



# Schlumberger

Company: **Esso Australia Pty Ltd.**

Well: **A-5**  
 Field: **Marlin**  
 Rig: **Prod 4 / Crane**

Country: **Australia**

**RST-C**  
**Sigma**  
**Survey**

Prod 4 / Crane  
 Marlin  
 Gippsland  
 A-5  
 Esso Australia Pty Ltd.

LOCATION		Elev.:	K.B.	24.4 m
Gippsland Basin		G.L.		-59 m
Bass Strait		D.F.		24.4 m
Permanent Datum:	M.S.L.	Elev.:	0 m	
Log Measured From:	K.B.		24.4 m	above Perm. Datum
Drilling Measured From:	K.B.			
State: Victoria	Max. Well Deviation	Longitude	Latitude	
	48 deg	148 13'09.81"E	038 13'55.49"S	

Logging Date	22-Oct-2007
Run Number	One
Depth Driller	2045 m
Schlumberger Depth	2045 m
Bottom Log Interval	2045 m
Top Log Interval	1915 m
Casing Fluid Type	Production Fluid
Salinity	
Density	
Fluid Level	
BIT/CASING/TUBING STRING	
Bit Size	12.500 in
From	466.6 m
To	2098.5 m
Casing/Tubing Size	9.625 in
Weight	40 lbm/ft
Grade	N-80
From	9.43 m
To	2098.5 m
Maximum Recorded Temperatures	176 degF
Logger On Bottom	22-Oct-2007
Unit Number	889
Recorded By	G Wright, S Gilbert.
Witnessed By	G Rimmer, A Smyth.

Run 1

PVT DATA	
Oil Density	
Water Salinity	
Gas Gravity	
Bo	
Bw	
1/Bg	
Bubble Point Pressure	
Bubble Point Temperature	
Solution GOR	
Maximum Deviation	48 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

Run Number

Depth Driller

Schlumberger Depth

Bottom Log Interval

Top Log Interval

Casing Fluid Type

Salinity

Density

Fluid Level

BIT/CASING/TUBING STRING

Bit Size

From

To

Casing/Tubing Size

Weight

Grade

From

To

Maximum Recorded Temperatures

Logger On Bottom

Unit Number

Recorded By

Witnessed By

## DEPTH SUMMARY LISTING

Date Created: 23-OCT-2007 7:18:03

### Depth System Equipment

Depth Measuring Device	Tension Device	Logging Cable
Type: IDW-EB Serial Number: 6373 Calibration Date: 04-Jan-2007 Calibrator Serial Number: 9 Calibration Cable Type: 2-32ZT Wheel Correction 1: -2 Wheel Correction 2: -4	Type: PSDS/OSDS Serial Number: 325357 Calibration Date: 10-Oct-2007 Calibrator Serial Number: 1174 Calibration Gain: 0.89 Calibration Offset: 180.00	Type: 2-32ZT Serial Number: 24426 Length: 5584.85 M <hr/> Conveyance Method: Wireline Rig Type: Rigless

### Depth Control Parameters

Log Sequence:	Subsequent Log In the Well
Reference Log Name:	Solar composite log.
Reference Log Run Number:	
Reference Log Date:	

### Depth Control Remarks

1. IDW used as primary depth control
2. Z Chart used as secondary depth control

#### DISCLAIMER

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OTHER SERVICES1  
OS1: None

REMARKS: RUN NUMBER 1  
Log correlated to Solar composite supplied with logging program.  
Maximum well deviation = 48 degree's at 1139m MDKB.  
RST-C Sigma survey with the well shut-in.  
Pass one was a Gamma-Ray survey over the interval  
Passes 2 and 3 were RST-C Sigma survey over the same interval.  
SBHP: 1999 psia @ 1930m MDKB  
SBHT: 171 degf @ 1930m MDKB  
HUD: 2047m MDKB

Crew : J Light,J Annear,B Taylor,K Kerr.

RUN 1

SERVICE ORDER #: AusI07509086  
 PROGRAM VERSION: 14C0-302  
 FLUID LEVEL:

