Schlumberger

Company: **Esso Australia Pty Ltd.**

Well: **A−13a**
Field: **Bream A**
Rig: **Prod4 / Crane** Country: **Australia**

Rig: Prod4 / Crane
Field: Bream A
Location: Gippsland
Well: A−13a
Company: Esso Australia Pty Ltd.

RST−C Static
SIGMA Survey

LOCATION

Gippsland
Basin
Bass Strait

Elev.: K.B. 32.80 m
G.L. −59.00 m
D.F. 32.80 m

Permanent Datum: M.S.L — Elev.: 0.00 m
Log Measured From: D.F — 32.80 m above Perm. Datum
Drilling Measured From: D.F

State:	Max. Well Deviation	Longitude	Latitude
Victoria	65 deg	147 46'15"E	038 30'04"S

		Run 1
PVT DATA	Oil Density	
	Water Salinity	
	Gas Gravity	
	Bo	
	Bw	
	1/Bg	
	Bubble Point Pressure	
	Bubble Point Temperature	
	Solution GOR	
	Maximum Deviation	65 deg
	CEMENTING DATA	
	Primary/Squeeze	Primary
	Casing String No	
	Lead Cement Type	
	Volume	
	Density	
	Water Loss	
	Additives	
	Tail Cement Type	
	Volume	
	Density	
	Water Loss	
	Additives	
	Expected Cement Top	

Logging Date		31−Oct−2009				Logging Date	
Run Number		1				Run Number	
Depth Driller		2578 m				Depth Driller	
Schlumberger Depth		2575 m				Schlumberger Depth	
Bottom Log Interval		2575 m				Bottom Log Interval	
Top Log Interval		2550 m				Top Log Interval	
Casing Fluid Type		Production Fluids				Casing Fluid Type	
Salinity						Salinity	
Density						Density	
Fluid Level		377 m				Fluid Level	
BIT/CASING/TUBING STRING						BIT/CASING/TUBING STRING	
Bit Size		6.000 in				Bit Size	
From		2455 m				From	
To		2733 m				To	
Casing/Tubing Size		4.500 in				Casing/Tubing Size	
Weight		12.6 lbm/ft				Weight	
Grade		L−80				Grade	
From		2291 m				From	
To		2682 m				To	
Maximum Recorded Temperatures		210 degF				Maximum Recorded Temperatures	
Logger On Bottom	Time	31−Oct−2009	3:10			Logger On Bottom	Time
Unit Number	Location	889	AUSL / PROD 4			Unit Number	Location
Recorded By		S Gilbert.				Recorded By	
Witnessed By		B White				Witnessed By	

DEPTH SUMMARY LISTING

Date Created: 22−OCT−2009 3:04:54

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−EB	Type:	PSDS/OSDS	Type:	2−32ZT
Serial Number:	6373	Serial Number:	325357	Serial Number:	207505
Calibration Date:	13−Oct−2009	Calibration Date:	21−Oct−2009	Length:	6421 M
Calibrator Serial Number:	30	Calibrator Serial Number:	854		
Calibration Cable Type:	2−32ZT	Number of Calibration Points:	9	Conveyance Method:	Wireline
Wheel Correction 1:	0	Calibration RMS:	454	Rig Type:	Rigless
Wheel Correction 2:	−2	Calibration Peak Error:	281		

Depth Control Parameters

Log Sequence: Subsequent Trip To the Well
Reference Log Name: Solar Composite Log
Reference Log Run Number:
Reference Log Date:
Subsequent Trip Down Log Correction:

Depth Control Remarks

1. IDW used as primary depth control
2. Z Chart used as secondary depth control.
3. Full pressure gear used in rig up , surface Zero check incorrect.
4.
5.
6.

OTHER SERVICES1
OS1: Powerjet Perforation
OS2: 4.5" Posiset Plug

REMARKS: RUN NUMBER 1
Log correlated to ExxonMobil composite supplied with logging program.
Maximum well deviation = 65deg @ 1113m MDKB.
Log objectives: Log RST−C SIGMA Surveys over the interval HUD (2578m) to 2550m
making 2 passes at 900ft/hr with the well shut in .
Tag Depth: 2575m MDKB
SBHP 2621 psia

SBHT: 206 degf

All Depths are MDKB

Crew : J Annear , A Pratt

RUN 1		
SERVICE ORDER #:	B297−00017	
PROGRAM VERSION:	17C0−154	
FLUID LEVEL:	377 m	
LOGGED INTERVAL	START	STOP

RUN 2		
SERVICE ORDER #:		
PROGRAM VERSION:		
FLUID LEVEL:		
LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1

SURFACE EQUIPMENT

WITM−A 3918
PSC_16MHZ 3918

DOWNHOLE EQUIPMENT

AH−SWBS−B 789 — 13.30
AH−SWBS−B 789

AH−SWBS−B 788 — 12.61
AH−SWBS−B 788

AH−SWBS−B 787 — 11.93
AH−SWBS−B 787

AH−SWBS−B 786 — 11.24
AH−SWBS−B 786

AH−SWBS−B 785 — 10.55
AH−SWBS−B 785

MH−SWHS−A 759 — 9.87
MH−SWHS−A 759

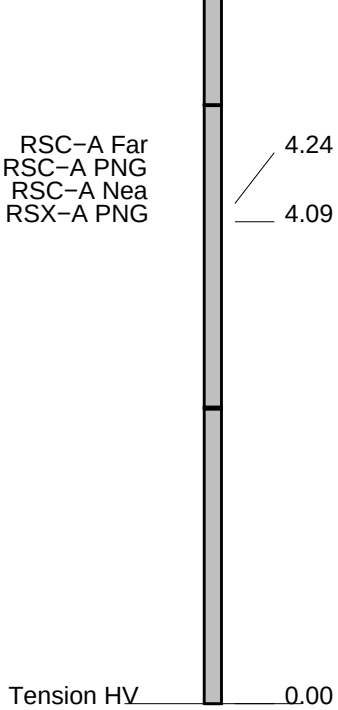
PSPT 3918 — 9.54
PSC−B 3918
PSPT−B 3918
PSTC−A 3918
PBMS−B 3918
CQG_F_Mano 3918
RTD_Thermometer 3918
GR 3918
CCL 3918
PBMS 3918

