1.24 (10.3ppg)

After the leak-off test, the bit was run into the hole to open the 9.875" hole from 364-370 metres, and subsequently drilled ahead from 370 to 1017 metres, reaming at every connection. At 1017 metres, the programmed casing depth, the mud was circulated clean prior to the bit being pulled out of the hole without problem. This bit drilled 647 metres in 9.62 hrs (on-bottom) at an average rate of penetration of 67.3 m/hr and was graded 2-2-EC-G-E-I-FC-TD. The drilling parameters

used on this bit run were: WOB 0-30 klbs, RPM 120-140 and pump pressure 1800 psi at 650 gpm.

The wireline tools were then rigged up and the following logs were run:

Run	Log Type	Interval
1	DLL-MSFL-BHC-SP-GR-CAL-AMS	355.0m - 1012m
2	VSP	348.0m - 980m
3	CST (30 shot, 27 recovered)	373.5m - 1010m

Seventy six joints of 9.625" casing (47 lb/ft, P110) was then run with the shoe set at 1007.42 metres. The casing was cemented with 254 sx class "G" cement at 1.9 sg (15.8 ppg), and displaced with 223 bbls of mud.

8.5" Hole Section: 1017 to 1875 metres

NB#5, an 8.5" Hughes ATM22 (1x14, 2x10 jets) was then made up in combination with a Teleco MWD tool and run into the hole. The top of the cement was tagged at 968 metres. The float was then drilled together with the shoe and shoe track. The rathole was reamed and cleaned out to 1017 metres and surged for junk on bottom to recover lost CST bullets.

New hole was drilled from 1017 metres to 1020 metres, and the bit was then pulled back to the shoe to perform a Formation integrity Test. The results were as follows:

Depth (m)	Casing Shoe (m)	Hole Size (inches)	Mud σ (sg)	Fracture Press (sg EMD)
1020	1007	8.50	1.08	1.95 (16.3ppg)

Drilling continued from 1020 metres to 1238 metres where a flow-check was performed due to a suspected rise in the active pits (no flow). From 1355 metres, problems were encountered due to high and erratic torque. Initially, it was thought to be related to the stabilizers entering the many well-cemented sandstone bands. By 1625 metres however, the situation had worsened to the point of continually stalling out the rotary and it was decided to pull the bit. This bit drilled 608 metres in 27.68 hrs (on-bottom) at an average rate of penetration of 21.96 m/hr and was graded 8-8-BT-A-F-24-WT-TQ. Typical drilling parameters used on this bit run were: WOB 5-35 klbs, RPM 100-115 and pump pressure 2300 psi at 405 gpm. The trip out recorded tight hole from 1518-480 metres and required overpull up to a maximum of 90 klbs.

NB#6, an 8.5" Hughes ATM22 (1x14, 2x10 jets) was then made up in combination with a Teleco MWD tool and run into the hole. Due to the last bit being excessively undergauge, this bit was reamed and washed to bottom, encountering only minor drag of up to 30 klbs. Drilling ahead continued from 1625 metres without problem. Trip gas of 0.04% was recorded on bottoms up. At 1875 metres, the programed Total Depth for the well, a survey was taken (Dev = 1.1° at 1867 metres) and the shakers circulated until clean. A slug was then pumped and a 20 stand wiper trip then performed. Intermittent drag was recorded from 1816-1352 metres of up to 120 klbs at 1643 metres, and averaging 60 klbs. The bit was then run back to bottom with only normal drag. The shakers were again circulated until clean, prior to a slug being pumped and the bit pulled out of the hole to run logs. No problems were encountered during the trip out. This bit drilled 250 metres in 14.55 hrs (on-bottom) at an average rate of penetration of 17.2 m/hr and was graded 5-7-BT-H-E-1-WT-LOG. Typical drilling parameters used on this bit run were: WOB 15-35 klbs, RPM 110-115 and pump pressure 2200 psi at 395 gpm.

The wireline unit was then rigged up and the following logs were run:

Run	Log Type	Interval
1	DLL-MSFL-AS-AMS-GR-CAL	1871 m - 1007 m
2	FMS-CNL-LDL	1825 m - 1007 m
3	VSP (aborted)	- m - - m
4	RFT	1790 m - 1058 m
5	VSP (re-run)	1820 m - 900 m
6	CST (60 shot) (55 recovered)	1814 m - 1029 m

Eric the Red-1 was then plugged and abandoned according to the BHP abandonment plan.

b. Bit Optimisation

Bit performance was continuously monitored and the operator advised of rate of penetration, torque and formation changes. See Table 4 for a detailed breakdown bit data. No bits were tripped on a cost/metre criteria.

Eric the Red-1 was drilled using a total of 6 new bits and 1 re-run bit in 62.63 hrs on-bottom at an average rate of penetration of 28.34 m/hr.

The 36" section was drilled in one run using one new bit.

NB#1, a 26.0" Security S3SJ bit (IADC 111), was run in tandem with a 36.0" hole-opener. This bit drilled 16 metres in 0.63 hrs (on-bottom) at rates of penetration varying between 15 and 168 m/hr with an average of 25.4 m/hr. Drilling parameters used were: WOB 0-5 klb, RPM 30-80 and pump pressure 300 psi at 970 gpm. This bit performed well and showed only minor wear consistent with the small amount of new formation penetrated. It was graded 1-1-NO-A-1-I-NO-TD.

The 9.875" hole section was drilled using one new bit.

NB#2, a 9.875" Security S44GF (IADC 137), was used to drill the pilot hole for this section from 116 to 370 metres, a distance of 254 metres, in 3.85 hrs (on-bottom). Penetration rates varied from 15 to 220 m/hr with an average of 65.9 m/hr. It was graded 1-1-NO-A-1-I-NO-TD. The bit was pulled to allow the section to be opened out to 36.0" showing only minor wear. Typical drilling parameters used were: WOB 0-15 klb, RPM 120-135 and pump pressure 1150 psi at 1180 gpm.

The top 9.875" hole section was opened to 36.0" using one rerun bit.

RR#1.1, a 26.0" Security S3J (IADC 111), run in conjunction with a 36.0" hole-opener, was used to open the pilot hole to 137 metres prior to running 30.0" casing. This bit drilled 21.0 metres in 1.8 hrs at an average penetration rate of 12.0 m/hr and was graded 2-2-NO-A-E-I-NO-TD. The drilling parameters used were: WOB 20 klb, RPM 120 and pump pressure 1250 psi at 1080 gpm.

The remainder of the 9.875" hole section was opened to 17.5" with one new bit.

NB#3, a 17.5" Security SS44G (IADC 135), opened the remaining 9.875" pilot hole section of the previous run from 137 -364 metres, in 6.5 hours (on-bottom). Penetration rates averaged 72.3 m/hr. This bit was pulled to run 13.375" casing, showing only minor wear for the amount of formation drilled and was graded 2-2-NO-A-1-I-NO-TD. Typical drilling parameters used were: WOB 5-25 klb, RPM 100-120 and pump pressure 2900 psi at 1080 gpm.

The 12.25" hole section was drilled using one new bit.

NB#4, a Hughes ATM11H 12.25" (IADC 437), was used to drill the cement, shoe track, shoe and 6 metres of 9.875" pilot hole to 370 metres. New hole was drilled from 370 metres to 1017 metres, in 9.62 hours (on bottom). Penetration rates averaged 67.26 m/hr over the hole section. This bit performed well and showed only moderate wear consistent with the amount of new formation penetrated. It was graded 2-2-EC-G-E-I-FC-TD. Typical drilling parameters were: WOB 0-30 klb, RPM 120-140, and pump pressure 1800 psi at 650 gpm.

The 8.5" hole section was drilled using two new bits in 42.23 hours at an average penetration rate of 19.1 m/hr.

NB#5, a Hughes ATM22 8.5" (IADC 517), was used to drill the cement, shoe track, shoe and clean up 10 metres of 12.25" rathole to 1017 metres. New hole was drilled from 1017 metres to 1625, in 27.68 hours (on-bottom). Penetration rates averaged 22.0 m/hr over the hole section. This bit did not perform well considering the amount of new formation drilled. It recorded extensive wear in all areas, notably teeth and gauge, and was graded 8-8-BT-A-F-24-WT-TQ. Typical drilling parameters were: WOB 5-35 Klb, RPM 100-115, and pump pressure 2300 psi at 405 gpm.

NB#6, a Hughes ATM22 8.5" (IADC 517), drilled new hole from 1625 metres to 1875, in 14.55 hours (on-bottom). Penetration rates averaged 17.18 m/hr over the hole section. This bit performed moderately well and showed wear above what was expected for the amount of new formation penetrated. It was graded 5-7-BT-H-E-1-WT-LOG. Typical drilling parameters were: WOB 15-35 Klb, RPM 110-115, and pump pressure 2200 psi at 395 gpm.

c. Hydraulics Optimisation

Hydraulics analyses were provided for the operator on a daily basis. Results of these analyses are provided on the daily Geological - Engineering reports and on the Hydraulic data printouts in Appendices VII and VIII, respectively. A summary of this data is also provided in Table 5.

The rig was equipped with two NATIONAL 12-P-160 triplex pumps. A pump output of 5.38 gal/stk at 96% efficiency was utilized.

The 36" hole section was drilled with returns to the sea floor using seawater with guar gum, hi-vis sweeps as the drilling fluid. Flow rates of 250-300 gpm were used giving fairly low annular velocities with laminar flow around the collars. The impact force and percentage pressure loss were low due to the presence of the 36" hole-opener. However, the lithology penetrated was probably insufficiently consolidated for the poor hydraulics to significantly affect the rate of penetration.

The 9.875" pilot hole section was drilled using seawater with hi-vis gel sweeps as the drilling fluid at a flow rate of 970 gpm, producing excellent cuttings transport properties but turbulent flow regimes within the 9.875" hole section. Bit hydraulics were optimal with the percentage pressure loss at the bit being 83% of the surface pressure. This hole section was subsequently opened out to 17.5" using a flow rate of 1080 gpm, again producing excellent cuttings transport properties but turbulent flow regimes within the 17.5" hole section. Bit hydraulics were sub-optimal, with the percentage bit pressure drop being 14% due to the presence of the hole-opener.

The 12.25" hole section was drilled using a closed KCL/PHPA mud system. Adequate mud rheology and flow rates in the order of 600-700 gpm resulted in laminar flow regimes throughout all sections of the annulus whilst drilling, thus keeping hole erosion to a minimum. Cuttings transport was also optimal with sufficient annular velocities in the largest annular section (i.e. the marine riser) to maintain efficient hole cleaning. Bit hydraulics were optimal (despite the use of a MWD tool with the associated 'parasitic' pressure loss) with a typical bit pressure drop of 58%, producing hydraulic power of between 590 and 660 hp, impact force of between 1300 and 1400 lbf and jet velocities of between 130 and 135 m/sec.

The 8.5" hole section was again drilled with a closed KCL/PHPA mud system and using an MWD tool. Flow rates were maintained between 390 to 415 gpm which, when combined with good mud properties, ensured laminar flow regimes throughout all section of the annulus. Thus, hole erosion was minimised whilst maintaining optimal cuttings transport in the largest annular section (riser). Bit hydraulics were also optimal (despite the use of a MWD tool with the associated 'parasitic' pressure loss) with bit pressure losses at between 52 and 73% of total losses. Hydraulic power was maintained between 230 and 370 hp, impact force between 615 and 830 lbf and jet velocity ranged from 113 to 131 m/sec.

d. Borehole Condition.

Borehole condition was monitored by observing rotary torque, overpull and cavings for indications of tight hole. Carbides were also run to check the lag and indicate the average hole size.

The 36" hole was drilled to 116 metres with no hole problems.

The 9.875" pilot hole was drilled to 370 metres with no hole problems. This was subsequently opened out to 36.0" to 137 metres without problems and the 30.0" casing run without drag. The remainder of the pilot hole section was then opened up to 17.5" and 13.375" casing run without problem.

The 12.25" hole section recorded no hole problems whilst drilling. Torque and drag on connections remained normal. Carbide lag checks run at 588, 644 and 848 metres indicated the open hole to this depth was washed out to 17.2, 17.2 and 15.2" respectively. The trip out at 1017 metres recorded only normal drag.

The 8.5" hole section was drilled without any hole problems from 1017 to 1355 metres. From 1355-1625 metres, high and erratic torque was encountered. Initially this was thought to be related to well-cemented sandstone bands causing the stabilizers to hang up. However, by 1625 metres very high torque had caused repeated stalling of the rotary and it was decided to pull the bit. The trip out recorded drag of up to 90 klbs from 1518-480 metres. The bit was subsequently found to be severely undergauge (1.25") and therefore largely responsible for the hole problems encountered. NB#6 was then washed and reamed to bottom as a precaution for undergauge hole and recorded only slightly above normal drag of up to 30 klbs. At TD (1875 metres), a 20 stand wiper trip recorded overpull of up to 120 klbs from 1816-1352 metres. The trip in and subsequent trip out to run logs, recorded only normal drag.

3. PRESSURE EVALUATION

a. Formation Fracture Pressure

Fracture pressures were calculated using the "Constant Effective Stress Ratio" method. This utilises leak-off data and allows for lithological and pore pressure variations. It should be noted that this method assumes uniform tectonic stress, and any unconformities may place the section on either side in a different stress regime. See Appendix III, Pressure Gradient Analysis Plot.

Two Formation Integrity Tests were conducted during the drilling of Eric the Red-1 and the results were as follows:

Depth (m)	Casing Shoe (m)	Hole Size (inches)	Mud σ (sg)	Fracture Press (sg EMD)
364	355.0	12.25	1.07	1.24 (10.3ppg)
1020	1007.0	8.50	1.08	1.95 (16.3ppg)

Whilst drilling the 12.25" hole mud losses remained low and no partial or total loss of returns was encountered. The minimum fracture pressure of 1.24 sg EMD was not exceeded at any time by the maximum circulating density of 1.11 sg. Some minor drilling losses were encountered within this section but were thought to be the product of mud invasion resulting from an overbalanced mud system.

The 8.5" hole was drilled with no mud losses. The minimum estimated fracture pressure of 1.95 sg EMD was never exceeded by the maximum equivalent circulating density of 1.16 sg.

b. Formation Pore Pressure

Pore pressure indicators, including Dxc, flowline temperature, mud resistivity, hole condition, cavings and gas values, were monitored on a continuous basis while drilling and pore pressure estimates were reported to the operator on a daily basis. Plots of relevant pressure indicators and pressure estimates are detailed in the Drilling Data Pressure Plot in Appendix II and the Pressure Gradient Analysis Plot in Appendix III. Based on data from nearby wells, a normal pore pressure gradient of 1.03 sg EMD (8.6 ppg) is assumed for Eric the Red-1.

36.0" and 9.875" Hole Sections

It was not possible to accurately monitor pore pressure through these sections as there were no returns to surface. However the Dxc plot showed a normal trend through this interval and it is assumed that pore pressure remained normal at 1.03 sg EMD to 370 metres.

12.25" Hole Section

For this section of the well, all pressure parameters remained normal, indicating a normally pressured regime. Both Dxc, temperature and resistivity show normally pressured trends. Increasing background gas and the presence of connection gasses was not found and therefore it can be assumed that this interval is normally pressured at 1.03 sg EMD to 1017 metres.

8.5" Hole Section

The 8.5" hole section showed a normal pore pressure regime from 1017 to 1875 metres TD. This assumption was made, based on the following evidences. The mud density used in drilling out this section was 1.13 sg and there was no connection gases encountered. The background gas remained low at around 0.06% and showed no increasing trend. Flow-checks made after drill breaks were static and there were no overpressured cavings present at the shakers. The Dxc, temperature and resistivity readings also corroborated with this normal pressure trend of 1.03 sg EMD.

From the RFT results, a normal pore pressure regime was also obtained.

4. GEOLOGY AND SHOWS

See Enclosure 1 - Mudlog.

5. TESTING AND EVALUATION

a. Hydrocarbon Evaluation

Standard mudlogging techniques were utilized while drilling the Eric the Red-1. Total combustible gas levels in the mud were monitored continuously using an FID Total Gas Detector. The gas was also analyzed for its components (methane through pentane) using an FID Chromatograph. Carbon dioxide and hydrogen sulfide detectors were also run for the duration of the well. Mud returns, unwashed and washed were observed under ultra-violet light and cut with solvent to check for the presence of liquid hydrocarbons. Selected chromatograph data at certain depth intervals were used to produce gas ratio plots as an aid in interpreting any oil shows.

b. Wireline Logging

Depth (m)	Hole Diameter (inch)	LOGS
1017.0	12.25"	DLL-MSFL-BHC-SP-GR-CAL-AMS VSP CST (30 shot) (27 recovered)
1875.0	8.50"	DLL-MSFL-AS-AMS-GR-CAL FMS-CNL-LDL VSP (aborted) RFT VSP (re-run) CST (60 shot) (53 recovered)

c. Coring

No cores were cut during the drilling of Eric The Red-1.

d. Measurement while Drilling.

Measurement while drilling services were provided by Eastman-Teleco. Data was regularly transferred to Exlog's DrillByte computer and plots against penetration rate were submitted to BHP on a daily basis. See Appendix IV for the MWD data plot.

e. Formation Testing

10 RFT's were performed in 1 runs. The RFT results are tabulated in Table 6.

6. DATA INVENTORY

The following were supplied to BHPP on a daily basis or as required:

1 copy	Morning Report
1 copy	Hydraulics Printout
1 copy	Formation Evaluation Log

As well as the above, data (drilling, geological and MWD) was transmitted to BHPPs office in Melbourne, by modem, on a daily basis.

On completion of Eric the Red-1, all charts, worksheets, raw data and data disks were forwarded to EXLOG Australia. Four (4) copies of the Final Well Report were compiled, with EXLOG Australia retaining one (1) copy, as well as all relevant data.

EXLOG Australia will use all reasonable diligence to maintain and store the listed items in a manner to reasonably prevent damage or loss. Provided , however, EXLOG Australia assumes no responsibility for the loss, damage or theft of these items or information contained herein, and shall not be liable to the Operator in any such event irrespective of cause, fault, or the active or passive negligence of EXLOG Australia its employees.

TABLES

1. Deviation Survey Record
2. Casing and Cementing Details
3. Drilling Fluid Properties
4. Bit Record
5. Bit Hydraulics Record
6. RFT Preliminary results

TABLES

Table 1.
Survey Data

Depth m	Inclination deg	Azinuth deg
137.0	1.0	-
370.0	0.5	-
396.6	1.1	309.1
542.0	1.3	273.3
718.0	0.8	302.1
891.0	0.4	210.0
1001.0	0.4	221.2
1150.0	0.1	221.2
1292.0	0.3	110.2
1439.0	0.4	355.2
1584.0	0.7	290.2
1728.0	0.4	203.0
1867.0	1.1	229.7

Table 2.
Casing and Cementing Summary

Hole Depth m	Hole Size in	Casing Size		Weight ppf	Shoe Depth m	Joints Run	Cement Details
		Nom in	ID in				
137	36.00	30.000	29.000	310	136	3	456 sx 'G' cement @ 1.90 sg (15.9 ppg) + 2% CaCl
364	17.50	13.375	12.347	68	355	21	Lead: 300 sx Class 'G' cement @ 1.50 sg (12.5 ppg) + 0.55 gal/sack Econolite Tail: 500 sx Class 'G' neat slurry @ 1.90 sg (15.8 ppg)
1017	12.25	9.375	8.681	47	1007	76	254 sx Class 'G' cement @ 1.90 sg (15.8 ppg) displaced with 223 bbl drilling mud

Table 3.
Mud Properties

Depth #	NV sg	Vis sec/qt	PV cp	YP lb/cft ²	Gels lb/cft ² 10m/10m	F cc	FC 1/32"	SOL %	OIL %	SD %	NBT	pH	Cl Kppm	Ca mg/l	K+	KCl %
370	1.03	Seawater with Guar Gum Hi-Vis sweeps used for the 36.0, 9.875, 17.5" hole sections														
460	1.08	53	18	29	5/6	14.0	1.0	5.0	-	2.00	5.0	9.0	33.0	240	26.8	5.2
960	1.10	58	17	28	3/4	6.0	1.0	6.2	-	2.50	6.0	9.2	35.0	275	33.3	6.4
1017	1.08	50	13	12	2/3	7.0	1.0	5.0	-	0.10	5.0	11.5	38.0	300	33.0	6.0
1206	1.08	50	15	20	3/4	7.0	1.0	5.0	-	1.50	5.0	10.2	37.0	110	31.6	6.0
1333	1.10	68	20	30	4/7	6.0	1.0	6.5	-	0.50	6.0	9.0	40.0	150	30.0	6.0
1652	1.10	51	16	18	3/4	5.0	1.0	5.8	-	0.50	6.0	9.0	40.0	190	38.0	7.2
1781	1.10	51	16	22	4/6	5.2	1.0	6.0	-	0.25	8.0	9.3	39.0	120	38.4	7.3
1875	1.10	54	19	21	4/6	5.2	1.0	6.0	-	0.50	8.0	9.0	41.0	200	39.0	7.4

Table 4.
Bit Record

Run #	Bit #	Vendor	Type	Size in	IADC	Jets 1/32"	Depth In (m)	Metres run	Hours	Avg ROP	WOB klb	RPM	Torque amps	Pump psi	GPM	Grade IODLBCOR
1	NB1	Security H/O	SJJ	26.00 36.00	111 111	24,24,24 22,22,22	100.0	16.0	0.63	25.4	0-5	30-80	36-176	300	970	1-1-NO-A-1-I-NO-TD
2	NB2	Security	S44GP	9.875	137	16x16x16	116.0	254.0	3.85	65.9	0-15	110-120	40-200	1150	1180	1-1-NO-A-1-I-NO-TD
3	RR1.1	Security H/O	SJJ	26.00 36.00	111 111	24,24,24 CJx20,4x20	Open up 9.875" hole to 36" from 116-137m									2-2-NO-A-B-I-NO-TD
4	NB3	Security	SS44G	17.50	135	18,18,18	Open up 9.875" hole to 17.5" from 137-364m									1-1-NO-A-B-I-NO-TD
5	NB4	HTC	ATN11H	12.25	437	13,16,18	370.0	647.0	9.62	67.3	0-30	120-140	100-350	1800	650	2-2-BC-G-B-I-PC-TD
6	NB5	HTC	ATN22	8.50	517	14,10,10	1017.0	608.0	27.68	22.0	5-35	100-115	180-600	2300	405	8-8-BT-A-P-24-WT-TQ
7	NB6	HTC	ATN22	8.50	517	14,10,10	1625	250.0	14.55	17.2	15-35	110-115	150-250	2200	395	5-7-BT-B-B-1-WT-LOG

Note : Gauge in 1/16"

Table 5.
Hydraulics Summary

Bit #	Depth ft	Hole Size in	Jets	NW sg	PV/YP	Flow Rate gpm	RCD sg	Annular Velocities Min; DP; DC; Crit ft/min	Jet Vel ft/sec	HHP hp	Impact Force lbf	Loss Bit psi	Pump Pres psi	Bit Loss
NB4	629	12.25	13,16,18	1.06	15/18	652	1.07	13 ; 38 ; 57 ; 117	111	399	1088	1049	1739	60
	1017			1.10	15/22	640	1.12	13 ; 38 ; 56 ; 129	109	391	1088	1049	1742	60
NB5	1206	8.50	14,10,10	1.08	15/20	413	1.16	9 ; 62 ; 116 ; 169	133	366	833	1520	2100	73
	1593			1.09	18/24	408	1.15	8 ; 65 ; 114 ; 188	131	359	829	1511	2200	69
NB6	1771	8.50	14,10,10	1.10	16/22	390	1.16	7 ; 56 ; 98 ; 175	113	229	615	1122	2150	52
	1875			1.10	19/21	395	1.16	8 ; 63 ; 111 ; 180	127	329	784	1429	2200	65

Table 6.
Preliminary Open Hole RFT Results

Test No.	Depth		Formation Pressure psig	Temp degC	Mobility mD/cp	Comments
	mTVDRT	mTVDSS				
1	1058.5	1033.5	1496.8	50.2	-	Lost Seal
2	1154.0	1129.0	-	-	-	
3	1343.5	1318.5	1897.8	57.7	340.0	
4	1378.5	1353.5	1947.2	50.3	60.3	
5	1478.5	1453.5	2088.8	60.4	7.7	Tight
6	1631.5	1606.5	2306.6	65.1	7.4	
7	1781.0	1756.0	-	70.0	-	Tight
8	1154.5	1129.5	1631.1	52.4	1095.0	
9	1781.5	1756.5	-	-	-	
10	1785.0	1760.0	-	-	-	

APPENDIX VI: Drilling Data Printout

TIME h:mm:ss	DEPTH m	ROP m/hr	WOB klb	RPM	TRQ amp	SPP psi	FLOW		MUD DENSITY		MUD TEMP		RETURNS DEPTH m	PVT bbl	-BIT-		ECD sg	DIC	GAS %
							IN gpm	OUT	IN sg	OUT	IN deg C	OUT			mts	hh:mm			
17th February 1993																			
RRR#1. Security S3J, 26.0" 3x24																			
07:36:26	102.0	40.7	8.1	33	378	6	192	1.04	0.00	18.3	16.9	100.0	681	2.0	0:03	1.04	0.60	0.00	
07:36:26	103.0	40.7	8.1	33	378	6	192	1.04	0.00	18.3	16.9	100.0	681	3.0	0:05	1.04	0.60	0.00	
07:37:54	104.0	47.7	1.8	40	326	10	520	1.04	0.00	18.3	16.9	100.3	681	4.0	0:07	1.04	0.39	0.00	
07:39:59	105.0	25.6	2.9	41	373	10	608	1.04	0.00	18.4	16.9	100.7	681	5.0	0:09	1.04	0.50	0.00	
07:43:51	106.0	34.2	1.2	42	317	10	481	1.04	0.00	18.4	16.9	101.2	681	6.0	0:11	1.04	0.48	0.00	
07:47:08	107.0	29.7	1.0	42	316	10	565	1.04	0.00	18.4	16.9	101.7	681	7.0	0:13	1.04	0.44	0.00	
07:50:00	108.0	22.4	1.3	42	300	10	565	1.04	0.00	18.4	16.9	102.2	681	8.0	0:16	1.04	0.47	0.00	
07:52:42	109.0	74.4	0.8	50	378	10	567	1.04	0.00	18.5	17.0	103.8	681	9.0	0:17	1.04	0.40	0.00	
07:54:50	110.1	89.0	1.3	51	408	10	567	1.04	0.00	18.4	17.0	104.8	681	10.1	0:17	1.04	0.00	0.00	
07:57:02	111.0	78.2	0.9	53	436	10	568	1.04	0.00	18.5	17.0	105.2	681	11.0	0:17	1.04	0.25	0.00	
07:59:01	112.0	56.5	1.9	52	430	10	569	1.04	0.00	18.5	17.0	105.8	681	12.0	0:18	1.04	0.42	0.00	
08:01:22	113.0	36.5	0.9	51	401	10	571	1.04	0.00	18.5	17.0	106.3	681	13.0	0:20	1.04	0.40	0.00	
08:04:12	114.0	115.9	0.5	52	361	10	581	1.04	0.00	18.7	17.0	107.4	681	14.0	0:21	1.04	0.24	0.00	
08:07:38	115.0	16.6	4.2	61	329	10	586	1.04	0.00	18.6	17.0	109.1	681	15.0	0:24	1.04	0.67	0.00	
08:24:48	116.0	2.9	6.0	62	365	10	581	1.04	0.00	18.7	17.1	115.5	681	16.0	0:38	1.04	0.94	0.00	
18th February 1993																			
NB#2.0.Security,9.875" 3x16 jets																			
12:10:24	117.0	48.9	2.9	108	46	20	511	1.04	0.00	18.7	18.5	116.0	681	1.0	0:01	1.04	1.05	0.00	
12:11:17	118.1	75.8	5.3	108	54	20	533	1.04	0.00	18.7	18.6	116.1	681	2.1	0:02	1.04	0.67	0.00	
12:11:58	119.1	95.5	5.3	108	49	20	572	1.04	0.00	18.7	18.6	116.1	681	3.1	0:02	1.04	0.62	0.00	
12:12:36	120.0	96.2	5.5	108	50	20	587	1.04	0.00	18.7	18.6	116.8	681	4.0	0:03	1.04	0.60	0.00	
12:12:53	121.0	100.9	6.1	110	59	20	592	1.04	0.00	18.7	18.6	117.1	681	5.0	0:04	1.05	0.63	0.00	
12:13:54	122.0	92.5	5.8	117	55	20	594	1.04	0.00	18.7	18.6	117.3	681	6.0	0:04	1.05	0.62	0.00	
12:14:41	123.0	75.9	5.1	119	51	20	594	1.04	0.00	18.7	18.6	117.9	681	7.0	0:05	1.05	0.63	0.00	
12:15:28	124.0	77.2	5.4	120	54	20	594	1.04	0.00	18.7	18.6	118.4	681	8.0	0:06	1.05	0.66	0.00	
12:16:12	125.1	97.9	6.1	120	59	20	594	1.04	0.00	18.7	18.6	118.9	681	9.1	0:07	1.05	0.64	0.00	
12:16:46	126.1	95.2	6.5	120	55	20	594	1.04	0.00	18.6	18.6	119.4	681	10.1	0:07	1.05	0.64	0.00	
12:17:20	127.0	99.4	6.2	120	52	20	594	1.04	0.00	18.6	18.6	119.8	681	11.0	0:08	1.05	0.61	0.00	
12:17:52	128.0	105.8	6.3	120	53	20	594	1.04	0.00	18.6	18.6	120.5	681	12.0	0:08	1.06	0.61	0.00	
12:18:29	129.0	79.9	6.8	120	64	20	594	1.04	0.00	18.6	18.6	121.1	681	13.0	0:09	1.06	0.66	0.00	
12:19:19	130.1	68.2	7.3	120	54	20	594	1.04	0.00	18.6	18.6	121.9	681	14.1	0:10	1.06	0.68	0.00	
12:20:16	131.0	59.3	6.5	120	58	20	595	1.04	0.00	18.6	18.6	122.8	681	15.0	0:11	1.06	0.73	0.00	
12:21:06	132.0	79.2	4.7	120	53	20	594	1.04	0.00	18.6	18.6	123.4	681	16.0	0:11	1.06	0.65	0.00	
12:21:53	133.0	79.4	5.6	120	63	20	594	1.04	0.00	18.6	18.6	124.0	681	17.0	0:12	1.06	0.67	0.00	
12:22:40	134.1	79.1	6.2	120	59	20	594	1.04	0.00	18.6	18.6	124.8	681	18.1	0:13	1.06	0.65	0.00	
12:31:59	135.0	113.6	6.3	118	67	20	584	1.04	0.00	18.6	18.6	129.9	682	19.0	0:13	1.06	0.65	0.00	
12:32:27	136.0	116.1	4.2	119	64	20	587	1.04	0.00	18.6	18.7	131.0	682	20.0	0:14	1.06	0.47	0.00	
12:33:08	137.0	121.1	3.5	119	59	20	588	1.04	0.00	18.6	18.7	132.4	682	21.0	0:14	1.07	0.47	0.00	
12:33:49	138.1	86.7	3.0	119	57	20	589	1.04	0.00	18.6	18.7	133.9	682	22.1	0:15	1.07	0.56	0.00	
12:34:51	139.0	48.0	2.7	119	48	20	592	1.04	0.00	18.6	18.7	135.2	682	23.0	0:16	1.07	0.62	0.00	
12:36:22	140.1	67.7	2.7	119	48	20	599	1.04	0.00	18.6	18.7	136.7	682	24.1	0:17	1.07	0.68	0.00	
12:37:28	141.0	50.4	3.6	119	51	20	597	1.04	0.00	18.6	18.7	137.4	682	25.0	0:18	1.07	0.64	0.00	
12:38:37	142.0	54.1	2.5	119	51	20	594	1.04	0.00	18.6	18.7	138.3	682	26.0	0:19	1.07	0.61	0.00	
12:39:24	143.0	87.8	3.3	119	55	20	597	1.04	0.00	18.6	18.7	138.7	682	27.0	0:20	1.07	0.59	0.00	
12:39:58	144.0	109.8	4.2	119	62	20	594	1.04	0.00	18.6	18.7	139.0	682	28.0	0:21	1.07	0.54	0.00	
12:40:33	145.1	114.9	4.5	119	73	20	592	1.04	0.00	18.5	18.7	139.2	682	29.1	0:21	1.07	0.54	0.00	
12:41:04	146.1	116.0	3.8	118	74	20	591	1.04	0.00	18.6	18.7	139.3	682	30.1	0:22	1.07	0.54	0.00	
12:41:35	147.0	103.2	4.4	119	71	20	591	1.04	0.00	18.6	18.8	139.6	682	31.0	0:22	1.07	0.54	0.00	
12:42:13	148.0	93.3	4.5	119	67	20	591	1.04	0.00	18.6	18.8	140.0	682	32.0	0:23	1.07	0.57	0.00	
12:42:50	149.1	98.8	3.8	119	63	20	592	1.04	0.00	18.6	18.8	140.5	682	33.1	0:24	1.08	0.54	0.00	
12:43:25	150.0	91.3	3.8	119	65	20	595	1.04	0.00	18.6	18.8	140.8	682	34.0	0:24	1.08	0.56	0.00	

Table with 19 columns: TIME, DEPTH, ROP, WOB, RPM, TRQ, SPP, FLOW IN/OUT, MUD DENSITY IN/OUT, MUD TEMP IN/OUT, RETURNS DEPTH, PVT, -BIT- mts/hh:mm, ECD sg, DXC, GAS %.

TIME	DEPTH	ROP	WOB	RPM	TRQ	SPP	FLOW	MUD DENSITY	MUD TEMP	RETURNS	PVT	-BIT-	ECD	DYC	GAS
h:mm:sec	m	m/hr	klb	amp	psi	gpm	IN OUT	IN OUT	deg C	m	bbl	mts hh:mm	sg		%
04:39:05	1256.0	11.3	27.6	114	150	2170	398 376	1.08 1.09	34.4 34.4	1248.7	525	239.0 10:10	1.13	1.50	0.04
04:44:06	1257.0	13.3	26.5	114	147	2166	398 377	1.08 1.09	34.5 34.3	1249.7	524	240.0 10:15	1.13	1.42	0.03
04:50:00	1258.1	11.2	26.9	114	146	2143	398 354	1.08 1.09	34.5 34.4	1251.0	525	241.1 10:21	1.13	1.47	0.04
04:55:11	1259.1	13.3	27.7	114	149	2173	398 359	1.08 1.09	34.5 34.5	1252.0	522	242.1 10:26	1.13	1.48	0.03
05:00:59	1260.0	10.6	26.3	114	144	2190	398 364	1.08 1.10	34.5 34.6	1254.0	522	243.0 10:32	1.13	1.47	0.04
05:07:58	1261.0	8.9	27.7	114	142	2181	398 361	1.08 1.10	34.5 34.7	1255.4	524	244.0 10:39	1.13	1.54	0.07
05:12:55	1262.0	12.5	27.8	114	148	2184	398 347	1.08 1.10	34.5 34.8	1256.3	518	245.0 10:44	1.13	1.45	0.06
05:19:00	1263.0	11.1	29.0	114	147	2179	398 351	1.08 1.10	34.6 34.9	1257.4	517	246.0 10:50	1.13	1.49	0.04
05:24:52	1264.0	9.8	29.2	114	149	2184	398 358	1.09 1.10	34.6 35.0	1258.4	518	247.0 10:56	1.14	1.52	0.04
05:29:12	1265.0	13.9	29.5	114	154	2201	399 356	1.09 1.11	34.7 35.1	1259.2	519	248.0 11:00	1.14	1.45	0.04
05:33:57	1266.0	16.2	29.4	114	147	2210	398 356	1.09 1.12	34.8 35.2	1259.9	519	249.0 11:05	1.14	1.47	0.03
05:38:01	1267.0	11.7	29.4	114	155	2202	399 367	1.09 1.13	34.8 35.2	1260.5	518	250.0 11:09	1.14	1.41	0.03
05:43:34	1268.0	13.7	29.2	114	147	2210	399 356	1.09 1.13	34.9 35.2	1261.4	517	251.0 11:15	1.14	1.49	0.03
05:48:29	1269.0	14.4	29.7	114	150	2183	399 361	1.09 1.12	35.0 35.3	1262.2	516	252.0 11:19	1.14	1.47	0.02
05:52:26	1270.0	11.9	29.4	114	150	2176	399 347	1.09 1.11	35.0 35.4	1262.9	515	253.0 11:23	1.14	1.41	0.02
05:56:09	1271.0	17.2	29.2	114	142	2205	399 364	1.09 1.11	35.1 35.5	1263.5	515	254.0 11:27	1.14	1.39	0.02
05:59:51	1272.0	17.6	29.1	114	147	2223	399 371	1.09 1.11	35.2 35.4	1264.1	515	255.0 11:31	1.14	1.39	0.02
06:03:45	1273.0	17.3	29.5	114	151	2191	399 359	1.08 1.10	35.2 35.4	1265.1	514	256.0 11:35	1.14	1.40	0.02
06:07:33	1274.0	15.6	29.0	114	153	2230	399 386	1.09 1.10	35.3 35.4	1265.7	509	257.0 11:39	1.14	1.39	0.03
06:11:43	1275.0	13.9	29.5	114	144	2251	399 355	1.08 1.10	35.3 35.4	1266.7	508	258.0 11:43	1.14	1.42	0.04
06:15:37	1276.0	25.5	29.6	114	144	2223	399 360	1.08 1.10	35.4 35.5	1267.4	508	259.0 11:47	1.14	1.41	0.04
06:25:56	1277.0	32.4	25.0	115	148	2259	405 90	1.09 1.10	35.4 35.0	1269.6	511	260.0 11:49	1.14	1.21	0.04
06:25:22	1278.0	25.1	27.7	115	156	2260	408 11	1.09 1.11	35.4 34.7	1270.1	511	261.0 11:52	1.14	1.23	0.04
06:25:22	1280.0	15.0	27.7	115	156	2260	408 11	1.09 1.11	35.4 34.7	1270.1	513	263.0 11:58	1.14	1.40	0.04
06:35:22	1282.0	16.0	27.7	115	156	2260	408 11	1.09 1.11	35.4 34.7	1270.1	513	265.0 12:04	1.14	1.42	0.04
06:35:22	1284.0	16.0	27.7	115	156	2260	408 11	1.09 1.11	35.4 34.7	1270.1	514	267.0 12:10	1.14	1.41	0.04
06:35:22	1286.0	15.2	27.7	115	156	2260	408 11	1.09 1.11	35.4 34.7	1270.1	515	269.0 12:16	1.14	1.43	0.04
06:35:22	1287.0	15.2	27.7	115	156	2260	408 11	1.09 1.11	35.4 34.7	1270.1	513	270.0 12:22	1.14	1.41	0.04
06:35:22	1289.0	15.0	27.7	115	156	2260	408 11	1.09 1.11	35.4 34.7	1270.1	513	272.0 12:28	1.14	1.43	0.04
07:39:00	1291.0	14.8	29.7	115	147	2222	399 415	1.09 1.12	33.1 33.4	1284.0	505	274.0 12:35	1.14	1.41	0.04
07:39:00	1293.0	14.8	29.7	115	147	2222	399 415	1.09 1.12	33.1 33.4	1284.0	506	276.0 12:45	1.14	1.41	0.04
07:42:27	1294.0	20.4	30.4	115	162	2239	402 417	1.09 1.12	35.6 36.0	1285.0	507	277.0 12:48	1.14	1.37	0.04
07:43:54	1295.0	53.7	26.1	115	148	2231	402 447	1.09 1.13	35.7 36.0	1285.5	505	278.0 12:50	1.14	1.03	0.04
07:45:58	1296.0	28.4	25.0	115	138	2207	402 438	1.09 1.13	35.7 36.1	1286.1	504	279.0 12:52	1.14	1.18	0.04
07:55:05	1297.0	16.3	31.3	115	129	2202	402 440	1.09 1.14	35.8 36.1	1288.9	504	280.0 13:01	1.14	1.66	0.04
08:00:18	1298.0	12.1	30.1	115	134	2195	402 446	1.09 1.16	35.8 36.0	1290.5	504	281.0 13:06	1.14	1.49	0.06
08:02:35	1299.0	26.6	28.3	115	147	2199	402 434	1.09 1.16	35.9 36.1	1291.3	503	282.0 13:09	1.14	1.23	0.06
08:04:56	1300.0	22.4	24.3	115	135	2196	402 434	1.09 1.15	35.9 36.2	1292.0	515	283.0 13:11	1.14	1.18	0.06
08:11:27	1301.0	10.0	31.5	115	133	2194	402 434	1.09 1.15	35.9 36.2	1293.4	516	284.0 13:17	1.14	1.58	0.04
08:14:53	1302.0	25.5	29.4	115	148	2193	402 408	1.09 1.15	36.0 36.2	1295.0	514	285.0 13:21	1.14	1.36	0.04
08:33:56	1303.0	17.8	29.9	114	142	2198	404 439	1.09 1.11	35.9 35.4	1296.6	506	286.0 13:22	1.14	1.28	0.03
08:34:49	1304.0	14.6	29.7	114	154	2234	403 453	1.09 1.10	35.9 35.0	1296.7	495	287.0 13:23	1.14	1.34	0.03
08:37:29	1305.0	16.7	24.5	114	134	2188	404 406	1.09 1.10	35.9 35.0	1297.3	502	288.0 13:26	1.14	1.37	0.03
08:38:51	1306.0	17.7	26.6	114	144	2215	404 425	1.09 1.10	35.9 35.0	1297.7	501	289.0 13:27	1.14	1.35	0.03
08:42:16	1307.1	19.5	28.6	114	149	2222	403 432	1.09 1.10	35.9 35.1	1298.6	502	290.1 13:31	1.14	1.33	0.03
08:45:33	1308.0	18.4	27.8	114	153	2215	404 447	1.09 1.11	35.8 35.3	1299.5	504	291.0 13:34	1.14	1.32	0.04
08:49:03	1309.0	14.6	29.0	115	153	2221	403 437	1.09 1.11	35.8 35.6	1300.5	514	292.0 13:38	1.14	1.36	0.04
08:53:13	1310.0	14.6	27.6	115	150	2212	404 444	1.09 1.11	35.7 35.8	1301.6	525	293.0 13:42	1.14	1.38	0.03
7:14	1311.0	14.7	27.0	115	149	2220	403 450	1.09 1.12	35.6 35.8	1302.7	524	294.0 13:46	1.14	1.37	0.03
09:01:14	1312.0	15.1	27.2	115	148	2207	404 449	1.09 1.13	35.6 35.9	1303.8	534	295.0 13:50	1.14	1.38	0.04
09:05:43	1313.0	11.7	28.4	115	147	2213	403 428	1.09 1.13	35.6 35.8	1305.1	534	296.0 13:54	1.14	1.42	0.04
09:11:01	1314.0	8.6	27.9	115	149	2223	403 429	1.09 1.13	35.6 35.7	1306.4	543	297.0 13:60	1.14	1.47	0.04
09:12:32	1315.0	66.5	24.0	115	154	2205	404 458	1.09 1.14	35.6 35.7	1306.8	544	298.0 14:01	1.14	1.01	0.04

DrillByte Drilling Data Printout

COMPANY: BHP PETROLEUM

WELL: ERIC THE RED-1

TIME	DEPTH	ROP	WOB	RPM	TRQ	SPP	FLOW		MUD DENSITY		MUD TRMP		RETURNS	PVT	-BIT-		ECD	DIX	GAS
							IN	OUT	IN	OUT	IN	OUT			mts	hh:mm				sg	%
h:mm:sec	m	m/hr	klb		amp	psi	gpm		sg	deg C		m	bbl						
03:59:06	1841.0	29.1	23.8	114	167	2120	389	339	1.09	1.10	36.5	36.9	1823.1	552	216.0	12:58	1.10	1.22	0.05
04:01:30	1842.0	29.9	20.4	114	154	2107	389	313	1.09	1.10	36.5	36.9	1823.8	558	217.0	13:00	1.10	1.17	0.04
04:05:00	1843.0	14.8	25.2	114	162	2115	389	303	1.09	1.10	36.5	36.9	1824.7	550	218.0	13:04	1.10	1.35	0.04
04:07:39	1844.0	22.2	21.8	114	154	2106	389	319	1.09	1.10	36.4	36.8	1825.1	551	219.0	13:06	1.10	1.31	0.04
04:10:21	1845.0	20.6	20.5	114	150	2095	388	323	1.09	1.10	36.4	36.8	1826.4	552	220.0	13:09	1.10	1.20	0.07
04:12:51	1846.0	32.8	21.7	114	155	2107	388	336	1.09	1.10	36.4	36.8	1827.7	556	221.0	13:12	1.10	1.20	0.08
04:14:40	1847.0	30.8	22.5	114	162	2092	388	335	1.09	1.10	36.4	36.9	1828.4	556	222.0	13:13	1.10	1.12	0.08
04:17:01	1848.0	26.0	23.4	114	167	2106	389	340	1.09	1.10	36.4	36.8	1829.5	555	223.0	13:16	1.10	1.22	0.07
04:19:50	1849.0	29.1	22.3	114	157	2116	389	308	1.09	1.10	36.4	36.8	1830.5	558	224.0	13:19	1.10	1.22	0.06
04:22:28	1850.0	25.0	21.2	114	155	2106	389	303	1.09	1.10	36.4	36.8	1831.5	551	225.0	13:21	1.10	1.21	0.07
04:24:49	1851.0	29.7	21.7	114	152	2095	388	384	1.09	1.10	36.4	36.9	1832.6	552	226.0	13:24	1.10	1.19	0.06
04:28:30	1852.0	13.9	24.6	114	155	2103	389	365	1.09	1.10	36.4	37.0	1834.2	554	227.0	13:27	1.10	1.35	0.08
04:30:26	1853.0	25.8	21.3	114	154	2111	389	345	1.10	1.10	36.4	36.8	1834.8	552	228.0	13:29	1.10	1.13	0.09
04:33:18	1854.0	17.3	25.2	114	165	2099	390	348	1.10	1.10	36.4	36.9	1836.0	558	229.0	13:32	1.10	1.29	0.07
04:48:57	1855.1	20.1	24.1	115	161	2146	390	327	1.09	1.10	36.3	36.2	1841.1	550	230.1	13:35	1.10	1.31	0.05
04:51:31	1856.0	26.7	23.9	115	155	2147	391	349	1.09	1.10	36.3	35.7	1841.8	551	231.0	13:38	1.10	1.25	0.06
04:54:35	1857.0	16.3	24.1	115	154	2150	391	344	1.09	1.10	36.3	36.0	1842.9	552	232.0	13:41	1.10	1.30	0.04
04:57:20	1858.1	38.0	24.6	115	164	2150	392	380	1.09	1.10	36.2	36.4	1843.9	546	233.1	13:44	1.10	1.27	0.05
04:59:25	1859.1	27.8	22.5	115	160	2150	394	396	1.09	1.10	36.2	36.5	1844.6	546	234.1	13:46	1.10	1.17	0.06
05:01:20	1860.0	33.7	22.4	115	161	1974	378	337	1.10	1.10	36.2	36.6	1845.3	545	235.0	13:48	1.10	1.15	0.07
05:03:16	1861.0	31.3	23.2	115	171	2022	377	329	1.09	1.10	36.2	36.6	1846.0	548	236.0	13:50	1.10	1.16	0.07
05:05:30	1862.0	24.2	23.6	115	158	2020	381	304	1.10	1.10	36.2	36.6	1846.7	541	237.0	13:52	1.10	1.20	0.07
05:08:10	1863.0	28.4	24.3	115	175	2021	381	353	1.10	1.10	36.2	36.5	1847.6	542	238.0	13:55	1.10	1.26	0.07
05:10:42	1864.0	28.3	24.9	115	172	2024	381	366	1.10	1.10	36.2	36.5	1848.5	544	239.0	13:57	1.10	1.26	0.07
05:14:17	1865.0	15.7	24.5	115	164	2094	386	359	1.10	1.10	36.2	36.5	1849.8	542	240.0	14:01	1.10	1.33	0.07
05:17:50	1866.0	20.0	24.2	115	170	2214	403	434	1.10	1.10	36.3	36.5	1851.1	548	241.0	14:04	1.10	1.34	0.06
05:20:49	1867.1	24.4	24.9	115	175	2218	402	394	1.10	1.10	36.3	36.5	1852.2	540	242.1	14:07	1.10	1.30	0.07
05:24:05	1868.0	15.4	25.5	115	170	2213	401	405	1.10	1.10	36.3	36.6	1853.4	541	243.0	14:10	1.10	1.34	0.06
05:27:35	1869.0	13.0	24.1	115	164	2208	401	380	1.10	1.10	36.3	36.7	1854.2	542	244.0	14:14	1.10	1.35	0.04
05:29:39	1870.0	24.5	25.2	115	163	2202	402	354	1.10	1.10	36.3	36.8	1854.8	546	245.0	14:16	1.10	1.35	0.04
05:32:25	1871.0	20.9	26.1	115	175	2209	402	420	1.10	1.10	36.4	36.8	1856.0	546	246.0	14:19	1.10	1.30	0.04
05:35:20	1872.0	19.9	25.1	116	165	2205	403	409	1.10	1.10	36.4	36.7	1857.1	546	247.0	14:22	1.10	1.30	0.05
05:38:14	1873.1	30.2	24.4	116	145	2218	403	416	1.09	1.10	36.4	36.8	1858.2	544	248.1	14:25	1.10	1.27	0.06
05:41:41	1874.0	16.3	25.0	116	131	2205	402	378	1.10	1.10	36.5	36.7	1859.6	545	249.0	14:28	1.10	1.35	0.07
05:46:46	1875.0	9.9	25.8	116	128	2189	402	413	1.09	1.10	36.5	36.7	1861.6	544	250.0	14:33	1.10	1.48	0.09
Reached Total Depth																			

APPENDIX VII: Bit Hydraulics Printouts

EXLOG DRILLBYTE EAP : MUD HYDRAULICS ANALYSIS

Data Printed on : Sun Feb 21 00:02:22 1993

INPUT DATA

Hydraulics Model	POWER LAM	Casing Shoe Depth	355.0 m	Jet 1	18 in/32
Depth	629.2 m	Weakest Patn Depth	355.0 m	Jet 2	16 in/32
Vertical Depth	629.1 m	Mud Density	1.06 sg	Jet 3	13 in/32
Flow Rate	652 gpm	300 rpm viscometer	33	Total Fluid Area	0.5745 in ²
Average ROP	176.8 m/hr	600 rpm viscometer	48		
Cuttings Density	2.60 spc	Plastic Viscosity	15.00 cP		
Cuttings Diameter	0.200 in	Yield Point	18.00 #/100ft ²		
Cuttings Shape	SPHERICAL	Power Law k	1.17465 #sec ⁿ /100ft ²		
Cuttings Thickness	0.000 in	Power Law n	0.54057		

CALCULATED RESULTS

Section	Top	Length	Hole Size	Pipe		Volumes & Capacities			Mud Velocity			Flow Regime
				OD	ID	Hole	Pipe Annulus	Pipe	Annulus	Critical		
	m	m	in	in	in	bbbl	bbbl	bbbl	m/min	m/min	m/min	
Surface	98.5	19.750	5.000	4.276	4.276	122	6	115	266.4	13.4	72.4	LAMINAR
100.0	255.0	12.347	5.000	4.276	4.276	124	15	103	266.4	38.3	94.8	LAMINAR
355.0	5.8	12.250	5.000	4.276	4.276	3	0	2	266.4	39.0	95.2	LAMINAR
360.8	134.7	12.250	5.000	3.000	3.000	64	4	54	541.2	39.0	95.2	LAMINAR
495.5	133.7	12.250	8.000	2.875	2.875	64	4	37	589.3	56.6	116.6	LAMINAR

Hydrostatic Pressure	946 psi
Annular Volume	310 bbl
Pipe Capacity	28 bbl
Circulating Volume	339 bbl
Pipe Displacement	39 bbl
Total Hole Volume	377 bbl

HYDRAULICS RESULTS AT VARIOUS FLOW RATES

Flow Rate	gpm	552	572	592	612	632	652	672	692	712	732	752
Flow Regime at TD		LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM
Jet Velocity	m/sec	94.0	97.4	100.8	104.2	107.6	111.0	114.4	117.8	121.2	124.6	128.0
Impact Force	lbf	779.8	837.3	896.9	958.5	1022.2	1087.9	1155.7	1225.5	1297.4	1371.3	1447.2
Hydraulic Power	hhp	242.0	269.2	298.5	329.8	363.2	398.7	436.6	476.7	519.3	564.3	611.8
Bit Loss	psi	752	807	865	924	986	1049	1114	1182	1251	1322	1395
% Bit Loss		55.0	56.3	57.4	58.5	59.4	60.3	61.2	61.9	62.6	63.3	63.9
Pipe Loss	psi	364	385	406	428	451	473	496	520	544	568	593
Annular Loss	psi	11	11	11	12	12	12	12	12	12	13	13
Cuttings Loss	psi	229	220	211	204	196	190	183	177	172	166	161
Surface Loss	psi	11	12	13	13	14	15	16	17	18	19	20
Total Loss	psi	1367	1435	1506	1581	1658	1739	1822	1908	1997	2088	2182
Circ Pressure	psi	1186	1177	1169	1161	1154	1147	1141	1136	1130	1125	1120
ECD @ TD	sg	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
ECD @ Shoe	sg	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
ECD @ Weakest Depth	sg	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
ECD @ TD (cuttings)	sg	1.33	1.32	1.31	1.30	1.29	1.29	1.28	1.27	1.27	1.26	1.26

Recommended Minimum Flow to maintain cuttings transport in top section is 142 gpm
 Recommended Maximum Flow to maintain laminar flow in lowest section is 1344 gpm

EXLOG DRILLBYTE EAP : MUD HYDRAULICS ANALYSIS

Data Printed on : Mon Feb 22 01:29:14 1993

INPUT DATA

Hydraulics Model	POWER LAW	Casing Shoe Depth	355.0 m	Jet 1	18 in/32
Depth	1017.0 m	Weakest Ptn Depth	355.0 m	Jet 2	16 in/32
Vertical Depth	1017.0 m	Mud Density	1.10 sg	Jet 3	13 in/32
Flow Rate	640 gpm	300 rpm viscometer	37	Total Fluid Area	0.5745 in ²
Average ROP	66.6 m/hr	600 rpm viscometer	53		
Cuttings Density	2.60 spc g	Plastic Viscosity	15.00 cP		
Cuttings Diameter	0.200 in	Yield Point	22.00 #/100ft ²		
Cuttings Shape	SPHERICAL	Power Law k	1.78874 #sec ⁿ /100ft ²		
Cuttings Thickness	0.050 in	Power Law n	0.49099		

CALCULATED RESULTS

Section	Hole Length	Hole Size	Pipe		Volumes & Capacities			Mud Velocity			Flow Regime
			OD	ID	Hole	Pipe	Annulus	Pipe	Annulus	Critical	
Top	Length	Size	in	in	bbl	bbl	bbl	m/min	m/min	m/min	
Surface	98.5	19.750	5.000	4.276	122	6	115	261.5	13.1	84.8	LAMINAR
100.0	255.0	12.347	5.000	4.276	124	15	103	261.5	37.6	107.4	LAMINAR
355.0	393.6	12.250	5.000	4.276	188	23	157	261.5	38.3	107.9	LAMINAR
748.6	134.7	12.250	5.000	3.000	64	4	54	531.2	38.3	107.9	LAMINAR
883.3	133.7	12.250	8.000	2.875	64	4	37	578.4	55.6	129.0	LAMINAR

Hydrostatic Pressure	1588 psi		
Annular Volume	465 bbl	3628 strokes	30 mins
Pipe Capacity	51 bbl	398 strokes	3 mins
Circulating Volume	516 bbl	4025 strokes	34 mins
Pipe Displacement	47 bbl		
Total Hole Volume	563 bbl		

HYDRAULICS RESULTS AT VARIOUS FLOW RATES

Flow Rate	gpm :	540	560	580	600	620	640	660	680	700	720	740
Flow Regime at TD	:	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM
Jet Velocity	m/sec :	91.9	95.3	98.7	102.1	105.5	108.9	112.3	115.8	119.2	122.6	126.0
Impact Force	lbf :	774.4	832.9	893.4	956.1	1020.9	1087.8	1156.9	1228.0	1301.3	1376.8	1454.3
Hydraulic Power	hhp :	235.1	262.2	291.3	322.5	355.8	391.4	429.2	469.4	512.1	557.2	605.0
Bit Loss	psi :	747	803	861	922	984	1049	1115	1184	1255	1327	1402
% Bit Loss	:	56.3	57.2	58.1	58.8	59.5	60.2	60.8	61.4	61.9	62.4	62.9
Pipe Loss	psi :	427	452	477	503	529	556	583	611	639	668	697
Annular Loss	psi :	21	21	21	22	22	22	23	23	23	24	24
Cuttings Loss	psi :	121	116	112	108	104	100	97	94	91	88	86
Surface Loss	psi :	11	12	13	13	14	15	16	17	18	19	20
Total Loss	psi :	1326	1403	1484	1567	1653	1742	1834	1929	2026	2126	2228
Circ Pressure	psi :	1730	1725	1721	1718	1714	1711	1708	1705	1703	1700	1698
ECD @ TD	sg :	1.11	1.11	1.11	1.11	1.12	1.12	1.12	1.12	1.12	1.12	1.12
ECD @ Shoe	sg :	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
ECD @ Weakest Depth	sg :	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
ECD @ TD (cuttings)	sg :	1.20	1.19	1.19	1.19	1.19	1.18	1.18	1.18	1.18	1.18	1.18

Recommended Minimum Flow to maintain cuttings transport in top section is 99 gpm
 Recommended Maximum Flow to maintain laminar flow in lowest section is 1486 gpm

EXLOG DRILLBYTE EAP : MUD HYDRAULICS ANALYSIS

Data Printed on : Wed Feb 24 00:33:49 1993

INPUT DATA

Hydraulics Model	POWER LAM	Casing Shoe Depth	1007.0 m	Jet 1	14 in/32
Depth	1206.0 m	Weakest Fmtn Depth	1007.0 m	Jet 2	10 in/32
Vertical Depth	1205.9 m	Mud Density	1.07 sg	Jet 3	10 in/32
Flow Rate	413 gpm	300 rpm viscometer	35	Total Fluid Area	0.3037 in ²
Average ROP	30.1 m/hr	600 rpm viscometer	50		
Cuttings Density	2.60 spc g	Plastic Viscosity	15.00 cP		
Cuttings Diameter	0.200 in	Yield Point	20.00 W/100ft ²		
Cuttings Shape	SPHERICAL	Power Law k	1.46273		
Cuttings Thickness	0.000 in	Power Law n	0.51457		

