Company: **Esso Australia Ltd.**

Well: **TNA A−31**

Field: **Tuna**

Rig: **ISDL 453** State: **Victoria**

Rig: ISDL 453
Field: Tuna
Location: Bass Strait
Well: TNA A−31
Company: Esso Australia Ltd.

Schlumberger

VISION Density Neutron
1:500 True Vertical Depth
Recorded Mode Log

Location			Elevation		
	Total depth:	3220 m		K.B.	Top Drive
	Spud date:	30−May−02		G.L.	−59.40 m
	Runs:	3 To 3		D.F.	31.30 m

Permanent datum: Mean Sea Level Elev.: 59.40 m
Log measured from: Drill Floor 31.30 m above Perm. datum
Depth reference: Driller's Pipe Tally

API serial no.	x = 5774227.40m (North)	Longitude	Latitude
	y = 624231.22m (East)	E 148 25 5.666	S 38 10 16.232

Depth logged:	829.0 m To 3206 m	Mag decl:	13.156 deg	Other services:
Date logged:	8−Jul−02 To 16−Jul−02	Mag dip:	−68.695 deg	Directional Drilling

Bore hole record			Casing record			
Hole size	from	to	Size	Density	from	to
12 1/4 in.	145.0 m	835.0 m	20 in.	84 lb/ft	Surface	147.3 m
8 1/2 in.	835.0 m	3220.0 m	9 5/8 in.	47 lb/ft	Surface	829.0 m

Mud record			Borehole deviation record			
Type	from	to	Min	Max	from	to
Seawater	145.0 m	835.0 m	2.88 deg	71.08 deg	145.0 m	835.0 m
KCL/PHPA	829 m	3220 m	68.84 deg	72.86 deg	829 m	3220 m

Surface equipment		Software record	
Unit	OLU−FB−924	IDEAL Wis	ID6_1C_10r
Depth system	PDA	SPM	ID6_1C_10r
		LWD	see toolsketch
		MWD	see toolsketch

IDEAL
services from
Anadrill

Bit Run Summary

Run number	3		
Bit size	8.5	in	
Bit start depth	829	m	
Bit end depth	3220	m	
Top interval logged	829	m	
Bottom interval logged	3206	m	
Begin log: time	4:00		
Begin log: date	8−Jul−02		
End log: time	13:00		
End log: date	16−Jul−02		
Mud data			
Depth	3220	m	
Type	KCL/PHPA/GLYCOL		

Type		KCL/PHPA/GLYCOL									
Mud weight	ppg	10.3									
Solids	%vol	7.3									
Chlorides	mg/l	48,000									
Rm	Ohmm@degC	0.1419@20									
Rmf	Ohmm@degC	0.1046@20									
Rmc	Ohmm@degC	0.2120@20									
Potassium	%vol	4									
Environmental data											
GR											
Mud weight	ppg	10.3									
Bit size	in	8.5									
Resistivity											
Neutron porosity											
Hole Size	in	8.5									
Mud weight	ppg	10.3									
Temperature	DegC	75.29									
Mud salinity	mg/l	48,000									
Formation salinity											
Recording rate 1	SEC	10									
Recording rate 2	SEC	10									
Filtering GR		3 pt									
Filtering density		3 pt									
Filtering Neutron		3 pt									
Company representative		G. Cambell	B. Davies								
Anadrill personnel		J. Walta	L. Bon	W. Betheux							

OTHER SERVICES FOR RUN3	OTHER SERVICES FOR RUN	OTHER SERVICES FOR RUN
Directional Surveys		
REMARKS: RUN NUMBER 3	**REMARKS: RUN NUMBER**	**REMARKS: RUN NUMBER**
8−1/2in Hole Section was logged from 829 m to 3206 m MD. Depth is referenced to the Driller's pipe tally. All data presented is from tool memory. GR corrected for mud weight, tool and bit size. RAB6 Resistivity is corrected for the bit size, mud resistivity and borehole temperature. Bottom quadrant density is presented. Neutron porosity is calculated with limestone matrix and is corrected for the bit size, borehome salinity, temperature and mud hydrogen index (from mud weight, temperature and pressure) Mud type is water based KCl/PHPA/GLYCOL. Barite is present in the mud. RAB6C Downhole Software 6C−V6.1 ADN6C Downhole Software 6.2B08		

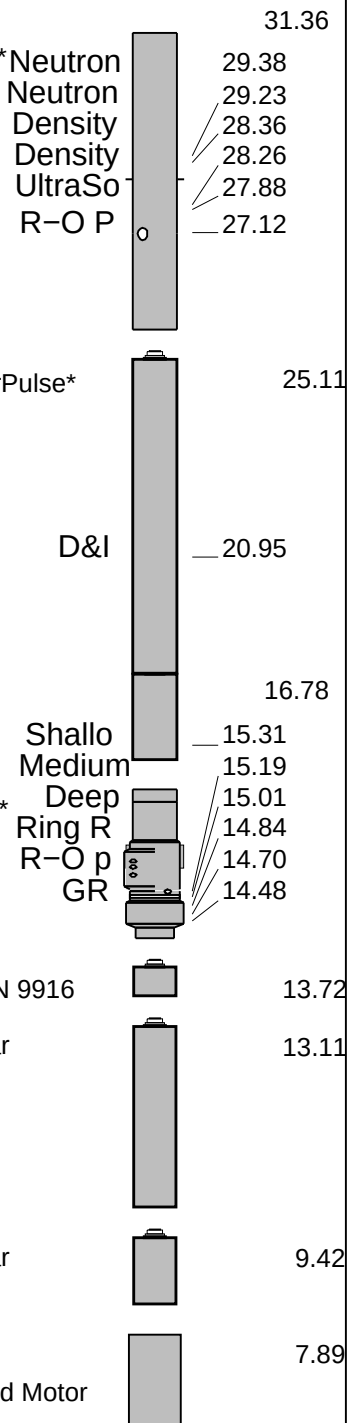
RAB6C Downhole Software 6C−V6.1
ADN6C Downhole Software 6.2B08

There were discrepancies in the pipe tally this run.

EQUIPMENT DESCRIPTION

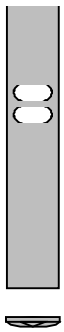
RUN1	RUN	RUN

DOWNHOLE EQ



A675XP S/N 2179

0.78 deg bend



0.19

0.00

Bit−PDC

Geo−Diamond Model: S75HPX

MAXIMUM STRING DI

ALL LENGTHS I

True Vertical Depth Log

IDEAL Version: ID7_0C_02

IDF

RAB	**IDEAL Version: ID7_0C_02**	**MWD_10**	**IDEAL Version: ID7_0C_02**
ADN	**IDEAL Version: ID7_0C_02**		

Format: A31 RM Density Neutron **Vertical Scale: 1:500** **Graphics File Created: 21−Jul−2002 16:54**

Parameters

DLIS Name	Description	Value	
ADN_COLLAR_STR	ADN Collar Type String	ADDC−AA: Slick	
ADN_STAB_STR	ADN Stabilizer Type String	None	
AVE_ADN	ADN/Array Channels: perform averaging(RM) :	YES	
A_DHS	ADN Down Hole Software Version String	V6.2B	
BHA_COEF_VER	RAB: BHA Coef Generator Version	62012.0	
BHT_RM	Bottom Hole Temperature (RM)	75.290	degC
BSAL_RM	Mud Salinity (RM)	79.200	ppk
BS_RM	Bit Size (RM)	8.500	in
DEVI	Well Section Deviation	0.100	deg
DHS_VERSION	RAB: DownHole Software Version	6.101	
DO	Depth Offset	0.0	m
DTMUD	Delta−T for Mud	630.0	us/m
ENVCOR	Neutron Quadrant Processing: Environmental Correction?	YES	
GRDC	Grid corr angle	−0.880	deg
LITHO_TYPE_ADN	Lithology (RM)	LIME	
MST_RM	Mud Sample temperature (RM)	20.000	degC
MW_RM	Mud Weight (RM)	10.300	lbm/gal
OBM	RAB: Oil base Mud	NO	
OBMF_RM	Oil Based Mud	NO	
RAB_TEMP_SELECT	RAB Temperature Selection	MEAS	
READOUT_PORT_MP	RAB: ROP to Bit Face Distance	14.700	m
RHOF_RM	Mud Filtrate Density (RM)	1.000	g/cm3
RHOM_RM	Matrix density (RM)	2.710	g/cm3
RMS_RM	Resistivity of Mud Sample (RM)	0.142	ohm.m
RWS_RM	Resistivity of Connate Water (RM)	1.000	ohm.m
SHT_RM	Surface Hole Temperature (RM)	15.000	degC
SSIZ_ADN	ADN Stabilizer Size	8.250	in
STAB	RAB: Run with Stabilizer	YES	
TD_RM	Total Measured Depth (RM)	3220.0	m
TOOLTYPE	RAB: Azimuthal Tool	YES	
TRPM_RM	Average Tool Rotational Speed	20.000	c/min
TSIZ_ADN	ADN Tool Size	6.750	in
TS_VERSION	RAB: ToolScope Software Version	6.101	
TWS_RM	Temperature of Connate Water (RM)	23.889	degC
USMIN_RM	ADN:Minimum Ultrasonic standoff (RM)	0.300	in
VERS_ADN	ADN Downhole Software Version	6.200	