Detail MT — 9.54
TelStatus
CTEM
GR — 8.41
Well_Temp — 7.48
CQG Manom — 7.37
CCL — 7.25
PBMS PSTC — 7.02

RST−C 145 — 7.02
RSCH−A 111
RSC−C 111
RSS−A 108
RSXH−A 145

RUN 2

RSX−C 145



MAXIMUM STRING DIAMETER 1.72 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS

Production String	(in) OD	(in) ID	(m) MD	Well Schematic	(m) MD	(in) OD	(in) ID	Casing String
Tubing Hanger	7.000	3.500	15.0					
Tubing	3.500		15.0		13.4	10.750		Casing String
					14.1	10.750	7.000	Liner Hanger
Shutin Valve	3.500		463.0					
Gas Lift Mandrel	3.500		1138.5					
Gas Lift Mandrel	3.500		1814.6					
					1297.0	10.750		Casing Shoe
Gas Lift Mandrel	3.500		2064.0					

Gas Lift Mandrel	3.500		2004.0					
Nipple	3.500		2252.0					
Packer	7.000	3.500	2268.0					
					2291.0	4.500		Casing String
Flow Coupling	4.500	3.500	2292.0		2291.0	7.000	4.500	Liner Hanger
Tubing Bottom	3.500		2298.4		2455.3	7.000		Casing Shoe
Nipple	3.500		2295.0					
					2573.4			Perforation Zone
Bridge Plug	4.500	0.000	2578.0					
					2582.0			Perforation Zone
Bridge Plug	4.500	0.000	2586.0					
Bridge Plug	4.500	0.000	2588.0					
					2592.5			Perforation Zone
Bridge Plug	4.500	0.000	2597.0					
					2599.5			Perforation Zone
Bridge Plug	4.500	0.000	2604.0					
					2608.5			Perforation Zone
Bridge Plug	4.500	0.000	2612.0					
					2672.0	4.500		Casing Shoe

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Job Events Summary

MAXIS Field Log

Schlumberger Job Event Summary

	Time	Elapsed Time	Depth (M)	File
Log Pass (up)	31-Oct-2009 2:02	000:09	2579.2 - 2527.4	RST_PSP_003LUP
Log Pass (up)	31-Oct-2009 2:26	000:10	2577.1 - 2530.4	RST_PSP_006LUP
Log Pass (up)	31-Oct-2009 2:39	000:09	2577.5 - 2534.3	RST_PSP_007LUP

Schlumberger

Static SIGMA Pass # 2

MAXIS Field Log

Company: Esso Australia Pty Ltd. **Well: A−13a**

Output DLIS Files

DEFAULT	RST_PSP_007LUP	FN:9	PRODUCER	31−Oct−2009 02:39
A13A_RST_CLIENT_STATIC	RST_PSP_007LUC	FN:10	CUSTOMER	31−Oct−2009 02:39