CALCULATED RESULTS

Section	Top	Length	Hole Size	Pipe		Volumes & Capacities			Mud Velocity			Flow Regime
				OD	ID	Hole	Pipe	Annulus	Pipe	Annulus	Critical	
	m	m	in	in	in	bbbl	bbbl	bbbl	m/min	m/min	m/min	
Surface	98.5	19.750	5.000	4.276	122	6	115	168.7	8.5	79.2	LAMINAR	
100.0	788.6	8.681	5.000	4.276	189	46	126	168.7	61.6	130.3	LAMINAR	
888.6	118.4	8.681	5.000	3.000	28	3	19	342.8	61.6	130.3	LAMINAR	
1007.0	16.3	8.500	5.000	3.000	4	0	2	342.8	65.7	132.7	LAMINAR	
1023.3	164.9	8.500	6.500	2.813	38	4	16	389.9	102.8	160.9	LAMINAR	
1188.2	17.8	8.500	6.750	2.813	4	0	2	389.9	115.6	168.6	LAMINAR	

Hydrostatic Pressure	1833 psi		
Annular Volume	279 bbl	2178 strokes	28 mins
Pipe Capacity	60 bbl	470 strokes	6 mins
Circulating Volume	339 bbl	2648 strokes	34 mins
Pipe Displacement	47 bbl		
Total Hole Volume	386 bbl		

HYDRAULICS RESULTS AT VARIOUS FLOW RATES

Flow Rate	gpm :	363	373	383	393	403	413	423	433	443	453	463
Flow Regime at TD	:	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM
Jet Velocity	m/sec :	116.9	120.1	123.3	126.5	129.8	133.0	136.2	139.4	142.6	145.9	149.1
Impact Force	lbf :	643.8	679.8	716.7	754.7	793.6	833.4	874.3	916.1	958.9	1002.7	1047.4
Hydraulic Power	hhp :	248.5	269.6	291.9	315.3	340.0	366.0	393.2	421.8	451.7	482.9	515.6
Bit Loss	psi :	1174	1240	1307	1376	1447	1520	1594	1671	1749	1828	1910
% Bit Loss	:	72.9	73.4	73.9	74.4	74.8	75.2	75.6	76.0	76.4	76.7	77.0
Pipe Loss	psi :	284	296	308	321	334	347	360	374	388	401	415
Annular Loss	psi :	90	91	92	93	94	96	97	98	99	100	101
Cuttings Loss	psi :	59	57	56	54	53	51	50	49	47	46	45
Surface Loss	psi :	5	5	6	6	6	7	7	7	7	8	8
Total Loss	psi :	1612	1689	1769	1851	1935	2020	2108	2198	2290	2384	2480
Circ Pressure	psi :	1981	1981	1980	1980	1980	1979	1979	1979	1979	1979	1979
ECD @ TD	sg :	1.12	1.12	1.12	1.12	1.13	1.13	1.13	1.13	1.13	1.13	1.13
ECD @ Shoe	sg :	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
ECD @ Weakest Depth	sg :	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
ECD @ TD (cuttings)	sg :	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16

Recommended Minimum Flow to maintain cuttings transport in top section is 96 gpm
 Recommended Maximum Flow to maintain laminar flow in lowest section is 602 gpm

EXLOG DRILLBYTE EAP : MUD HYDRAULICS ANALYSIS

Data Printed on : Thu Feb 25 01:04:29 1993

INPUT DATA

Hydraulics Model	POWER LAW	Casing Shoe Depth	1007.0 m	Jet 1	14 in/32
Depth	1593.0 m	Weakest Ptn Depth	1007.0 m	Jet 2	10 in/32
Vertical Depth	1593.0 m	Mud Density	1.09 sg	Jet 3	10 in/32
Flow Rate	408 gpm	300 rpm viscometer	42	Total Fluid Area	0.3037 in ²
Average ROP	19.4 m/hr	600 rpm viscometer	60		
Cuttings Density	2.60 spc	Plastic Viscosity	18.00 cP		
Cuttings Diameter	0.200 in	Yield Point	24.00 #/100ft ²		
Cuttings Shape	SPHERICAL	Power Law k	1.75528 #sec ⁿ /100ft ²		
Cuttings Thickness	0.000 in	Power Law n	0.51457		

CALCULATED RESULTS

Section	Hole		Pipe		Volumes & Capacities			Mud Velocity			Flow Regime	
	Top	Length	Size	OD	ID	Hole	Pipe	Annulus	Pipe	Annulus		Critical
m	m	in	in	in	in	bbl	bbl	bbl	m/min	m/min	m/min	
Surface	98.5	19.750	5.000	4.276	4.276	122	6	115	166.7	8.4	88.5	LAMINAR
100.0	907.0	8.681	5.000	4.276	4.276	218	53	145	166.7	60.8	145.5	LAMINAR
1007.0	268.6	8.500	5.000	4.276	4.276	62	16	40	166.7	64.9	148.1	LAMINAR
1275.6	134.7	8.500	5.000	3.000	3.000	31	4	20	338.7	64.9	148.2	LAMINAR
1410.3	164.9	8.500	6.500	2.813	2.813	38	4	16	385.2	101.6	179.7	LAMINAR
1575.2	17.8	8.500	6.750	2.813	2.813	4	0	2	385.2	114.2	188.2	LAMINAR

Hydrostatic Pressure	2467 psi		
Annular Volume	337 bbl	2631 strokes	35 mins
Pipe Capacity	83 bbl	646 strokes	9 mins
Circulating Volume	420 bbl	3277 strokes	43 mins
Pipe Displacement	56 bbl		
Total Hole Volume	475 bbl		

HYDRAULICS RESULTS AT VARIOUS FLOW RATES

	gpm :	358	368	378	388	398	408	418	428	438	448	458
Flow Rate	gpm :	358	368	378	388	398	408	418	428	438	448	458
Flow Regime at TD		LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM
Jet Velocity	m/sec :	115.3	118.5	121.7	124.9	128.1	131.4	134.6	137.8	141.0	144.2	147.5
Impact Force	lbf :	637.9	674.1	711.2	749.3	788.5	828.6	869.7	911.8	954.9	999.0	1044.1
Hydraulic Power	hhp :	242.8	263.7	285.8	309.1	333.6	359.4	386.5	414.9	444.7	475.8	508.4
Bit Loss	psi :	1163	1229	1297	1366	1438	1511	1586	1663	1741	1822	1904
% Bit Loss		68.8	69.3	69.9	70.3	70.8	71.2	71.7	72.1	72.4	72.8	73.2
Pipe Loss	psi :	341	356	371	386	402	418	434	451	467	484	501
Annular Loss	psi :	137	139	140	142	144	146	148	150	151	153	155
Cuttings Loss	psi :	45	44	43	41	40	39	38	37	36	35	35
Surface Loss	psi :	5	5	6	6	6	7	7	7	7	8	8
Total Loss	psi :	1691	1773	1857	1943	2031	2121	2213	2307	2404	2502	2607
Circ Pressure	psi :	2649	2649	2650	2650	2651	2652	2653	2654	2654	2655	2656
ECD @ TD	sg :	1.15	1.15	1.15	1.15	1.15	1.15	1.16	1.16	1.16	1.16	1.16
ECD @ Shoe	sg :	1.13	1.13	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
ECD @ Weakest Depth	sg :	1.13	1.13	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
ECD @ TD (cuttings)	sg :	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17

Recommended Minimum Flow to maintain cuttings transport in top section is 79 gpm
 Recommended Maximum Flow to maintain laminar flow in lowest section is 672 gpm

EXLOG DRILLBYTE EAP : MUD HYDRAULICS ANALYSIS

Data Printed on : Fri Feb 26 02:29:15 1993

INPUT DATA

Hydraulics Model	POWER LAW	Casing Shoe Depth	1007.0 m	Jet 1	14 in/32
Depth	1771.0 m	Weakest Ptn Depth	1007.0 m	Jet 2	10 in/32
Vertical Depth	1770.9 m	Mud Density	1.10 sg	Jet 3	10 in/32
Flow Rate	350 gpm	300 rpm viscometer	38	Total Fluid Area	0.3037 in ²
Average ROP	28.0 m/hr	600 rpm viscometer	54		
Cuttings Density	2.60 spc	Plastic Viscosity	16.00 cP		
Cuttings Diameter	0.200 in	Yield Point	22.00 #/100ft ²		
Cuttings Shape	SPHERICAL	Power Law k	1.66454 #sec ⁿ /100ft ²		
Cuttings Thickness	0.100 in	Power Law n	0.50696		

CALCULATED RESULTS

Section	Hole Length	Hole Size	Pipe		Volumes & Capacities			Mud Velocity			Flow Regime
			OD	ID	Hole	Pipe	Annulus	Pipe	Annulus	Critical	
Top	Length	Size	in	in	bbl	bbl	bbl	m/min	m/min	m/min	
Surface	98.5	19.750	5.000	4.276	122	6	115	143.0	7.2	83.5	LAMINAR
100.0	907.0	8.681	5.000	4.276	218	53	145	143.0	52.2	136.0	LAMINAR
1007.0	446.6	8.500	5.000	4.276	103	26	67	143.0	55.6	138.4	LAMINAR
1453.6	134.7	8.500	5.000	3.000	31	4	20	290.5	55.7	138.5	LAMINAR
1588.3	164.9	8.500	6.500	2.813	38	4	16	330.4	87.2	167.3	LAMINAR
1753.2	17.8	8.500	6.750	2.813	4	0	2	330.4	98.0	175.1	LAMINAR

Hydrostatic Pressure	2768 psi		
Annular Volume	364 bbl	2839 strokes	44 mins
Pipe Capacity	93 bbl	727 strokes	11 mins
Circulating Volume	457 bbl	3566 strokes	55 mins
Pipe Displacement	59 bbl		
Total Hole Volume	516 bbl		

HYDRAULICS RESULTS AT VARIOUS FLOW RATES

Flow Rate	gpm	300	310	320	330	340	350	360	370	380	390	400
Flow Regime at TD		LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM
Jet Velocity	m/sec	96.6	99.8	103.0	106.2	109.5	112.7	115.9	119.1	122.3	125.6	128.8
Impact Force	lbf	452.1	482.7	514.4	547.0	580.7	615.3	651.0	687.7	725.3	764.0	803.7
Hydraulic Power	hhp	144.2	159.1	175.0	191.9	209.9	229.0	249.2	270.5	293.1	316.8	341.8
Bit Loss	psi	824	880	938	998	1059	1122	1187	1254	1323	1393	1466
% Bit Loss		63.8	64.4	64.9	65.7	66.4	67.1	67.7	68.3	68.9	69.4	69.9
Pipe Loss	psi	251	271	293	308	323	338	353	368	384	400	416
Annular Loss	psi	126	128	130	132	134	136	138	140	142	143	145
Cuttings Loss	psi	86	83	80	78	75	73	71	68	66	65	63
Surface Loss	psi	4	4	4	4	5	5	5	5	6	6	6
Total Loss	psi	1291	1366	1446	1519	1595	1673	1753	1836	1920	2007	2096
Circ Pressure	psi	2980	2979	2978	2977	2977	2976	2976	2976	2976	2976	2976
ECD @ TD	sg	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.16	1.16	1.16	1.16
ECD @ Shoe	sg	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
ECD @ Weakest Depth	sg	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
ECD @ TD (cuttings)	sg	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18

Recommended Minimum Flow to maintain cuttings transport in top section is 77 gpm
 Recommended Maximum Flow to maintain laminar flow in lowest section is 626 gpm

EXLOG DRILLBYTE EAP : MUD HYDRAULICS ANALYSIS

Data Printed on : Sat Feb 27 02:25:29 1993

INPUT DATA

Hydraulics Model	POWER LAW	Casing Shoe Depth	1007.0 m	Jet 1	14 in/32
Depth	1875.0 m	Weakest Ptn Depth	1007.0 m	Jet 2	10 in/32
Vertical Depth	1874.9 m	Mud Density	1.10 sg	Jet 3	10 in/32
Flow Rate	395 gpm	300 rpm viscometer	40	Total Fluid Area	0.3037 in ²
Average ROP	17.0 m/hr	600 rpm viscometer	59		
Cuttings Density	2.60 spc g	Plastic Viscosity	19.00 cP		
Cuttings Diameter	0.200 in	Yield Point	21.00 #/100ft ²		
Cuttings Shape	SPHERICAL	Power Law k	1.25729 #sec ⁿ /100ft ²		
Cuttings Thickness	0.100 in	Power Law n	0.56071		

CALCULATED RESULTS

Section	Top	Length	Hole Size	Pipe		Volumes & Capacities			Mud Velocity			Flow Regime
				OD	ID	Hole	Pipe	Annulus	Pipe	Annulus	Critical	
	m	m	in	in	in	bbl	bbl	bbl	m/min	m/min	m/min	
Surface	98.5	19.750	5.000	4.276	4.276	122	6	115	161.4	8.1	77.0	LAMINAR
100.0	907.0	8.681	5.000	4.276	4.276	218	53	145	161.4	58.9	134.7	LAMINAR
1007.0	550.6	8.500	5.000	4.276	4.276	127	32	82	161.4	62.8	137.4	LAMINAR
1557.6	134.7	8.500	5.000	3.000	3.000	31	4	20	327.9	62.8	137.4	LAMINAR
1692.3	164.9	8.500	6.500	2.813	2.813	38	4	16	372.9	98.4	170.7	LAMINAR
1857.2	17.8	8.500	6.750	2.813	2.813	4	0	2	372.9	110.6	179.9	LAMINAR

Hydrostatic Pressure	2930 psi		
Annular Volume	379 bbl	2961 strokes	40 mins
Pipe Capacity	39 bbl	774 strokes	11 mins
Circulating Volume	478 bbl	3735 strokes	51 mins
Pipe Displacement	62 bbl		
Total Hole Volume	540 bbl		

HYDRAULICS RESULTS AT VARIOUS FLOW RATES

Flow Rate	gpm :	345	355	365	375	385	395	405	415	425	435	445
Flow Regime at TD	:	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM	LAM
Jet Velocity	m/sec :	111.1	114.3	117.5	120.7	124.0	127.2	130.4	133.6	136.8	140.1	143.3
Impact Force	lbf :	597.9	633.0	669.2	706.4	744.6	783.7	823.9	865.1	907.3	950.5	994.7
Hydraulic Power	hhp :	219.3	238.9	259.7	281.6	304.8	329.1	354.8	381.7	410.0	439.6	470.6
Bit Loss	psi :	1090	1154	1220	1288	1358	1429	1502	1578	1655	1733	1814
% Bit Loss	:	66.1	66.7	67.2	67.7	68.2	68.7	69.1	69.5	69.9	70.3	70.7
Pipe Loss	psi :	367	384	401	419	436	455	473	492	511	530	549
Annular Loss	psi :	139	141	143	146	148	150	152	154	156	158	160
Cuttings Loss	psi :	48	46	45	44	42	41	40	39	38	37	36
Surface Loss	psi :	5	5	5	6	6	6	6	7	7	7	8
Total Loss	psi :	1649	1731	1815	1902	1990	2081	2174	2269	2366	2466	2567
Circ Pressure	psi :	3117	3118	3119	3120	3120	3121	3122	3123	3124	3125	3127
ECD @ TD	sg :	1.15	1.15	1.15	1.15	1.16	1.16	1.16	1.16	1.16	1.16	1.16
ECD @ Shoe	sg :	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
ECD @ Weakest Depth	sg :	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
ECD @ TD (cuttings)	sg :	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17

Recommended Minimum Flow to maintain cuttings transport in top section is 101 gpm
 Recommended Maximum Flow to maintain laminar flow in lowest section is 643 gpm

APPENDIX VIII: Geological-Engineering Morning Reports



A Baker Hughes company

DRILLBYTE MORNING REPORT NO 1

COMPANY BHP Petroleum WELL ERIC THE RED - 1
 DATE 18.02.93 TIME 2400 hr
 DEPTH 370m LAST REPORT DEPTH - m
 RIG OPERATIONS Run 30" casing.
 REPORT BY S. Ong REPORT RECEIVED BY G. Howard (OPTR)

DRILLING REPORT

Bit No. NB#2 Type SECURITY S44GF size 9.875 in Jets open
 On Bit: Distance 254.0 m Hours 3:52 hh:mm ROP 65.6 m/hr WOB 10-15 RPM 120
 Pump Press 100 SPN 116 Torque 40-120 amp TDR _____ CP I:0 _____ CP S:0 _____

HYDRAULICS REPORT

Mud Density In 0.00 sg Mud Density out 0.00 sg BCD _____ PV/VP _____
 Gels _____ Salinity _____ PPM Cl Solids _____
 Hole Volume _____ Annular Volume _____ Tubing Volume _____ Displaced Volume _____
 Carbide Lag-Calculated Lag _____ Flowrate _____
 DrillPipe Annular Vel (Max. Dia. Sec.) _____ DrillPipe Annular Vel (Open Hole) _____
 Drill Collar Annular Vel (Open Hole) _____ Critical Vel _____
 Pressure Loss System _____ Pressure Loss Bit _____ % Pressure Loss _____
 Nozzle Vel _____ Jet Impact Force _____ HHP _____

PRESSURE PARAMETERS

Drilling Exponent _____ Flowline Temp _____
 Shale Density _____ Shale Factor _____
 Background Gas _____ Max. Formation Gas _____ Trip Gas _____
 Other Gas _____
 Fill _____ Tight Hole _____
 Cavings Est % _____ Average Size _____

ESTIMATED PORE AND FRACTURE PRESSURE

Rick Tolerance _____ Min. Estimated Fracture Pressure (Open Hole) _____
 Estimated Pore Pressure 1.03 sg Min. Estimated Pore Pressure (Open Hole) 1.03 sg
 Max. Estimated Pore Pressure (Open Hole) _____ Estimated Fracture Pressure at TD _____

COMMENTS

RKB - MSL = 25 m ; RKB- SB = 100 m.
Spud Eric the Red-1 at 0700 hrs w/ RB#1 SEC S3J 26" 3 x 24 jets w/ 36" HO from 100 m to 116 m.
POOH RB#1 at 116m.
RIH NB#2 SEC S44GF 9.875" w/ open jets to drilled from 116m to 370m. POOH at 370m.
RIH RB#1.1 to open 9.875" to 36" from 116 m to 137 m.
POOH RB#1.1 for 30" casing run.



COMPANY BHP Petroleum WELL ERIC THE RED-1
DATE 18.2.93 TIME 2400 hrs
DEPTH 370 m (364 m 17.5" hole) LAST REPORT DEPTH 370 m
RIG OPERATIONS Open pilot hole to 17.5" w/ NB#3. Run 13.375" casing w/ shoe set at 355 m.
REPORT BY S. Ong REPORT RECEIVED BY G.Howard (OPTR)

DRILLING REPORT

Bit No. NB#3 Type SECURITY S44G size 17.500 in Jets 3 x 18
On Bit: Distance 227.0 m Hours 3:00 hh:mm ROP 50.4 WOB 10-30 RPM 155
Pump Press 2900 RPM 200 Torque 50-200 TDR 41850 CP I:# _____ CP B:# _____

HYDRAULICS REPORT

Mud Density In 0.00 SG Mud Density out 0.00 SG BCD _____ PV/TP _____
Gels _____ Salinity _____ PPM Cl Solids _____
Mole Volume _____ Annular Volume _____ Tubing Volume _____ Displaced Volume _____
Carbide Log-Calculated Log _____ Flowrate _____
DrillPipe Annular Vel (Max. Dia. Sec.) _____ DrillPipe Annular Vel (Open Hole) _____
Drill Collar Annular Vel (Open Hole) _____ Critical Vel _____
Pressure Loss System _____ Pressure Loss Bit _____ % Pressure Loss _____
Nozzle Vel _____ Jet Impact Force _____ ROP _____

PRESSURE PARAMETERS

Drilling Exponent _____ Flowline Temp _____
Shale Density _____ Shale Factor _____
Background Gas _____ Max. Formation Gas _____ Trip Gas _____
Other Gas _____
Fill _____ Tight Hole _____
Cavings Est % _____ Average Size _____

ESTIMATED PORE AND FRACTURE PRESSURE

Kick Tolerance _____ Min. Estimated Fracture Pressure (Open Hole) _____
Estimated Pore Pressure 1.03 SG Min. Estimated Pore Pressure (Open Hole) _____
Max. Estimated Pore Pressure (Open Hole) _____ Estimated Fracture Pressure at TD _____

COMMENTS 30" casing shoe set at 136 m. RIH NB#3 to tag cmt @ 133.5 m. Drilled out cmt and shoe. Open 9.875" pilot hole f/ 137-364 m. POOH NB#3 for 13.375" casing run. Run and set 13.375" casing shoe at 355 m.

Note : Returns to seabed.



A Baker Hughes company

DRILLBYTE MORNING REPORT NO 3

COMPANY BHP Petroleum WELL ERIC THE RED-1
 DATE 19.2.93 TIME 2400 hrs
 DEPTH 370 m (364 m 17.5" hole) LAST REPORT DEPTH 370 m (9.875" hole)
 RIG OPERATIONS Run BOP's and riser. Test BOP's.
 REPORT BY S. Ong REPORT RECEIVED BY G. Howard (OPTR)

DRILLING REPORT

Bit No. - Type - size 0.000 in Jets -
 On Bit: Distance 0.0 m Hours 00:00 hh:mm ROP WOB RPM
 Pump Press - SPN - Torque - TBR - CP I:Ø - CP B:Ø -

HYDRAULICS REPORT

Mud Density In 0.00 sg Mud Density out 0.00 sg BCD - PV/YP -
 Gels - Salinity - PPM Cl - Solids -
 Hole Volume - Annular Volume - Tubing Volume - Displaced Volume -
 Carbide Lag-Calculated Lag - Flowrate -
 DrillPipe Annular Vel (Max. Dia. Sec.) - DrillPipe Annular Vel (Open Hole) -
 Drill Collar Annular Vel (Open Hole) - Critical Vel -
 Pressure Loss System - Pressure Loss Bit - % Pressure Loss -
 Nozzle Vel - Jet Impact Force - HMP -

PRESSURE PARAMETERS

Drilling Exponent - Flowline Temp -
 Shale Density - Shale Factor -
 Background Gas - Max. Formation Gas - Trip Gas -
 Other Gas -
 Fill - Tight Hole -
 Cavings Est % - Average Size -

ESTIMATED PORE AND FRACTURE PRESSURE

Kick Tolerance - Min. Estimated Fracture Pressure (Open Hole) 1.75 sg
 Estimated Pore Pressure 1.03 sg Min. Estimated Pore Pressure (Open Hole) 1.03 sg @ 355 m
 Max. Estimated Pore Pressure (Open Hole) 1.03 sg @ 370 m Estimated Fracture Pressure at TD 1.80 sg

COMMENTS

Run BOP's and riser. Pressure test BOP's to BHP's specifications.



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DRILLBYTE MORNING REPORT NO 4

COMPANY BHP Petroleum WELL ERIC THE RED-1
 DATE 20.2.93 TIME 2400 hrs
 DEPTH 633 m LAST REPORT DEPTH 370 m (9.875" hole)
 RIG OPERATIONS Drilling ahead w/ NB#4.
 REPORT BY S. Ong REPORT RECEIVED BY G.Howard (OPTR)

DRILLING REPORT

Bit No. NB#4 Type ATM-11H Size 12.250 in Jets 13x16x18
 On Bit: Distance 263.0 m Hours 2:53 hh:mm ROP 91.2 m/hr WOB 0 - 10 klbs RPM 120-140
 Pump Press 1700-2000 RPM 610-710 gpm Torque 100-350 TAR 25540 CP I:Q _____ CP S:Q _____

HYDRAULICS REPORT

Mud Density In 1.06 sg Mud Density out 1.06 sg BCD 1.08 sg PV/TV 18/32
 Gels 3/4 Salinity _____ PPM Cl Solids _____
 Hole Volume 379 bbls Annular Volume 310 bbls Tubing Volume 29 bbls Displaced Volume 40 bbls
 Carbide Lag-Calculated Lag 3438 - 2464 strokes Flowrate 650 gpm
 DrillPipe Annular Vel (Max. Dia. Sec.) 13.4 m/min DrillPipe Annular Vel (Open Hole) 39.2 m/min
 Drill Collar Annular Vel (Open Hole) 56.9 m/min Critical Vel 116.6 m/min
 Pressure Loss System 1739 psi Pressure Loss Bit 1049 psi % Pressure Loss 60.3
 Nozzle Vel 111 m/sec Jet Impact Force 1088 lbf HNP 399 hp

PRESSURE PARAMETERS

Drilling Reagent 0.5 - 1.09 Flowline Temp 30.2 deg C
 Shale Density _____ Shale Factor _____
 Background Gas 0.02% Max. Formation Gas _____ Trip Gas _____
 Other Gas _____
 Fill _____ Tight Hole _____
 Cavings Est % _____ Average Size _____

ESTIMATED PORE AND FRACTURE PRESSURE

Kick Tolerance _____ Min. Estimated Fracture Pressure (Open Hole) 1.24 sg
 Estimated Pore Pressure 1.03 sg Min. Estimated Pore Pressure (Open Hole) 1.03 sg @ 355 m
 Max. Estimated Pore Pressure (Open Hole) 1.03 sg @ 370 m Estimated Fracture Pressure at TD 1.90 sg

COMMENTS

Tag cement top at 319 m. Drilled out cement, P/C at 331 m, cement and shoe at 355 m.
Pump 100 bbls Guar Gum, 100 bbls seawater and displaced hole with mud.
Ream hole from 355 m to 370 m. CBU at 370 m. Pull bit to shoe for L.O.T.
EMW = 1.24 sg
Carbide lag at 588 m and 644 m both indicated an average open hole diameter of 17.2".



DRILLBYTE MORNING REPORT NO 5

COMPANY BHP Petroleum WELL ERIC THE RED-1
DATE 21.2.93 TIME 2400 hrs
DEPTH 1017 m LAST REPORT DEPTH 633 m
RIG OPERATIONS Run E-Logs #2 VSP
REPORT BY S. Ong REPORT RECEIVED BY G.Howard (OPTR)

DRILLING REPORT

Bit No. NB#4 Type ATM-11H size 12.250 in Jets 13x16x18
On Bit: Distance 384.0 m Hours 6:50 hh:mm ROP 56.2 m/hr WOB 5 - 30 klbs RPM 120-140
Pump Press 1700-2000 RPM 600-670 gpm Torque 100-25 TBR 58520 CP I:0 - CP S:0 -

HYDRAULICS REPORT

Mud Density In 1.10 sg Mud Density out 1.10 sg BCD 1.11 sg PV/TV 15/22
Gels 3/4 Salinity 38000 PPM Cl Solids 6.15 %
Mole Volume 563 bbls Annular Volume 465 bbls Tubing Volume 51 bbls Displaced Volume 47 bbls
Carbide Lag-Calculated Lag 4080 - 3078 strokes @ 848 m Flowrate 640 gpm
DrillPipe Annular Vel (Max. Dia. Sec.) 13.1 m/min DrillPipe Annular Vel (Open Hole) 38.3 m/min
Drill Collar Annular Vel (Open Hole) 55.6 m/min Critical Vel 129.0 m/min
Pressure Loss System 1742 psi Pressure Loss Bit 1049 psi % Pressure Loss 60.2
Nozzle Vel 112.3 m/sec Jet Impact Force 1156.9 lbf MHP 429.2 hp

PRESSURE PARAMETERS

Drilling Equivalent 0.5 - 1.3 Flowline Temp 33.3 deg C
Shale Density - Shale Factor -
Background Gas 0.02% Max. Formation Gas - Trip Gas -
Other Gas -
Fill - Tight Mole -
Cavings Est % - Average Size -

ESTIMATED PORE AND FRACTURE PRESSURE

Kick Tolerance - Min. Estimated Fracture Pressure (Open Hole) 1.24 sg
Estimated Pore Pressure 1.03 sg Min. Estimated Pore Pressure (Open Hole) 1.03 sg @ 355 m
Max. Estimated Pore Pressure (Open Hole) 1.03 sg @ 1017 m Estimated Fracture Pressure at TD 1.60 sg

COMMENTS

CBU at 1017 m and POOH for E-Logs.
NB#4 drilled 647 m in 9.7 on-bottom hrs / 15.72 rotating hrs. Average ROP is 66.6 m/hr. TBR = 840
Run #1 : DLL-MSFL-SDT-SP-GR-CAL-AMS
Run #2 : VSP
Carbide lag at 848 m indicated an average open hole diameter of 15.2" (24.3% overgauge).



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DRILLBYTE MORNING REPORT NO 6

COMPANY BHP Petroleum WELL ERIC THE RED-1
 DATE 22.2.93 TIME 2400 hrs
 DEPTH 1017 m LAST REPORT DEPTH 1017 m
 RIG OPERATIONS Test BOP's.
 REPORT BY S. Ong REPORT RECEIVED BY G.Howard (OPTR)

DRILLING REPORT

Bit No. - Type - Size - in Jets -
 On Bit: Distance 0.0 m Hours 0 hh:mm rop - WOB - RPM -
 Pump Press - RPM - Torque - TOR - CP I:Q - CP B:Q -

HYDRAULICS REPORT

Mud Density In 1.07 sg Mud Density out 1.07 sg BCD - PV/YP -
 Gels - Salinity - PPM Cl Solids -
 Hole Volume - Annular Volume - Tubing Volume - Displaced Volume -
 Carbide Log-Calculated Log - Flowrate -
 DrillPipe Annular Vel (Max. Dia. Sec.) - DrillPipe Annular Vel (Open Hole) -
 Drill Collar Annular Vel (Open Hole) - Critical Vel -
 Pressure Loss System - Pressure Loss Bit - % Pressure Loss -
 Nozzle Vel - Jet Impact Force - MHP -

PRESSURE PARAMETERS

Drilling Exponent - Flowline Temp -
 Shale Density - Shale Factor -
 Background Gas - Max. Formation Gas - Trip Gas -
 Other Gas -
 Fill - Tight Hole -
 Cavings Est % - Average Size -

ESTIMATED PORE AND FRACTURE PRESSURE

Kick Tolerance - Min. Estimated Fracture Pressure (Open Hole) 1.24 sg
 Estimated Pore Pressure 1.03 sg Min. Estimated Pore Pressure (Open Hole) 1.03 sg @ 355 m
 Max. Estimated Pore Pressure (Open Hole) 1.03 sg @ 1017 m Estimated Fracture Pressure at TD 1.60 sg

COMMENTS

Run #3 CST 1010.0 - 373.5 m.
 R/D Schlumberger
 Retrieve wear bushing.
 Run and set 9.625" casing with shoe at 1007 m.



DRILLBYTE MORNING REPORT NO 7

COMPANY BHP Petroleum WELL ERIC THE RED-1
DATE 24.2.93 TIME 2400 hrs
DEPTH 1206 m LAST REPORT DEPTH 1017 m
RIG OPERATIONS Drilling ahead w/ NB#5.
REPORT BY S. Ong REPORT RECEIVED BY J. Dickson (OPTR)

DRILLING REPORT

Bit No. NB#5 Type HTC ATM-22 size 8.5 in Jets 10x10x14
On Bit: Distance 189 m Hours 6:12 hh:mm ROP 30.5 m/hr WOB 10-30 klbs RPM 110
Pump Press 2100 SPN 410 gpm Torque 100-180 TOR 48713 CP I:0 - CP B:0 -

HYDRAULICS REPORT

Mud Density In 1.07 sg Mud Density out 1.07 sg SCD 1.13 sg PV/TV 15/20
Gels 3/4 Salinity - PPM Cl Solids - %
Mole Volume 386 bbls Annular Volume 279 bbls Tubing Volume 60 bbls Displaced Volume 47 bbls
Carbide Log-Calculated Log - Flowrate 413 gpm
DrillPipe Annular Vel (Max. Dia. Sec.) 8.5 m/min DrillPipe Annular Vel (Open Hole) 65.7 m/min
Drill Collar Annular Vel (Open Hole) 115.6 m/min Critical Vel 168.6 m/min
Pressure Loss System 2020 psi Pressure Loss Bit 1520 psi % Pressure Loss 75.2
Nozzle Vel 133 m/sec Jet Impact Force 833.4 lbf HWP 366 hp

PRESSURE PARAMETERS

Drilling Exponent 0.7 - 1.45 Flowline Temp 31.9 deg C
Shale Density - Shale Factor -
Background Gas 0.02 % Max. Formation Gas - Trip Gas -
Other Gas -
Fill - Tight Hole -
Cavings Est % - Average Size -

ESTIMATED PORE AND FRACTURE PRESSURE

Rick Tolerance - Min. Estimated Fracture Pressure (Open Hole) 1.96 sg
Estimated Pore Pressure 1.03 sg Min. Estimated Pore Pressure (Open Hole) 1.03 sg @ 1007 m
Max. Estimated Pore Pressure (Open Hole) 1.03 sg @ 1206 m Estimated Fracture Pressure at TD 2.00 sg

COMMENTS

Test BOP's.
RIH NB#5 to drill out cement, F/c, and casing shoe at 1007 m. Ream down to 1017 m and drilled 3 m new hole to 1020 m. Circulate hole clean and condition mud in the hole to 1.08 sg. Pull bit into casing and perform F.I.T. EMW = 1.96 sg
Drill ahead with NB#5.



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DRILLBYTE MORNING REPORT NO 8

COMPANY BHP Petroleum WELL ERIC THE RED-1
 DATE 25.2.93 TIME 2400 hrs
 DEPTH 1593 m LAST REPORT DEPTH 1206 m
 RIG OPERATIONS Drilling ahead w/ NB#5.
 REPORT BY S. Ong REPORT RECEIVED BY J. Dickson (OPTR)

DRILLING REPORT

Bit No. NB#5 Type HTC ATM-22 Size 8.500 in Jets 10x10x14
 On Bit: Distance 387 m Hours 19:54 hh:mm ROP 19.4 m/hr WOB 20-30 klbs RPM 110
 Pump Press 2300 RPM 410 gpm Torque 120-310 TBR 133124 CP I:# - CP B:# -

HYDRAULICS REPORT

Mod Density In 1.09 sg Mod Density out 1.11 sg BCD 1.14 sg PV/VP 18/24
 Gels 4 Salinity - PPM Cl Solids - %
 Hole Volume 475 bbls Annular Volume 337 bbls Tubing Volume 83 bbls Displaced Volume 56 bbls
 Carbide Lag-Calculated Lag - Flowrate 410 gpm
 DrillPipe Annular Vel (Max. Dia. Sec.) 8.4 m/min DrillPipe Annular Vel (Open Hole) 64.9 m/min
 Drill Collar Annular Vel (Open Hole) 114.2 m/min Critical Vel 188.2 m/min
 Pressure Loss System 2143 psi Pressure Loss Bit 1511 psi % Pressure Loss 70.5
 Nozzle Vel 131.4 m/sec Jet Impact Force 828.6 lbf HHP 359.4 hp

PRESSURE PARAMETERS

Drilling Exponent 0.8 - 1.61 Flowline Temp 38.5 deg C
 Shale Density - Shale Factor -
 Background Gas 0.05 % Max. Formation Gas - Trip Gas -
 Other Gas -
 Fill - Tight Hole -
 Cavings Est % - Average Size -

ESTIMATED PORE AND FRACTURE PRESSURE

Rick Tolerance - Min. Estimated Fracture Pressure (Open Hole) 1.96 sg
 Estimated Pore Pressure 1.04 sg Min. Estimated Pore Pressure (Open Hole) 1.03 sg @ 1007 m
 Max. Estimated Pore Pressure (Open Hole) 1.04 sg @ 1539 m Estimated Fracture Pressure at TD 2.50 sg

COMMENTS

Flow check active pits volume increase at 1238 m (-ve).

 Total footage drilled = 576 m in 25.92 hrs. Ave. ROP = 22.2 m/hr.
 Total rotating time = 30.48 hrs.
 TBR = 181837



COMPANY BHP Petroleum WELL ERIC THE RED-1
DATE 25.02.93 TIME 24:00 hrs
DEPTH 1771m LAST REPORT DEPTH 1593m
RIG OPERATIONS Drilling ahead.
REPORT BY Matt Sale REPORT RECEIVED BY J.Dickson/J.Boorman (OPTR)

DRILLING REPORT

Bit No. NB#6 Type HTC ATM22 size 8.500 in Jets 2 x 10, 1 x 14
On Bit: Distance 146 m Hours 9:50 hh:mm ROP 6 - 76 m/hr WOB 15 - 35 klb RPM 110-115
Pump Press 2150 psi SPM 65 Torque 150-250 TBR 66,969 CP I:0 - CP B:0 -

HYDRAULICS REPORT

Mod Density In 1.09 SG Mod Density out 1.10 SG BCD 1.15 SG PV/VP 16/22
Gels 4/6 Salinity 39000 PPM Cl Solids 6.0%
Mole Volume 516 bbl Annular Volume 364 bbl Tubing Volume 93 bbl Displaced Volume 59 bbl
Carbide Lag-Calculated Lag 2839 stks Flowrate 350 gpm
DrillPipe Annular Vel (Max. Dia. Sec.) 7.2 m/min DrillPipe Annular Vel (Open Hole) 55.7 m/min
Drill Collar Annular Vel (Open Hole) 98.0 m/min Critical Vel 175.1 m/min
Pressure Loss System 2150 psi Pressure Loss Bit 1122 psi % Pressure Loss 52.0%
Nozzle Vel 112.7 m/sec Jet Impact Force 615.3 lbf HHP 229.0 hp

PRESSURE PARAMETERS

Drilling Exponent 0.97 - 174 Flowline Temp 37.5 deg C
Shale Density - Shale Factor -
Background Gas 0.06 % Max. Formation Gas 0.09% @ 1733m Trip Gas 0.04% @ 1625m
Other Gas Nil
#111 Nil Tight Hole See below
Cavings Est % Nil Average Size -

ESTIMATED PORE AND FRACTURE PRESSURE

Rick Tolerance 0.50 sg Min. Estimated Fracture Pressure (Open Hole) 1.96 sg at shoe
Estimated Pore Pressure 1.03 sg Min. Estimated Pore Pressure (Open Hole) 1.03 sg @ shoe
Max. Estimated Pore Pressure (Open Hole) 1.03 sg @ TD Estimated Fracture Pressure at TD 2.03 sg

COMMENTS All pore pressure parameters remain normal.

Continue drilling from 1593 - 1625m.

Pump slug & POOH. Tight f/ 1518 - 1470m & 1390 - 1370m of up to 40 klb o/pull.

1170 - 1160m up to 40 klb o/pull, 1160 - 1110m up to 90 klb o/pull, 1110 - 1080m

up to 40 klb o/pull, 1080 - 480m up to 80 klb o/pull.

Dump memory on mwd. B/out bit #5 and m/up NB#6 & RIH.

Wash/ream from 1596 - 1625m.

Drill 1625 - 1771m.



COMPANY BHP Petroleum WELL ERIC THE RED-1
DATE 26.02.93 TIME 24:00hrs
DEPTH 1875m LAST REPORT DEPTH 1771m
RIG OPERATIONS Logging.
REPORT BY Matt Sale REPORT RECEIVED BY J.Dickson/J.Boorman (OPTR)

DRILLING REPORT

Bit No. NB#6 Type HTC ATM22 size 8.500 in Jets 2 x 10, 1 x 14
On Bit: Distance 250 m Hours 14:36 hh:mm ROP 8 - 40 m/hr WOB 20 - 30 klb RPM 115
Pump Press 2200 psi RPM 73 Torque 160-250 TBR 99,504 CP I:0 - CP B:0 -

HYDRAULICS REPORT

Mud Density In 1.10 sg Mud Density out 1.10 sg BCD 1.16 sg PV/TV 19/21
Gels 4/6 Salinity 41000 PPM Cl Solids 6.0%
Mud Volume 540 bbl Annular Volume 379 bbl Tubing Volume 99 bbl Displaced Volume 62 bbl
Carbide Log-Calculated Log 2961 stk Flowrate 395 gpm
DrillPipe Annular Vel (Max. Dia. Sec.) 8.1 m/min DrillPipe Annular Vel (Open Hole) 62.8 m/min
Drill Collar Annular Vel (Open Hole) 110.6 m/min Critical Vel 179.9 m/min
Pressure Loss System 2200 psi Pressure Loss Bit 1429 psi % Pressure Loss 65
Nozzle Vel 127.2 m/sec Jet Impact Force 783.7 lbf RHP 329.1 hp

PRESSURE PARAMETERS

Drilling Exponent 0.98 - 1.57 Flowline Temp 36.7 deg c
Shale Density - Shale Factor -
Background Gas 0.06% Max. Formation Gas 0.14% e 1789m Trip Gas WTG=0 e 1875m
Other Gas Nil
Fill Nil Tight Hole See below
Cavings Est % Nil Average Size -

ESTIMATED PORE AND FRACTURE PRESSURE

Rick Tolerance 0.46 sg Min. Estimated Fracture Pressure (Open Hole) 1.96 at shoe
Estimated Pore Pressure 1.03 sg Min. Estimated Pore Pressure (Open Hole) 1.03 sg e shoe
Max. Estimated Pore Pressure (Open Hole) 1.03 sg e TD Estimated Fracture Pressure at TD 2.049 sg

COMMENTS

All pore pressure parameters remain normal.
Cont drill from 1771 - 1875m (TD). Survey at TD = 1.1 deg, az 229.7 deg at 1867m.
Circ hole till shakers clean. Pump slug & POOH for 20 std wiper trip.
Tight hole from 1816 - 1352m w/ max o/pull up to 120 klbs at 1643m.
RIH to bottom - hole good. Circ till shakers clean.
Pump slug - POOH - hole good. Dump memory on mwd tool.
R/up Schlum & run: Log #1 DLL-MSFL-GR-AMS
Log #2 FMS-LDT-CNL-GR-AMF.



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DRILLBYTE MORNING REPORT NO 11

COMPANY BHP PETROLEUM WELL ERIC THE RED-1
 DATE 27.01.93 TIME 24:00HRS
 DEPTH 1875m LAST REPORT DEPTH 1875m
 RIG OPERATIONS R/dwn Schlumberger.
 REPORT BY Matt Sale REPORT RECEIVED BY J.Dickson/J.Borrman (OPTR)

DRILLING REPORT

Bit No. _____ Type _____ Size _____ in Jets _____
 On Bit: Distance _____ m Hours _____ hh:mm ROE _____ WOB _____ RPM _____
 Pump Press _____ SPN _____ Torque _____ TDR _____ CP I:0 _____ CP B:0 _____

HYDRAULICS REPORT

Mud Density In 1.10 sg Mud Density out _____ sg BCD _____ PV/TV 18/21
 Gels 4/6 Salinity 41000 PPM Cl Solids 6.0%
 Hole Volume 540 bbl Annular Volume _____ Tubing Volume _____ Displaced Volume _____
 Carbide Lag-Calculated Lag _____ Flowrate _____
 DrillPipe Annular Vel (Max. Dis. Sec.) _____ DrillPipe Annular Vel (Open Hole) _____
 Drill Collar Annular Vel (Open Hole) _____ Critical Vel _____
 Pressure Loss System _____ Pressure Loss Bit _____ % Pressure Loss _____
 Nozzle Vel _____ Jet Impact Force _____ MWP _____

PRESSURE PARAMETERS

Drilling Exposure _____ Flowline Temp _____
 Shale Density _____ Shale Factor _____
 Background Gas _____ Max. Formation Gas _____ Trip Gas _____
 Other Gas _____
 Fill _____ Tight Hole _____
 Cavings Est % _____ Average Size _____

ESTIMATED PORE AND FRACTURE PRESSURE

Kick Tolerance 0.46 sg Min. Estimated Fracture Pressure (Open Hole) 1.95 sg at shoe
 Estimated Pore Pressure 1.03 sg Min. Estimated Pore Pressure (Open Hole) 1.03 sg @ shoe
 Max. Estimated Pore Pressure (Open Hole) 1.03 sg @ TD Estimated Fracture Pressure at TD 2.049 sg

COMMENTS

R/dwn Log#2.
Run Log#3 C-SAT - misrun & r/dwn.
R/up & run Log#4 RFT-GR-TCC-AMS-PER. R/dwn Log#4.
R/up & run Log#5 C-SAT re-run.
R/up & run Log#6 CST.
R/dwn Schlumberger.



COMPANY BHP Petroleum WELL ERIC THE RED-1
DATE 28.01.93 TIME 24:00hrs
DEPTH 1875m LAST REPORT DEPTH 1875m
RIG OPERATIONS Plug & Abandon Well.
REPORT BY Matt Sale REPORT RECEIVED BY J.Dicksin/J.Boorman (OPTR)

DRILLING REPORT

Bit No. - Type - Size - in Jets -
On Bit: Distance - in Hours - hh:mm:sec ROP - WOB - RPM -
Pump Press - SPM - Torque - TBR - CP I:Q - CP B:Q -

HYDRAULICS REPORT

Mud Density In - SG Mud Density out - SG SCD - PV/TV -
Gels - Salinity - PPM Cl Solids -
Mole Volume - Annular Volume - Tubing Volume - Displaced Volume -
Carbide Log-Calculated Log - Flowrate -
DrillPipe Annular Vel (Max. Dia. Sec.) - DrillPipe Annular Vel (Open Hole) -
Drill Collar Annular Vel (Open Hole) - Critical Vel -
Pressure Loss System - Pressure Loss Bit - % Pressure Loss -
Nozzle Vel - Jet Impact Force - NHP -

PRESSURE PARAMETERS

Drilling Exponent - Flowline Temp -
Shale Density - Shale Factor -
Background Gas - Max. Formation Gas - Trip Gas -
Other Gas -
Fill - Tight Hole -
Cavings Est % - Average Size -

ESTIMATED PORE AND FRACTURE PRESSURE

Kick Tolerance - Min. Estimated Pressure Pressure (Open Hole) 1.03 sg at shoa
Estimated Pore Pressure 1.03 sg Min. Estimated Pore Pressure (Open Hole) 1.03 sg • shoa
Max. Estimated Pore Pressure (Open Hole) 1.03 sg • TD Estimated Fracture Pressure at TD 2.049 sg

COMMENTS

M/up mule shoe & RIH OEDP to 1100m.
Break circ.
Swap to Halco - test lines - pump cmt.
Slowly POOH to 800m.
Circ pipe clean.
RIH to tag cmt at 900m & POOH.
L/out mule shoe.

Appendix 3 Eastman Teleco End of Well Report (MWD)

BHP PETROLEUM
ERIC THE RED-1
VICTORIA - OTWAY BASIN
FEBRUARY-MARCH 1993

END OF WELL REPORT

EASTMAN TELECO

FIELD SERVICE ENGINEERS

A. FELL

P. PRINCE

PETROLEUM DIVISION

15 DEC 1993

DISCLAIMER

Eastman Teleco does not guarantee the accuracy or correctness of interpretation provided in or from this report. Since all interpretations are opinions based on measurements Teleco shall, under no circumstances, be responsible for consequential damages or any other loss, costs, damages or expenses incurred or expressed and implied warranties related to its service which is governed by Teleco's terms and conditions.

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Section 1

INTRODUCTION

1. INTRODUCTION

Eastman Teleco's Dual Propagation Resistivity Measurement While Drilling services were utilized onboard the BYFORD DOLPHIN for the drilling of BHP Petroleum's ERIC THE RED-1 well in the VIC/P31 Permit, offshore Victoria.

ERIC THE RED-1 was spudded on February 17th 1993 and Eastman Teleco's MWD services were utilized on the well from February 20th from a depth of 364m.

The 12 1/4" hole section was drilled from 364m to 1017m where wireline logs were run and the 9 5/8" casing was set.

The 8 1/2" hole section was drilled from 1017m to 1875m.

Eastman Teleco services were completed on February 26th, 1993. Eastman Teleco depths were measured in meters below the Drill Floor and were based on the drillers pipe tally.

Section 2

GENERAL WELL INFORMATION

2. GENERAL WELL INFORMATION

Oil Company	: BHP PETROLEUM
Oil Company Personnel	: G. Howard, J. Dickson
Well Name	: ERIC THE RED-1
Well Type	: EXPLORATION
Well Permit	: VIC/P31
Area	: OTWAY BASIN
D.F. Elevation	: 25.3m
Water Depth	: 75.0m
Spud Date	: 17th FEBRUARY 1993
Teleco Comencement Date	: 20th FEBRUARY 1993
Teleco Completion Date	: 26th FEBRUARY 1993
Completion Depth	: 1875 m
Drilling Contractor	: DOLPHIN DRILLING
Rig Name	: BYFORD DOLPHIN
Rig Type	: SEMI-SUBMERSIBLE
Teleco Services	: DPR
Teleco Job Number	: ETAU 234
Teleco Personnel	: A. Fell, P. Prince

Section 3

TOOL SUMMARY

3. MWD TOOL SUMMARY

Two tools were used over 3 runs to drill from 364m to 1875m.

<u>Run #</u>	<u>Tool Size</u>	<u>Serial No</u>	<u>Tool Type</u>	<u>DPR Hours</u>	<u>Drilled Interval</u>	<u>Failure Type</u>
1	8 1/4"	8439-01	DPR	23.00	364 - 1017	-
2	6 3/4"	1644-09	DPR	37.50	1017 - 1625	-
3	6 3/4"	1644-09	DPR	20.50	1625 - 1875	-

Interval Drilled: 364 - 1875m - 1511m
Interval Logged: Gamma Ray - 98 %
Resistivity - 98 %

Failure Statistics

Total DPR hours 81.0
DPR failures 0
Mean Time Between Failures N/A

Section 4

MWD RUN SUMMARIES

RUN SUMMARY

No.1

Hole Size: 12 1/4"
Tool Type & No: DPR TF4 B8439-01
Time & Date in the Hole: 11:30 hrs 20th February 1993
Time & Date out of Hole: 14:45 hrs 21st February 1993
Depth Range: 364m - 1017m
Circulating Hours for Run: 23.0
Operating Hours for Run: 23.0

Comments.

The Teleco tool was run in an assembly with a HTC ATM 11H bit. The assembly was locked up with a near bit roller reamer, shock sub, string roller reamer, x/o, MWD and a stabilizer located above the Teleco tool.

om 370m to 405m pump number #1 was "jacking off" in a most violent manor. The pump voltage was oscillating rapidly between 100 and 400 amps. This totally obscured the MWD pulse. The cause of the problem was attributed to polymer in the valve seats. Once this was cleared the pump noise disappeared and the MWD signal was able to be decoded.

Drilling parameters while drilling were: WOB 0 to 25 klbs, RPM 145 to 150, Flow rate 560 to 705 g/min giving a Pump Pressure of 1750 to 2060 Psi. Rate of penetration ranged from 30 to 200 m/hr.

The hole was drilled from 364m to 1017m with inclination building from 1.1 degrees at 396m to 1.3 degrees at 542m. It then dropped back to 0.4 degrees at 1001m. The azimuth turned from 309.1 degrees to 221.2 degrees.

RUN SUMMARY

No.2

Hole Size: 8 1/2"
Tool Type & No: DPR / DHE 1644-09
Time & Date in the Hole: 08:15 hrs 23rd February 1993
Time & Date out of Hole: 07:00 hrs 25th February 1993
Depth Range: 1017m - 1625m
Circulating Hours for Run: 37.5
Operating Hours for Run: 37.5

Comments.

The Teleco tool was run in an assembly with a HTC ATM 22 bit. The assembly was locked up with a near bit roller reamer, an integral blade stabiliser on the MWD and a string roller reamer located above the Teleco tool.

om 1150m the torque became erratic causing some loss of transmitted MWD data. The torque appeared to be emanating from the stabilisers as it appeared in the MWD valve off whilst rotating off bottom as well as when drilling. This was most evident when drilling through the sandstone formations. On pulling the bit it was discovered that the bit was 1 1/2" under-gauge, hence the source of the problem. Bit generated torque was also seen at formation boundaries, particularly when entering a sandstone formation.

Inclination rose slightly from 0.1 degrees at 1150m to 0.7 degrees at 1584m. The azimuth turned from 115.4 degrees to 290.2 degrees over the same interval.

Drilling parameters through the run were: WOB 10 to 30 klbs, RPM 110 to 115, pump flow of 430 to 470 gpm giving a pressure of 2000 to 2250 psi. Rate of penetration ranged from 6 to 100 m/hr.

RUN SUMMARY

No.3

Hole Size: 8 1/2"
Tool Type & No: DPR / DHE 1644-09
Time & Date in the Hole: 08:00 hrs 25th February 1993
Time & Date out of Hole: 13:30 hrs 26th February 1993
Depth Range: 1625m - 1875m
Circulating Hours for Run: 20.50
Operating Hours for Run: 20.50

Comments.

The Teleco tool was re-run in an assembly with a HTC ATM 22 bit. The assembly was locked up with a near bit roller reamer, an integral blade stabiliser on the MWD and a stabiliser located above the Teleco tool.

Drilling continued to a TD of 1875m with the tool performing to specifications throughout the run.

Inclination rose slightly from 0.4 degrees at 1728m to 1.1 degrees at 1867m. The azimuth turned from 203.0 degrees to 229.7 degrees over the same interval.

Drilling parameters through the run were: WOB 20 to 35 klbs, RPM 110 to 115, pump flow of 340 to 410 gpm giving a pressure of 2100 to 2300 psi. Rate of penetration ranged from 8 to 45 m/hr.

Section 5

MWD TOOL PERFORMANCE REPORT

PERFORMANCE REPORT NO.1

TOOL DHB 8439-01

Equipment Description: 8 1/4" DPR
Serial No. B8439-01 TF4 X4 Split Phase

Teleco Run No.: 1

Total Circulating Hours: 23.00

Non Operating Hours:

Resistivity: 0.0

Gamma Ray: 0.0

Directional: 0.0

Interval Drilled: 364m - 1017m

Operational Problems

No operational problems were seen with the tool performing to specifications throughout the run. Formation data loss above 395m was attributed to severe interference to the MWD tool caused by pump number 1 "jacking" off. The cause of this was a build up of polymer in the valve seats.

PERFORMANCE REPORT NO.2

TOOL DHE 1644-09

Equipment Description: 6 3/4" DPR
Serial No. E1644-09 TF4 X4 Split Phase
Teleco Run No.: 2 - 3
Total Circulating Hours: 58.00
Non Operating Hours:
Resistivity: 00.00
Gamma Ray: 00.00
Directional: 00.00
Interval Drilled: 1017m - 1875m

Operational Problems

No operational problems were seen with the tool performing to specifications throughout the run. Erratic torque during Run 2 resulted in some loss of RWD data.

Section 6

SENSOR VERIFICATION DATA

6.1 FORMATION EVALUATION SENSOR VERIFICATION DATA

<u>Teleco Run No:</u>	<u>Pre 1</u>	<u>Pre 2</u>	<u>Pre 3</u>
DPR Sub No:	8881	6133	6133
PDBV deg:	9.016	7.474	7.474
PDOV deg:	8.971	7.683	7.641
PDCV +/- deg:	-0.045	0.209	0.167
ATBV dB:	5.813	5.702	5.702
ATOV dB:	5.957	6.110	6.084
ATCV +/- dB:	0.144	0.408	0.167
STEEL m:	1.5	1.5	1.5
TCDV deg C:	20.6	14.8	31.3
GR Detector No:	413-8	393-2	393-2
Background cps:	3.3	4.5	4.1

2 VERIFICATION MNEMONICS

MNEMONIC

EXPLANATION

PDBV = Phase Difference - Shop air-hang calibration temperature corrected for rig verification temperature.
PDOV = Phase Difference - Wellsite air-hang verification.
PDCV = Phase Difference - Variance.
ATBV = Attenuation - Shop air-hang calibration temperature corrected for rig verification temperature.
ATOV = Attenuation - Wellsite air-hang verification.
ATCV = Attenuation - Variance.
STEEL = Distance to nearest steel during wellsite air-hang.
TCDV = Teleco Tool Temperature during air-hang verification.

Section 7

SENSOR OFFSETS

and

ENVIRONMENTAL CORRECTIONS

7.1 SENSOR TO BIT DISTANCE (M)

<u>Teleco Run No</u>	<u>1</u>	<u>2</u>	<u>3</u>
Resistivity	10.06	3.78	2.99
Gamma Ray	11.53	5.51	4.72
Directional	14.17	8.24	7.55

7.2 LOG ENVIRONMENTAL CORRECTIONS:

Gamma Ray: Normalised for Tool Size, Borehole Size, Sensor Type and mud Potassium

Resistivity: Normalised for Tool Size, Borehole Size, Mud Resistivity, Temperature. No correction has been applied for formation dielectric properties.

LOG CORRECTIONS

<u>Date</u>	<u>Time</u>	<u>Depth</u> <u>m</u>	<u>Chloride</u> <u>ppm</u>	<u>Resist.(Rm)</u> <u>ohm.m / deg C</u>	<u>KCL</u> <u>ppb</u>	<u>M.W.</u> <u>sg</u>
20-02-93	09:00	370	40000	0.0771 / 40	3.32	1.03
20-02-93	20:30	470	35000	0.0989 / 32	2.56	1.05
21-02-93	00:55	680	33000	0.1079 / 30	3.13	1.04
21-02-93	08:45	985	35000	0.0954 / 34	3.13	1.08
23-02-93	11:50	1017	38000	0.0832 / 38	3.13	1.08
23-02-93	20:47	1135	33000	0.1003 / 34	3.13	1.08
23-02-93	23:50	1202	37000	0.0865 / 37	3.00	1.08
24-02-93	07:50	1296	35000	0.0863 / 40	2.53	1.09
24-02-93	10:25	1337	40000	0.0784 / 39	3.32	1.09
24-02-93	14:53	1441	40000	0.0748 / 42	3.32	1.09
24-02-93	19:20	1519	44000	0.0670 / 44	3.41	1.09
25-02-93	12:35	1625	40000	0.0759 / 41	3.41	1.10
25-02-93	18:43	1707	40000	0.0704 / 46	3.41	1.10

Section 8

LOG MNEMONICS

8. TELECO FORMATION EVALUATION LOG INFORMATION

8.1 LOG MNEMONICS

GRAM = Natural Gamma Ray [RWD] (MWD-API)
GRAX = Natural Gamma Ray [MWD] (MWD-API)
TCDM = MWD Tool Temperature [RWD] (Deg C)
TCDX = MWD Tool Temperature [MWD] (Deg C)
RPCX = Resistivity Phase Difference, Corrected [MWD] (Ohmm)
RACX = Resistivity Amplitude Ratio, Corrected [MWD] (Ohmm)
RPCM = Resistivity Phase Difference, Corrected [RWD] (Ohmm)
RACM = Resistivity Amplitude Ratio, Corrected [RWD] (Ohmm)
RPDM = Resistivity Phase Difference, Dielectric Corrected [MWD]
RADM = Resistivity Amplitude Ratio, Dielectric Corrected [RWD].....
PDEM = Phase Difference, Elapsed Time Since Drilled [RWD] (Min)
PDDM = Phase Difference, Data Density Integrated.
WBCS = Surface Weight On Bit (1000 Lbs)
ROPS = Rate of Penetration (m/hr)
RPMS = Surface Revolutions Per Minute.