USMIN_RM	ADN:Minimum Ultrasonic standoff (RM)	0.300	in
VERS_ADN	ADN Downhole Software Version	6.200	
VRAB6	Rab Tool type (ENP/PILOT)	RAB6_C_SERIES	

PIP SUMMARY

Neutron Samples

Density Samples

Gamma Ray Samples

Rate of Penetration, Averaged over Last 5ft (ROP5_RM)
200 (M/HR) 0

Gas Area
From ROBB to TNPH

RAB Gamma Ray (GR_RAB)
0 (GAPI) 200

Bulk Density, Bottom (ROBB)
1.85 (G/C3) 2.85

Density Time After Bit (TAB_DEN)
0 (HR) 10

Thermal Neutron Porosity (TNPH)
45 (PU) -15

Vertical Hole Diameter (VERD)
6 (IN) 16

Bulk Density (RHOB)
1.85 (G/C3) 2.85

Horizontal Hole Diameter (HORD)
6 (IN) 16

ADN Rotational Speed (RPM_ADN) (RPM)
0 200

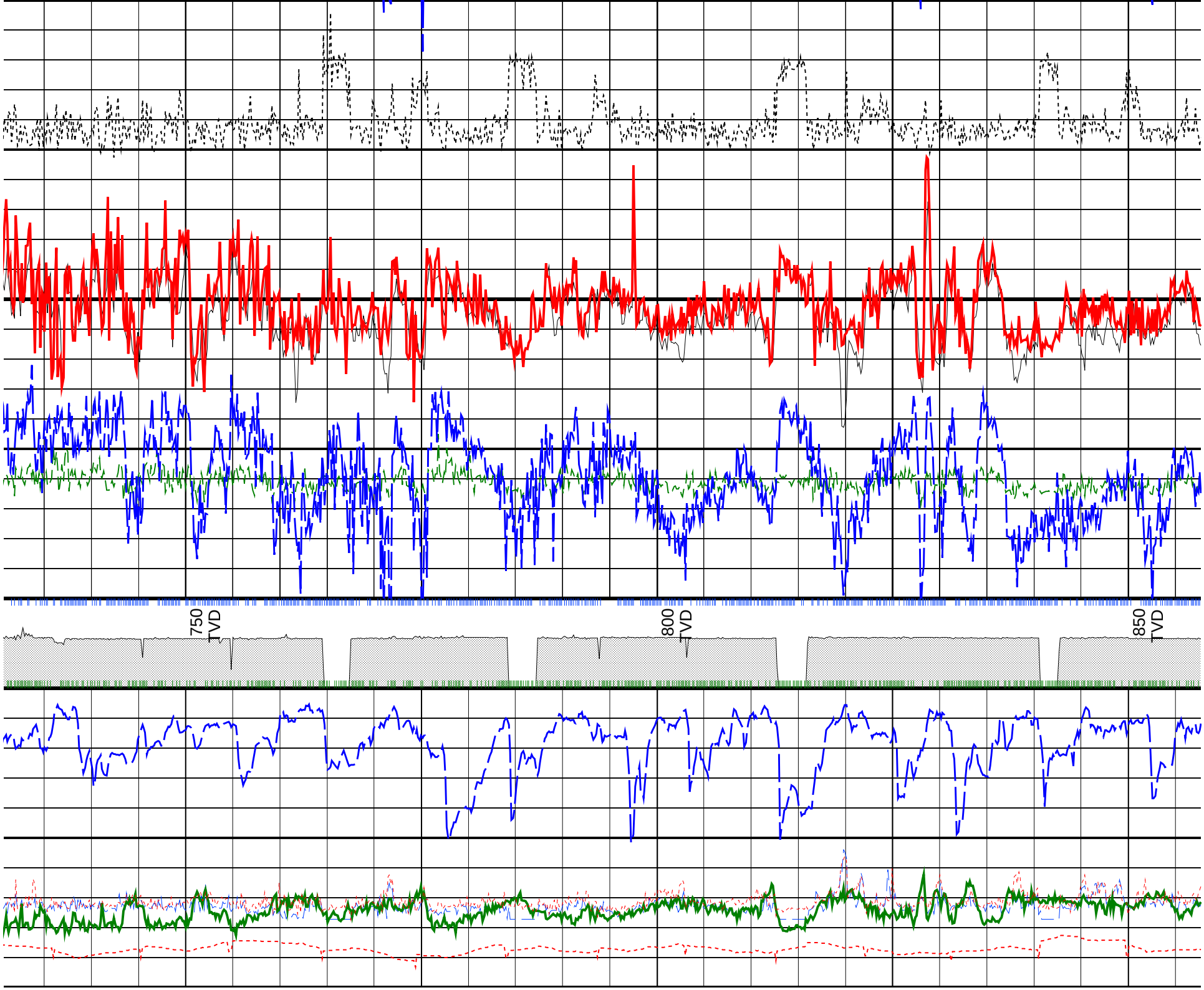
Photoelectric Factor, Bottom (PEB)
0 (----- 10

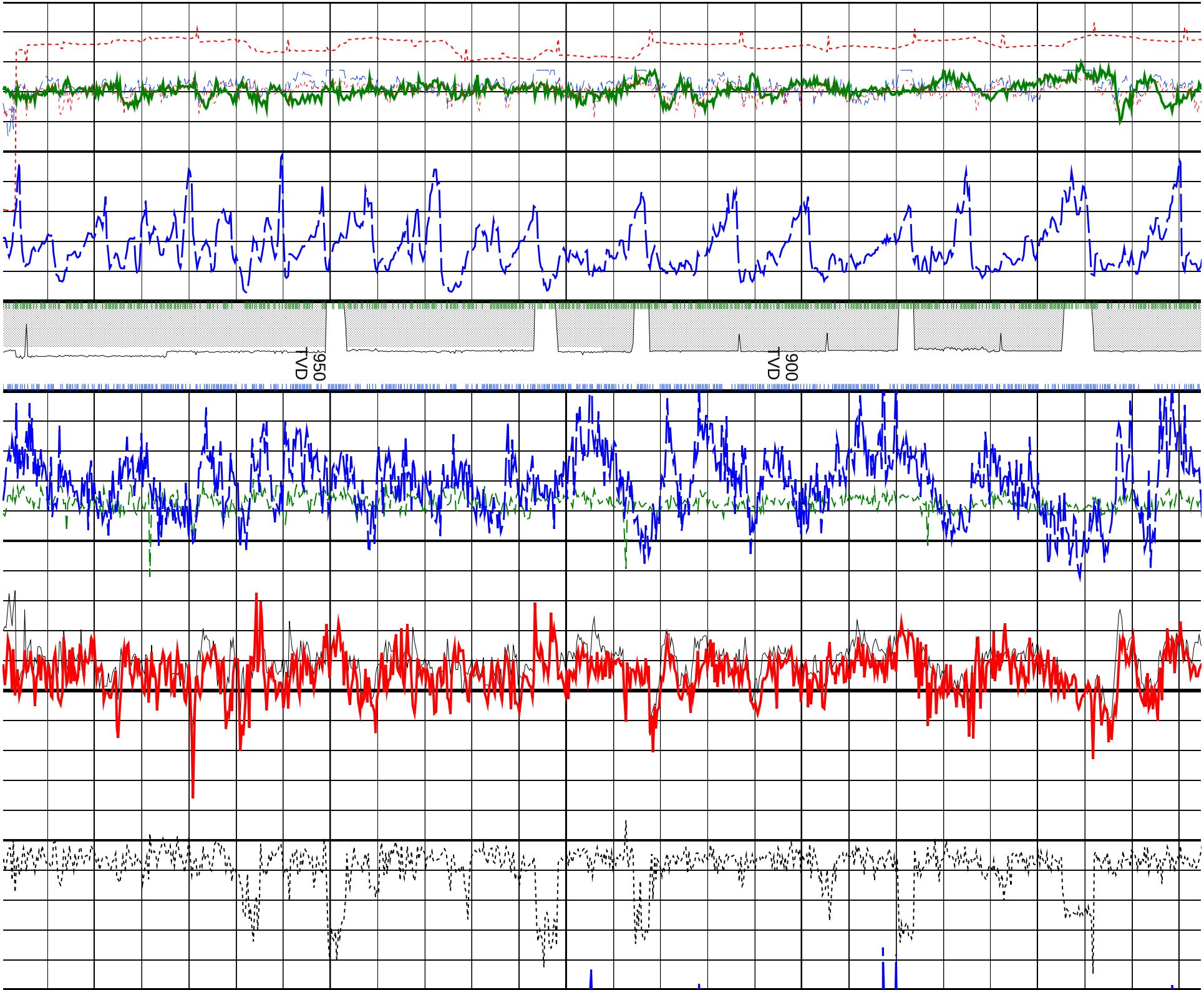
Bulk Density Correction, Bottom (DRHB)
-0.25 (G/C3) 0.25

