HALLIBURTON

CIRCUMFERENTIAL ACOUSTIC SCANNING TOOL - MONOCABLE

Company	KINDER MORGAN CO2 CO LP
Well	COW CANYON CS #1
Field	MCELMO DOME
County	MONTEZUMA
State	CO

Company KINDER MORGAN CO2 CO LP
Well COW CANYON CS #1
Field MCELMO DOME
County MONTEZUMA State CO

API No.: 05-083-06709-0000 Serv #: 901221601
Location: SURFACE HOLE LOCATION:
1350' FNL & 210' FWL
LAT: 37.526170
LONG: -108.939440

Other Services
GAUGE RING
CBL
RMT

Sec: 27 Twp: 38N Rge: 19W

Permanent Datum	GROUND LEVEL	Elevation	6459'
Log Measured From	KB	, 22.5' Ft. above perm. datum	
Drilling Measured From	KB		

Elevation
K.B. 6481.5'
D.F. 6480.5'
G.L. 6459'

Date @ Time Logged	27 MAR 2014	Type Fluid in Hole	WATER
Run No.	ONE	Density of Fluid	8.4#
Depth - Driller	8306'	Fluid Level	FULL
Depth - Logger	8264'	Cement Top Est. Logged	SEE LOG
Bottom - Logged Interval	8264'	Equipment / Location	11726117 / G.J.
Top - Log Interval	SURFACE	Recorded by	D. SOLIS
Max. Recorded Temp.	197 DEG F	Witnessed by	R. SCOTT

CEMENTING DATA	Surface String	Protection String	Production String	Liner
Date / Time Cemented	N/A	N/A	N/A	N/A
Primary / Squeeze				
Expected Compressive Strength	psi@ hrs	psi@ hrs	psi@ hrs	psi@ hrs
Cement Volume	/	/	/	/
Cement Type / Weight	/	/	/	/
Formulation	/	/	/	/
Mud Type / Mud Wgt.	/	/	/	/

Run Number	Borehole Record Bit	From	To	Casing & Tubing Record Size	Weight	From	To
ONE	12.25"	SURFACE	3000'	9.625"	36.0#	SURFACE	3000'
TWO	8.75"	3000'	8306'	7.0"	29 & 32#	SURFACE	8306'

<<< Fold Here >>>

HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

Comments

CORRELATED TO HALLIBURTON LAS DATA DATED: 06 MAR 2014 AT 8200'.

GR-CBL-CAST RAN IN COMBINATION.

LOG INTERVALS PER CUSTOMER REQUEST.

WELL WAS CEMENTED WITH NITRIFIED FOAM CEMENT.

CAST RAN AS FOLLOWS: 4-3/8" HEAD, BROWN TRANSDUCER, CIM MODE, 72 SHOTS, 4 SCANS

THANK YOU FOR HOOSING HALLIBURTON ENERGY SERVICES.

Service Ticket No. 901221601 API No. 05-083-06709-0000 PGM Ver 111027_R5

The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client

EQUIPMENT DATA

TELEMETRY		CEMENT BOND TOOL		CAST ELECTRONICS		CAST MANDREL	
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	11510542	Serial No.	11858780	Serial No.	12030244	Serial No.	438_12030243
Model No.	TTTC-U-002	Model No.	CBL-M	Model No.	CAST-M	Model No.	CAST-M
Diameter	1.688"	Diameter	2.75"	Diameter	2.75"	Diameter	3.125"

LOGGING DATA

General Data

Pass No.	Depths From	To	Well Head Pressure	Speed Ft/Min	Logging Run Comments
ONE	8264'	SURFACE	0	52	MAIN LOG SECTION

Pass	GAMMA RAY Scale		IRC VECTOR Scale		THICKNESS VECTOR Scale		IMPEDANCE Scale	
No.	L	R	L	R	L	R	L	L
ONE	0	200	2.76	3.26	0.36	0.56	0	6.15

DIRECTIONAL INFORMATION

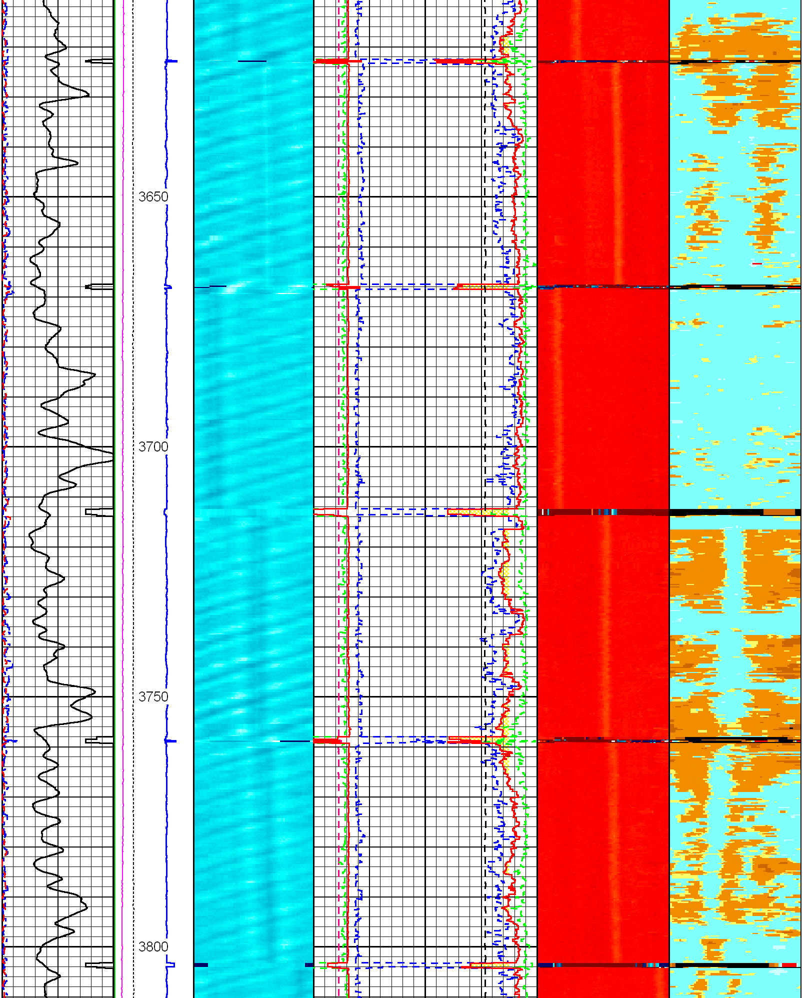
Maximum Deviation	N/A	deg. @	N/A	KOP	N/A

