Schlumberger

Company: **Santos Ltd./Strike Oil**

12.25 in. Section

Well: **Casino−2**

Field: **VIC/P 44**

Rig: **Ocean Bounty** State: **Victoria**

Rig: Ocean Bounty
Field: VIC/P 44
Location: Otway Basin
Well: Casino−2
Company: Santos Ltd./Strike Oil

ISONIC
Measured Depth 1:500
Recorded Mode

Location

Total depth:	2112.0 m
Spud date:	24 Sep 02
Runs:	1 To 3

Elevation

K.B.	Top Drive m
G.L.	− 68 m
D.F.	25 m

Permanent datum:	LAT	Elev.:	0.0 m
Log measured from:	Drill Floor	25 m	above Perm. datum
Depth reference:	Driller's Depth		

API serial no.	X = 651 752.63 mE	Longitude	Latitude
	Y = 5 704 463.79 mN	142°44'50.746" E	38°47'43.887" S

Depth logged: 690.5 m To 2106.9 m	Mag decl: 10.89 deg.	Other services:
Date logged: 27 Sep 02 To 04 Oct 02	Mag dip: −70.02 deg.	MWD Survey, IWW

Bore hole record

Hole size	from	to
914 mm/36 in.	Seabed	140.0 m
445 mm/17.5 in.	140.0 m	700.0 m
311 mm/12.25 in.	700.0 m	2112.0 m

Casing record

Size	Density	from	to
762 mm	461 kg/m	Wellhead	137.0 m
340 mm	101 kg/m	Wellhead	690.55 m

Mud record

Type	from	to
Seawater	Seabed	700.0 m
KCl/PHPA/Glyc	700.0 m	2112.0 m

Borehole deviation record

Min	Max	from	to
0 deg.	0.56 deg.	Seabed	729.0 m
0.56 deg.	2.47 deg.	729.0 m	2112.0 m

Surface equipment		Software record			
Unit	OLU−JC902	IDEAL Wis	id7_0C_02		
Depth system	Geoograph, GTE	SPM	id7_2c_09		
		LWD	6.0B12		
		MWD	6.1C00		

Bit Run Summary

Run number		1	2	3
Bit size	in.	12.25	12.25	12.25
Bit start depth	m	700.00	1646.0	1763.0
Bit end depth	m	1646.00	1763.0	2112.0
Top interval logged	m	690.55	1640.95	1757.97
Bottom interval logged	m	1640.95	1757.97	2106.9
Begin log: time		22:30	23:31	22:00
Begin log: date		27 Sep 02	30 Sep 02	02 Oct 02
End log: time		21:10	10:30	10:30
End log: date		30 Sep 02	01 Oct 02	04 Oct 02
Mud data				
Depth	m	1646	1763	2112
Type		KCl/PHPA/Gly	KCl/PHPA/Gly	KCl/PHPA/Gly
Mud weight	ppg	10.0	10.1	10.3
Solids	%	10.0	10.4	10.8
Chlorides	mg/L	23000	31000	31500
Rm	ohmm@degC	0.188@24	0.132@24	0.146@22
Rmf	ohmm@degC	0.138@24	0.129@23	0.128@23
Rmc	ohmm@degC	0.252@24	0.232@24	0.242@23

Potassium	mg/L	27000	32000	32400							
Environmental data											
GR											
Mud weight	ppg	10.0	10.1	10.3							
Bit size	in.	12.25	12.25	12.25							
Resistivity											
Neutron porosity											
Hole Size	in.	12.25	12.25	12.25							
Mud weight	ppg	10.0	10.1	10.3							
Borehole Temperature	degC	53.0	55.0	70.0							
Mud salinity	n/a	n/a	n/a	n/a							
Formation salinity	n/a	n/a	n/a	n/a							
Recording rate 1	SEC	10	10	10	GR / Res						
Recording rate 2	SEC	10	10	10	Sonic Array						
Filtering GR		3 pt	3 pt	3 pt							
Filtering density		n/a	n/a	n/a							
Filtering Neutron		n/a	n/a	n/a							
Company representative		R. King	G. Othen	S. Hodgetts	R. Subramanian	M. D'Cruz					
Anadrill personnel		A. Abad	C.Tue								

DISCLAIMER

THE USE OF AND RELIANCE UPON THIS RECORDED−DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED−DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED−DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED−DATA.

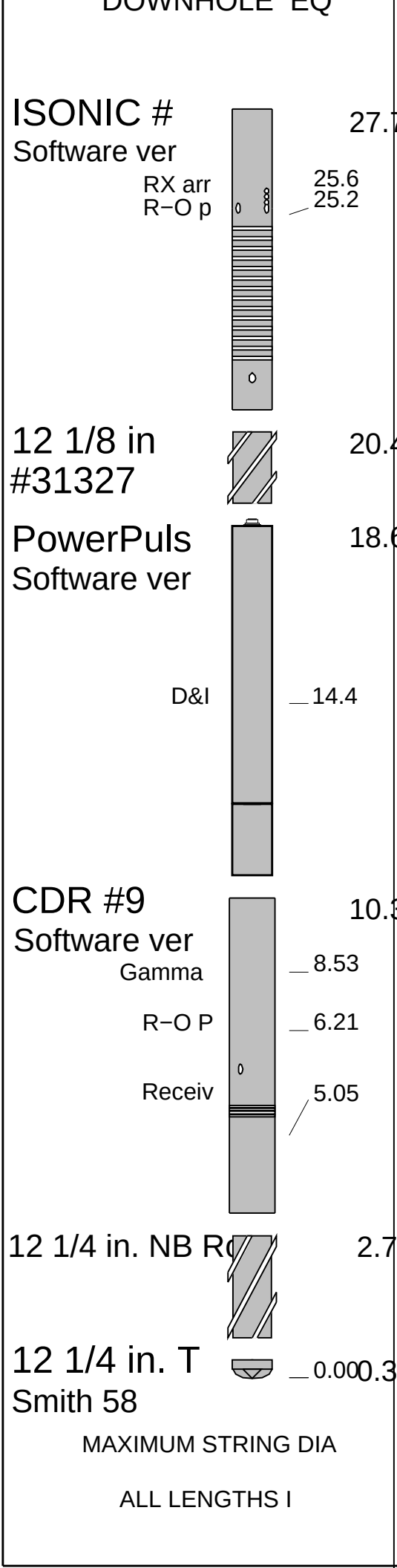
OTHER SERVICES FOR RUN1	OTHER SERVICES FOR RUN2	OTHER SERVICES FOR RUN3
MWD Surveys Interact Web Witness (IWW)	MWD Surveys Interact Web Witness (IWW)	MWD Surveys Interact Web Witness (IWW)

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2	REMARKS: RUN NUMBER 3
CDR gamma ray is corrected for mud weight, bit size and tool size, but not environmentally corrected for potassium content in mud. CDR resitivity is bore hole compensated but not environmentally corrected. ISONIC measurements are borehole compensated, but not environmentally corrected. Depth is Driller's Depth. Sensor offsets are described in Toolskech. ISONIC data quality was affected by high rate of penetrations, shocks and vibrations while drilling from 700 meters to 900 meters. POOH to change bit. Run TD: 1646 meters	CDR gamma ray is corrected for mud weight, bit size and tool size, but not environmentally corrected for potassium content in mud. CDR resitivity is bore hole compensated but not environmentally corrected. ISONIC measurements are borehole compensated, but not environmentally corrected. Depth is Driller's Depth. Sensor offsets are described in Toolskech. MWD Realtime transmission failure in this bit run from 1696.0 meters to run TD but did not affect the recorded data form CDR and ISONIC tool. POOH to change bit and laid down CDR and PowerPulse MWD tool. Run TD: 1763 meters	ARC gamma ray is corrected for mud weight, bit size and tool size and environmentally corrected for potassium content in mud. ARC resitivity is bore hole compensated but not environmentally corrected. ISONIC measurements are borehole compensated, but not environmentally corrected. Depth is Driller's Depth. Sensor offsets are described in Toolskech. ARC tool was pick−up due to the fact that it was set−up to run with the back−up MWD tool. ISONIC array log quality appear spiky when drilling sandstone formations interbedded with siltstones. The ISONIC array response was consistent throughout the entire run reflecting every change in formation. This run resulted to well TD at 2112 meters.