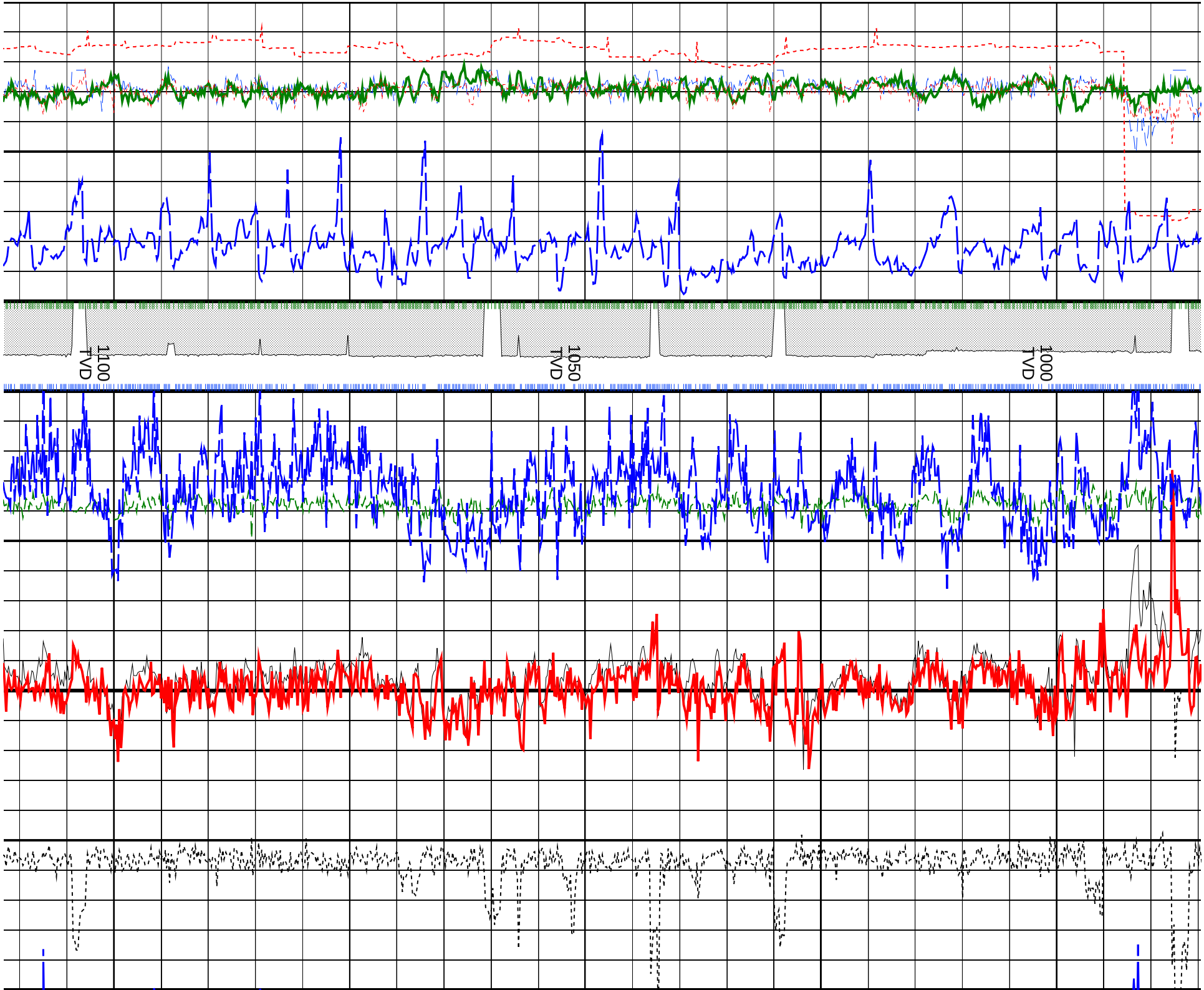
First Reading

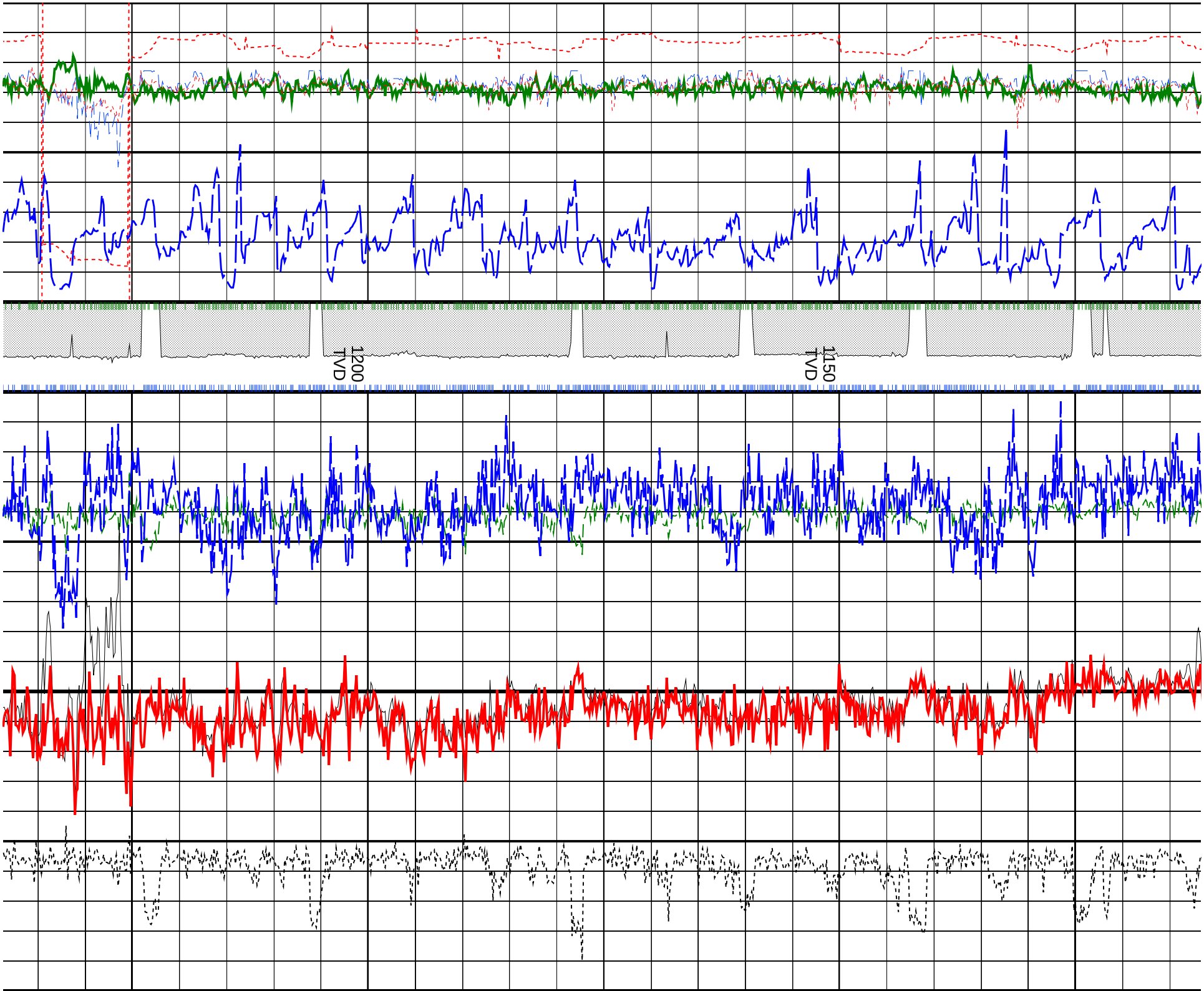
Casing

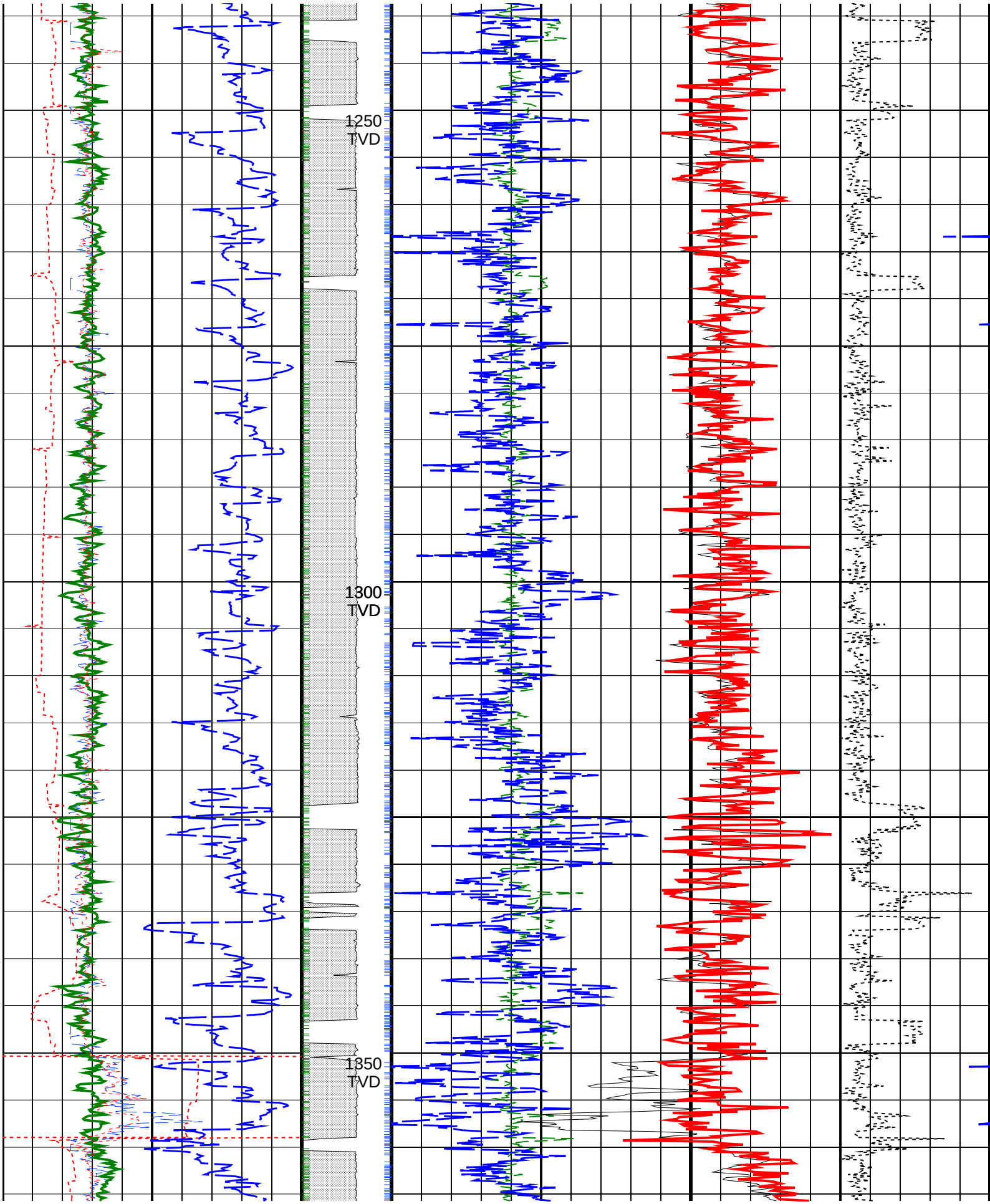
700
TVD

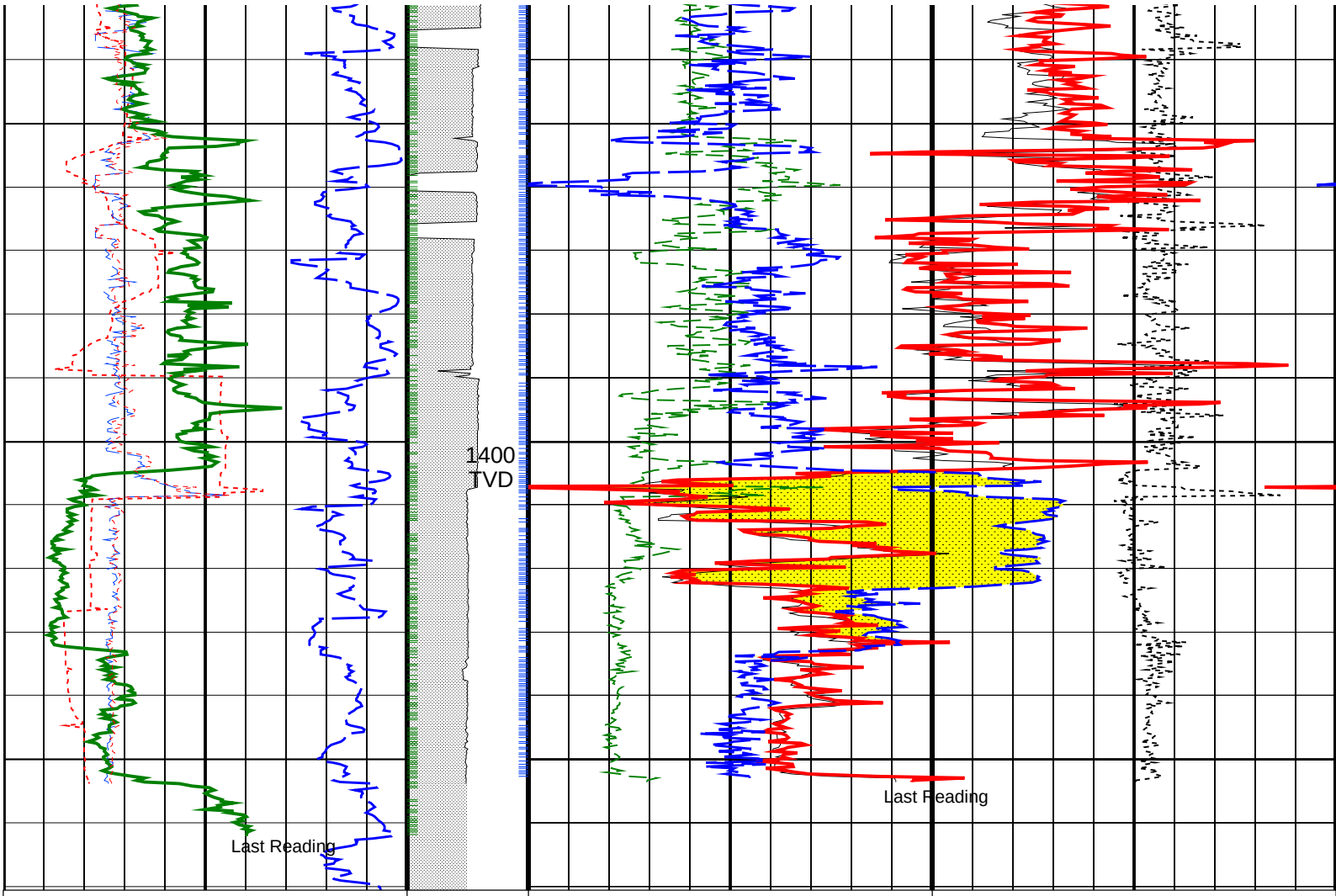

750
TVD
800
TVD
850
TVD


950
TVD
900
TVD


1100
TVD
1050
TVD
1000
TVD


1200
TVD
1150
TVD


1250
TVD
1300
TVD
1350
TVD



Horizontal Hole Diameter (HORD) 6 (IN) 16	ADN Rotational Speed (RPM_ADN) (RPM) 0 200	Photoelectric Factor, Bottom (PEB) 0 (---- 10
Vertical Hole Diameter (VERD) 6 (IN) 16		Bulk Density (RHOB) 1.85 (G/C3) 2.85
Density Time After Bit (TAB_DEN) 0 (HR) 10		Thermal Neutron Porosity (TNPH) 45 (PU) -15
RAB Gamma Ray (GR_RAB) 0 (GAPI) 200		Bulk Density, Bottom (ROBB) 1.85 (G/C3) 2.85
Rate of Penetration, Averaged over Last 5ft (ROP5_RM) 200 (M/HR) 0		Gas Area From ROBB to TNPH

Bulk Density Correction, Bottom (DRHB)
-0.25 (G/C3) 0.25

PIP SUMMARY

Neutron Samples

Density Samples

Gamma Ray Samples

IDEAL Version: ID7_0C_02

IDF

RAB	IDEAL Version: ID7_0C_02	MWD_10	IDEAL Version: ID7_0C_02
ADN	IDEAL Version: ID7_0C_02		

ADN **IDEAL Version: ID7_0C_02**

True Vertical Depth Log

6.75−in. Azimuthal Density Neutron / Equipment Identification

Primary Equipment:		
Tool Name and Serial Number	ADN6 − CA	289
Neutron Logging Source	NSR − M	A161
Density Logging Source	GSR − J/Z	A2125
Stabilizer Size	8.25 − in.	
Calibration Status	Valid	

Master: 5−MAY−2002 12:34

6.75−in. Azimuthal Density Neutron Calibration

Density: Magnesium Block

Phase	LS window 3 − Mg CPS	Value	Phase	SS window 1 − Mg CPS	Value	Phase	SS window 3 − Mg CPS	Value
Master		1304	Master		3005	Master		7415
	250.0 (Minimum) 4125 (Nominal) 8000 (Maximum)			700.0 (Minimum) 9350 (Nominal) 18000 (Maximum)			2500 (Minimum) 23750 (Nominal) 45000 (Maximum)	