HALLIBURTON

MAIN LOG SECTION

5" = 100'

Database File:	cs1_cast.db
Dataset Pathname:	MAIN1
Presentation Format:	cast_m
Dataset Creation:	Thu Mar 27 15:37:31 2014 by Log Halliburton Casedho
Charted by:	Depth in Feet scaled 1:240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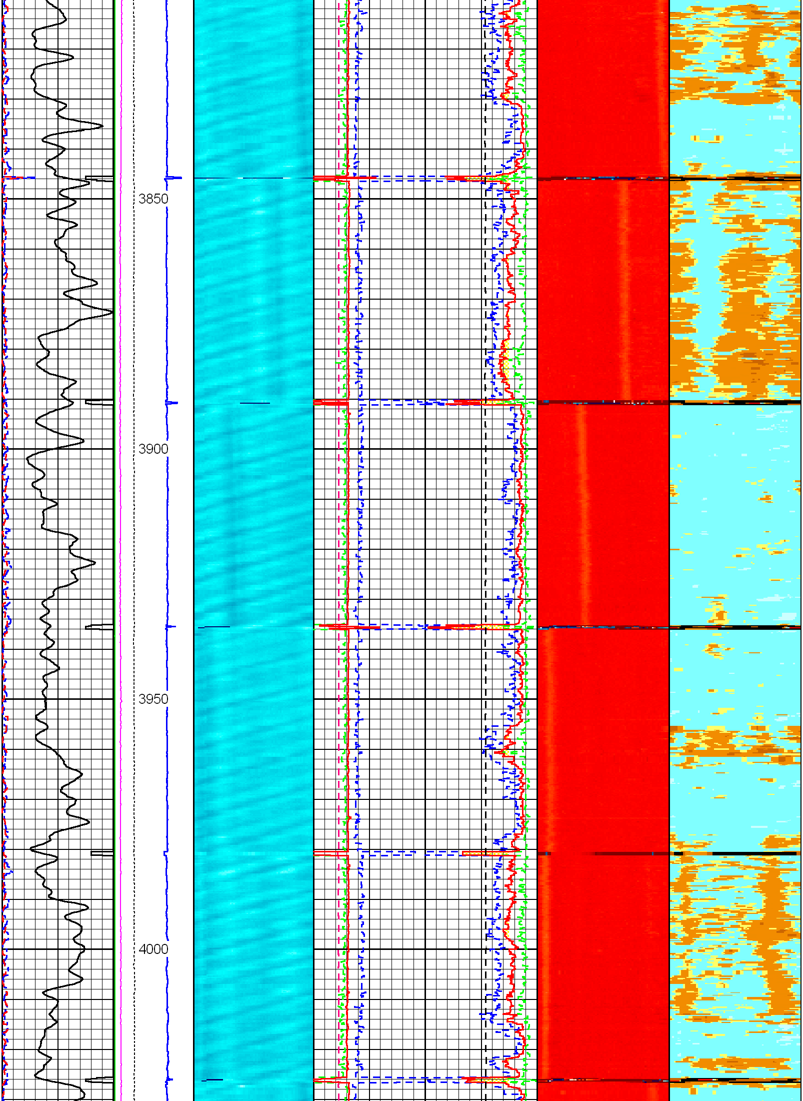
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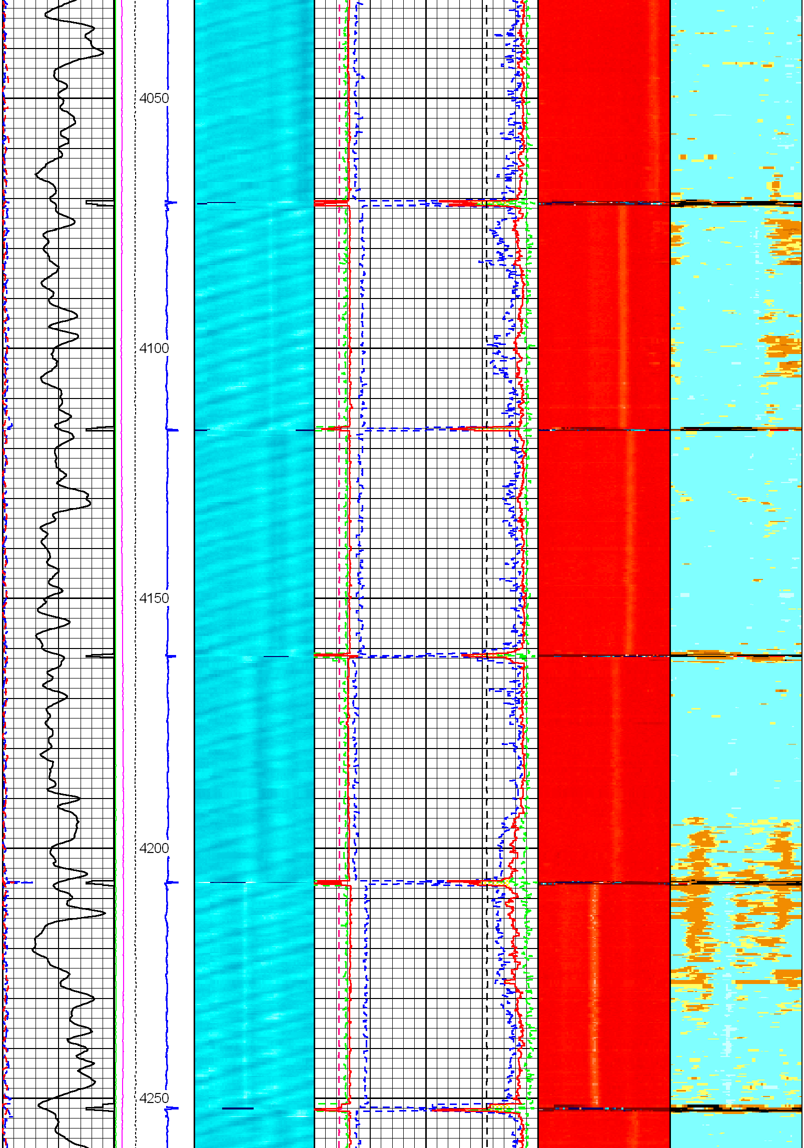
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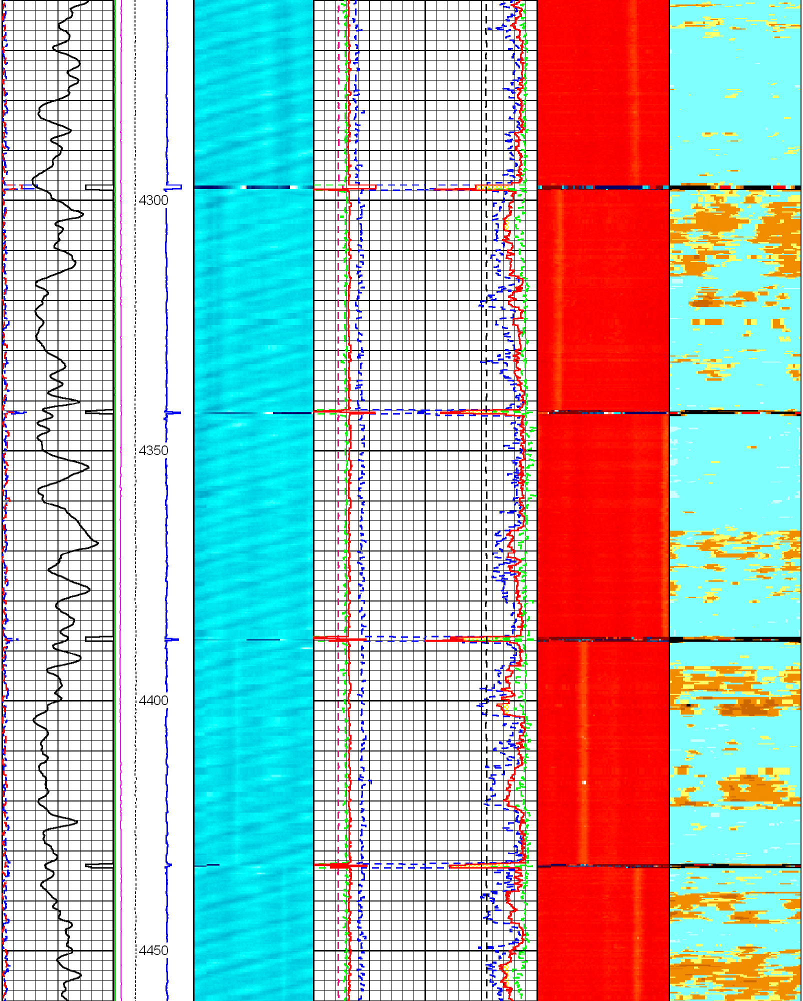