LOGGED INTERVAL	START	STOP

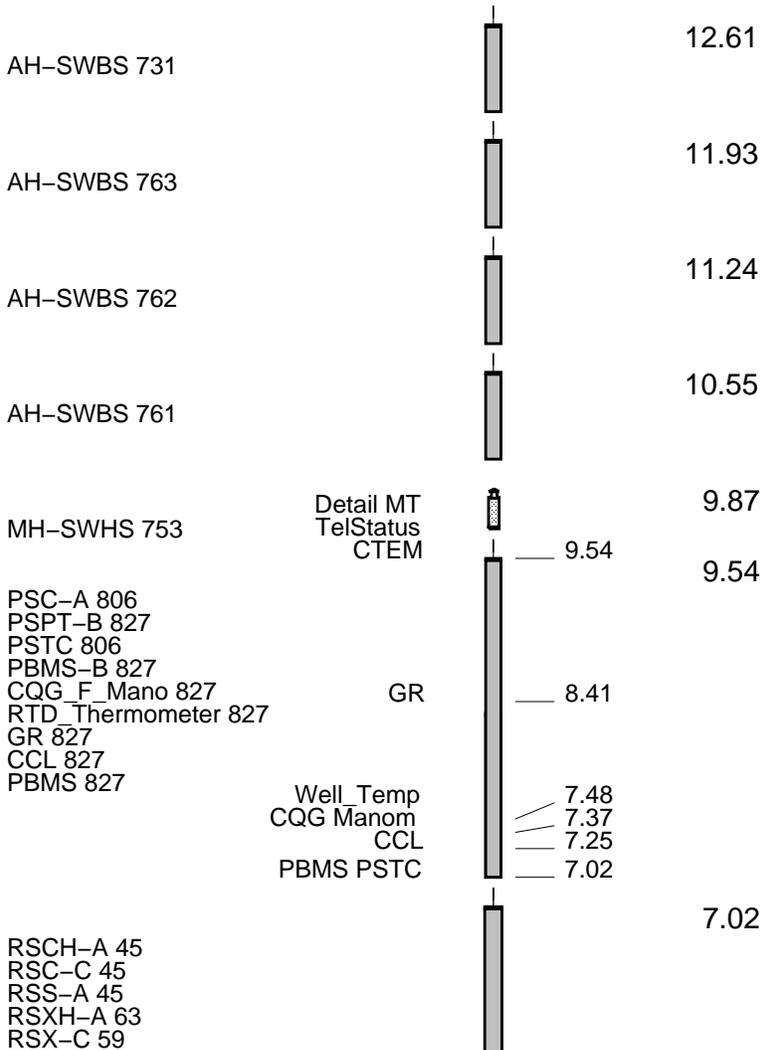
## EQUIPMENT DESCRIPTION

RUN 1

### SURFACE EQUIPMENT

WITM-A 806  
 PSC\_16MHZ 827

### DOWNHOLE EQUIPMENT



RSC-A Far  
 RSC-A PNG  
 RSC-A Nea  
 RSX-A PNG

4.24  
 4.09

Tension HV  
 TOOL ZERO 0.00

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



Production String

(in) (m)  
 OD ID MD

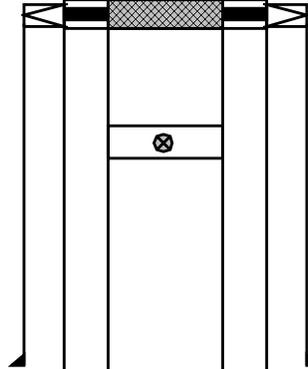
Well Schematic

(m) (in)  
 MD OD ID

Casing String

Tubing

5.500 11.7



9.4 12.5

Casing String  
 Casing String

Shutin Valve

5.500 150.7

466.6 13.375

Casing Shoe

Sliding Sleeve

5.500

1849.0

Packer

9.625

5.500

1868.7

1889.0

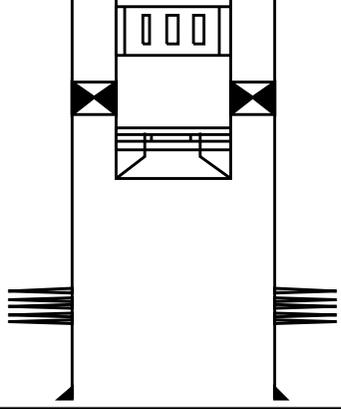
Nipple

5.500

1892.0

Bell Nipple Guide

5.500



1924.0

Perforation Zone

2098.5

9.625

Casing Shoe



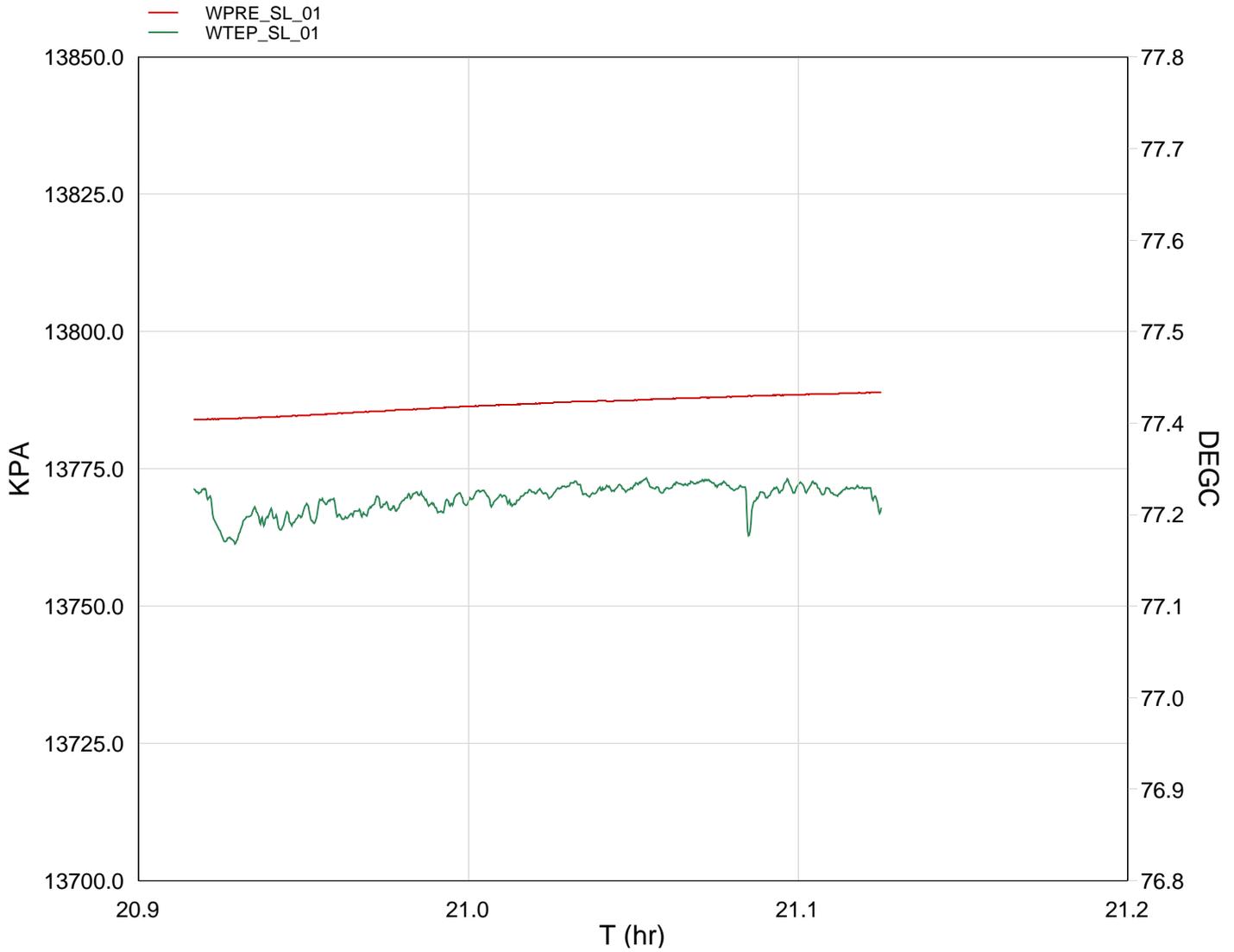
## Job Event Summary

MAXIS Field Log

### Schlumberger Job Event Summary

Time	Elapsed Time	Depth (M)	File
Log Pass (up)	22-Oct-2007 20:35	000:16	2050.4 - 1898.9 RST_PSP_008LUP
Station Log	22-Oct-2007 20:54	000:13	1937.3 - 1.9 RST_PSP_009LTP
Log Pass (up)	22-Oct-2007 21:21	000:32	2051.5 - 1907.1 RST_PSP_012LUP
Log Pass (up)	22-Oct-2007 22:01	000:31	2051.2 - 1905.0 RST_PSP_013LUP
Log Pass (up)	22-Oct-2007 22:41	000:26	2046.9 - 1903.6 RST_PSP_017LUP

MAXIS Field Log



TIME	TOJ	WTEP_SL	WPRE_SL
6420.0000	20.9048	171.0009	1998.0734
6480.0000	20.9323	171.0315	1999.2403
6540.0000	20.9490	171.0365	1999.3030
6600.0000	20.9657	171.0482	1999.3890
6660.0000	20.9823	171.0804	1999.4673
6720.0000	20.9990	171.0617	1999.5425
6780.0000	21.0157	171.0741	1999.6042
6840.0000	21.0323	171.1128	1999.6682
6900.0000	21.0490	171.0966	1999.7050
6960.0000	21.0657	171.1071	1999.7609
7020.0000	21.0823	171.1030	1999.8049
7080.0000	21.0990	171.0898	1999.8550



**RST-C Sigma Pass # 3**  
**900ft/hr 2045m to 1915m MDKB**

MAXIS Field Log

Company: Esso Australia Pty Ltd.

Well: A-5

**Input DLIS Files**

DEFAULT	RST_PSP_017LUP	FN:16	PRODUCER	22-Oct-2007 22:41	2046.9 M	1903.6 M
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**Output DLIS Files**

DEFAULT	RST_PSP_019PUP	FN:18	PRODUCER	22-Oct-2007 23:08	2047.3 M	1899.1 M
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**OP System Version: 14C0-302**