EQUIPMENT DESCRIPTION

RUN1	RUN2	RUN3

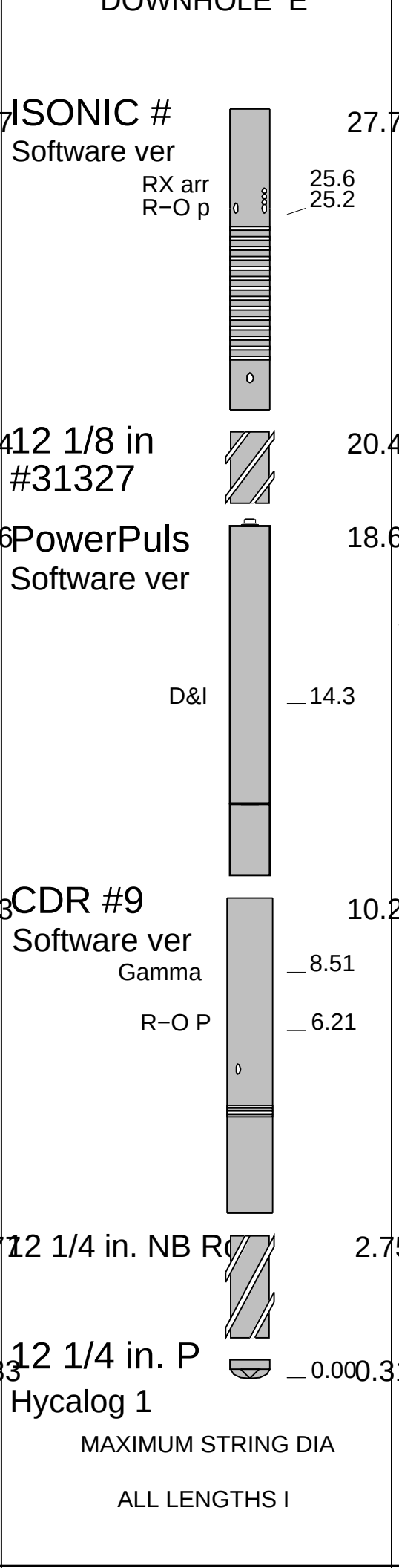
DOWNHOLE EQ



MAXIMUM STRING DIA

ALL LENGTHS I

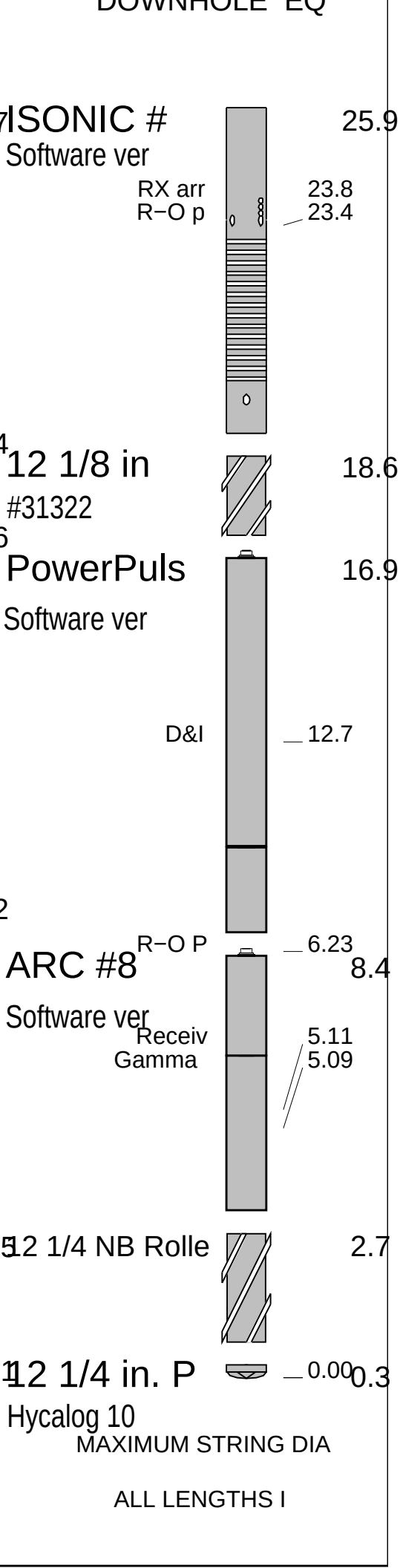
DOWNHOLE E



MAXIMUM STRING DIA

ALL LENGTHS I

DOWNHOLE EQ



MAXIMUM STRING DIA

ALL LENGTHS I

IDEAL Version: ID7_0C_02

IDF

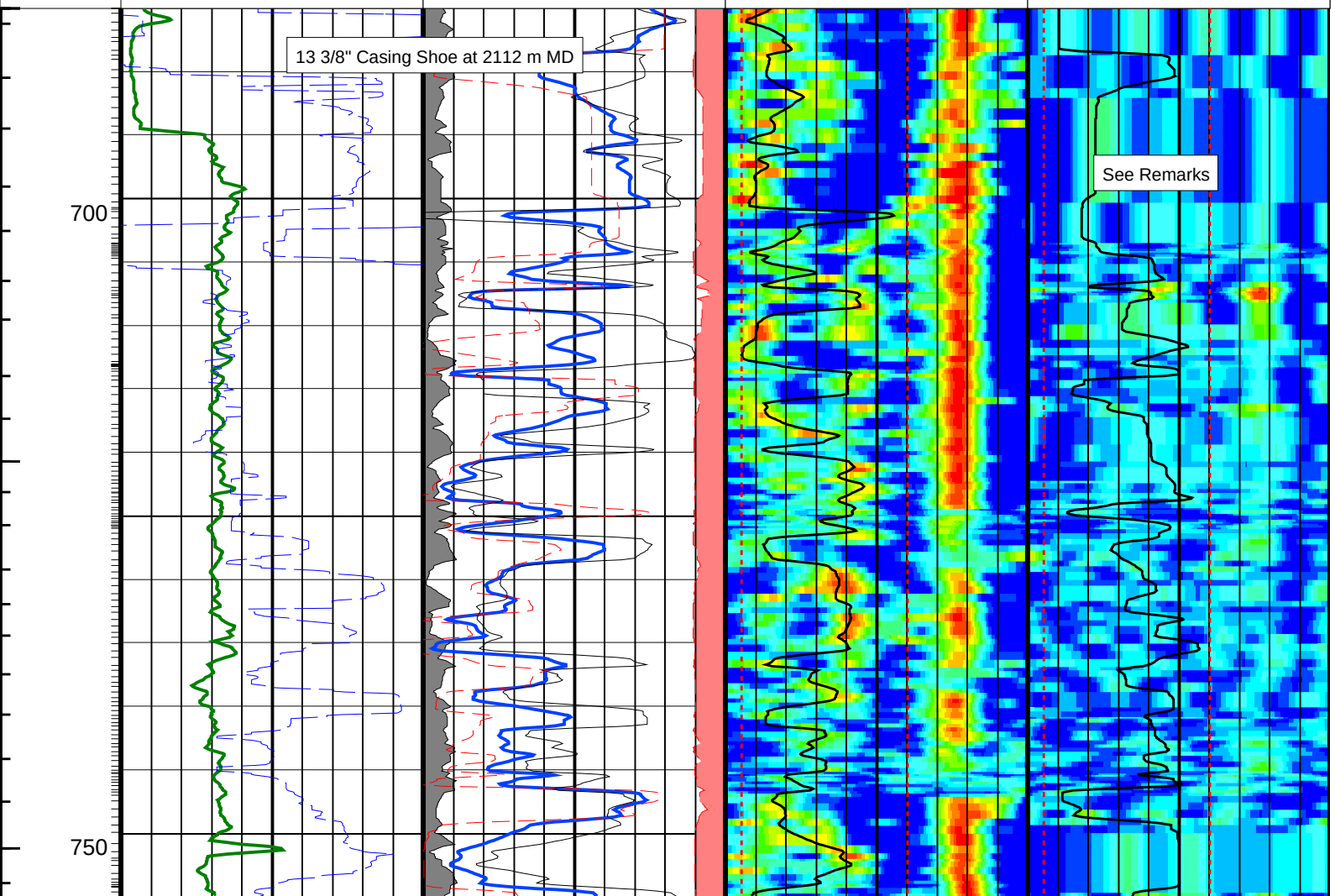
MWD_10 IDEAL Version: ID7_0C_02 SON825 IDEAL Version: ID7_0C_02