Master: 5−MAY−2002 12:34

6.75−in. Azimuthal Density Neutron Calibration

Density: Aluminum Block

Phase	LS window 3 − Al CPS	Value	Phase	SS window 1 − Al CPS	Value	Phase	SS window 3 − Al CPS	Value
Master		201.7	Master		1593	Master		4761
	50.00 (Minimum) 725.0 (Nominal) 1400 (Maximum)			500.0 (Minimum) 4250 (Nominal) 8000 (Maximum)			1500 (Minimum) 15750 (Nominal) 30000 (Maximum)	

Master: 5−MAY−2002 12:34

6.75−in. Azimuthal Density Neutron Calibration

Density: Background

Phase	LS window 3 − Background CPS	Value	Phase	SS window 1 − Background CPS	Value	Phase	SS window 3 − Background CPS	Value
Master		52.44	Master		125.1	Master		546.0
	15.00 (Minimum) 82.50 (Nominal) 150.0 (Maximum)			40.00 (Minimum) 220.0 (Nominal) 400.0 (Maximum)			150.0 (Minimum) 825.0 (Nominal) 1500 (Maximum)	

Master: 5−MAY−2002 12:34

6.75−in. Azimuthal Density Neutron Calibration

Density: Water Block Check

Phase	Long spacing water density G/C3	Value	Phase	Short spacing water density G/C3	Value
Master		1.035	Master		1.136
	1.015 (Minimum) 1.030 (Nominal) 1.045 (Maximum)			1.095 (Minimum) 1.120 (Nominal) 1.145 (Maximum)	

Master: 5−MAY−2002 12:34

6.75−in. Azimuthal Density Neutron Calibration

Neutron: Water Tank

Phase	Far 1 tube 1 gain ----	Value	Phase	Far 1 tube 1 offset CPS	Value
Master		1.123	Master		−0.8040
	0.9000 (Minimum) 1.100 (Nominal) 1.300 (Maximum)			−1.200 (Minimum) −0.9000 (Nominal) −0.6000 (Maximum)	
Phase	Far 1 tube 2 gain ----	Value	Phase	Far 1 tube 2 offset CPS	Value
Master		1.054	Master		−0.9360
	0.9000 (Minimum) 1.100 (Nominal) 1.300 (Maximum)			−1.200 (Minimum) −0.9000 (Nominal) −0.6000 (Maximum)	
Phase	Far 1 tube 3 gain ----	Value	Phase	Far 1 tube 3 offset CPS	Value
Master		1.093	Master		−0.6810