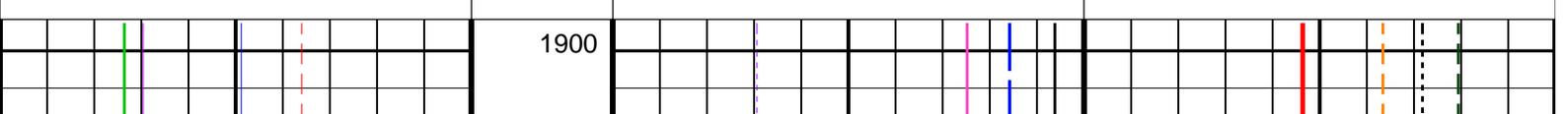
MCM

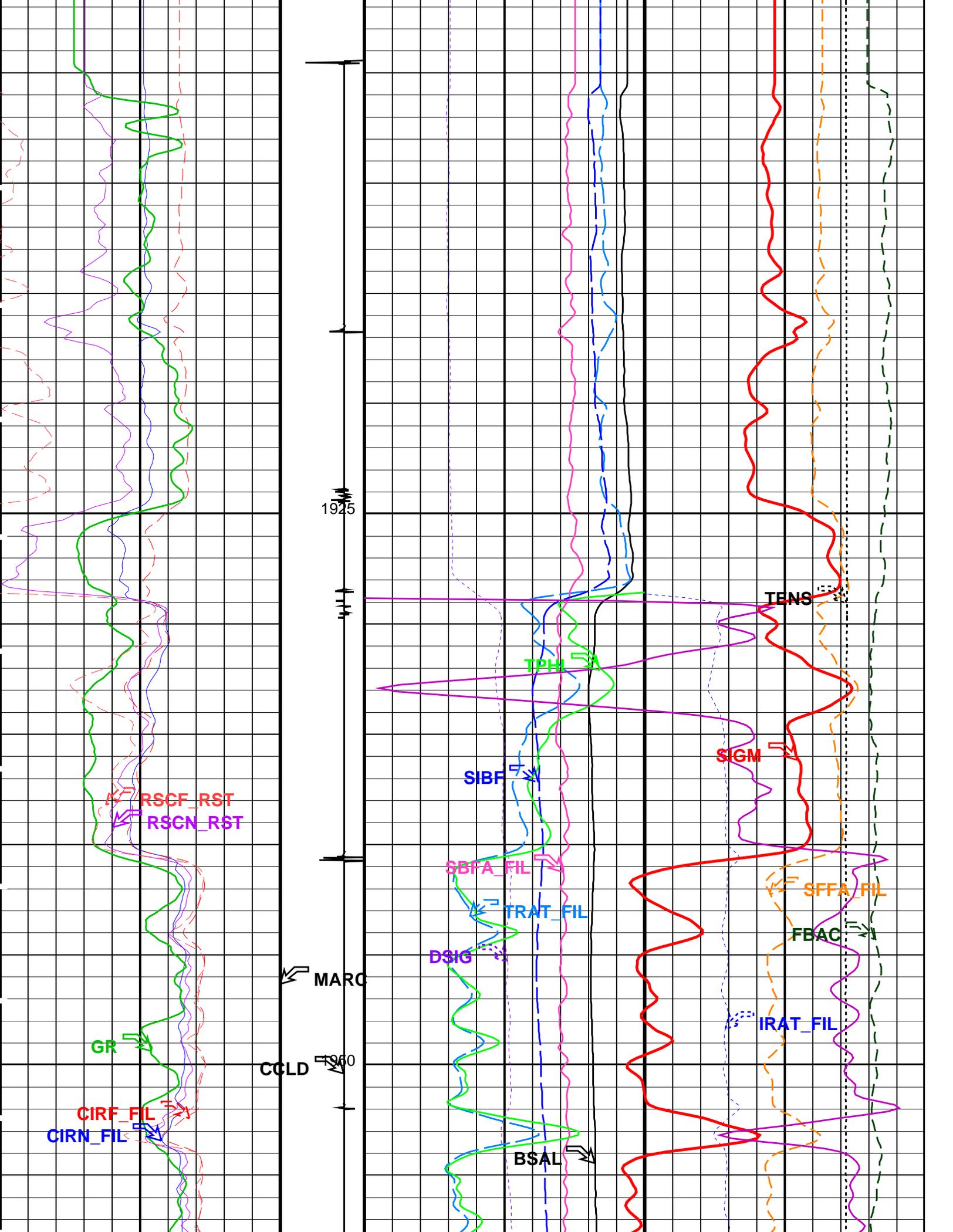
RST-C	14C0-302	PSPT-A/B	14C0-302
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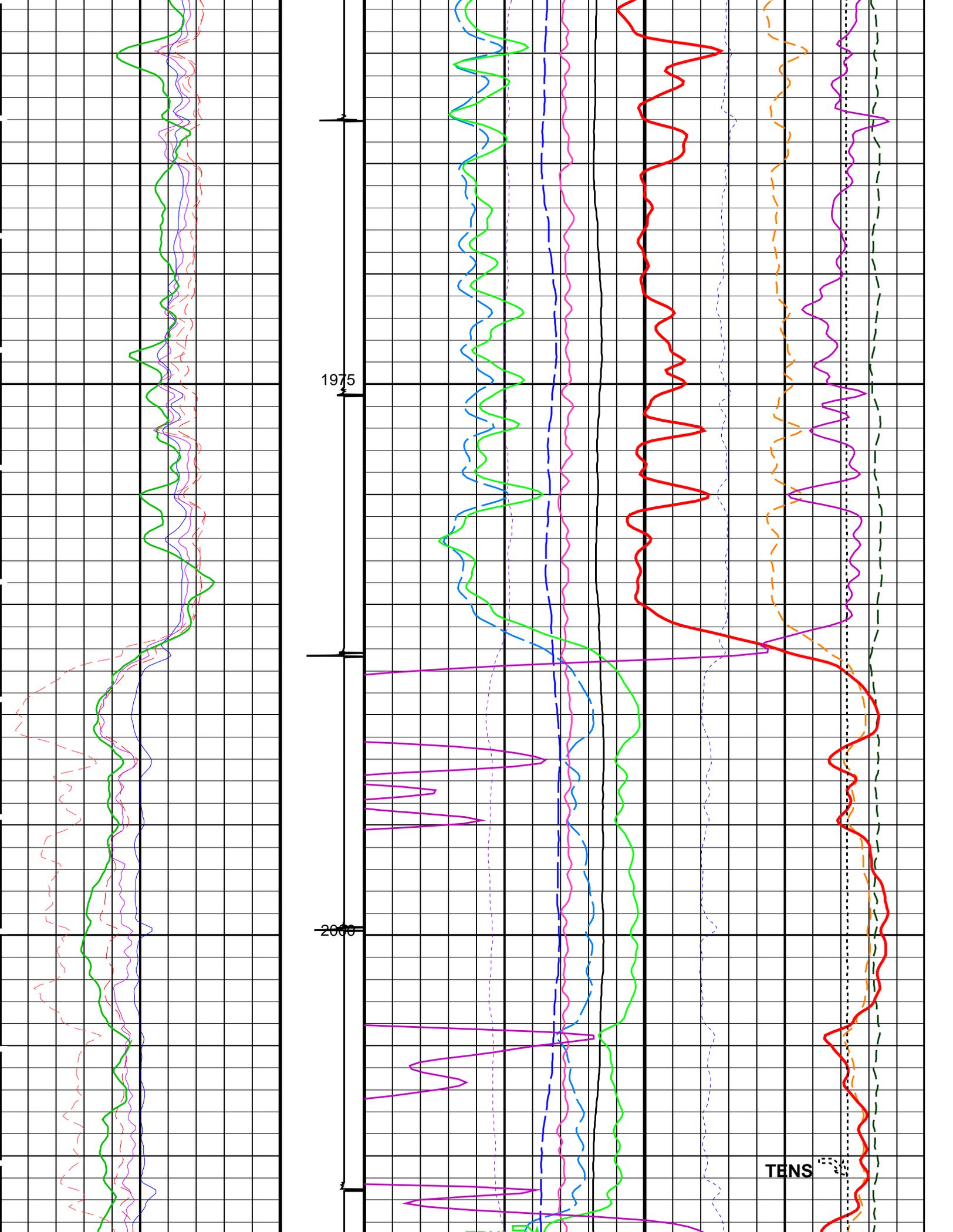
**PIP SUMMARY**

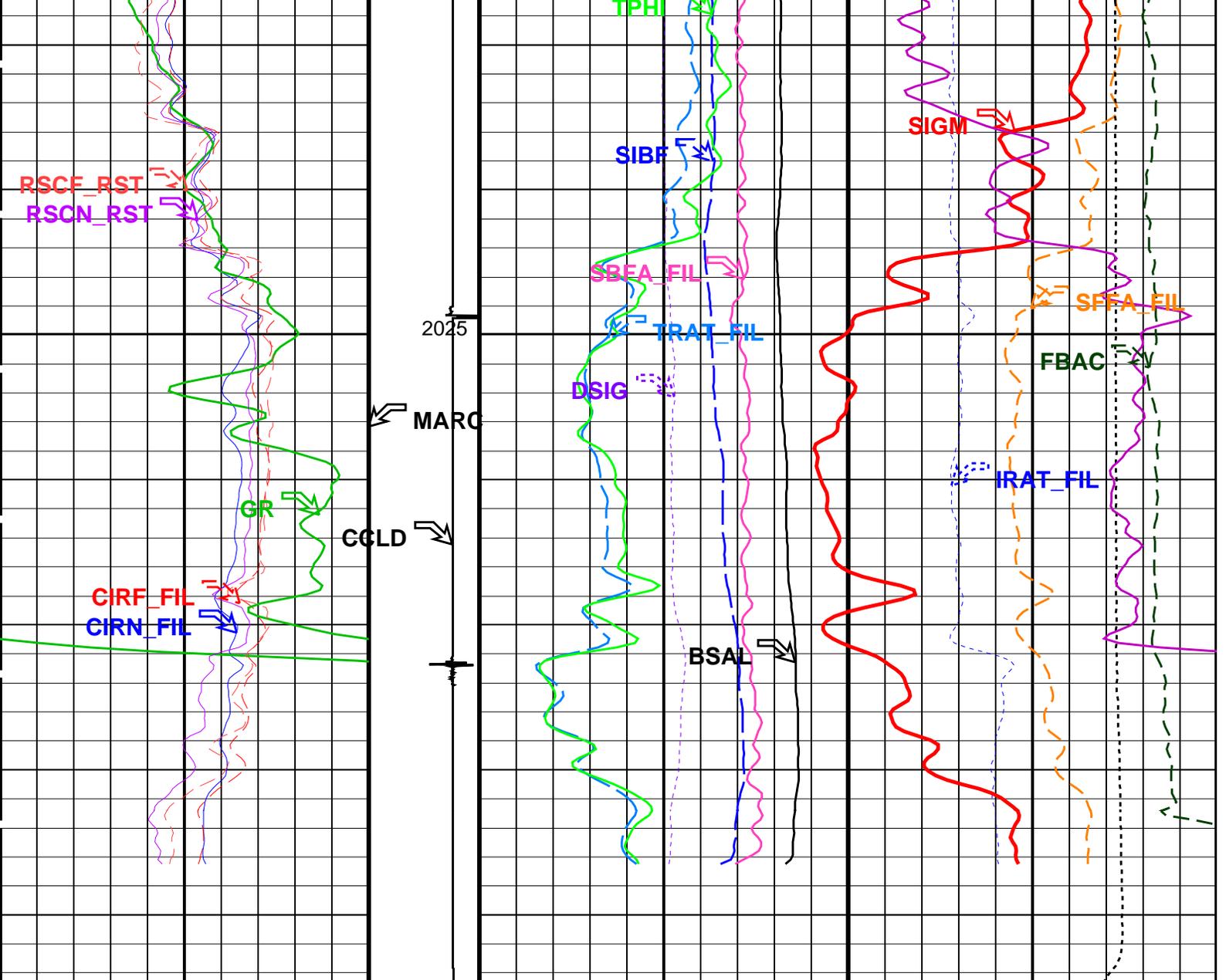
Time Mark Every 60 S

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









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

60

RST Sigma (SIGM)

(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	
SMBMO	RST Sigma Mode Background Minitron Off	No	
TIER_SIGM	RST Sigma Acquisition Mode	0_RST_Sigma	
	PSPT-A/B: Production Services Logging Platform		
BHS	Borehole Status	CASED	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
	System and Miscellaneous		
BS	Bit Size	12.500	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	9.625	IN
CWEI	Casing Weight	40.00	LB/F
DO	Depth Offset for Playback	0.4	M
PP	Playback Processing	NORMAL	

Format: RST\_SIG\_ANSW

Vertical Scale: 1:200

Graphics File Created: 22-Oct-2007 23:08

## OP System Version: 14C0-302

MCM

RST-C 14C0-302 PSPT-A/B 14C0-302

## Input DLIS Files

DEFAULT RST\_PSP\_017LUP FN:16 PRODUCER 22-Oct-2007 22:41 2046.9 M 1903.6 M

## Output DLIS Files

DEFAULT RST\_PSP\_019PUP FN:18 PRODUCER 22-Oct-2007 23:08



RST-C Sigma Pass # 2  
900 ft/hr 2045m to 1915m MDKB

MAXIS Field Log

Company: Esso Australia Pty Ltd.