OP System Version: 17C0−154

RST−C	17C0−154	PSPT−B	17C0−154

PIP SUMMARY

Time Mark Every 60 S

RST Sigma (SIGM) 60 (CU) 0

RST Weighted Inelastic Ratio (WINR_RST) 0.4 (−−−− 0

RST Porosity (TPHI) 0.6 (V/V) 0

RST Far Effective Capture CR (RSCF_RST) 45 (−−−− 0

RST Sigma Borehole Fluid (SIBF) 100 (CU) 0

RST Near Effective Capture CR (RSCN_RST) 45 (−−−− 0

Sigma Borehole Far Apparent (SBFA_FIL) 150 (CU) 0

Tension (TENS) 0 (LBF) 3000

RST Capture to Inelastic Ratio Far (CIRF_FIL) 5 (−−−− 0

RST Capture Ratio (TRAT_FIL) 1.5 (−−−− 0.5

Sigma Formation Far Apparent (SFFA_FIL) 60 (CU) 0

RST Capture to Inelastic Ratio Near (CIRN_FIL) 2.5 (−−−− 0

Minitron Arc Detection (MARC) 0 (−−−− 5

RST Sigma Difference (DSIG) −30 (CU) 30

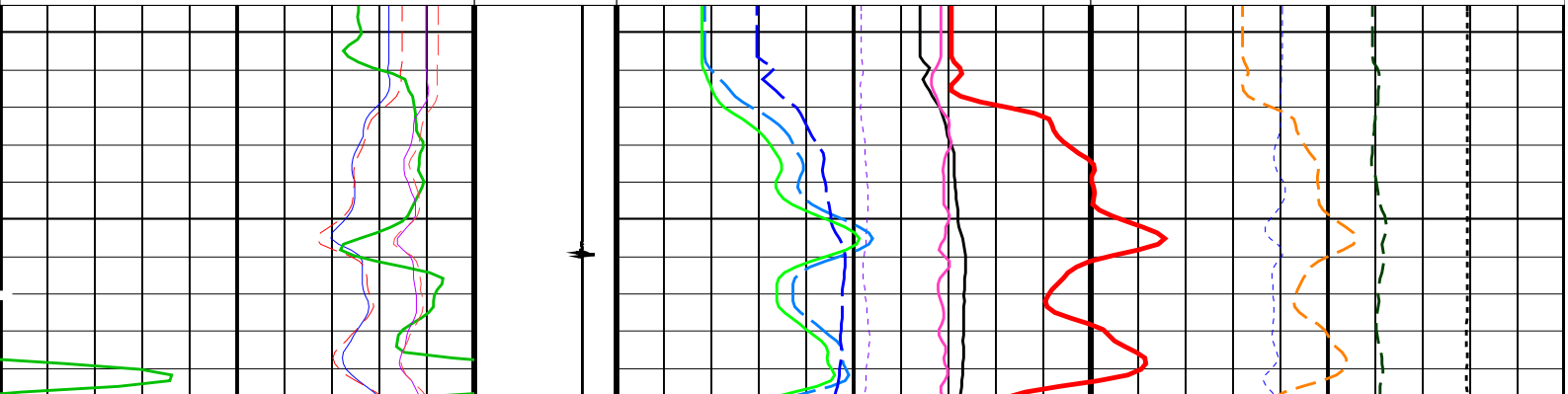
MCS Far Background (filtered) (FBAC) 0 (CPS) 5000