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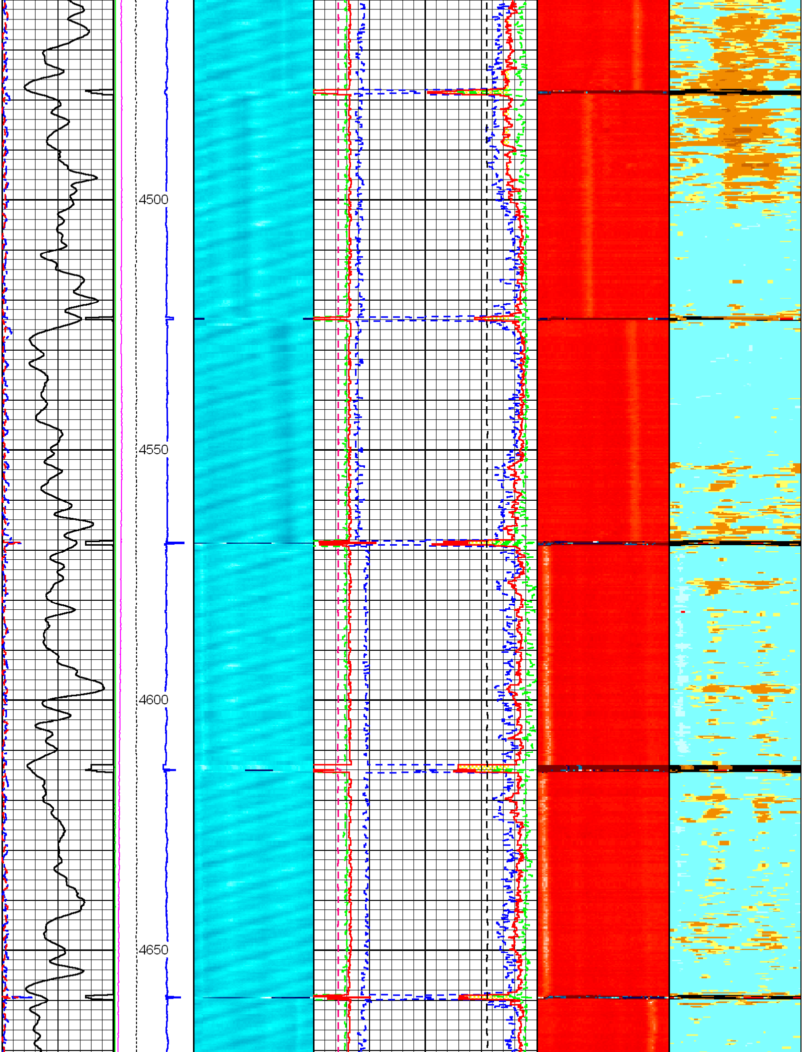
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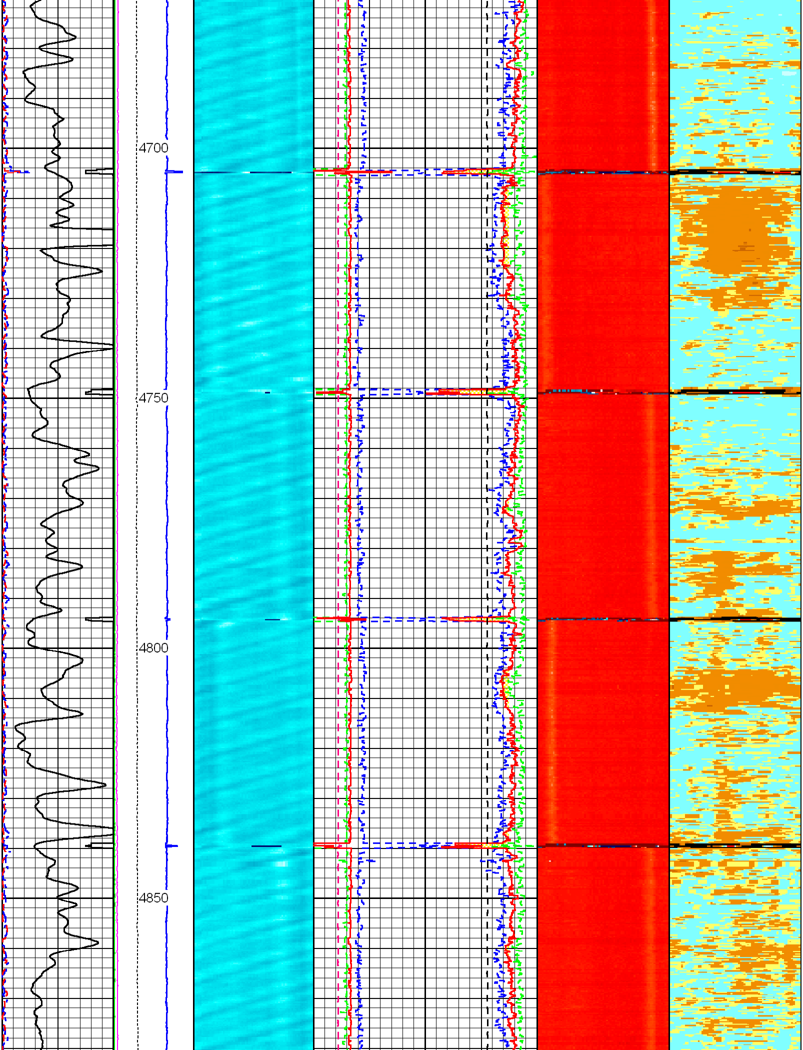
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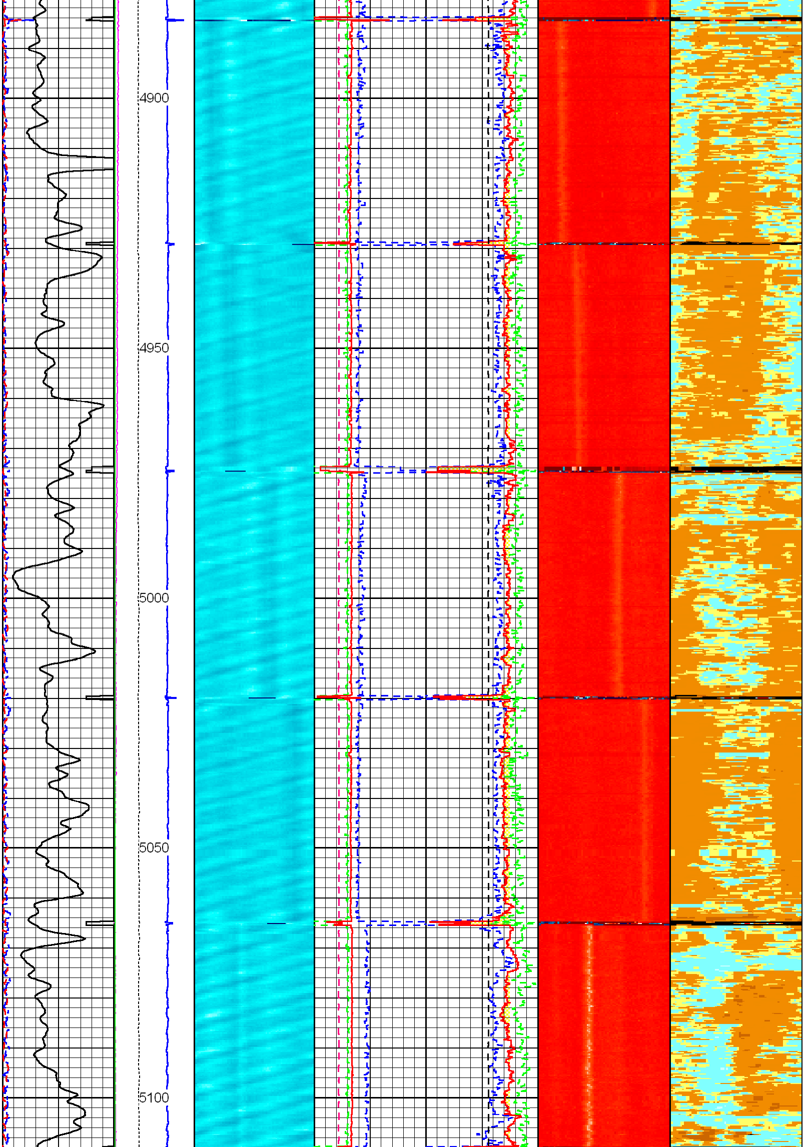