	0.9000 (Minimum) 1.100 (Nominal) 1.300 (Maximum)			−1.200 (Minimum) −0.9000 (Nominal) −0.6000 (Maximum)	

0.9000 (Minimum)	1.100 (Nominal)	1.300 (Maximum)

Phase	Far 2 tube 1 gain ----	Value
Master		1.114

0.9000 (Minimum)	1.100 (Nominal)	1.300 (Maximum)

Phase	Far 2 tube 2 gain ----	Value
Master		0.9960

0.9000 (Minimum)	1.100 (Nominal)	1.300 (Maximum)

Phase	Far 2 tube 3 gain ----	Value
Master		1.117

0.9000 (Minimum)	1.100 (Nominal)	1.300 (Maximum)

Phase	Near 1 tube 1 gain ----	Value
Master		1.091

0.9000 (Minimum)	1.100 (Nominal)	1.300 (Maximum)

Phase	Near 2 tube 1 gain ----	Value
Master		1.070

0.9000 (Minimum)	1.100 (Nominal)	1.300 (Maximum)

−1.200 (Minimum)	−0.9000 (Nominal)	−0.6000 (Maximum)

Phase	Far 2 tube 1 offset CPS	Value
Master		−0.7390

−1.200 (Minimum)	−0.9000 (Nominal)	−0.6000 (Maximum)

Phase	Far 2 tube 2 offset CPS	Value
Master		−0.9070

−1.200 (Minimum)	−0.9000 (Nominal)	−0.6000 (Maximum)

Phase	Far 2 tube 3 offset CPS	Value
Master		−0.7540

−1.200 (Minimum)	−0.9000 (Nominal)	−0.6000 (Maximum)

6.75−in. Resistivity At−the−Bit / Equipment Identification

Primary Equipment:

Tool Name and Serial Number	RAB6 − CA	136
Calibration Status	Valid	

Master: 10−JUN−2002 14:00

6.75−in. Resistivity At−the−Bit Calibration

Resistivity: Fixture

Phase	Ring/T1 factor ----	Value
Master		0.9840

0.9750 (Minimum)	1.000 (Nominal)	1.025 (Maximum)

Phase	Ring/T2 factor ----	Value
Master		0.9910

0.9750 (Minimum)	1.000 (Nominal)	1.025 (Maximum)

Phase	M0/T1 factor ----	Value
Master		0.9920

0.9750 (Minimum)	1.000 (Nominal)	1.025 (Maximum)

Phase	M0/T2 factor ----	Value
Master		0.9960

0.9750 (Minimum)	1.000 (Nominal)	1.025 (Maximum)

Phase	M2/T1 factor ----	Value
Master		0.9940

0.9750 (Minimum)	1.000 (Nominal)	1.025 (Maximum)