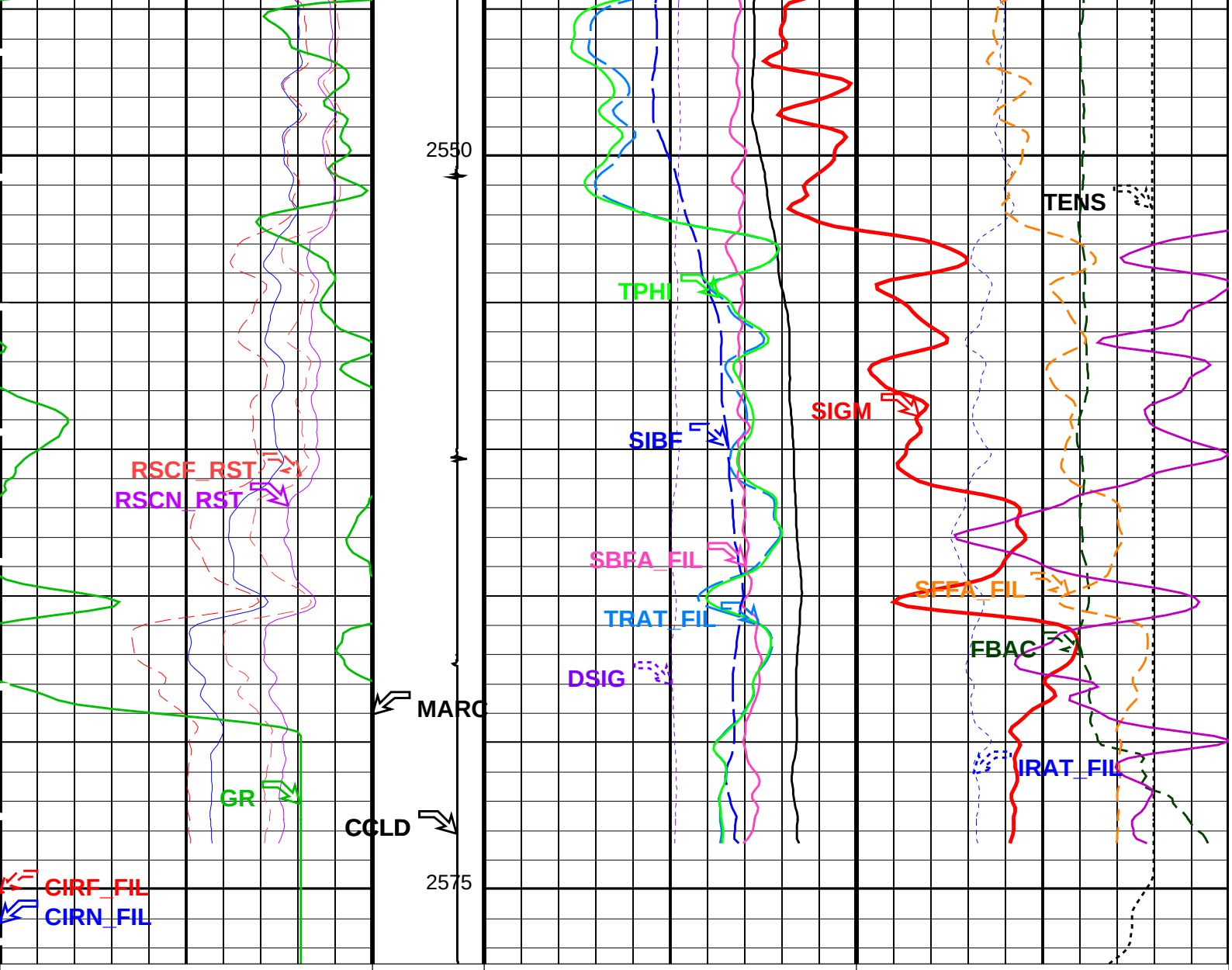
Gamma Ray (GR) 0 (GAPI) 150

Discriminated CCL (CCLD) 3 (V) −1

RST Borehole Salinity (BSAL) 450 (PPK) −50

RST Inelastic Ratio (IRAT_FIL) 0.75 (−−−− 0





Gamma Ray (GR) 0 (GAPI) 150	Discriminated CCL (CCLD) 3 (V) −1	RST Borehole Salinity (BSAL) 450 (PPK) −50
RST Capture to Inelastic Ratio Near (CIRN_FIL) 2.5 (---- 0	Minitron Arc Detection (MARC) 0 (---- 5	RST Sigma Difference (DSIG) −30 (CU) 30
RST Capture to Inelastic Ratio Far (CIRF_FIL) 5 (---- 0		RST Capture Ratio (TRAT_FIL) 1.5 (---- 0.5
RST Near Effective Capture CR (RSCN_RST) 45 (---- 0		Sigma Borehole Far Apparent (SBFA_FIL) 150 (CU) 0
RST Far Effective Capture CR (RSCF_RST) 45 (---- 0		RST Sigma Borehole Fluid (SIBF) 100 (CU) 0
		RST Porosity (TPHI) 0.6 (V/V) 0
		RST Weighted Inelastic Ratio (WINR_RST) 0.4 (---- 0

RST Inelastic Ratio (IRAT_FIL) 0.75 (---- 0	
MCS Far Background (filtered) (FBAC) 0 (CPS) 5000	
Sigma Formation Far Apparent (SFFA_FIL) 60 (CU) 0	
	Tension (TENS) 0 (LBF) 3000

RST Sigma (SIGM)

60 (CU) 0

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	RST−C: Reservoir Saturation Pro Tool C		
AIRB	RST Air Borehole	No	
BHS	Borehole Status	CASED	
BSALOPT	RST Borehole Salinity Option	Unknown	
BSFL	RST Borehole Salinity Filter Length	51	
DFPC	RST Depth Filter Processing Constant	One	
DFPC_TDTL	RST Depth Filter Processing Constant (TDT−like)	Two	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
NORM_IRAT_RST	RST Normalized Inelastic Ratio	0.48	
NORM_SIGM_RST	RST Normalized Sigma	30	CU
RGAI	Near/Far Gain Calibration Ratio	1	
TIER_SIGM	RST Sigma Acquisition Mode	0_RST_Sigma	
	PSPT−B: Production Services Logging Platform		
BHS	Borehole Status	CASED	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
	System and Miscellaneous		
BS	Bit Size	6.000	IN
BSAL	Borehole Salinity	−50000.00	PPM
CSIZ	Current Casing Size	4.500	IN
CWEI	Casing Weight	12.60	LB/F

Format: RST_SIG_ANSW Vertical Scale: 1:200 Graphics File Created: 31−Oct−2009 02:39

OP System Version: 17C0−154

RST−C	17C0−154	PSPT−B	17C0−154

Output DLIS Files

DEFAULT	RST_PSP_007LUP	FN:9	PRODUCER	31−Oct−2009 02:39
A13A_RST_CLIENT_STATIC	RST_PSP_007LUC	FN:10	CUSTOMER	31−Oct−2009 02:39

Schlumberger

Static SIGMA Pass # 1

MAXIS Field Log

Company: Esso Australia Pty Ltd. Well: A−13a

Output DLIS Files

DEFAULT	RST_PSP_006LUP	FN:7	PRODUCER	31−Oct−2009 02:26
A13A_RST_CLIENT_STATIC	RST_PSP_006LUC	FN:8	CUSTOMER	31−Oct−2009 02:26