Well: A-5

## Input DLIS Files

DEFAULT RST\_PSP\_013LUP FN:12 PRODUCER 22-Oct-2007 22:01 2051.2 M 1905.0 M

## Output DLIS Files

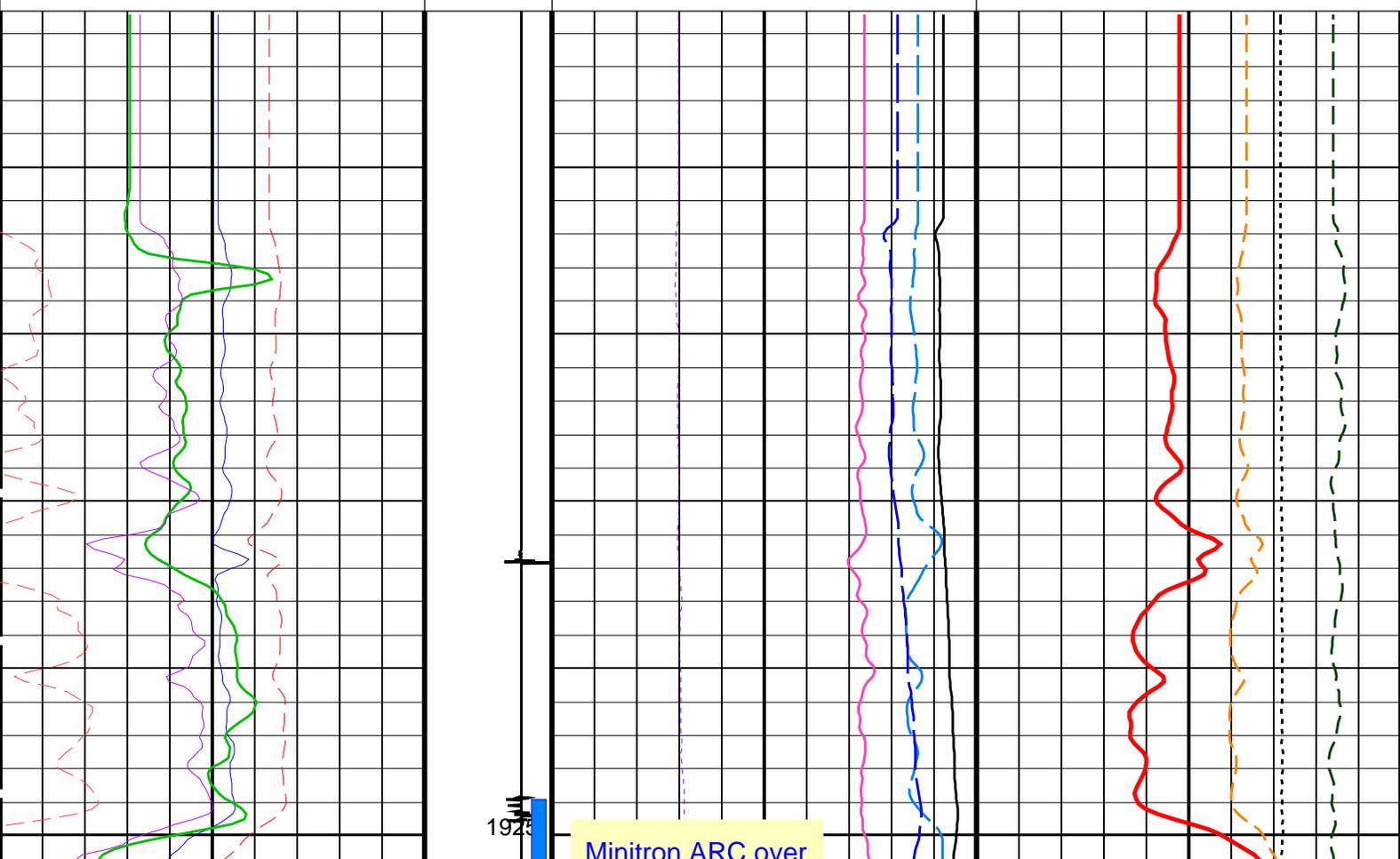
DEFAULT RST\_PSP\_016PUP FN:15 PRODUCER 22-Oct-2007 22:37 2051.5 M 1900.3 M