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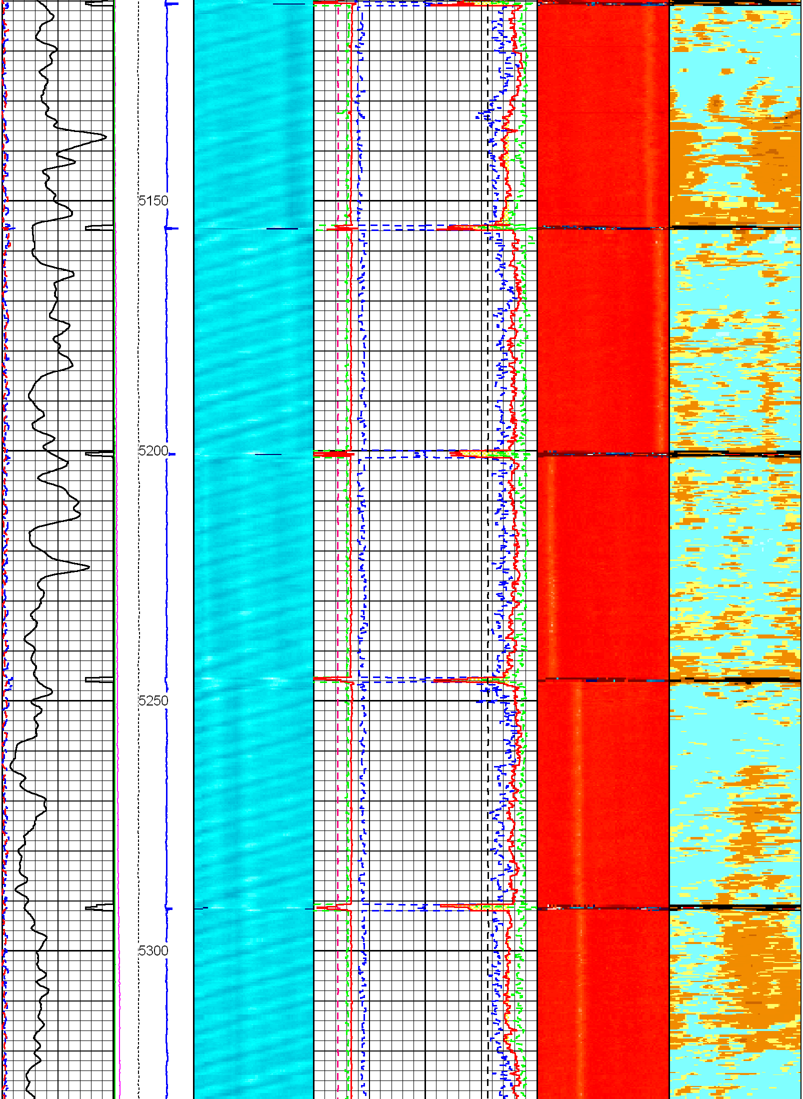
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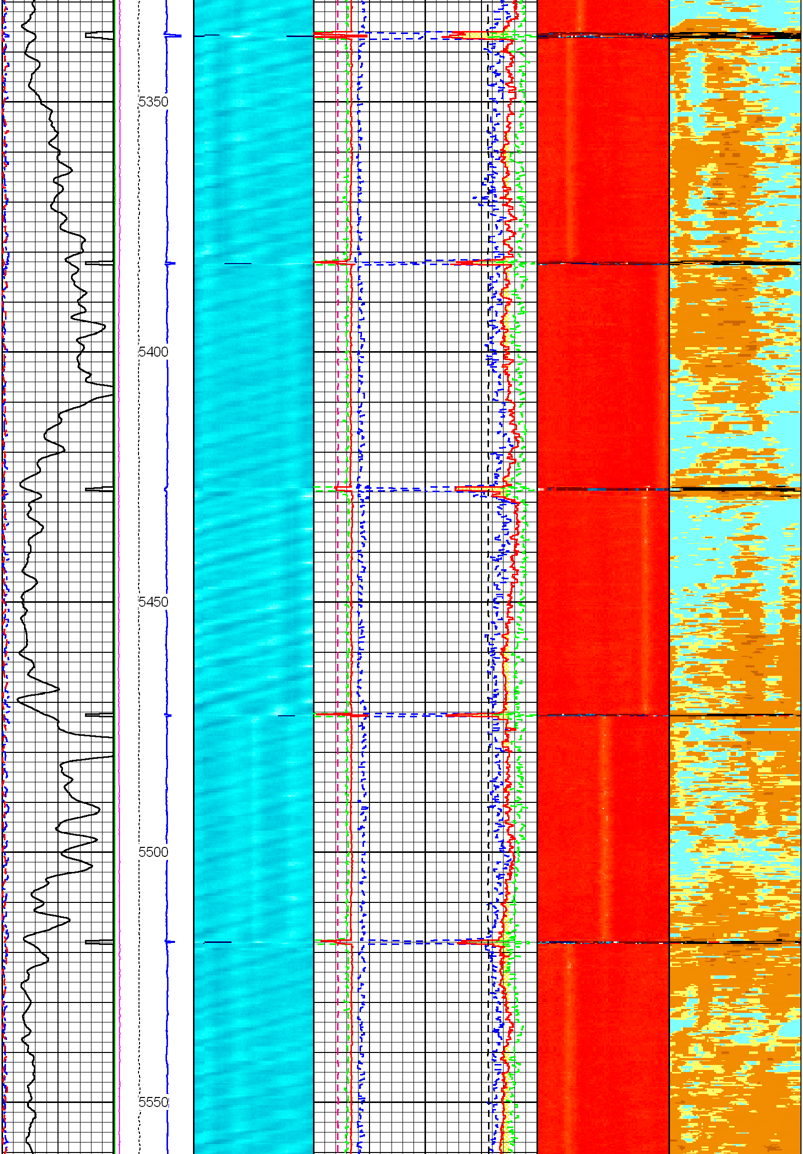
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