OP System Version: 17C0−154

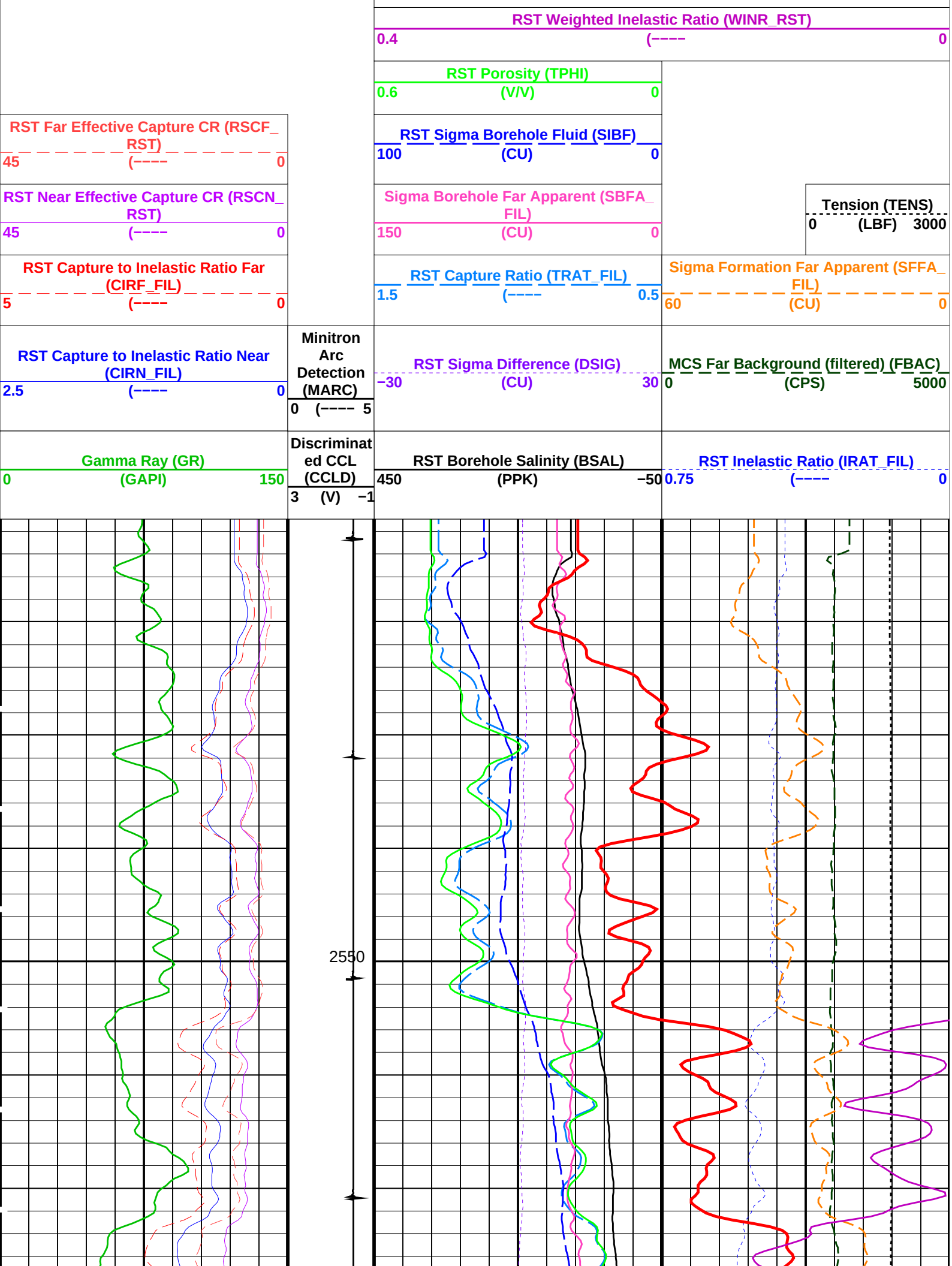
RST−C	17C0−154	PSPT−B	17C0−154

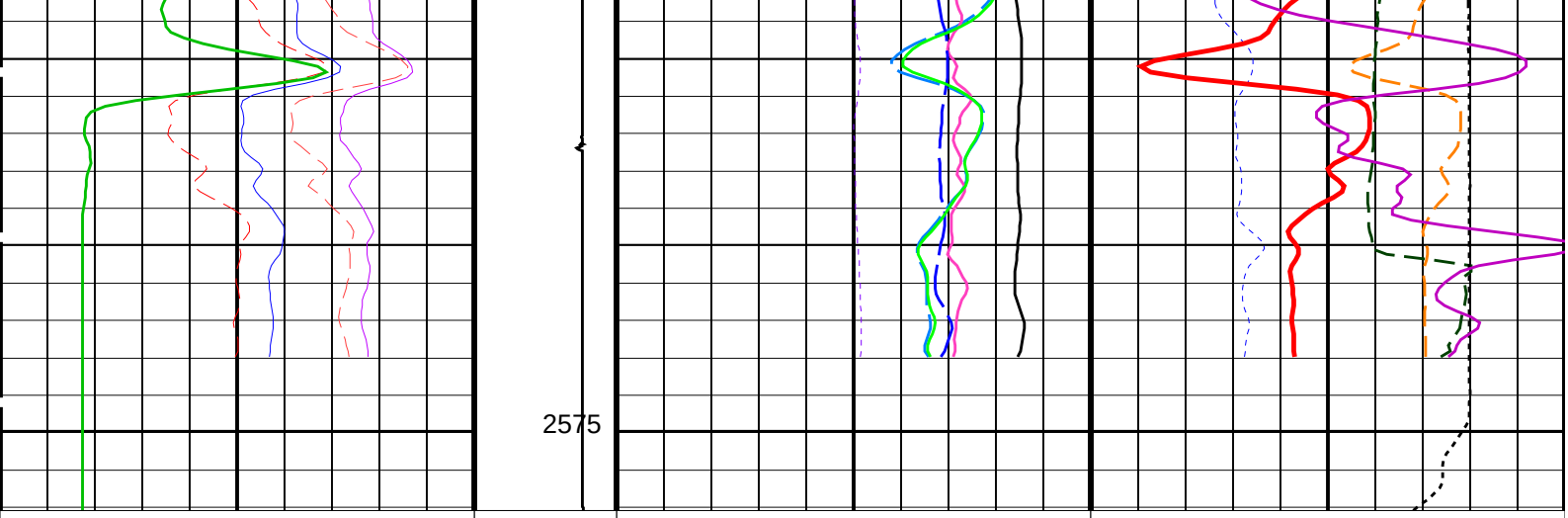
PIP SUMMARY

Time Mark Every 60 S

RST Sigma (SIGM)

60 (CU) 0


RST Weighted Inelastic Ratio (WINR_RST)
0.4 (----- 0
RST Porosity (TPHI)
0.6 (V/V) 0
RST Far Effective Capture CR (RSCF_RST)
45 (---- 0
RST Sigma Borehole Fluid (SIBF)
100 (CU) 0
RST Near Effective Capture CR (RSCN_RST)
45 (---- 0
Sigma Borehole Far Apparent (SBFA_FIL)
150 (CU) 0
Tension (TENS)
0 (LBF) 3000
RST Capture to Inelastic Ratio Far (CIRF_FIL)
5 (---- 0
RST Capture Ratio (TRAT_FIL)
1.5 (---- 0.5
Sigma Formation Far Apparent (SFFA_FIL)
60 (CU) 0
RST Capture to Inelastic Ratio Near (CIRN_FIL)
2.5 (---- 0
Minitron Arc Detection (MARC)
0 (---- 5
RST Sigma Difference (DSIG)
−30 (CU) 30
MCS Far Background (filtered) (FBAC)
0 (CPS) 5000
Gamma Ray (GR)
0 (GAPI) 150
Discriminated CCL (CCLD)
3 (V) −1
RST Borehole Salinity (BSAL)
450 (PPK) −50
RST Inelastic Ratio (IRAT_FIL)
0.75 (---- 0
2550