PIP SUMMARY

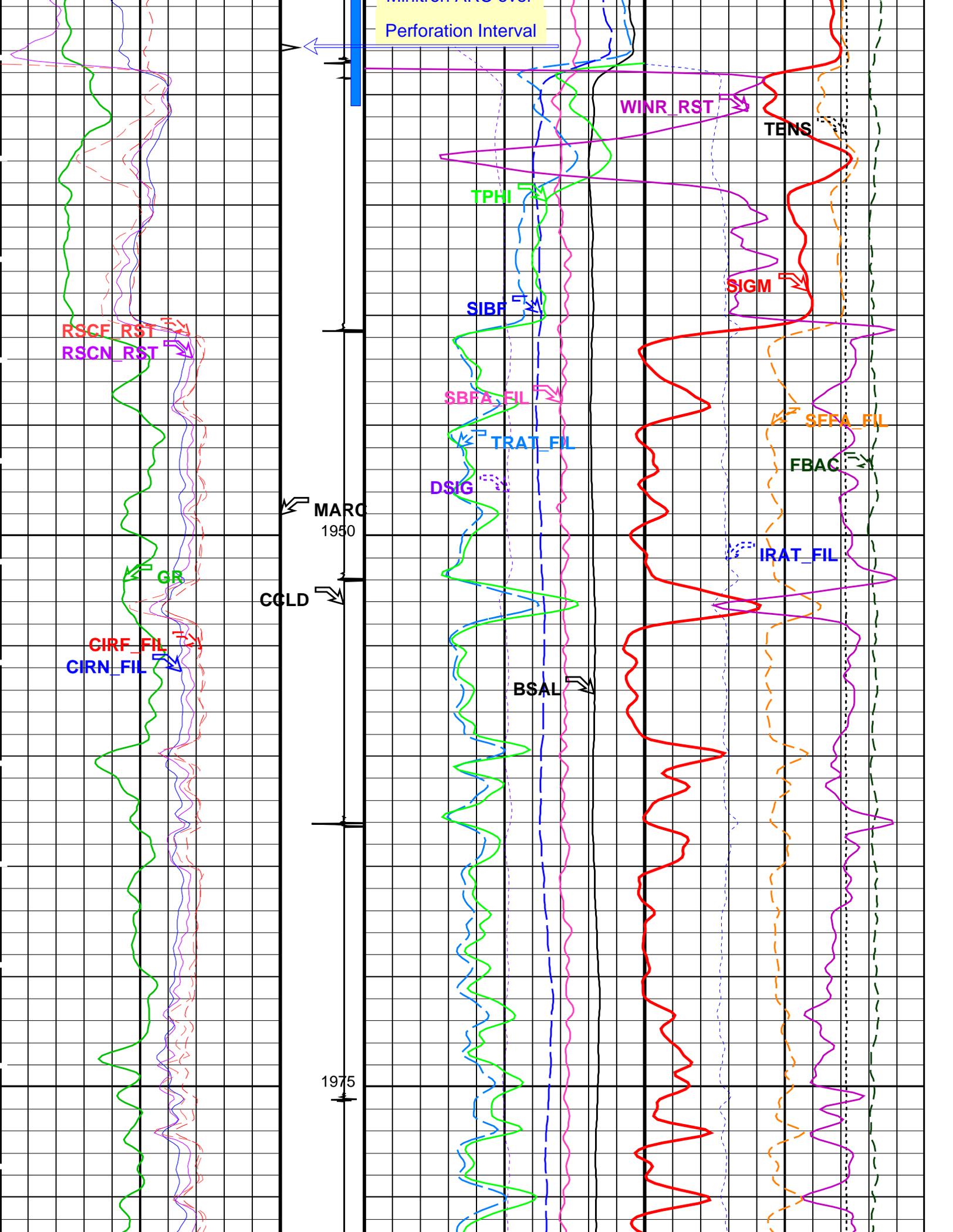
Time Mark Every 60 S

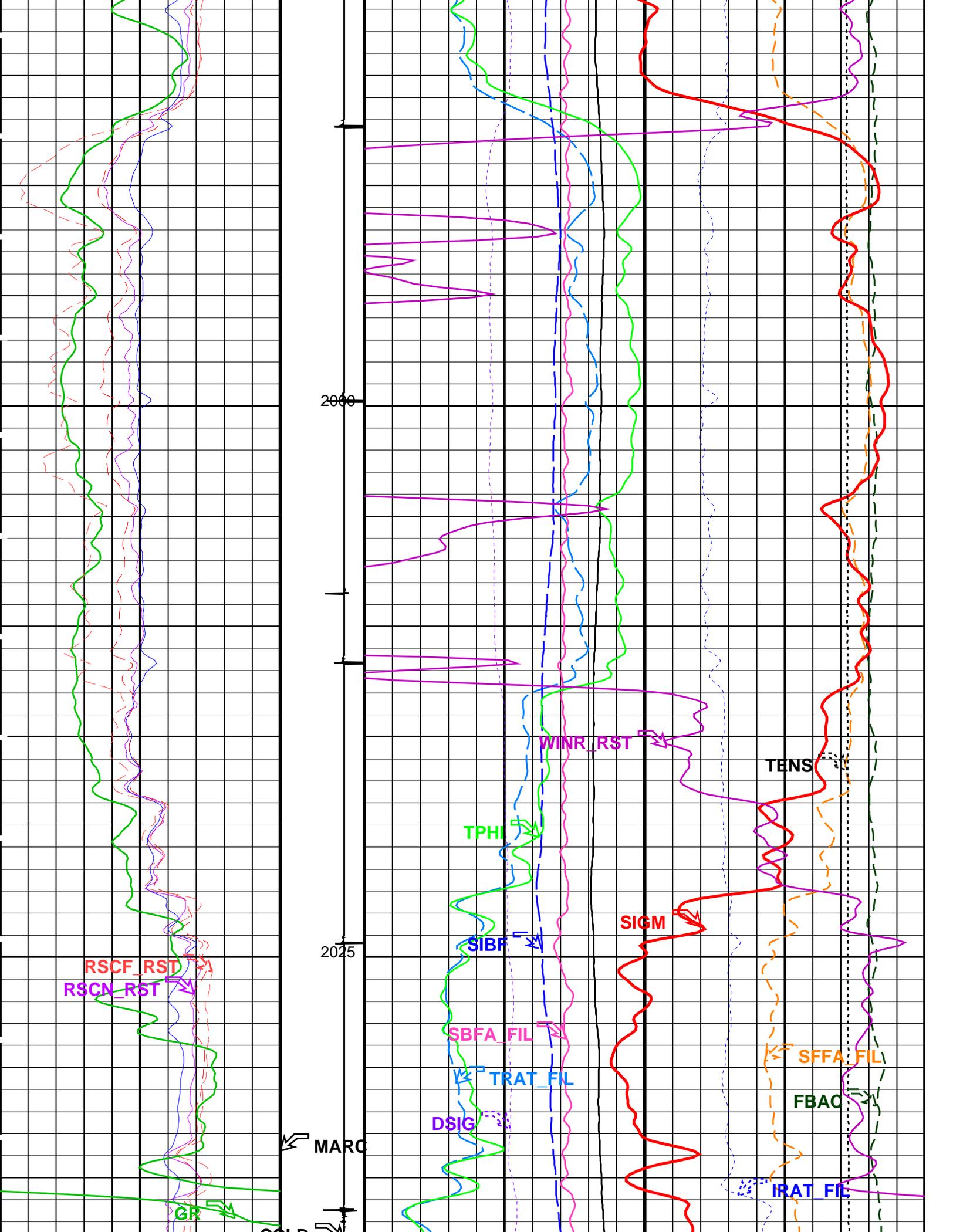
		<b>RST Sigma (SIGM)</b>						
		60	(CU)	0				
		<b>RST Weighted Inelastic Ratio (WINR_RST)</b>						
		0.4	(----	0				
		<b>RST Porosity (TPHI)</b>						
		0.6	(V/V)	0				
<b>RST Far Effective Capture CR (RSCF_RST)</b>		<b>RST Sigma Borehole Fluid (SIBF)</b>						
45	(----	0	100	(CU)	0			
<b>RST Near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

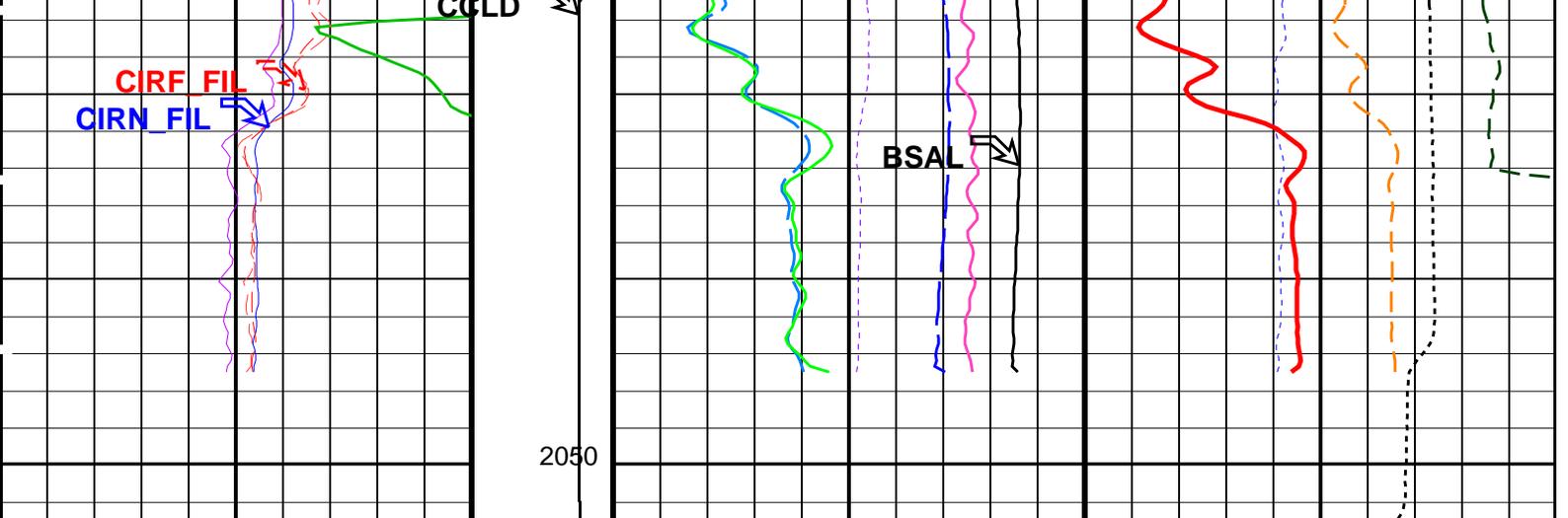
Tension (TENS)  
0 (LBF) 3000



1925 Minitron ARC over







<b>Gamma Ray (GR)</b> (GAPI)	<b>Discriminat</b> <b>ed CCL</b> <b>(CCLD)</b> 3 (V) -1	<b>RST Borehole Salinity (BSAL)</b> (PPK)	<b>RST Inelastic Ratio (IRAT_FIL)</b> (----)
<b>RST Capture to Inelastic Ratio Near</b> <b>(CIRN_FIL)</b>	<b>Minitron</b> <b>Arc</b> <b>Detection</b> <b>(MARC)</b> 0 (---- 5)	<b>RST Sigma Difference (DSIG)</b> (CU)	<b>MCS Far Background (filtered) (FBAC)</b> (CPS)
<b>RST Capture to Inelastic Ratio Far</b> <b>(CIRF_FIL)</b>		<b>RST Capture Ratio (TRAT_FIL)</b> (----)	<b>Sigma Formation Far Apparent (SFFA_</b> <b>FIL)</b> (CU)
<b>RST Near Effective Capture CR (RSCN_</b> <b>RST)</b>		<b>Sigma Borehole Far Apparent (SBFA_</b> <b>FIL)</b> (CU)	<b>Tension (TENS)</b> (LBF)
<b>RST Far Effective Capture CR (RSCF_</b> <b>RST)</b>		<b>RST Sigma Borehole Fluid (SIBF)</b> (CU)	
		<b>RST Porosity (TPHI)</b> (V/V)	
		<b>RST Weighted Inelastic Ratio (WINR_RST)</b> (----)	
		<b>RST Sigma (SIGM)</b> (CU)	