8.2 SUB ASSEMBLY MNEMONICS:

DPR = Dual Propagation Resistivity Sub
DIR = Directional MWD Collar

Section 9

MWD SURVEY LISTING

DIRECTIONAL SURVEYS

COMPANY BHP PETROLEUM
WELL ERIC THE RED-1
FIELD VIC/P31
COUNTY OTWAY BASIN
STATE VICTORIA
COUNTRY AUSTRALIA

WELL LOCATION : LATITUDE LONGITUDE
LAT : 39° 00' 45.44" SOUTH
LONG : 143° 10' 51.45" EAST

DRILLING COMPANY : DOLPHIN DRILLING RIG : BYFORD

PERMANENT DEPTH DATUM : M.S.L.T. ELEV. : 75M
SURVEYS MEAS. FROM : ROTARY TABLE, LOCATED 25.3M ABOVE PERM. DATUM.

SPUD DATE 17TH FEB 1993 PROP. AZIMUTH N.A.
MWD STARTED .. 20TH FEB 1993 TOTAL DEPTH 1875M
MWD ENDED 26TH FEB 1993 TELECO JOB ID .. ETRU 234

COORD. GRID SYSTEM :
GRID ORIGIN : GRID CORR. : 0
MAGNETIC DECL. CORR. : 11.01 GRID DECL. CORR. : 11.01

MINIMUM CURVATURE METHOD USED FOR SURVEY CALCULATIONS.
VERTICAL WELL : CLOSURE CALCULATED AT EACH SURVEY STATION.
INITIAL TIE-IN TO SERBED.

COMPANY PERSONNEL G. HOWARD
J. DICKSON
DIRECTIONAL COMPANY ... N.A.
DIRECTIONAL DRILLER ... N.A.
TELECO PERSONNEL A. FELL
P. PRINCE

REMARKS :

 **EASTMAN
TELECO**
A Baker Hughes company

TELECO DIRECTIONAL SURVEY LISTING

Company..... BHP PETROLEUM
 Well..... ERIC THE RED-1
 Survey Calc. Method..... Minimum Curvature
 Vert. Sect. Calc. Method..... Vertical well: Closure calculated at each survey station.
 Proposed Azimuth..... N.A.

Page 2 of 2
 Teleco Job ID.: ETRU 234
 Grid Correction: 0
 Mag. Decl. Corr.: 11.01
 Grid Decl. Corr.: 11.01

N. DPTH meters	CRS LEN meters	INCLINATION degrees	AZIMUTH degrees	T.V.D. meters	CLOSURE meters	NORTH/SOUTH meters	EAST/WEST meters	DEG/30m deg/30m
INITIAL TIE-IN COORDINATES								
75.0		0.000	0.000	75.00	0.00	0.00	0.00	
395.6	321.6	1.100	309.100	395.58	3.09	1.95	-2.40	0.103
542.0	445.4	1.300	273.300	541.95	5.90	2.92	-5.13	0.157
718.0	576.0	0.800	302.100	717.92	8.96	3.68	-8.16	0.121
891.0	733.0	0.400	210.000	890.91	10.22	3.81	-9.48	0.157
1001.0	810.0	0.400	221.200	1000.91	10.43	3.19	-9.99	0.021
1150.0	949.0	0.100	115.400	1149.91	10.52	2.74	-10.15	0.088
1292.0	1120.0	0.300	110.200	1291.91	10.03	2.56	-9.68	0.042
1439.0	1270.0	0.400	355.200	1438.91	9.82	2.94	-9.38	0.121
1584.0	1450.0	0.700	290.200	1583.90	10.91	3.75	-10.25	0.133
1728.0	1640.0	0.400	203.000	1727.90	11.83	3.99	-11.27	0.164
1867.0	1830.0	1.100	229.700	1866.88	12.68	2.28	-12.48	0.165
PROJECTED BOTTOM-HOLE LOCATION (Extrapolated from last two survey stations)								
1875.0	8.0	1.140	231.237	1874.88	12.79	2.18	-12.60	
CLOSURE AZIMUTH = 279.814								



Section 10

BOTTOM HOLE ASSEMBLY RECORDS

MWD Run #1

<u>ITEM</u>	<u>OD (ins.)</u>	<u>ID (ins.)</u>	<u>LENGTH (m)</u>	<u>REMARKS</u>
BIT	12 1/4	-	0.30	HTC ATM 11H
NB ROLLER REAMER	12 1/4	3	2.46	WITH FLOAT
SHOCK SUB	8	2 13/16	3.85	
STRING R/R	12 1/4	2 7/8	2.36	
X / O	8 1/4	2 3/4	0.50	TSI-23
TELECO MWD	8 3/4	-	12.38	B8439-01 DPR
STABILIZER	12 1/4	2 7/8	1.41	
DC	7 5/8	2 29/32	9.02	
DC	7 5/8	2 15/16	9.13	
DC	7 13/16	3	9.20	
DC	7 3/4	2 13/16	9.15	
DC	7 5/8	2 7/8	9.55	
DC	7 3/4	2 7/8	9.44	
DC	7 5/8	2 15/16	9.04	
DC	7 5/8	2 13/16	9.33	
DC	7 5/8	2 29/32	9.26	
PONY DC	7 13/16	2 13/16	2.74	
PARS	8 1/16	2 7/8	5.61	
J	7 15/16	2 7/8	9.20	
DC	7 7/8	2 13/16	9.22	
X/O	8 1/8	3 3/8	0.58	
1 X HWDP	5	3	8.84	
DART SUB	6 7/16	2 3/4	0.69	
15 X HWDP	5	3	125.12	
<hr/>				
TOTAL BHA			268.38	

BIT RUN #2 HTC ATM 11H, 12 1/4" 18,16,13 JETS.
DRILLED FROM 364m TO 1017m. BIT GRADED 2-2-EC-G-E-1-FC-TD

TELECO MWD DHB 8439-01 DPR TF4, DATA RATE X4SP
TURBINE FLOW RANGE 425 - 900 gpm. VALVE GAP 1.00".

MWD Run #2

<u>ITEM</u>	<u>OD (ins.)</u>	<u>ID (ins.)</u>	<u>LENGTH (m)</u>	<u>REMARKS</u>
BIT	8 1/2	-	0.24	HUGHES ATM22
JUNK SUB	6 1/2	2 3/16	1.03	
NB ROLLER REAMER	8 1/2	1 7/8	1.84	
X / O	6 3/4	2 13/16	0.35	6750-049
TELECO MWD	6 3/4	-	12.83	E1644-09 DPR
STAB	8 3/8	3	1.77	
DC	6 5/16	2 7/8	9.23	
DC	6 5/16	3	9.13	
DC	6 5/16	2 7/8	9.02	
DC	6 5/16	2 7/8	9.02	
DC	6 1/4	2 7/8	9.05	
DC	6 1/4	2 13/16	9.28	
DC	6 1/4	2 15/16	9.16	
DC	6 5/16	2 15/16	9.19	
DC	6 3/8	2 15/16	9.19	
DC	6 1/4	2 7/8	9.35	
DC	6 1/4	2 29/32	9.29	
DC	6 1/4	2 29/32	9.39	
DC	6 5/16	2 7/8	9.36	
DC	6 5/16	2 7/8	9.39	
J	6 1/4	2 7/8	9.02	
PONY DC	6 1/2	2 7/8	3.07	
JARS	6 3/8	2 5/16	5.40	
DC	6 1/4	2 13/16	9.28	
DC	6 1/2	2 29/32	9.07	
1 X HWDP	5	3	8.84	
DIDS	6 7/16	2 3/4	0.69	
14 X HWDP	5	3	125.12	
<hr/>				
TOTAL BHA			317.36	

BIT RUN #3 HUGHES ATM22 8 1/2" 1 X 14, 2 X 10 JETS.
DRILLED FROM 1017m TO 1625m. BIT GRADED 8-8-BT-A-F-24-WT-TQ

TELECO MWD DHE 1644-09 DPR TF4, DATA RATE X4SP
TURBINE FLOW RANGE 250 - 500 gpm. VALVE GAP 0.90".

MWD Run #3

<u>ITEM</u>	<u>OD (ins.)</u>	<u>ID (ins.)</u>	<u>LENGTH (m)</u>	<u>REMARKS</u>
BIT	8 1/2	-	0.24	HUGHES ATM22
NB ROLLER REAMER	8 1/2	1 7/8	1.84	
X / O	6 3/4	2 13/16	0.35	6750-049
TELECO MWD	6 3/4	-	12.83	E1644-09 DPR
STAB	8 3/8	3	1.77	
DC	6 5/16	2 7/8	9.23	
DC	6 5/16	3	9.13	
DC	6 5/16	2 7/8	9.02	
DC	6 5/16	2 7/8	9.02	
DC	6 1/4	2 7/8	9.05	
DC	6 1/4	2 13/16	9.28	
DC	6 1/4	2 15/16	9.16	
DC	6 5/16	2 15/16	9.19	
DC	6 3/8	2 15/16	9.19	
DC	6 1/4	2 7/8	9.35	
DC	6 1/4	2 29/32	9.29	
DC	6 1/4	2 29/32	9.39	
DC	6 5/16	2 7/8	9.36	
DC	6 5/16	2 7/8	9.39	
DC	6 1/4	2 7/8	9.02	
PONY DC	6 1/2	2 7/8	3.07	
JARS	6 3/8	2 5/16	5.40	
DC	6 1/4	2 13/16	9.28	
DC	6 1/2	2 29/32	9.07	
1 X HWDP	5	3	8.84	
DIDS	6 7/16	2 3/4	0.69	
14 X HWDP	5	3	125.12	
TOTAL BHA			316.57	

BIT RUN #4 HUGHES ATM22 8 1/2" 1 X 14, 2 X 10 JETS.
 DRILLED FROM 1625m TO 1875m. BIT GRADED 5-7-BT-H-E-1-WT-LOG

TELECO MWD DHE 1644-09 DPR TF4, DATA RATE X4SP
 TURBINE FLOW RANGE 250 - 500 gpm. VALVE GAP 0.90".

Section 11

DRILLING DIARY

DRILLING DIARY

<u>Date</u>	<u>Time</u>	<u>Operation</u>
20-02-93		<u>Teleco Run #1</u>
	09:30	Pick up 12 1/4" BHA, RIH.
	12:45	Tag firm cmt @ 319m & hard cmt @ 320m. Drill cmt float @ 331m, cmt & shoe @ 355m.
	14:45	Pump 100 bbl Guar Gum, 100 bbl sea-water & displace hole with mud.
	15:15	Ream rathole from 355m to 364m.
	15:15	Drill 12 1/4" hole from 364m to 367m.
	16:00	Circ hole clean.
	17:00	Rack back std, Rig up & run LOT. Press test lines & perform LOT @ 355m with 100 psi = 1.24 EMW.
	17:45	Drill 12 1/4" hole from 367m to 625m.
21-02-93	00:00	Drill 12 1/4" hole from 625m to 1017m. Ream conns
	10:00	Circ hole until clean @ shaker. Work pipe.
	12:15	Pump slug & POOH.
	14:15	Dump memory on MWD & service same.
	14:45	Rig up Schlumberger.
	15:15	Run Log #1 - DLT, MSFL, Sonic, Gamma, AMS.
	18:30	Rig down Log #1.
	19:00	Rig up Log #2.
	19:15	Run Log #2. Sea Sat, TCC, AH64, PEH.
22-02-93	00:00	Cont run Log #2. Rig up Log #3. 6 misfires, 3 lost & 21 back.
	08:00	W.O Loggers.
	09:00	Rig down schlumberger.
	10:00	RIH & retrieve wear bushing. POOH. Lay out same.
	10:30	Make up cement head on stand of HWDP & rack back.
	11:15	Rig up to run 9 5/8" csg.
	12:00	Run 9 5/8" csg.
	17:00	Rig up & circ csg down last 6m to landout.
	17:30	Circ hole @ 400gpm.
	18:15	Swap to Halco & press test lines.
	18:30	Drop Bally pump 5 bbl to shear btm plug. Cmt csg.
	19:30	Set seal assembly.
	19:45	Pump 3 bbl. Close middle pipe rams. Test seal assembly against rams.
	20:15	Test BOP upper pipe rams, all other rams.
23-02-93	00:00	Cont test BOP's, annulus.
	02:00	Pick up 60 000 overpull & shear out of hanger. POOH Service tool, lay out.
	02:45	Test csg & shear rams.
	03:15	RIH & set wear bushing, POOH lay out R/tool.
	03:45	Service break cmt head & lay out same. Rig down bails.
	04:15	Pick up 12 1/4" BHA and lay out same.
		<u>Teleco Run #2</u>
	06:30	Pick up 8 1/2" BHA & RIH.
	08:00	Dump memory in MWD & run surface test.
	08:30	Pick up 18 6 1/2" DC's & jars & cont RIH.
	11:30	Tag firm cmt @ 968m. Make up TD's & wash to float.

DRILLING DIARY

<u>Date</u>	<u>Time</u>	<u>Operation</u>
23-02-93	11:45	Tag float @ 983m, drill through same.
	12:00	Drill cmt & shoe track - clean out rat hole 7 surge for junk on btm.
	15:00	Drill 8 1/2" hole from 1017m to 1020m.
	15:15	Circulate.
	15:30	Pull into shoe & perform LOT. (16.2 ppg) EMW.
	16:45	Drill 8 1/2" hole from 1020m to 1206m.
24-02-93	00:00	Drill 8 1/2" hole from 1206m to 1238m.
	03:00	Flow check hole. Put in crease - hole static.
	03:15	Drill 8 1/2" hole from 1238m to 1593m.
25-02-93	00:00	Drill 8 1/2" hole from 1593m to 1625m.
	03:00	Pump slug & POOH. Tight from 1518m to 1430m, 1390m to 1370m, 30-40 000 lb overpull, 1170m - 1160m, 40 000 lb overpull, 1160m - 1110m, 90 000 lb overpull, 1110m to 1080m, 40 000 lb overpull, 1180m - 1150m, 80 000 lb overpull.
	07:30	Dump MWD memory & run surface test.
		<u>Teleco Run #3</u>
	08:00	Break out bit #4, make up bit #5 & RIH.
	09:15	Service TDS.
	09:45	Continue RIH.
	11:00	Fill pipe & ream from 1567m to 1595m.
	11:30	Repair leak in water cooling line on TDS.
	12:00	Wash and ream from 1596m to 1625m.
	12:45	Drill 8 1/2" hole from 1625m to 1771m.
26-02-93	00:00	Drill 8 1/2" hole from 1771m to TD of 1825m.
	06:00	Pump slug & POOH. 20 std wiper trip, RIH hole good. Intermittant tight hole from 1816m to 1352m. Max overpull 120 000 lb @ 1643m. Rest of tight hole 60 000 il max.
	07:30	Circ hole till shakers clean.
	10:15	Pump slug & POOH. Hole good.
	13:15	Dump MWD memory.
	13:45	Rig up Schlumberger.

SECTION 12

MUD RECORD

MUD REPORTS

TELECO RUN #	1	1	2	2	3
HOLE SIZE ins	12.25	12.25	8.50	8.50	8.50
DATE	20-02	21-02	23-01	24-01	25-02
TIME	24:00	11:00	23:30	17:00	24:00
DEPTH m	633	1017	1200	1470	1781
WEIGHT sg	1.08	1.10	1.08	1.08	1.09
VISCOSITY sec	58	53	48	58	52
PV cp	18	15	14	18	16
YP lb/100 sq ft	22	22	20	24	22
GELS 10s/10min	5/6	3/4	3/4	4/5	4/5
FILTRATE cc/30 min	14	6	7.0	6.0	5.2
HPHT FILTRATE cc/30 min	-	-	-	-	-
CAKE 32nd	1.0	1.0	1.0	1.0	1.0
SOLIDS % by vol	5.0	5.0	5.0	5.0	5.60
WATER CONTENT % by volume	95.0	93.85	95.0	95.0	94.40
SAND % by vol	0.75	1.75	0.50	0.20	Tr
PH	9.5	9.3	10.2	9.0	9.3
CHLORIDES Kppm	33	38	37	42	39
CALCIUM mg/l	240	400	110	190	120
POTASSIUM Kmg/l % WT KCl	33.9 6.50	33.3 6.40	31.6 6.00	36.0 7.00	38.4 7.30

Appendix 4 Micropalaeontology: Basic Data and Range Charts

PETROLEUM DIVISION

15 DEC 1993

**MICROPALAEONTOLOGICAL ANALYSIS
ERIC THE RED-1, PERMIT VIC-P-31
OTWAY BASIN**

**FOR
BHP PETROLEUM PTY LTD**

**J.P. REXILIUS
SEPTEMBER, 1993**

**INTERNATIONAL STRATIGRAPHIC CONSULTANTS PTY LTD
A.C.N. 009 183 555**

**UNIT 2, 10 STATION STREET
P.O. BOX 26
COTTESLOE 6011
WESTERN AUSTRALIA
PHONE 3852571 FAX 3843257**

CONTENTS

I. SUMMARY

APPENDIX NO. 1

Summary of micropalaeontological data, Eric The Red-1.

I. SUMMARY

Eric The Red-1 was drilled in offshore petroleum permit Vic-P-31, Otway Basin to a depth of 1875mKB. A total of 3 sidewall core samples from the Tertiary section have been examined for foraminifera and calcareous nannoplankton. All 3 samples are clean sandstones which are barren of foraminifera and nannoplankton.

APPENDIX NO. 1 : SUMMARY OF MICROPALAEONTOLOGICAL DATA, ERIC THE RED-1

DEPTH (mKB)	FORAM YIELD	FORAM PRESERV.	FORAM DIVERSITY	NANNO YIELD	NANNO PRESERV.	NANNO DIVERSITY
SWC30, 373.5	barren	-	-	barren	-	-
SWC28, 388	barren	-	-	barren	-	-
SWC24, 467	barren	-	-	barren	-	-

Appendix 5 Palynology: Basic Data and Range Charts

PETROLEUM DIVISION

15 DEC 1993

ERIC THE RED #1

MORGAN PALAEO ASSOCIATES: Palynological Consultants
Box 161, Maitland, South Australia, 5573.
phone (088) 32 2795 .. fax (088) 32 2798

C L I E N T: BHP Petroleum Exploration

W E L L: Eric the Red

F I E L D / A R E A: Otway Basin

A N A L Y S T: Roger Morgan

D A T E : March '93

N O T E S: all sample depths are in metres

RW = reworked * = caved CF = comparable to

? = questionable identification X = present outside count

figures are percentages based on 100 specimen count

RANGE CHART OF OCCURRENCES BY LOWEST APPEARANCE - by group -

BOTRYOCOCCUS
FUNGAL SETAE

2267

2268

0373.5 SWC	.	.	0373.5 SWC
0388.0 SWC	4	.	0388.0 SWC
0429.0 SWC	.	.	0429.0 SWC
0467.0 SWC	3	.	0467.0 SWC
0553.5 SWC	6	.	0553.5 SWC
0562.0 SWC	.	.	0562.0 SWC
0569.0 SWC	.	.	0569.0 SWC
0599.0 SWC	.	.	0599.0 SWC
0612.5 SWC	X	.	0612.5 SWC
0642.0 SWC	.	.	0642.0 SWC
0664.5 SWC	1	.	0664.5 SWC
0689.5 SWC	.	.	0689.5 SWC
0720.5 SWC	1	.	0720.5 SWC
0746.0 SWC	.	.	0746.0 SWC
0812.5 SWC	1	.	0812.5 SWC
0876.0 SWC	.	.	0876.0 SWC
0893.5 SWC	1	.	0893.5 SWC
0970.0 SWC	.	.	0970.0 SWC
1010.0 SWC	3	.	1010.0 SWC
1025 CUTTS	5	.	1025 CUTTS
1080 CUTTS	.	.	1080 CUTTS
1097.0 SWC	.	.	1097.0 SWC
1151.0 SWC	52	.	1151.0 SWC
1177.0 SWC	.	.	1177.0 SWC
1180 CUTTS	1	P	1180 CUTTS
1219.5 SWC	16	.	1219.5 SWC
1250.5 SWC	.	.	1250.5 SWC
1275.0 SWC	.	.	1275.0 SWC
1306 CUTTS	4	.	1306 CUTTS
1316.0 SWC	.	.	1316.0 SWC
1328.5 SWC	.	.	1328.5 SWC
1334.0 SWC	5	.	1334.0 SWC
1336.0 SWC	.	.	1336.0 SWC
1364.5 SWC	3	.	1364.5 SWC
1437.0 SWC	X	.	1437.0 SWC
1452 CUTTS	7	.	1452 CUTTS
1515 CUTTS	2	.	1515 CUTTS
1575.0 SWC	3	.	1575.0 SWC
1602.0 SWC	.	.	1602.0 SWC
1630.0 SWC	10	.	1630.0 SWC
1667.0 SWC	.	.	1667.0 SWC
1678.0 SWC	.	.	1678.0 SWC
1703 CUTTS	.	.	1703 CUTTS
1719.0 SWC	X	.	1719.0 SWC
1749.5 SWC	X	.	1749.5 SWC
1754.5 SWC	X	.	1754.5 SWC
1790.0 SWC	.	.	1790.0 SWC
1813.5 SWC	.	.	1813.5 SWC

0373.5 SWC
0388.0 SWC
0429.0 SWC
0467.0 SWC
0553.5 SWC
0562.0 SWC
0569.0 SWC
0599.0 SWC
0612.5 SWC
0642.0 SWC
0664.5 SWC
0689.5 SWC
0720.5 SWC
0746.0 SWC
0812.5 SWC
0876.0 SWC
0893.5 SWC
0970.0 SWC
1010.0 SWC
1025 CUTTS
1080 CUTTS
1097.0 SWC
1151.0 SWC
1177.0 SWC
1180 CUTTS
1219.5 SWC
1250.5 SWC
1275.0 SWC
1306 CUTTS
1316.0 SWC
1328.5 SWC
1334.0 SWC
1335.0 SWC
1364.5 SWC
1437.0 SWC
1452 CUTTS
1515 CUTTS
1575.0 SWC
1602.0 SWC
1630.0 SWC
1667.0 SWC
1678.0 SWC
1703 CUTTS
1719.0 SWC
1749.5 SWC
1754.5 SWC
1790.0 SWC
1813.5 SWC

39 ISABELIDINIUM RECTANGULARIS
40 TRITHYROIDINIUM MARSHALLII
41 ISABELIDINIUM BALHET
42 ISABELIDINIUM BELFASTENSE ROTUNDATA
43 ISABELIDINIUM SP
44 ISABELIDINIUM CRETACEA
45 CANNINGIA FOVEOLATA
46 HYSTRICODINIUM PULCHRUM
47 ISABELIDINIUM LATUM
48 MADURADINIUM PENTAGONUM
49 ODONTOCHITINA COSTATA
50 ODONTOCHITINA CRIBROFOIDA
51 TRITHYROIDINIUM PUNCTATE
52 TRITHYROIDINIUM SUSPECTUM
53 TRITHYROIDINIUM THICK PSILATE
54 TRITHYROIDINIUM THICK RETICULATUS
55 AMPHIDIADEMA DENTICULATA
56 CHATANGIELLA VICTORIENSIS
57 ODONTOCHITINA PORIFERA
58 PTEROSPERNELLA SP
59 HETEROSPHAERIDIUM LATEROBRACHIUS
60 NELSONIELLA ACERAS
61 ODONTOCHITINA STUBBY
62 SPINIDIINIUM SP
63 AREOSPHAERIDIUM SP
64 AREOSPHAERIDIUM SUGGESTIUM
65 CANNINGIA RETICULATA CF
66 NELSONIELLA SEMIRETICULATA
67 NELSONIELLA TUBERCULATA
68 TRICHODINIUM
69 HENIKOOD AUSTRALIS
70 EXOCHOSPHAERIDIUM SP
71 OLIGOSPHAERIDIUM SP
72 CANNINGINOPSIS BRETONENSIS
73 ISABELIDINIUM KOROJONENSE
74 ISABELIDINIUM PELLUCIDUM
75 AREOLIGERA SENONENSIS
76 AREOLIGERA CORONATA

SPECIES LOCATION INDEX

Index numbers are the columns in which species appear.

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125	AEQUITRIRADITES SPINULOSUS	120	DILWYNITES GRANULATUS
126	AEQUITRIRADITES TILCHAENESIS	238	DILWYNITES TUBERCULATUS
196	AEQUITRIRADITES VERRUCOSUS	261	DIPORITES SP.
166	AMOSOPOLLIS CRUCIFORMIS	81	DYPHES COLLIFERUM
5	AMPHIDIADEMA DENTICULATA	199	ERICIPITES SCABRATUS
83	ANACOLOSIDITES ACUTULLUS	17	EXOCHOSPHAERIDIUM PHRAGMITES
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169	APPENDICISPORITES DISTOCARINATUS	101	FALCISPORITES GRANDIS
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76	ARAUCARIACITES FISSUS	103	FORAMINISPORIS DAILYI
75	AREOLIGERA CORONATA	139	FORAMINISPORIS WONTHAGGIENSIS
84	AREOLIGERA SENONENSIS	149	FOVEOGLEICHENIIDITES
85	AREOSPHERIDIUM ARCUATUM	131	FOVEOTRILETES PARVIRETUS
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64	AREOSPHERIDIUM SP	200	GAMBIERINA RUDATA
33	AREOSPHERIDIUM SUGGESTIUM	219	GEPHRAPOLLENITES WAHOENSIS
173	ASCODINIUM PARVUM	104	GLEICHENIIDITES
192	AUSTRALOPOLLIS OBSCURIS	239	HALORAGACIDITES HARRISII
145	BACULATISPORITES	227	HERKOSPORITES ELLIOTTII
145	BALMEISPORITES HOLODICTYUS	37	HETEROSPHAERIDIUM CONJUNCTUM
151	BALMEISPORITES TRIDICTYUS	11	HETEROSPHAERIDIUM HETEROCANTHUM
257	BEAUPREADITES VERRUCOSUS	59	HETEROSPHAERIDIUM LATEROBRACHIUS
146	BIRETRISPORITES	38	HETEROSPHAERIDIUM SOLIDA
267	BOTRYOCOCCUS	46	HYSTRICHODINIUM PULCHRUM
197	CADARGASPORITES BACULATUS	87	HYSTRICHOSPHAERIDIUM TUBIFERUM
180	CALAMOSPORA SP	175	INTERULOBITES INTRAVERRUCATUS
25	CALLAOISPHAERIDIUM ASYMMETRICUM	240	INTRATRIPOROPOLLENITES NOTABILIS
108	CALLIALASPORITES DAMPIERI	41	ISABELIDINIUM BALMEI
96	CALLIALASPORITES TURBATUS	34	ISABELIDINIUM BELFASTENSE
258	CAMEROZONOSPORITES LATROBENSIS	42	ISABELIDINIUM BELFASTENSE ROTUNDATA
190	CAMEROZONOSPORITES OHAISIENSIS	29	ISABELIDINIUM COOKSONIAE
170	CAMEROZONOSPORITES ROBUSTA	44	ISABELIDINIUM CRETACEA
226	CAMEROZONOSPORITES SP	73	ISABELIDINIUM KOROJONENSE
45	CANNINGIA FOVEOLATA	47	ISABELIDINIUM LATUM
65	CANNINGIA RETICULATA CF	74	ISABELIDINIUM PELLUCIDUM
14	CANNINGIA SPINOSA	39	ISABELIDINIUM RECTANGULARIS
72	CANNINGINOPSIS BRETONENSIS	43	ISABELIDINIUM SP
77	CERATIOPSIS SPECIOSUS	132	ISCHYOSPORITES PUNCTATUS
7	CERATOSPORITES EQUALIS	193	ISCHYOSPORITES SP
56	CEREBROCYSTA SP	155	JANUASPORITES SPINULOSUS
15	CHATANGIELLA VICTORIENSIS	12	KIOKANSIUM POLYPES
181	CHLAMYDOPHORELLA NYEI	140	KLUKISPORITES SCABERIS
127	CIBOTIUMSPORA JURIENSIS	262	KUYLISPORITES WATERBOLKII
147	CICATRICOSISPORITES AUSTRALIENSIS	176	KUYLISPORITES ZIPPERI
159	CICATRICOSISPORITES FOVEOAUSTRALIENSIS	177	LAEVIGATOSPORITES OVATUS
114	CICATRICOSISPORITES HUGHESI	6	LEIOSPHAERIDIA
174	CICATRICOSISPORITES LUDBROOKIAE	110	LEPTOLEPIDITES MAJOR
171	CICATRICOSISPORITES RADIATUS	121	LEPTOLEPIDITES VERRUCATUS
160	CICATRICOSPORITES WRINKLY AUSTRALIENSIS	172	LILIACIDITES KAITANGATAENSIS
26	CINGUTRILETES CLAVUS	201	LILIACIDITES PERORETICULATUS
27	CIRCULODINIUM DEFLANDREI	178	LYCOPIACIDITES ASPERATUS
167	CIRCULODINIUM HIRTELLUM	220	LYGISTIPOLLENITES BALMEI
8	CLAVIFERA TRIPLEX	179	LYGISTIPOLLENITES FLORINII
148	CLEISTOSPHAERIDIUM SPP	48	MADURADINIUM PENTAGONUM
109	CONCAVISSIMISPORITES PENOLAENSIS	259	MALVACIPOLLIS LARGE
161	CONTIGNISPORITES COOKSONIAE	241	MALVACIPOLLIS SUBTILIS
161	CONTIGNISPORITES GLEBULENTUS	79	MANUMIELLA CORONATA
194	COPTOSPORA PARADOXA	1	MICRHYSTRIDIUM
162	COPTOSPORA PILEOSA	105	MICROCACHRYDITES ANTARCTICUS
163	COPTOSPORA WRINKLY	13	MICROFASTA EVANSII
80	CORDOSPHAERIDIUM INODES	88	MILLIOUDIDIUM TENUITABULATUS
78	CORDOSPHAERIDIUM SP	202	MUROSPORA FLORIDA
98	COROLLINA TOROSUS	252	MYRTACEIDITES PARVUS
164	CORONATISPOA PERFORATA	60	NELSONIELLA ACERAS
115	COUPERISPORITES TABULATUS	66	NELSONIELLA SEMIRETICULATA
4	CRIBROPERIDINIUM EDWARDSII	67	NELSONIELLA TUBERCULATA
16	CRIBROPERIDINIUM sp	212	NEORAISTRICKIA
152	CRYBELOSPORITES MAGNIFICA	133	NEVESISPORITES VALLATUS
153	CRYBELOSPORITES MEGASTRIATUS	228	NOTHOFAGIDITES BRACHYSPINULOSUS
116	CRYBELOSPORITES STRIATUS	253	NOTHOFAGIDITES DEMINUTUS
186	CYATHEACIDITES TECTIFERA	242	NOTHOFAGIDITES EMARCIDUS
99	CYATHIDITES AUSTRALIS	208	NOTHOFAGIDITES ENDURUS
100	CYATHIDITES MINOR	263	NOTHOFAGIDITES FALCATA
237	CYATHIDITES SPP	243	NOTHOFAGIDITES FLEMINGII
128	CYCADOPITES FOLLICULARIS	206	NOTHOFAGIDITES SENECTUS
86	CYCLONEPHELIUM COMPACTUM	30	NUMMUS MONOCULATUS
91	CYCLOSPORITES HUGHESI	19	NUMMUS SP
154	DEFLANDREA PHOSPHORITICA	49	ODONTOCHITINA COSTATA
91	DEFLANDREA TRUNCATA	50	ODONTOCHITINA CRIBROPODA
118	DENSOISPORITES VELATUS	31	ODONTOCHITINA OPERCULATA
118	DICTYOPHYLLIDITES	57	ODONTOCHITINA PORIFERA
119	DICTYOTOSPORITES COMPLEX	61	ODONTOCHITINA STUBBY
129	DICTYOTOSPORITES SPECIOSUS	5	OLIGOSPHAERIDIUM COMPLEX
120	DILWYNITES GRANULATUS	20	OLIGOSPHAERIDIUM PULCHERRIMUM
238	DILWYNITES TUBERCULATUS	71	OLIGOSPHAERIDIUM SP
261	DIPORITES SP.	92	OPERCULODINIUM
		82	OPERCULODINIUM CENTROCARPUM
		187	ORNAMENTIFERA SENTOSA
		106	OSMUNDACIDITES WELLMANII
		35	PARALECANIELLA
		134	PERINOPOLLENITES ELATOIDES
		244	PERIPOROPOLLENITES DEMARCATUS
		221	PERIPOROPOLLENITES POLYORATUS

0373.5	SWC	229	PILOSISPORITES GRANDIS
0388.0	SWC	230	PROTEACIDITES GRANDIS
0429.0	SWC	231	PROTEACIDITES ORNATUS
0467.0	SWC	232	PROTEACIDITES OTHAVENSIS
0553.5	SWC	233	PROTEACIDITES RETICULOCORNAUS
0562.0	SWC	234	TRIPOROPOLLENITES AMBIGUUS
0569.0	SWC	235	TRIPUNCTISPORIS PUNCTATUS
0599.0	SWC	236	ANACOLOSIDITES ACUTULLUS
0612.5	SWC	237	CYATHIDITES SPP
0642.0	SWC	238	DILHYNITES TUBERCULATUS
0664.5	SWC	239	HALORAGACIDITES HARRISII
0689.5	SWC	240	INTRATRIPOROPOLLENITES NOTABILIS
0720.5	SWC	241	HALUACIPOLLIS SUBTILIS
0746.0	SWC	242	NOTHOFAGIDITES EMARCIUS
0812.5	SWC	243	NOTHOFAGIDITES FLEMINGII
0876.0	SWC	244	PERIPOROPOLLENITES DEMARCATUS
0893.5	SWC	245	PROTEACIDITES ASPEROPOLUS
0970.0	SWC	246	PROTEACIDITES OBESOLABRUS
1010.0	SWC	247	PROTEACIDITES PACHYFOLUS
1025	CUTTS	248	PROTEACIDITES SCABORATUS
1080	CUTTS	249	PROTEACIDITES TUBERCULIFORMIS
1097.0	SWC	250	TRICOLPORITES ESTOUTUS
1151.0	SWC	251	VERRUCOSISPORITES KOPUKUENSIS
1177.0	SWC	252	MYRTACEIDITES PARVUS
1180	CUTTS	253	NOTHOFAGIDITES DEMINUTUS
1219.5	SWC	254	POLYCOLPITES ESOLALTEUS
1250.5	SWC	255	PROTEACIDITES ANNULARIS
1275.0	SWC	256	PROTEACIDITES LEIGHTONII
1306	CUTTS	257	BEAUPREADITES VERRUCOSUS
1316.0	SWC	258	CAMEROZONOSPORITES LATROBENSIS
1328.5	SWC	259	HALUACIPOLLIS LARGE
1334.0	SWC	260	TRIORITES MAGNIFICUS
1336.0	SWC	261	DIPORITES SP.
1364.5	SWC	262	KUYLISPORITES WATERBOLKII
1437.0	SWC	263	NOTHOFAGIDITES FALCATA
1452	CUTTS	264	PROTEACIDITES HAPUKUI
1515	CUTTS	265	PROTEACIDITES KOPIENSIS
1575.0	SWC	266	SANTALUNITIDES CAINOZOICUS
1602.0	SWC		
1630.0	SWC		
1667.0	SWC		
1678.0	SWC		
1703	CUTTS		
1719.0	SWC		
1749.5	SWC		
1754.5	SWC		
1790.0	SWC		
1813.5	SWC		

71 OBLICQUATIPORITES
 92 OPERCULODINIUM
 82 OPERCULODINIUM CENTROCARPUM
 187 ORNAMENTIFERA SENTOSA
 106 OSMUNDACIDITES WELLMANII
 35 PARALECANIELLA
 134 PERINOPOLLENITES ELATOIDES
 244 PERIPOROPOLLENITES DEMARCATUS
 221 PERIPOROPOLLENITES POLYORATUS
 156 PEROTRILETES JUBATUS/MORGANII
 210 PEROTRILETES LINEARIS
 198 PEROTRILETES MAJUS
 182 PEROTRILETES SP
 189 PHIMOPOLLENITES PANNOSUS
 93 PHTHANOPERIDINIUM COMATUM
 141 PHYLLOCLADIDITES EUNUCHUS
 142 PHYLLOCLADIDITES MAWSONII
 211 PHYLLOCLADIDITES VERRUCATUS
 229 PILOSISPORITES GRANDIS
 143 PILOSISPORITES NOTENSIS
 111 PODOSPORITES MICROSACCATUS
 135 POLYCYINGULATISPORITES CREMULATUS
 144 POLYCYINGULATISPORITES MOONIENSIS
 254 POLYCOLPITES ESOBALTEUS
 203 POLYPOROPOLLENITES POLYORATUS
 168 PROTEACIDITES
 255 PROTEACIDITES ANNULARIS
 245 PROTEACIDITES ASPEROPOLUS
 230 PROTEACIDITES GRANDIS
 264 PROTEACIDITES HAPUKUI
 265 PROTEACIDITES KOPIENSIS
 256 PROTEACIDITES LEIGHTONII
 246 PROTEACIDITES OBESOLABRUS
 231 PROTEACIDITES ORNATUS
 232 PROTEACIDITES OTWAYENSIS
 247 PROTEACIDITES PACHYPOLUS
 209 PROTEACIDITES PALISADUS
 233 PROTEACIDITES RETICULOCONCAVUS
 248 PROTEACIDITES SCABORATUS
 249 PROTEACIDITES TUBERCULIFORMIS
 195 PROTEACIDITES: large
 21 PTEROSPERMELLA AUREOLATA
 22 PTEROSPERMELLA AUSTRALIENSIS
 58 PTEROSPERMELLA SP
 107 RETITRILETES AUSTRICLAVATIDITES
 136 RETITRILETES CIRCOLUMENUS
 165 RETITRILETES FACETUS
 122 RETITRILETES NODOSUS
 213 REWORKING - JURASSIC
 123 REWORKING - PERMIAN
 124 REWORKING - TRIASSIC
 266 SANTALUMIDITES CAINOZOICUS
 9 SCHIZOSPORIS PSILATA
 2 SCHIZOSPORIS RETICULATUS
 185 SENECTOTETRADITES VARIETICULATUS
 62 SPINIDIUM SP
 23 SPINIFERITES FURCATUS/RAMOSUS
 112 STERIESPORITES ANTIQUASPORITES
 222 STERIESPORITES REGIUM
 32 SUBTILISPHAERA TRENDALLII
 94 SYSTEMATOPHORA PLACACANTHA
 223 TETRACOLPORITES RETICULATUS
 214 TETRACOLPORITES VERRUCOSUS
 68 TRICHODINIUM
 207 TRICOLPITES CONFESSUS
 224 TRICOLPITES DETTMANNIAE
 191 TRICOLPITES GILLII
 215 TRICOLPITES LONGUS
 204 TRICOLPITES SABULOSUS
 188 TRICOLPITES SP
 205 TRICOLPITES VARIVERRUCATUS
 225 TRICOLPITES WAIPAWAENSIS
 216 TRICOLPORITES APOXYEXINUS
 250 TRICOLPORITES ESTOUTUS
 217 TRICOLPORITES LILLIEI
 183 TRILOBOSPORITES TRIBOTRYS
 150 TRILOBOSPORITES TRIORETICULOSUS
 260 TRIORITES MAGNIFICUS
 137 TRIPOROLETES RADIATUS
 157 TRIPOROLETES RETICULATUS
 158 TRIPOROLETES SIMPLEX
 234 TRIPOROPOLLENITES AMBIGUUS
 218 TRIPOROPOLLENITES SECTILIS
 235 TRIPUNCTISPORIS PUNCTATUS
 10 TRITHYRODINIUM FINE GRANULES
 40 TRITHYRODINIUM MARSHALLII
 51 TRITHYRODINIUM PUNCTATE
 52 TRITHYRODINIUM SUSPECTUM
 53 TRITHYRODINIUM THICK PSILATE
 54 TRITHYRODINIUM THICK RETICULATUS
 251 VERRUCOSISPORITES KOPUKUENSIS
 3 VERYHACHIUM
 184 VITREISPORITES PALLIDUS
 89 VOZZHENNIKOVIA EXTENSA
 69 XENIKOON AUSTRALIS

ERIC THE RED #1

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C L I E N T: BHP Petroleum Exploration

W E L L: Eric the Red

F I E L D / A R E A: Otway Basin

A N A L Y S T: Roger Morgan

D A T E : March '93

N O T E S: all sample depths are in metres

RW = reworked * = caved CF = comparable to

? = questionable identification X = present outside count

figures are percentages based on 100 specimen count

RANGE CHART OF OCCURRENCES BY LOWEST APPEARANCE (by groups)

	259	260	261	262	263	264	265	266	267	268	269	270
	BOTRYOCOCCUS	SCHIZOSPORIS RETICULATUS	LEIOSPHAERIDIA	SCHIZOSPORIS PSILATA	MICROFASTA EVANSII	MUMMUS SP	MUMMUS MONOCULATUS	PARALECANIELLA	FUNGAL SETAE	REWORKING - PERMIAN	REWORKING - TRIASSIC	REWORKING - JURASSIC
0373.5 SWC	.	.	.	.	.	.	.	.	.	.	.	.
0388.0 SWC	4	.	.	.	.	.	.	.	.	.	.	.
0429.0 SWC	.	.	.	.	.	.	.	.	.	.	.	.
0467.0 SWC	3	.	.	.	.	.	.	.	.	.	.	.
0553.5 SWC	6	.	.	.	.	.	.	.	.	.	.	.
0562.0 SWC	.	.	.	.	.	.	.	.	.	.	.	.
0569.0 SWC	.	.	.	.	.	.	6	.	.	.	.	.
0599.0 SWC	.	.	.	.	.	.	.	4	.	.	.	.
0612.5 SWC	X	.	.	.	.	.	.	.	.	.	.	.
0642.0 SWC	.	.	.	.	.	.	.	.	.	.	.	.
0664.5 SWC	1	.	.	.	.	.	.	.	.	1	.	.
0689.5 SWC	.	.	.	.	.	.	.	.	.	X	.	.
0720.5 SWC	1	X	.	.	.	.	.	.	.	X	.	.
0746.0 SWC	.	.	.	.	.	.	.	.	.	.	X	.
0812.5 SWC	1	.	.	.	.	.	.	.	.	1	.	.
0876.0 SWC	.	.	.	.	.	.	.	.	.	X	.	.
0893.5 SWC	1	.	.	.	.	.	X	.	.	1	.	.
0970.0 SWC	.	.	.	.	.	.	.	.	.	X	.	.
1010.0 SWC	3	.	.	.	.	.	.	.	.	X	.	.
1025 CUTTS	5	.	.	.	.	.	.	.	.	.	.	.
1080 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.
1097.0 SWC	.	.	.	.	.	.	.	.	.	X	.	.
1151.0 SWC	52	.	.	.	.	.	.	.	.	.	.	.
1177.0 SWC	.	.	.	.	.	.	.	.	.	.	.	.
1180 CUTTS	1	.	.	.	.	.	.	.	.	.	.	.
1219.5 SWC	16	.	.	.	.	.	.	.	.	.	.	.
1250.5 SWC	.	.	.	.	.	.	.	.	.	1	.	.
1275.0 SWC	.	.	.	.	.	.	.	.	.	.	.	.
1306 CUTTS	4	.	.	.	.	.	3	1	.	.	.	.
1316.0 SWC	.	.	.	.	.	.	.	.	.	.	X	.
1328.5 SWC	.	.	.	.	.	.	1	.	.	1	.	.
1334.0 SWC	7	.	.	.	.	.	.	.	.	.	.	.
1336.0 SWC	.	.	.	.	.	.	.	.	.	X	X	.
1364.5 SWC	3	.	.	.	.	.	.	.	.	.	.	.
1437.0 SWC	X	.	.	.	.	.	.	.	.	X	.	.
1452 CUTTS	7	.	.	.	.	RM	.	.	.	.	.	.
1455.0 SWC	2	.	.	.	.	.	.	.	.	.	.	.
1515 CUTTS	2	.	.	.	.	.	.	.	.	.	.	.
1520.0 SWC	3	.	.	.	.	.	.	.	.	.	.	.
1575.0 SWC	3	.	.	.	.	.	.	.	.	1	.	.
1602.0 SWC	.	.	.	.	.	.	.	.	.	.	.	.
1630.0 SWC	10	.	.	.	.	.	.	.	.	.	.	.
1667.0 SWC	.	.	.	.	.	.	.	.	.	.	.	.
1678.0 SWC	X	X	.	.	.	.	.	.	.	.	.	.
1703 CUTTS	.	.	.	.	.	.	.	.	.	.	.	.
1719.0 SWC	X	.	.	.	.	.	.	.	.	X	.	.
1749.5 SWC	X	.	.	.	.	.	.	.	.	X	X	.
1754.5 SWC	X	X	.	.	.	.	.	.	.	X	X	.
1790.0 SWC	.	.	.	.	.	.	.	.	.	.	.	.
1813.5 SWC	.	.	.	.	.	.	.	.	.	.	.	.

0373.5 SWC	0373.5 SWC
0388.0 SWC	0388.0 SWC
0429.0 SWC	0429.0 SWC
0467.0 SWC	0467.0 SWC
0553.5 SWC	0553.5 SWC
0562.0 SWC	0562.0 SWC
0569.0 SWC	0569.0 SWC
0599.0 SWC	0599.0 SWC
0612.5 SWC	0612.5 SWC
0642.0 SWC	0642.0 SWC
0664.5 SWC	0664.5 SWC
0689.5 SWC	0689.5 SWC
0720.5 SWC	0720.5 SWC
0746.0 SWC	0746.0 SWC
0812.5 SWC	0812.5 SWC
0876.0 SWC	0876.0 SWC
0893.5 SWC	0893.5 SWC
0970.0 SWC	0970.0 SWC
1010.0 SWC	1010.0 SWC
1025 CUTTS	1025 CUTTS
1080 CUTTS	1080 CUTTS
1097.0 SWC	1097.0 SWC
1151.0 SWC	1151.0 SWC
1177.0 SWC	1177.0 SWC
1180 CUTTS	1180 CUTTS
1219.5 SWC	1219.5 SWC
1250.5 SWC	1250.5 SWC
1275.0 SWC	1275.0 SWC
1306 CUTTS	1306 CUTTS
1316.0 SWC	1316.0 SWC
1328.5 SWC	1328.5 SWC
1334.0 SWC	1334.0 SWC
1336.0 SWC	1336.0 SWC
1364.5 SWC	1364.5 SWC
1437.0 SWC	1437.0 SWC
1452 CUTTS	1452 CUTTS
1455.0 SWC	1455.0 SWC
1515 CUTTS	1515 CUTTS
1520.0 SWC	1520.0 SWC
1575.0 SWC	1575.0 SWC
1602.0 SWC	1602.0 SWC
1630.0 SWC	1630.0 SWC
1667.0 SWC	1667.0 SWC
1678.0 SWC	1678.0 SWC
1703 CUTTS	1703 CUTTS
1719.0 SWC	1719.0 SWC
1749.5 SWC	1749.5 SWC
1754.5 SWC	1754.5 SWC
1790.0 SWC	1790.0 SWC
1813.5 SWC	1813.5 SWC

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39	AEQUITRIRADITES VERRUCOSUS
62	AMOSOPOLLIS CRUCIFORMIS
49	AMPHIDIADREMA DENTICULATA
28	ANACOLOSIDITES ACUTULLUS
77	APECTODINIUM HOMOMORPHA (SH. SP)
30	APPENDICISPORITES DISTOCARINATUS
66	APPENDICISPORITES TRICORNITATUS
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183	CAMEROZONOSPORITES OHAIENSIS
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118	CAMEROZONOSPORITES SP
39	CANNINGIA FOVEOLATA
59	CANNINGIA RETICULATA CF
14	CANNINGIA SPINOSA
6	CANNINGINOPSIS BRETONENSIS
1	CERATIOPSIS SPECIOSUS
1	CERATOSPORITES EQUALIS
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229	CYATHIDITES SPP
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253	DIPORITES SP.
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9	HETEROSPHAERIDIUM HETEROCANTHUM
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240	PROTEACIDITES SCABORATUS
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21	PTEROSPERMELLA AUSTRALIENSIS
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129	TRIPOROLES RADIATUS
149	TRIPOROLES RETICULATUS
150	TRIPOROLES SIMPLEX
226	TRIPOROPOLLENITES AMBIGUUS
210	TRIPOROPOLLENITES SECTILIS
227	TRIPUNCTISPORIS PUNCTATUS
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34	TRITHYRODINIUM MARSHALLII
45	TRITHYRODINIUM PUNCTATE
46	TRITHYRODINIUM SUSPECTUM
47	TRITHYRODINIUM THICK PSILATE
48	TRITHYRODINIUM THICK RETICULATUS
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Appendix 6 Rig Positioning Report

PETROLEUM DIVISION

15 DEC 1993

POSITIONING REPORT

FOR

BHP PETROLEUM LTD

RIG MOVE OF THE

DRILLING RIG BYFORD DOLPHIN

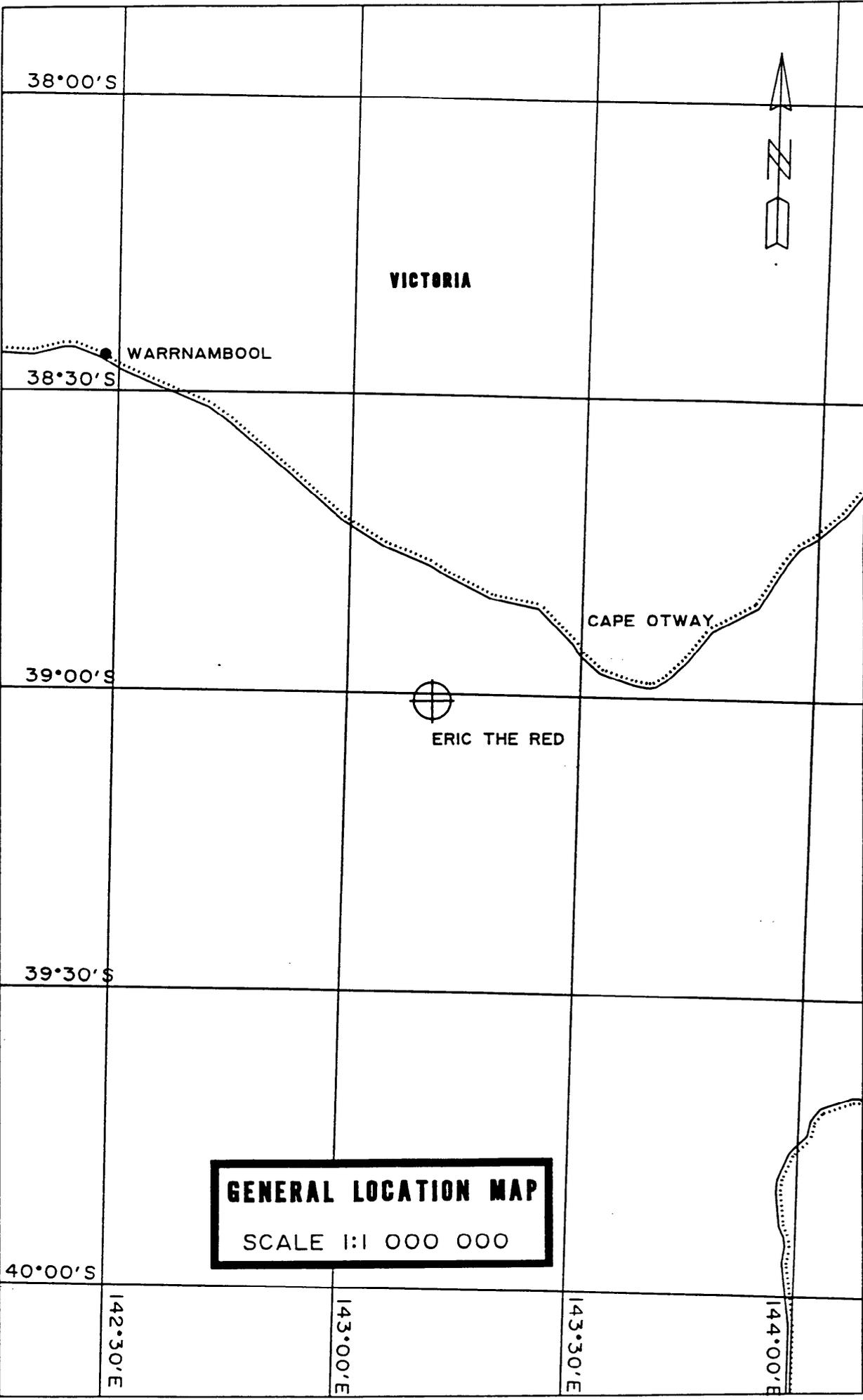
LOCATION : ERIC THE RED-1
BLOCK : VIC P31
DATED : 10th of February - 18th of February, 1993
REPORT REF : 2051

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38°00'S

VICTORIA

WARRNAMBOOL

38°30'S

CAPE OTWAY

39°00'S



ERIC THE RED

39°30'S

GENERAL LOCATION MAP

SCALE 1:1 000 000

40°00'S

142°30'E

143°00'E

143°30'E

144°00'E

1. ABSTRACT

This report details the services provided by RACAL SURVEY AUSTRALIA LIMITED (Racal), prior to and during the positioning of the semi-submersible drilling rig "BYFORD DOLPHIN" over the ERIC THE RED-1 location in the Otway Basin, offshore South Australia, for BHP Petroleum Limited (BHPP).

Personnel and equipment mobilised to Portland on the 10th of February, 1993. The BHPP supplied Standby/Survey vessel M.V. "PACIFIC MARLIN" was mobilised with the survey equipment on the 10th of February. On the 11th and 12th of February, a four transponder acoustic net was deployed and calibrated around the ERIC THE RED-1 location. Positioning equipment was set up on the "Byford Dolphin" on the 13th of February, 1993.

The "Byford Dolphin" was positioned over the ERIC THE RED-1 location, on the 16th of February, 1993.

A final Differential GPS position was obtained, after the "Byford Dolphin" had ballasted down to drilling draught, during the evening of the 17th of February, 1993.

Proposed Location

The co-ordinates of the proposed location, ERIC THE RED-1, were provided by BHPP as follows:

Datum AGD 84

Latitude : 39° 00' 45.40" South
Longitude : 143° 10' 51.30" East

AMG Zone 54 C.M. 141° E

Easting : 688 826.0m
Northing : 5 679 546.0m

Rig Heading : 230°

Final Differential GPS Position - ERIC THE RED-1

The final DGPS position of the "Byford Dolphin" was derived between 0708 and 0836 hours on the 17th of February, 1993. The final DGPS position was as follows:

Datum AGD 84

Latitude : 39° 00' 45.44" South
Longitude : 143° 10' 51.45" East

AMG Zone 54 C.M. 141° E

Easting : 688 829.7m
Northing : 5 679 544.8m

Rig Heading : 225°

The final position is 3.9 metres on a bearing of 106.4° (T) from the intended ERIC THE RED-1 location.

2. REQUIREMENTS

Racal Survey Australia Limited were contracted by BHPP to provide personnel and positioning equipment consisting of a 4 transponder Sonardyne net and interfacing to BHPE's Del Norte 1008 GPS receivers for the rig move of the "Byford Dolphin" onto the ERIC THE RED-1 location. Racal's GNS and Oasis II software were used to provide real-time navigation and acoustic calibration facilities. In addition to the acoustic system, Racal were requested to provide the "SkyFix" Differential GPS as back-up to the Del Norte GPS receivers. Due to technical malfunctions with the Del Norte 1008 differential link, Racal's "SkyFix" system was used as the primary navigation system.

The requirements were as follows:

- a. To deploy and calibrate, both in relative and absolute position, a four transponder acoustic array around the ERIC THE RED-1 location.
- b. To provide real-time positioning for the semi-submersible drilling rig "Byford Dolphin" during the tow and onto the ERIC THE RED-1 location.
- c. To track, using a Golf II Laser system the Anchor Handling Vessels, during anchor deployment operations.
- d. To provide a final Differential GPS position of the ERIC THE RED-1 well.

3. SUMMARY OF EVENTS

Racal Survey personnel C. Robinson and K. Eddy departed Perth for Melbourne on the 9th of February, 1993. Racal Engineer, Laurie Etheridge also arrived in Melbourne the same evening. The Racal personnel and the BHPE survey representative, C. Sellers, departed Melbourne for Portland on the 10th of February arriving in Portland at 1000 hours.

Mobilisation of the Standby/Survey Vessel, M.V. "Pacific Marlin", with Racal and BHPE equipment took place on the 10th of February. All Racal equipment was installed and fully operational by 1400 hours. The "Pacific Marlin" departed Portland harbour for the ERIC THE RED-1 site at 1600 hours on the 10th of February, 1993.

The "Pacific Marlin" arrived at the location at 0600 hours on the 11th of February, 1993. A STD-12 velocity profile was completed at 0800 hours. Results are located in Appendix B. Between 0930 and 1039 hours on the 11th of February, 1993, four sonardyne compatts were deployed in the area around the ERIC THE RED-1 location.

Between 1205 and 1730 hours on the 11th of February, 1993, the calibration of the acoustic net was carried out. The sonardyne towfish was recovered at 1730 hours and the "Pacific Marlin" was placed on standby, to resume calibration operations at first light on the 12th of February.