Gamma Ray (GR)	Discriminated CCL (CCLD)	RST Borehole Salinity (BSAL)	RST Inelastic Ratio (IRAT_FIL)
0 (GAPI) 150	3 (V) −1	450 (PPK) −50	0.75 (---- 0
RST Capture to Inelastic Ratio Near (CIRN_FIL)	**Minitron Arc Detection (MARC)**	**RST Sigma Difference (DSIG)**	**MCS Far Background (filtered) (FBAC)**
2.5 (---- 0	0 (---- 5	−30 (CU) 30	0 (CPS) 5000
RST Capture to Inelastic Ratio Far (CIRF_FIL)		**RST Capture Ratio (TRAT_FIL)**	**Sigma Formation Far Apparent (SFFA_FIL)**
5 (---- 0		1.5 (---- 0.5	60 (CU) 0
RST Near Effective Capture CR (RSCN_RST)		**Sigma Borehole Far Apparent (SBFA_FIL)**	**Tension (TENS)**
45 (---- 0		150 (CU) 0	0 (LBF) 3000
RST Far Effective Capture CR (RSCF_RST)		**RST Sigma Borehole Fluid (SIBF)**	
45 (---- 0		100 (CU) 0	
		RST Porosity (TPHI)	
		0.6 (V/V) 0	
		RST Weighted Inelastic Ratio (WINR_RST)	
		0.4 (---- 0	
		RST Sigma (SIGM)	
		60 (CU) 0	

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	RST−C: Reservoir Saturation Pro Tool C		
AIRB	RST Air Borehole	No	
BHS	Borehole Status	CASED	
BSALOPT	RST Borehole Salinity Option	Unknown	
BSFL	RST Borehole Salinity Filter Length	51	
DFPC	RST Depth Filter Processing Constant	One	
DFPC_TDTL	RST Depth Filter Processing Constant (TDT−like)	Two	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
NORM_IRAT_RST	RST Normalized Inelastic Ratio	0.48	
NORM_SIGM_RST	RST Normalized Sigma	30	CU
RGAI	Near/Far Gain Calibration Ratio	1	
TIER_SIGM	RST Sigma Acquisition Mode	0_RST_Sigma	
	PSPT−B: Production Services Logging Platform		
BHS	Borehole Status	CASED	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
	System and Miscellaneous		
BS	Bit Size	6.000	IN

BSAL	Borehole Salinity	−50000.00	PPM
CSIZ	Current Casing Size	4.500	IN
CWEI	Casing Weight	12.60	LB/F

Format: RST_SIG_ANSW Vertical Scale: 1:200 Graphics File Created: 31−Oct−2009 02:26

OP System Version: 17C0−154

RST−C	17C0−154	PSPT−B	17C0−154

Output DLIS Files

DEFAULT	RST_PSP_006LUP	FN:7	PRODUCER	31−Oct−2009 02:26
A13A_RST_CLIENT_STATIC	RST_PSP_006LUC	FN:8	CUSTOMER	31−Oct−2009 02:26

Schlumberger

Gamma−Ray Pass

MAXIS Field Log

Company: Esso Australia Pty Ltd. Well: A−13a

Input DLIS Files

DEFAULT	RST_PSP_003LUP	FN:2	PRODUCER	31−Oct−2009 02:02	2579.2 M	2527.4 M

Output DLIS Files

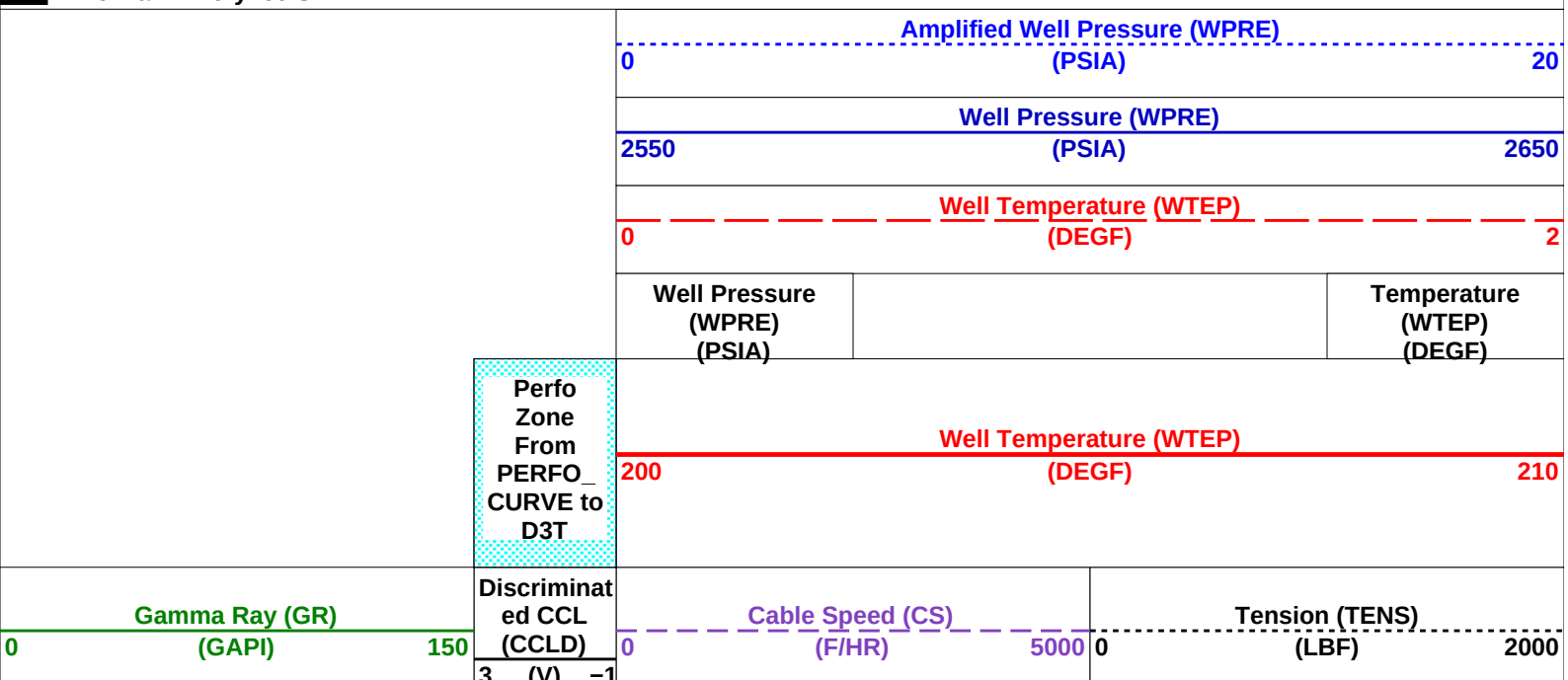
DEFAULT	RST_PSP_005PUP	FN:5	PRODUCER	31−Oct−2009 02:12	2576.9 M	2519.8 M
A13A_RST_CLIENT_STATIC	RST_PSP_005PUC	FN:6	CUSTOMER	31−Oct−2009 02:12	2576.9 M	2519.8 M