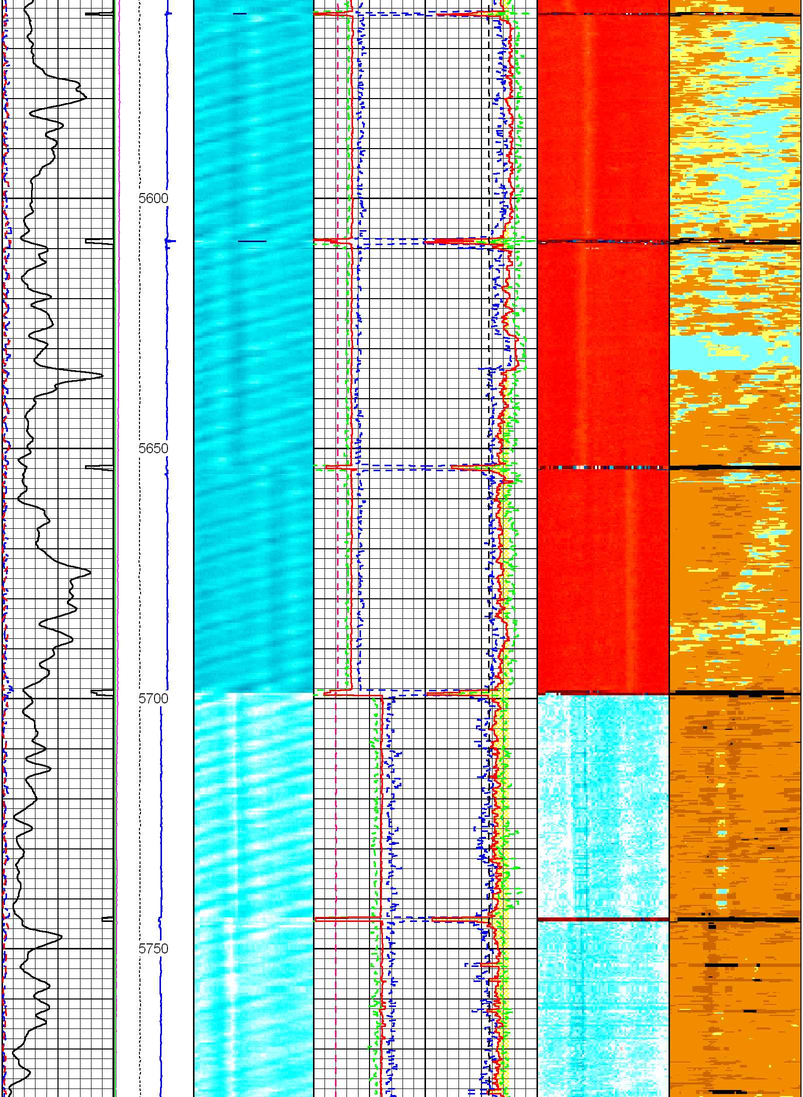
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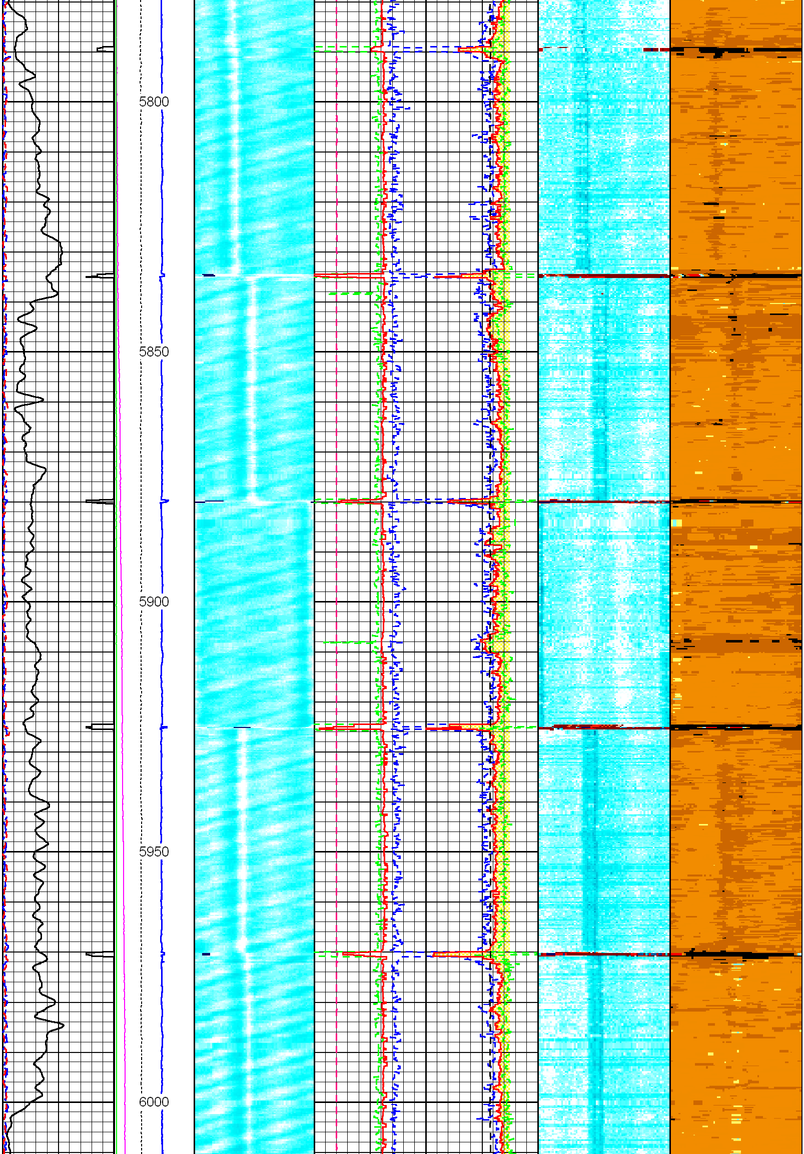
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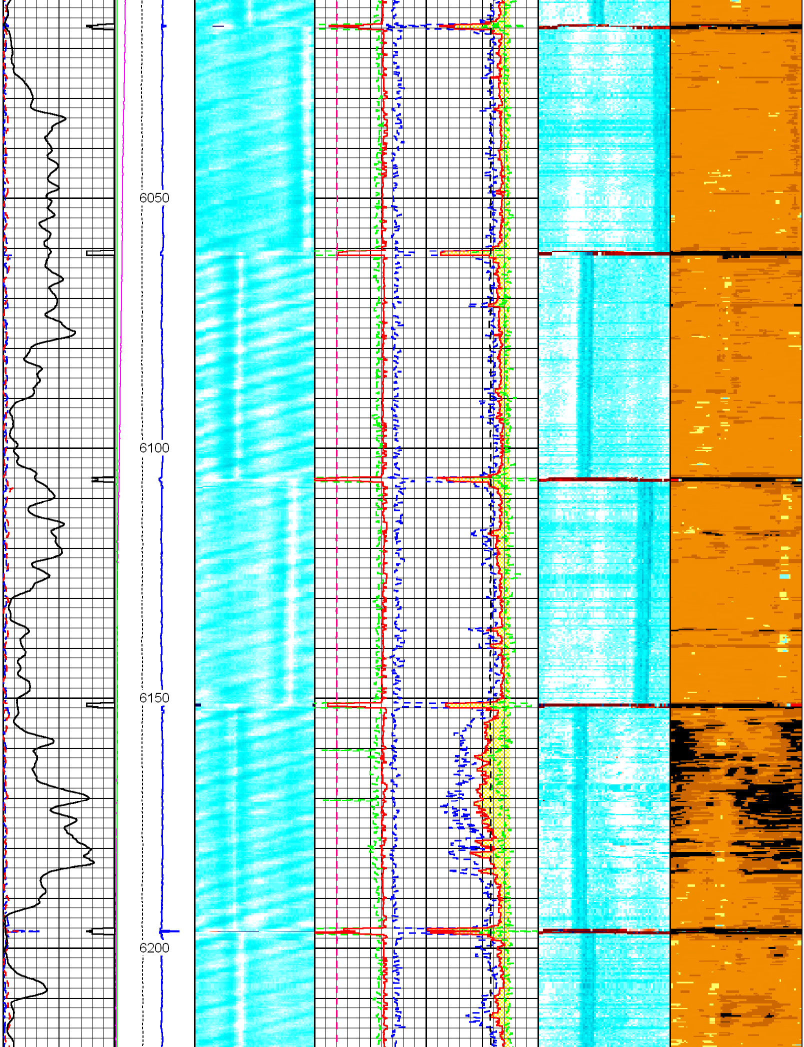