At 0740 hours on the 12th of February, 1993, the sonardyne towfish was re-deployed to continue calibration operations. Calibration operations were completed at 1310 hours and Acoustic/DGPS positioning comparisons were conducted at 1342 hours. The results of the calibration are attached in Appendices C, D and E. At 1417 hours on the 12th of February, 1993, the "Pacific Marlin" departed the ERIC THE RED-1 location for the "Byford Dolphin" at the LA BELLA-1 location. At 1715 hours the "Pacific Marlin" arrived at the LA BELLA location and assumed standby duties for the "Byford Dolphin".

At 0910 hours on the 13th of February, 1993, the "Pacific Marlin" departed the LA BELLA site for Portland. As weather conditions did not facilitate the transfer of personnel to the "Byford Dolphin" it was necessary to transport personnel and equipment to Portland for transfer by helicopter to the rig. The "Pacific Marlin" berthed at Portland harbour at 1600 hours. The equipment and personnel were transferred to Portland airport, and departed for the "Byford Dolphin". The equipment and personnel arrived on board the "Byford Dolphin" at 1810 hours on the 13th of February, 1993.

By 2030 hours on the 13th of February, 1993, the GNS was fully operational and interfaced to the Del Norte GPS receiver. At 0730 hours on the 14th of February, 1993, anchor operations commenced which were completed by 1530 hours on the 15th of February, 1993.

The 5 mile run-in to the ERIC THE RED-1 location commenced at 2130 hours on the 15th of February, 1993. Anchor handling operations commenced at 2240 hours with anchor No. 7 being set on the seabed. Anchor handling operations were completed at 1737 hours on the 16th of February, 1993, with the final anchor No. 9 being set on the bottom. Pre-tensioning operations commenced at 1820 hours. The "Byford Dolphin" moved over the ERIC THE RED-1 location at 2045 hours, and ballasting of the rig commenced at 2045 hours.

Ballasting operations were completed at 0318 hours on the 17th of February, 1993. The DGPS final fix commenced at 0708 hours and was completed at 0834 hours. The Sonardyne compatts were released between 0755 hours and 0827 hours, and retrieved by the "Pacific Marlins" fast standby vessel.

At 1900 hours on the 17th of February, 1993, all personnel departed the rig for Portland, arriving at 2000 hours.

All personnel departed Portland at 0720 hours on the 18th of February, arriving in Melbourne at 0830 hours.

Racal Personnel K. Eddy and C. Robinson departed Melbourne at 0900 hours to arrive in Perth by 1015 (WST) hours.

Nb: All times, except where stated, are Eastern Standard Time (EST).

4. GEODETIC PARAMETERS

The Geodetic parameters used during the project were as follows:

The location co-ordinates and the acoustic positioning systems are defined on Australian Geodetic Datum 84 (AGD 84). It was determined that the difference between AGD 84 and AGD 66 for the ERIC THE RED-1 location was negligible.

The Global Positioning System (G.P.S.) is referenced to World Geodetic System 1984 (WGS 84).

4.1 DATUMS

DATUM	:	AGD 1984
Spheroid	:	Australian National
Semi-major Axis (a)	:	6 378 160.000m
Semi-minor Axis (b)	:	6 356 774.719m
Eccentricity Squared (e^2)	:	0.006 694 542
Flattening (1/f)	:	298.25

DATUM	:	WGS-84
Spheroid	:	WGS-84
Semi-major Axis (a)	:	6 378 137.0000m
Semi-minor Axis (b)	:	6 356 752.3142
Eccentricity Squared (e^2)	:	0.006 694 380
Flattening (1/f)	:	298.257 223 563

4.2 PROJECTION	:	U.T.M.
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AMG Zone	:	54°
Central Meridian (C.M.)	:	141° East
Scale factor on the C.M.:	:	0.9996
False Easting	:	500 000m
False Northing	:	10 000 000m
Latitude of Origin	:	0° (Equator)
Unit of Measure	:	International Metre

4.3 DATUM TRANSFORMATION PARAMETERS

The datum transformation parameters used in Racal software to convert WGS 84 co-ordinates to AGD 84 co-ordinates were as follows:

GNS Version R2.06A and R2.06D(PC) Oasis II Version 1.7C.

Dx	=	+	116.00m
Dy	=	+	50.47m
Dz	=	-	141.69m
Rx	=	+	0.230"
Ry	=	+	0.390"
Rz	=	+	0.344"
Scale(k)	=	-	0.0983

4.4 GEOID/SPHEROID SEPARATION

The computed Geoid/Spheroid separation value (N) at the ERIC THE RED-1 location is -1.77m. This value was computed using the Ohio State University OSU91A Geoid Interpretation Program.

5. GLOBAL POSITION SYSTEM (GPS)

5.1 SYSTEM DESCRIPTION

The NAVSTAR GPS (Navigational Satellite Timing and Ranging Global Positioning System) is an USA Military all weather, space based positioning system that transmits signals from a constellation of satellites orbiting the Earth. It is capable of providing suitably equipped users worldwide with accurate three dimensional positions on or near the Earth's surface. The accuracy of the determined positions can vary from a few millimetres to 100 metres depending on the method of data acquisition and processing. System design consists of three integrated parts: the Ground Control Segment, the Space Segment and the User Segment. The Space Segment is still in the process of being installed and as such is not completely operational.

When completed, the operational space segment will consist of 21 production satellites and 3 active spares; the term Space Vehicle (SV) is used as a synonym for satellite. The satellites will be in high orbits, at approximately 20,200km, having an orbit period of 12 hours. They will be arranged in 6 orbital planes, inclined at 55 degrees with near circular orbits.

The final configuration will provide complete 4 satellite (3D) coverage worldwide. With the present launch schedule, 24 hour 3 dimensional coverage will not be available until late 1993.

The current configuration consists of both Block I (testing) and Block II satellites orbiting and transmitting healthy data. The Block I's are SV's 3, 11, 12, and 13. The current Block II satellites are SV's 2, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28 and 32. The amount of coverage that the satellite configuration provides, depends upon the geographical position of the user.

It should be noted that available coverage does not represent actual usable working periods, as the satellites will at times combine to produce poor geometry and therefore poor positioning. This can happen for short periods during the middle of multi-satellite coverage and is a result of the limited satellite constellations presently available. It is essential to ascertain the periods of good coverage prior to commencing any project involving GPS. Predicted satellite availability printouts are contained in Appendix J.

Individual satellites can be set 'unhealthy' from time to time whilst they are manoeuvred into new orbital planes or due to other operational circumstances which are usually predicted. The status of GPS and individual satellites can be obtained from one of the USA based GPS Bulletin Board Services. Prior to a project commencing Racal Australia download by modem the current status and almanac file, usually from the US Coast Guard Bulletin Board. In addition the Racal Survey Ltd office in Great Yarmouth, England monitor the GPS status daily and fax to all Racal operating companies any Notice Advisory to NAVSTAR Users (NANU's) that may affect the operational capabilities of the system.

5.2 OBSERVATIONS

There are two important types of GPS observations (observables):

Pseudorange and Carrier phase.

Carrier phase is sometimes also referred to as carrier beat phase. Pseudorange techniques are generally used for navigation e.g. Deltanav. In high-precision baseline surveying the carrier phase is used. Although the (undifferenced) phase can be used directly, it has become common practice, at least in surveying applications, to process certain linear combinations of the original carrier phase observations (double differences and triple differences).

5.2.1 Pseudoranges

The pseudorange is a measure of the distance between the satellite and the receiver at the epochs of transmission and reception of the signals. The transit time of the signals is measured by comparing (correlating) identical pseudo-random noise (PRN) codes generated by the satellite and by the receiver. A code-tracking loop within the receiver shifts the internal replica of the PRN code in time until maximum correlation occurs. The codes generated at the receiver are derived from the receiver's own clock, and the codes of the satellite transmissions are generated by the satellite system of clocks. It follows that unavoidable timing errors in both the satellite and the receiver clock will cause the measured quantity (pseudorange) to differ from the geometric distance.

In applications offshore where instantaneous positions are required, the pseudorange is the preferred observable. Given the satellite ephemeris (i.e. the position of the satellite at the epoch of transmission), there are seven unknowns: two clock errors, three receiver co-ordinates and the ionospheric and tropospheric delays. The effect of the satellite clock error is negligible for the typical navigation solution, particularly considering that the time errors are indistinguishable from the ionospheric and tropospheric delays. The satellite clocks are constantly monitored and synchronized with GPS time as maintained by the control centre. Actual offsets of the satellite clocks are approximated by polynomials in time and transmitted as part of the navigation message to the user for the correction of the measured pseudoranges. The ionospheric and tropospheric delays can be computed on the basis of ionospheric and tropospheric models, thus there are four unknowns left X, Y, Z and receiver clock error. These can be determined from four pseudoranges measured simultaneously to four GPS satellites.

5.2.2 Carrier Phase

The phase observable is the difference between the phase of the carrier signal of the satellite, measured at the receiver, and the phase of the local oscillator within the receiver at the epoch of measurement. This can be regarded as a biased range measurement of the satellite-receiver distance with the integer number of carrier waves being unknown. The wavelength of the L1 carrier is about 19cm. Because of the fraction of the carrier phase is measured, the term "interferometry" is often used to describe carrier phase techniques.

5.3 DIFFERENTIAL GPS (DGPS)

As the GPS is primarily a USA Defence system it can be expected that the navigation accuracy to the civil user will be degraded to about 100 metres standard deviation (Standard Position Service -SPS) as specified in the USA 1990 Federal Radio Navigation Plan. The means by which the USA Military degrade GPS is with the use of Selective Availability (SA) to control the accuracy of pseudorange measurements. Essentially, the user is given a false pseudorange for each satellite so that the resulting measurement is in error by a controlled amount.

DGPS is a means by which the civil user can overcome Selective Availability. It requires a receiver be located at a precisely known point from which pseudorange corrections for each satellite can be determined and monitored. These pseudorange corrections are then communicated by means of a telecommunications link to users at unknown locations. The DGPS technique has proven to be particularly effective and can improve the accuracy figure to 5 metres or better with or without Selective Availability activated. In the relative mode most of the important systematic errors common to the known station and at the unknown location cancel out to improve the accuracy of the computed position.

5.4 "SKYFIX" DIFFERENTIAL LINK

Racal Survey Australia Limited introduced its "SkyFix" Differential GPS System in Australia in January 1991, using the Inmarsat Pacific and Indian Ocean marine communications satellites as the differential data broadcast link. Extensive performance trials and projects undertaken to date have shown "SkyFix" to meet the best industry expectations in terms of quality of service and accuracy.

The system embodies the successful combination of data capacity, range and coverage with a flexible networked approach that lends itself to comprehensive performance and quality monitoring.

The link capacity of 1200 bits per second allows data from a number of networked reference stations to be sent simultaneously without introducing unacceptable delays between reference station and user. With four reference stations each generating correction data for ranges from eight satellites, an update rate of better than three seconds is achieved by the "SkyFix" system.

Satellite communications systems, particularly at the Inmarsat L-band frequencies of 1.5 GHz are reliable and free of the interference associated with the crowded M.F./H.F. bands. This high data integrity gives users confidence that the corrections will be continuously received without interference.

The "SkyFix" Australian network commenced operation in January 1991, and now comprises reference stations at Dampier, Broome, Perth, Adelaide, Sydney, Cairns and Darwin.

The differential corrections generated at each reference station are brought via landline links to the data hub and control centre in Singapore where the system is monitored for performance and quality. From there a composite message containing full RTCM 104 version 2 formatted data from all reference stations is sent via dual redundant links to satellite earth stations at Sentosa Island, Singapore and O.T.C. Perth, Western Australia for uplink and broadcast over the Inmarsat Pacific and Indian Ocean Region satellites.

The design of reference station networks provides a high quality service to major offshore hydrocarbons prospect areas, each of which, ideally will be within coverage of more than one reference station.

The system is easily expandable to provide new areas of coverage by the addition of further networked reference stations, with the correction data from these automatically included in the system performance and quality control function at the control centres.

Whilst the DGPS service provider has no control over the operation of the GPS system itself, performance can be monitored, quantified and reported to users. The functions of the "SkyFix" data hub and control centre in Singapore are of fundamental importance as its role is to guarantee the best possible system performance.

The "SkyFix" system includes a 24 hour monitoring facility to ensure the validity of data received at the control centre from the DGPS reference stations and that the same data is received over the "SkyFix" satellite data link.

The monitor system that has been developed by Racal Survey is designed to provide maximum system performance information availability whilst providing a rapid indication of performance or fault problems should they occur.

Monitoring and control functions therefore include extensive analysis and archiving of the reference corrections and the comparison of range rate corrections - arriving from different stations within the network. The system also receives the broadcast message from the satellite data link and applies this data to a monitor receiver at the control centre to verify positioning performance. Time series plots of this performance, in latitude, longitude, height, together with PDOP and HDOP figures are generated.

Monitoring the data on the link in this way also allows link performance to be appraised in terms of message success rate and in terms of overall system message delay.

Other functions include satellite status information, data recording, and a procedural approach to providing client information.

The "SkyFix" combination of the Inmarsat satellite communications links using the RTCM 104 Version 2 DGPS data protocol, the reference station, monitoring and user infrastructure has been shown through a growing body of project trials experience to provide a Differentially GPS operating environment consistently capable of providing position accuracies of 5 metres or better.

The "SkyFix" scheme is a homogeneous network within the WGS 84 geodetic reference frame. The original network, prior to the Australian extension included ten primary triangulation stations for which the WGS 84 values were supplied. The vectors established during this build up create a network between the Far East, Australia and Europe. Purely for the purposes of testing the strength and internal consistency the network has been subjected to a least squares adjustment by variation of co-ordinates. In the final analysis two of the primary triangulation stations, Dongara 38 (W.A.) and Matera (Italy), were held fixed. The residual errors pertaining to the remaining eight primaries are listed below. For all stations included in the final analysis the mean semi-major axis of the twenty-nine 95% error ellipsoids is just over 0.6 metres. The total variation about this mean is contained within plus or minus 0.6 metres.

STATION	LATITUDE	LONGITUDE	HEIGHT	MISCLOSURE
Port Stanley (Hong Kong)	0.53m	- 1.56m	- 0.53m	1.73m
TC 58 (Abu Dhabi)	0.76m	- 0.97m	0.83m	1.49m
Station Hill(Broome W.A.)	0.35m	0.50m	- 1.23m	1.95m
Gnangara (Perth W.A.)	1.04m	1.00m	- 1.82m	2.32m
Bologna (Italy)	- 0.14m	0.02m	0.39m	0.41m
Brimmond Hill (Scotland)	- 2.85m	0.32m	1.16m	3.09m
Dunnet Head (Scotland)	- 1.59m	1.50m	0.81m	2.04m
Tromso (Norway)	- 1.11m	2.25m	- 0.81m	2.64m

For the Australian extension to the network, two primary geodetic points were used at each site, together with the transportable laser ranging site, Gnangara 73 in Perth. Trimble 4000 SST geodetic receivers were used to simultaneously obtain phase data which was then post processed to derive the vectors between sites. The vector results were entered into "Geolab" 3D adjustment software, to obtain adjusted values for the reference stations.

5.5 Trimble 4000DL GPS Receiver

The Trimble 4000DL GPS receiver is designed for moderate precision static and dynamic positioning applications. The GPS receiver provides time and three-dimensional station co-ordinates at a once-per-second update rate.

The receiver receives the civilian coded signal (C/A) from the GPS NAVSTAR satellites. The receiver automatically acquires and simultaneously tracks GPS satellites and precisely measures carrier and code phase and computes position and velocity.

Latitude, longitude and height values are output on the World Geodetic System (WGS 84) Earth-centred, Earth-fixed co-ordinate system.

The receiver is designed to measure the following observables:

- Coarse/Acquisition (C/A) code pseudoranges
- Rate of change of pseudorange
- Integrated Carrier

C/A code correlation techniques measure the propagation time of the signal from the satellite to the antenna. Latitude, longitude, height and time can be determined from measurements made from at least 4 satellites, by a process similar to triangulation.

To determine speed and heading, the receiver calculates the rate of change of Range (the range-rate) by measuring the Doppler shift of the carrier.

It is capable of receiving and processing differential corrections from other reference sources using the standard format of the Radio Technical Commission for Maritime Services, Special Committee 104 (RTCM SC-104), Version 1.0 or 2.0 protocols.

The 4000DL has several options available, including internal data logging memory, event marker logging etc. and therefore may be used alone or as part of a more extensive navigation system.

5.6 DGPS OPERATION

During the acoustic net deployment and calibration the DGPS was operated using Trimble's DeltaNavN (DNAVN) 2.70 software in conjunction with a Toshiba T5200/100 computer. DNAVN controlled the Trimble GPS receiver and applied the RTCM 104 Version 2 differential corrections received from the "SkyFix" system to the observed GPS data. The computed DGPS position in WGS 84 was then output to the navigation computer and converted to AGD 84.

6. ACOUSTIC POSITIONING SYSTEM

6.1 SYSTEM DESCRIPTION

Sonardyne high precision acoustic technology incorporates COMPATT (Computing and Telemetry Transponder) and PAN (Programmable Acoustic Navigator). The system is available in low, medium and high frequency versions. This allows selection of the optimum frequency band to suit each requirement. Medium frequency equipment was used during rig move operations.

The microprocessor-controlled intelligent COMPATT makes direct measurements on the seabed to other Sonardyne transponders, and transmits this baseline data back to a ship or submersible via fast acoustic telemetry in order to calculate the relative position of each transponder.

In its interrogator mode the COMPATT will measure ranges to 8 individual transponders with just one single interrogation. This speeds up 'mobile' COMPATT operations such as ROV tracking and pipelaying.

The reply frequency of the COMPATT is selectable from 15 channels by acoustic command. This feature reduces the need for a large transponder stock and increases immunity to 'rogue' frequencies.

Other commands instruct sensors to measure parameters such as water temperature and pressure, and at the end of the mission another command will effect recovery. An automatic 'self-test' facility can be performed without opening the transponder.

The medium frequency version gives the optimum combination of 3km ranges and 20cm accuracy. This suits most sub-sea engineering operations including rig moves, pipelaying, jacket emplacement and ROV positioning.

6.2 ACOUSTIC VELOCITY PROFILE

An Applied Microsystems STD-12 acoustic velocity probe was used to determine the acoustic velocity of the water column at the ERIC THE RED-1 location on the 11th of February, 1993. The probe was deployed over the stern of the "Pacific Marlin". Readings of the temperature and conductivity were recorded against pressure (depth) at 1 metre intervals as it was lowered to and then raised from the seabed.

The probe recorded a maximum depth of 77.80 metres.

A mean velocity of 1513.2 m/sec for the entire water column was obtained using the Chen and Milleros formula.

For the acoustic net calibration the following values from the observed profile were entered into the Oasis II software:

Depth	VP(ms ⁻¹)
0.61	1517.8
4.97	1518.0
10.86	1518.1
15.43	1518.1
20.16	1518.2
25.68	1518.3
30.59	1517.7
35.41	1516.0
39.96	1512.8
44.91	1509.3
50.16	1509.1
55.01	1508.4
59.71	1507.9
65.42	1507.8
70.40	1507.8
74.68	1507.9
77.80	1508.0

6.3 TRANSPONDER DEPLOYMENT AND CALIBRATION

Sonardyne acoustic transponders were deployed and calibrated from the M.V. "Pacific Marlin" on the 11th and 12th of February, 1993.

The transponders were deployed in a quadrilateral, approximately 700-900 metres from the intended location. Drop positions and telemetered depths were used as the basis of subsequent relative and absolute calibrations.

As a check on the relative/absolute calibration of the Compatts, a 'Box-In' calibration was carried out on all of the Compatts.

The M.V. "Pacific Marlin" steamed in a clover-leaf configuration throughout the array, logging acoustic ranges to each transponder as well as the surface differential GPS. This recorded data enabled relative (to each other) and absolute calibrations to be computed. For this project both Racal's SkyFix DGPS and BHPE's Del Norte 1008 DGPS were used during the calibrations. The actual positions for the compatts were derived from the SkyFix DGPS system.

The 'Box-In' calibration (where the co-ordinates of only one Compatt are derived) is carried out by steaming a circle of radius 2.5 times the water depth, in each direction, again recording simultaneous surface and acoustic data.

The results of the Relative calibration were as follows:

Relative Calibration

12th of February, 1993

Transponder	X(m)	Y(m)	Depth(m)	Mean Range Residual(m)	S.D. (m)
1	503	0.00	71.81	-0.01	0.56
2	1106	1003.89	69.78	-0.01	0.58
3	1109	1052.74	72.37	0.02	0.60
4	1010	3.00	72.24	-0.00	0.53

Total solution standard error: 0.47 metres.

The result of the Absolute calibration was as follows:

Absolute Calibration

12th of February, 1993

Datum AGD 84 AMG Zone 54 C.M. 141° East

SkyFix DNAVN for Primary Positioning

Transponder	Easting (m)	Northing (m)	Depth (m)
1	503	688 392.52	71.81
2	1106	689 393.49	69.78
3	1109	689 360.63	72.37
4	1010	688 322.04	72.24

Standard error of dx mean residual	=	2.90m
Standard error of dy mean residual	=	3.12m
Total solution standard error	=	4.28m

6.4 'BOX-IN' CALIBRATIONS

A check on the Absolute calibration was carried out by 'Box-In' calibrations, of each transponder.

11th of February, 1993
 Datum AGD 84 AMG Zone 54 C.M 141° East
 Del Norte 1008 for Primary Positioning

Tp	Code	Easting(m)	Northing(m)	RMS
4	1010	688 324.28 dE -2.24	5 679 118.32 dN +1.43	2.9
2	1106	689 396.93 dE -3.44	5 680 002.14 dN+ 2.51	3.0

12th of February, 1993
 Datum AGD 84 AMG Zone 54 C.M. 141° East
 SkyFix DGPS for Primary Position

Tp	Code	Easting(m)	Northing(m)	RMS
3	1010	689 360.33 dE +0.30	5 678 935.55 dN -1.68	2.0
1	503	688 393.80 dE -1.28	5 680 082.12 dN -0.95	2.0

6.5 SEABED CALIBRATION

A seabed calibration was carried out on the 11th of February, 1993, as a check of the Del Norte Absolute/Relative calibrations. TP4 and TP2, coordinated by a Box-in Calibration utilising the Del Norte System, were fixed in the calculation.

Acoustic Net Positions After Seabed Calibration

Transponder	Easting (m)	Northing (m)	Depth (m)
1	5.08	-0.42	65.00
2	1009.03	0.00	70.00
3	1058.54	-1070.65	71.20
4	8.28	-964.48	72.00

Box-in Positions for Grid on Grid:

No	Easting (m)	Northing (m)
2	689 396.93	5 680 002.14
4	688 324.28	5 679 118.32

Movements Required for Boxed in Transponders:

No	Easting (m)	dEast (m)	Northing (m)	dNorth (m)
2	689 396.93	-0.00	5 680 002.14	-0.00
4	688 324.28	0.00	5 679 118.32	0.00

Solution Standard Error : 0.00

Grid on Grid Transponder Positions:

No	Easting	Northing
1	688 395.98	5 680 079.71
2	689 396.93	5 680 002.14
3	689 363.12	5 678 930.89
4	688 324.28	5 679 118.32

6.6 SUMMARY OF TRANSPONDER POSITIONS

<u>TP1/503</u>		Easting (m)	Northing (m)
1	Seabed/GG	688 395.98	5 680 079.71
2	Del Norte ABS	688 390.79	5 680 078.10
3	DnavN ABS	688 392.52	5 680 081.17
4	DnavN Box-in	<u>688 393.80</u>	<u>5 680 082.12</u>
		Mean 93.27	Mean 80.28
		S.D. 2.19	S.D. 1.76
		Range 5.19	Range 4.02

TP2/1106

1	Box-In Del Norte	689 396.93	5 680 002.14
2	Del Norte ABS	689 391.45	5 680 005.99
3	DnavN ABS	<u>689 393.49</u>	<u>5 680 004.65</u>
		Mean 93.96	Mean 4.26
		S.D. 2.77	S.D. 1.95
		Range 5.48	Range 3.85

TP3/1109

1	Seabed/GG	689 363.12	5 678 930.89
2	Del Norte ABS	689 363.01	5 678 935.31
3	DnavN Box-In	689 360.33	5 678 935.55
4	DnavN ABS	<u>689 360.63</u>	<u>5 678 933.87</u>
		Mean 61.77	Mean 33.91
		S.D. 1.50	S.D. 2.14
		Range 2.79	Range 4.66

TP4/1010

1	Box-In Del Norte	688 324.28	5 679 118.32
2	Del Norte ABS	688 323.81	5 679 117.14
3	DnavN ABS	<u>688 322.04</u>	<u>5 679 119.75</u>
		Mean 23.38	Mean 18.4
		S.D. 1.18	S.D. 1.31
		Range 2.24	Range 2.61

- NB (1) Underlined co-ordinates are those used in rig move setup.
 (2) Seabed/GG : - seabed calibration using TP4 and TP2 fixed from box-in's.
 (3) DNAVN ABS : - Absolute calibration utilising DNAVN as the positioning system.
 (4) DelNorte ABS : - Absolute calibration utilising Del Norte as the Positioning system.
 (5) Box-In : - Box-in calibration using DNAV or Del Norte

6.7 FINAL TRANSPONDER CO-ORDINATES

The final set of co-ordinates used during the ERIC THE RED-1 project were as follows:

Datum AGD 84

AMG Zone 54 C.M. 141° East

Transponder	Easting (m)	Northing (m)	Depth (m)
1 503	688 392.52	5 680 081.17	65.0
2 1106	689 393.49	5 680 004.65	70.0
3 1109	689 360.63	5 678 933.87	71.2
4 1010	688 322.04	5 679 119.75	72.0

7. FINAL DRILLSTEM POSITION

7.1 FINAL DIFFERENTIAL GPS POSITION - ERIC THE RED-1

The "Byford Dolphin" was positioned over the ERIC THE RED-1 location on the 16th of February, 1993.

A final position of the "Byford Dolphin" was determined using Racal's "SkyFix" Differential GPS between 0708 and 0834 on the 17th of February, 1993. A total of 455 samples from 10 constellations were observed.

CONSTELLATION	SAMPLES	SATELLITES
A	4	26, 15, 02, 13
B	6	26, 15, 02, 27, 13
C	18	26, 15, 02, 13
D	196	26, 15, 02, 27, 13
E	35	26, 02, 27, 13
F	9	26, 12, 02, 27, 13
G	7	26, 02, 27, 13
H	136	26, 12, 02, 27, 13
I	5	26, 12, 24, 02, 27, 13
J	39	26, 12, 24, 02, 13

Total number of samples used = 455.

The computed Antenna position, with constellations given equal weights, was as follows:

Datum WGS 84

Latitude : 39° 00' 40.586" South (s.d. 0.43m)
 Longitude : 143° 10' 55.046" East (s.d. 0.50m)
 Spheroidal
 Height : 22.45m (s.d. 1.18m)

Transforming the above WGS 84 co-ordinates to AGD 84 using the parameters in section 4, gives the following co-ordinates:

Datum AGD 84

Latitude : 39° 00' 45.904" South
 Longitude : 143° 10' 50.093" East
 Spheroidal
 Height : 39.63m

Applying the antenna to datum offsets to the above co-ordinates gives the following drillstem position, over the ERIC THE RED-1 location.

Datum AGD 84

Latitude : 39° 00' 45.439" South
 Longitude : 143° 10' 51.451" East

AMG Zone 54 C.M. 141° East

Easting : 688 829.73m
Northing : 5 679 544.81m

Rig Heading : 224.8°

This position is 3.92 metres on a bearing of 106.37° True from the intended ERIC THE RED-1 location.

8. PERSONNEL AND EQUIPMENT

8.1 PERSONNEL

The following personnel were employed on this project:

For : Racal Survey (Australia)

K. Eddy	-	Surveyor
L. Etheridge	-	Navigation/Acoustic Engineer
C. Robinson	-	Surveyor

For : BHPP Limited

C. Sellers	-	Client Representative
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8.2 EQUIPMENT

The following equipment was supplied for use on this project:

1 x Trimble 4000DL GPS Receiver, Cable and Antenna

1 x "SkyFix" Demodulator

1 x "SkyFix" Rig Portable

1 x Toshiba T5200/100 Computer (for DNAV-N)

2 x Sonardyne Pan Units

5 x Sonardyne Compatt Transponders

1 x Sonardyne Tow Fish

1 x Sonardyne Deck Winch

1 x Sonardyne Dunking Transducer

2 x HP 9000/320 Series Desktop Computers

1 x HP 9122D Dual Disk Drive

1 x HP 9122C Dual Disk Drive

2 x HP 35731B VDU's

2 x Barco Monitors

1 x HP Quietjet Plus Printer

1 x HP Thinkjet Printer

1 x HP 2673A Thermal Printer

2 x Toshiba T5200/100 Computers (for GNS PC Software)

2 x VGA Monitors

1 x STD-12 Velocity Probe

2 x Arma Brown Gyro Compasses

3 x Interface 80 Units

1 x Star LC-20 Printer

1 x Toshiba 1200 Computer (Velocity Probe)

2 x AC Voltage Stabilisers

1 x Golf Laser

plus all associated software (GNS Ver R2.06A, GNS Ver R2.06D PC, OASIS II Ver 1.7C), cables, manuals, etc.

9. DISTRIBUTION

Copies of this report have been distributed as follows:

BHP Engineering - Wollongong : 1 copy
Attn: Mr. S. Dykes

BHP Petroleum - Melbourne : 2 copies
Attn: Mr. R. Willmore

Racal Survey - Perth : 1 copy

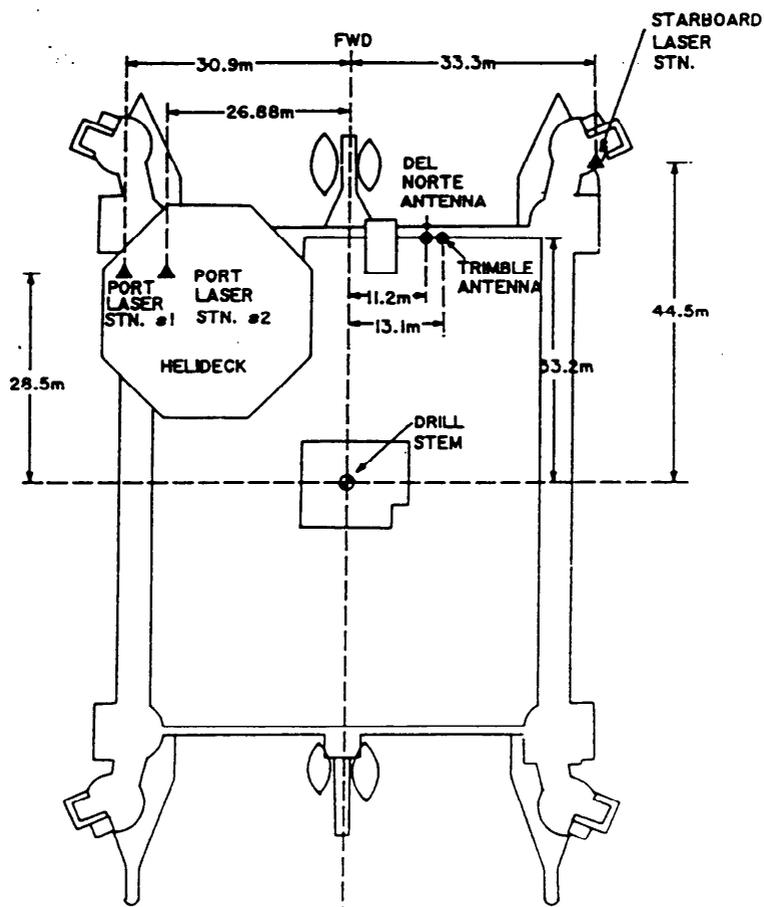
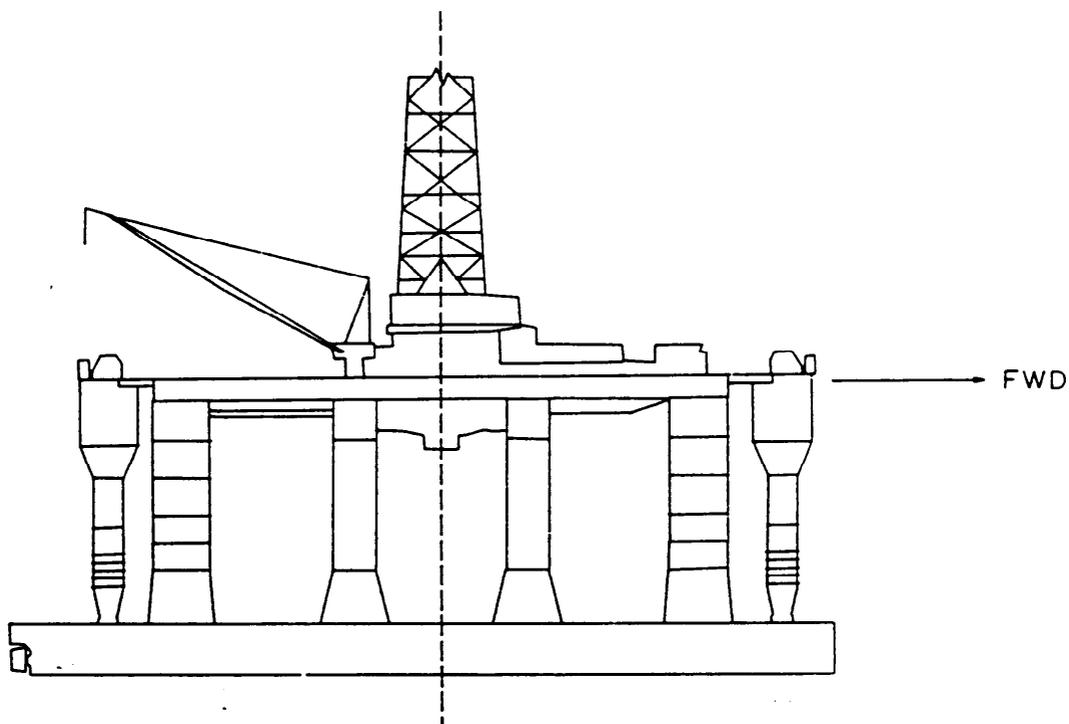

Ken Eddy
Surveyor


Gareth Jones
Area Surveyor

APPENDIX A
OFFSET DIAGRAMS - BYFORD DOLPHIN AND PACIFIC MARLIN

BYFORD DOLPHIN

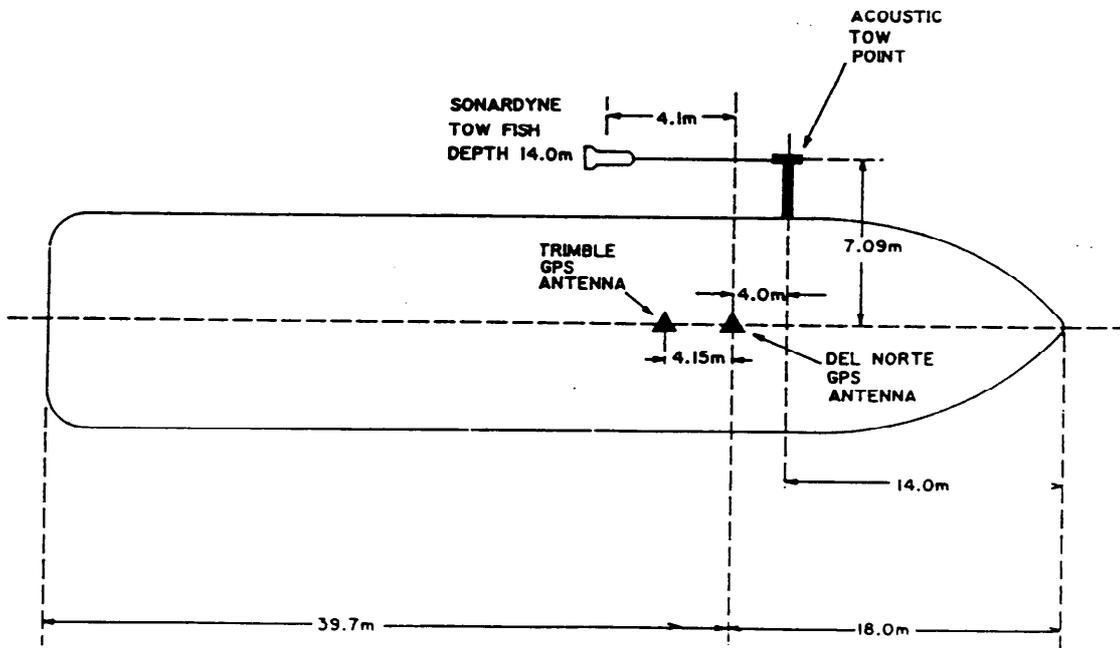
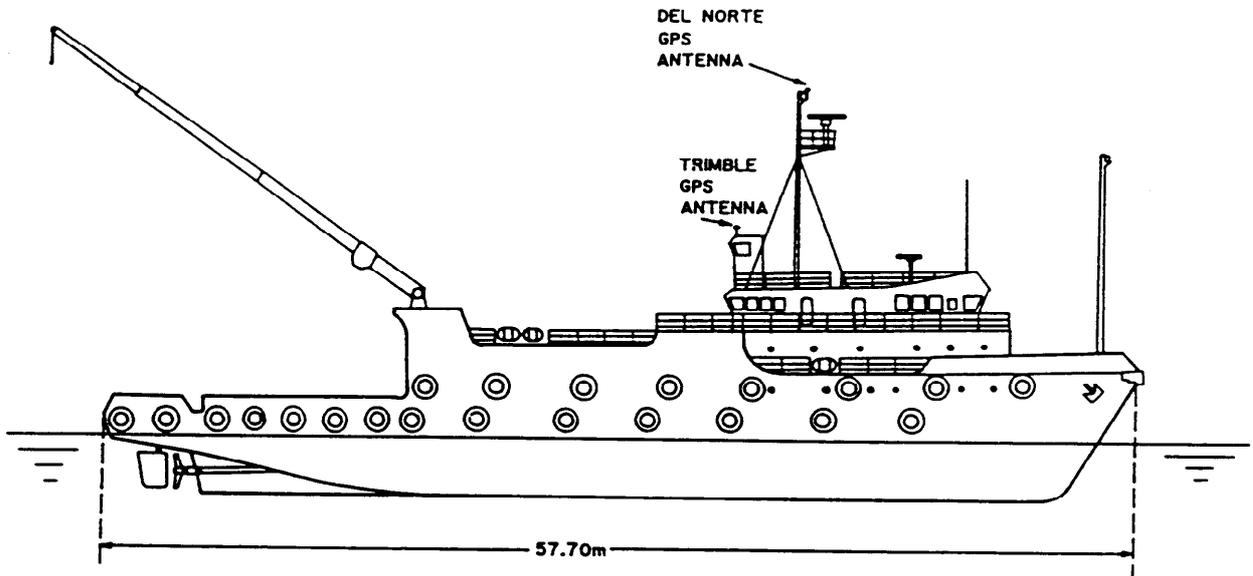
(NOT TO SCALE)



OFFSET DIAGRAM

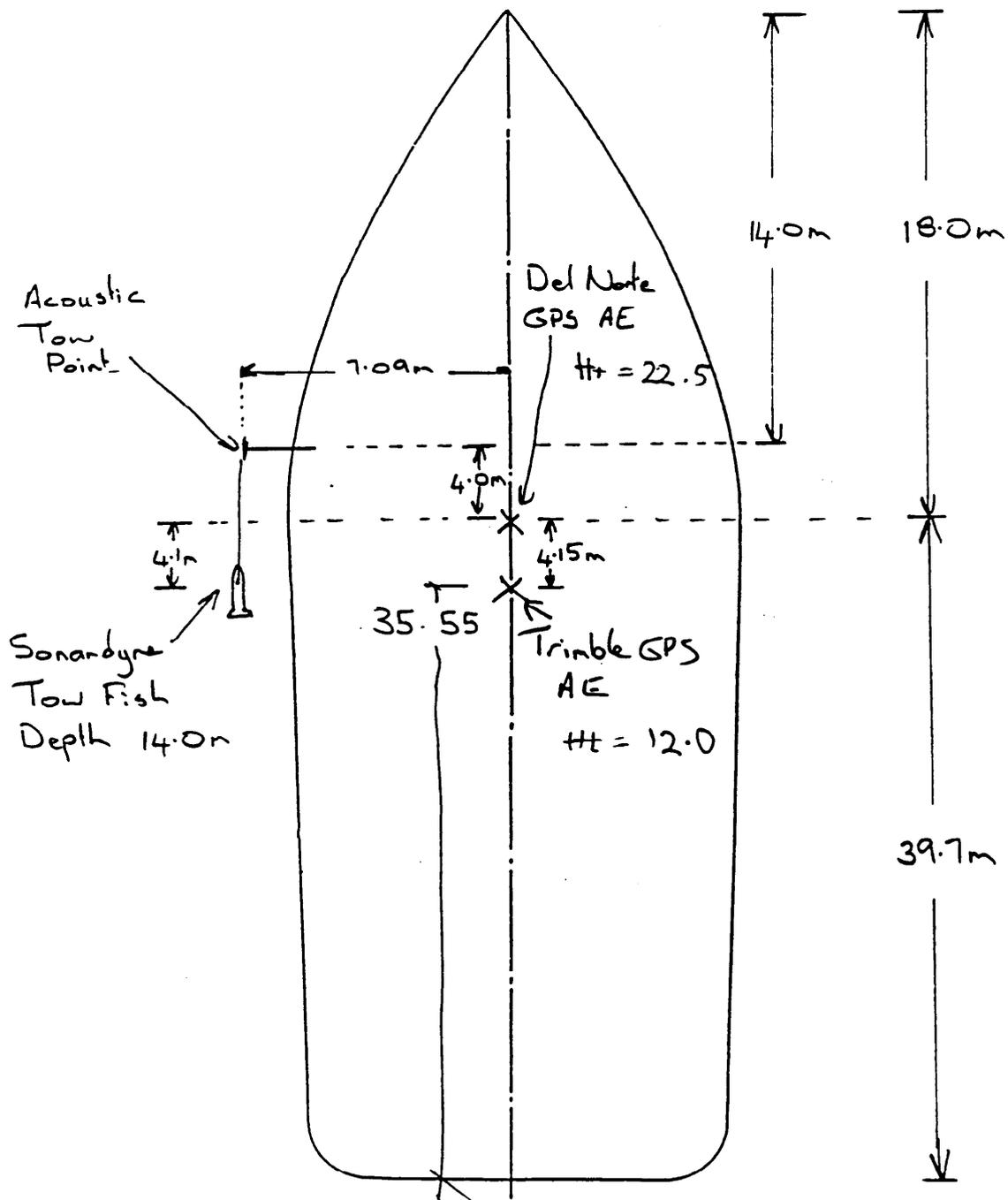
PACIFIC MARLIN

(NOT TO SCALE)



M.V. PACIFIC MARLIN

NOT TO SCALE



APPENDIX B
VELOCITY PROFILE PRINTOUT

DRY
BYFORD DOLPHIN R/M
ERIC THE RED-1

Configuration File for APPLIED MICROSYSTEMS LTD. STD 3 W 5PP.
SOFT-12. STD version 2.55

You have specified a CGA compatible monitor.

The communication parameters are 2400 baud, COM11.

The REAL TIME DISPLAY SAMPLE RATE is set at 1 sample every 5 sec.

There is a PRESSURE sensor.

PRESSURE will be displayed in decibars.

There is a CONDUCTIVITY sensor.

There is a TEMPERATURE sensor.

There is no DISSOLVED OXYGEN sensor.

DISSOLVED OXYGEN display units not applicable.

There is no PH sensor.

There is no TRANSMISSOMETER.

There is no REDOX sensor.

Water density will be displayed as Specific Gravity.

Data log time increment is one scan every 60 seconds.

Data log depth increment is one scan every 100 cm.

Sound velocity calculated using Chen & Milleros formula.

Sensor Coefficients

	A	B	C	D
Pressure	-6.086856E+02	2.999532E-02	1.215878E-06	1.000000E+01
Temperature	4.104309E+01	-1.478494E-03	1.807922E-06	1.000000E+01
Conductivity	-1.588024E+00	7.944621E-05	0.000000E+00	1.000000E+01

Created = 02-11-1993

Time sec.	Temp °C	Depth c.	Conc mS/cm	Salin ppt	Sp Grav	End Vel m/s
521	18.571	0.61	46.89	35.35	1.025400	1517.6
521	18.572	1.62	46.93	35.38	1.025400	1517.9
533	18.569	2.68	46.93	35.38	1.025400	1517.9
537	18.570	3.96	46.93	35.38	1.025400	1517.9
538	18.573	4.97	46.94	35.39	1.025400	1518.0
539	18.571	6.01	46.93	35.38	1.025400	1518.0
542	18.572	7.20	46.94	35.39	1.025400	1518.0
543	18.575	8.54	46.95	35.39	1.025400	1518.0
545	18.575	9.79	46.94	35.39	1.025400	1518.0
546	18.575	10.86	46.95	35.39	1.025400	1518.1
549	18.572	12.11	46.95	35.39	1.025400	1518.1
550	18.575	13.23	46.95	35.39	1.025400	1518.1
554	18.577	14.24	46.95	35.39	1.025400	1518.1
560	18.578	15.43	46.95	35.39	1.025400	1518.1
561	18.577	16.56	46.95	35.39	1.025400	1518.2
562	18.575	17.90	46.96	35.40	1.025400	1518.2
564	18.575	19.03	46.96	35.39	1.025400	1518.2
566	18.577	20.16	46.96	35.40	1.025400	1518.2
567	18.575	21.17	46.95	35.39	1.025400	1518.2
569	18.575	22.20	46.96	35.39	1.025400	1518.3
571	18.574	23.58	46.96	35.39	1.025400	1518.3
571	18.574	24.67	46.95	35.39	1.025400	1518.3
572	18.573	25.68	46.96	35.39	1.025400	1518.3
574	18.508	26.75	46.80	35.32	1.025400	1518.1
576	18.379	27.91	46.74	35.38	1.025500	1517.6
577	18.354	29.19	46.72	35.38	1.025500	1517.7
57	18.334	30.59	46.69	35.38	1.025500	1517.7
577	18.276	32.03	46.53	35.28	1.025400	1517.4
580	18.117	33.06	46.44	35.34	1.025500	1517.1
581	17.889	34.41	46.13	35.28	1.025500	1516.3
582	17.759	35.41	46.05	35.32	1.025600	1516.0
583	17.582	36.67	45.84	35.29	1.025600	1515.5
583	17.479	37.76	45.57	35.15	1.025500	1515.0
584	17.004	38.89	45.23	35.27	1.025700	1513.8
586	16.690	39.96	44.83	35.19	1.025700	1512.8
587	16.102	41.21	44.27	35.21	1.025900	1511.0
588	15.718	42.49	43.97	35.29	1.026000	1509.9
589	15.522	43.87	43.84	35.35	1.026100	1509.4
589	15.465	44.91	43.79	35.35	1.026100	1509.3
590	15.414	46.25	43.76	35.37	1.026200	1509.2
591	15.399	47.65	43.76	35.38	1.026200	1509.1
592	15.393	49.09	43.74	35.37	1.026200	1509.1
593	15.384	50.16	43.74	35.36	1.026200	1509.1
594	15.381	51.19	43.74	35.38	1.026200	1509.2
595	15.360	52.42	43.61	35.28	1.026100	1509.0
595	15.181	53.82	43.51	35.35	1.026200	1508.5

Tir st.	Temp °C	Depth c.	Cond mS/cm	Salin ppt	Sp Grav	End Vel m/s
597	15.119	55.01	43.47	35.37	1.026200	1508.4
599	15.103	56.23	43.37	35.29	1.026200	1508.3
601	14.959	57.30	43.31	35.37	1.026300	1507.9
604	14.963	58.49	43.31	35.37	1.026300	1507.9
605	14.948	59.71	43.30	35.37	1.026300	1507.9
607	14.937	61.09	43.30	35.37	1.026300	1507.9
608	14.932	62.16	43.28	35.36	1.026300	1507.9
611	14.929	63.23	43.29	35.37	1.026300	1507.9
612	14.920	64.39	43.26	35.36	1.026300	1507.9
613	14.894	65.42	43.25	35.37	1.026300	1507.8
618	14.890	66.68	43.25	35.37	1.026300	1507.9
619	14.895	68.05	43.25	35.37	1.026300	1507.9
619	14.894	69.33	43.24	35.36	1.026300	1507.9
621	14.859	70.40	43.23	35.38	1.026300	1507.8
625	14.868	71.41	43.24	35.38	1.026300	1507.9
625	14.866	72.45	43.23	35.37	1.026300	1507.9
626	14.868	73.52	43.23	35.37	1.026300	1507.9
627	14.871	74.68	43.24	35.37	1.026300	1507.9
630	14.861	75.72	43.23	35.37	1.026300	1507.9
631	14.863	76.79	43.23	35.38	1.026300	1507.9
633	14.864	77.80	43.23	35.37	1.026300	1508.0
649	14.864	76.66	43.23	35.38	1.026300	1507.9
650	14.867	75.50	43.23	35.37	1.026300	1507.9
651	14.864	74.47	43.23	35.37	1.026300	1507.9
656	14.870	73.46	43.24	35.38	1.026300	1507.9
660	14.885	72.45	43.24	35.37	1.026300	1507.9
665	14.873	71.35	43.24	35.37	1.026300	1507.9
668	14.867	70.31	43.23	35.37	1.026300	1507.8
673	14.872	69.12	43.24	35.38	1.026300	1507.8
678	14.881	67.84	43.24	35.37	1.026300	1507.8
680	14.889	66.83	43.25	35.38	1.026300	1507.9
685	14.892	65.82	43.26	35.38	1.026300	1507.9
687	14.905	64.78	43.27	35.38	1.026300	1507.9
690	14.922	63.68	43.28	35.38	1.026300	1507.9
693	14.921	62.68	43.29	35.38	1.026300	1507.9
696	14.939	61.67	43.29	35.37	1.026300	1507.9
698	14.924	60.63	43.29	35.38	1.026300	1507.9
702	14.949	59.56	43.31	35.38	1.026300	1507.9
703	14.962	58.55	43.32	35.38	1.026300	1508.0
708	14.985	57.45	43.35	35.38	1.026300	1508.0
709	15.008	56.45	43.38	35.39	1.026300	1508.1
713	15.055	55.35	43.43	35.39	1.026300	1508.2
715	15.087	54.34	43.46	35.39	1.026300	1508.3
717	15.138	53.18	43.51	35.40	1.026200	1508.4
722	15.218	51.99	43.60	35.40	1.026200	1508.7
723	15.305	50.89	43.69	35.41	1.026200	1508.9

STD-12 DATA PRINTOUT FACILITY File name = eric.ne1
 Created = 02-11-1993

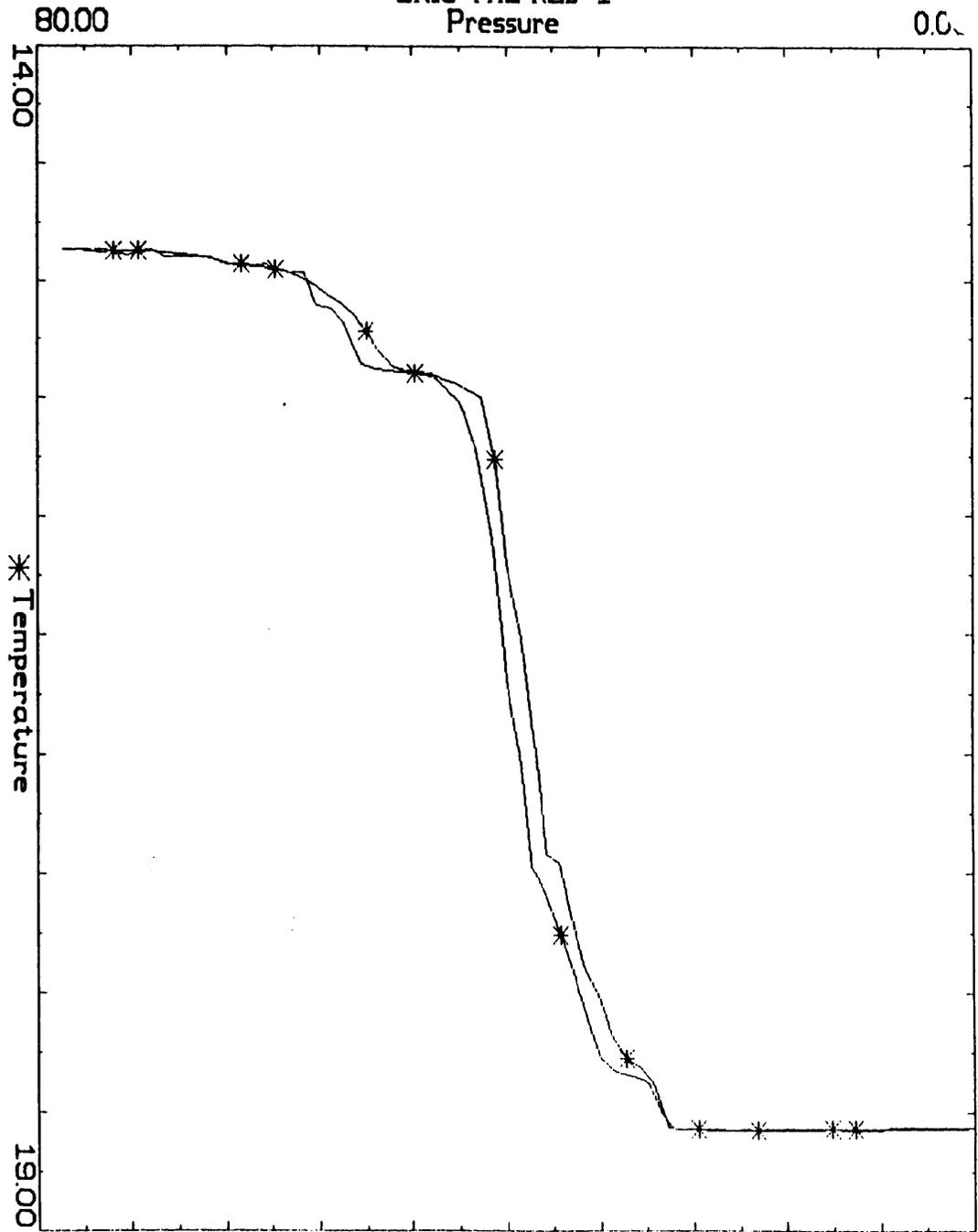
Time sec.	Temp °C	Depth m.	Cond mS/cm	Salin ppt	Sp Grav	Spd Vel m/s
727	15.369	49.67	43.73	35.39	1.026200	1509.1
729	15.386	48.63	43.74	35.38	1.026200	1509.1
732	15.390	47.44	43.75	35.39	1.026200	1509.1
736	15.398	46.28	43.76	35.38	1.026200	1509.1
740	15.423	45.24	43.78	35.39	1.026200	1509.2
742	15.444	44.14	43.81	35.39	1.026200	1509.2
744	15.476	43.07	43.84	35.39	1.026200	1509.3
748	15.501	42.07	43.88	35.40	1.026200	1509.4
750	15.765	41.00	44.17	35.42	1.026100	1510.2
752	16.197	39.99	44.54	35.37	1.026000	1511.5
756	16.521	38.71	45.01	35.50	1.026000	1512.6
758	16.992	37.52	45.56	35.57	1.026000	1514.1
763	17.421	36.48	45.77	35.37	1.025700	1515.1
764	17.459	35.47	45.83	35.40	1.025700	1515.2
767	17.692	34.38	46.08	35.41	1.025700	1515.9
769	17.887	33.34	46.28	35.41	1.025600	1516.5
773	18.017	32.12	46.44	35.43	1.025600	1516.9
778	18.179	30.99	46.64	35.46	1.025600	1517.3
779	18.277	29.80	46.68	35.41	1.025500	1517.5
781	18.313	28.64	46.70	35.40	1.025500	1517.6
785	18.378	27.51	46.84	35.46	1.025500	1517.9
790	18.566	26.23	46.96	35.40	1.025400	1518.3
791	18.569	25.19	46.96	35.40	1.025400	1518.3
797	18.571	24.09	46.96	35.40	1.025400	1518.3
798	18.569	22.63	46.96	35.40	1.025400	1518.3
803	18.574	21.62	46.96	35.40	1.025400	1518.2
806	18.577	20.62	46.96	35.40	1.025400	1518.2
808	18.574	19.40	46.96	35.40	1.025400	1518.2
812	18.577	18.39	46.96	35.40	1.025400	1518.2
814	18.572	17.35	46.96	35.40	1.025400	1518.2
817	18.573	16.31	46.96	35.40	1.025400	1518.2
818	18.570	15.25	46.96	35.40	1.025400	1518.1
820	18.572	14.18	46.96	35.40	1.025400	1518.1
822	18.572	15.28	46.96	35.40	1.025400	1518.1
824	18.574	14.27	46.96	35.40	1.025400	1518.1
825	18.571	13.17	46.96	35.40	1.025400	1518.1
825	18.571	12.08	46.96	35.40	1.025400	1518.1
831	18.573	11.04	46.96	35.40	1.025400	1518.1
832	18.570	10.03	46.96	35.40	1.025400	1518.0
838	18.570	8.81	46.96	35.40	1.025400	1518.0
839	18.574	7.81	46.96	35.40	1.025400	1518.0
843	18.567	6.71	46.96	35.40	1.025400	1518.0
844	18.567	5.56	46.96	35.40	1.025400	1518.0
848	18.568	4.45	46.96	35.40	1.025400	1517.9
851	18.567	3.41	46.96	35.40	1.025400	1517.9
851	18.567	2.25	46.96	35.40	1.025400	1517.9