Phase	M2/T2 factor ----	Value
Master		0.9980

0.9750 (Minimum)	1.000 (Nominal)	1.025 (Maximum)

Phase	BTN shallow/T1 factor ----	Value
Master		1.016

0.9750 (Minimum)	1.000 (Nominal)	1.025 (Maximum)

Phase	BTN shallow/T2 factor ----	Value
Master		1.017

0.9750 (Minimum)	1.000 (Nominal)	1.025 (Maximum)

Phase	BTN medium/T1 factor ----	Value
Master		1.019

0.9750 (Minimum)	1.000 (Nominal)	1.025 (Maximum)

Phase	BTN medium/T2 factor ----	Value
Master		1.021

0.9750 (Minimum)	1.000 (Nominal)	1.025 (Maximum)

Phase	BTN deep/T1 factor ----	Value
Master		1.018

0.9750 (Minimum)	1.000 (Nominal)	1.025 (Maximum)

Phase	BTN deep/T2 factor ----	Value
Master		1.021

0.9750 (Minimum)	1.000 (Nominal)	1.025 (Maximum)

Master: Calibration date not found

6.75−in. Resistivity At−the−Bit Calibration

Gamma Ray: Blanket

Phase	Gamma ray factor ----	Value
Master		0.8800

0.7500	1.000	1.250

0.7500 (Minimum)	1.000 (Nominal)	1.250 (Maximum)

ANADRILL

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Survey report 16–Jul–2002 15:22:12 Page 1 of 6

Client.....: Esso Australia Ltd.
Field.....: Tuna

Well.....: A–31
API number.....:
Engineer.....: J. Walta

COUNTY:.....: ISDL 453
STATE:.....: Victoria

Spud date.....: 30–Jun–02
Last survey date.....: 16–Jul–02
Total accepted surveys...: 141
MD of first survey.....: 0.00 m
MD of last survey.....: 3220.00 m

----- Survey calculation methods----------
Method for positions.....: Minimum curvature
Method for DLS.....: Mason & Taylor

----- Depth reference ----------
Permanent datum.....: GROUND LEVEL
Depth reference.....: Driller's Pipe Tally
GL above permanent.....: –59.40 m
KB above permanent.....: 31.30 m
DF above permanent.....: 31.30 m

----- Vertical section origin----------
Latitude (+N/S–).....: 1.86 m
Departure (+E/W–).....: 6.34 m

----- Platform reference point----------
Latitude (+N/S–).....: 1.86 m
Departure (+E/W–).....: 6.34 m

Azimuth from rotary table to target: 88.50 degrees

----- Geomagnetic data ----------
Magnetic model.....: BGGM version 2001
Magnetic date.....: 27–Jun–2002
Magnetic field strength..: 1200.42 HCNT
Magnetic dec (+E/W–).....: 13.16 degrees
Magnetic dip.....: –68.69 degrees

----- MWD survey Reference Criteria ---------
Reference G.....: 1000.02 mGal
Reference H.....: 1200.42 HCNT
Reference Dip.....: –68.69 degrees
Tolerance of G.....: (+/–) 2.50 mGal
Tolerance of H.....: (+/–) 6.00 HCNT
Tolerance of Dip.....: (+/–) 0.45 degrees

----- Corrections ----------
Magnetic dec (+E/W–).....: 13.16 degrees
Grid convergence (+E/W–).: –0.88 degrees
Total az corr (+E/W–).....: 14.04 degrees
(Total az corr = magnetic dec – grid conv)

[(c)2002 Anadrill IDEAL ID6_1C_10]

Seq # –	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S– (m)	Displ +E/W– (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 10m)	Srvy tool type	Tool qual type
1	0.00	0.00	0.00	0.00	0.00	0.00	1.86	6.34	0.00	73.65	0.00	TIP	–
2	12.07	0.07	344.00	12.07	12.07	0.00	1.87	6.34	0.01	73.59	0.06	GYR	–
3	17.07	0.15	344.00	5.00	17.07	0.00	1.88	6.34	0.02	73.50	0.16	GYR	–
4	22.07	0.14	312.50	5.00	22.07	–0.01	1.89	6.33	0.03	73.40	0.16	GYR	–
5	27.07	0.33	283.90	5.00	27.07	–0.03	1.89	6.31	0.04	73.29	0.44	GYR	–
6	32.07	0.48	276.70	5.00	32.07	–0.06	1.90	6.28	0.07	73.15	0.32	GYR	–
7	37.07	0.50	274.50	5.00	37.07	–0.10	1.90	6.23	0.11	73.01	0.05	GYR	–
8	42.07	0.49	276.00	5.00	42.07	–0.15	1.91	6.19	0.16	72.87	0.03	GYR	–
9	47.07	0.50	278.80	5.00	47.07	–0.19	1.91	6.15	0.20	72.71	0.05	GYR	–
10	52.07	0.36	277.40	5.00	52.07	–0.23	1.92	6.11	0.24	72.56	0.28	GYR	–
11	57.07	0.47	259.00	5.00	57.07	–0.26	1.92	6.07	0.27	72.48	0.34	GYR	–
12	62.07	0.41	247.50	5.00	62.07	–0.30	1.91	6.04	0.30	72.48	0.21	GYR	–
13	67.07	0.43	215.40	5.00	67.07	–0.33	1.88	6.01	0.33	72.59	0.47	GYR	–
14	72.07	0.51	202.50	5.00	72.07	–0.35	1.85	5.99	0.35	72.85	0.26	GYR	–
15	77.07	0.58	176.30	5.00	77.07	–0.36	1.80	5.99	0.36	73.23	0.51	GYR	–
16	82.07	0.73	162.00	5.00	82.07	–0.35	1.75	6.00	0.36	73.75	0.44	GYR	–
17	87.07	0.88	153.60	5.00	87.07	–0.32	1.68	6.02	0.36	74.39	0.38	GYR	–
18	92.07	1.13	141.90	5.00	92.07	–0.28	1.61	6.07	0.37	75.15	0.64	GYR	–
19	97.07	1.40	130.90	5.00	97.07	–0.20	1.53	6.15	0.38	76.02	0.72	GYR	–
20	102.07	1.84	120.70	5.00	102.06	–0.09	1.45	6.26	0.42	76.97	1.05	GYR	–
21	107.07	2.20	115.70	5.00	107.06	0.07	1.37	6.42	0.50	77.97	0.80	GYR	–
22	112.07	2.55	109.80	5.00	112.06	0.25	1.29	6.61	0.63	78.97	0.85	GYR	–
23	117.07	2.98	107.40	5.00	117.05	0.48	1.21	6.84	0.82	79.95	0.89	GYR	–
24	122.07	3.35	103.90	5.00	122.04	0.75	1.14	7.10	1.05	80.90	0.83	GYR	–
25	127.07	4.20	102.50	5.00	127.03	1.06	1.06	7.42	1.35	81.85	1.71	GYR	–
26	132.07	4.33	100.60	5.00	132.02	1.43	0.99	7.79	1.69	82.77	0.38	GYR	–
27	137.07	5.10	98.60	5.00	137.00	1.83	0.92	8.19	2.08	83.59	1.57	GYR	–
28	137.97	5.16	98.30	0.90	137.90	1.91	0.91	8.27	2.16	83.73	0.73	GYR	–
29	146.90	4.51	98.30	8.93	146.80	2.65	0.80	9.02	2.88	84.93	0.73	GYR	–
30	158.50	3.99	103.00	11.60	158.36	3.48	0.64	9.86	3.73	86.27	0.54	GYR	–

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Seq # –	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S– (m)	Displ +E/W– (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 10m)	Srvy tool type	Tool qual type