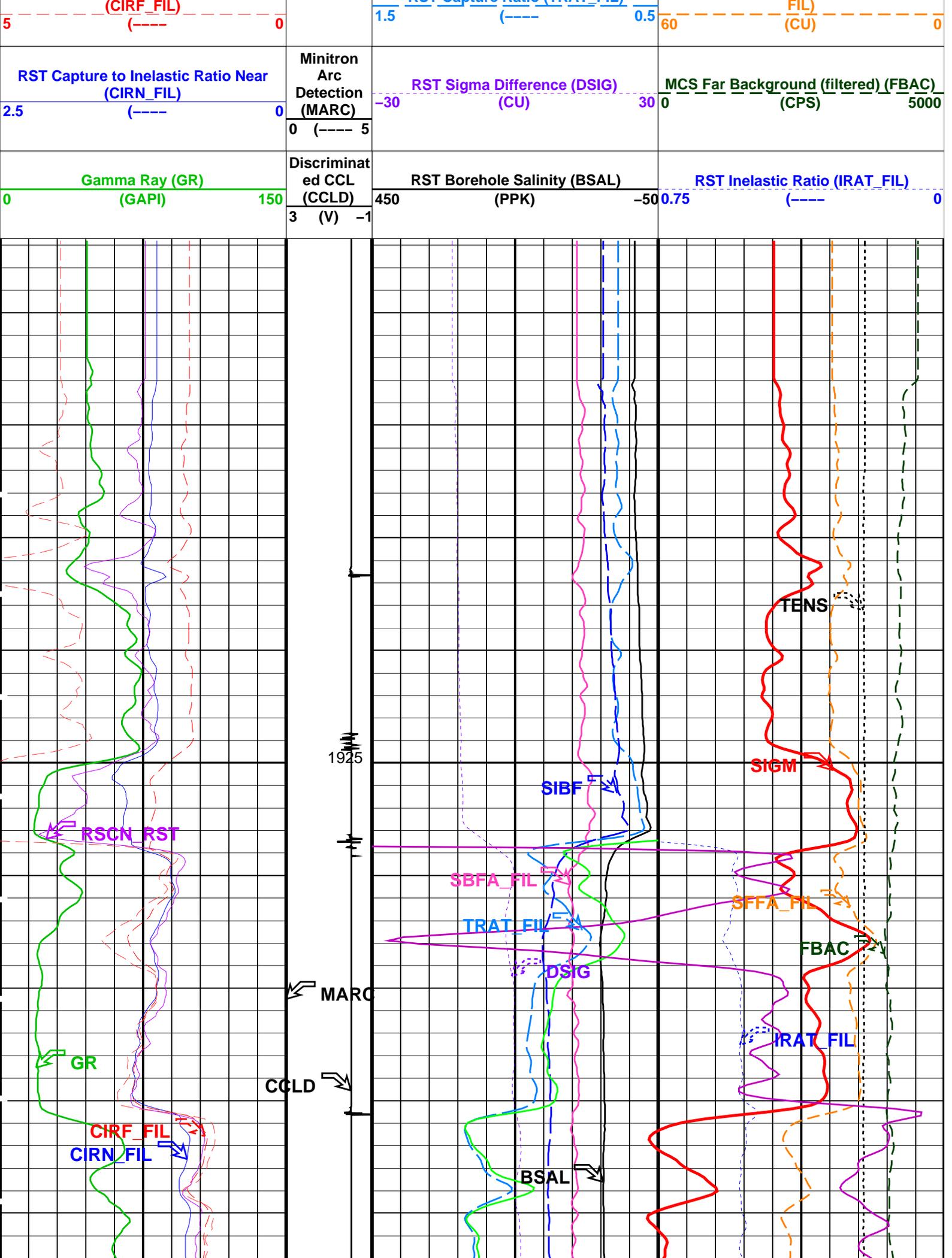
PIP SUMMARY

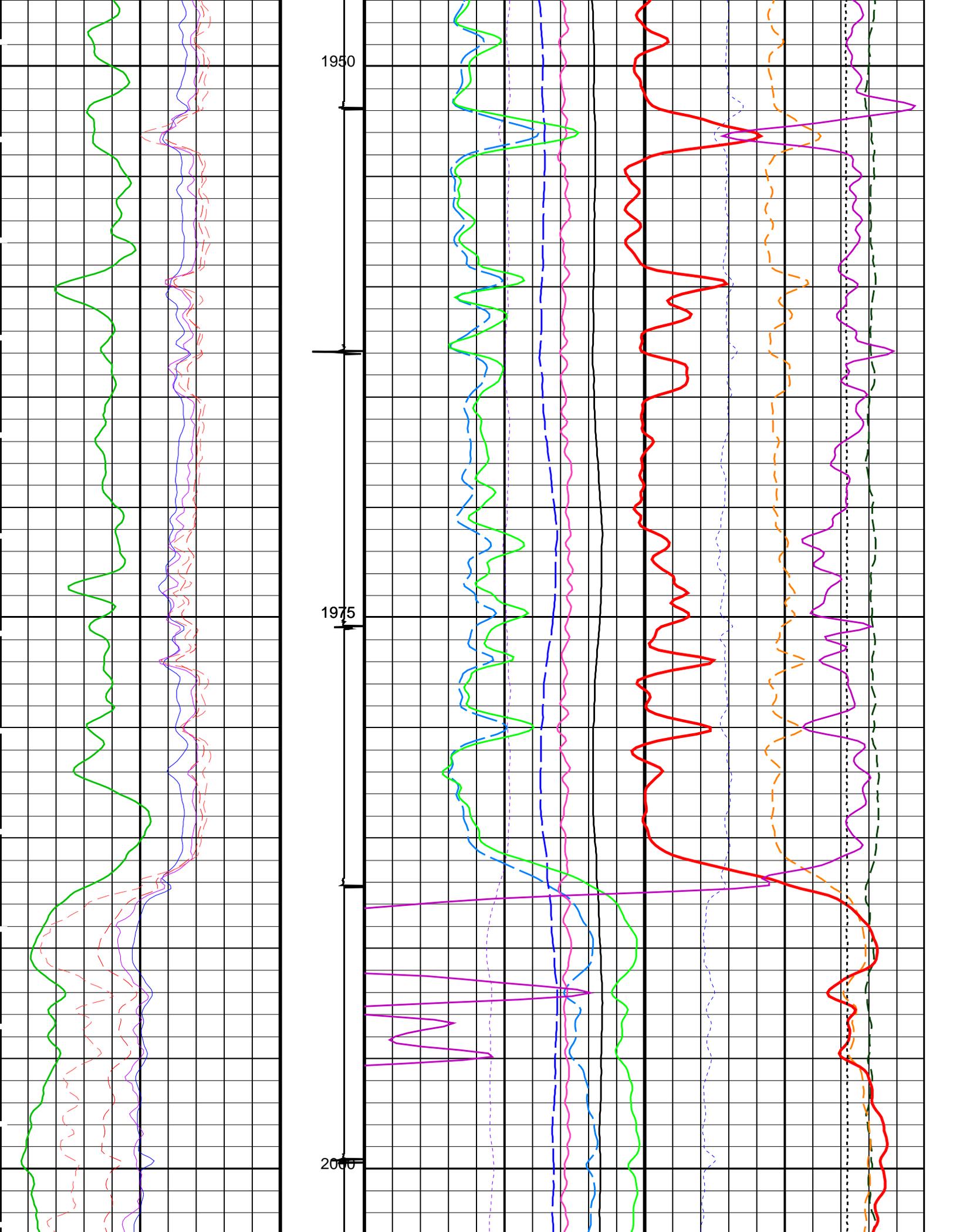
Time Mark Every 60 S

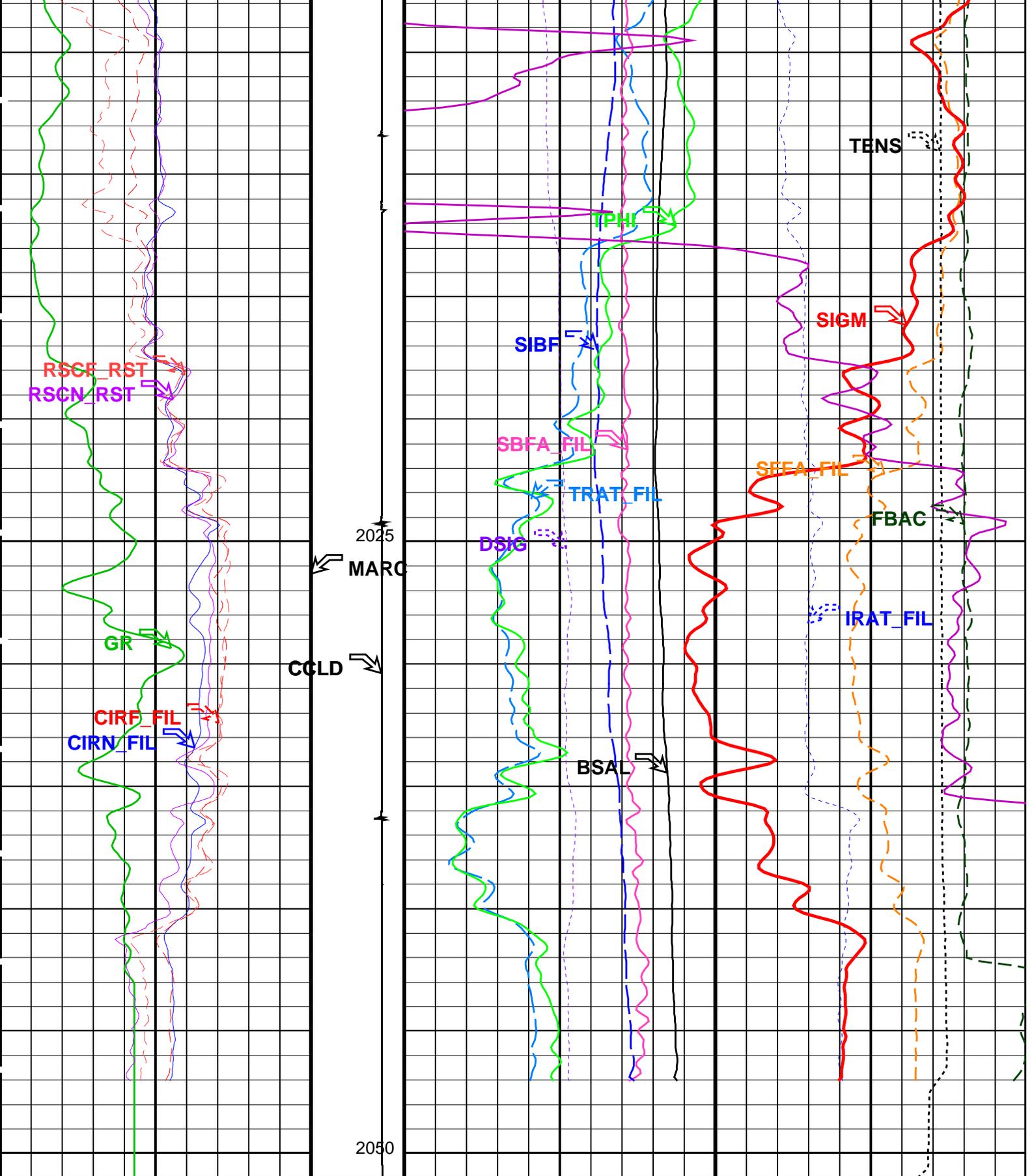
Parameters

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
SMBMO	RST Sigma Mode Background Minitron Off	No
TIER_SIGM	RST Sigma Acquisition Mode	0_RST_Sigma
PSPT-A/B: Production Services Logging Platform		
BHS	Borehole Status	CASED
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE
System and Miscellaneous		