STD-12 DATA PRINTOUT FACILITY File name = eric.rdl
Created - 02-11-1993

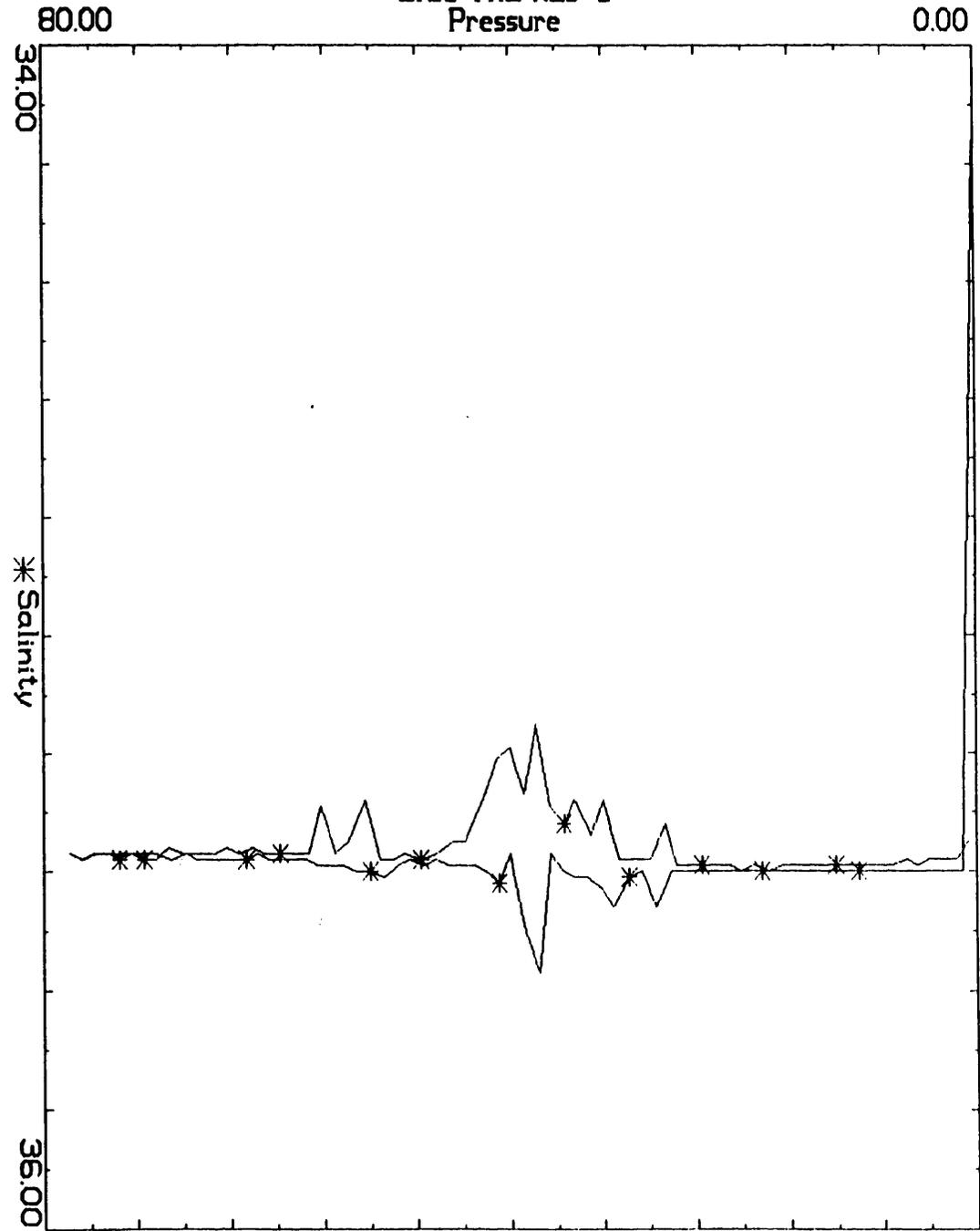
Time sec.	Temp °C	Depth m.	Cond mS/cm	Salin ppt	Sp Grav	Sp Vel m/s
857	18.567	1.10	46.95	35.40	1.025400	1517.9
860	18.566	0.03	45.47	34.16	1.024500	1518.5

age 4

BYFORD D PHIN R/M
ERIC THE RED-1
Pressure



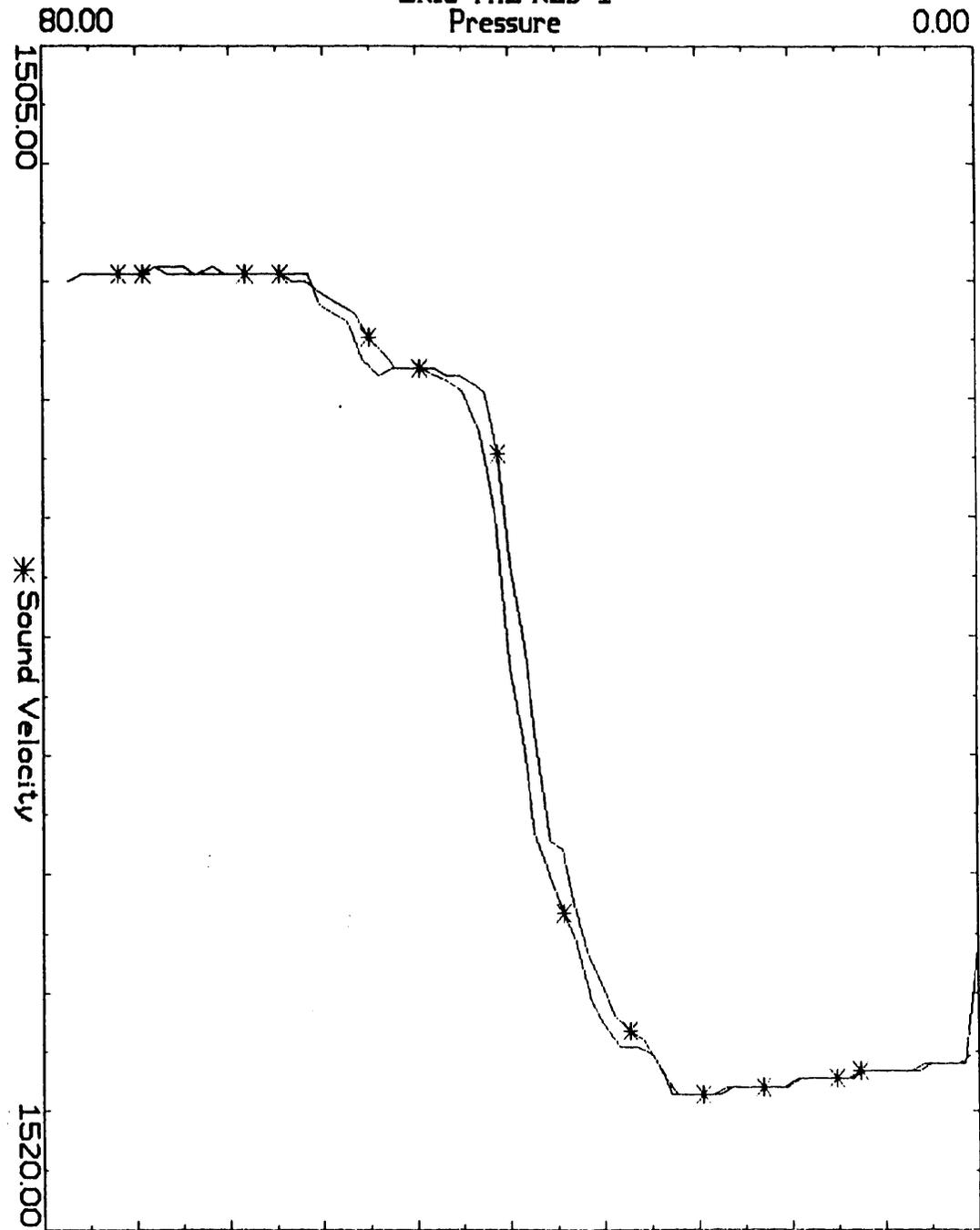
BYFORD DOI IN R/M
ERIC THE KED-1
Pressure



BYFORD DOLP R/M

ERIC THE RED-1

Pressure



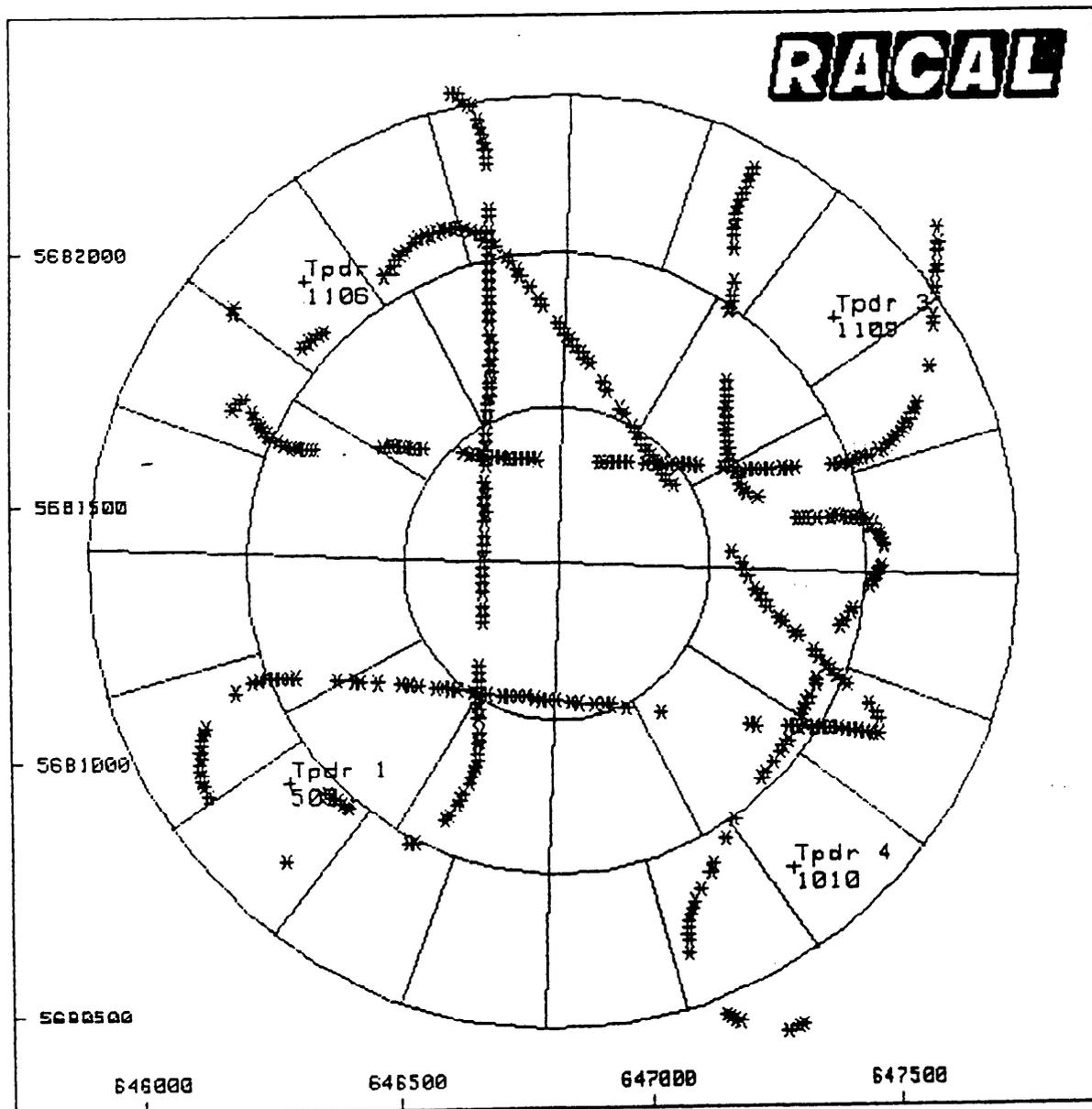
APPENDIX C
ACOUSTIC NET DEPLOYMENT AND
OASIS RELATIVE CALIBRATION PRINTOUTS

RELATIVE CALIBRATION (Calculation)

Speed of Sound Corrections

<u>Tx</u>	<u>Fish</u>	<u>TxDep</u>	<u>Vsnd</u>	<u>Vcor</u>
1	8.3	85.5	1506.1	1.00408
2	8.3	88.9	1505.9	1.00396
3	8.3	87.1	1506.0	1.00402
4	8.3	87.1	1506.0	1.00402

Fix Points for Relative Calibration



Range Residuals for Relative Calibration

No	Obs	Range Residuals				Residual
1	12	----	-.1	.2	.2	.3
2	13	.4	-.4	.1	-.2	.4
3	14	-.2	.1	0.0	.1	.2
4	15	.1	-.1	.1	-0.0	.1
5	16	0.0	0.0	-.2	-.1	.2
6	17	----	-0.0	0.0	0.0	.1
7	18	.1	-.1	0.0	-.1	.1
8	19	-.3	.3	0.0	.3	.4
9	20	0.0	-.1	.1	.1	.1
10	21	-0.0	0.0	.3	.3	.3
11	22	-.1	.1	.1	.2	.2
13	24	0.0	----	.3	.3	.4
14	25	0.0	----	.2	.2	.3
16	27	0.0	----	.2	.2	.2
17	32	----	.1	.1	.2	.3
18	33	----	.1	.1	.1	.1
19	47	.2	----	.2	.2	.4
20	52	-.8	.7	-.8	0.0	.9
21	54	-0.0	-0.0	----	-0.0	.1
22	55	0.0	.1	----	.1	.1
24	58	-.4	-.4	-.2	-.6	.6
25	59	.1	----	0.0	0.0	.1
26	61	0.0	.2	-.1	.1	.2
27	62	----	0.0	-0.0	0.0	.1
28	63	0.0	-.2	.1	-.2	.2
29	64	.1	.1	0.0	.1	.1
30	65	.1	.2	----	.2	.3
31	66	.1	.1	----	.1	.2
32	67	-0.0	.2	-.1	.2	.2
33	68	-.4	-.5	----	-.7	.9
34	70	0.0	-.5	.3	-.4	.5
36	74	.1	.1	----	.2	.3
37	75	.1	.1	----	.1	.2
38	76	-.1	-.1	----	-.1	.2
39	77	.2	.3	----	.3	.5
40	79	-0.0	-.1	----	-.1	.1
41	80	-.2	-.3	----	-.3	.5
42	81	-.2	-.2	----	-.2	.4
43	84	-0.0	-0.0	----	-0.0	.1
44	86	-0.0	-0.0	----	-0.0	0.0
45	87	0.0	0.0	----	0.0	0.0
46	89	0.0	0.0	----	0.0	0.0
47	94	-.2	-.2	----	-0.0	.3
48	95	-0.0	-0.0	----	-0.0	0.0
49	96	-.1	-.1	----	0.0	.1
50	97	0.0	-.1	.2	-.2	.2
51	98	.2	.1	.1	-.1	.2
52	99	-.4	-.3	0.0	.1	.4
53	100	-.2	-.6	.6	-.4	.7
54	103	-.7	-.4	----	.4	.9
55	110	.4	.1	----	-.3	.5
56	111	.3	.1	----	-.3	.5

Range Residuals for Relative Calibration

No	Obs	Range Residuals				Residual
58	113	-.4	-.2	.1	.2	.4
59	114	-.1	-0.0	----	.1	.1
60	115	.2	.2	-.2	----	.3
61	116	-.3	-0.0	0.0	.2	.3
62	117	.2	-0.0	----	-.2	.2
63	118	.4	-0.0	----	-.3	.5
64	119	0.0	-0.0	----	-0.0	.1
65	120	.1	-0.0	----	-.1	.1
66	122	0.0	-0.0	----	-0.0	0.0
67	140	.1	-.1	----	0.0	.2
68	161	-.2	.1	----	-.2	.3
69	162	.5	-.2	----	.4	.6
70	168	.4	-.1	----	.4	.6
71	169	.2	-0.0	----	.2	.3
72	171	.4	0.0	----	.4	.6
73	172	.3	0.0	----	.3	.4
74	173	.1	0.0	----	.1	.1
75	175	.2	.1	----	.3	.3
76	176	.4	-.1	.2	.2	.3
77	177	.1	0.0	----	.1	.2
78	178	.1	-.1	.2	----	.2
79	179	.5	-.4	.5	----	.8
80	180	.1	-.1	.1	----	.2
81	181	-.9	----	-.5	-.6	1.1
82	182	0.0	-0.0	0.0	----	0.0
83	183	.2	-.1	.3	----	.4
84	185	-.5	.1	-.4	-.2	.5
85	186	.2	.2	----	.3	.4
86	187	-.4	.4	-.6	.2	.6
87	188	.1	.1	-0.0	.1	.1
88	189	-.1	-.1	----	-.1	.1
89	190	-.2	-.2	----	-.3	.4
90	191	0.0	0.0	----	0.0	0.0
92	198	0.0	.1	----	.1	.2
93	199	0.0	0.0	----	0.0	.1
94	200	.1	.3	----	.3	.5
95	202	.3	0.0	.3	0.0	.3
96	203	.1	----	.1	-0.0	.2
97	204	.3	.2	.2	.1	.3
98	205	-0.0	.1	-0.0	.1	.1
99	206	.1	-.4	.2	-.4	.5
100	207	-0.0	-0.0	----	-0.0	0.0
103	211	-.1	-.2	-.1	-.1	.2
104	212	-.1	0.0	-.1	.1	.1
105	213	.4	.5	.4	.3	.6
106	214	-.4	-0.0	-.4	.2	.5
107	215	.1	.1	.1	.1	.2
108	216	-0.0	.2	0.0	.2	.2
109	218	-0.0	.2	----	.2	.2
110	219	-.1	-.1	-.1	-0.0	.1
111	220	-.2	-.1	-.2	----	.3
113	222	-.1	-.1	-.1	-0.0	.1
114	224	0.0	0.0	0.0	----	0.0

Range Residuals for Relative Calibration

No	Obs	Range Residuals				Residual
115	225	-.3	.1	-.3	.3	.4
116	226	-.1	.2	-0.0	.2	.2
117	227	-0.0	.3	.1	.2	.3
118	228	----	.2	.1	.2	.3
119	229	0.0	-0.0	0.0	-0.0	0.0
120	230	----	.3	.2	.2	.4
121	231	-.6	-.3	-.7	.3	.7
122	232	.1	.2	.3	----	.4
124	234	----	.2	.1	.1	.2
125	235	-.1	-.1	-.2	.1	.2
126	237	-.1	.1	0.0	.1	.1
127	238	-.2	.5	.2	.3	.5
128	239	-.4	.4	-0.0	.5	.5
129	240	----	0.0	0.0	0.0	0.0
130	241	-.1	.2	.1	.1	.2
131	242	.1	.1	.2	-.1	.1
132	243	0.0	.1	.1	-0.0	.1
133	244	----	0.0	0.0	-0.0	0.0
135	246	0.0	-.1	-0.0	----	.1
136	247	-.3	.2	-.1	.3	.3
137	248	.2	-.1	----	-.1	.3
138	250	-.4	.1	-.3	.5	.5
139	251	.2	-.4	-.3	----	.5
140	256	----	.2	.3	-.3	.5
141	257	-.1	-0.0	-.1	.2	.2
142	258	0.0	0.0	.1	-.1	.1
143	259	-0.0	-.1	-.1	.1	.1
144	260	-.1	.1	0.0	0.0	.1
145	261	.2	-.2	-0.0	-.1	.2
146	262	----	-.1	-.2	.2	.3
147	264	----	.2	.2	-.2	.4
149	266	-.1	-0.0	-.1	.1	.1
150	267	----	-0.0	-.1	.1	.1
151	268	.3	-0.0	.3	-.4	.4
152	322	----	-0.0	0.0	-0.0	0.0
153	323	----	.1	-.1	0.0	.1
154	339	-.2	-.3	.1	----	.4
155	340	0.0	0.0	-0.0	----	0.0
156	341	.3	.3	-.1	----	.4
157	342	.3	.3	-.1	----	.4
158	343	.4	.4	-.1	----	.6
159	344	-0.0	-0.0	0.0	----	0.0
160	345	.3	.3	-.1	----	.4
161	347	.3	.3	-.1	----	.4
162	348	-.1	-.1	0.0	----	.1
163	350	0.0	0.0	-0.0	----	0.0
164	351	.1	.1	-0.0	----	.1
165	352	.2	.2	0.0	----	.3
166	353	0.0	0.0	0.0	----	0.0
168	355	-.1	-.1	-0.0	----	.1
169	368	-.3	-.2	-.2	----	.4
170	369	.4	.3	.3	----	.6
171	370	-.4	-.3	-.3	----	.5

Range Residuals for Relative Calibration

No	Obs	Range Residuals			Residual	
172	371	.1	.1	.1	----	.1
173	372	.1	.1	.1	----	.2
174	373	.3	.2	.2	----	.4
175	374	.1	.1	.1	----	.2
176	375	-.1	-.1	-.1	----	.2
177	382	-0.0	-0.0	-.1	----	.1
178	383	-0.0	-0.0	-0.0	----	0.0
179	384	.2	.1	.2	----	.3
180	385	0.0	0.0	0.0	----	0.0
181	387	-.1	-.1	-.2	----	.2
182	388	-.1	-0.0	-.1	0.0	.1
183	389	.1	0.0	.1	----	.1
184	390	.1	.1	.2	0.0	.2
185	391	.3	.5	.4	.3	.5
186	392	.3	-.3	.1	-.4	.4
187	393	.1	.1	.2	0.0	.2
188	394	-0.0	-.8	-.3	-.7	.8
189	404	----	.3	.2	.3	.4
190	405	----	-.1	-0.0	-.1	.1
191	406	0.0	.3	.2	.2	.3
192	407	----	.1	.1	.1	.2
193	408	.3	0.0	.3	-0.0	.3
194	409	.1	-.5	-.3	-.5	.5
195	412	-.1	.2	0.0	.2	.2
196	413	.3	-.5	-0.0	-.5	.5
197	414	----	-0.0	-0.0	-0.0	0.0
198	415	.2	----	.2	0.0	.3
199	416	-.1	0.0	-.1	----	.2
200	418	-.1	.6	.3	.6	.6
201	419	.1	.1	.2	.1	.2
202	420	-.2	.2	-0.0	.2	.3
203	421	.1	0.0	.1	0.0	.1
204	425	----	-.1	-.2	-.2	.3
205	427	----	-.1	-.2	-.2	.3
206	429	----	-.1	-.2	-.2	.3
207	430	----	-0.0	-.1	-.1	.1
208	431	----	-.2	-.5	-.5	.7
209	432	----	.1	.1	.1	.2
210	434	----	-0.0	-.1	-.1	.2
211	435	----	-.1	-.2	-.2	.3
212	436	----	-.1	-.5	-.5	.7
213	442	----	0.0	-.1	-.1	.1
214	443	----	-.1	.4	.3	.5
215	444	----	0.0	-.1	-.1	.2
216	445	.2	-.3	.5	.3	.5
217	446	.2	-.3	.4	.1	.4
218	447	----	-.1	.3	.2	.4
219	448	----	.1	-.4	-.4	.6
220	449	----	-0.0	0.0	0.0	0.0
221	451	-.1	-0.0	.2	.2	.2
222	452	----	0.0	-0.0	-0.0	0.0
223	453	-.1	0.0	.1	.2	.2
224	454	.1	-0.0	-.1	-.1	.1

Range Residuals for Relative Calibration

No	Obs	Range Residuals				Residual
225	455	-.1	-.1	.2	.2	.3
226	456	0.0	-.2	.3	.2	.3
227	457	----	.3	-.4	-.3	.5
228	458	.1	.1	-.2	-.2	.2
229	459	----	0.0	-.1	-0.0	.1
230	460	----	-.1	.1	.1	.2
231	461	----	0.0	-.1	-0.0	.1
232	462	----	-0.0	0.0	0.0	0.0
233	468	----	-.1	.1	0.0	.2
234	474	----	.1	-.1	-0.0	.2
236	479	----	-.6	.7	-.2	.9
237	481	----	.2	-.2	.1	.3
238	482	----	.2	-.2	.1	.3
239	484	----	.1	-.2	.1	.2
240	485	----	.1	-.2	.1	.3
242	506	----	0.0	-.2	.1	.2
243	545	----	0.0	0.0	-0.0	0.0
244	546	----	-0.0	-.1	.1	.1
245	547	----	.2	.3	-.3	.5
246	549	----	-.1	-.3	.2	.4
247	550	----	-.1	-.2	.2	.3
248	551	-.1	.3	.4	-.2	.4
249	552	----	-.1	-.2	.2	.3
250	553	-0.0	----	-.1	.1	.1
251	554	.1	-.1	-.1	----	.2
252	555	-.1	.2	.1	----	.2
254	562	-0.0	0.0	0.0	----	0.0
255	564	-.3	-.1	-.3	.3	.4
256	565	-.3	.2	0.0	.2	.3
257	566	-.2	.3	.1	.1	.2
259	577	----	-.2	-.2	-.2	.3
260	578	.2	0.0	.3	----	.3
261	579	----	.2	.3	.2	.4
262	580	.2	.1	.3	.1	.3
263	581	-0.0	.6	.6	.6	.7
265	583	-.2	0.0	-.2	----	.3
266	584	.2	-.3	-.1	-.3	.3
267	585	.6	-.4	.3	-.3	.6
268	586	.4	-.2	.3	-.1	.4
269	587	-.2	.2	-0.0	.2	.2
270	588	----	.3	.4	.4	.7
271	589	-.1	.3	.2	.3	.3
272	590	-0.0	-.1	-.2	-.2	.2
273	591	.7	-.5	.3	-.3	.7
275	593	----	.1	.2	.2	.3
276	594	----	.3	.4	.5	.7
277	595	----	.1	.2	.2	.3
279	605	0.0	----	0.0	0.0	0.0
280	606	-.5	.5	-0.0	.4	.6
281	607	-.2	.2	-.1	.1	.3
282	609	-.2	.2	-.3	-.1	.3
283	611	0.0	----	-.3	-.3	.5
284	612	.2	-.1	-.3	-.5	.4

Range Residuals for Relative Calibration

	<u>No Obs</u>	<u>Range Residuals</u>				<u>Residual</u>
	286 615	.5	-.6	.5	---- |	.9
	287 616	.3	-.3	.1	-.2 |	.4
	288 617	.1	-.1	.2	.1 |	.2
	289 618	-0.0	-0.0	.1	.1 |	.1
	290 619	0.0	----	-0.0	-0.0 |	0.0
	291 620	-0.0	----	0.0	0.0 |	0.0
	292 622	----	-0.0	.1	.1 |	.1
	293 623	-.2	.2	-.1	.1 |	.2
	294 624	----	.2	-.4	-.3 |	.5
	295 625	----	.1	-.2	-.1 |	.2
	296 626	----	-.2	.4	.3 |	.5
	297 631	----	-.1	.2	.2 |	.3
	298 632	----	-.2	.4	.3 |	.5
	299 633	----	-.1	.2	.1 |	.2
	300 634	----	-0.0	0.0	0.0 |	0.0
	301 635	----	-.1	.2	.1 |	.2
	302 636	----	.3	-.7	-.6 |	1.0
	303 637	----	0.0	-0.0	-0.0 |	0.0
	304 643	.1	----	-.5	-.5 |	.8
	305 644	-0.0	----	.1	.1 |	.1
	306 646	-.3	.3	-.2	.1 |	.3
	307 647	----	-0.0	.2	.2 |	.3
	308 657	-0.0	----	0.0	0.0 |	0.0
	309 658	0.0	----	-.1	-.1 |	.1
	310 660	-0.0	----	-.2	-.2 |	.3
	311 661	-0.0	----	-.1	-.1 |	.2
	312 662	-0.0	----	-.1	-.1 |	.2
	313 663	0.0	----	0.0	0.0 |	0.0
	314 667	0.0	----	.1	.1 |	.1
	315 668	.1	----	.3	.3 |	.5
	316 669	-.1	----	-.3	-.3 |	.5
	317 671	-.1	.1	-0.0	.1 |	.1
	318 673	-0.0	-0.0	-.1	-.1 |	.1
	319 674	0.0	----	.1	.1 |	.1
	320 681	-.4	----	-.2	-.4 |	.6
	321 684	0.0	----	0.0	0.0 |	0.0
	322 688	-.5	----	.1	-.6 |	.7
	323 689	0.0	----	-0.0	0.0 |	.1
	324 692	-.5	.2	----	-.4 |	.7
	325 694	-.3	.3	-.1	-.1 |	.3
	326 695	-.3	-0.0	.2	-.4 |	.4
	327 696	-.6	.5	-.1	-.3 |	.6
	328 697	-.2	.3	-.2	0.0 |	.3
	329 698	.2	-.1	----	.1 |	.2
	330 699	.4	-.3	----	.2 |	.5
	331 700	-.3	.2	----	-.2 |	.4
	332 702	.2	-.2	----	.1 |	.3
	333 714	-0.0	----	0.0	-0.0 |	.1
	334 715	.1	----	-.2	.2 |	.3
	335 716	-0.0	----	.2	-.2 |	.2
	336 717	.1	----	-.6	.6 |	.9
	337 727	-0.0	----	-.9	.9 |	1.2
	338 729	-0.0	----	-.4	.4 |	.6

Range Residuals for Relative Calibration

No	Obs	Range Residuals				Residual
339	730	0.0	----	.1	-.1	.1
340	780	-0.0	----	0.0	0.0	0.0
341	781	-0.0	----	0.0	0.0	.1
342	783	-0.0	----	.1	.1	.1
343	788	.1	----	-.2	-.3	.4
344	789	-.1	----	.2	.2	.3
345	790	.1	----	-.5	-.5	.7
347	792	0.0	----	-.2	-.2	.2
348	794	0.0	----	-.7	-.7	.9
349	795	-0.0	----	.1	.1	.1
351	799	-0.0	----	-.3	-.3	.4
352	801	-0.0	----	-.2	-.1	.2
353	802	.1	----	.2	.2	.3
354	804	-0.0	----	-.1	-.1	.1
355	805	.1	----	.2	.2	.3
356	806	-0.0	----	-.1	-.1	.1
357	807	.1	----	.1	.1	.2
358	809	-0.0	----	-0.0	-0.0	.1
359	810	.1	----	.1	.1	.2
360	811	-0.0	----	-0.0	-0.0	0.0
361	813	----	-.1	-.1	-.1	.2
362	825	----	-.2	-.2	-.3	.4
363	826	----	-.1	-.1	-.1	.1
364	827	-.6	-.1	-.6	-.1	.6
365	828	.1	-.5	-.3	-.5	.6
366	829	----	-.2	-.1	-.2	.3
367	830	-.1	-0.0	-.1	-0.0	.1
368	831	.3	-.5	-.1	-.5	.5
369	832	.2	0.0	.2	----	.3
370	833	-.2	-.1	-.2	-.1	.2
371	834	.4	-.2	.3	-.3	.4
372	835	-.1	0.0	-0.0	0.0	.1
373	837	----	-.1	-.1	-.1	.2
375	841	-.1	-.1	-.1	----	.2
376	842	----	-.1	-0.0	-0.0	.1
377	845	----	-.1	-.1	-.1	.2
378	846	-.2	-.1	-.2	.1	.2
379	847	-.4	.1	-.3	.3	.4
380	848	-.5	.2	-.3	.5	.6
381	849	-0.0	-.1	-.1	0.0	.1
382	850	-.1	-.4	-.4	----	.6
383	851	.2	-.2	----	-.2	.3
385	855	0.0	0.0	0.0	----	0.0
386	856	0.0	.1	.1	----	.1
387	858	0.0	-.1	-.1	----	.2
388	860	-0.0	.1	.1	----	.2
389	861	0.0	-.1	-.1	----	.1
390	862	.1	.1	.2	-.1	.2
391	863	.2	-.2	0.0	-.2	.2
392	865	.1	-.3	-.2	-0.0	.3
393	866	.1	.2	.3	-.3	.3
394	867	0.0	-0.0	-0.0	----	0.0
396	869	0.0	0.0	0.0	-0.0	0.0

Range Residuals for Relative Calibration

No	Obs	Range Residuals				Residual
397	870	-.2	0.0	-.1	.2	.2
399	872	.3	-.5	-.4	----	.7
400	873	0.0	-0.0	-0.0	----	0.0
401	874	-0.0	0.0	0.0	----	.1
402	875	0.0	-.1	-0.0	----	.1
403	876	.1	-.1	-.1	----	.2
404	877	-.1	.1	.1	----	.2
405	878	-.2	-.1	-.3	.3	.3
406	879	0.0	-0.0	-0.0	----	0.0
407	881	-.1	.2	.2	----	.3
408	882	.4	-.2	.1	-.4	.4
409	883	.1	-.1	0.0	-.1	.1
410	884	.1	-.3	-.3	----	.4
411	886	0.0	-.2	-.2	----	.3
412	898	.1	-.5	.2	-.6	.5
413	899	.2	.6	-.1	.3	.5
415	901	----	.1	-.1	.1	.1
416	902	-0.0	-.1	-0.0	----	.1
417	913	-.1	-.1	.1	----	.2
418	914	-.4	-.5	.3	----	.7
419	915	-0.0	-0.0	0.0	----	0.0
420	992	-.3	0.0	----	-.2	.3
421	993	----	.2	-.3	.2	.4
422	994	-.4	.2	-.2	-.1	.4
423	995	.4	-.4	.3	----	.6
424	996	-.1	.1	-.1	0.0	.2
425	997	.4	-.7	.7	-.3	.8

Means : 0.00 -0.00 -0.00 .01
sds : .22 .22 .23 .24

Total Solution St.Err.: .36

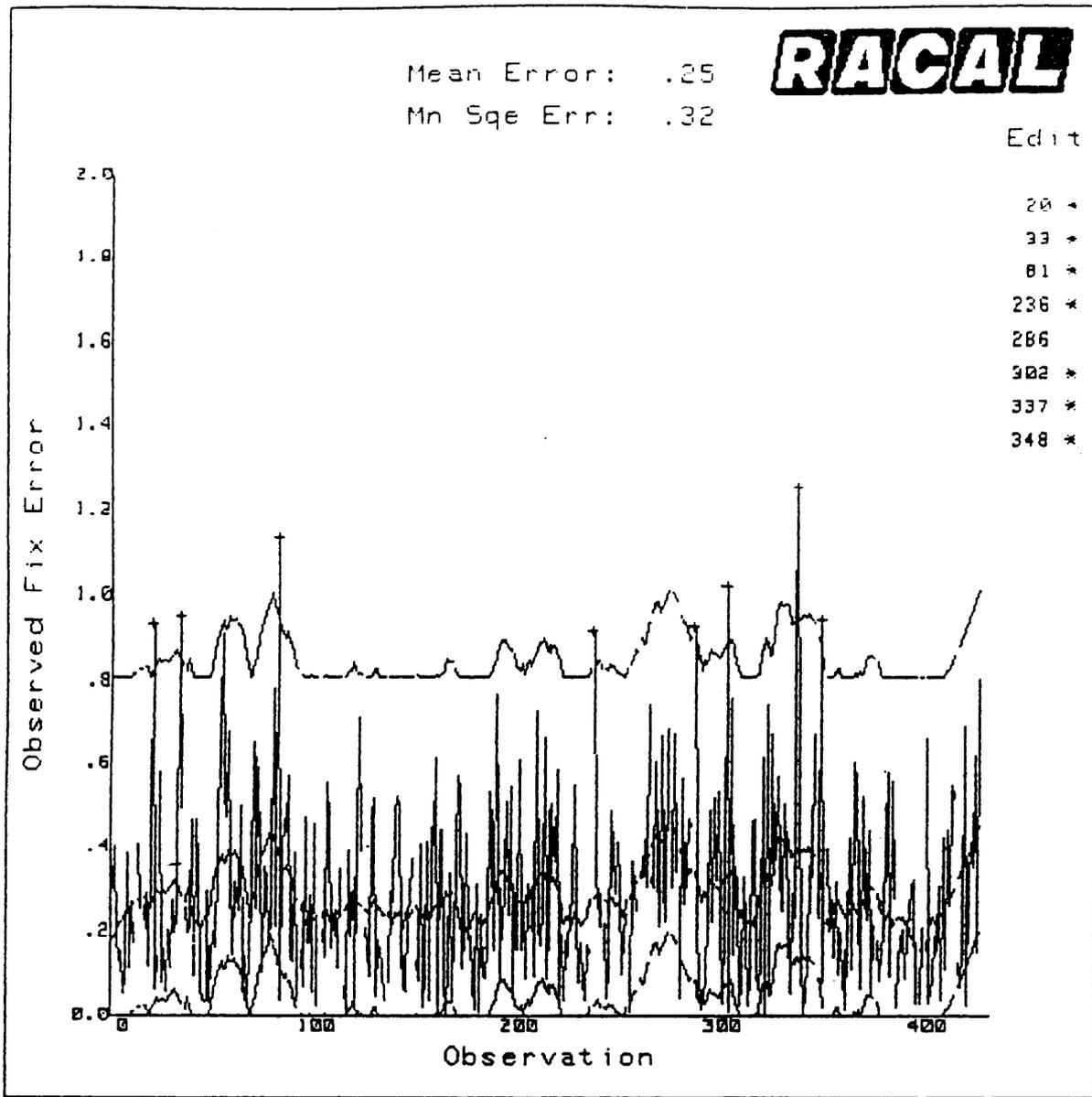
Worst 8 Observations : 337 1.25
: 81 1.13
: 302 1.02
: 33 .95
: 348 .94
: 20 .93
: 286 .92
: 236 .91

Acoustic Net Positions After Relative Calibration

Transponder	X coord	Y coord	Depth
1	0.00	0.00	89.62
2	982.49	-0.00	89.96
3	948.76	-1056.61	88.02
4	-144.32	-1018.92	89.49

(in metres)

Fix Points for Relative Calibration



Statistics for Transponder 1

<u>Interval</u>	<u>Count</u>	<u>Mean</u>	<u>Standard Error</u>
0- 200	15	-.02	.26
200- 400	38	-.03	.30
400- 600	25	-.01	.19
600- 800	51	-.01	.23
800-1000	48	.05	.24
1000-1200	108	0.00	.18
1200-1400	27	-.02	.19

Statistics for Transponder 2

<u>Interval</u>	<u>Count</u>	<u>Mean</u>	<u>Standard Error</u>
0- 200	8	.04	.30
200- 400	52	-.03	.21
400- 600	59	-.01	.20
600- 800	36	.05	.20
800-1000	84	.02	.23
1000-1200	45	.03	.23
1200-1400	45	-.02	.16
1400-1600	14	-.03	.24

Statistics for Transponder 3

<u>Interval</u>	<u>Count</u>	<u>Mean</u>	<u>Standard Error</u>
200- 400	67	-.03	.26
400- 600	72	.03	.23
600- 800	79	.03	.21
800-1000	63	-.02	.19
1000-1200	37	.01	.19
1200-1400	15	-.11	.29
1400-1600	9	.20	.34

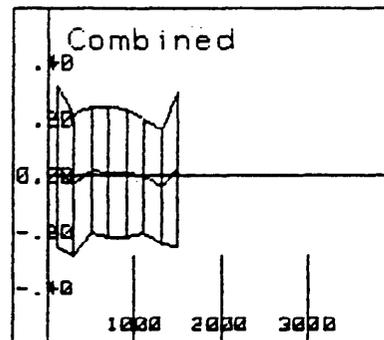
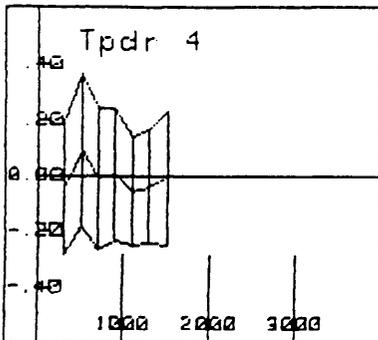
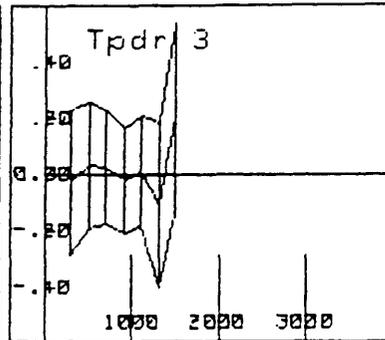
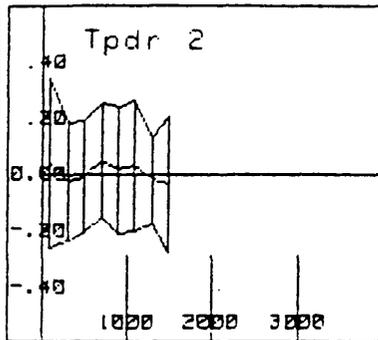
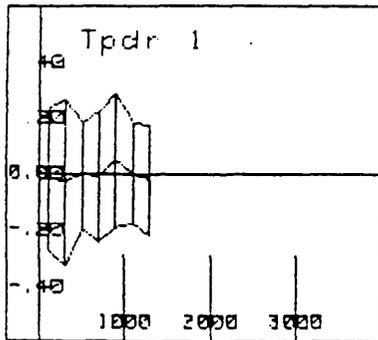
Statistics for Transponder 4

<u>Interval</u>	<u>Count</u>	<u>Mean</u>	<u>Standard Error</u>
200- 400	49	-.05	.24
400- 600	25	.09	.27
600- 800	66	-.01	.25
800-1000	89	.01	.24
1000-1200	37	-.06	.19
1200-1400	34	-.04	.20
1400-1600	19	-.01	.24

Statistics for All Transponders

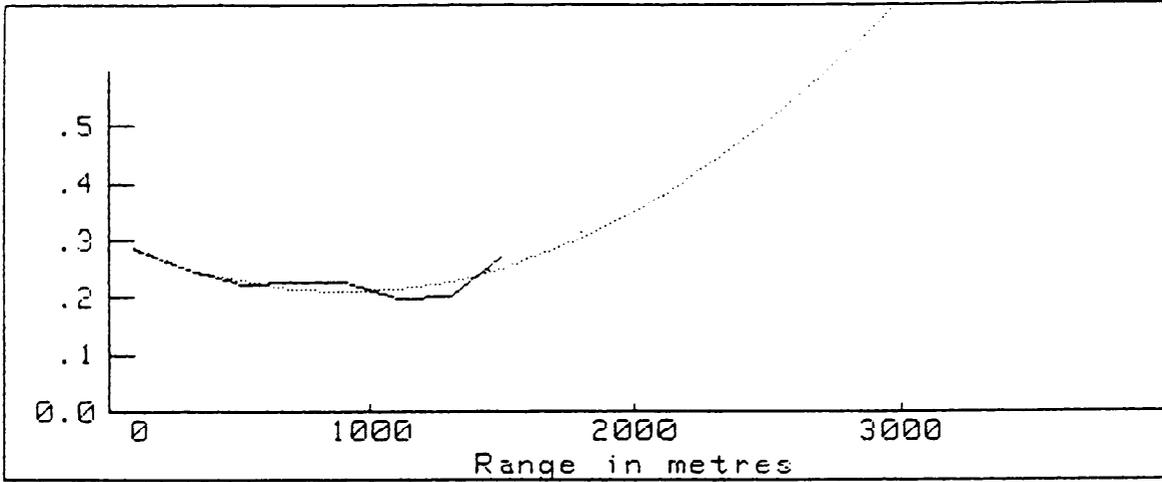
<u>Interval</u>	<u>Count</u>	<u>Mean</u>	<u>Standard Error</u>
0- 200	27	.04	.28
200- 400	206	-.03	.25
400- 600	181	.02	.22
600- 800	232	.01	.23
800-1000	284	.01	.23
1000-1200	227	-0.00	.20
1200-1400	121	-.04	.20
1400-1600	46	.02	.27

TRANSPONDER STATISTICS

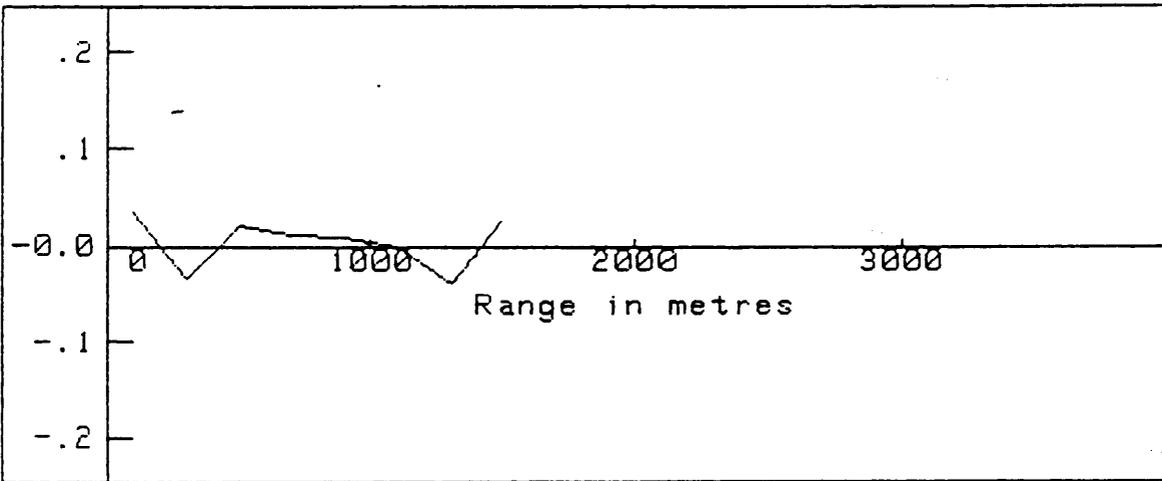


STANDARD ERROR

RACAL



BIAS v RANGE



APPENDIX D

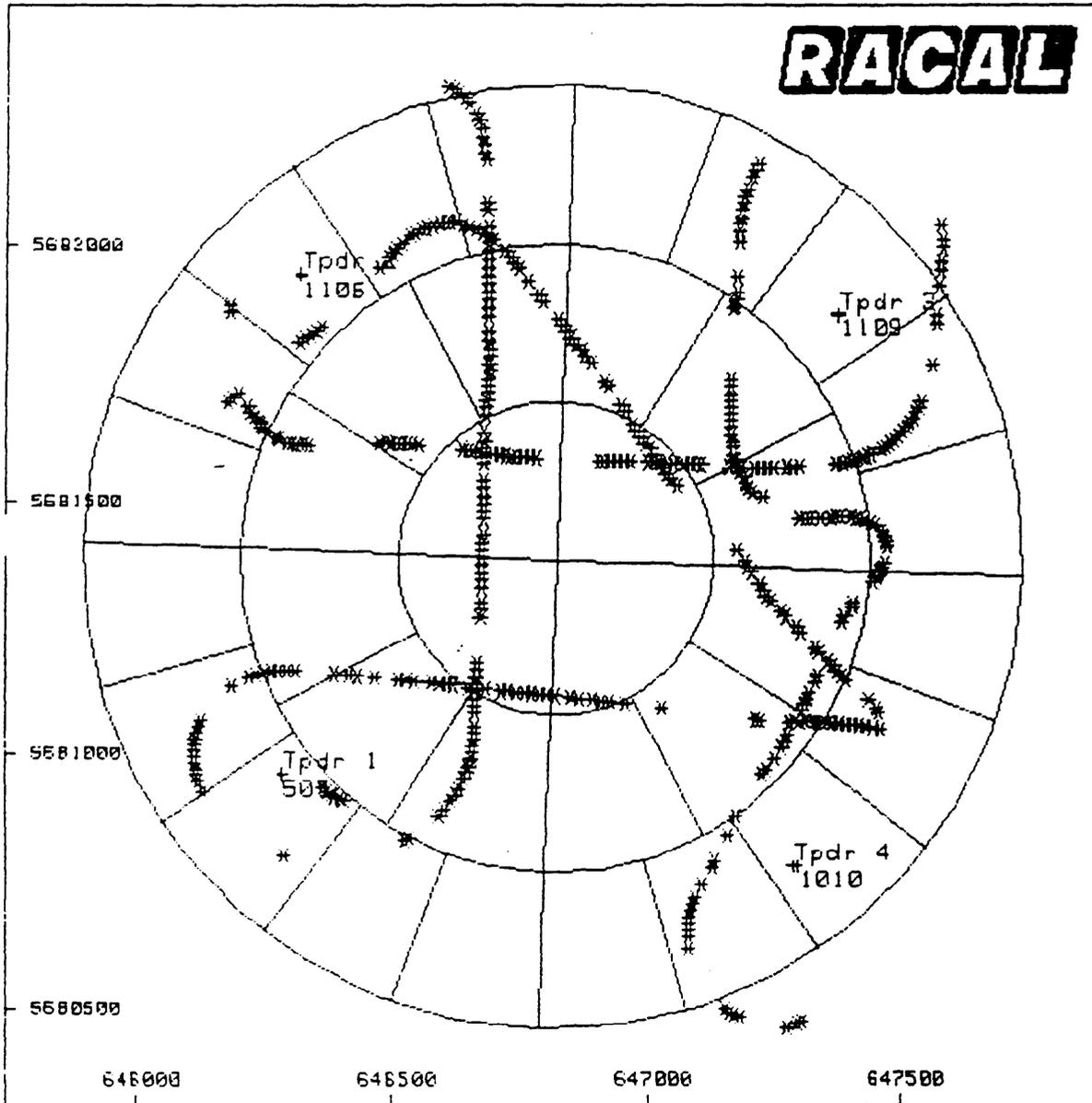
OASIS ACOUSTIC ABSOLUTE CALIBRATION PRINTOUTS

ABSOLUTE CALIBRATION (Calculation)

Speed of Sound Corrections

T _A	Fish	T _x Dep	V _{snd}	V _{cor}
1	8.3	89.6	1505.9	1.00394
2	8.3	90.0	1505.9	1.00393
3	8.3	88.0	1506.0	1.00399
4	8.3	89.5	1505.9	1.00395

Fix Points for Absolute Calibration



Origin at E 646284.83 N 5680953.07 with axis at -87.99 deg.

Fix Residuals For Absolute Calibration

No	Obs	<u>dx</u>	<u>dy</u>	<u>Residual</u>	
1	12	-2.64	1.84	3.22	
2	13	-3.10	2.27	3.84	
3	14	-3.29	1.65	3.68	
13	24	-2.40	1.29	2.72	
14	25	-3.31	-.78	3.40	
15	26	-1.02	.52	1.14	
16	27	-1.70	-1.37	2.18	
17	32	-2.29	1.35	2.65	
18	33	-1.37	.77	1.57	
19	47	-1.73	.06	1.73	
20	52	-2.52	.16	2.52	
21	54	-1.85	1.48	2.37	
22	55	-1.36	1.86	2.31	
24	58	-.96	1.82	2.06	
25	59	-1.67	1.47	2.23	
26	61	-.79	.65	1.02	
27	62	-.37	.52	.64	
28	63	-1.84	-0.00	1.84	
29	64	-1.27	.67	1.43	
30	65	-.51	.58	.77	
32	67	-2.03	1.60	2.58	
33	68	-.61	-1.19	1.33	
34	70	-.68	1.12	1.31	
35	72	-.81	.52	.97	
36	74	-.98	1.88	2.11	
37	75	-1.33	.64	1.48	
38	76	-.61	.69	.92	
39	77	-2.56	.18	2.57	
40	79	-2.55	.40	2.58	
43	84	-.60	.99	1.16	
44	86	.10	2.08	2.08	
45	87	-.30	1.48	1.51	
46	89	-2.25	1.10	2.51	
47	94	-1.39	1.53	2.07	
48	95	-1.40	1.11	1.78	
49	96	-2.04	.86	2.21	
50	97	-2.42	1.34	2.77	
51	98	-1.36	.85	1.61	
52	99	-1.23	.69	1.42	
53	100	-1.23	.69	1.41	
55	110	-1.15	-.93	1.48	
56	111	-.24	-1.27	1.29	
57	112	-.57	-1.73	1.82	
58	113	2.26	-2.86	3.65	
59	114	3.55	-1.88	4.02	
63	118	3.57	-1.89	4.04	
67	140	3.18	.90	3.31	
70	168	.91	1.48	1.74	
71	169	1.03	2.52	2.72	
72	171	.40	2.93	2.96	

Fix Residuals For Absolute Calibration

<u>No</u>	<u>Obs</u>	<u>dx</u>	<u>dy</u>	<u>Residual</u>	
73	172	-.69		3.49	3.56
74	173	.63		2.87	2.94
75	175	.09		2.54	2.54
76	176	-.27		1.97	1.99
77	177	-.76		.91	1.19
78	178	.46		3.45	3.48
79	179	-1.39		2.33	2.72
80	180	-1.03		2.59	2.78
82	182	-.44		1.61	1.67
83	183	-1.04		2.00	2.25
84	185	-.50		3.00	3.04
85	186	.20		1.75	1.76
86	187	-1.39		2.00	2.43
87	188	-.42		.70	.82
88	189	-.66		3.23	3.29
89	190	-.73		.62	.96
90	191	.11		2.89	2.89
93	199	.14		2.97	2.97
94	200	-1.04		2.39	2.61
95	202	.02		3.28	3.28
96	203	-1.44		.94	1.72
97	204	-1.09		2.47	2.70
98	205	-1.70		1.44	2.23
99	206	-.65		2.75	2.82
100	207	.60		1.95	2.04
101	208	.75		.41	.86
102	209	1.30		.10	1.31
103	211	-.52		2.19	2.25
104	212	.62		1.63	1.74
105	213	-1.10		.87	1.40
106	214	-.81		1.37	1.59
107	215	-.55		1.47	1.57
108	216	-1.14		-.25	1.17
109	218	-.24		.50	.55
110	219	-.28		2.13	2.14
111	220	-1.09		-.11	1.09
112	221	2.36		-1.91	3.03
113	222	1.59		1.05	1.90
114	224	1.15		1.36	1.78
115	225	.01		2.28	2.28
116	226	1.10		1.95	2.24
117	227	.63		1.53	1.66
118	228	.57		1.69	1.79
119	229	.34		1.69	1.72
120	230	.13		1.79	1.79
121	231	-1.36		2.01	2.43
122	232	-.30		2.18	2.20
123	233	1.12		1.86	2.17
124	234	-1.14		1.24	1.68
125	235	-.78		2.38	2.50
126	237	-1.29		2.12	2.48
127	238	-1.46		2.38	2.79
128	239	-.81		2.47	2.60

Fix Residuals For Absoute Calibration

<u>No</u>	<u>Obs</u>	<u>dx</u>	<u>dy</u>	<u>Residual</u>
129	240	-.79	1.49	1.69
130	241	-.04	2.65	2.65
131	242	-.47	2.51	2.56
132	243	-1.11	3.09	3.28
133	244	-1.47	2.13	2.59
135	246	-.45	2.27	2.31
136	247	-1.03	1.98	2.23
137	248	-.41	.33	.53
138	250	-.70	1.50	1.65
139	251	-.61	.59	.85
140	256	-1.82	2.31	2.94
141	257	-2.38	1.87	3.03
142	258	-2.80	1.81	3.33
143	259	-3.04	1.11	3.24
144	260	-3.40	.99	3.54
145	261	-3.56	.48	3.60
152	322	.91	-1.45	1.71
153	323	1.42	-2.02	2.47
158	343	1.85	-2.55	3.15
159	344	1.98	-2.13	2.91
160	345	.78	.27	.82
161	347	2.96	1.76	3.44
162	348	2.85	-.77	2.95
163	350	3.07	-.07	3.07
165	352	1.87	.44	1.92
166	353	3.37	.73	3.45
169	368	-.09	2.35	2.35
170	369	3.15	.75	3.24
171	370	3.12	.43	3.14
172	371	3.43	-.41	3.45
173	372	2.25	-.25	2.27
174	373	2.97	-2.01	3.58
175	374	2.33	-.58	2.40
176	375	3.12	-.50	3.16
177	382	2.64	.32	2.66
178	383	3.60	-1.71	3.99
179	384	2.18	-.71	2.29
180	385	2.98	-.56	3.04
181	387	2.50	-1.36	2.85
183	389	3.16	-2.00	3.74
184	390	2.73	-1.64	3.19
185	391	2.51	.11	2.51
186	392	1.84	-.94	2.06
187	393	2.00	.57	2.08
188	394	2.30	.88	2.47
189	404	1.75	.11	1.75
190	405	2.07	-.36	2.11
191	406	.93	.75	1.19
192	407	1.93	.53	2.01
193	408	1.79	-.32	1.81
194	409	3.20	-.49	3.24
195	412	2.77	-1.34	3.08
196	413	2.33	-.27	2.35

Fix Residuals For Absolute Calibration

<u>No</u>	<u>Obs</u>	<u>dx</u>	<u>dy</u>	<u>Residual</u>
197	414	1.83	-2.64	3.21
200	418	3.47	-1.86	3.93
209	432	3.08	-.61	3.14
210	434	2.58	-1.45	2.96
212	436	2.03	.20	2.04
213	442	2.64	.87	2.78
216	445	2.20	.61	2.28
217	446	1.52	2.34	2.79
218	447	2.80	1.42	3.14
219	448	2.14	1.22	2.46
220	449	2.13	1.35	2.52
221	451	.89	1.86	2.06
222	452	1.77	-.14	1.77
223	453	.51	2.01	2.07
224	454	1.49	2.00	2.49
225	455	.25	1.50	1.52
226	456	.73	1.93	2.06
227	457	2.28	2.50	3.39
228	458	1.02	2.49	2.69
229	459	1.66	3.05	3.47
230	460	.63	2.75	2.82
231	461	2.06	1.07	2.32
232	462	.53	2.07	2.14
233	468	.65	2.18	2.27
234	474	1.01	1.58	1.87
235	475	.60	3.76	3.81
237	481	1.80	1.08	2.10
238	482	2.54	1.89	3.17
239	484	1.91	.31	1.93
240	485	.89	-1.43	1.68
242	506	-4.10	.17	4.10
243	545	-.56	-1.59	1.69
244	546	-2.57	-2.17	3.36
245	547	-1.87	-3.01	3.54
246	549	-2.87	-1.09	3.07
247	550	-2.07	-1.69	2.67
248	551	-.23	-2.59	2.60
249	552	-1.25	-1.94	2.30
250	553	.31	-3.83	3.84
251	554	-1.04	-2.29	2.52
252	555	-.17	-3.04	3.05
253	557	1.32	-.14	1.33
254	562	-.09	-1.54	1.55
255	564	-1.09	-2.23	2.49
258	567	-1.18	2.98	3.20
259	577	.66	-.62	.91
260	578	-.07	-1.01	1.01
261	579	2.13	-1.28	2.49
262	580	1.14	-1.50	1.88
263	581	1.18	-.98	1.54
264	582	2.69	-2.25	3.51
265	583	.44	-1.62	1.68
266	584	.44	-2.98	3.01