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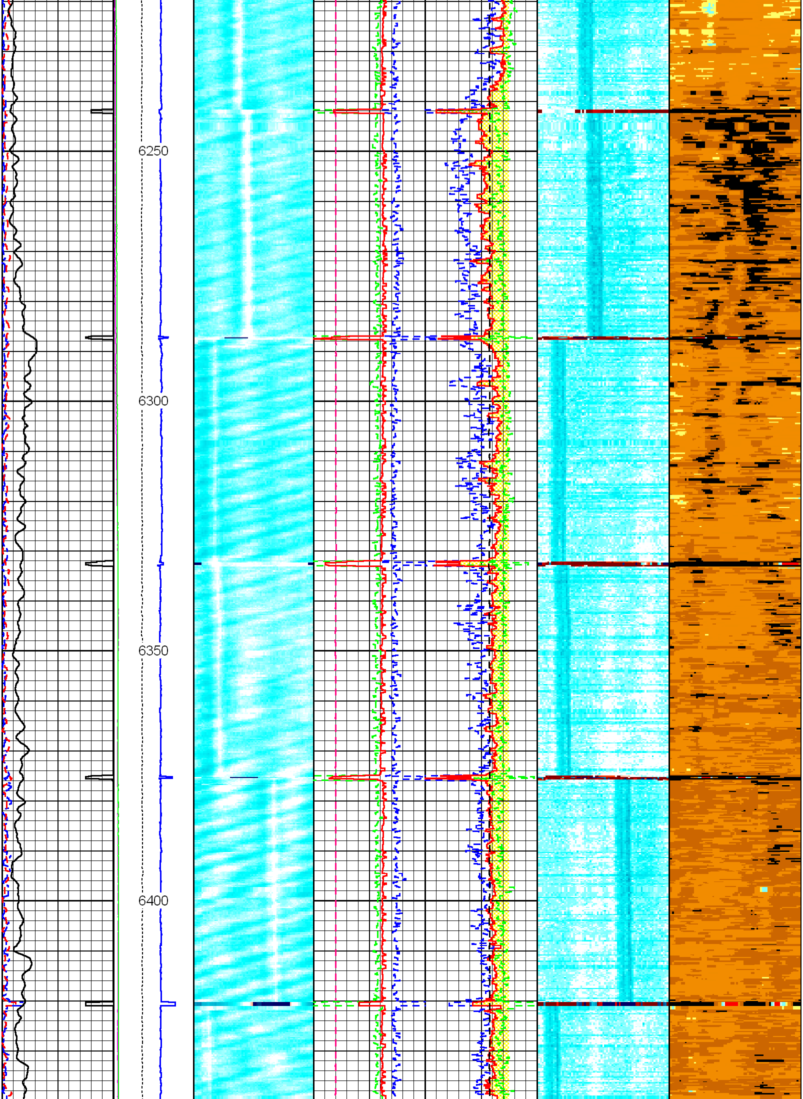
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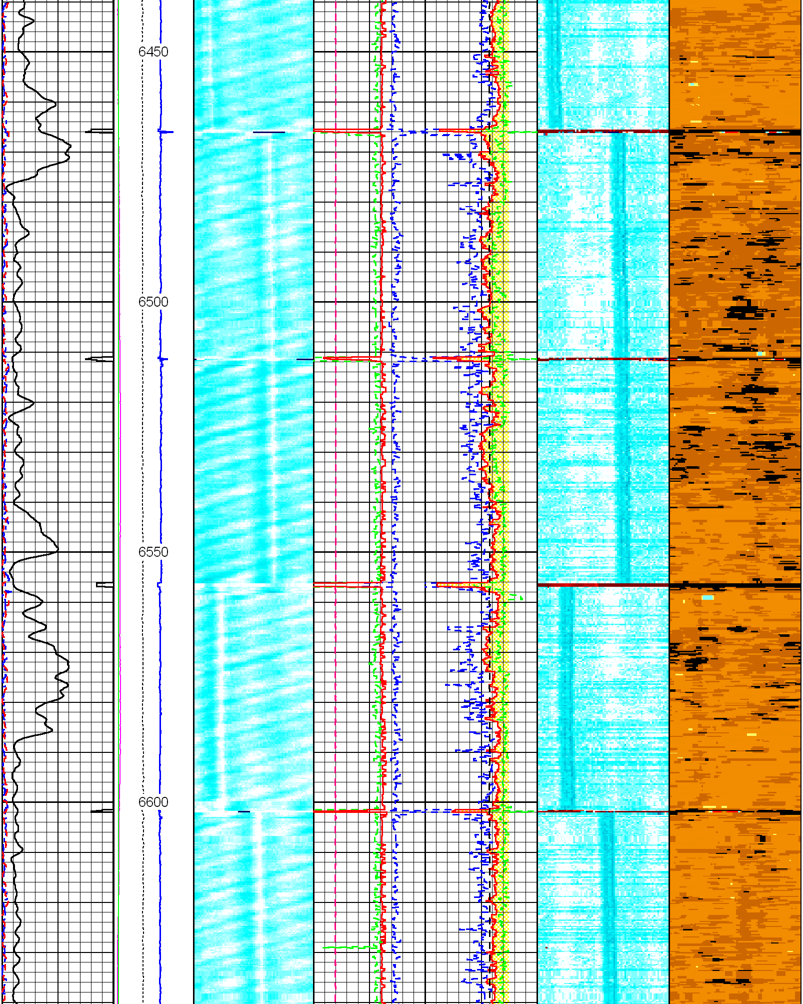
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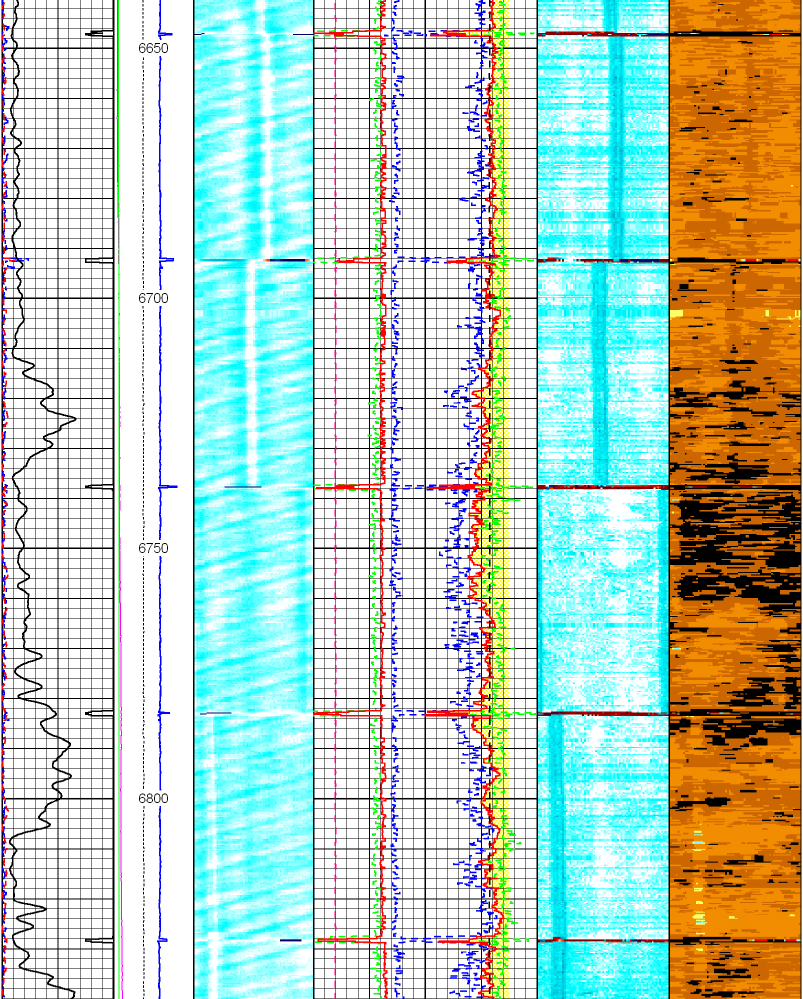