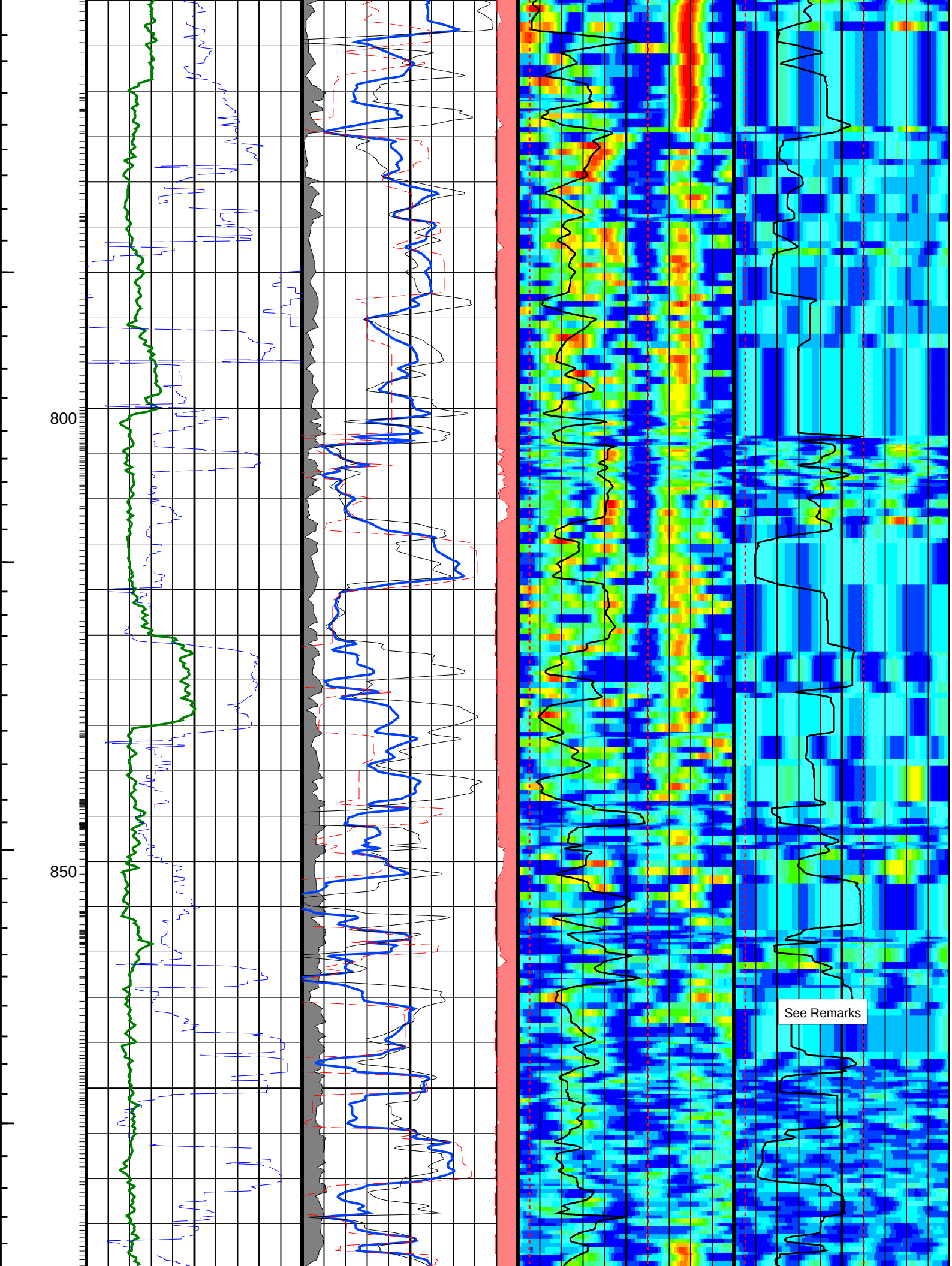
Format: ISONIC_BHC_Log Vertical Scale: 1:500 Graphics File Created: 09−Oct−2002 15:52