–	(m)	(deg)	(deg)	(m)	(m)	(m)	(m)	(m)	(m)	(deg)	10m)	type	type
31	174.60	3.62	103.90	16.10	174.43	4.51	0.36	10.90	4.80	87.92	0.23	GYR	–
32	195.00	2.99	112.10	20.40	194.79	5.62	0.00	12.01	5.97	89.81	0.39	GYR	–
33	222.00	2.88	120.80	27.00	221.76	6.84	−0.61	13.25	7.34	92.47	0.17	GYR	–
34	241.10	3.91	130.60	19.10	240.83	7.73	−1.28	14.16	8.42	95.01	0.62	GYR	–
35	260.10	4.76	122.40	19.00	259.77	8.87	−2.13	15.31	9.82	97.85	0.55	GYR	–
36	279.30	5.31	103.40	19.20	278.90	10.39	−2.76	16.85	11.48	99.26	0.91	GYR	–
37	299.90	6.86	80.10	20.60	299.38	12.52	−2.77	18.99	13.47	98.27	1.40	GYR	–
38	316.15	10.55	72.73	16.25	315.44	14.92	−2.16	21.37	15.56	95.76	2.37	GYR	–
39	352.61	15.35	86.12	36.46	350.98	22.96	−0.84	29.38	23.19	91.56	1.54	MWD	6–axis
40	381.38	18.05	94.30	28.77	378.53	31.20	−0.92	37.62	31.40	91.40	1.24	MWD	6–axis
41	411.78	22.54	100.22	30.40	407.04	41.60	−2.31	48.06	41.93	92.70	1.62	MWD	6–axis
42	440.11	27.94	100.01	28.33	432.66	53.42	−4.42	59.95	53.97	94.18	1.91	MWD	6–axis
43	468.74	33.27	97.20	28.63	457.29	67.77	−6.58	74.35	68.54	95.08	1.93	MWD	6–axis
44	497.29	38.36	92.89	28.55	480.44	84.36	−8.01	90.99	85.22	95.00	1.99	MWD	6–axis
45	525.14	42.74	90.51	27.85	501.60	102.43	−8.53	109.08	103.26	94.45	1.67	MWD	6–axis
46	553.01	46.80	88.98	27.87	521.38	122.05	−8.43	128.70	122.79	93.73	1.51	MWD	6–axis
47	581.11	49.46	88.91	28.10	540.13	142.97	−8.04	149.62	143.62	93.06	0.95	MWD	6–axis
48	610.17	54.19	89.41	29.06	558.09	165.81	−7.71	172.45	166.39	92.55	1.63	MWD	6–axis
49	638.05	55.66	87.50	27.88	574.11	188.62	−7.09	195.26	189.13	92.07	0.77	MWD	6–axis
50	666.55	59.63	85.97	28.50	589.36	212.68	−5.72	219.29	213.08	91.48	1.46	MWD	6–axis
51	694.05	62.75	86.06	27.50	602.61	236.75	−4.04	243.32	237.06	91.04	1.13	MWD	6–axis
52	722.81	62.20	87.21	28.76	615.91	262.24	−2.54	268.78	262.48	90.53	0.40	MWD	6–axis
53	751.15	63.87	87.30	28.34	628.76	287.49	−1.33	294.01	287.69	90.25	0.59	MWD	6–axis
54	778.71	68.59	88.51	27.56	639.86	312.70	−0.42	319.21	312.88	90.07	1.76	MWD	6–axis
55	807.83	70.94	88.67	29.12	649.93	340.02	0.25	346.52	340.19	90.02	0.81	MWD	6–axis
56	812.33	71.08	88.93	4.50	651.40	344.28	0.34	350.78	344.44	89.94	0.63	MWD	6–axis
57	845.38	70.42	89.00	33.05	662.29	375.48	0.91	381.97	375.63	89.86	0.20	MWD	6–axis
58	874.18	71.18	89.28	28.80	671.77	402.67	1.32	409.17	402.83	89.81	0.28	MWD	6–axis
59	902.04	71.77	90.21	27.86	680.62	429.08	1.43	435.58	429.24	89.81	0.38	MWD	6–axis
60	931.93	71.89	89.41	29.89	689.94	457.48	1.53	463.98	457.64	89.81	0.26	MWD	6–axis

Seq # –	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S– (m)	Displ +E/W– (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 10m)	Srvy tool type	Tool qual type
61	960.85	71.56	88.10	28.92	699.01	484.94	2.12	491.44	485.10	89.75	0.45	MWD	6–axis
62	**989.81**	**70.75**	**87.66**	**28.96**	**708.36**	**512.34**	**3.14**	**518.82**	**512.49**	**89.65**	**0.31**	**MWD**	**6–axis**
63	**1018.64**	**69.68**	**87.09**	**28.83**	**718.12**	**539.46**	**4.38**	**545.92**	**539.59**	**89.54**	**0.42**	**MWD**	**6–axis**
64	1047.42	68.84	87.34	28.78	728.31	566.37	5.69	572.81	566.48	89.43	0.30	MWD	6–axis
65	1076.22	70.95	88.00	28.80	738.21	593.41	6.79	599.83	593.51	89.35	0.76	MWD	6–axis
66	1104.92	71.26	88.33	28.70	747.50	620.57	7.65	626.97	620.65	89.30	0.15	MWD	6–axis
67	1133.56	70.77	88.57	28.64	756.82	647.65	8.39	654.04	647.73	89.26	0.19	MWD	6–axis
68	1162.76	69.60	88.22	29.20	766.72	675.12	9.16	681.50	675.20	89.23	0.42	MWD	6–axis
69	1192.29	70.68	87.70	29.53	776.75	702.89	10.15	709.25	702.96	89.18	0.40	MWD	6–axis
70	1220.68	70.21	87.93	28.39	786.25	729.64	11.17	735.99	729.71	89.13	0.18	MWD	6–axis
71	1249.53	71.42	88.09	28.85	795.74	756.89	12.11	763.22	756.95	89.09	0.42	MWD	6–axis
72	1278.47	70.83	88.55	28.94	805.10	784.27	12.91	790.59	784.33	89.06	0.25	MWD	6–axis
73	1307.78	70.41	88.78	29.31	814.82	811.92	13.56	818.23	811.98	89.05	0.16	MWD	6–axis
74	1336.76	71.90	87.82	28.98	824.18	839.35	14.37	845.65	839.40	89.02	0.60	MWD	6–axis
75	1365.54	71.58	88.03	28.78	833.20	866.67	15.36	872.96	866.72	89.01	0.13	MWD	6–axis
76	1394.99	70.65	87.88	29.45	842.73	894.54	16.36	900.81	894.58	89.01	0.32	MWD	6–axis
77	1423.91	71.30	88.18	28.92	852.16	921.88	17.30	928.13	921.92	88.93	0.25	MWD	6–axis
78	1453.13	70.73	88.04	29.22	861.67	949.51	18.21	982.91	976.73	88.91	0.20	MWD	6–axis
79	1482.00	69.94	87.98	28.87	871.38	976.69	19.15	982.91	976.73	88.88	0.27	MWD	6–axis
80	1511.29	71.58	88.27	29.29	881.03	1004.34	20.06	1010.55	1004.38	88.86	0.57	MWD	6–axis
81	1540.24	71.22	88.49	28.95	890.27	1031.78	20.83	1037.98	1031.81	88.85	0.14	MWD	6–axis
82	1569.45	71.83	88.59	29.21	899.52	1059.49	21.54	1065.67	1059.52	88.84	0.21	MWD	6–axis
83	1598.45	70.89	88.78	29.00	908.79	1086.96	22.17	1093.15	1086.99	88.84	0.33	MWD	6–axis
84	1627.03	70.31	88.62	28.58	918.29	1113.92	22.78	1120.10	1113.95	88.83	0.21	MWD	6–axis
85	1655.99	70.03	88.33	28.96	928.11	1141.16	23.51	1147.33	1141.19	88.82	0.13	MWD	6–axis
86	1684.63	70.80	88.15	28.64	937.71	1168.15	24.33	1174.30	1168.17	88.81	0.28	MWD	6–axis
87	1712.70	70.52	87.93	28.07	947.01	1194.63	25.24	1200.77	1194.66	88.79	0.12	MWD	6–axis
88	1741.50	70.18	87.75	28.80	956.69	1221.75	26.26	1227.87	1221.78	88.77	0.13	MWD	6–axis
89	1770.04	71.16	87.80	28.54	966.14	1248.68	27.31	1254.78	1248.70	88.75	0.34	MWD	6–axis
90	1798.12	71.43	87.83	28.08	975.14	1275.28	28.32	1281.36	1275.30	88.73	0.10	MWD	6–axis