<p><b>Gamma Ray (GR)</b> (GAPI)</p> <p>0 150</p>	<p><b>Discriminat ed CCL (CCLD)</b> (V)</p> <p>3 -1</p>	<p><b>RST Borehole Salinity (BSAL)</b> (PPK)</p> <p>450 -50</p>	<p><b>RST Inelastic Ratio (IRAT_FIL)</b> (----)</p> <p>0.75 0</p>
<p><b>RST Capture to Inelastic Ratio Near (CIRN_FIL)</b> (----)</p> <p>2.5 0</p>	<p><b>Minitron Arc Detection (MARC)</b> (----)</p> <p>0 5</p>	<p><b>RST Sigma Difference (DSIG)</b> (CU)</p> <p>-30 30</p>	<p><b>MCS Far Background (filtered) (FBAC)</b> (CPS)</p> <p>0 5000</p>

<b>RST Capture to Inelastic Ratio Far (CIRF_FIL)</b> 5 (----) 0	<b>RST Capture Ratio (TRAT_FIL)</b> 1.5 (----) 0.5	<b>Sigma Formation Far Apparent (SFFA_FIL)</b> 60 (CU) 0
<b>RST Near Effective Capture CR (RSCN_RST)</b> 45 (----) 0	<b>Sigma Borehole Far Apparent (SBFA_FIL)</b> 150 (CU) 0	<b>Tension (TENS)</b> 0 (LBF) 3000
<b>RST Far Effective Capture CR (RSCF_RST)</b> 45 (----) 0	<b>RST Sigma Borehole Fluid (SIBF)</b> 100 (CU) 0	
	<b>RST Porosity (TPHI)</b> 0.6 (V/V) 0	
	<b>RST Weighted Inelastic Ratio (WINR_RST)</b> 0.4 (----) 0	
	<b>RST Sigma (SIGM)</b> 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
SMBMO	RST Sigma Mode Background Minitron Off	No
TIER_SIGM	RST Sigma Acquisition Mode	0_RST_Sigma
PSPT-A/B: Production Services Logging Platform		
BHS	Borehole Status	CASED
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE
System and Miscellaneous		
BS	Bit Size	12.500 IN
BSAL	Borehole Salinity	-50000.00 PPM
CSIZ	Current Casing Size	9.625 IN
CWEI	Casing Weight	40.00 LB/F
DO	Depth Offset for Playback	-0.5 M
PP	Playback Processing	NORMAL

Format: RST\_SIG\_ANSW

Vertical Scale: 1:200

Graphics File Created: 22-Oct-2007 22:34

OP System Version: 14C0-302

MCM

RST-C 14C0-302 PSPT-A/B 14C0-302

Input DLIS Files

DEFAULT RST\_PSP\_012LUP FN:11 PRODUCER 22-Oct-2007 21:21 2051.5 M 1907.1 M

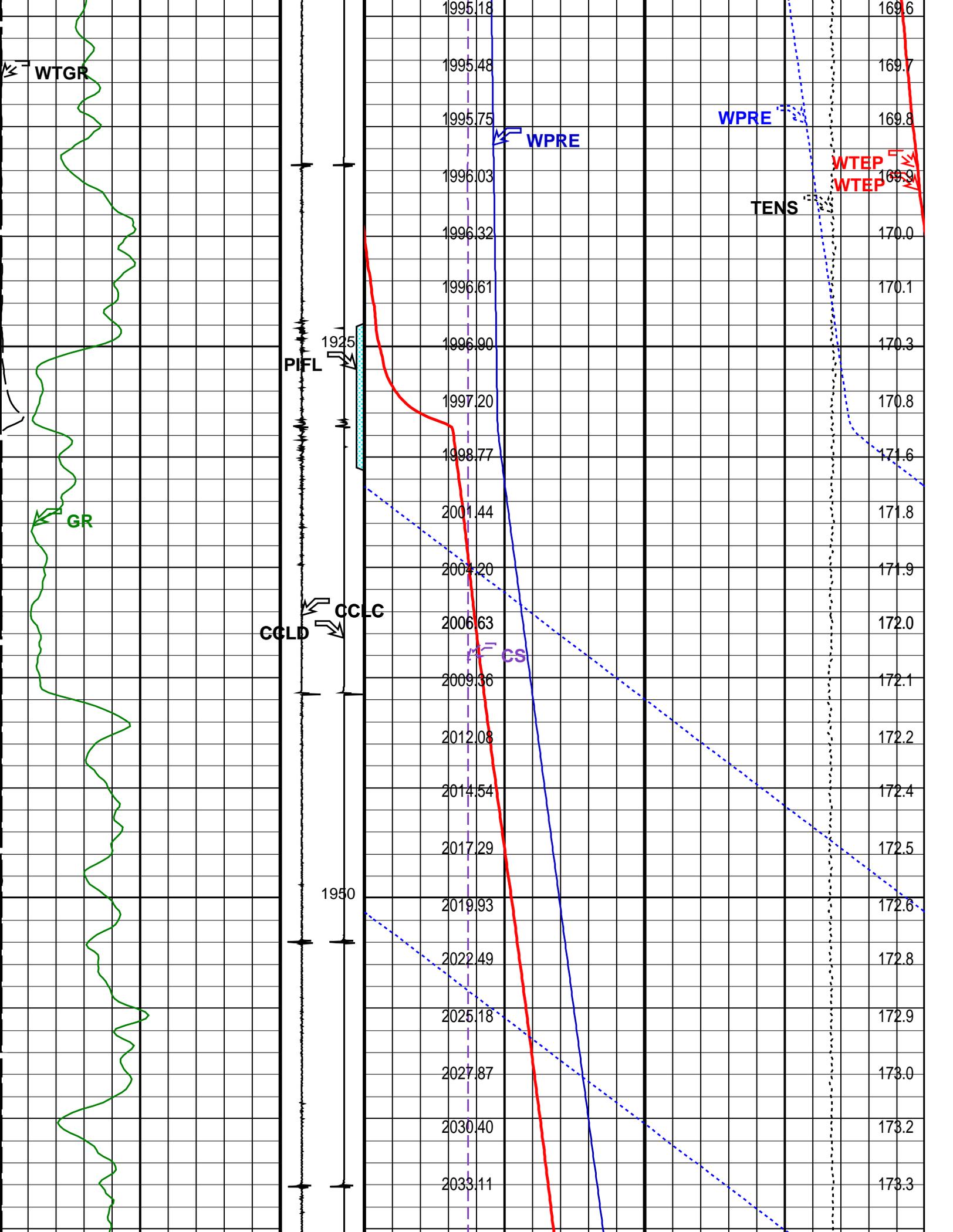
Output DLIS Files

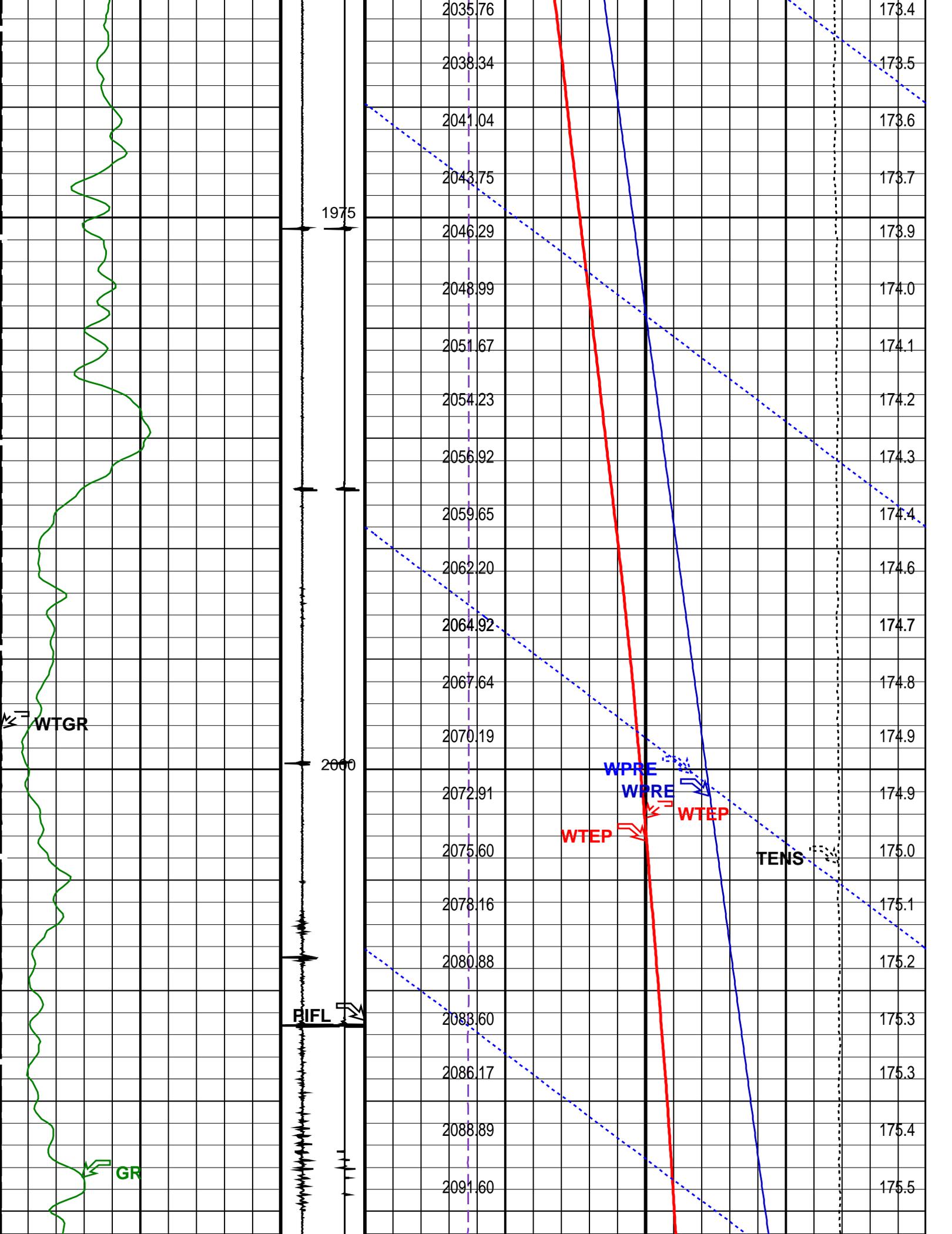
DEFAULT RST\_PSP\_014PUP FN:13 PRODUCER 22-Oct-2007 22:34