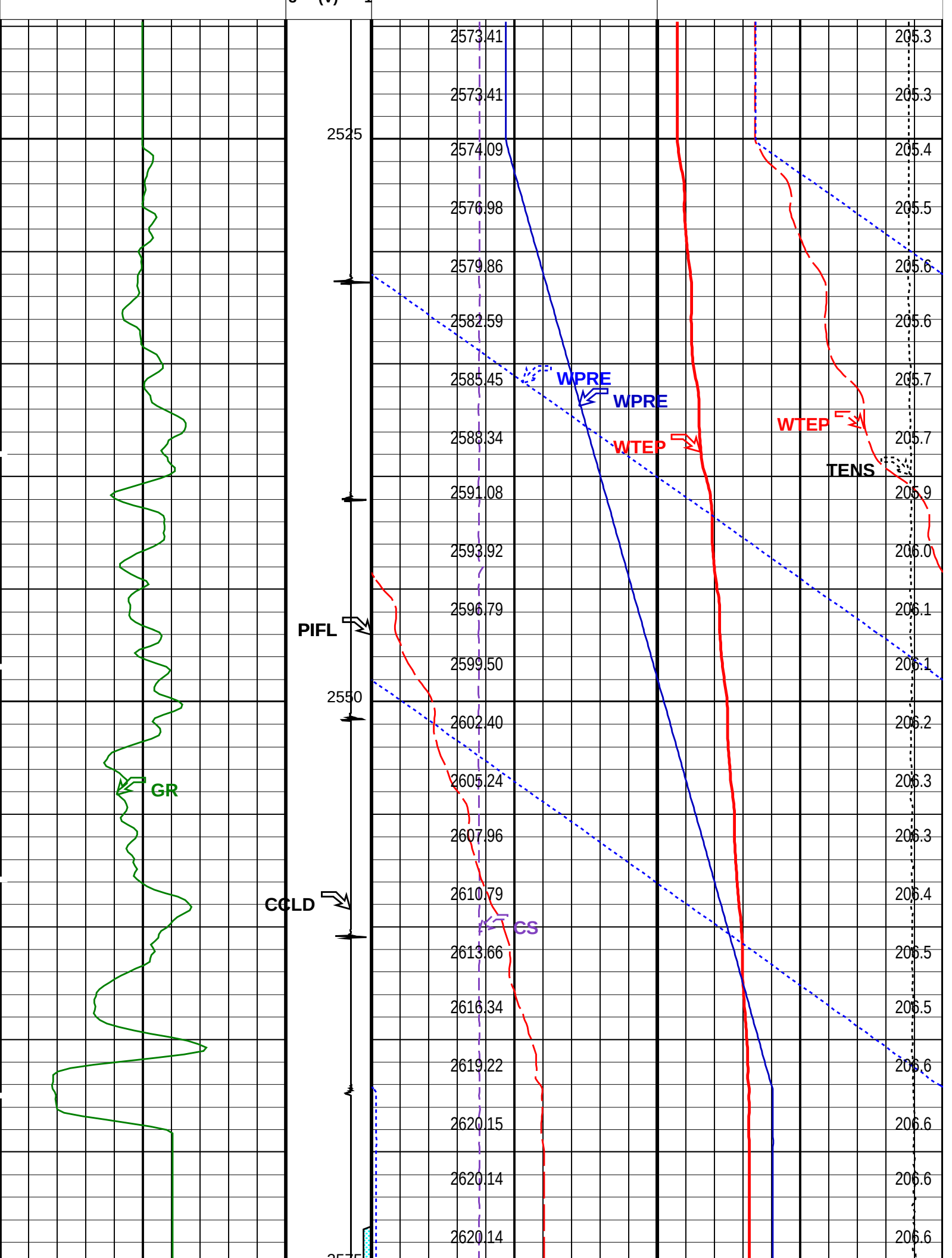
OP System Version: 17C0−154

RST−C	17C0−154	PSPT−B	17C0−154

PIP SUMMARY

Time Mark Every 60 S




2573.41
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2525
2574.09
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2579.86
2582.59
2585.45
WPRE
WPRE
2588.34
WTEP
WTEP
TENS
2591.08
2593.92
2596.79
PIFL
2599.50
2550
2602.40
2605.24
2607.96
GR
2610.79
CCLD
CS
2613.66
2616.34
2619.22
2620.15
2620.14
2620.14
205.3
205.3
205.4
205.5
205.6
205.6
205.7
205.7
205.9
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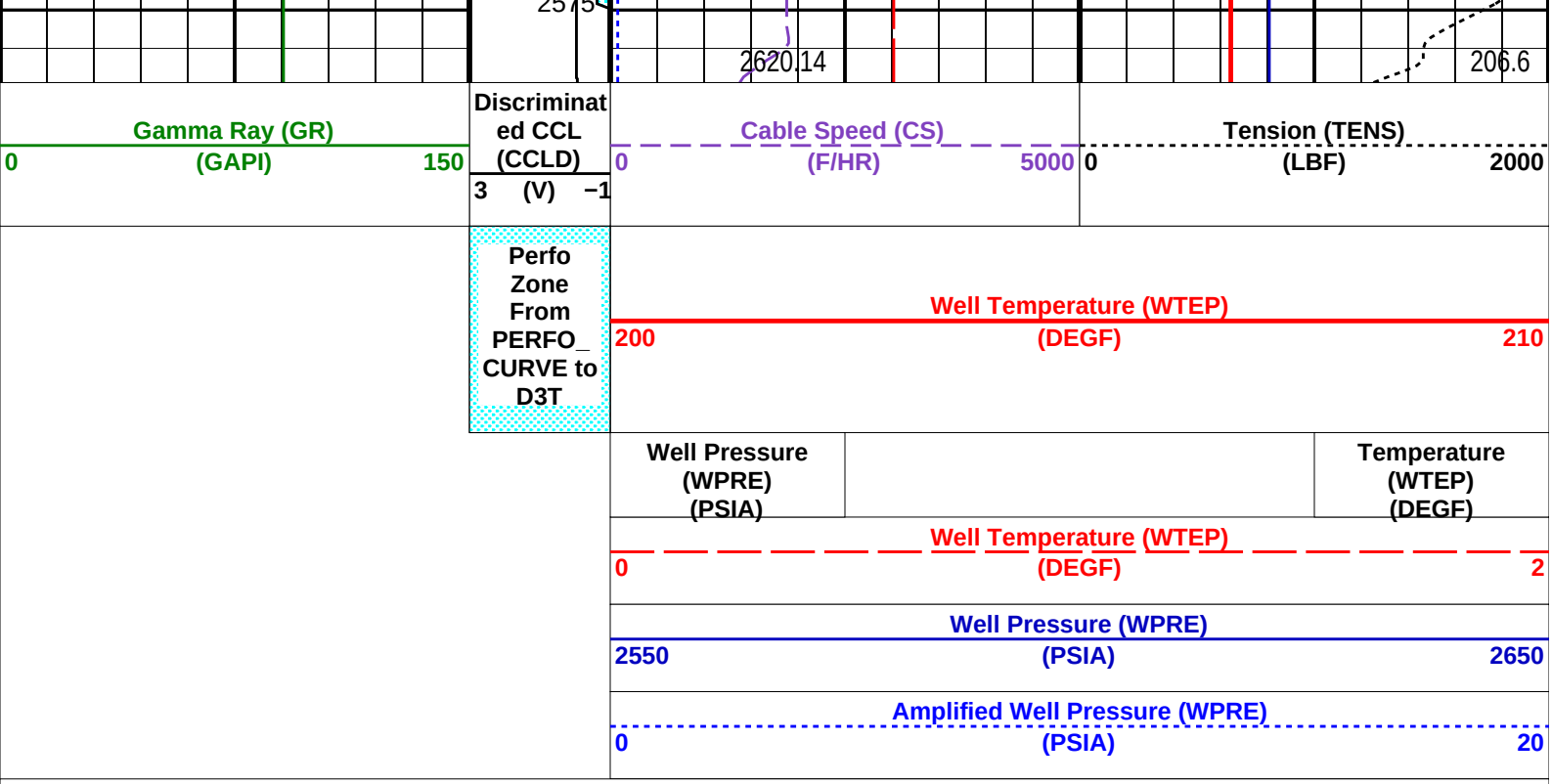
206.6



Format: PSP_1_1 Vertical Scale: 1:200 Graphics File Created: 31−Oct−2009 02:12

OP System Version: 17C0−154

RST−C	17C0−154	PSPT−B	17C0−154

Parameters

DLIS Name	Description	Value
	System and Miscellaneous	
DO	Depth Offset for Playback	−2.3 M
PP	Playback Processing	NORMAL

Input DLIS Files

DEFAULT	RST_PSP_003LUP	FN:2	PRODUCER	31−Oct−2009 02:02	2579.2 M	2527.4 M

Output DLIS Files

DEFAULT	RST_PSP_005PUP	FN:5	PRODUCER	31−Oct−2009 02:12	
A13A_RST_CLIENT_STATIC	RST_PSP_005PUC	FN:6	CUSTOMER	31−Oct−2009 02:12	

Company: **Esso Australia Pty Ltd.**

Schlumberger

Well: **A−13a**
Field: **Bream A**
Rig: **Prod4 / Crane**
Country: **Australia**

RST−C Static
SIGMA Survey