Fix Residuals For Absolute Calibration

<u>No</u>	<u>Obs</u>	<u>dx</u>	<u>dy</u>	<u>Residual</u>	
267	585	.71	-3.76	3.83	
269	587	.88	-3.21	3.32	
270	588	1.01	-3.79	3.92	
271	589	2.19	-3.00	3.72	
272	590	1.10	-3.88	4.03	
288	617	2.32	.43	2.36	
289	618	1.83	-.61	1.93	
290	619	2.38	-1.11	2.62	
291	620	1.60	-.66	1.73	
292	622	-.91	-2.76	2.91	
293	623	-1.12	-1.71	2.04	
294	624	-3.07	-1.92	3.62	
305	644	.78	-3.81	3.89	
306	646	-1.84	-3.31	3.78	
309	658	1.07	-3.82	3.97	
310	660	-.34	-2.11	2.14	
311	661	-2.05	-2.46	3.20	
312	662	-1.78	-1.19	2.14	
313	663	-1.58	-2.12	2.65	
314	667	-.81	-3.02	3.12	
315	668	-.45	-2.58	2.62	
316	669	.02	-2.27	2.27	
317	671	1.37	-1.96	2.39	
318	673	1.80	-.88	2.00	
319	674	-.42	1.97	2.01	
322	688	.61	-3.42	3.48	
323	689	1.36	-4.92	5.10	
324	692	1.46	-3.45	3.75	
325	694	.24	-3.26	3.27	
328	697	.39	-4.00	4.02	
332	702	2.37	-2.85	3.71	
339	730	3.14	1.34	3.42	
340	780	-1.31	-1.64	2.10	
341	781	-1.84	-3.29	3.77	
343	788	-2.26	-.21	2.26	
344	789	-2.83	-2.04	3.49	
345	790	-1.38	-.14	1.39	
346	791	-.97	.90	1.32	
347	792	-.58	-.05	.58	
348	794	-.28	.10	.30	
349	795	-.27	-.59	.64	
350	798	-.51	.87	1.01	
351	799	.99	-.49	1.10	
352	801	-.86	.59	1.04	
353	802	.62	-.55	.82	
354	804	-.96	.60	1.13	
355	805	-.47	.10	.47	
356	806	1.25	-.87	1.52	
357	807	.42	-1.60	1.66	
358	809	1.44	1.08	1.80	
359	810	1.27	1.06	1.65	
360	811	1.29	.76	1.50	
361	813	-.54	1.26	1.37	

Fix Residuals For Absolute Calibration

No	Obs	dx	dy	Residual
362	825	-.68	-.98	1.20
363	826	-1.24	.23	1.26
364	827	-.86	1.13	1.42
365	828	-.52	1.07	1.19
366	829	-.73	1.96	2.09
367	830	-1.27	2.00	2.37
368	831	-.66	1.73	1.86
369	832	-1.92	1.37	2.36
370	833	-1.26	2.58	2.86
371	834	-1.03	2.81	3.00
372	835	.23	.11	.26
373	837	-.64	-1.11	1.28
374	838	-2.35	-2.47	3.41
375	841	-2.55	-1.83	3.14
376	842	-2.71	-1.49	3.09
377	845	-.50	-1.07	1.18
378	846	-.79	-.93	1.23
379	847	.76	-.96	1.22
380	848	-.03	-2.27	2.27
381	849	.64	-.60	.88
382	850	.55	-1.41	1.52
383	851	.74	-1.37	1.55
384	852	1.45	-1.40	2.02
385	855	1.32	-1.63	2.10
386	856	.77	-1.04	1.29
387	858	.73	-.71	1.02
388	860	.52	-.82	.97
389	861	.90	-.71	1.15
390	862	.39	-1.54	1.59
391	863	-.46	-1.67	1.73
392	865	-1.51	-2.18	2.65
393	866	-.69	-1.96	2.08
394	867	-.41	-2.08	2.12
395	868	-.61	-.40	.73
396	869	-.49	-1.57	1.65
397	870	-1.18	-2.37	2.65
398	871	-2.15	2.37	3.21
399	872	-1.47	-.40	1.53
400	873	-1.87	-1.82	2.61
401	874	-1.34	-.88	1.60
402	875	-1.96	-3.03	3.61
403	876	-1.42	-1.80	2.30
404	877	-1.68	-1.27	2.11
405	878	-2.24	.07	2.24
406	879	-2.74	-1.79	3.27
407	881	-1.79	-2.59	3.15
408	882	-2.35	-1.39	2.73
409	883	-2.28	-3.20	3.93
410	884	-1.53	-2.19	2.67
411	886	-1.68	-3.61	3.98
412	898	-2.78	-3.29	4.31
413	899	-3.08	-2.79	4.15
414	900	-3.18	-2.22	3.88

Fig. Residuals For Absolute Calibration

<u>No</u>	<u>Obs</u>	<u>dx</u>	<u>dy</u>	<u>Residual</u>
415	901	-3.02	-2.37	3.83
417	913	.81	-2.47	2.60
418	914	.21	-1.44	1.45
419	915	.81	-2.43	2.56
420	992	1.71	-.89	1.92
421	993	3.94	-1.67	4.28
423	995	.89	3.43	3.55

Xdif Mean: 0.00 with se: 1.70
Xdif Mean: -0.00 with se: 1.87
Total Solution St.Err.= 2.54

Worst 8 Observations : 323 5.10
: 412 4.31
: 421 4.28
: 413 4.15
: 242 4.10
: 63 4.04
: 272 4.03
: 59 4.02

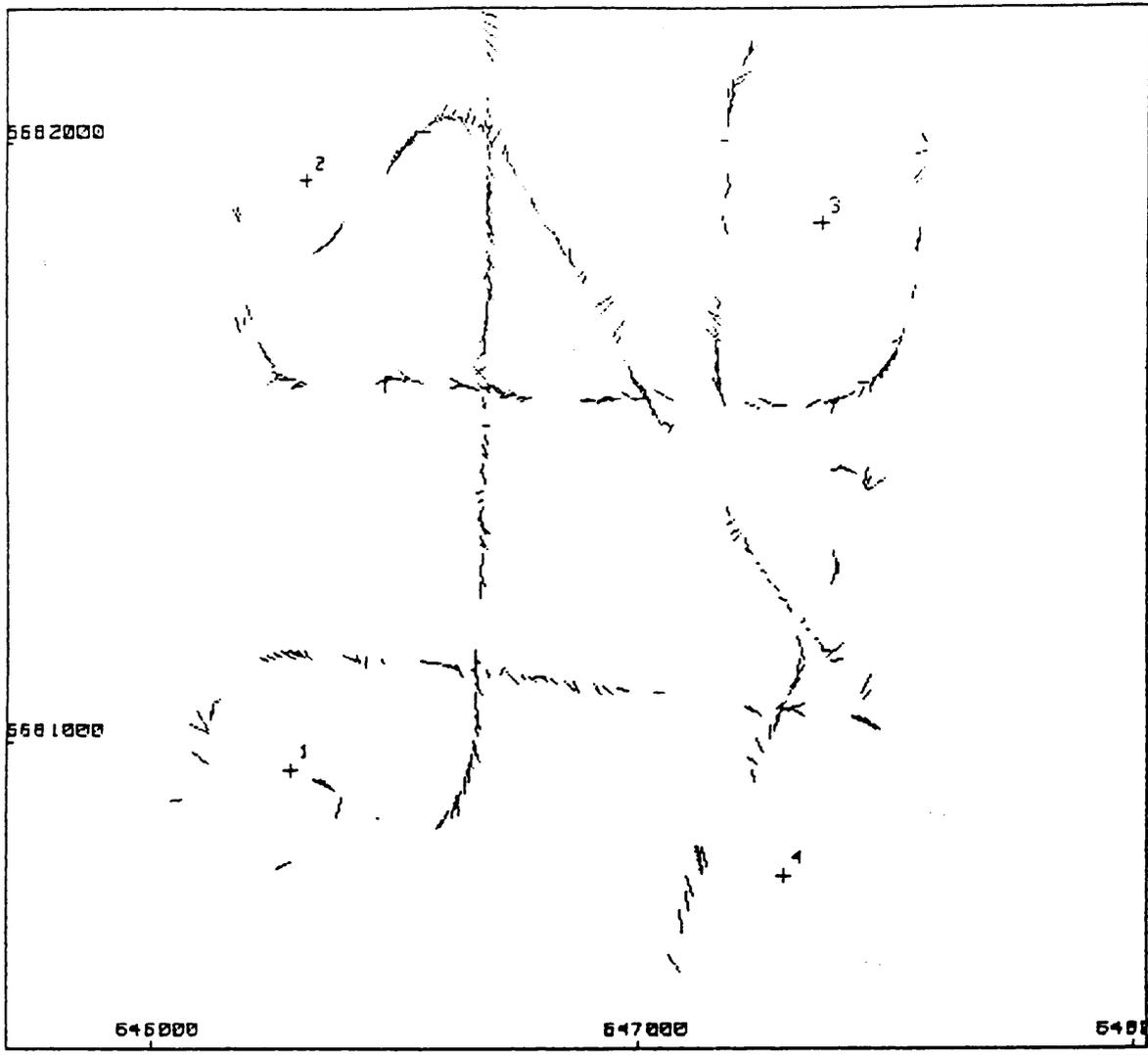
Acoustic Net Positions After Absolute Calibration

Transponder	Easting	Northing	Depth
1	646284.83	5680953.07	89.62
2	646319.23	5681934.96	89.96
3	647374.01	5681864.26	88.02
4	647298.07	5680773.17	89.49

(in metres)

LA BELLA Gyro

RACAL



Fix Points for Absolute Calibration

LA BELLA Gyro

RACAL

68	280.1 1.3			244	1.6 1.5	391	1.6
64	277.8 1.3		199	5.1 1.4		387	101.4 1.6
59	279.2 1.3	112	193.4 1.3	186	.6 1.3	240	1.3 1.5
54	279.4 1.3			177	17.2 1.3	235	359.2 1.5
				172	31.6 1.3	231	.7 1.4
		100	251.1 1.3			227	8.9 1.4
		96	268.0 1.3			222	5.6 1.4
						218	2.0 1.4
32	280.4 1.2	87	278.6 1.3			213	2.8 1.4
24	272.6 1.2					208	4.6 1.4
						204	1.6 1.4
		75	278.6 1.3			199	4.0 1.4
12	282.3 1.2					261	337.4 2.5
						257	355.1 2.5
						248	2.4 1.5
						323	181.6 1.7
						352	54.7 1.7
						347	119.4 1.7
						368	104.9 1.6
						372	102.7 1.6

LA BELLA Gyro

RACAL

455	45.8 1.6		583	184.9 1.6	653	211.3 1.6		795	319.5 999.0
451	61.4 1.6		579	185.5 1.6	658	209.9 1.6		790	317.5 999.0
446	73.5 1.6								
442	86.9 1.6							781	321.4 1.5
					644	217.3 1.6			
432	93.2 1.6								
			557	184.3 1.6					
			552	195.1 1.6	623	163.5 1.6	694	208.5 1.7	
					618	125.3 1.6			
414	99.1 1.6	481	6.1 1.6	547	205.1 1.6				
408	95.3 1.6								
404	84.7 1.6								
		468	9.4 1.6					671	221.8 1.6
		459	29.3			587	173.4 1.6		

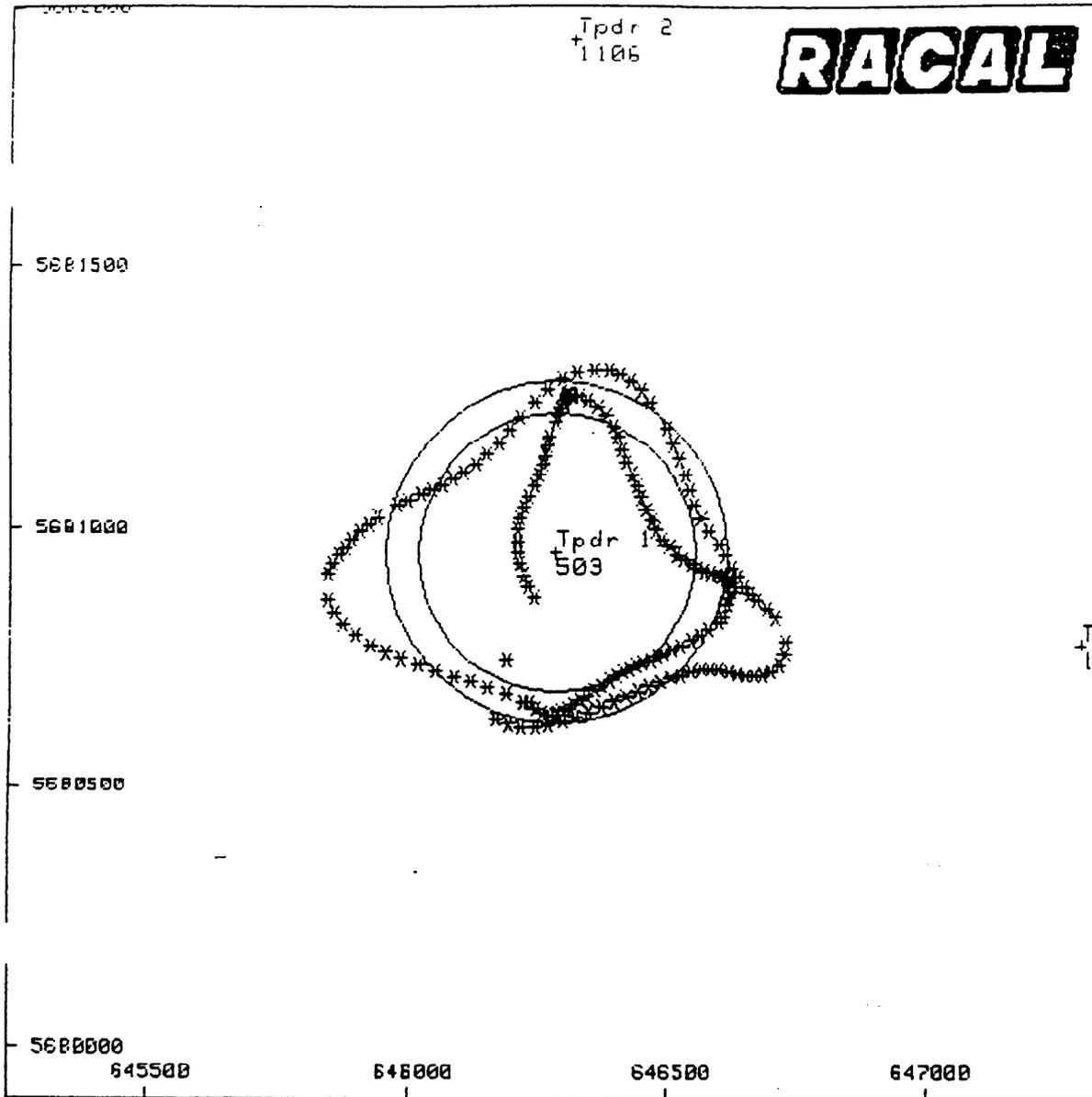
Fix Points for Absolute Calibration

LA BELLA Gyro



840	323.7 1.6			
845	324.7 1.6			
		899	237.5 1.6	
837	328.1 1.5			
832	330.6 999.0			
828	326.4 1.5	893	223.9 1.6	
		878	237.1 1.6	
		874	256.5 1.6	
		870	280.7 1.6	
813	324.1 999.0	866	304.1 1.9	
807	332.8 999.0	881	323.5 1.6	
802	317.5 999.0	855	324.7 1.6	993 130.5 1.7
		813	232.4 1.6	

APPENDIX E
OASIS ACOUSTIC 'BOX-IN' PRINTOUTS



Solution Residuals

<u>No</u>	<u>Residual</u>	<u>Plan Range</u>
1	.6	300.68
2	2.0	295.57
3	.5	296.74
4	.1	303.55
5	-.8	314.68
6	-1.5	328.65
7	-.1	346.48
8	-.8	365.48
9	0.0	385.13
10	1.6	404.19
11	1.2	421.32
12	-.1	435.29
13	.1	445.72
14	-.5	450.36
15	-2.7	441.00
16	-4.6	428.44

Solution Residuals

<u>No</u>	<u>Residual</u>	<u>Plan Range</u>
17	-3.4	417.90
18	-4.0	405.95
19	-1.8	394.64
20	-1.6	381.07
21	-2.1	366.36
22	-2.4	349.82
23	-4.8	316.49
24	-1.6	302.29
25	-1.8	284.60
26	-.9	269.22
27	.1	255.17
28	-.8	242.91
29	.7	235.52
30	-0.0	230.34
31	-.3	230.36
32	.7	237.92
33	1.6	251.23
34	.3	267.56
35	-.9	288.55
36	-.3	310.66
37	.3	331.45
38	3.1	348.24
39	3.5	359.23
40	1.6	363.25
41	-.9	360.99
42	-1.4	354.94
43	-1.8	346.93
44	.1	339.25
45	-.9	317.23
46	-1.2	304.28
47	-1.3	294.77
48	-.6	288.02
49	-.2	281.22
50	1.7	281.82
51	2.8	289.62
52	4.0	302.58
53	.5	316.24
54	2.3	329.45
55	3.3	343.55
56	4.1	358.39
57	6.9	375.67
58	6.8	389.77
59	5.6	406.83
60	5.1	428.73
61	4.3	449.80
62	-.6	479.81
63	-3.1	484.18
64	-4.0	480.91
65	-3.5	473.05
66	-5.7	459.72
67	-5.1	447.84
68	-5.1	433.73
69	-5.0	418.88

Solution Residuals

<u>No</u>	<u>Residual</u>	<u>Plan Range</u>
70	-3.9	404.76
71	-1.7	389.16
72	-1.5	375.46
73	.5	363.35
74	1.3	351.99
75	1.4	341.88
76	.9	332.43
77	.6	324.52
78	-1.2	317.61
79	-1.3	312.70
80	-1.3	311.01
81	-2.2	310.11
82	-1.5	313.06
83	-1.3	317.76
84	-1.2	323.29
85	-.1	330.40
86	-.9	336.70
87	-1.3	342.98
88	-1.6	346.69
89	-3.0	346.29
90	-3.1	343.58
91	2.5	234.94
92	1.0	299.59
93	-.6	307.96
94	.4	315.78
95	-1.3	318.35
96	-2.9	318.19
97	-5.7	314.61
98	-5.3	311.12
99	-5.8	305.18
100	-6.7	298.64
101	-4.5	294.68
102	-2.1	290.94
103	-2.8	283.94
104	-2.7	277.84
105	-.3	274.61
106	0.0	271.04
107	-.5	267.53
108	.2	267.56
109	1.1	269.24
110	1.5	270.08
111	3.6	275.97
112	3.4	281.27
113	4.1	286.11
114	4.3	291.84
115	3.7	298.75
116	3.4	306.65
117	3.1	314.70
118	1.2	322.70
119	-0.0	330.55
120	-6.7	336.30
121	-6.4	340.88
122	-2.9	343.41

Solution Residuals

<u>No</u>	<u>Residual</u>	<u>Plan Range</u>
123	-1.1	346.46
124	-2.3	344.69
125	-2.8	342.81
126	-4.3	339.53
127	-4.6	336.70
128	-4.4	332.96
129	-4.4	327.59
130	-3.7	318.76
131	-2.4	310.14
132	-2.8	298.51
133	-1.8	286.27
134	-2.5	273.07
135	-3.8	257.78
136	-3.2	244.12
137	-2.1	230.17
138	-1.3	217.04
139	-1.0	205.16
140	.3	197.12
141	-.3	191.33
142	.7	191.66
143	.5	194.03
144	0.0	198.59
145	.9	208.43
146	.8	219.51
147	1.2	234.96
148	1.9	251.65
149	.8	265.98
150	.6	278.97
151	.5	289.15
152	.4	297.41
153	-.4	300.69
154	-2.1	299.39
155	-4.5	297.74
156	-5.5	297.45
157	-5.8	296.35
158	-5.8	295.39
159	-6.0	292.67
160	-6.1	287.83
161	-4.9	283.90
162	-5.4	276.76
163	-5.5	267.93
164	-5.5	257.64
165	-4.7	246.12
166	-3.1	218.85
167	-2.1	202.52
168	-.8	185.51
169	-.6	167.12
170	1.0	150.28
171	.9	133.28
172	-1.4	116.71
173	3.1	108.54
174	-.2	94.64
175	.7	86.18

Solution Residuals

<u>No</u>	<u>Residual</u>	<u>Plan Range</u>
176	-1.4	78.12
177	-.3	75.64
178	.2	75.84
179	-3.6	74.65
180	-1.8	84.17
181	.8	98.26

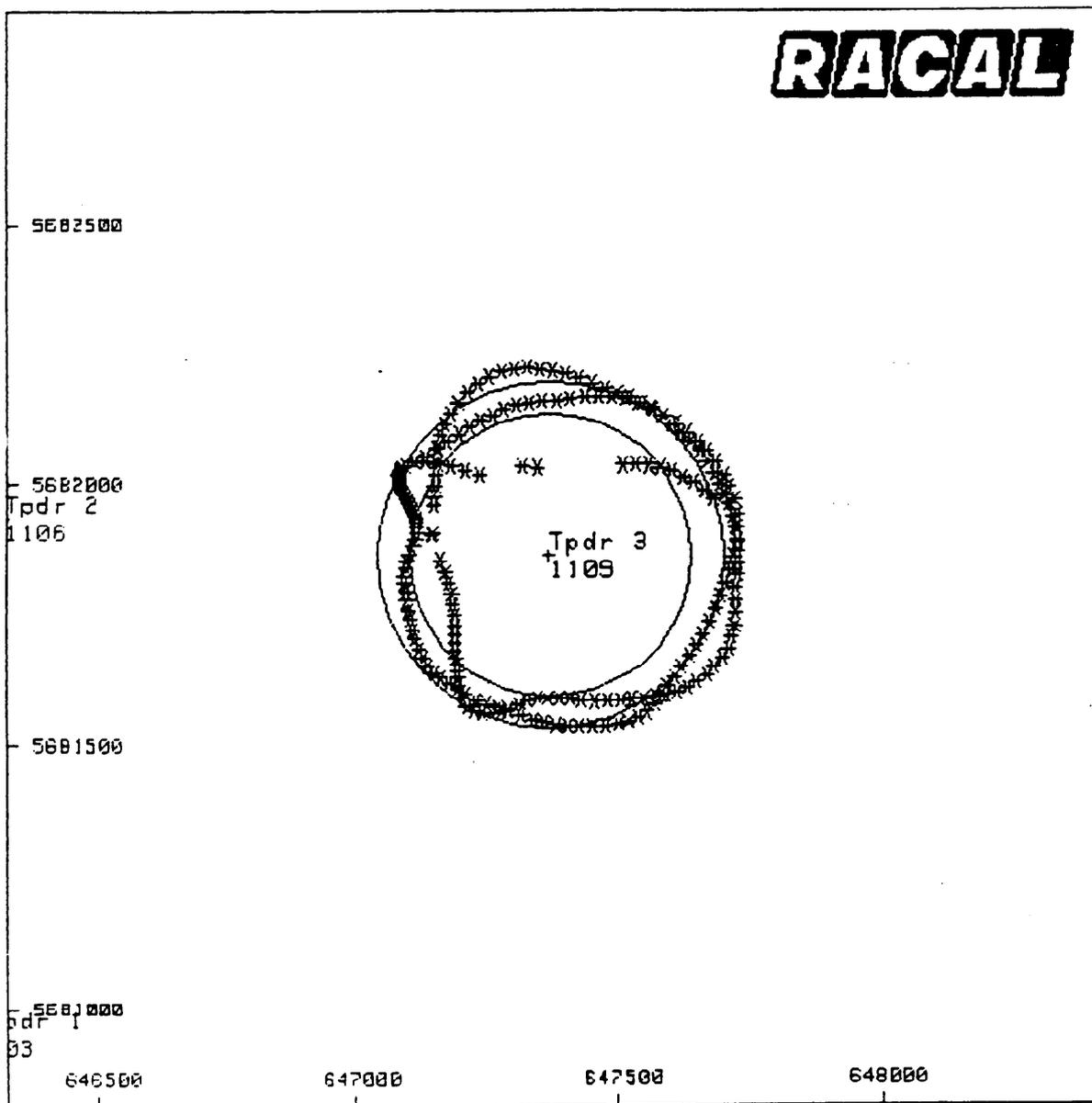
<u>Solution</u>		
<u>Easting</u>	<u>Northing</u>	<u>Depth</u>
646286.43	5680954.78	89.62
RMS Residual : 2.9		

Worst 8 Values:	57	6.86
	: 58	6.81
	: 120	6.72
	: 100	6.72
	: 121	6.36
	: 160	6.09
	: 159	5.97
	: 99	5.85

Data for Calculation

No	Easting(ref)	Northing(ref)	Plan Range	Gyro	RMS(ref)
205	647194.62	5681680.37	257.30	344.3	0.0
206	647193.65	5681694.64	245.54	347.3	0.0
207	647192.99	5681711.30	236.33	349.7	0.0
208	647192.61	5681729.91	227.42	350.5	0.0
209	647192.03	5681750.44	214.29	349.4	0.0
210	647190.23	5681768.60	207.20	346.4	0.0
211	647187.09	5681789.25	201.42	340.8	0.0
212	647182.34	5681810.62	199.45	335.8	0.0
213	647174.82	5681831.61	201.20	334.8	0.0
214	647165.99	5681853.77	207.48	338.2	0.0

Box Tx: 3



Solution Residuals

<u>No</u>	<u>Residual</u>	<u>Plan Range</u>
1	-4.8	326.44
2	-3.5	317.13
3	-2.9	305.19
4	-2.0	293.97
5	-2.8	280.25
6	-3.0	266.30
7	-3.1	251.09
8	-3.4	234.42
9	-4.8	216.11
10	-24.2	142.47
11	-28.1	148.05
12	1.4	201.43
13	-1.1	224.86
14	-1.3	249.52
15	-.4	274.17
16	-0.0	295.90
17	.9	312.21
18	.6	320.84
19	-1.9	322.72
20	-3.5	322.63
21	-4.0	322.21
22	-4.7	321.51
23	-6.5	319.24
24	-6.0	317.99
25	-6.6	315.31
26	-5.4	313.12
27	-5.1	310.50
28	-4.7	309.48
29	-5.7	305.01
30	-4.8	298.87
31	-5.0	291.80
32	-4.9	285.41
33	-3.5	279.47
34	-1.8	273.32
35	-1.0	267.72
36	-2.6	262.40
37	-2.9	258.76
38	-2.2	257.12
39	.1	256.91
40	1.8	258.90
41	3.0	264.37
42	1.3	267.79
43	1.5	274.00
44	2.4	279.72
45	.7	281.71
46	-0.0	282.89
47	-.4	284.85
48	.8	287.65
49	.6	290.65
50	.7	294.86
51	1.2	299.76
52	2.2	305.50
53	-1.2	308.60

Solution Residuals

<u>No</u>	<u>Residual</u>	<u>Plan Range</u>
54	-.3	312.78
55	-1.5	314.42
56	-2.3	313.36
57	-3.2	311.57
58	-1.7	312.68
59	-1.3	312.19
60	-.5	312.30
61	-2.1	309.54
62	-1.1	309.16
63	-.7	309.45
64	-.7	310.61
65	-.9	312.98
66	0.0	317.70
67	-1.1	321.68
68	-.5	327.43
69	-1.1	330.88
70	-.3	334.93
71	1.4	340.63
72	.2	346.05
73	-.5	351.50
74	-.2	354.99
75	0.0	356.39
76	-.9	354.38
77	-.9	349.62
78	-1.1	343.23
79	1.6	339.31
80	1.2	334.89
81	-.3	330.18
82	.2	329.57
83	1.8	331.28
84	-.1	331.11
85	-.2	332.40
86	.2	334.27
87	-1.0	335.15
88	1.4	340.90
89	.7	346.41
90	.1	352.16
91	-.5	357.30
92	-1.2	362.16
93	-1.3	364.86
94	-1.0	366.50
95	-.7	366.34
96	-.9	364.49
97	-1.4	361.57
98	-2.1	357.66
99	-1.5	354.08
100	-.9	350.23
101	-.4	346.72
102	-.4	342.23
103	-.9	338.75
104	1.2	336.46
105	-0.0	328.98
106	-.6	321.87

Solution Residuals

<u>No</u>	<u>Residual</u>	<u>Plan Range</u>
107	-.7	314.30
108	-1.0	304.67
109	-.4	296.56
110	1.0	292.09
111	.3	289.52
112	-.4	289.17
113	-.1	289.82
114	.1	288.62
115	1.3	285.44
116	.8	284.26
117	-.6	282.94
118	2.1	287.21
119	1.9	291.92
120	2.2	297.74
121	1.7	302.91
122	4.0	231.67
123	3.5	230.41
124	4.6	244.08
125	3.8	249.89
126	3.6	258.94
127	3.6	269.14
128	2.5	280.55
129	2.9	294.51
130	2.9	308.23
131	.9	318.54
132	2.4	328.50
133	1.0	337.28
134	1.4	345.22
135	1.4	352.69
136	.8	357.52
137	.5	359.81
138	.5	359.91
139	.9	358.40
140	.8	354.90
141	.3	350.63
142	.3	345.95
143	.7	341.09
144	1.3	337.65
145	1.2	334.93
146	.3	333.48
147	1.0	335.81
148	.3	337.00
149	.6	339.06
150	-1.6	337.37
151	-.2	338.70
152	-0.0	340.46
153	-.1	343.96
154	-.4	347.34
155	-.6	350.36
156	-1.8	350.35
157	.4	351.92
158	4.4	355.38
159	1.5	358.05

Solution Residuals

<u>No</u>	<u>Residual</u>	<u>Plan Range</u>
160	1.2	358.95
161	-.9	356.97
162	-2.9	356.21
163	-2.3	357.30
164	-1.0	358.26
165	-1.3	358.93
166	.3	361.38
167	-.5	363.95
168	-1.2	369.24
169	-2.8	374.44
170	.4	382.23
171	-.9	384.09
172	-3.0	381.38
173	-1.9	379.77
174	-2.1	376.05
175	-3.3	370.05
176	-2.4	364.71
177	-2.3	357.44
178	-2.8	348.09
179	-2.6	337.96
180	-1.9	327.48
181	-1.7	317.80
182	-1.8	309.62
183	-1.1	302.26
184	-2.4	292.85
185	-1.0	286.27
186	-1.6	278.35
187	-1.6	273.75
188	-.4	274.29
189	.8	277.80
190	-1.2	282.20
191	-1.2	292.02
192	-5.0	301.88
193	-1.3	311.56
194	-.9	321.58
195	-2.7	326.53
196	-3.1	328.49
197	-5.3	325.29
198	-3.4	319.50
199	-1.9	311.04
200	-3.0	299.82
201	-3.1	290.86
202	-2.0	282.06
203	-1.7	273.28
204	-.7	265.14
205	.3	257.30
206	-2.1	245.54
207	-.6	236.33
208	1.8	227.42
209	-.2	214.29
210	.3	207.20
211	.4	201.42
212	1.0	199.45

Solution Residuals

<u>No</u>	<u>Residual</u>	<u>Plan Range</u>
213	0.0	201.20
214	-0.0	207.48

<u>Solution</u>		
<u>Easting</u>	<u>Northing</u>	<u>Depth</u>
647373.17	5681865.22	88.02

RMS Residual : 3.4

Worst 8 Values:	11	28.09
	: 10	24.23
	: 25	6.62
	: 23	6.53
	: 24	5.99
	: 29	5.72
	: 26	5.40
	: 197	5.34

APPENDIX F

DGPS FINAL POSITION ANALYSIS PRINTOUTS - ERIC THE RED-1

TERTIARY COMPUTATION CONSTELLATION SUB FINAL POSITION - Tau

Sub-Final Position A Constellation:(26,15,02,13)
07:08:44 17 Feb 1993 to 07:09:16 17 Feb 1993
No samples: 4 1 to 4
No samples used: Lat/Long 4 Height 3
D.O.P Minimum 2.8 Maximum 2.8
H.D.O.P Minimum 1.3 Maximum 1.3
3D error Minimum 0.0m Maximum 0.0m
2D error Minimum 0.0m Maximum 0.0m
Latitude 39 DEG 00 MIN 40.598 SEC S (S.D. .64m)
Longitude 143 DEG 10 MIN 55.025 SEC E (S.D. .46m)
Height 17.33 m (S.D. 1.79m)

TERTIARY COMPUTATION CONSTELLATION SUB FINAL POSITION - Tau

Sub-Final Position B Constellation:(26,15,02,27,13)
07:09:57 17 Feb 1993 to 07:10:59 17 Feb 1993
No samples: 6 5 to 10
No samples used: Lat/Long 6 Height 6
P.D.O.P Minimum 2.8 Maximum 2.8
H.D.O.P Minimum 1.3 Maximum 1.3
3D error Minimum 0.0m Maximum 0.0m
2D error Minimum 0.0m Maximum 0.0m
Latitude 39 DEG 00 MIN 40.620 SEC S (S.D. 1.49m)
Longitude 143 DEG 10 MIN 55.022 SEC E (S.D. 1.66m)
Height 22.67 m (S.D. 4.54m)

TERTIARY COMPUTATION CONSTELLATION SUB FINAL POSITION - Tau

Sub-Final Position C Constellation:(26,15,02,13)
07:11:39 17 Feb 1993 to 07:14:42 17 Feb 1993
No samples: 18 11 to 28
No samples used: Lat/Long 18 Height 18
P.D.O.P Minimum 2.8 Maximum 3.2
H.D.O.P Minimum 1.3 Maximum 1.7
3D error Minimum 0.0m Maximum 0.0m
2D error Minimum 0.0m Maximum 0.0m
Latitude 39 DEG 00 MIN 40.565 SEC S (S.D. 1.35m)
Longitude 143 DEG 10 MIN 55.079 SEC E (S.D. 2.09m)
Height 24.63 m (S.D. 3.53m)

TERTIARY COMPUTATION CONSTELLATION SUB FINAL POSITION - Tau

Sub-Final Position D Constellation:(26,15,02,27,13)
07:15:23 17 Feb 1993 to 07:49:39 17 Feb 1993
No samples: 196 29 to 224
No samples used: Lat/Long 196 Height 196
P.D.O.P Minimum 2.9 Maximum 3.1
H.D.O.P Minimum 1.3 Maximum 1.4
3D error Minimum 0.0m Maximum 1.0m
2D error Minimum 0.0m Maximum 0.0m
Latitude 39 DEG 00 MIN 40.613 SEC S (S.D. 1.93m)
Longitude 143 DEG 10 MIN 55.015 SEC E (S.D. 1.31m)
Height 18.76 m (S.D. 5.68m)

TERTIARY COMPUTATION CONSTELLATION SUB FINAL POSITION - Tau

Sub-Final Position E Constellation:(26,02,27,13)
07:50:19 17 Feb 1993 to 07:58:19 17 Feb 1993

No samples: 35 225 to 259
 No samples used: Lat/Long 35 Height 35
 P.D.O.P Minimum 3.8 Maximum 4.4
 H.D.O.P Minimum 1.8 Maximum 1.9
 3D error Minimum 0.0m Maximum 1.0m
 2D error Minimum 0.0m Maximum 1.0m
 Latitude 39 DEG 00 MIN 40.593 SEC S (S.D. 1.34m)
 Longitude 143 DEG 10 MIN 55.058 SEC E (S.D. 1.10m)
 Height 25.40 m (S.D. 3.83m)

TERTIARY COMPUTATION CONSTELLATION SUB FINAL POSITION - Tau

Sub-Final Position F Constellation:(26,12,02,27,13)
 07:58:59 17 Feb 1993 to 08:00:36 17 Feb 1993
 No samples: 9 260 to 268
 No samples used: Lat/Long 9 Height 9
 P.D.O.P Minimum 2.5 Maximum 3.8
 H.D.O.P Minimum 1.3 Maximum 1.9
 3D error Minimum 0.0m Maximum 0.0m
 2D error Minimum 0.0m Maximum 0.0m
 Latitude 39 DEG 00 MIN 40.536 SEC S (S.D. .90m)
 Longitude 143 DEG 10 MIN 55.067 SEC E (S.D. 1.07m)
 Height 24.02 m (S.D. 2.94m)

TERTIARY COMPUTATION CONSTELLATION SUB FINAL POSITION - Tau

Sub-Final Position G Constellation:(26,02,27,13)
 08:01:18 17 Feb 1993 to 08:02:50 17 Feb 1993
 No samples: 7 269 to 275
 No samples used: Lat/Long 7 Height 7
 P.D.O.P Minimum 2.4 Maximum 3.7
 H.D.O.P Minimum 1.2 Maximum 1.9
 error Minimum 0.0m Maximum 1.0m
 2D error Minimum 0.0m Maximum 0.0m
 Latitude 39 DEG 00 MIN 40.616 SEC S (S.D. .99m)
 Longitude 143 DEG 10 MIN 54.941 SEC E (S.D. 3.06m)
 Height 19.30 m (S.D. 6.06m)

TERTIARY COMPUTATION CONSTELLATION SUB FINAL POSITION - Tau

Sub-Final Position H Constellation:(26,12,02,27,13)
 08:03:32 17 Feb 1993 to 08:27:13 17 Feb 1993
 No samples: 136 276 to 411
 No samples used: Lat/Long 136 Height 136
 P.D.O.P Minimum 2.1 Maximum 2.4
 H.D.O.P Minimum 1.2 Maximum 1.2
 3D error Minimum 0.0m Maximum 0.0m
 2D error Minimum 0.0m Maximum 0.0m
 Latitude 39 DEG 00 MIN 40.595 SEC S (S.D. 2.28m)
 Longitude 143 DEG 10 MIN 55.066 SEC E (S.D. 1.53m)
 Height 23.71 m (S.D. 2.34m)

TERTIARY COMPUTATION CONSTELLATION SUB FINAL POSITION - Tau

Sub-Final Position I Constellation:(26,12,24,02,27,13)
 08:27:55 17 Feb 1993 to 08:28:36 17 Feb 1993
 No samples: 5 412 to 416
 samples used: Lat/Long 5 Height 5
 P.D.O.P Minimum 2.1 Maximum 2.1
 H.D.O.P Minimum 1.2 Maximum 1.2

3D error Minimum 0.0m Maximum 0.0m
2D error Minimum 0.0m Maximum 0.0m
Latitude 39 DEG 00 MIN 40.546 SEC S (S.D. .28m)
Longitude 143 DEG 10 MIN 55.100 SEC E (S.D. .38m)
Height 24.98 m (S.D. .87m)

TERTIARY COMPUTATION CONSTELLATION SUB FINAL POSITION - Tau

Sub-Final Position J Constellation: (26,12,24,02,13)
08:29:18 17 Feb 1993 to 08:36:00 17 Feb 1993
No samples: 39 417 to 455
No samples used: Lat/Long 39 Height 39
P.D.O.P Minimum 2.1 Maximum 2.2
H.D.O.P Minimum 1.1 Maximum 1.1
3D error Minimum 0.0m Maximum 0.0m
2D error Minimum 0.0m Maximum 0.0m
Latitude 39 DEG 00 MIN 40.580 SEC S (S.D. 1.22m)
Longitude 143 DEG 10 MIN 55.085 SEC E (S.D. 1.13m)
Height 23.54 m (S.D. 1.94m)

FINAL POSITION ANALYSIS: BYFORD DOLPHIN R/M ERIC THE RED-1
GNS v R2.06 07:08:44 17 Feb 1993 to 08:36:00 17 Feb 1993
GPS Weighting Option - Constellations given equal weights
Mean Corrected Gyro...224.8 Gyro Correction... +0.0
Mean Grid Heading.....226.1 Convergence..... -1.373

TERTIARY COMPUTATION - Tau

CONSTELLATIONS USED

Const.	# Samples	S.U.s
A	4 (3)	26,15,02,13
B	6	26,15,02,27,13
C	18	26,15,02,13
D	196	26,15,02,27,13
E	35	26,02,27,13
F	9	26,12,02,27,13
G	7	26,02,27,13
H	136	26,12,02,27,13
I	5	26,12,24,02,27,13
J	39	26,12,24,02,13

Total number of samples used = 455 (454)

() denotes # of height samples used after adjustment for altitude aiding

COMPUTED FINAL ANTENNA POSITION

WGS 84 Spheroid

Latitude 39 DEG 00 MIN 40.586 SEC S (S.D. .43 Metres)
Longitude 143 DEG 10 MIN 55.046 SEC E (S.D. .50 Metres)
Height 22.43 Metres (S.D. 1.18 Metres)

AUSTRALIAN NAT 1984 Spheroid

Latitude 39 DEG 00 MIN 45.904 SEC S
Longitude 143 DEG 10 MIN 50.093 SEC E
Height 39.63 Metres

UTM/TM

Easting 688796.72 Metres
Northing 5679531.24 Metres

COMPUTED FINAL DATUM POSITION

AUSTRALIAN NAT 1984 Spheroid

Latitude 39 DEG 00 MIN 45.439 SEC S
Longitude 143 DEG 10 MIN 51.451 SEC E
UTM/TM

Easting 688829.73 Metres
Northing 5679544.81 Metres

INTENDED FINAL DATUM LOCATION

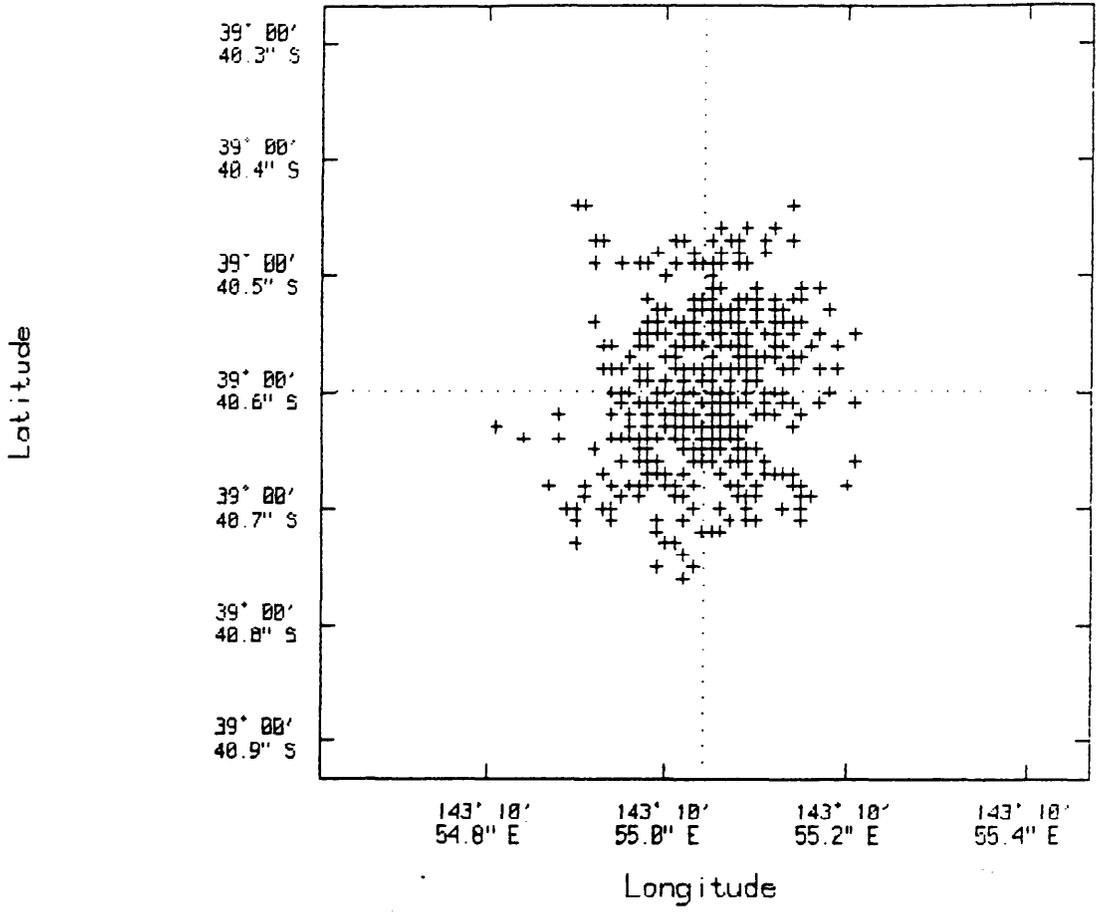
AUSTRALIAN NAT 1984 Spheroid

Latitude 39 DEG 00 MIN 45.403 SEC S
Longitude 143 DEG 10 MIN 51.295 SEC E
UTM/TM

Easting 688826.00 Metres
Northing 5679546.00 Metres

nal Datum Position is 3.92 Metres (spheroidal distance) bearing 106.37 T from the Intended Loc.

Tertiary Computation GPS Scatter Plot (Tau)



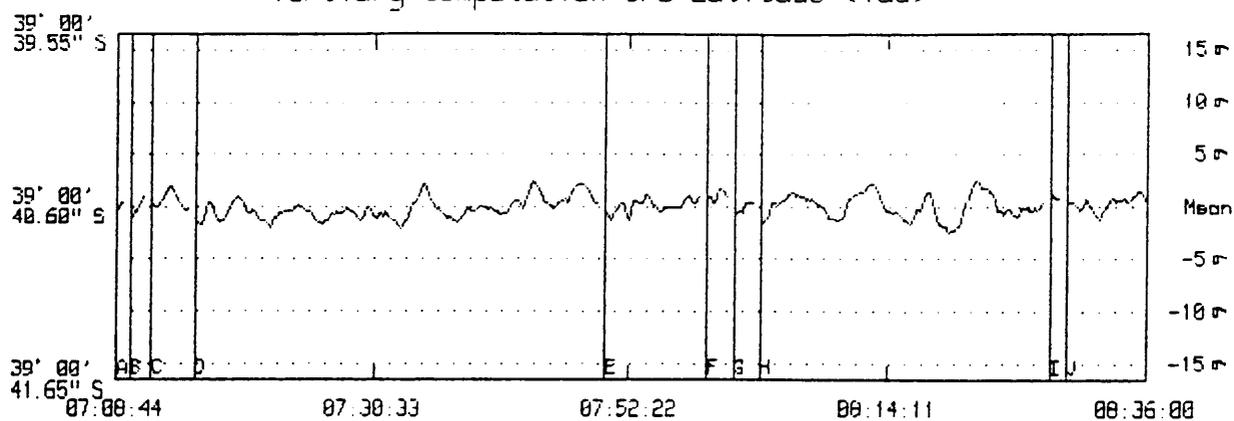
Centred on mean antenna position (passes 1 to 455).

WGS 84 Spheroid

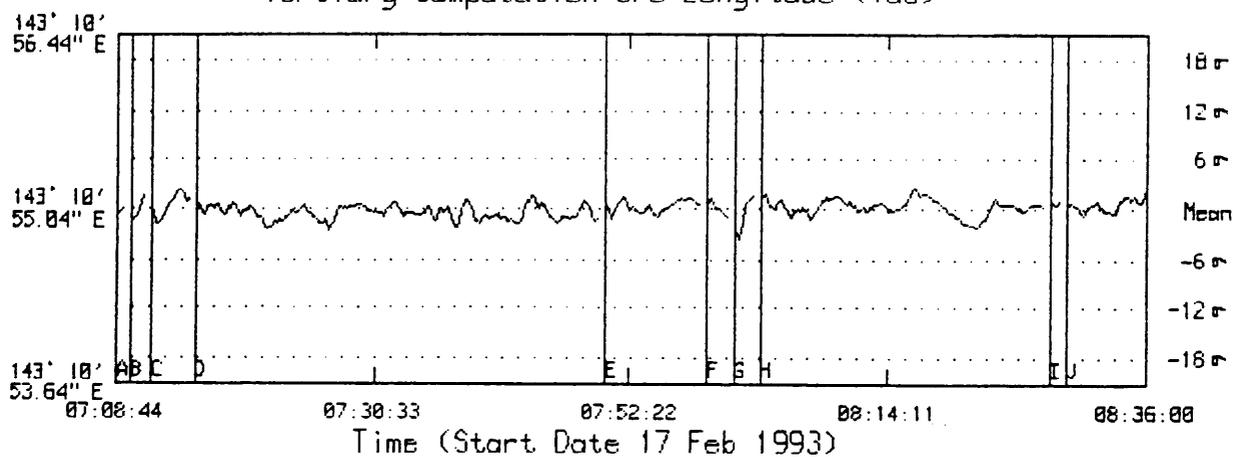
Latitude 39 DEG 00 MIN 40.599 SEC S

Longitude 143 DEG 10 MIN 55.043 SEC E

Tertiary Computation GPS Latitude (Tau)



Tertiary Computation GPS Longitude (Tau)



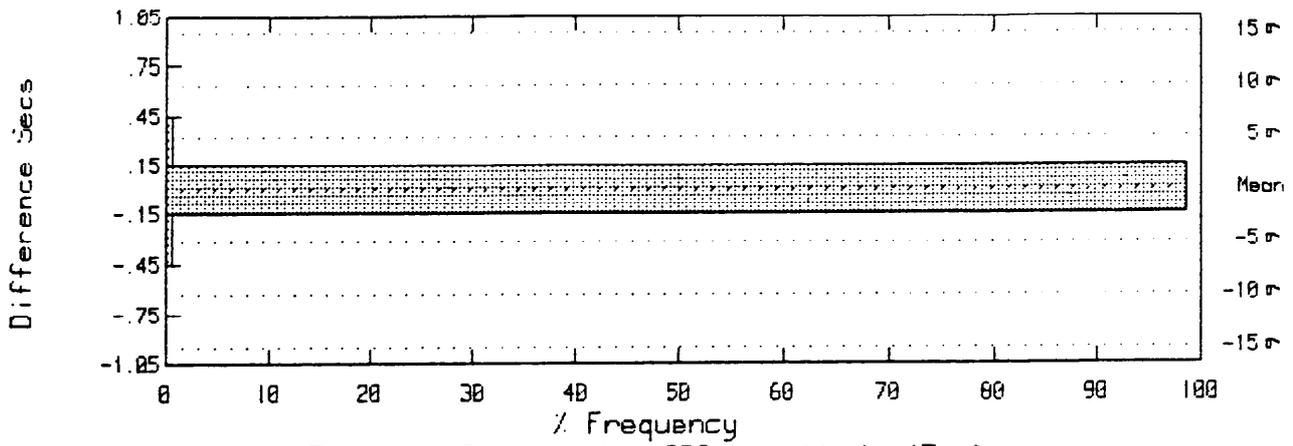
Tertiary Computation (WGS 84 - Tau)

Centred on mean of antenna position (passes 1 to 455).

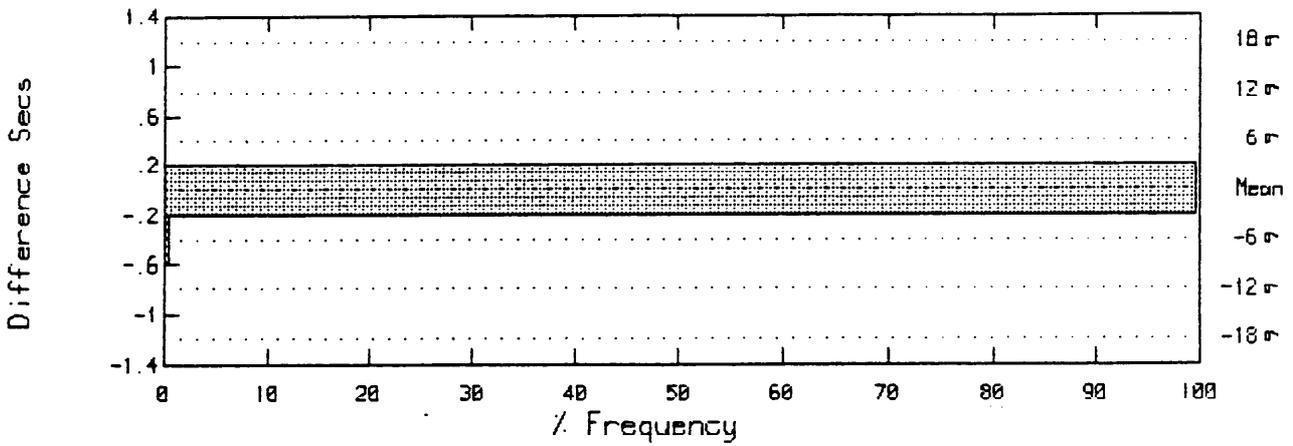
Latitude 39 DEG 00 MIN 40.599 SEC S Sd 1.952 Metres

Longitude 143 DEG 10 MIN 55.043 SEC E Sd 1.585 Metres

Tertiary Computation GPS Latitude (Tau)



Tertiary Computation GPS Longitude (Tau)



Tertiary Computation (WGS 84 - Tau)

Centred on mean of antenna position (passes 1 to 455).

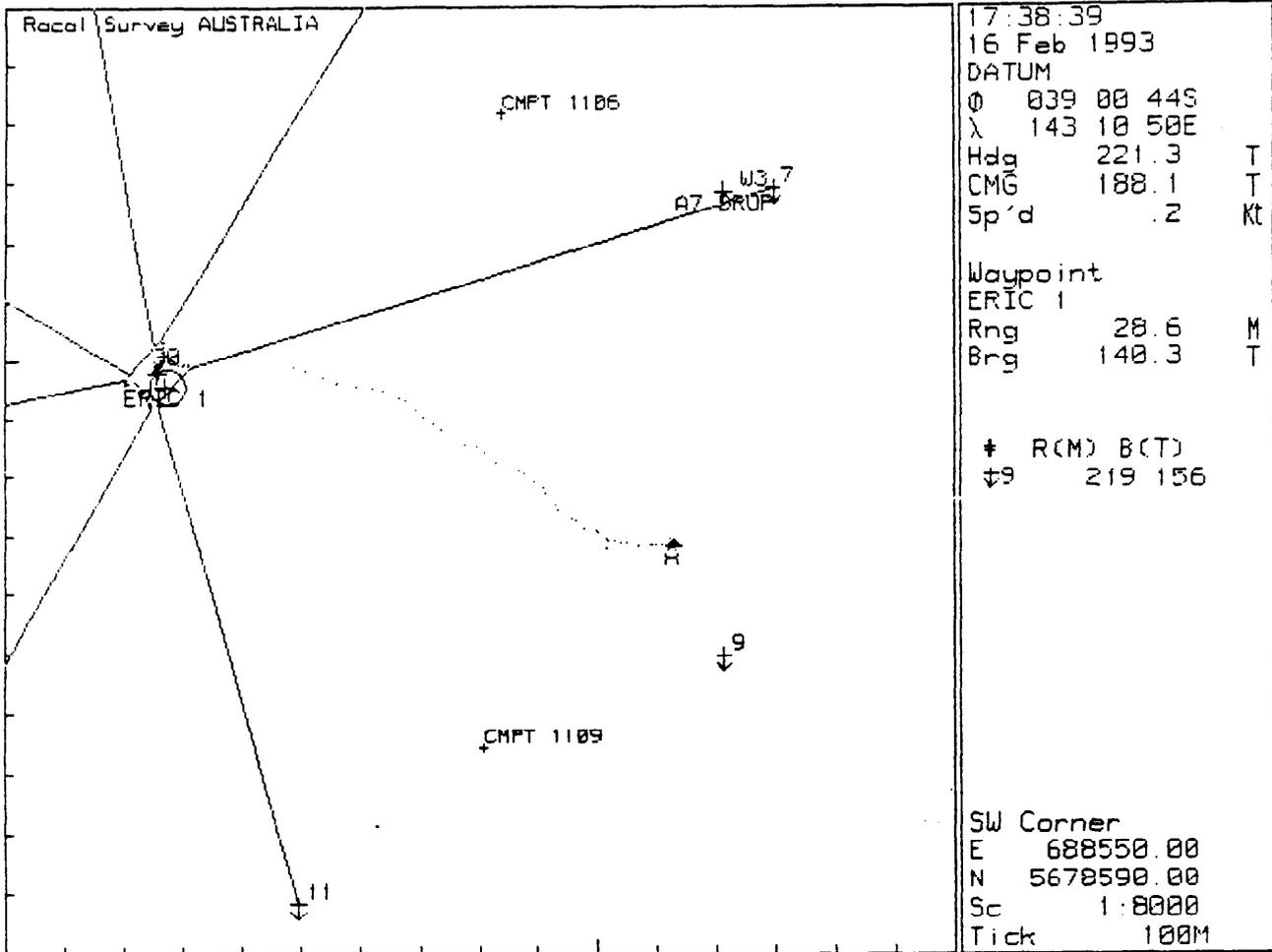
Latitude 39 DEG 00 MIN 40.599 SEC S Sd 1.952 Metres

Longitude 143 DEG 10 MIN 55.043 SEC E Sd 1.585 Metres

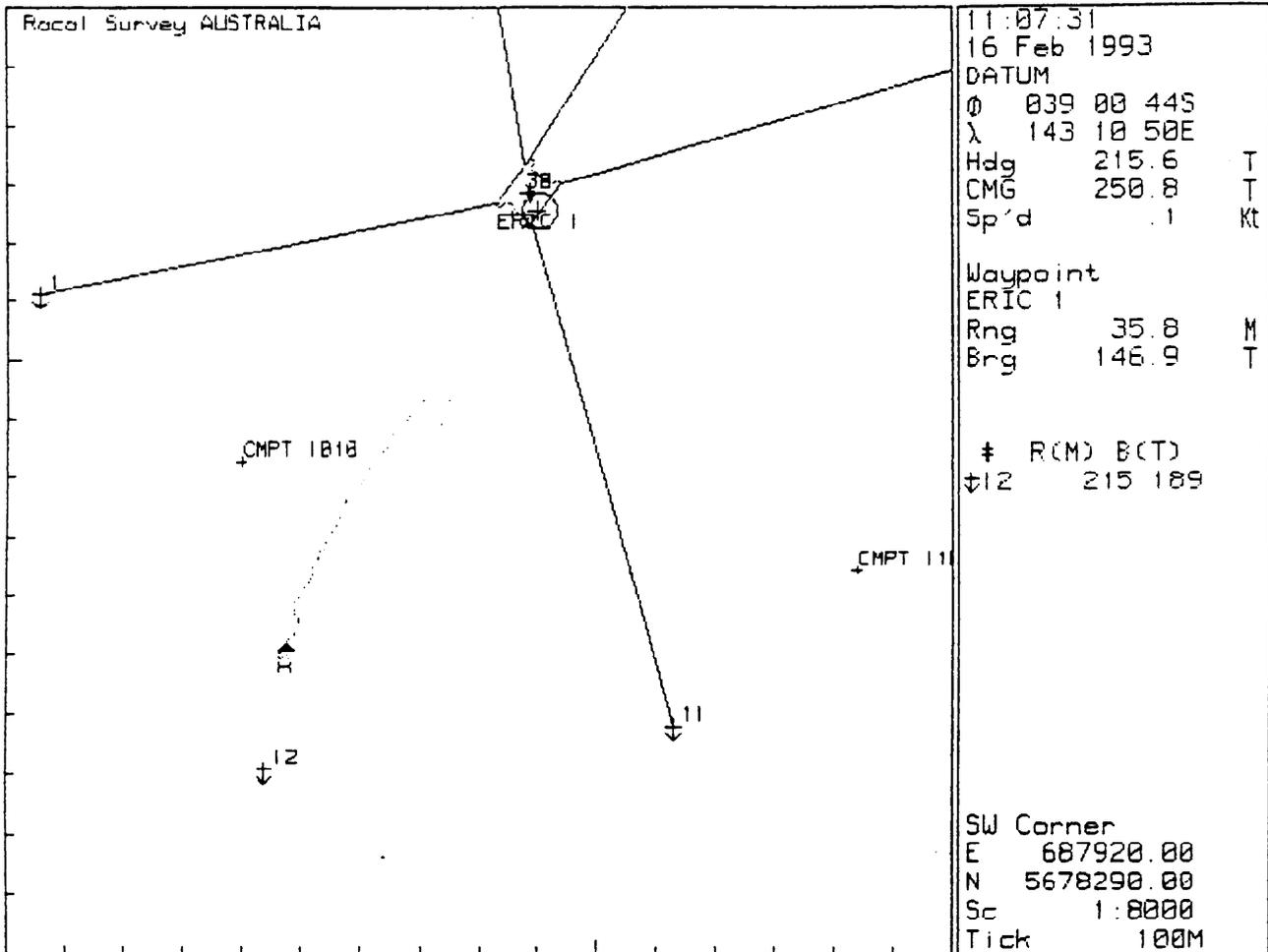
Analysis data stored to file ANALYSIS2

APPENDIX G
GOLF LASER TRACKING PRINTOUTS

Vessel Datum : 688805.68E, 5679568.27N Gyro : 220.60
 Laser : HELI82 688806.61E, 5679529.10N
 Range 905.00 metres Bearing 243.40 Relative to Vessel Head
 Tug Posn 689679E, 5679289N
 Rng & Brg to Intended drop 219.3 metres 155.8 deg. True



Laser : HELI#2 688814.63E, 5679537.83N
 Range 860.00 metres Bearing 353.40 Relative to Vessel Head
 Tug Posn 688386E, 5678789N
 Rng & Brg to Intended drop 192.1 metres 186.6 deg. True



RANGE & BEARING DISPLAY TABLE

!Slot! To ! From !