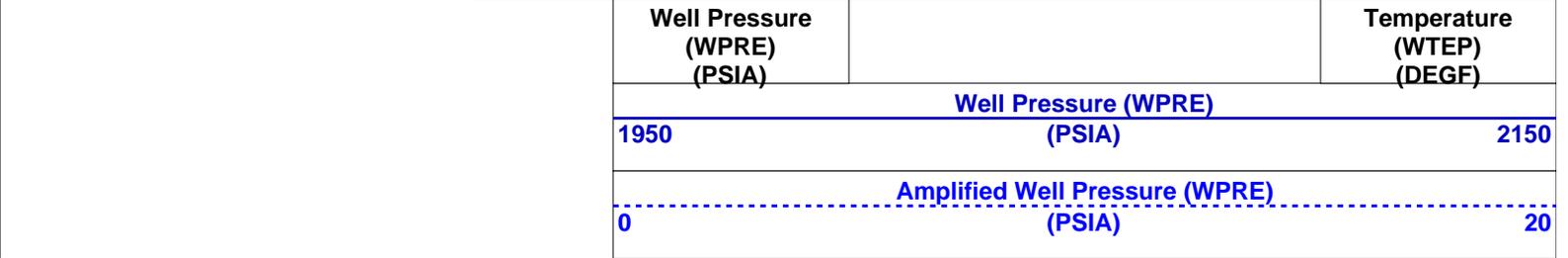
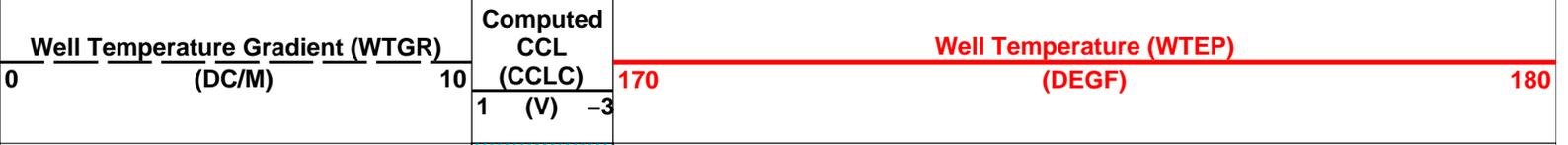
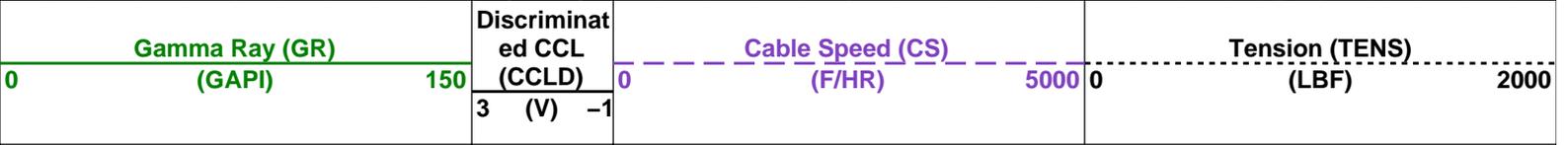
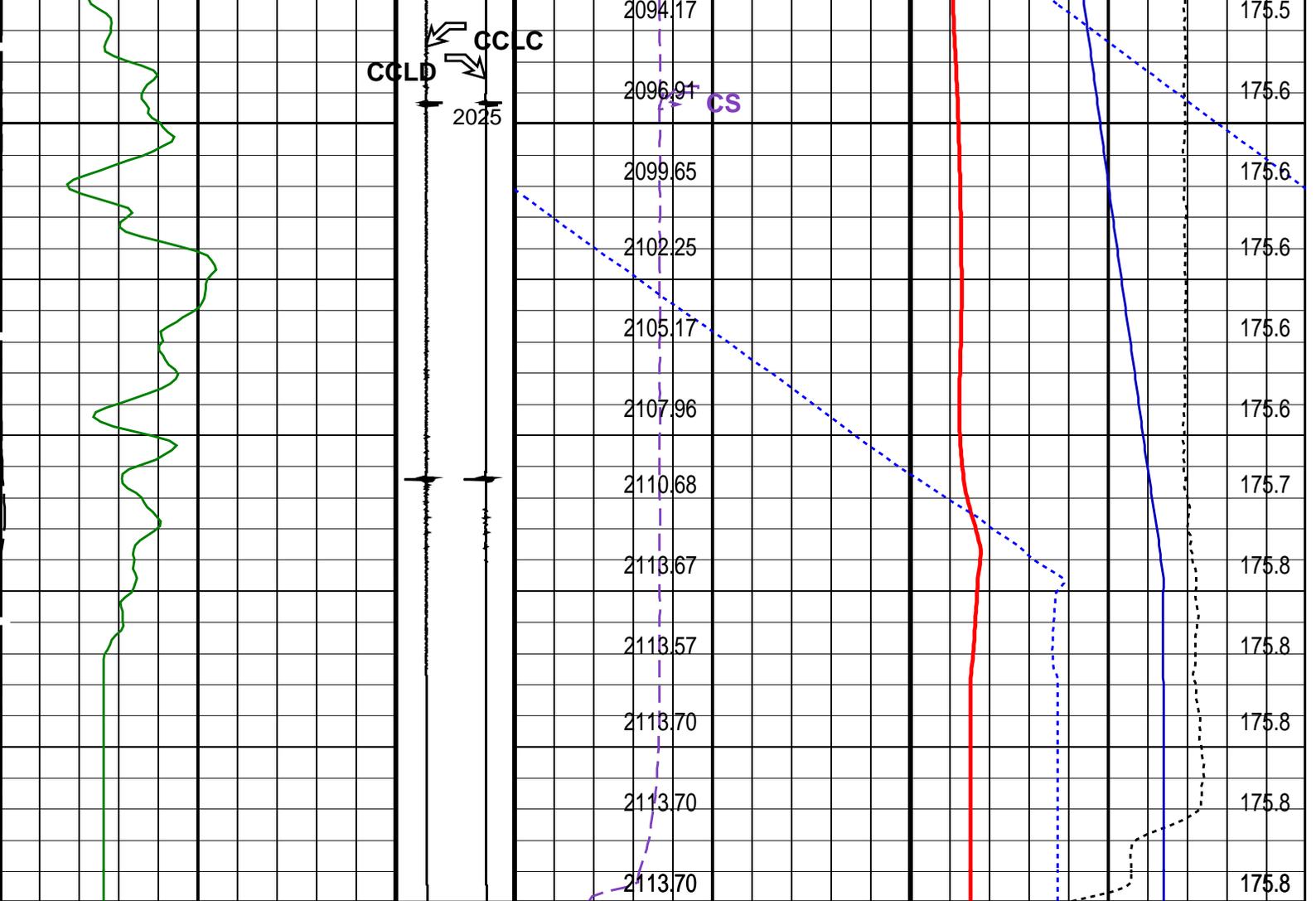


Gamma-Ray Pass









**PIP SUMMARY**

Time Mark Every 60 S  
 Format: PSP\_1    Vertical Scale: 1:200    Graphics File Created: 22-Oct-2007 21:11

**OP System Version: 14C0-302**  
MCM

**Parameters**

<b>DLIS Name</b>	<b>Description</b>	<b>Value</b>
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DO PP	System and Miscellaneous Depth Offset for Playback Playback Processing	-0.5 M NORMAL
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**Input DLIS Files**

DEFAULT	RST_PSP_008LUP	FN:7	PRODUCER	22-Oct-2007 20:35	2050.4 M	1898.9 M
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**Output DLIS Files**

DEFAULT	RST_PSP_011PUP	FN:10	PRODUCER	22-Oct-2007 21:11
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Company: **Esso Australia Pty Ltd.**

**Schlumberger**

Well: **A-5**  
Field: **Marlin**  
Rig: **Prod 4 / Crane**  
Country: **Australia**

RST-C  
Sigma  
Survey