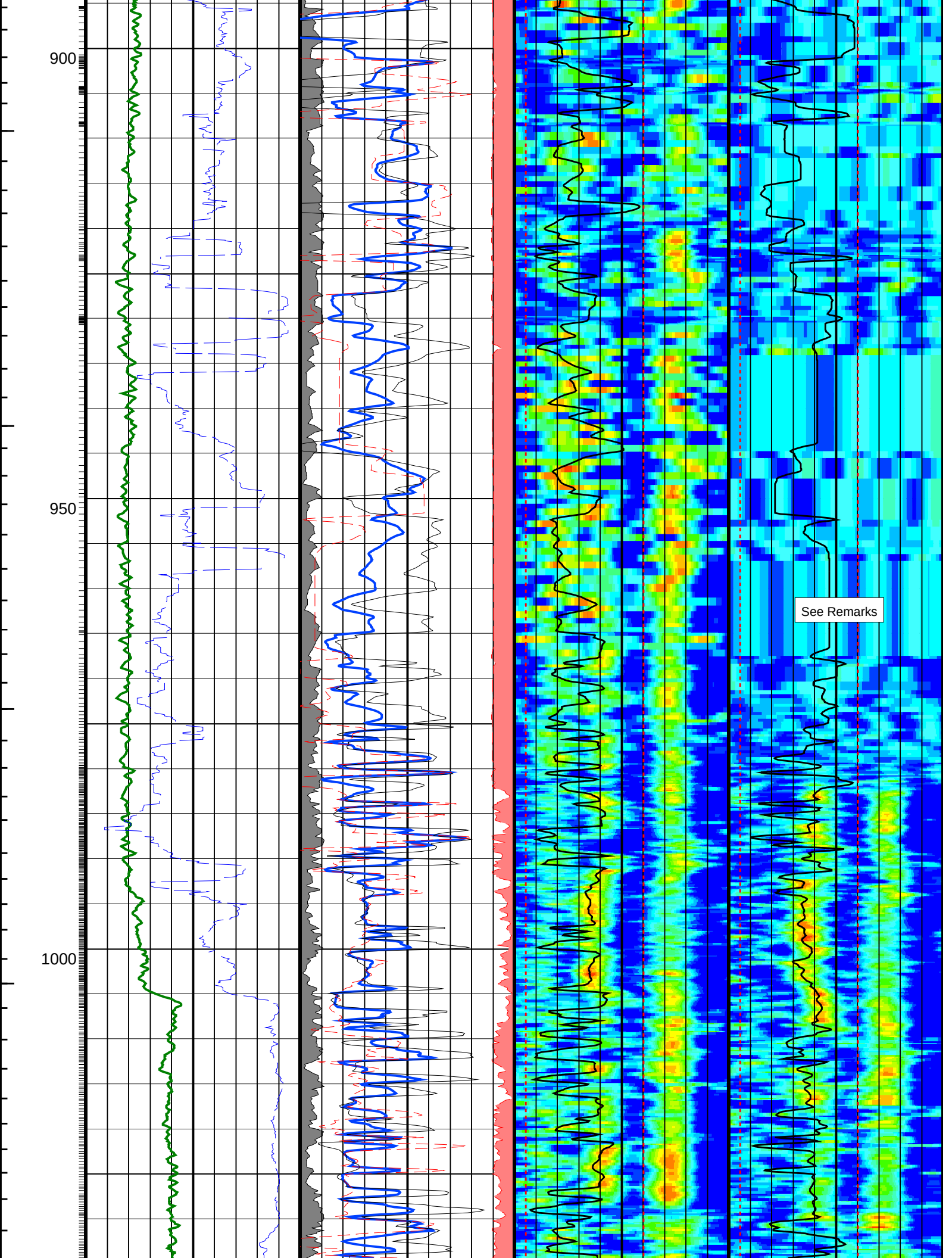
PIP SUMMARY

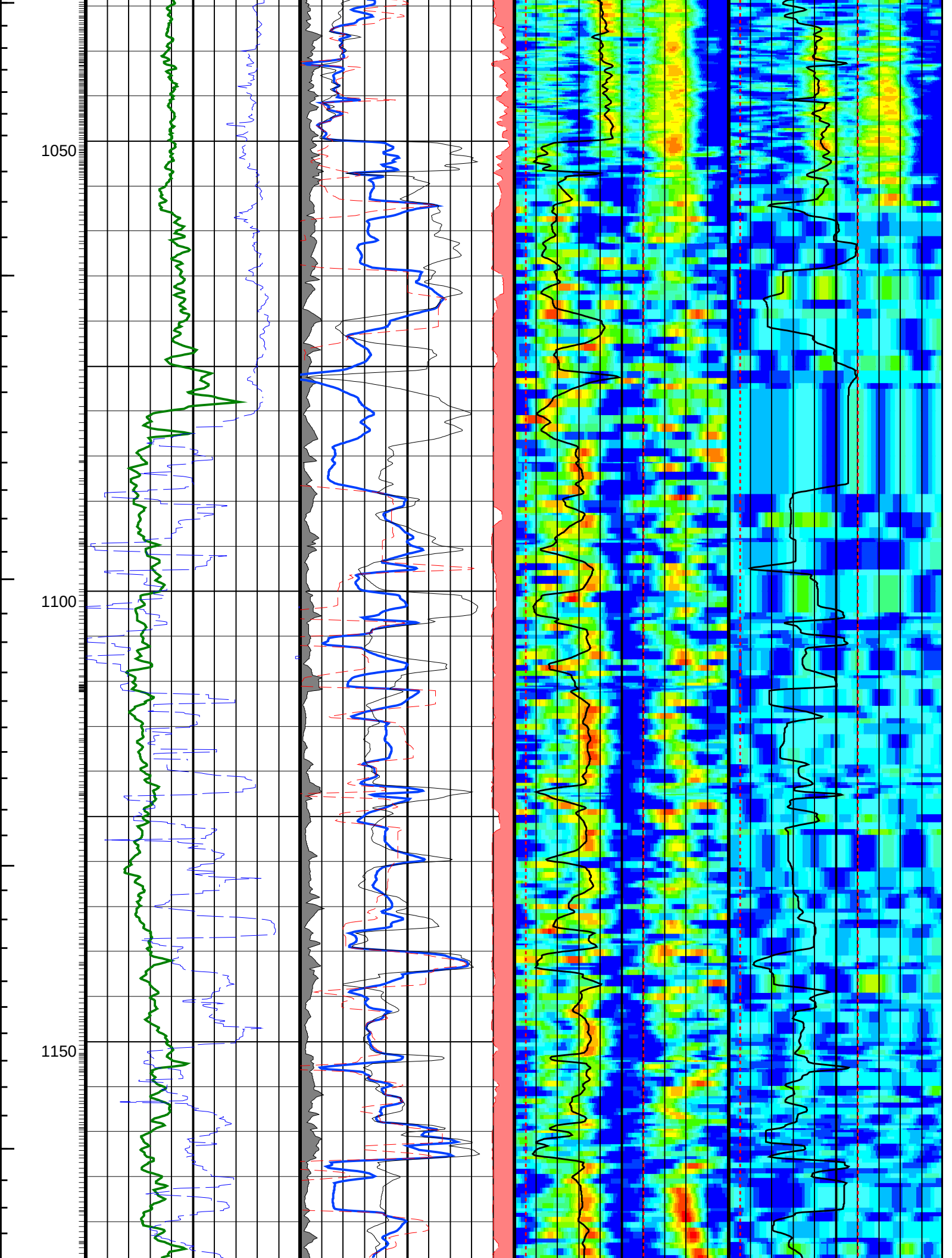
ISONIC Integrated Transit Time Every 1 MS
ISONIC Integrated Transit Time Every 10 MS
ISONIC Samples

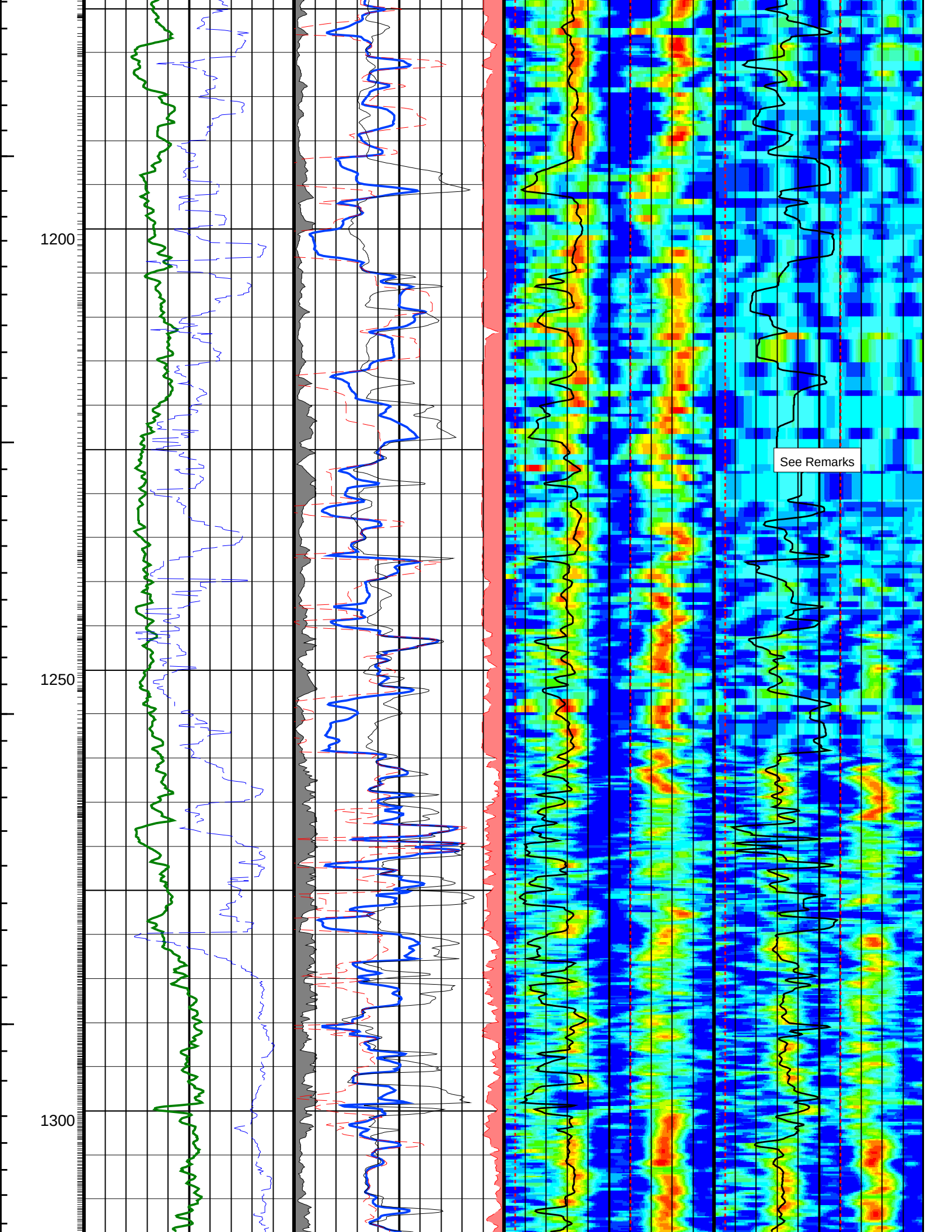
	Delta−T Compressional Borehole Compensated (Depth Derived) (DTBC) 140 (US/F) 40		
	Coherence at Compressional Peak for the Transmitter Array (CHTA) −4 (−−−− 1	Min Amplitude Max 0 RCVR Projection (STRA) 1 40 (US/F) 240	Min Amplitude Max 0 TRSM Projection (STTA) 1 40 (US/F) 240
Rate of Penetration, Averaged over Last 5ft (ROP5_RM) 200 (M/HR) 0	Coherence at Compressional Peak for the Receiver Array (CHRA) 1 (−−−− −4	Maximum Labeling Slowness, Compressional (MXSL) 40 (US/F) 240	Maximum Labeling Slowness, Compressional (MXSL) 40 (US/F) 240
CDR Gamma Ray (GR_CDR) 0 (GAPI) 200	Delta−T Compressional from Transmitter Array (DTTA) 140 (US/F) 40	Minimum Labeling Slowness, Compressional (MNSL) 40 (US/F) 240	Minimum Labeling Slowness, Compressional (MNSL) 40 (US/F) 240
ARC Gamma Ray (GR_ARC) 0 (GAPI) 200	Delta−T Compressional from Receiver Array (DTRA) 140 (US/F) 40	Delta−T Compressional from Receiver Array (DTRA) 40 (US/F) 240	Delta−T Compressional from Transmitter Array (DTTA) 40 (US/F) 240