Seq # –	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S– (m)	Displ +E/W– (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 10m)	Srvy tool type	Tool qual type
91	1826.11	70.51	87.92	27.99	984.27	1301.73	29.30	1307.80	1301.75	88.71	0.33	MWD	6–axis
92	1854.99	70.21	88.08	28.88	993.97	1328.93	30.25	1334.99	1328.95	88.70	0.12	MWD	6–axis
93	1883.45	71.73	88.50	28.46	1003.25	1355.84	31.05	1361.88	1355.85	88.69	0.55	MWD	6–axis
94	1911.83	71.46	88.41	28.38	1012.22	1382.77	31.78	1388.80	1382.78	88.69	0.10	MWD	6–axis
95	1940.74	70.88	88.18	28.91	1021.55	1410.13	32.59	1416.15	1410.14	88.68	0.21	MWD	6–axis

95	1940.74	70.88	88.18	28.91	1021.55	1410.13	32.59	1416.15	1410.14	88.68	0.21	MWD 6-axis
96	1969.40	70.59	87.87	28.66	1031.01	1437.18	33.53	1443.18	1437.19	88.67	0.15	MWD 6-axis
97	1997.53	70.80	87.93	28.13	1040.31	1463.73	34.50	1469.71	1463.74	88.65	0.08	MWD 6-axis
98	2025.72	70.53	88.02	28.19	1049.64	1490.33	35.44	1496.30	1490.34	88.64	0.10	MWD 6-axis
99	2054.36	70.76	87.93	28.64	1059.13	1517.35	36.39	1523.30	1517.36	88.63	0.09	MWD 6-axis
100	2082.32	71.12	87.77	27.96	1068.26	1543.77	37.39	1549.71	1543.78	88.62	0.14	MWD 6-axis
101	2110.78	71.56	87.78	28.46	1077.37	1570.73	38.43	1576.65	1570.74	88.60	0.15	MWD 6-axis
102	2139.97	71.34	88.05	29.19	1086.66	1598.41	39.44	1604.31	1598.41	88.59	0.12	MWD 6-axis
103	2168.08	71.08	88.00	28.11	1095.71	1625.02	40.36	1630.91	1630.91	88.58	0.09	MWD 6-axis
104	2196.66	70.48	88.06	28.58	1105.12	1652.00	41.28	1657.88	1652.01	88.57	0.21	MWD 6-axis
105	2224.04	70.56	88.41	27.38	1114.25	1677.81	42.08	1683.68	1677.82	88.57	0.12	MWD 6-axis
106	2252.28	69.98	88.12	28.24	1123.78	1704.4	42.88	1710.25	1704.40	88.56	0.23	MWD 6-axis
107	2281.17	70.52	88.43	28.89	1133.54	1731.59	43.70	1737.42	1731.59	88.56	0.21	MWD 6-axis
108	2309.72	70.74	88.71	28.55	1143.01	1758.52	44.37	1764.35	1758.52	88.56	0.12	MWD 6-axis
109	2338.26	71.66	88.51	28.54	1152.21	1785.54	45.03	1791.36	1795.54	88.56	0.33	MWD 6-axis
110	2366.50	70.97	88.30	28.24	1161.26	1812.29	45.77	1818.10	1812.29	88.56	0.25	MWD 6-axis
111	2394.81	71.70	88.78	28.31	1170.32	1839.11	46.46	1844.91	1839.11	88.56	0.30	MWD 6-axis
112	2423.21	71.20	88.59	28.40	1179.35	1866.03	47.08	1871.83	1866.04	88.56	0.19	MWD 6-axis
113	2451.21	72.24	88.33	28.00	1188.14	1892.62	47.62	1898.41	1892.62	88.56	0.38	MWD 6-axis
114	2479.83	71.81	88.61	28.62	1196.97	1919.84	48.52	1925.62	1919.85	88.56	0.18	MWD 6-axis
115	2508.56	71.30	88.90	28.73	1206.06	1947.10	49.11	1952.87	1947.10	88.56	0.20	MWD 6-axis
116	2536.94	71.30	88.28	28.38	1215.16	1973.98	49.77	1979.74	1973.98	88.56	0.21	MWD 6-axis
117	2565.00	70.95	88.92	28.06	1224.23	2000.53	50.42	2006.28	2000.53	88.56	0.25	MWD 6-axis
118	2593.75	71.06	88.00	28.75	1233.59	2027.71	51.15	2033.46	2027.72	88.56	0.30	MWD 6-axis
119	2621.34	70.89	88.69	27.59	1242.59	2053.80	51.90	2059.53	2053.80	88.56	0.24	MWD 6-axis
120	2649.12	71.64	88.05	27.78	1251.51	2080.10	52.65	2085.83	2080.11	88.55	0.35	MWD 6-axis

Seq # -	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 10m)	Srvy tool type	Tool qual type
121	2677.65	71.61	87.32	28.53	1260.50	2107.18	53.75	2112.88	2107.18	88.54	0.24	MWD	6-axis
122	2706.95	71.20	87.67	29.30	1269.85	2134.94	54.96	2140.62	2134.94	88.53	0.18	MWD	6-axis
123	2734.92	71.02	87.18	27.97	1278.90	2161.40	56.15	2167.06	2161.40	88.51	0.18	MWD	6-axis
124	2763.51	70.88	87.43	28.59	1288.23	2188.42	57.42	2194.06	2188.42	88.50	0.10	MWD	6-axis
125	2791.53	70.61	87.84	28.02	1297.47	2214.87	58.51	2220.49	2214.87	88.49	0.17	MWD	6-axis
126	2820.22	70.49	88.27	28.69	1307.03	2241.92	59.43	2247.52	2241.92	88.48	0.15	MWD	6-axis
127	**2849.03**	**70.21**	**88.69**	**28.81**	**1316.71**	**2269.05**	**60.15**	**2274.64**	**2269.05**	**88.48**	**0.17**	**MWD**	**6-axis**
128	**2876.04**	**70.13**	**89.20**	**27.01**	**1325.88**	**2294.46**	**60.62**	**2300.05**	**2294.46**	**88.49**	**0.18**	**MWD**	**6-axis**
129	2904.05	71.38	88.95	28.01	1335.11	2320.90	61.04	2326.49	2320.90	88.50	0.45	MWD	6-axis
130	2931.57	72.04	88.48	27.52	1343.75	2347.03	61.63	2352.61	2347.03	88.50	0.29	MWD	6-axis
131	2957.82	72.11	88.37	26.25	1351.82	2372.01	62.32	2377.58	2372.01	88.50	0.05	MWD	6-axis
132	2988.58	72.86	87.28	30.76	1361.08	2401.34	63.43	2406.89	2401.34	88.49	0.42	MWD	6-axis
133	3016.69	72.05	87.25	28.11	1369.56	2428.14	64.71	2433.66	2428.14	88.48	0.29	MWD	6-axis
134	3044.23	71.27	87.17	27.54	1378.22	2454.27	65.98	2459.77	2454.27	88.46	0.28	MWD	6-axis
135	3072.08	71.29	87.84	27.85	1387.16	2480.64	67.13	2486.12	2480.64	88.45	0.23	MWD	6-axis
136	3100.54	70.27	88.02	28.46	1396.53	2507.51	68.10	2512.98	2507.51	88.45	0.36	MWD	6-axis
137	3128.49	69.94	88.36	27.95	1406.04	2533.80	68.93	2539.25	2533.80	88.44	0.16	MWD	6-axis
138	3156.30	70.71	88.09	27.81	1415.40	2559.98	69.74	2565.42	2559.98	88.44	0.29	MWD	6-axis
139	3184.71	71.86	87.90	28.41	1424.52	2586.89	70.68	2592.31	2586.89	88.44	0.41	MWD	6-axis
140	3197.86	72.24	87.73	13.15	1428.57	2599.40	71.16	2604.81	2599.40	88.43	0.31	MWD	6-axis
141	3220.00	72.50	87.60	22.14	1435.28	2620.50	72.02	2625.90	2620.50	88.43	0.13	Projection TD	

Company: Esso Australia Ltd.

Well: TNA A-31

Field: Tuna

Rig: ISDL 453

State: Victoria

IDEAL services from **Anadrill**

VISION Density Neutron
1:500 True Vertical Depth
Recorded Mode Log

Schlumberger

Recorded Mode Log