1	Intended Drop 3	Laser Target 1A
2	!OFF	!OFF
3	!OFF	!OFF
4	!OFF	!OFF
5	!OFF	!OFF
6	!OFF	!OFF
7	!OFF	!OFF
8	!OFF	!OFF
9	!OFF	!OFF
10	!OFF	!OFF
11	!OFF	!OFF
12	!OFF	!OFF

RANGE & BEARING DISPLAY TABLE

!Slot! To ! From !

1	Actual Drop 3	Winch Offset 3
2	!OFF	!OFF
3	!OFF	!OFF
4	!OFF	!OFF
5	!OFF	!OFF

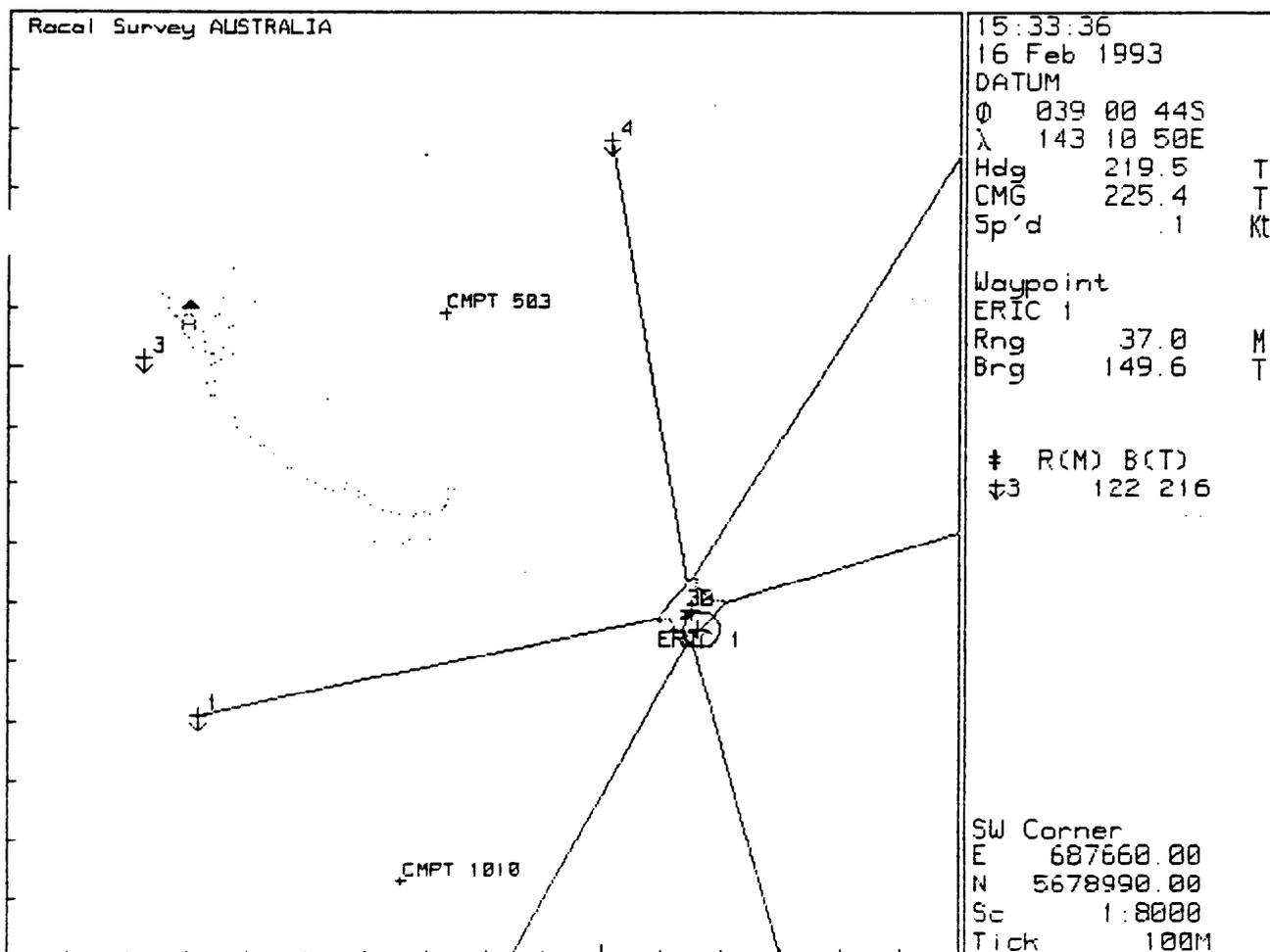
Vessel Datum : 688000.20E, 5679575.90N Gyro : 219.1021
 Laser : STARB 688754.05E, 5679561.72N
 Range 910.00 metres Bearing 83.90 Relative to Vessel Head
 Tug Posn 688002E, 5680076N
 Rng & Brg to Intended drop 134.8 metres 236.7 deg. True

TUG TRACKING FIX @ TIME 15:32:08 Ident 1 A
 Current Anchor # 3 Int. Location 687888E, 5680005N
 Vessel Datum : 688807.68E, 5679574.68N Gyro : 219.5021
 Laser : STARB 688753.38E, 5679562.82N
 Range 950.00 metres Bearing 83.30 Relative to Vessel Head
 Tug Posn 687967E, 5680097N
 Rng & Brg to Intended drop 121.3 metres 219.5 deg. True

TUG TRACKING FIX @ TIME 15:32:50 Ident 1 A

↓ 3 OTB

Current Anchor # 3 Int. Location 687888E, 5680005N
 Vessel Datum : 688807.22E, 5679576.91N Gyro : 219.4021
 Laser : STARB 688752.94E, 5679564.95N
 Range 950.00 metres Bearing 83.40 Relative to Vessel Head
 Tug Posn 687967E, 5680099N
 Rng & Brg to Intended drop 122.8 metres 218.8 deg. True



RANGE & BEARING DISPLAY TABLE

Id	To	From
1	Intended Drop 9	Winch Offset 9
2	OFF	OFF

Laser : STARB 688753.37E, 5679562.25N
 Range 980.00 metres Bearing 81.50 Relative to Vessel Head
 Tug Posn 687927E, 5680088N
 Rng & Brg to Intended drop 92.0 metres 203.6 deg. True

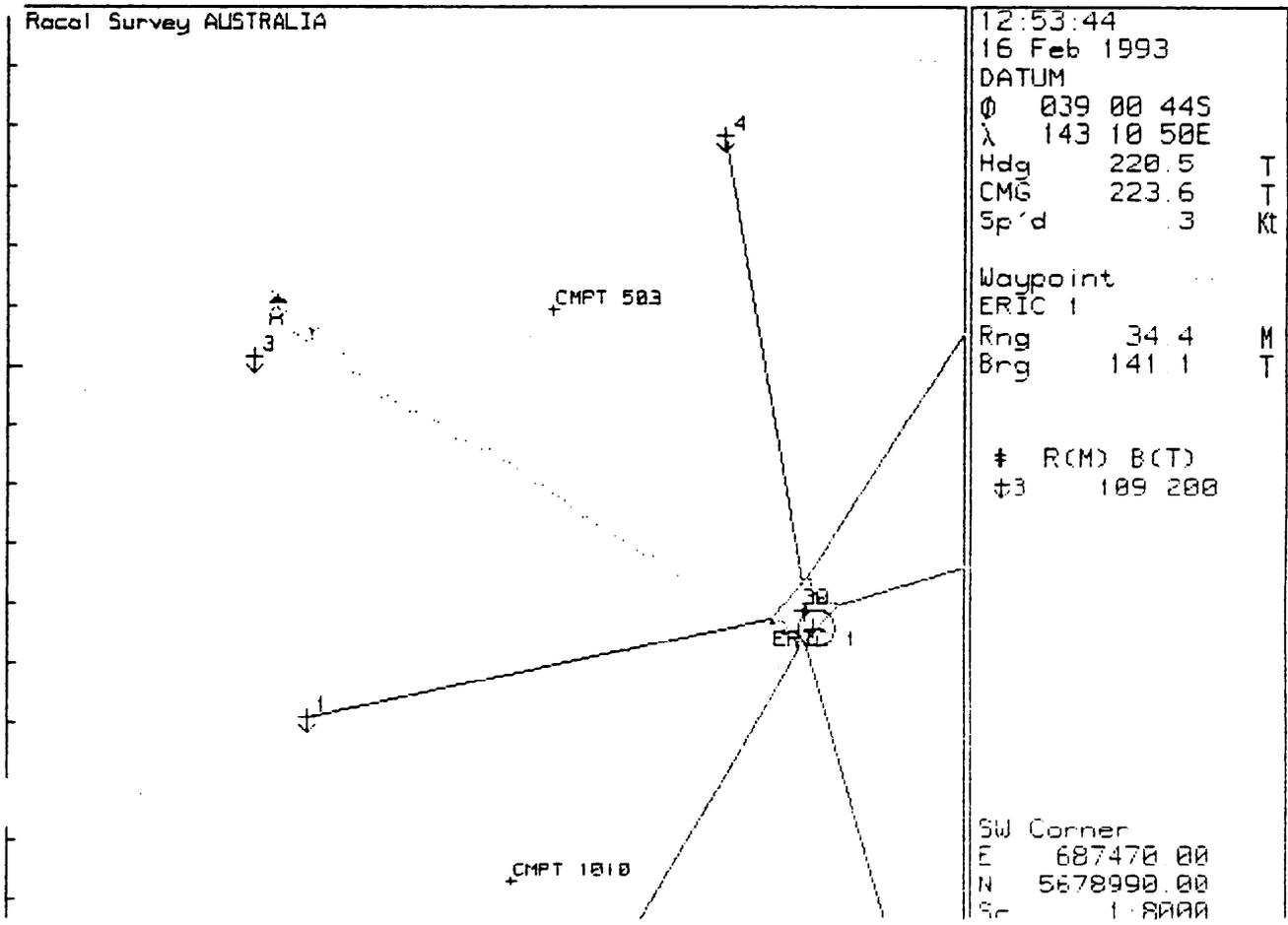
TUG TRACKING FIX @ TIME 12:52:19 Ident 1 A
 Current Anchor # 3 Int. Location 687888E, 5680005N
 Vessel Datum : 688808.46E, 5679574.55N Gyro : 219.70½T
 Laser : STARB 688754.12E, 5679562.89N
 Range 990.00 metres Bearing 82.30 Relative to Vessel Head
 Tug Posn 687926E, 5680105N
 Rng & Brg to Intended drop 107.1 metres 199.4 deg. True

TUG TRACKING FIX @ TIME 12:52:45 Ident 1 A
 Current Anchor # 3 Int. Location 687888E, 5680005N

Vessel Datum : 688808.78E, 5679574.07N Gyro : 220.00½T
 Laser : STARB 688754.37E, 5679562.69N
 Range 1000.00 metres Bearing 81.90 Relative to Vessel Head
 Tug Posn 687919E, 5680112N
 Rng & Brg to Intended drop 111.2 metres 194.6 deg. True

TUG TRACKING FIX @ TIME 12:52:53 Ident 1 A
 Current Anchor # 3 Int. Location 687888E, 5680005N
 Vessel Datum : 688808.27E, 5679573.16N Gyro : 220.00½T
 Laser : STARB 688753.87E, 5679561.78N
 Range 990.00 metres Bearing 82.00 Relative to Vessel Head
 Tug Posn 687927E, 5680107N
 Rng & Brg to Intended drop 109.3 metres 199.7 deg. True

↓ 3 CTB



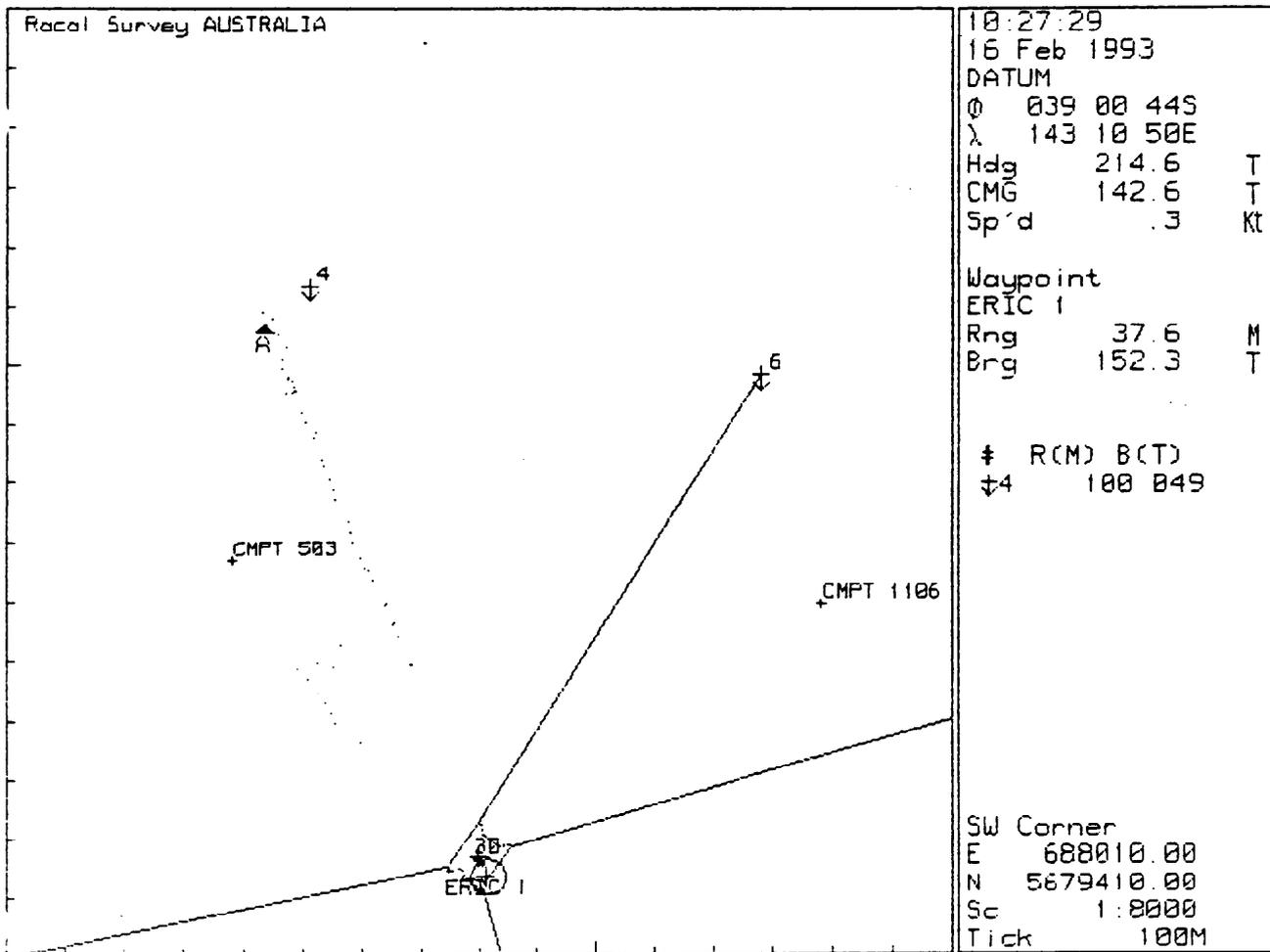
TUG TRACKING FIX @ TIME 10:25:28 Ident 1 A
 Current Anchor # 4 Int. Location 688520E, 5680544N
 Vessel Datum : 688811.25E, 5679576.67N Gyro : 216.20½T
 Laser : STARB 688757.72E, 5679561.71N
 Range 935.00 metres Bearing 123.70 Relative to Vessel Head
 Tug Posn 688461E, 5680448N
 Rng & Brg to Intended drop 112.6 metres 30.4 deg. True

TUG TRACKING FIX @ TIME 10:26:14 Ident 1 A
 Current Anchor # 4 Int. Location 688520E, 5680544N
 Vessel Datum : 688810.07E, 5679577.43N Gyro : 214.80½T
 Laser : STARB 688756.93E, 5679561.17N
 Range 955.00 metres Bearing 125.10 Relative to Vessel Head
 Tug Posn 688450E, 5680465N

Rng & Brg to Intended drop 105.5 metres 40.1 deg. True

TUG TRACKING FIX @ TIME 10:26:40 Ident 1 A
 Current Anchor # 4 Int. Location 688520E, 5680544N
 Vessel Datum : 688808.78E, 5679578.24N Gyro : 214.50½T
 Laser : STARB 688755.72E, 5679561.69N
 Range 970.00 metres Bearing 125.40 Relative to Vessel Head
 Tug Posn 688445E, 5680480N
 Rng & Brg to Intended drop 98.7 metres 48.5 deg. True

↓ 4 OTTB



RANGE & BEARING DISPLAY TABLE

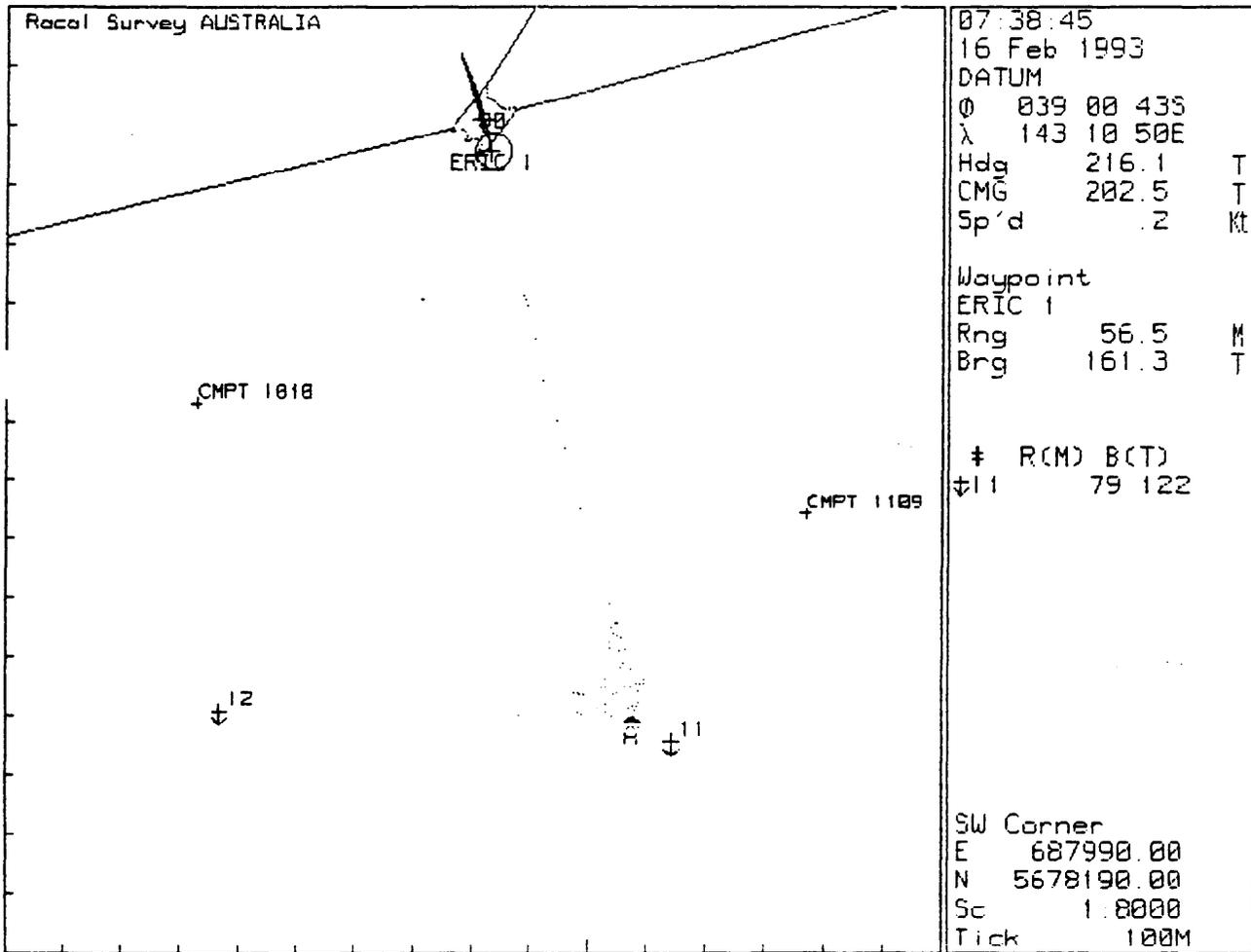
!Slot! To ! From !

TUG TRACKING FIX @ TIME 07:38:00 Ident 1 A
 Current Anchor # 11 Int. Location 689132E, 5678548N
 Vessel Datum : 688806.16E, 5679603.89N Gyro : 216.30
 Laser : HELI#2 688810.02E, 5679564.90N
 Range 1030.00 metres Bearing 307.40 Relative to Vessel Head
 Tug Posn 689075E, 5678570N
 Rng & Brg to Intended drop 60.7 metres 109.6 deg. True

Anchor # 11 on the Seated.

TUG TRACKING FIX @ TIME 07:38:09 Ident 1 A
 Current Anchor # 11 Int. Location 689132E, 5678548N
 Vessel Datum : 688806.86E, 5679602.95N Gyro : 216.30
 Laser : HELI#2 688810.72E, 5679563.96N
 Range 1005.00 metres Bearing 307.60 Relative to Vessel Head
 Tug Posn 689066E, 5678592N

Rng & Brg to Intended drop 79.1 metres 122.4 deg. True



RANGE & BEARING DISPLAY TABLE

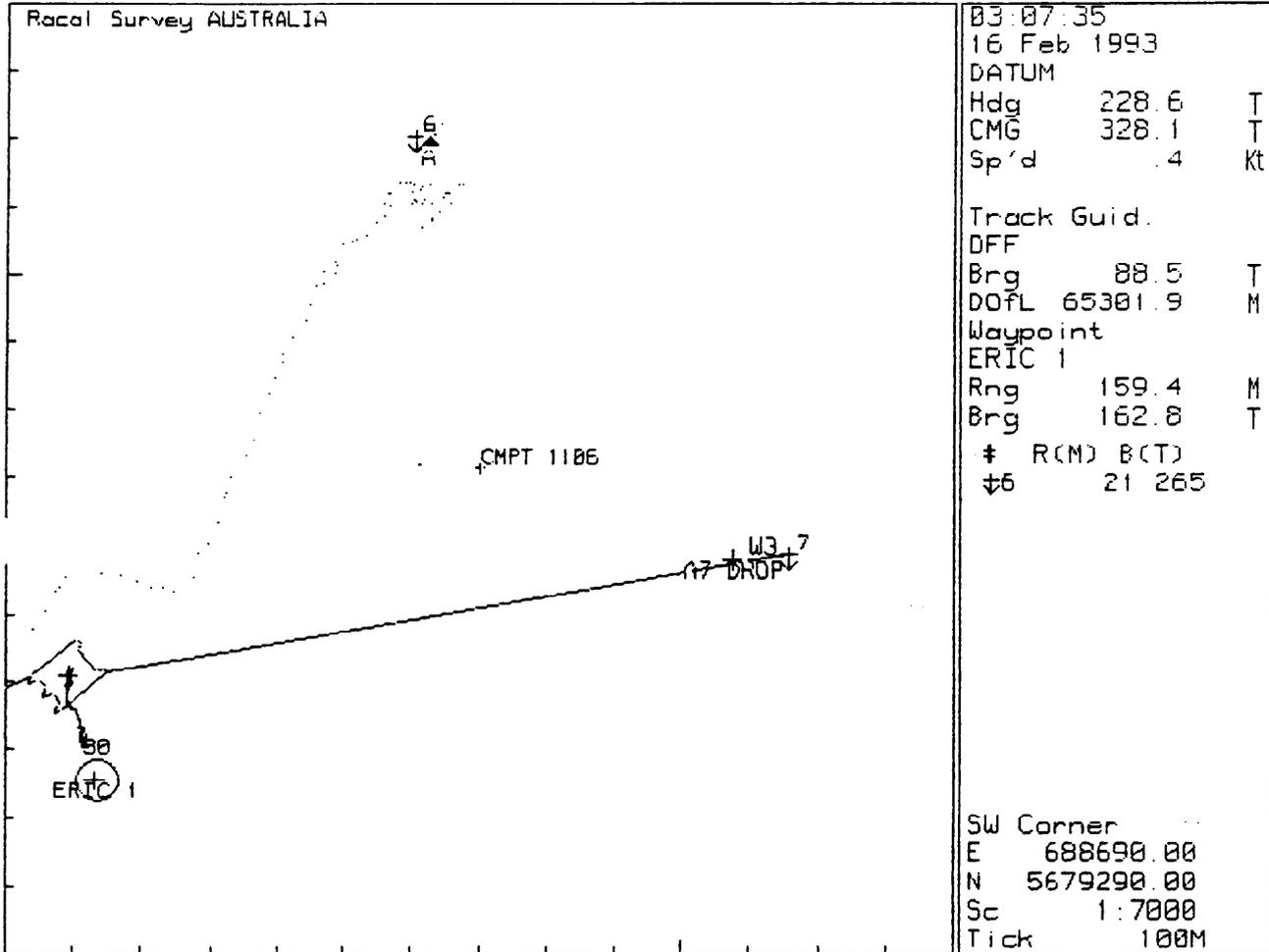
lot	To	From
1	Intended Drop	Winch Offset 12
2	OFF	OFF

Range 1005.00 metres Bearing 167.80 Relative to Vessel head

Tug Posn 689322E, 5680496N
Rng & Brg to Intended drop 28.0 metres 261.7 deg. True

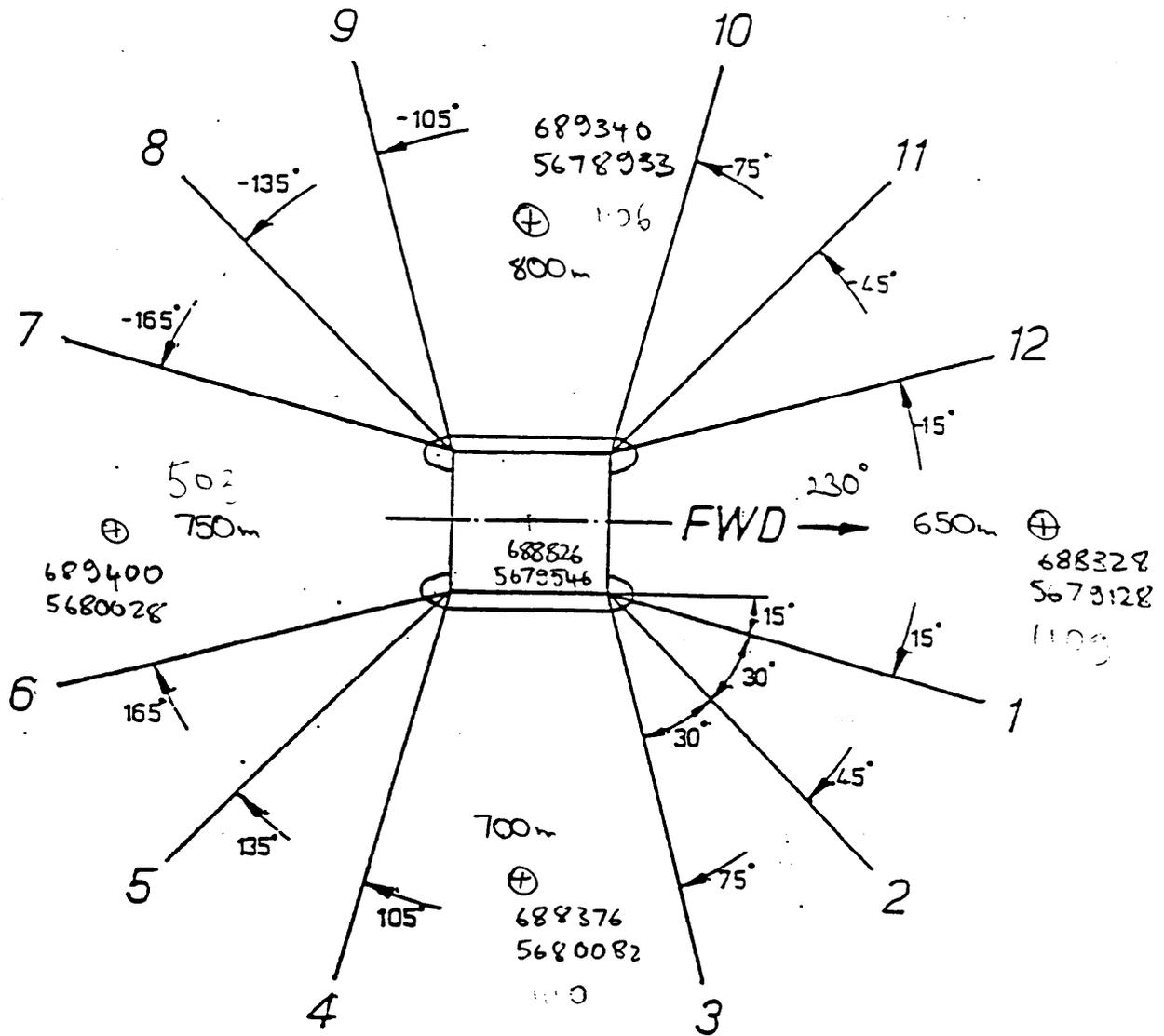
TUG TRACKING FIX @ TIME 03:07:17 Ident 1 A
Current Anchor # 6 Int. Location 689294E, 5680493N
Vessel Datum : 688783.47E, 5679696.26N Gyro : 228.10±1
Laser : STARB 688728.00E, 5679692.65N
Range 995.00 metres Bearing 167.00 Relative to Vessel Head
Tug Posn 689315E, 5680495N
Rng & Brg to Intended drop 21.3 metres 264.5 deg. True

Anchor # 6 on the Seabed.



APPENDIX H

ANCHOR INTENDED AND DROP LOCATION PRINTOUTS



Regular 12-line anchor pattern

Fig. 5

APPENDIX I
ANCHOR PATTERN DIAGRAM

Rig BYFORD DOLPHIN at LA-BELLA Rig Heading 230.0 degrees

Location Co ordinates : Easting 646791.490 Northing 5681400.630

ANCHOR # BEARING DISTANCE EASTING NORTHING

ANCHOR #	BEARING	DISTANCE	EASTING	NORTHING
1	245.00	1000 000	645828 089	5680974.489
				12 5681484.263
				15 5681970.684
				15 5682362.552
				19 5682452.438
				10 5682275.396
				11 5681826.771
				18 5681316.997
				15 5680830.576
				15 5680438.708
				11 5680348.822
				10 5680525.864

ANCHOR	INTENDED (E,N)	ORIG LOAN (E,N)
1	645828.0, 5680974.0	645772.9, 5680963.0
2	645738.0, 5681484.0	645761.6, 5681609.6
3	645915.0, 5681970.0	NOT YET LAID
4	646382.0, 5682362.0	646422.4, 5682391.6
5	646892.0, 5682452.0	646911.7, 5682457.7
6	647378.0, 5682275.0	647391.5, 5682256.6
7	647754.0, 5681826.0	647767.0, 5681838.0
8	647833.0, 5681230.0	647883.3, 5681230.5
9	647555.0, 5680697.0	647548.8, 5680705.1
10	647200.0, 5680438.0	NOT YET LAID
11	646865.0, 5680349.0	646908.7, 5680381.9
12	646278.0, 5680179.0	646288.1, 5680199.2

FINAL ANCHOR

POSITIONS

21/1/93.

LA-BELLA

BYFORD DOLPHIN.

t)

t;

-99)

3 00 14.3

lea input longitude (ex, w120 00 01.2345)=?

42 41 42.9

loading geoid height data (30 degree latitude band)

0 14.3000 el42 41 42.9000 undulation = -3.462 m

lease input latitude(ex, s40 00 01.2345)=? (end, -99)

565915.4

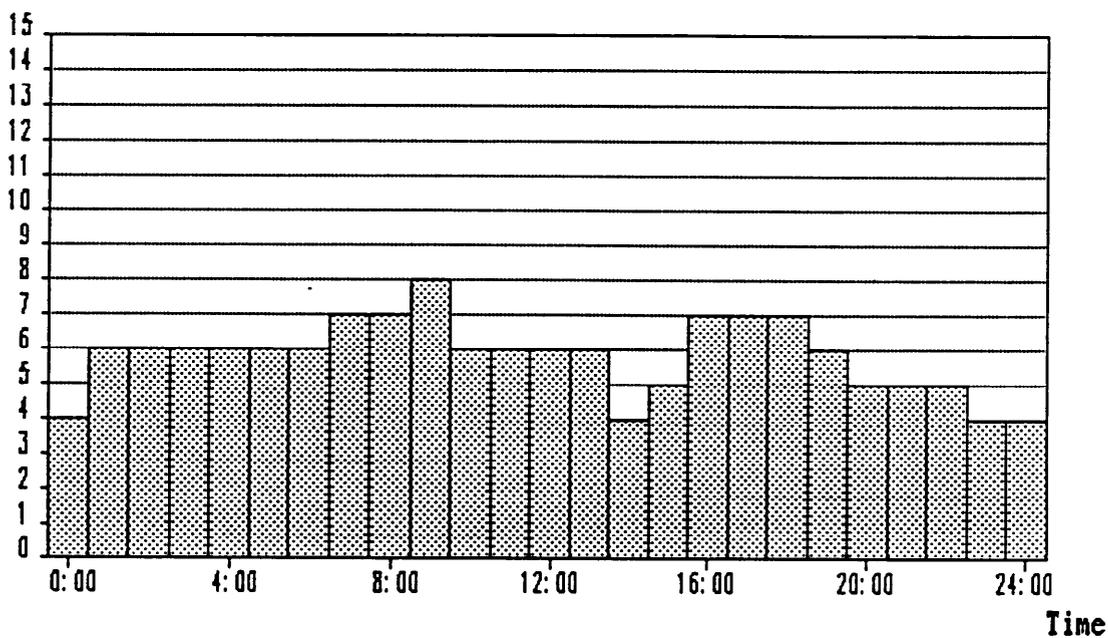
APPENDIX J
SATELLITE AVAILABILITY PREDICTIONS



Number of Visible Satellites vs Time

Station : EricTheRed Latitude : 39 00'45"S Longitude : 143 10'51"E
Date : 17 Feb 1993 Zone : 0:00 Cut-off Elevation : 10

Number of Satellites

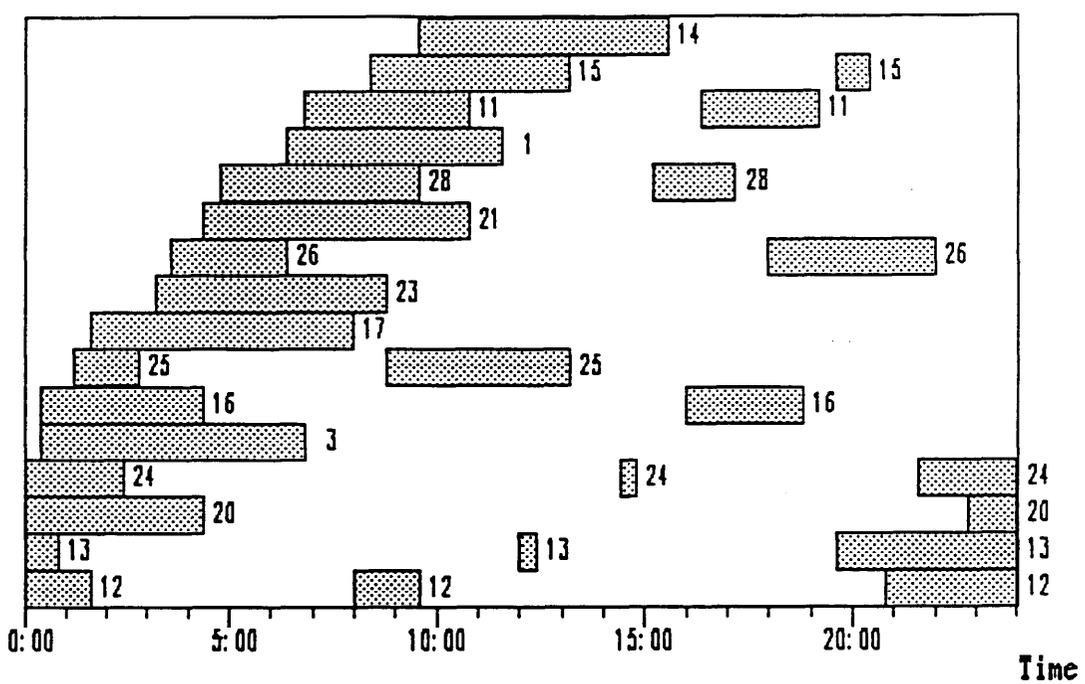


Increment of 60.0 minutes



Visible Satellites vs Time

Station : EricTheRed Latitude : 39 00'45"S Longitude : 143 10'51"E
Date : 17 Feb 1993 Zone : 0:00 Cut-off Elevation : 10

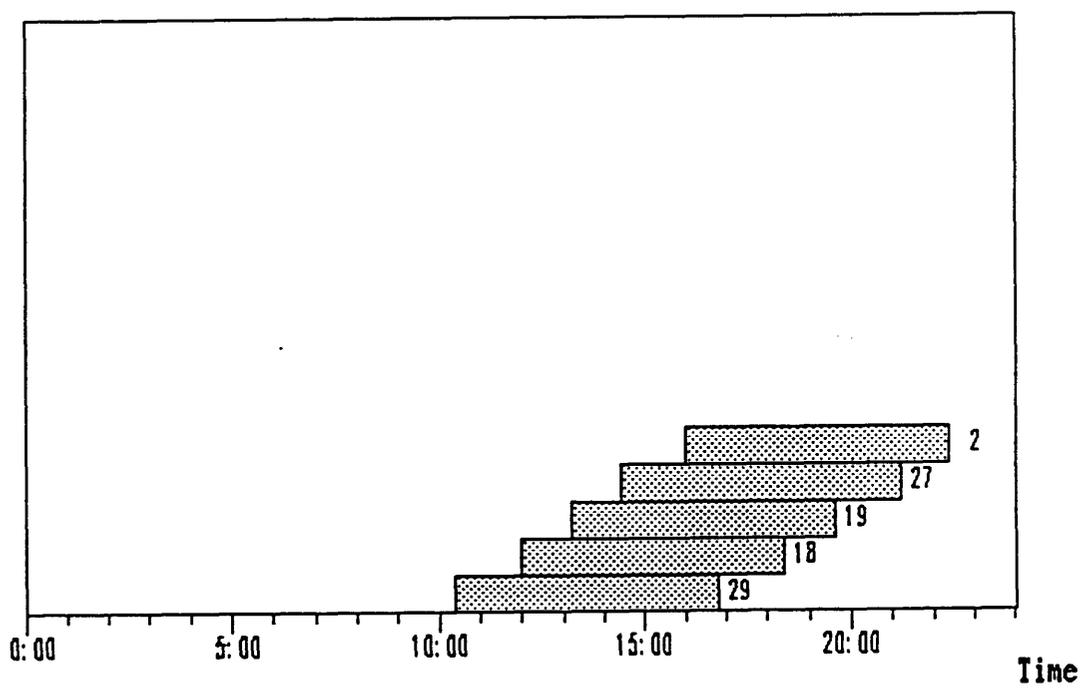


Increment of 60.0 minutes
Page 1 of 2 Pages



Visible Satellites vs Time

Station : EricTheRed Latitude :39 00'45"S Longitude :143 10'51"E
Date : 17 Feb 1993 Zone : 0:00 Cut-off Elevation : 10



Increment of 60.0 minutes
Page 2 of 2 Pages

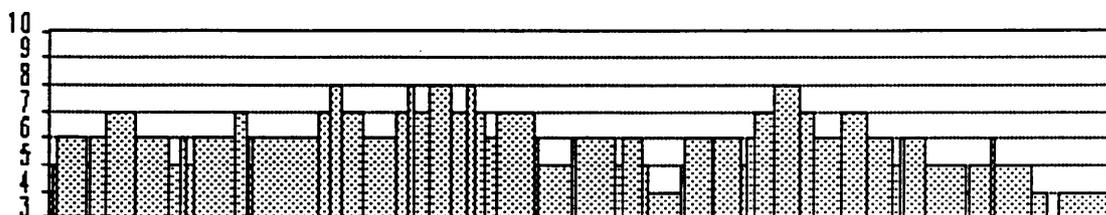


All-In-View PDOP vs Time

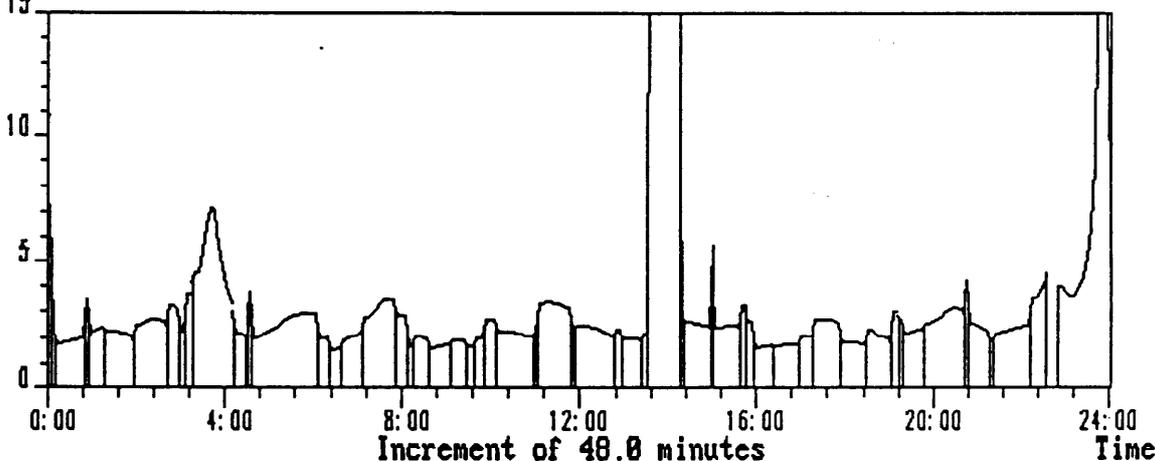
Station : EricTheRed Latitude : 39 00'45"S Longitude : 143 10'51"E
Date : 17 Feb 1993 Zone : 0:00 Cut-off Elevation : 10

Number of Satellites

8 Channel Receiver



PDOP



All-In-View PDOP for EricTheRed

Date : 17 Feb 1993
 Time : 0:00 -> 24:00
 Cut-off Elevation : 10°

Latitude : 39° 00' 45" S
 Longitude : 143° 10' 51" E
 Zone : 0:00

satellite Constellation	Time Rise	Time Set	dT	PDOP Rise	PDOP Set
12 13 20 24	0:00	0:07	0:07	10.8	7.2
12 13 16 20 24	0:07	0:12	0:05	2.3	2.3
3 12 13 16 20 24	0:12	0:52	0:40	1.8	2.0
3 12 16 20 24	0:52	0:57	0:05	3.5	3.5
3 12 16 20 24 25	0:57	1:17	0:20	2.2	2.4
3 12 16 17 20 24 25	1:17	1:57	0:40	2.2	1.9
3 16 17 20 24 25	1:57	2:42	0:45	2.5	2.4
3 16 17 20 25	2:42	2:57	0:15	3.2	3.0
3 16 17 20 23 25	2:57	3:07	0:10	2.2	2.2
3 16 17 20 23	3:07	3:17	0:10	3.7	4.1
3 16 17 20 23 26	3:17	4:12	0:55	4.6	3.0
3 16 17 20 21 23 26	4:12	4:27	0:15	2.1	2.1
3 16 17 21 23 26	4:27	4:32	0:05	2.2	2.2
3 17 21 23 26	4:32	4:37	0:05	3.8	3.8
3 17 21 23 26 28	4:37	6:07	1:30	2.0	2.9
1 3 17 21 23 26 28	6:07	6:22	0:15	2.0	2.1
1 3 11 17 21 23 26 28	6:22	6:37	0:15	1.6	1.6
1 3 11 17 21 23 28	6:37	7:07	0:30	1.9	2.1
1 11 17 21 23 28	7:07	7:52	0:45	2.8	3.4
1 11 12 17 21 23 28	7:52	8:07	0:15	2.8	2.8
1 11 12 15 17 21 23 28	8:07	8:17	0:10	1.6	1.6
1 11 12 15 21 23 28	8:17	8:37	0:20	2.0	2.0
1 11 12 15 21 23 25 28	8:37	9:07	0:30	1.6	1.8
1 11 12 15 21 25 28	9:07	9:27	0:20	1.9	1.9
1 11 12 14 15 21 25 28	9:27	9:37	0:10	1.7	1.7
1 11 12 14 15 21 25	9:37	9:52	0:15	2.0	2.1
1 11 14 15 21 25	9:52	10:07	0:15	2.7	2.7
1 11 14 15 21 25 29	10:07	10:57	0:50	2.2	2.0
1 11 14 15 25 29	10:57	11:02	0:05	2.2	2.2
1 14 15 25 29	11:02	11:47	0:45	3.3	3.1
1 13 14 15 25 29	11:47	11:52	0:05	2.3	2.3
13 14 15 18 25 29	11:52	12:47	0:55	2.5	2.0
4 15 18 25 29	12:47	12:57	0:10	2.3	2.2
14 15 18 19 25 29	12:57	13:22	0:25	2.0	1.9
14 18 19 25 29	13:22	13:32	0:10	2.2	2.2
14 18 19 29	13:32	14:17	0:45	21.0	99.9
14 18 19 24 29	14:17	14:22	0:05	2.9	2.9
14 18 19 24 27 29	14:22	14:57	0:35	2.6	2.4
14 18 19 27 29	14:57	15:02	0:05	5.7	5.7
14 18 19 27 28 29	15:02	15:37	0:35	2.4	2.4
18 19 27 28 29	15:37	15:47	0:10	3.2	3.1
16 18 19 27 28 29	15:47	15:57	0:10	2.6	2.6
2 16 18 19 27 28 29	15:57	16:22	0:25	1.6	1.7
2 11 16 18 19 27 28 29	16:22	16:57	0:35	1.7	1.8
2 11 16 18 19 27 28	16:57	17:17	0:20	2.0	2.1

All-In-View PDOP for EricTheRed

Date : 17 Feb 1993
 Time : 0:00 -> 24:00
 Cut-off Elevation : 10°

Latitude : 39° 00' 45" S
 Longitude : 143° 10' 51" E
 Zone : 0:00

Satellite Constellation	Time Rise	Time Set	dT	PDOP Rise	PDOP Set
2 11 16 18 19 27	17:17	17:52	0:35	2.7	2.5
2 11 16 18 19 26 27	17:52	18:27	0:35	1.9	1.8
2 11 16 19 26 27	18:27	19:02	0:35	2.3	1.9
2 11 19 26 27	19:02	19:12	0:10	3.0	2.9
2 11 15 19 26 27	19:12	19:17	0:05	2.7	2.7
2 13 15 19 26 27	19:17	19:47	0:30	2.2	2.3
2 13 15 26 27	19:47	20:42	0:55	2.5	3.0
2 13 26 27	20:42	20:47	0:05	4.3	4.3
2 12 13 26 27	20:47	21:17	0:30	2.5	2.1
2 12 13 24 26 27	21:17	21:22	0:05	1.9	1.9
2 12 13 24 26	21:22	22:12	0:50	2.2	2.5
2 12 13 24	22:12	22:35	0:23	3.6	4.6
12 13 20 24	22:50	24:00	1:10	4.0	7.7

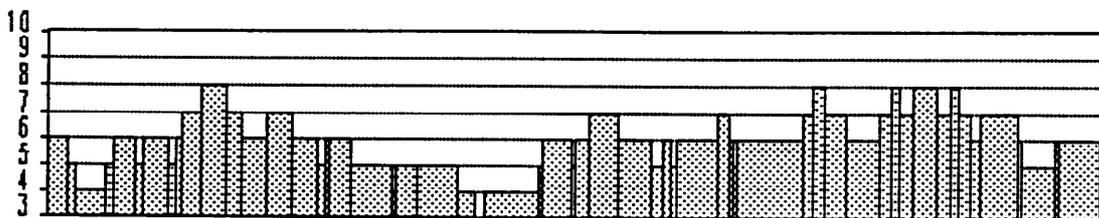


All-In-View PDOP vs Time

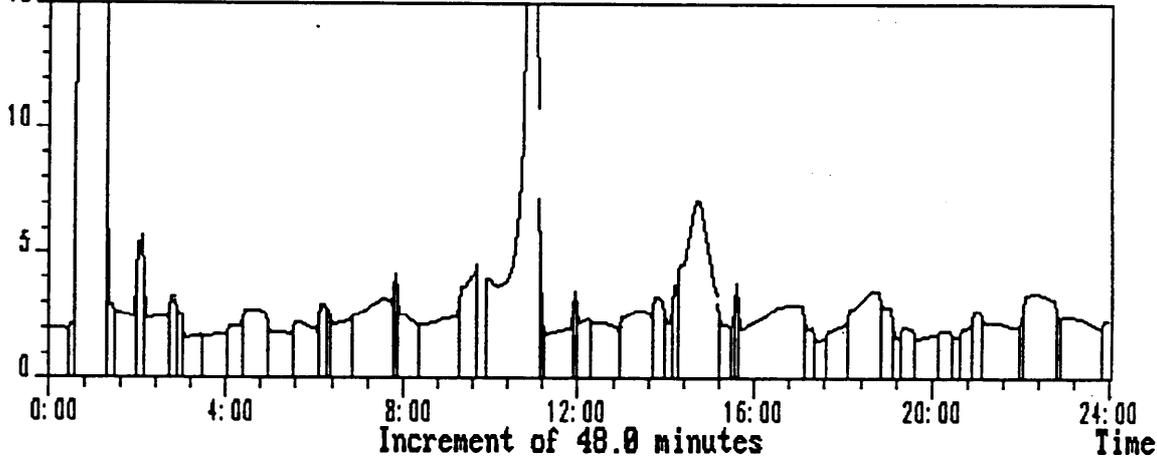
Station : EricTheRed Latitude : 39 00'45"S Longitude : 143 10'51"E
Date : 17 Feb 1993 Zone : 11:00 Cut-off Elevation : 10

Number of Satellites

8 Channel Receiver



PDOP 15



All-In-View PDOP for EricTheRed

Date : 17 Feb 1993
 Time : 0:00 -> 24:00
 Cut-off Elevation : 10°

Latitude : 39° 00' 45" S
 Longitude : 143° 10' 51" E
 Zone : 11:00

Satellite Constellation	Time Rise	Time Set	dT	PDOP Rise	PDOP Set
14 15 18 25 29	0:00	0:02	0:02	2.2	2.2
14 15 18 19 25 29	0:02	0:27	0:25	2.0	1.9
14 18 19 25 29	0:27	0:37	0:10	2.2	2.2
14 18 19 29	0:37	1:17	0:40	21.3	99.9
14 18 19 24 29	1:17	1:27	0:10	3.0	2.9
14 18 19 24 27 29	1:27	1:57	0:30	2.6	2.4
14 18 19 27 29	1:57	2:07	0:10	5.4	5.8
14 18 19 27 28 29	2:07	2:42	0:35	2.4	2.4
18 19 27 28 29	2:42	2:52	0:10	3.2	3.1
16 18 19 27 28 29	2:52	3:02	0:10	2.6	2.6
2 16 18 19 27 28 29	3:02	3:27	0:25	1.6	1.7
2 11 16 18 19 27 28 29	3:27	4:02	0:35	1.7	1.8
2 11 16 18 19 27 28	4:02	4:22	0:20	2.0	2.1
2 11 16 18 19 27	4:22	4:57	0:35	2.7	2.5
2 11 16 18 19 26 27	4:57	5:32	0:35	1.9	1.8
2 11 16 19 26 27	5:32	6:07	0:35	2.3	1.9
2 11 19 26 27	6:07	6:17	0:10	3.0	2.9
2 11 15 19 26 27	6:17	6:22	0:05	2.7	2.7
2 13 15 19 26 27	6:22	6:52	0:30	2.2	2.3
2 13 15 26 27	6:52	7:47	0:55	2.5	2.9
2 13 26 27	7:47	7:52	0:05	4.2	4.2
2 12 13 26 27	7:52	8:22	0:30	2.5	2.1
2 12 13 24 26	8:22	9:17	0:55	2.1	2.5
2 12 13 24	9:17	9:40	0:23	3.6	4.6
1 3 20 24	9:55	11:07	1:12	3.9	7.2
12 13 16 20 24	11:07	11:12	0:05	2.3	2.3
3 12 13 16 20 24	11:12	11:52	0:40	1.8	2.0
3 12 16 20 24	11:52	11:57	0:05	3.5	3.5
3 12 16 20 24 25	11:57	12:17	0:20	2.2	2.4
3 12 16 17 20 24 25	12:17	12:57	0:40	2.2	1.9
3 16 17 20 24 25	12:57	13:42	0:45	2.5	2.4
3 16 17 20 25	13:42	13:57	0:15	3.2	3.0
3 16 17 20 23 25	13:57	14:07	0:10	2.2	2.2
3 16 17 20 23	14:07	14:17	0:10	3.7	4.1
3 16 17 20 23 26	14:17	15:12	0:55	4.6	3.0
3 16 17 20 21 23 26	15:12	15:27	0:15	2.1	2.1
3 16 17 21 23 26	15:27	15:32	0:05	2.2	2.2
3 17 21 23 26	15:32	15:37	0:05	3.8	3.8
3 17 21 23 26 28	15:37	17:07	1:30	2.0	2.9
1 3 17 21 23 26 28	17:07	17:22	0:15	2.0	2.1
1 3 11 17 21 23 26 28	17:22	17:37	0:15	1.6	1.6
1 3 11 17 21 23 28	17:37	18:07	0:30	1.9	2.1
1 11 17 21 23 28	18:07	18:52	0:45	2.8	3.4
1 11 12 17 21 23 28	18:52	19:07	0:15	2.8	2.8
1 11 12 15 17 21 23 28	19:07	19:17	0:10	1.6	1.6

All-In-View PDOP for EricTheRed

Date : 17 Feb 1993
 Time : 0:00 -> 24:00
 Cut-off Elevation : 10°

Latitude : 39° 00' 45" S
 Longitude : 143° 10' 51" E
 Zone : 11:00

Satellite Constellation	Time Rise	Time Set	dT	PDOP Rise	PDOP Set
1 11 12 15 21 23 28	19:17	19:37	0:20	2.0	2.0
1 11 12 15 21 23 25 28	19:37	20:07	0:30	1.6	1.8
1 11 12 15 21 25 28	20:07	20:27	0:20	1.9	1.9
1 11 12 14 15 21 25 28	20:27	20:37	0:10	1.7	1.7
1 11 12 14 15 21 25	20:37	20:52	0:15	2.0	2.1
1 11 14 15 21 25	20:52	21:07	0:15	2.7	2.7
1 11 14 15 21 25 29	21:07	21:57	0:50	2.2	2.0
1 11 14 15 25 29	21:57	22:02	0:05	2.2	2.2
1 14 15 25 29	22:02	22:47	0:45	3.3	3.1
1 13 14 15 25 29	22:47	22:52	0:05	2.3	2.3
13 14 15 18 25 29	22:52	23:47	0:55	2.5	2.0
14 15 18 25 29	23:47	23:57	0:10	2.3	2.2

APPENDIX K
ACOUSTIC/DGPS COMPARISON PRINTOUTS

tion Pattern Codes

Code	Secondary(ON)		Tertiary(ON)[TRACKING]				Quaternary(OFF)				
	SRC	HRB	LOP	Patt Code	SRC	HRB	LOP	Patt Code	SRC	HRB	No Data
0503	113	R	1	Geogs	211	1	1	Geogs	311	1	
1106	116	R									
1109	119	R									
1010		R									

* R=Receiver C=Channel **Pattern temporarily not used in computation

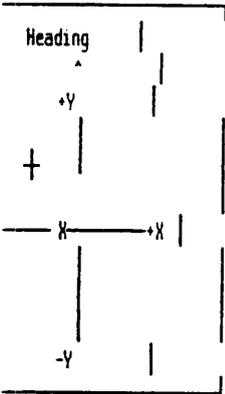
Definition

1	Sonardyne	On/Off Status=ON
2	Del Norte	On/Off Status=ON
3	Tau	On/Off Status=ON
4	Not defined	On/Off Status=OFF

TRANSFER SEQUENCE TO ONLINE OPERATION COMPLETE - R2.06A

er Offsets

Sonardyne
er 1
Y Depth
+8.20 +15.00



Transducer 1+

Parameters

Sonardyne
of Propagation = 1513.2 M/Sec
tow point-fish= 0.0 M

TRANSFER SEQUENCE TO ONLINE OPERATION COMPLETE - R2.06A

TRANSFER SEQUENCE TO ONLINE OPERATION COMPLETE - R2.06A

TRANSFER SEQUENCE TO ONLINE OPERATION COMPLETE - R2.06A

13:42:11 12 Feb 1993 Gyro(T): 176.8 Corrns: -5.9 Speed MG(K): 2.8
CURRENT OFFSET : DATUM +0.00 X +0.00 Y
E 686...79 N 5679890.17 Lat 39 0 34.194S 145 10 53.727E

BHP
BYFORD DOLPHIN R/M
ERIC THE RED

ACOUSTIC / SKYFIX-DGPS
COMPARISONS.