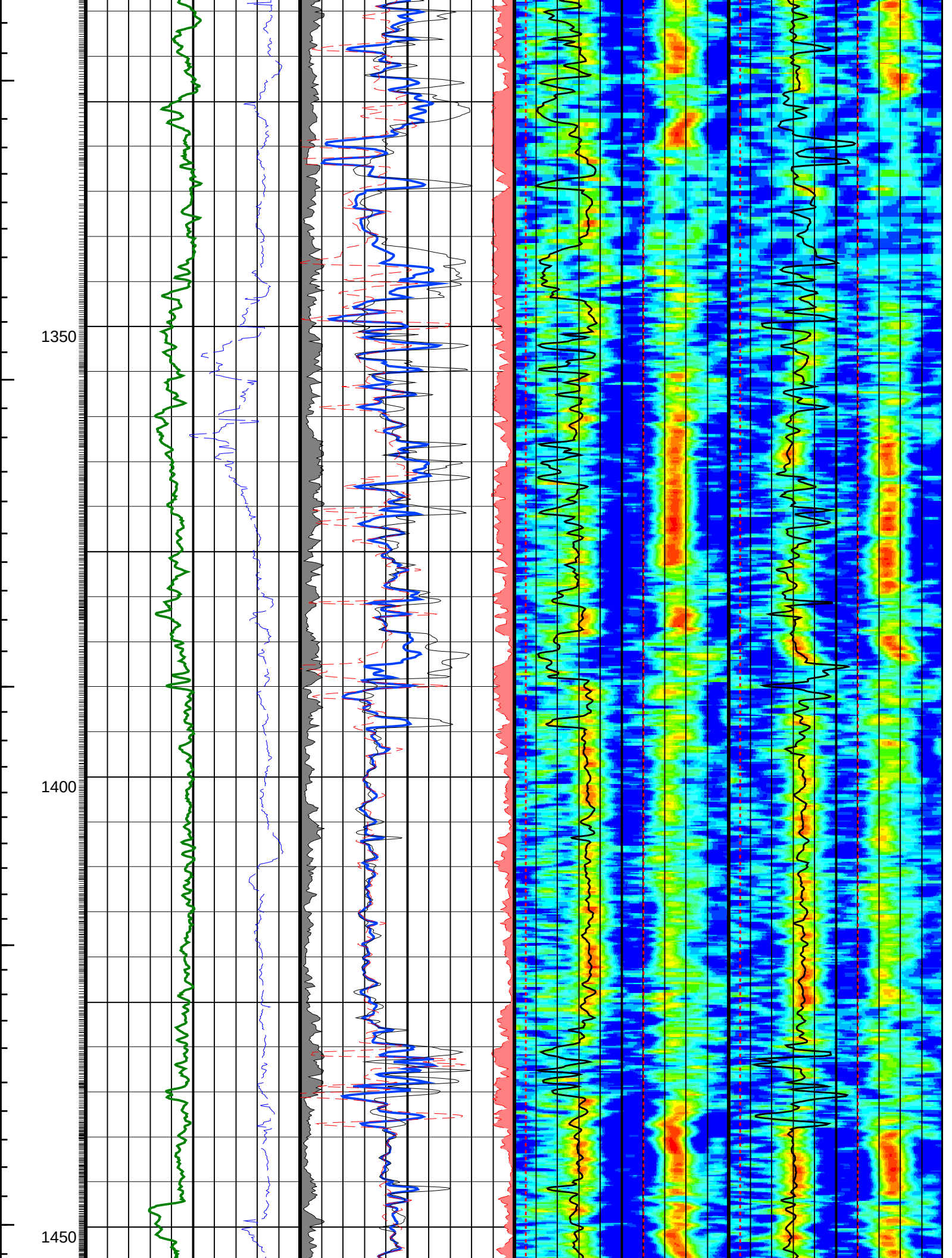


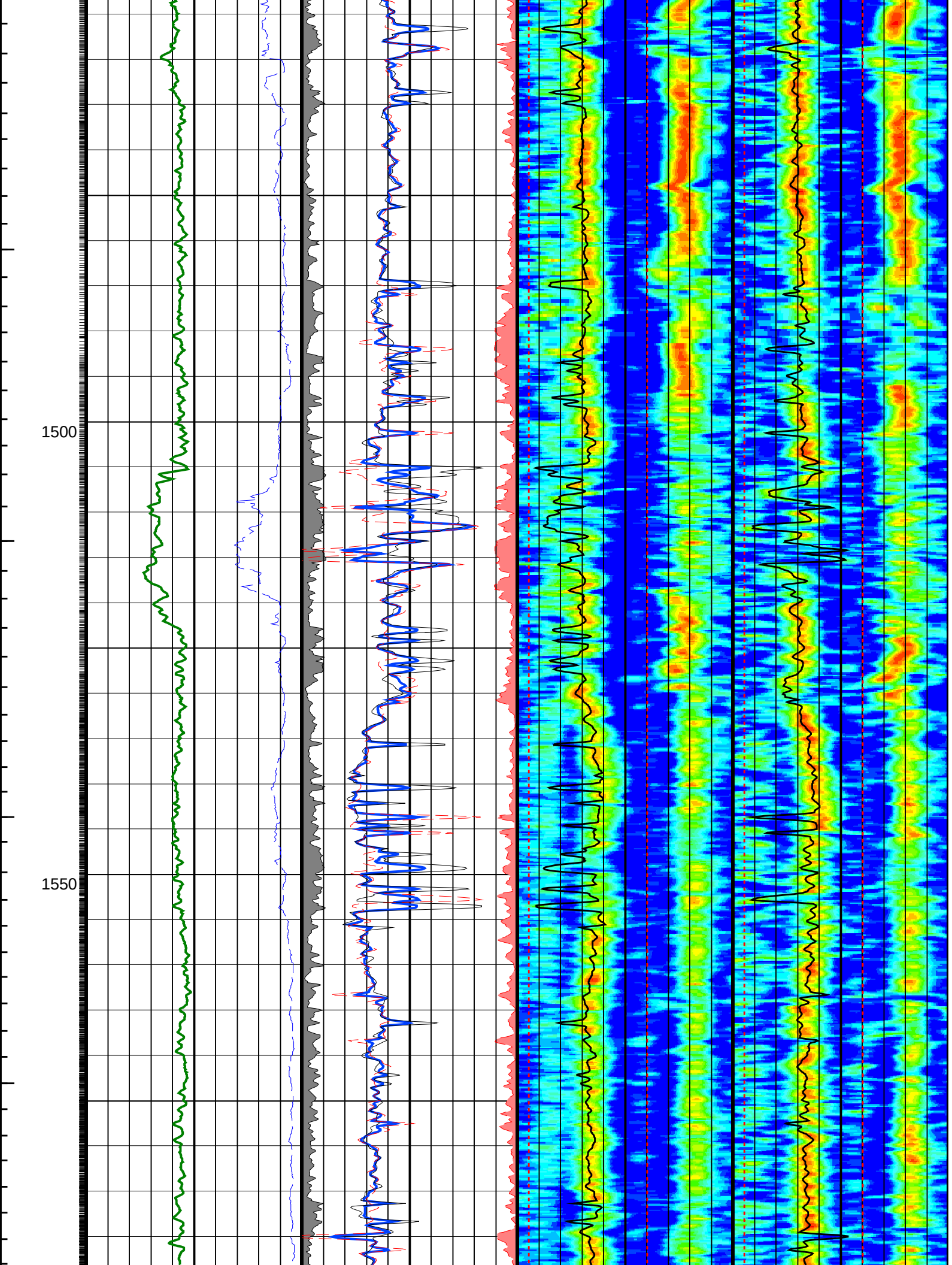

800
850
See Remarks

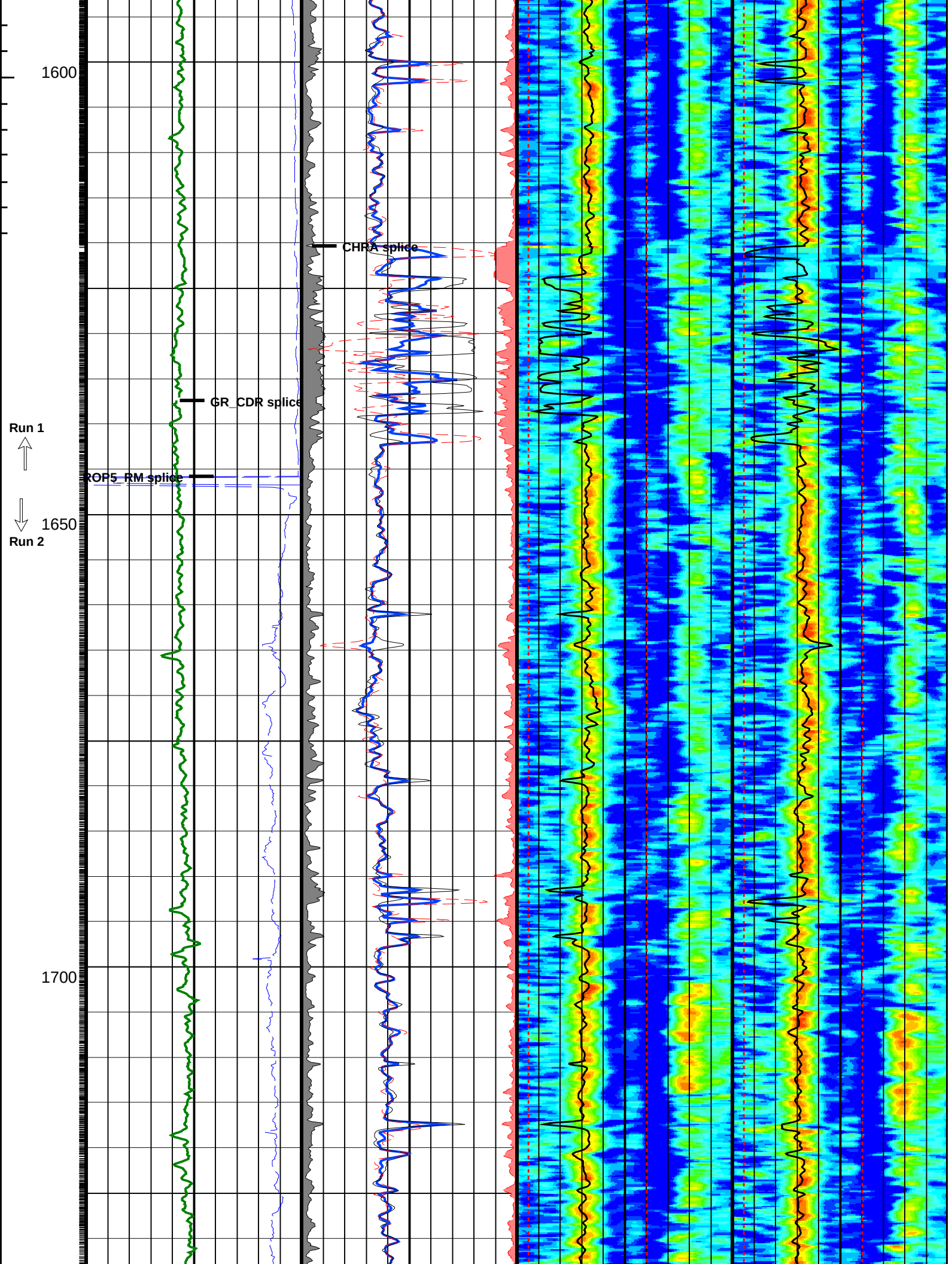

900
950
1000
See Remarks

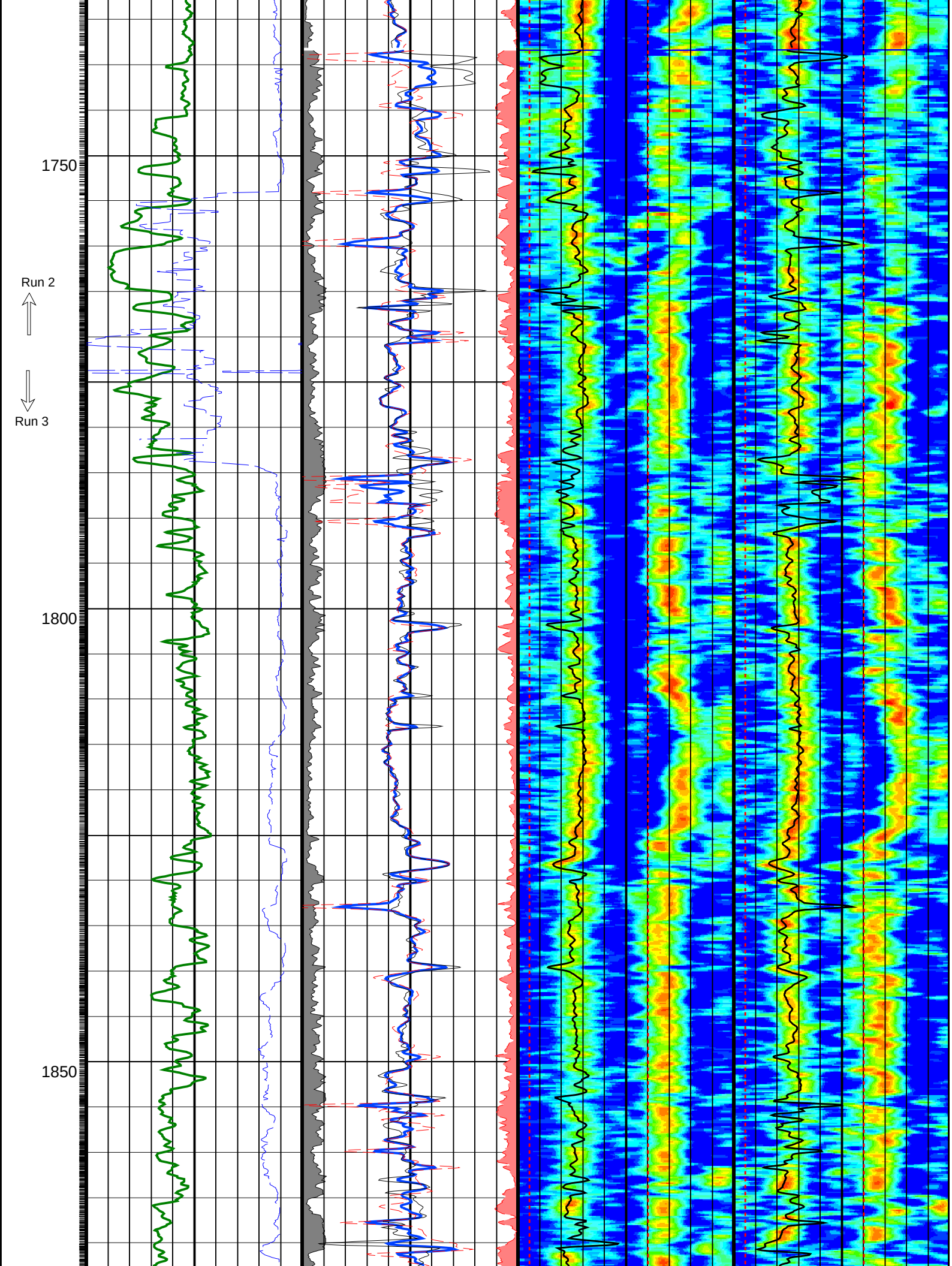

1050
1100
1150

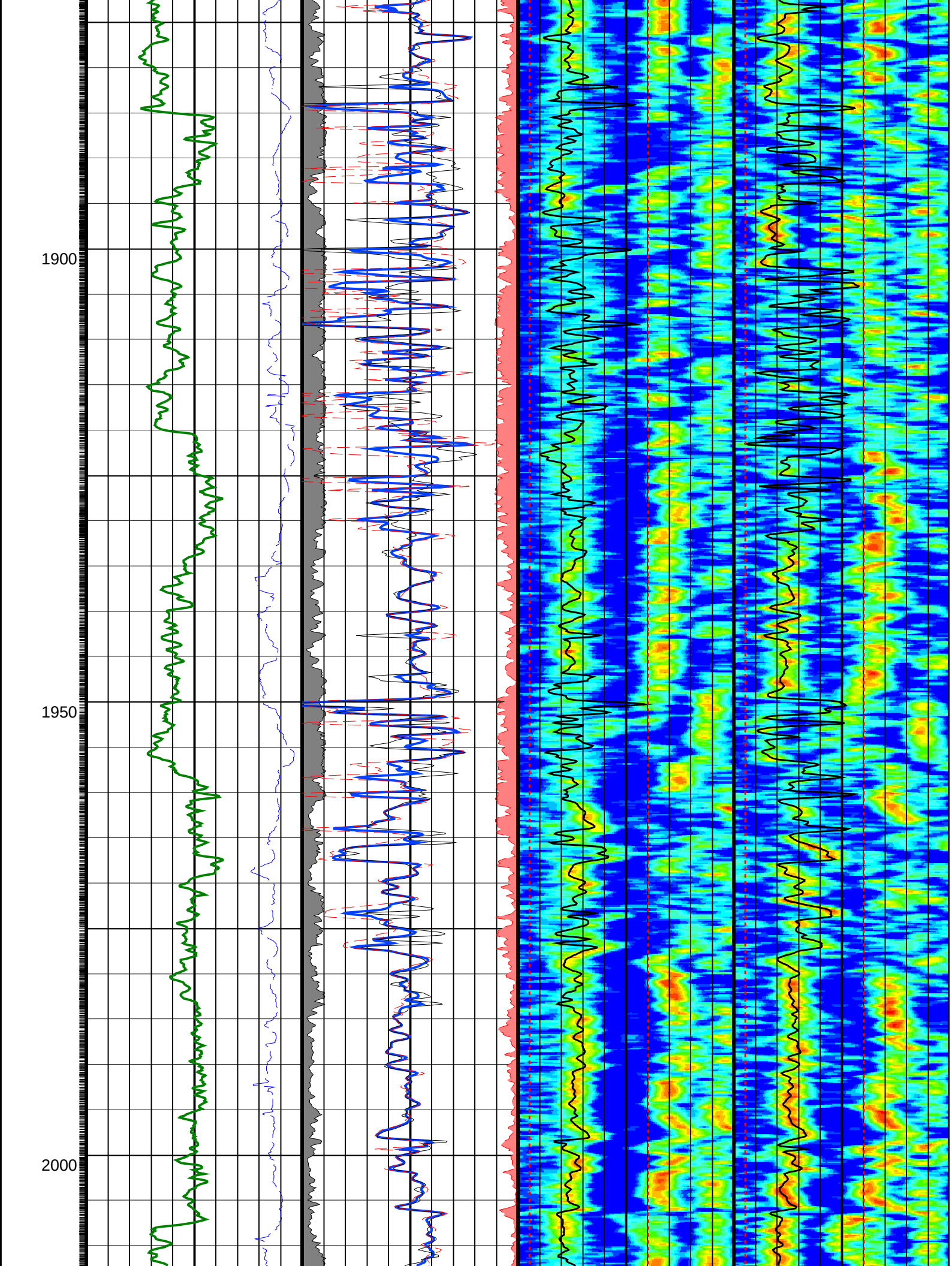

1200
1250
1300
See Remarks

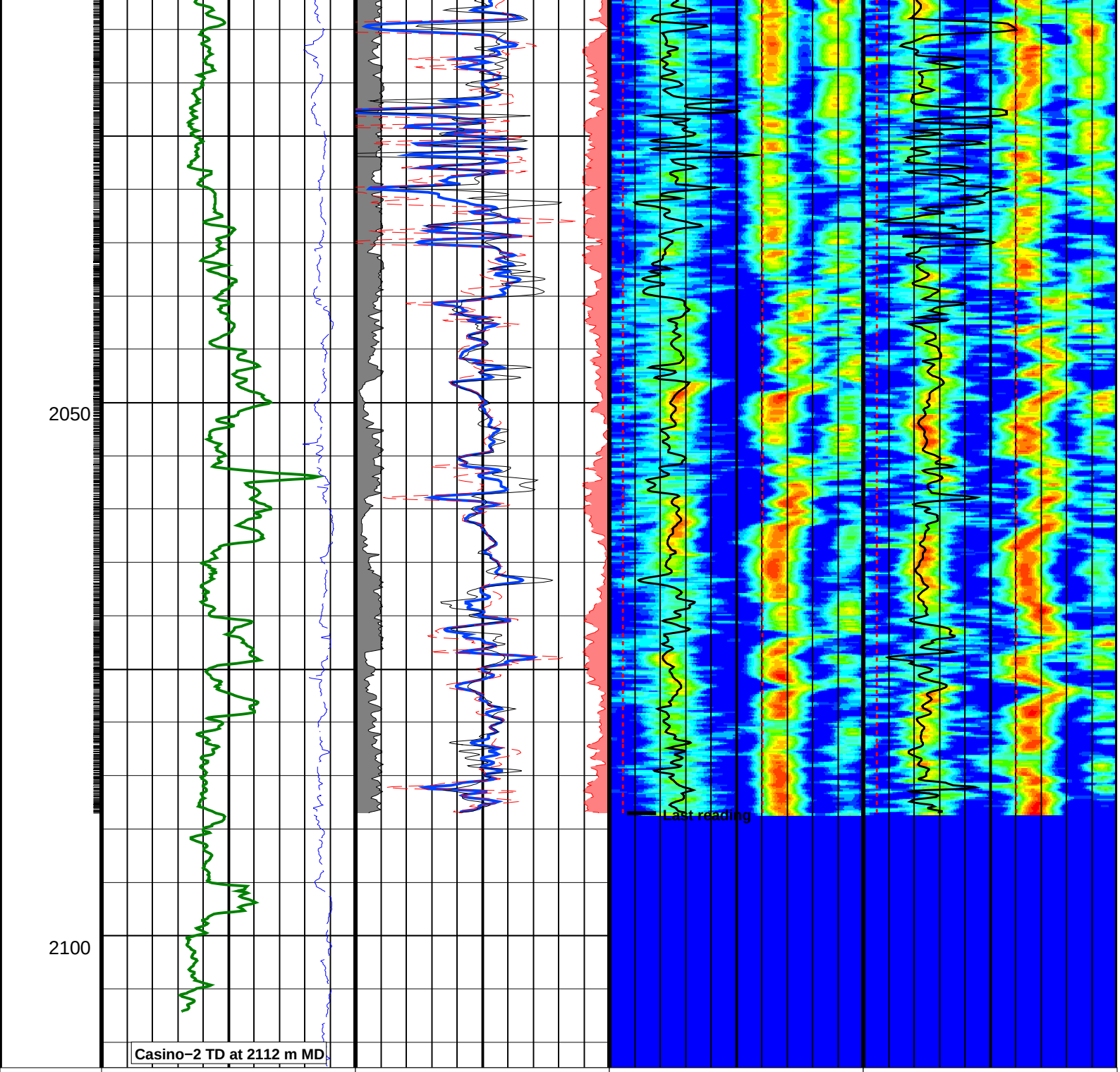

1350
1400
1450


1500
1550


1600
CHRA splice
GR_CDR splice
Run 1
ROP5_RM splice
1650
Run 2
1700


1750
Run 2
Run 3
1800
1850


1900
1950
2000



ARC Gamma Ray (GR_ARC)	Delta−T Compressional from Receiver Array (DTRA)	Delta−T Compressional from Receiver Array (DTRA)	Delta−T Compressional from Transmitter Array (DTTA)
0 (GAPI) 200	140 (US/F) 40	40 (US/F) 240	40 (US/F) 240
CDR Gamma Ray (GR_CDR)	**Delta−T Compressional from Transmitter Array (DTTA)**	**Minimum Labeling Slowness, Compressional (MNSL)**	**Minimum Labeling Slowness, Compressional (MNSL)**
0 (GAPI) 200	140 (US/F) 40	40 (US/F) 240	40 (US/F) 240
Rate of Penetration, Averaged over Last 5ft (ROP5_RM)	**Coherence at Compressional Peak for the Receiver Array (CHRA)**	**Maximum Labeling Slowness, Compressional (MXSL)**	**Maximum Labeling Slowness, Compressional (MXSL)**
200 (M/HR) 0	1 (−−−− −4	40 (US/F) 240	40 (US/F) 240
	Coherence at Compressional Peak for the Transmitter Array (CHTA)	Min Amplitude Max	Min Amplitude Max
	−4 (−−−− 1	0 RCVR Projection (STRA) 1	0 TRSM Projection (STTA) 1
		40 (US/F) 240	40 (US/F) 240
	Delta−T Compressional		

Borehole Compensated (Depth Derived) (DTBC)		
140	(US/F)	40

PIP SUMMARY

- ISONIC Integrated Transit Time Every 1 MS
- ISONIC Integrated Transit Time Every 10 MS
  - ISONIC Samples

IDEAL Version: ID7_0C_02

IDF

MWD_10	**IDEAL Version: ID7_0C_02**	**SON825**	**IDEAL Version: ID7_0C_02**

9.50−in. Compensated Dual Resistivity / Equipment Identification

Primary Equipment:

Tool Name and Serial Number	RGS9 − AA	9556
Gamma Ray Type	Plat − GR	
Calibration Status	−	

Master: 17−Aug−2002 0:16

9.50−in. Compensated Dual Resistivity Calibration

Resistivity: Air

Phase	Attenuation down DB	Value	Phase	Attenuation up DB	Value	Phase	BHC attenuation DB	Value
Master		3.920	Master		3.912	Master		3.916
3.290 (Minimum)	3.890 (Nominal)	4.490 (Maximum)	3.290 (Minimum)	3.890 (Nominal)	4.490 (Maximum)	3.790 (Minimum)	3.890 (Nominal)	3.990 (Maximum)