TRANSponder COORDS
FROM SEABED / BOX-INS

RIGNOUC / GNS

Line: P'LAND TO ERIC 1 CC Speed(K): 1.6 Dist to Go(M): 112

Waypoint: ERIC THE R Dist(M): 351 Brg(T): 189.6

PRIMARY COMP. E 688896.09 N 5679895.08

LOP	PATT	TF	SRC	RAW DATA	C-0	RESIDUAL	WEIGHT				
1	0503	R	113	544.43	+0.00	-.63	1.0	Diff E	+3.3	Diff N	+4.9
2	1106	R	116	509.81	+0.00	+13	1.0	Drms	3.1	Max Error	3.6 Orient 1.6
3	1109	R	119	1061.65	+0.00	-.77	1.0	Rms	.8	Mn Ut Res	.5
4	I		1110	964.80	+0.00	+.62	1.0				

SECONDARY COMP.

GPS (Del Norte) E 688917.90 N 5679916.63 Diff E +25.11 Diff N +26.46 No. Sats. used unknown

C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84

Latitude: 39 0 27.999 S Longitude: 143 10 59.697 E Height: -21.90 M

TERTIARY COMP. (T)

GPS (Tau) E 688892.79 N 5679890.17 Height +12.6

C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84

12 Feb 1993 UTC Time :02 41 44.4 CMG :03.20 SMG :003.2

Posn(WGS 84) Lat : 39 0 28.740 S Long :143 10 58.670 E (PR Corr.) Ht : 7.80 M

PRNs:[20 SN:24 RE:000 STAT:0][17 SN:13 RE:001 STAT:0][24 SN:09 RE:000 STAT:0][03 SN:16 RE:000 STAT:0][25 SN:10 RE:001 STAT:0]

POOP :02.8 HDOP :01.7 3D-Err :000 2D-Err :000 Mode :3SU & ALT

13:43:04 12 Feb 1993 Gyro(T): 187.8 Corrn: -5.9 Speed MG(K): 1.7

CURRENT OFFSET : DATUM +0.00 X +0.00 Y

E 688919.97 N 5679832.79 Lat 39 0 36.033S 143 10 54.914E

Line: P'LAND TO ERIC 1 CC Speed(K): .9 Dist to Go(M): 60

Waypoint: ERIC THE R Dist(M): 302 Brg(T): 196.8

PRIMARY COMP. E 688924.18 N 5679835.74

LOP	PATT	TF	SRC	RAW DATA	C-0	RESIDUAL	WEIGHT				
1	0503	R	113	593.06	+0.00	+.08	1.0	Diff E	+4.2	Diff N	+2.9
2	1106	R	116	0.00	+0.00	-501.99	0.0	Drms	3.5	Max Error	4.1 Orient 52.2
3	1109	R	119	996.53	+0.00	+.08	1.0	Rms	.1	Mn Ut Res	.1
4	1010	R	1110	933.47	+0.00	-.05	1.0				

SECONDARY COMP.

GPS (Del Norte) E 688948.39 N 5679846.68 Diff E +28.42 Diff N +13.89 No. Sats. used unknown

C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84

Latitude: 39 0 30.242 S Longitude: 143 11 1.033 E Height: -24.50 M

TERTIARY COMP. (T)

GPS (Tau) E 688919.97 N 5679832.79 Height +11.3

C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84

12 Feb 1993 UTC Time :02 42 37.3 CMG :01.80 SMG :001.8

Posn(WGS 84) Lat : 39 0 30.580 S Long :143 10 59.890 E (PR Corr.) Ht : 6.50 M

PRNs:[20 SN:22 RE:000 STAT:0][17 SN:12 RE:000 STAT:0][24 SN:07 RE:000 STAT:0][03 SN:16 RE:000 STAT:0][25 SN:10 RE:001 STAT:0]

POOP :02.8 HDOP :01.7 3D-Err :000 2D-Err :000 Mode :3SU & ALT

13:43:31 12 Feb 1993 Gyro(T): 189.9 Corrn: -5.9 Speed MG(K): 1.4

CURRENT OFFSET : DATUM +0.00 X +0.00 Y

E 688932.36 N 5679813.70 Lat 39 0 36.642S 143 10 55.448E

Line: P'LAND TO ERIC 1 CC Speed(K): .6 Dist to Go(M): 40

Waypoint: ERIC THE R Dist(M): 288 Brg(T): 200.3

PRIMARY COMP. E 688931.00 N 5679806.54

LOP	PATT	TF	SRC	RAW DATA	C-0	RESIDUAL	WEIGHT				
1	0503	R	113	615.81	+0.00	+3.18	1.0	Diff E	-1.4	Diff N	-7.2
2	1106	R	116	499.70	+0.00	-7.43	1.0	Drms	3.0	Max Error	3.5 Orient 353.5
3	1109	R	119	973.77	+0.00	+6.53	1.0	Rms	10.2	Mn Ut Res	6.8
4	1010	R	1110	905.76	+0.00	-9.97	1.0				

SECONDARY COMP. ABORTED

TERTIARY COMP. (T)

GPS (Tau) E 688932.36 N 5679813.70 Height +13.7

C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84

12 Feb 1993 UTC Time :02 43 04.3 CMG :01.40 SMG :001.4

Posn(WGS 84) Lat : 39 0 31.190 S Long :143 11 .430 E (PR Corr.) Ht : 8.90 M

PRNs:[20 SN:21 RE:000 STAT:0][17 SN:14 RE:000 STAT:0][24 SN:07 RE:000 STAT:0][03 SN:15 RE:000 STAT:0][25 SN:10 RE:000 STAT:0]

PDOP :02.8 HDOP :01.7 3D-Err :000 2D-Err :000 Mode :3SU & ALT

13:43:59 12 Feb 1993 Gyro(T): 182.8 Corrn: -5.9 Speed MG(K): 1.7

CURR. OFFSET : DATUM +0.00 X +0.00 Y

E 688952.29 N 5679800.52 Lat 39 0 37.0545 143 10 56.289E

Line: P'LAND TO ERIC 1 CC Speed(K): .2 Dist to Go(M): 16

Waypoint: ERIC THE R Dist(M): 284 Brg(T): 205.0

PRIMARY COMP. E 688955.12 N 5679803.94

LOP PATT TF SRC RAW DATA C-0 RESIDUAL WEIGHT

1	0503	R	113	634.86	+0.00	-.21	-.21	1.0	Diff E	+2.8	Diff N	+3.4
2	1106	R	116	485.14	+0.00	+.03	+.03	1.0	Drms	3.0	Max Error	3.5 Orient 349.3
3	1109	R	119	954.46	+0.00	-.22	-.22	1.0	Rms	.2	Mn Ut Res	.2
4	1010	R	1110	931.61	+0.00	+.17	+.17	1.0				

SECONDARY COMP.

GPS (Del Norte) E 688977.15 N 5679802.23 Diff E +24.86 Diff N +1.72 No. Sats. used unknown

C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84

Latitude: 39 0 31.661 S Longitude: 143 11 2.273 E Height: -25.00 M

TERTIARY COMP. (T)

GPS (Tau) E 688952.29 N 5679800.52 Height +15.0

C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84

12 Feb 1993 UTC Time :02 43 32.4 CMG :01.60 SMG :001.6

Posn(WGS 84) Lat : 39 0 31.600 S Long :143 11 1.250 E (PR Corr.) Ht : 10.20 M

PRNs:[20 SN:22 RE:001 STAT:0][17 SN:10 RE:000 STAT:0][24 SN:11 RE:001 STAT:0][03 SN:14 RE:000 STAT:0][25 SN:07 RE:000 STAT:0]

PDOP :02.8 HDOP :01.7 3D-Err :000 2D-Err :000 Mode :3SU & ALT

13:44:30 12 Feb 1993 Gyro(T): 177.7 Corrn: -5.9 Speed MG(K): 1.5

CURRENT OFFSET : DATUM +0.00 X +0.00 Y

E 688971.43 N 5679789.88 Lat 39 0 37.3845 143 10 57.095E

Line: P'LAND TO ERIC 1 CC Speed(K): -0.0 Dist to Go(M): -6

Waypoint: ERIC THE R Dist(M): 284 Brg(T): 209.4

PRIMARY COMP. E 688992.38 N 5679759.99

LOP PATT TF SRC RAW DATA C-0 RESIDUAL WEIGHT

1	0503	R	113	661.39	+0.00	-27.29	-27.29	1.0	Diff E	+21.0	Diff N	-29.9
2	1106	R	116	468.77	+0.00	-3.99	-3.99	1.0	Drms	3.0	Max Error	3.4 Orient 339.6
3	1109	R	119	872.98	+0.00	-26.63	-26.63	1.0	Rms	28.7	Mn Ut Res	17.8
4	1010	R	1110	941.20	+0.00	+13.48	+13.48	1.0				

SECONDARY COMP.

GPS (Del Norte) E 688987.82 N 5679796.34 Diff E +16.39 Diff N +6.47 No. Sats. used unknown

C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84

Latitude: 39 0 31.844 S Longitude: 143 11 2.722 E Height: -31.30 M

TERTIARY COMP. (T)

GPS (Tau) E 688971.43 N 5679789.88 Height +13.6

C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84

12 Feb 1993 UTC Time :02 44 02.4 CMG :01.40 SMG :001.4

Posn(WGS 84) Lat : 39 0 31.930 S Long :143 11 2.040 E (PR Corr.) Ht : 8.80 M

PRNs:[20 SN:23 RE:001 STAT:0][17 SN:14 RE:000 STAT:0][24 SN:09 RE:001 STAT:0][03 SN:16 RE:000 STAT:0][25 SN:11 RE:001 STAT:0]

PDOP :02.8 HDOP :01.7 3D-Err :000 2D-Err :000 Mode :3SU & ALT

13:44:57 12 Feb 1993 Gyro(T): 173.9 Corrn: -5.9 Speed MG(K): 1.4

CURRENT OFFSET : DATUM +0.00 X +0.00 Y

E 688991.78 N 5679783.86 Lat 39 0 37.5635 143 10 57.946E

Line: P'LAND TO ERIC 1 CC Speed(K): .2 Dist to Go(M): -27

Waypoint: ERIC THE R Dist(M): 290 Brg(T): 213.5

PRIMARY COMP. E 688999.89 N 5679788.15

LOP PATT TF SRC RAW DATA C-0 RESIDUAL WEIGHT
 1 0503 R 113 685.53 +0.00 +2.83 +2.83 1.0 Diff E +8.1 Diff N +4.3
 1106 R 116 454.41 +0.00 +3.13 +3.13 1.0 Drms 3.0 Max Error 3.5 Orient 340.9
 1109 R 119 924.74 +0.00 +2.03 +2.03 1.0 Rms 3.4 Mn Wt Res 2.3
 4 1010 R 1110 954.58 +0.00 +1.31 +1.31 1.0

SECONDARY COMP.

GPS (Del Norte) E 689003.56 N 5679790.45 Diff E +11.78 Diff N +6.60 No. Sats. used unknown
 C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84
 Latitude: 39 0 32.022 S Longitude: 143 11 3.382 E Height: -32.00 M

TERTIARY COMP. (T)

GPS (Tau) E 688991.78 N 5679783.86 Height +12.8
 C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84
 12 Feb 1993 UTC Time :02 44 29.4 CM6 :01.70 SM6 :001.7
 Posn(WGS 84) Lat : 39 0 32.110 S Long :143 11 2.880 E (PR Corr.) Ht : 8.00 M
 PRNs:[20 SN:25 RE:001 STAT:0][17 SN:12 RE:000 STAT:0][24 SN:11 RE:001 STAT:0][03 SN:15 RE:000 STAT:0][25 SN:07 RE:001 STAT:0]
 PDOP :02.8 HDOP :01.7 3D-Err :000 2D-Err :000 Mode :3SU & ALT

13:45:00 12 Feb 1993 Gyro(T): 173.5 Corrn: -5.9 Speed MG(K): 1.5

CURRENT OFFSET : DATUM +0.00 X +0.00 Y
 E 688993.96 N 5679783.50 Lat 39 0 37.573S 143 10 58.037E
 Line: P'LAND TO ERIC 1 CC Speed(K): .3 Dist to Go(M): -29
 Waypoint: ERIC THE R Dist(M): 291 Brg(T): 213.9

PRIMARY COMP. E 689000.06 N 5679784.94

LOP PATT TF SRC RAW DATA C-0 RESIDUAL WEIGHT
 1 0503 R 113 686.60 +0.00 +2.32 +2.32 1.0 Diff E +6.1 Diff N +1.4
 2 1106 R 116 453.11 +0.00 +.46 +.46 1.0 Drms 3.0 Max Error 3.5 Orient 340.7
 3 1109 R 119 921.94 +0.00 +2.22 +2.22 1.0 Rms 2.4 Mn Wt Res 1.5
 4 1010 R 1110 950.09 +0.00 -1.14 -1.14 1.0

SECONDARY COMP.

GPS (Del Norte) E 689001.34 N 5679790.41 Diff E +7.38 Diff N +6.92 No. Sats. used unknown
 C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84
 Latitude: 39 0 32.025 S Longitude: 143 11 3.289 E Height: -31.80 M

TERTIARY COMP. (T)

GPS (Tau) E 688993.96 N 5679783.50 Height +11.2
 C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84
 12 Feb 1993 UTC Time :02 44 33.4 CM6 :01.50 SM6 :001.5
 Posn(WGS 84) Lat : 39 0 32.120 S Long :143 11 2.970 E (PR Corr.) Ht : 6.40 M
 PRNs:[20 SN:23 RE:001 STAT:0][17 SN:14 RE:000 STAT:0][24 SN:10 RE:001 STAT:0][03 SN:18 RE:000 STAT:0]
 PDOP :02.8 HDOP :01.7 3D-Err :000 2D-Err :000 Mode :3SU & ALT

13:46:44 12 Feb 1993 Gyro(T): 154.1 Corrn: -5.9 Speed MG(K): 1.6

CURRENT OFFSET : DATUM +0.00 X +0.00 Y
 E 689080.14 N 5679777.81 Lat 39 0 37.691S 143 11 1.624E
 Line: P'LAND TO ERIC 1 CC Speed(K): .8 Dist to Go(M): -106
 Waypoint: ERIC THE R Dist(M): 344 Brg(T): 226.3

PRIMARY COMP. E 689081.12 N 5679779.77

LOP PATT TF SRC RAW DATA C-0 RESIDUAL WEIGHT
 1 0503 R 113 761.09 +0.00 +.73 +.73 1.0 Diff E +1.0 Diff N +2.0
 2 1106 R 116 385.45 +0.00 +.61 +.61 1.0 Drms 3.1 Max Error 3.5 Orient 328.3
 3 1109 R 119 889.55 +0.00 +.66 +.66 1.0 Rms .8 Mn Wt Res .5
 4 1010 R 1110 1011.24 +0.00 +.03 +.03 1.0

SECONDARY COMP.

GPS (Del Norte) E 689075.14 N 5679790.36 Diff E -5.01 Diff N +12.55 No. Sats. used unknown
 C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84
 Latitude: 39 0 31.970 S Longitude: 143 11 6.356 E Height: -31.90 M

TERTIARY COMP. (T)

GPS (Tau) E 689080.14 N 5679777.81 Height +11.7
 C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84

12 Feb 1993 UTC Time :02 46 17.4 CMG :01.90 SMG :001.9

Posn(WGS 84) Lat : 39 0 32.250 S Long :143 11 6.500 E (PR Corr.) Ht : 6.90 M

PRNs:[20 SN:22 RE:000 STAT:0][17 SN:12 RE:000 STAT:0][24 SN:12 RE:001 STAT:0][03 SN:17 RE:000 STAT:0][25 SN:08 RE:000 STAT:0]

PDOP :02.8 HDOP :01.7 3D-Err :000 2D-Err :000 Mode :3SU & ALT

13:47:23 12 Feb 1993 Gyro(T): 144.3 Corrn: -5.9 Speed MG(K): 1.7

CURR FFSET : DATUM +0.00 X +0.00 Y

E 689114.16 N 5679785.38 Lat 39 0 37.4195 143 11 3.030E

Line: P'LAND TO ERIC 1 CC Speed(K): 1.2 Dist to Go(M): -132

Waypoint: ERIC THE R Dist(M): 375 Brg(T): 228.9

PRIMARY COMP. E 689112.11 N 5679785.63

LOP PATI TF SRC RAW DATA C-D RESIDUAL WEIGHT

1 0503 R 113 786.67 +0.00 +.20 +.20 1.0 Diff E -2.0 Diff N +.3

2 1106 R 116 356.03 +0.00 +.56 +.56 1.0 Drms 3.1 Max Error 3.6 Orient 325.0

3 1109 R 119 887.20 +0.00 +.18 +.18 1.0 Rms .5 Mn Wt Res .3

4 1010 R 1110 1040.62 +0.00 +.39 +.39 1.0

SECONDARY COMP.

GPS (Del Norte) E 689114.06 N 5679790.70 Diff E -.10 Diff N +5.32 No. Sats. used unknown

C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84

Latitude: 39 0 31.928 S Longitude: 143 11 7.973 E Height: -38.90 M

TERTIARY COMP. (T)

(Tau) E 689114.16 N 5679785.38 Height +10.0

C-0s applied dLat : +0.00 dLong : +0.00 dHeight : +0.00 Rx spheroid : WGS 84

12 Feb 1993 UTC Time :02 46 55.4 CMG :02.00 SMG :002.0

Posn(WGS 84) Lat : 39 0 31.990 S Long :143 11 7.880 E (PR Corr.) Ht : 5.20 M

PRNs:[20 SN:24 RE:000 STAT:0][17 SN:14 RE:000 STAT:0][24 SN:10 RE:001 STAT:0][03 SN:14 RE:000 STAT:0][25 SN:08 RE:000 STAT:0]

PDOP :02.8 HDOP :01.7 3D-Err :000 2D-Err :000 Mode :3SU & ALT

APPENDIX L
DAILY LOG SHEETS



DAILY RECORD SHEET

WX	SeaStat	Roll	WindDir.
0000	3	2-3	60° 15kt
0600	3	2	60° 15kt
1200	3	2-3	90° 22kt
1800	3	3-4	110° 45kt

RCRD 1/PE900171/P431

Client : BHP		Job No : 2051		Date : 14-2-93		Vessel : BYFORD DOLPHIN		Anchors / Tpdrs			
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered	
SKYFIX RIG PORT	✓		STD 12 / VELOCITY PROBE			K. EDDY	ITEM	USED	REMAIN	503	
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			1106	
MICROFIX			SIDESCAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			1109	
ARGO			BOOMER (DELPH/EPC)				ELICS PAPER			1010	
GNS PC	✓		SPARKER (DELPH/EPC)				DISKS				
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.				
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS				
TELEMETRY GOLF LASER	✓		UNDERWATER TRACKING			C. SELLERS					
SONARDYNE COMPATTS	4										
SONARDYNE PAN	✓										
SONARDYNE (Dunker/Winch/Fish)	✓										

DIARY OF OPERATIONS:

0700 - Helicopter arrived with Skyfix equipment.
 0730 - Byford Dolphin commenced recovering anchors.
 1930 - Byford Dolphin still has 4 ~~anchors~~ anchors to recover

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Client's Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Transponders to be listed by type and serial numbers. Following codes to be used: L - Laid, R - Recovered, FR - Failed to Reply, FS - Failed to Surface.

Signature

K. Eddy
 SURVEYOR/ENGINEER

WHITE : Commercial Office
 BLUE : Operations
 YELLOW : Client's Representative

Signature

C. Sellers
 CLIENTS REPRESENTATIVE



DAILY RECORD SHEET

WX	Sea State	Wind	Wind Dir.
0000	2.5	2-3	110° 25k
0	2.5	2-3	0° 10k
1200	1.5	1-2	280° 15k
1800	1.5	1-2	Var 2k

RCRD / PE900171 / P432

Client : BHP		Job No : 2051		Date : 15-2-93		Vessel : BYFORD DOLPHIN		Anchors / Tpdrs		
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered
SKYFIX RIG PORT	✓		STD 12 / VELOCITY PROBE			K. EDDY	ITEM	USED	REMAIN	503
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			1106
MICROFIX			SIDESCAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			1109
ARGO			BOOMER (DELPH/EPC)				ELICS PAPER			1010
GNS PC	✓		SPARKER (DELPH/EPC)				DISKS			7
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.			
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS			
TELEMETRY GOLF LASER	✓		UNDERWATER TRACKING			C. SELLERS				
SONARDYNE COMPATTS	4									
SONARDYNE PAN	✓									
SONARDYNE (Dunker/Winch/Fish)	✓									

DIARY OF OPERATIONS:

0730 - Byford Dolphin has recovered all anchors except No. 7. Towing vessels are on anchors 1 & 12 shortening chain before commencing recovery of No. 7.

1200 - Byford Dolphin at anchor with No. 7. Far Sword on static tow on anchor #1. Bona Vista still playing with anchor #12 chain and anchor. Approx 1.5 → 2 hrs before Byford can commence recovering anchor #7.

1400 - Byford Dolphin commenced recovering anchor #7.

1530 - Byford Dolphin recovered anchor #7. Commenced Tow to Eric The Red-1 location.

2130 - Commenced 5 mile run-in to ERIC THE RED-1 location.

2240 - 7 O.T.B (68°58'48"E 567°28'29"N)

2345 - Byford Dolphin 50m north of location and rig is preparing to run anchor #1.

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Transponders to be listed by type and serial numbers. Following codes to be used: L - Laid, R - Recovered, FR - Failed to Reply, FS - Failed to Surface.

Signature K. Eddy
SURVEYOR/ENGINEER

WHITE : Commercial Office
BLUE : Operations
YELLOW : Clients Representative

Signature Colin McLeod
CLIENTS REPRESENTATIVE

RACAL SURVEY AUSTRALIA LIMITED



DAILY RECORD SHEET

WX	SeaSt.	Roll	WindDir.
0000			
06			
1200			
1800			

ACRD 1 / PE900171 / P433

Client: BHP		Job No: 2051		Date: 16-2-93		Vessel: BYFORD DOLPHIN		Anchors / Tpdrs		
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered
SKYFIX RIG PORT	✓		STD 12 / VELOCITY PROBE			K. EDDY	ITEM	USED	REMAIN	503
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			1106
MICROFIX			SIDESCAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			1109
ARGO			BOOMER (DELPH/EPC)				ELICS PAPER			1010
GNS PC	✓		SPARKER (DELPH/EPC)				DISKS			± 1
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.			± 6
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS			± 7
TELEMETRY GOLF LASER	✓		UNDERWATER TRACKING			C. SELLERS				± 11
SONARDYNE COMPATTS	4									± 4
SONARDYNE PAN	✓									
SONARDYNE (Dunker/Winch/Freq)	✓									

DIARY OF OPERATIONS:

0039 - Far Sword commenced running anchor #1

0115 - Anchor #1 on the seabed

0225 - Far Sword commenced running anchor #6

0303 - Anchor #6 going over stern roller

0307 - Anchor #6 on the seabed

0706 - Far Sword commenced running anchor #11.

0718 - Far Sword commenced lowering anchor #11 to the seabed.

0738 - Anchor #11 on the seabed.

1000 - Far Sword commenced running anchor #4.

1009 - Far Sword commenced lowering anchor #4 to the seabed.

1026 - Anchor #4 on the seabed.

1053 - Bonavista to commence running anchor #12

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Client's Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Transponders to be listed by type and serial numbers. Following codes to be used: L - Laid, R - Recovered, FR - Failed to Reply, FS - Failed to Surface.

Signature K. Eddy
SURVEYOR/ENGINEER

WHITE : Commercial Office
BLUE : Operations

Signature Colin Sellers
CLIENTS REPRESENTATIVE

WX	SeaStat	Call	WindDir.
0000			
01	1	1	120° S kt
1200			
1800			



DAILY RECORD SHEET

RCRD 1 / PE900171 / P434

Client : BHP			Job No : 2051			Date : 16-2-93	Vessel : BYFORD DOLPHIN			Anchors / Tpdrs	
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables			Laid	Recovered
SKYFIX RIG PORT	✓		STD 12 / VELOCITY PROBE			K. EDDY	ITEM	USED	REMAIN	± 12	
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDECAN PAPER			± 3	
MICROFIX			SIDECAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			± 3 (re-run)	
ARGO			BOOMER (DELPH/EPC)				ELICS PAPER			± 9	
GNS PC	✓		SPARKER (DELPH/EPC)				DISKS				
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.				
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS				
TELEMETRY GOLF LAXER	✓		UNDERWATER TRACKING			C. SELLERS					
SONARDYNE COMPATTS	4										
SONARDYNE PAN	✓										
SONARDYNE (Dunker/Wiret/Fish)	✓										

DIARY OF OPERATIONS: 11:06 - Bonavista commenced lowering anchor #12 to the seabed. #12 dropped, Shackle broke.

12:34 - Far Sword commenced running anchor #3.

12:47 - Far Sword commence lowering anchor #3 to the seabed.

12:52 - Anchor #3 on the seabed.

13:10 - Anchor #3 slipping. To be re-run.

13:50 - Winch #3 hauling in Far Sword.

14:45 - Far Sword commence re-running anchor #3. Anchor sitting wrong. Haul in again to rectify.

15:12 - Far Sword re-commence re-running.

15:28 - Far Sword commence lowering anchor #3 to the seabed.

15:32 - Anchor #3 on the seabed.

1716 - Far Sword commenced running anchor #9.

1734 - Far Sword commence lowering anchor #9 to the seabed.

1737 - Anchor #9 on the seabed.

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Transponders to be listed by type and serial numbers. Following codes to be used: L - Laid, R - Recovered, FR - Failed to Reply, FS - Failed to Surface.

Signature K. Eddy
SURVEYOR/ENGINEER

WHITE	Commercial Office
BLUE	Operations
YELLOW	Client's Representative

Signature John Sellers
CLIENTS REPRESENTATIVE



DAILY RECORD SHEET

WX	Sea State	Temp	Wind Dir.
0000			
01			
1200			
1800			

Client : BHP		Job No : 2051		Date : 16-02-93		Vessel : BYFORD DOLPHIN		Anchors / Tpdrs		
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered
SKYFIX RIG PORT	✓		STD 12 / VELOCITY PROBE			K. EDDY	ITEM	USED	REMAIN	
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			
MICROFIX			SIDESCAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			
ARGO			BOOMER (DELPH/EPC)				ELICS PAPER			
GNS PC	✓		SPARKER (DELPH/EPC)				DISKS			
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.			
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS			
TELEMETRY GOLF LASER	✓		UNDERWATER TRACKING			C. SEWERS				
SONARDYNE COMPATTS	4									
SONARDYNE PAN	✓									
SONARDYNE (Dunkar/Winch/Fish)	✓									

DIARY OF OPERATIONS: 18:20 Pre-tensioning operations commencing.

2000 - Byford Dolphin moving towards Eric The Red-I location.

2045 - Byford Dolphin completed moving over Eric The Red-I. Commenced Ballasting down.

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Transponders to be listed by type and serial numbers. Following codes to be used: L - Laid, R - Recovered, FR - Failed to Reply, FS - Failed to Surface.

Signature K. Eddy
SURVEYOR/ENGINEER

WHITE : Commercial Office
BLUE : Operations
YELLOW : Clients Representative

Signature John Sellers
CLIENTS REPRESENTATIVE

RCRD 1 / PE900171 / P435



RACAL SURVEY AUSTRALIA LIMITED

DAILY RECORD SHEET

WX	Sea State	veil	Wind Dir.
0000			
0			
1200			
1800			

RCRD 1 / PE900171 / P436

Client : BHP		Job No : 2051		Date : 17-2-93		Vessel : BYFORD DOLPHIN		Anchors / Tpdrs		
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered
SKYFIX RIG PORT	✓		STD 12 / VELOCITY PROBE			K. EDDY	ITEM	USED	REMAIN	503
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			1106
MICROFIX			SIDESCAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			1109
ARGO			BOOMER (DELPH/EPC)				ELICS PAPER			1010
GNS PC	✓		SPARKER (DELPH/EPC)				DISKS			
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.			
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS			
TELEMETRY GOLF LASER	✓		UNDERWATER TRACKING			C. SELLERS	PRINTER PAP	0.5	1.0	
SONARDYNE COMPATTS	4									
SONARDYNE PAN	✓									
SONARDYNE (Dunker/Winch/Fish)	✓									

DIARY OF OPERATIONS :

0318 - Byford Dolphin completed Ballasting down.

0705 - Commenced collecting Trimble/Skyfix/DNAVN DGPS data for Final Position determination at Eric The Red location. Differential corrections via Sydney

0748 - Differential corrections via Adelaide.

0755 - Enabled all Sonardyne Compatts.

TP	Addr	BC	Udls
1	503	54	26.1
2	1106	54	26.1
3	1109	54	26.4
4	1010	54	26.6

0757 Released Compatt 1010

0759 Pacific Marlin RS recovered Compatt 1010

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Transponders to be listed by type and serial numbers. Following codes to be used: L - Laid, R - Recovered, FR - Failed to Reply, FS - Failed to Surface.

Signature *K. Eddy*
SURVEYOR/ENGINEER

WHITE : Commercial Office
BLUE : Operations
YELLOW : Clients Representative

Signature *C. Sellers*
CLIENTS REPRESENTATIVE



RACAL SURVEY AUSTRALIA LIMITED

DAILY RECORD SHEET

WX	Sea State	||	Wind Dir.
0000			
0600			
1200			
1800			

ACRD 1 / PE900171 / P437

Client : BHP		Job No : 2051		Date : 17-2-93		Vessel : BYFORD DOLPHIN		Anchors / Tpdrs		
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered
SKYFIX RIG PORT	✓		STD 12 / VELOCITY PROBE			K. EDDY	ITEM	USED	REMAIN	1010
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			503
MICROFIX			SIDESCAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			1106
ARGO			BOOMER (DELPH/EPC)				ELIGS PAPER			1109
GNS PL	✓		SPARKER (DELPH/EPC)				DISKS			
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.			
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS			
TELEMETRY GOLF LASER	✓		UNDERWATER TRACKING			C. SELLERS				
SONARDYNE COMPATTS	4									
SONARDYNE PAN	✓									
SONARDYNE (Dunker/Winch/Fish)	✓									

DIARY OF OPERATIONS:

0808 - Released Compatt 503

0810 - Compatt 503 recovered by R5

0813 - Released Compatt 1106

0815 - Compatt 1106 recovered by R5

0824 - Released Compatt 1109

0827 - Compatt 1109 recovered by R5

0834 - Completed collecting DGPS data for final position determination.

0835 - Final position of Eric The Red 1.

* Lat 39° 00' 45.44" South Long 143° 10' 51.45" East

 Eing 688 829.7m Ning 5 679 544.8m

This places the well 3.9 metres on a bearing of 106.4° from the intended Eric-The-Red 1 location.

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Signature

K. Eddy
SURVEYOR/ENGINEER

WHITE : Commercial Office
 BLUE : Operations
 YELLOW : Clients Representative

Signature

Eric Sellers
CLIENTS REPRESENTATIVE

RCRD 1/PE900171/P438



RACAL SURVEY AUSTRALIA LIMITED

DAILY RECORD SHEET

WX	SeaSta	well	WindDir.
0000			
06			
1200			
1800			

Client : BHP		Job No : 2051		Date : 10-293		Vessel : PACIFIC MARLIN		Anchors / Tpdrs		
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered
SKYFIX	✓		STD 12 / VELOCITY PROBE	✓		K.EDDY	ITEM	USED	REMAIN	
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			
MICROFIX			SIDESCAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			
ARGO			BOOMER (DELPH/EPC)				ELICS PAPER			
GNS	✓		SPARKER (DELPH/EPC)				DISKS			
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.			
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS			
TELEMETRY			UNDERWATER TRACKING			C. SELLERS				
SONARDYNE COMPATTS	5									
SONARDYNE PAN	1									
SONARDYNE (Dunker/Winch/Fish)	1									

DIARY OF OPERATIONS:

1000 - K.EDDY, C. ROBINSON, L. ETHERIDGE & C. SELLERS arrive Portland airport

1100 - Personnel arrive Pacific Marlin - commence setting equipment to work.

1130 - Checked all Sonardyne Compatts

Addr Code	S/No	BC	Volts	Error
503	7271-05	469	21.2	0
1010	9227-04	468	24.2	0
1109	48542-04	469	25.4	0
1106	48542-04	469	24.6	0
203	9178-03	817	21.3	0

1300 All compatts except 203 placed on charge.

1400 All equipment tested and operational.

1600 Pacific Marlin departed Portland harbour

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Transponders to be listed by type and serial numbers. Following codes to be used: L - Laid, R - Recovered, FR - Failed to Reply, FS - Failed to Surface.

Signature

K. Eddy
SURVEYOR/ENGINEER

WHITE	Commercial Office
BLUE	Operations
YELLOW	Clients Representative

Signature

C. Sellers
CLIENTS REPRESENTATIVE



RACAL SURVEY AUSTRALIA LIMITED

DAILY RECORD SHEET

WX	Sea Sld	well	Wind Dir.
0000			
06			
1200			
1800			

RCRD 1 / PE900171 / P439

Client : BHP		Job No : 2051		Date : 10-2-93		Vessel : PACIFIC MARLIN		Anchors / Tpdrs					
RACAL Equipment on Board		Op	NonOp	RACAL Equipment on Board		Op	NonOp	RACAL Personnel		Consummables		Laid	Recovered
SKYFIX	RIG PORT	✓		STD 12 / VELOCITY PROBE	✓			K. EDDY	ITEM	USED	REMAIN		
SYLEDIS				ECHO SOUNDER (20/25)				C. ROBINSON	SIDESCAN PAPER				
MICROFIX				SIDESCAN (595/531/PINGER)				L. ETHERIDGE	E/SOUNDER PAPER				
ARGO				BOOMER (DELPH/EPC)					ELICS PAPER				
GNS		✓		SPARKER (DELPH/EPC)					DISKS				
GYRO		✓		CORING (GRAVITY/GRAB)					PRINTER CART.				
TRIMBLE SST'S				THEODOLITE / EDM				CLIENT Personnel	EPC ROLLS				
TELEMETRY				UNDERWATER TRACKING				C. SELLERS					
SONARDYNE COMPATTS		5											
SONARDYNE PAN		✓											
SONARDYNE (Dredge/Winch/Fish)		✓											

DIARY OF OPERATIONS:

1630 - Pacific Marlin at anchor off Portland.

2105 - Pacific Marlin departed Portland anchorage for Eric The Red location.

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Signature K. Eddy
SURVEYOR/ENGINEER

WHITE - Commercial Office
BLUE - Operations
YELLOW - Clients Representative

Signature John Sellers
CLIENTS REPRESENTATIVE



RACAL SURVEY AUSTRALIA LIMITED

DAILY RECORD SHEET

WX	Sea Str.	Wave	Wind Dir.
0000			
06	3/4	E-2m	N-3/4
1200	4-5	N-1.5	NW-4.5
1800	6-7	2m	N-7

RCRD 1 / PE900171 / P440

Client : BHP		Job No : 2051		Date : 11-2-93		Vessel : PACIFIC MARLIN		Anchors / Tpdrs		
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered
SKYFIX	✓		STD 12 / VELOCITY PROBE	✓		K. EDDY	ITEM	USED	REMAIN	503
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			1106
MICROFIX			SIDESCAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			1109
ARGO			BOOMER (DELPH/EPC)				ELICS PAPER			1010
GNS HP	✓		SPARKER (DELPH/EPC)				DISKS			
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.			
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS			
TELEMETRY			UNDERWATER TRACKING			C. SELLERS				
SONARDYNE COMPATTS	5									
SONARDYNE PAN	✓									
SONARDYNE (Dredger/Winch/Fish)	✓									

DIARY OF OPERATIONS :

0600 - Pacific Marlin arrived Eric the Red location.

0645 - Setting up equipment for Salinity Profile. Returning to Eric the Red location.

0730 - At Eric the Red location.

0745 - Carried out STD-12 Profile at Eric the Red location.

0800 - Received rig heading and anchor pattern from Byford Dolphin for Eric the Red location.

0930 - Setting up to deploy Sonardyne Compatts at Eric the Red location.

1009 - Deployed Sonardyne Compatt 503 Depth of TX 63.3m. - Del Norte Nav

1019 - Deployed Sonardyne Compatt 1106 Depth of TX point 70.0m

1029 - Deployed Sonardyne Compatt 1109 Depth of TX point 71.2m

1039 - Deployed Sonardyne Compatt 1010 Depth of TX point 72.0

1045 - Waiting on suitable DGPS coverage for Acoustic calibrations

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Transponders to be listed by type and serial numbers. Following codes to be used: L - Laid, R - Recovered, FR - Failed to Reply, FS - Failed to Surface.

Signature

Shelley
SURVEYOR/ENGINEER

WHITE : Commercial Office
 BLUE : Operations
 YELLOW : Clients Representative

Signature

John Sellers
CLIENTS REPRESENTATIVE



RACAL SURVEY AUSTRALIA LIMITED

DAILY RECORD SHEET

WX	Sea Str	well	Wind Dir.
0000			
01			
1200			
1800			

RCRD 1 / PE900171 / P442

Client : BHP		Job No : 2051		Date : 11-2-93		Vessel : PACIFIC MARLIN		Anchors / Tpdrs		
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered
SKYFIX RIG. PORT	✓		STD 12 / VELOCITY PROBE	✓		K. EDDY	ITEM	USED	REMAIN	503
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			1106
MICROFIX			SIDESCAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			1109
ARGO			BOOMER (DELPH/EPC)				ELICS PAPER			1010
GNS x 2	✓		SPARKER (DELPH/EPC)				DISKS			
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.			
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS			
TELEMETRY			UNDERWATER TRACKING			C. SELLERS				
SONARDYNE COMPATTS	5									
SONARDYNE PAN	✓									
SONARDYNE (Dunker/Winch/Fish)	✓									

DIARY OF OPERATIONS:

1520 - Commenced Box-in of TP2 Compatt 1106 Radius 300 Nav on Del Norte DGPS
 SU's 23, 20, 26, 16, 3, 17 PDOP 4.0 HDOP 2.1 VDOP 3.4 TDOP 2.4

1600 - ~~Box-in~~ Completed Box-in data collection of TP2 Compatt 1106

1614 - Box-in position of TP2 Compatt 1106
 ** EING 689 396.9m Ning 5 680 002.1 Depth 70.0 RMS 3.0

1626 - Commenced Sea-Bed Calibration data collection of Eric The Red array
 15 Cycles requested.

1711 - Completed Sea-Bed Calibration

1720 - Disabled all Compatts in Eric The Red array
 503 - BC 7 Volts 26.8 1106 - BC 7 Volts 26.5
 1109 - BC 7 Volts 26.7 1010 - BC 7 Volts 27.3

1730 - Recovered Sonardyne Tow Fish

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Signature

K. Eddy
 SURVEYOR/ENGINEER

WHITE : Commercial Office
 BLUE : Operations
 YELLOW : Clients Representative

Signature

C. Sellers
 CLIENTS REPRESENTATIVE



DAILY RECORD SHEET

WX	SeaSta	well	WindDir.
0000			
06			
1200			
1800			

RCRD 1 / PE900171 / P443

Client : BHP		Job No : 2051		Date : 11-2-93		Vessel : PACIFIC MARLIN		Anchors / Tpdrs	
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel		Consummables	
SKYFIX RIG PORT	✓		STD 12 / VELOCITY PROBE	✓		K.EDDY		ITEM	USED
SYLEDIS			ECHO SOUNDER (20/25)			C.ROBINSON		SIDESCAN PAPER	REMAIN
MICROFIX			SIDESCAN (595/531/PINGER)			L.ETHERIDGE		E/SOUNDER PAPER	
ARGO			BOOMER (DELPH/EPC)					ELICS PAPER	
GNS	✓		SPARKER (DELPH/EPC)					DISKS	
GYRO	✓		CORING (GRAVITY/GRAB)					PRINTER CART.	
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel		EPC ROLLS	
TELEMETRY			UNDERWATER TRACKING			C.SELLERS			
SONARDYNE COMPATTS	5								
SONARDYNE PAN	✓								
SONARDYNE (Dredge/Winch/Fish)	✓								

DIARY OF OPERATIONS:

1745 - Pacific Marlin steaming around Eric The Red location
 Commenced Relative/Absolute Calibration calculations.

2000 - Completed Relative/Absolute Calibration calculations - Results Not Used.

2010 - Eric The Red Transponder Positions from Sea Bed/Bottom results

TP	Addr	Reply Channel	Eing	Ning	Depth
1	80503	3	688 395.98	5 680 079.71	65.0
2	1106	6	689 396.93	5 680 002.14	70.0
3	1109	9	689 363.12	5 678 930.89	71.2
4	1010	10	688 324.28	5 679 118.32	72.0

2030 Pacific Marlin steaming around overnight.

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Signature

K. Eddy
SURVEYOR/ENGINEER

WHITE : Commercial Office
 BLUE : Operations
 YELLOW : Clients Representative

Signature

John Sellers
CLIENTS REPRESENTATIVE



RACAL SURVEY AUSTRALIA LIMITED

DAILY RECORD SHEET

WX	Sea Stat	Wave Hgt	Wind Dir.
0000	5	2m SWxW	5
06	5	4m SW 5	
1200	4	3-4m SW 3	
1800			

ACRD 1 / PE900171 / P444

Client : BHP		Job No : 2051		Date : 12-2-93		Vessel : PACIFIC MARLIN		Anchors / Tpdrs			
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered	
SKYFIX RIG PORT	✓		STD 12 / VELOCITY PROBE	✓		K. EDDY	ITEM	USED	REMAIN	503	
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			1106	
MICROFIX			SIDESCAN (595/531/PINGER)			L. BATHERIDGE	E/SOUNDER PAPER			1109	
ARGO			BOOMER (DELPH/EPC)				ELICS PAPER			1010	
GNS	✓		SPARKER (DELPH/EPC)				DISKS				
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.				
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS				
TELEMETRY			UNDERWATER TRACKING			C. SELLERS					
SONARDYNE COMPATTS	5										
SONARDYNE PAN	✓										
SONARDYNE (Dunker/Winch/Fish)	✓										

DIARY OF OPERATIONS:

0650 - Pacific Marlin at Eric The Red location.

0700 - Waiting on suitable DGPS coverage to carryout Acoustic calibrations using SkyFix

0740 - Deployed Sonardyne Tow Fish

0750 - Enabled Compatts 503, 1106 & 1109.

0756 - Commenced Box-In of TP3 Compatt 1109 Trimble/SkyFix/DNAUN Nav.
 S.V's 2, 13, 15, 26 & 27 HDOP 1.4 VDOP 2.7 h-10 0.3 v-10 0.6 Thr 1.0
 Sydney ~~Station~~ Ref Station Circle Radius 300m.

0808 - S.V's 2, 13, 26 & 27

0840 - Completed Box-In of TP3 Compatt 1109.

0842 - Enabled TP4 Compatt 1010.

0843 - Box-In Position of TP3/1109 from Trimble/SkyFix/DNAUN
 Eing 689 360.33 Ning 5 678 935.35 Depth 71.2.

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Transponders to be listed by type and serial numbers. Following codes to be used: L - Laid, R - Recovered, FR - Failed to Reply, FS - Failed to Surface.

Signature

K. Eddy
SURVEYOR/ENGINEER

WHITE	: Commercial Office
BLUE	: Operations
YELLOW	: Clients Representative

Signature

C. Sellers
CLIENTS REPRESENTATIVE



RACAL SURVEY AUSTRALIA LIMITED

DAILY RECORD SHEET

WX	Sea Str	Wav	Wind Dir.
0000			
0600			
1200			
1800			

RCRD 1 / PE900171 / P445

Client : BHP		Job No : 2051		Date : 12-2-93		Vessel : PACIFIC MARLIN		Anchors / Tpdrs		
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered
SKYFIX RIGS PORT	✓		STD 12 / VELOCITY PROBE	✓		K. EDDY	ITEM	USED	REMAIN	503
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			1106
MICROFIX			SIDESCAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			1109
ARGO			BOOMER (DELPH / EPC)				ELICS PAPER			1010
GNS	✓		SPARKER (DELPH / EPC)				DISKS			
GYRO			CORING (GRAVITY / GRAB)				PRINTER CART.			
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS			
TELEMETRY			UNDERWATER TRACKING			C. SELLERS				
SONARDYNE COMPATTS	S									
SONARDYNE PAN	✓									
SONARDYNE (Dredger/Winch/Fish)	✓									

DIARY OF OPERATIONS:

0905 - Commenced Relative/Absolute Calibration data collection of Eric The Red Array
 Nav on Trimble/SkyFix/DNAV 5.0's 2, 12, 13, 21 & 26 Adelaide Ref Station
 HDOP 1.2 VDOP 2.0 h-1@ 1.0 v-1@ 1.1 Thr 1.2
 Tow Fish Depth 15m. mark on waterline.

1110 - Completed Relative/Absolute data collection

1115 - Relative Calibration Calculation

1210 - Completed Relative Calibration Calculation

1223 - Commenced BoxIn calibration data collection of TPI/503 300m Radius
 Trimble/SkyFix/DNAV for Nav 5.0's 3, 12, 16, 20 & 24 Sydney Ref Station.
 HDOP 1.5 VDOP 3.5 h-1@ 0.3 v-1@ 0.5 Thr 1.1

1310 - Completed BoxIn calibration data collection of TPI/503

1342 - Carrying out Acoustic/DGPS comparisons.

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Transponders to be listed by type and serial numbers. Following codes to be used: L - Laid, R - Recovered, FR - Failed to Reply, FS - Failed to Surface.

Signature

K. Eddy
SURVEYOR/ENGINEER

WHITE : Commercial Office
 BLUE : Operations
 YELLOW : Clients Representative

Signature

C. Sellers
CLIENTS REPRESENTATIVE



RACAL SURVEY AUSTRALIA LIMITED

DAILY RECORD SHEET

WX	SeaStat	yell	Wind Dir.
0000			
06			
1200			
1800			

RCRD 1 / PE900171 / P446

Client : BHP		Job No : 2051		Date : 12-2-93		Vessel : PACIFIC MARLIN		Anchors / Tpdrs		
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered
SKYFIX <i>RIG PORT</i>	✓		STD 12 / VELOCITY PROBE	✓		K. EDDY	ITEM	USED	REMAIN	503
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			1106
MICROFIX			SIDESCAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			1109
ARGO			BOOMER (DELPH/EPC)				ELICS PAPER			1010
GNS <i>x2 HP</i>	✓		SPARKER (DELPH/EPC)				DISKS			
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.	<i>1 man</i>		
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS			
TELEMETRY			UNDERWATER TRACKING			C. SELLERS	PRINTER PAP	<i>1 man</i>		
SONARDYNE COMPATTS		5								
SONARDYNE PAN		✓								
SONARDYNE (Diver/Winch/Fish)		✓								

DIARY OF OPERATIONS:

1400 - Disabled all Sonardyne Compatts in Eric The Red acoustic array

TP	ADDR	REPLY CHANNEL	BC	USGTS	ERROR
1	503	3	16	26.5	0
2	1106	6	17	26.4	0
3	1109	9	17	26.5	0
4	1010	10	16	27.1	0

1415 - Recovered Sonardyne Tow Fish

1417 - Pacific Marlin departed Eric The Red location for Byford Dolphin @ La Bella

Forms are to be completed daily in duplicate on all vessels. Each form should be countersigned by the Clients Representative, the original being retained on board until the next crew change or at the end of job, whichever is the earlier, when they should be returned to the PERTH office.

Transponders to be listed by type and serial numbers. Following codes to be used: L - Laid, R - Recovered, FR - Failed to Reply, FS - Failed to Surface.

Signature

K. Eddy
SURVEYOR/ENGINEER

WHITE	: Commercial Office
BLUE	: Operations
YELLOW	: Clients Representative

Signature

John Sellers
CLIENTS REPRESENTATIVE

RACAL SURVEY AUSTRALIA LIMITED



DAILY RECORD SHEET

WX	SeaStat	Tide	Wind Dir.
0000			
06			
1200			
1800			

RCRD 1 / PE900171 / P447

Client: BHP		Job No: 2051		Date: 12-2-93		Vessel: PACIFIC MARLIN		Anchors / Tpdrs			
RACAL Equipment on Board	Op	NonOp	RACAL Equipment on Board	Op	NonOp	RACAL Personnel	Consummables		Laid	Recovered	
SKYFIX RIG PORT	✓		STD 12 / VELOCITY PROBE	✓		K. EDDY	ITEM	USED	REMAIN	503	
SYLEDIS			ECHO SOUNDER (20/25)			C. ROBINSON	SIDESCAN PAPER			1106	
MICROFIX			SIDESCAN (595/531/PINGER)			L. ETHERIDGE	E/SOUNDER PAPER			1109	
ARGO			BOOMER (DELPH/EPC)				ELICS PAPER			1010	
GNS x 2 HP	✓		SPARKER (DELPH/EPC)				DISKS				
GYRO	✓		CORING (GRAVITY/GRAB)				PRINTER CART.				
TRIMBLE SST'S			THEODOLITE / EDM			CLIENT Personnel	EPC ROLLS				
TELEMETRY			UNDERWATER TRACKING			C. SELLERS					
SONARDYNE COMPATTS	5										
SONARDYNE PAN	✓										
SONARDYNE (Dredger/Winch/Fish)	✓										

DIARY OF OPERATIONS:

**

1630 FINAL ABSOLUTE CO-ORDINATES OF ERIC THE RED ACOUSTIC ARRAY
 DERIVED FROM TRIMBLE/SKYFIX/DNAVN ABSOLUTE CALIBRATION.

TP	ADDR CODE	REPLY CHANNEL	EASTING	NORTHING	DEPTH
1	503	3	688 392.52	5 680 091.17	71.81
2	1106	6	689 393.49	5 680 004.65	69.78
3	1109	9	689 360.63	5 678 933.87	72.37
4	1010	10	688 322.04	5 679 119.75	72.24

**

1715- Pacific Marlin arrived La Bella location and assumed stand by duties for Byford Dolphin.

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Signature _____
 SURVEYOR/ENGINEER

WHITE	Commercial Office
BLUE	Operations
YELLOW	Client Representative

Signature
 CLIENTS REPRESENTATIVE

RACAL SURVEY AUSTRALIA LIMITED



DAILY RECORD SHEET

WX	SeaStat	Tide	Wind Dir.
0000			
06			
1200			
1800			

RCRD 1 / PE900171 / P448

Client : BHP		Job No : 2051		Date : 13-2-93		Vessel : PACIFIC MARLIN		Anchors / Tpdrs					
RACAL Equipment on Board		Op	NonOp	RACAL Equipment on Board		Op	NonOp	RACAL Personnel		Consummables		Laid	Recovered
SKYFIX	RIG PORT	✓		STD 12 / VELOCITY PROBE	✓			K. EDDY	ITEM	USED	REMAIN	503	
SYLEDIS				ECHO SOUNDER (20/25)				C. ROBINSON	SIDESCAN PAPER			1106	
MICROFIX				SIDESCAN (595/531/PINGER)				L. ETHERIDGE	E/SOUNDER PAPER			1109	
ARGO				BOOMER (DELPH/EPC)					ELICS PAPER			1010	
GNS	x 2 HP	✓		SPARKER (DELPH/EPC)					DISKS				
GYRO		✓		CORING (GRAVITY/GRAB)					PRINTER CART.				
TRIMBLE SST'S				THEODOLITE / EDM				CLIENT Personnel	EPC ROLLS				
TELEMETRY				UNDERWATER TRACKING				C. SELLERS					
SONARDYNE COMPATTS		5											
SONARDYNE PAN		✓											
SONARDYNE (Dredge/Winch/Fish)		✓											

DIARY OF OPERATIONS:

0700 - Pacific Marlin on Stand-By Duties. Waiting to Transfer to Byford Dolphin.

0839 - Sea Conditions marginal for transferring personnel and equipment by basket to Byford Dolphin.

0910 - Pacific Marlin departed Byford Dolphin @ La Bella location for Portland to off load survey personnel and equipment for helicopter flight to Byford Dolphin. Sea conditions unsafe to transfer personnel by basket.

1545 - Pacific Marlin arrived Portland harbour.

1600 - Pacific Marlin berthed Portland - unload survey equipment for Byford Dolphin.

1735 - Personnel & GNS survey equipment depart Portland by helicopter for Byford Dolphin. Trimble & Skyfix equipment remain at Portland airport - delivered to rig tomorrow.

1910 - Arrive Byford Dolphin.

2030 - GNS operational and interfaced to Del Norte GPS receiver.

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Transponders to be listed by type and serial numbers. Following codes to be used: L - Laid, R - Recovered, FR - Failed to Reply, FS - Failed to Surface.

Signature K. Eddy
SURVEYOR/ENGINEER

WHITE	Commercial Office
BLUE	Operations
YELLOW	Clients Representative

Signature [Signature]
CLIENTS REPRESENTATIVE

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7. ENCLOSURES

Enclosure 1 Exlog Mudlog

PE600077

This is an enclosure indicator page.
The enclosure PE600077 is enclosed within the
container PE900171 at this location in this
document.

The enclosure PE600077 has the following characteristics:

- ITEM_BARCODE = PE600077
- CONTAINER_BARCODE = PE900171
- NAME = ERIC THE RED 1 DRILLBYTE FORMATION
EVALUATION LOG; 1:500 (COPY), ENCLOSURE
1
- BASIN = Otway
- PERMIT = VIC/P31
- TYPE = WELL
- SUBTYPE = WELL_LOG
- DESCRIPTION = ERIC THE RED 1 DRILLBYTE FORMATION
EVALUATION LOG; 1:500 (COPY), ENCLOSURE
1
- REMARKS =
- DATE_CREATED = 26/02/93
- DATE_RECEIVED = 15/12/93
- W_NO = W1077
- WELL_NAME = ERIC THE RED 1
- CONTRACTOR = EXLOG
- CLIENT_OP_CO = BHP

(Inserted by DNRE - Vic Govt Mines Dept)

Enclosure 2 Eastman Teleco MWD Logs

PE600037

This is an enclosure indicator page.
The enclosure PE600037 is enclosed within the
container PE900171 at this location in this
document.

The enclosure PE600037 has the following characteristics:

ITEM_BARCODE = PE600037
CONTAINER_BARCODE = PE900171
NAME = ERIC THE RED 1 DUAL PROPAGATION
RESISTIVITY; GAMMA RAY; 1:1000,
ENCLOSURE 2
BASIN = Otway
PERMIT = VIC/P31
TYPE = WELL
SUBTYPE = WELL_LOG
DESCRIPTION = ERIC THE RED 1 DUAL PROPAGATION
RESISTIVITY; GAMMA RAY; 1:1000,
ENCLOSURE 2
REMARKS =
DATE_CREATED = 26/02/93
DATE_RECEIVED = 15/12/93
W_NO = W1077
WELL_NAME = ERIC THE RED 1
CONTRACTOR = EASTMAN TELECO
CLIENT_OP_CO = BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE600038

This is an enclosure indicator page.
The enclosure PE600038 is enclosed within the
container PE900171 at this location in this
document.

The enclosure PE600038 has the following characteristics:

ITEM_BARCODE = PE600038
CONTAINER_BARCODE = PE900171
NAME = ERIC THE RED 1 DUAL PROPAGATION
RESISTIVITY; GAMMA RAY; 1:500,
ENCLOSURE 2
BASIN = Otway
PERMIT = VIC/P31
TYPE = WELL
SUBTYPE = WELL_LOG
DESCRIPTION = ERIC THE RED 1 DUAL PROPAGATION
RESISTIVITY; GAMMA RAY; 1:500,
ENCLOSURE 2
REMARKS =
DATE_CREATED = 26/02/93
DATE_RECEIVED = 15/12/93
W_NO = W1077
WELL_NAME = ERIC THE RED 1
CONTRACTOR = EASTMAN TELECO
CLIENT_OP_CO = BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE600071

This is an enclosure indicator page.
The enclosure PE600071 is enclosed within the
container PE900171 at this location in this
document.

The enclosure PE600071 has the following characteristics:

ITEM_BARCODE = PE600071
CONTAINER_BARCODE = PE900171
NAME = ERIC THE RED 1 DUAL PROPAGATION
RESISTIVITY; GAMMA RAY; 1:200,
ENCLOSURE 2
BASIN = Otway
PERMIT = VIC/P31
TYPE = WELL
SUBTYPE = WELL_LOG
DESCRIPTION = ERIC THE RED 1 DUAL PROPAGATION
RESISTIVITY; GAMMA RAY; 1:200,
ENCLOSURE 2
REMARKS =
DATE_CREATED = 26/02/93
DATE_RECEIVED = 18/03/93
W_NO = W1077
WELL_NAME = ERIC THE RED 1
CONTRACTOR = EASTMAN TELECO
CLIENT_OP_CO = BHP

(Inserted by DNRE - Vic Govt Mines Dept)