Master: 17−Aug−2002 0:16

9.50−in. Compensated Dual Resistivity Calibration

Resistivity: Air

Phase	Phase shift down DEG	Value	Phase	Phase shift up DEG	Value	Phase	BHC phase shift DEG	Value
Master		−0.4190	Master		0.5240	Master		0.05250
−2.400 (Minimum)	0.1000 (Nominal)	2.600 (Maximum)	−2.400 (Minimum)	0.1000 (Nominal)	2.600 (Maximum)	−0.9000 (Minimum)	0.1000 (Nominal)	1.100 (Maximum)

Master: 18−Aug−2002 0:27

9.50−in. Compensated Dual Resistivity Calibration

Gamma Ray: Blanket

Phase	Gain	Value
Master		1.000
0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)

8.25−in. Array Resistivity Compensated / Equipment Identification

Primary Equipment:

Tool Name and Serial Number	ARC5 − 825
ARC825 Calibration Status	−

Master: 8−Aug−2002 22:40

8.25−in. Array Resistivity Compensated Calibration

Resistivity: Air

Phase	Phase−Shift T1 DEG	Value	Phase	Phase−Shift T2 DEG	Value	Phase	Phase−Shift T3 DEG	Value
Master		−0.04785	Master		1.116	Master		−0.7664
−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)	−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)	−3.900 (Minimum)	0.1000 (Nominal)	4.100 (Maximum)

Phase	Phase−Shift T4 DEG	Value	Phase	Phase−Shift T5 DEG	Value	Phase	Phase−Shift T1 at 400KHz DEG	Value
Master		0.5778	Master		−0.7787	Master		−0.01738

Phase	Phase−Shift T2 at 400KHz DEG	Value
Master		0.6494
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Phase	Phase−Shift T3 at 400KHz DEG	Value
Master		−0.4933
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Phase	Phase−Shift T4 at 400KHz DEG	Value
Master		0.6468
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Phase	Phase−Shift T5 at 400KHz DEG	Value
Master		−0.6120
	−3.900 (Minimum) 0.1000 (Nominal) 4.100 (Maximum)	

Master: 8−Aug−2002 22:40

8.25−in. Array Resistivity Compensated Calibration

Resistivity: Air

Phase	Attenuation T1 DB	Value
Master		7.863
	6.500 (Minimum) 8.500 (Nominal) 10.50 (Maximum)	

Phase	Attenuation T2 DB	Value
Master		6.846
	4.500 (Minimum) 6.500 (Nominal) 8.500 (Maximum)	

Phase	Attenuation T3 DB	Value
Master		4.618
	2.500 (Minimum) 4.500 (Nominal) 6.500 (Maximum)	

Phase	Attenuation T4 DB	Value
Master		4.695
	2.600 (Minimum) 4.600 (Nominal) 6.600 (Maximum)	

Phase	Attenuation T5 DB	Value
Master		3.201
	1.600 (Minimum) 3.600 (Nominal) 5.600 (Maximum)	

Phase	Attenuation T1 at 400KHz DB	Value
Master		7.873
	6.500 (Minimum) 8.500 (Nominal) 10.50 (Maximum)	

Phase	Attenuation T2 at 400KHz DB	Value
Master		6.819
	4.500 (Minimum) 6.500 (Nominal) 8.500 (Maximum)	

Phase	Attenuation T3 at 400KHz DB	Value
Master		4.546
	2.500 (Minimum) 4.500 (Nominal) 6.500 (Maximum)	

Phase	Attenuation T4 at 400KHz DB	Value
Master		4.757
	2.600 (Minimum) 4.600 (Nominal) 6.600 (Maximum)	

Phase	Attenuation T5 at 400KHz DB	Value
Master		3.133
	1.600 (Minimum) 3.600 (Nominal) 5.600 (Maximum)	

Master: 8−Aug−2002 9:39

8.25−in. Array Resistivity Compensated Calibration

Gamma Ray: Blanket

Phase	Gamma ray factor (equals Calibration Gain multiplied by API Gain Factor) CPS	Value
Master		8.496
	4.960 (Minimum) 7.200 (Nominal) 9.650 (Maximum)	

ANADRILL

SCHLUMBERGER

Survey report 4−Oct−2002 19:26:55 Page 1 of 2

Client.....: Santos
Field.....: Exploration

Well.....: Casino−2
API number.....:
Engineer.....: A. Abad, C. Tue

RIG:.....: Ocean Bounty
STATE:.....: Victoria

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

----- Depth reference ----------
Permanent datum.....: GROUND LEVEL
Depth reference.....:
GL above permanent.....: −68.00 m
KB above permanent.....: 0.00 m
DF above permanent.....: 25.00 m

----- Vertical section origin----------
Latitude (+N/S−).....: 0.00 m
Departure (+E/W−).....: 0.00 m

----- Platform reference point----------
Latitude (+N/S−).....: 0.00 m
Departure (+E/W−).....: 0.00 m

Azimuth from rotary table to target: 0.00 degrees

Spud date.....: 24 Sep 02
Last survey date.....: 04−Oct−02
Total accepted surveys...: 25
MD of first survey.....: 0.00 m
MD of last survey.....: 2112.00 m

----- Geomagnetic data ----------
Magnetic model.....: BGGM version 2001
Magnetic date.....: 27−Sep−2002
Magnetic field strength..: 1220.24 HCNT
Magnetic dec (+E/W−).....: 10.89 degrees
Magnetic dip.....: −70.02 degrees

----- MWD survey Reference Criteria ---------
Reference G.....: 1000.08 mGal
Reference H.....: 1220.24 HCNT
Reference Dip.....: −70.02 degrees
Tolerance of G.....: (+/−) 2.50 mGal
Tolerance of H.....: (+/−) 6.00 HCNT
Tolerance of Dip.....: (+/−) 0.45 degrees

----- Corrections ----------
Magnetic dec (+E/W−).....: 10.89 degrees
Grid convergence (+E/W−).: −1.09 degrees
Total az corr (+E/W−).....: 11.98 degrees
(Total az corr = magnetic dec − grid conv)
Sag applied (Y/N).....: No degree: 0.00

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	0.00	0.00	0.00	0.00	0.00	TIP	-
2	729.86	0.57	116.39	729.86	729.85	-1.61	-1.61	3.25	3.63	116.39	0.01	MWD	6-axis
3	842.72	0.61	203.59	112.86	842.70	-2.41	-2.41	3.51	4.26	124.48	0.07	MWD	6-axis
4	958.13	0.69	268.77	115.41	958.11	-2.99	-2.99	2.57	3.95	139.29	0.06	MWD	6-axis
5	1074.07	0.52	252.87	115.94	1074.04	-3.16	-3.16	1.37	3.45	156.52	0.02	MWD	6-axis
6	1130.64	0.79	283.25	56.57	1130.61	-3.15	-3.15	0.75	3.24	166.63	0.08	MWD	6-axis
7	1161.14	0.82	278.20	30.50	1161.10	-3.07	-3.07	0.33	3.09	173.91	0.03	MWD	6-axis
8	1188.85	0.76	272.62	27.71	1188.81	-3.03	-3.03	-0.05	3.03	180.99	0.04	MWD	6-axis
9	1217.68	0.78	286.97	28.83	1217.64	-2.97	-2.97	-0.43	3.00	188.27	0.07	MWD	6-axis
10	1247.53	0.88	282.51	29.85	1247.49	-2.86	-2.86	-0.85	2.98	196.55	0.04	MWD	6-axis
11	1277.80	0.94	274.80	30.27	1277.75	-2.79	-2.79	-1.32	3.08	205.41	0.05	MWD	6-axis
12	1364.44	1.05	276.88	86.64	1364.38	-2.63	-2.63	-2.82	3.86	226.98	0.01	MWD	6-axis
13	1421.10	1.45	272.46	56.66	1421.03	-2.54	-2.54	-4.05	4.78	237.93	0.07	MWD	6-axis
14	1450.24	1.55	270.01	29.14	1450.16	-2.52	-2.52	-4.81	5.43	242.35	0.04	MWD	6-axis
15	1508.96	1.49	255.36	58.72	1508.86	-2.72	-2.72	-6.35	6.90	246.84	0.07	MWD	6-axis
16	1565.71	1.58	268.16	56.75	1565.59	-2.93	-2.93	-7.84	8.37	249.53	0.06	MWD	6-axis
17	1622.24	1.67	265.96	56.53	1622.09	-3.01	-3.01	-9.44	9.91	252.32	0.02	MWD	6-axis
18	1652.08	1.45	267.41	29.84	1651.92	-3.06	-3.06	-10.25	10.70	253.40	0.07	MWD	6-axis
19	1796.08	1.43	253.78	144.00	1795.88	-3.64	-3.64	-13.80	14.27	255.22	0.02	MWD	6-axis
20	1853.43	1.50	250.23	57.35	1853.21	-4.10	-4.10	-15.19	15.74	254.91	0.02	MWD	6-axis
21	1911.17	1.48	243.72	57.74	1910.93	-4.68	-4.68	-16.57	17.22	254.23	0.03	MWD	6-axis
22	1998.68	1.91	243.21	87.51	1998.40	-5.84	-5.84	-18.89	19.77	252.82	0.05	MWD	6-axis
23	2028.08	2.08	243.11	29.40	2027.78	-6.30	-6.30	-19.80	20.78	252.35	0.06	MWD	6-axis
24	2085.35	2.47	242.08	57.27	2085.01	-7.35	-7.35	-21.82	23.02	251.39	0.07	MWD	6-axis
25	2112.00	2.47	242.08	26.65	2111.63	-7.89	-7.89	-22.83	24.16	250.94	0.00	TD Projection	

Company: **Santos Ltd./Strike Oil**

Schlumberger

Well: **Casino-2**

Field: **VIC/P 44**

Rig: **Ocean Bounty**

State: **Victoria**

12.25 in. Section

ISONIC
Measured Depth 1:500
Recorded Mode