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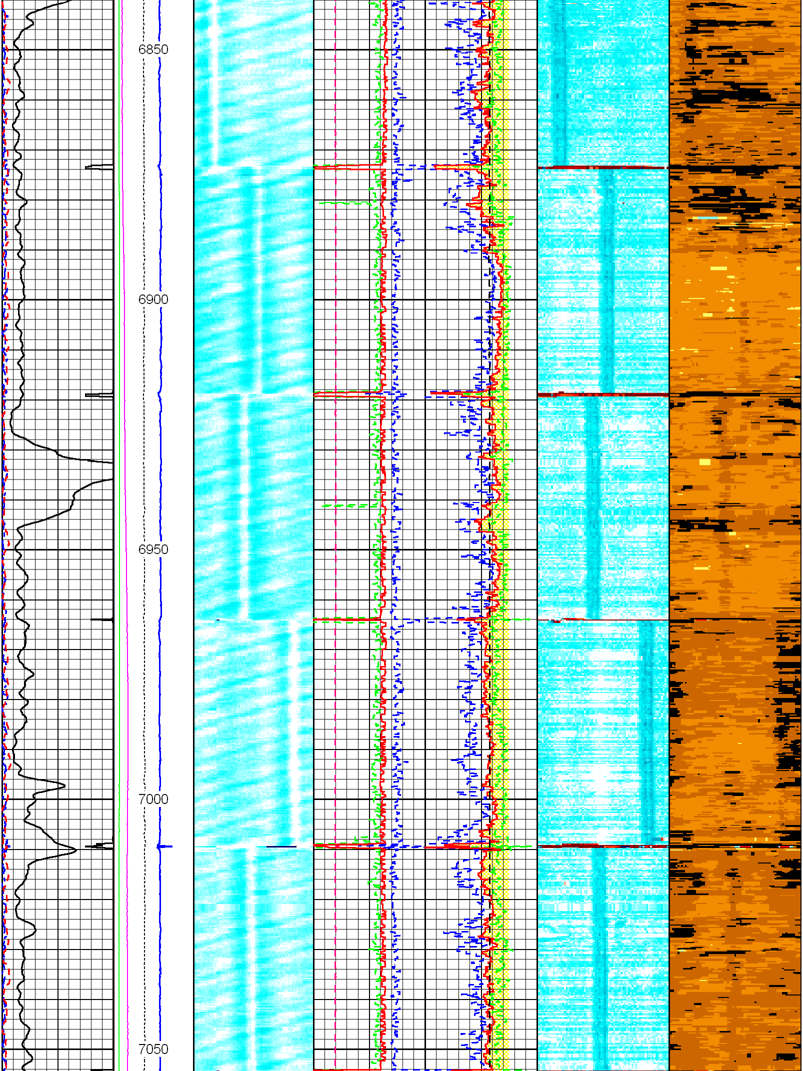
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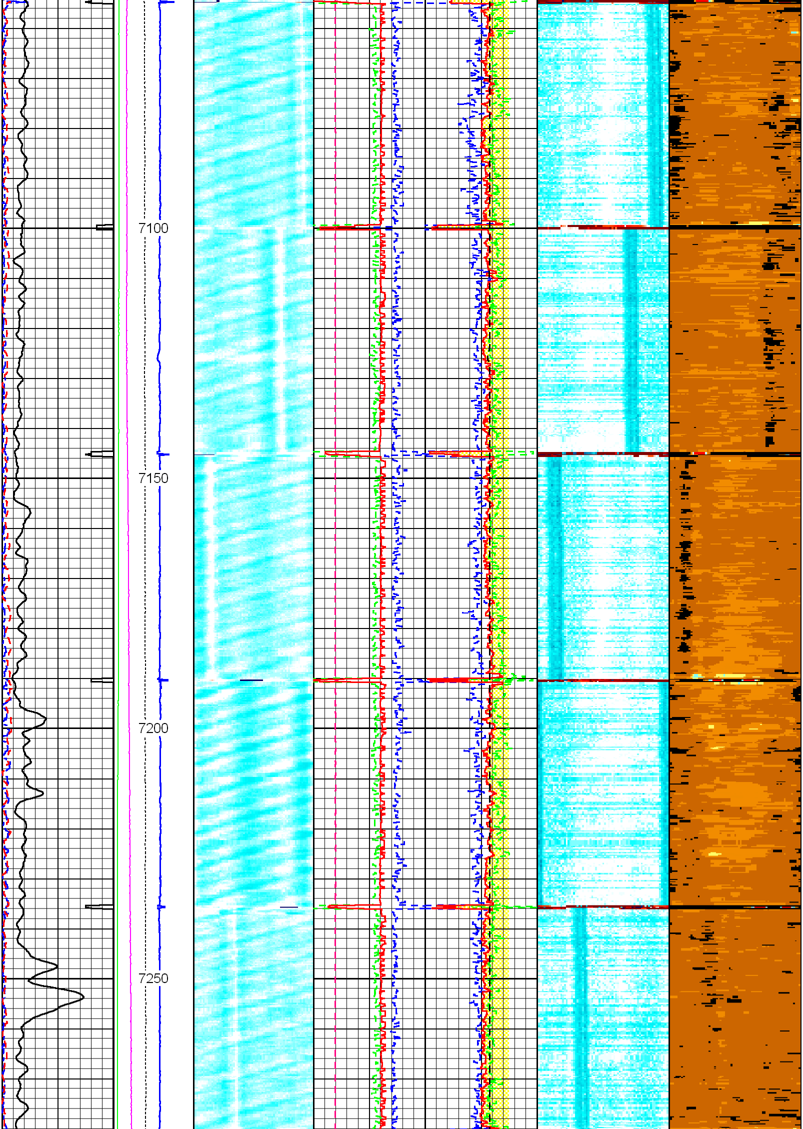
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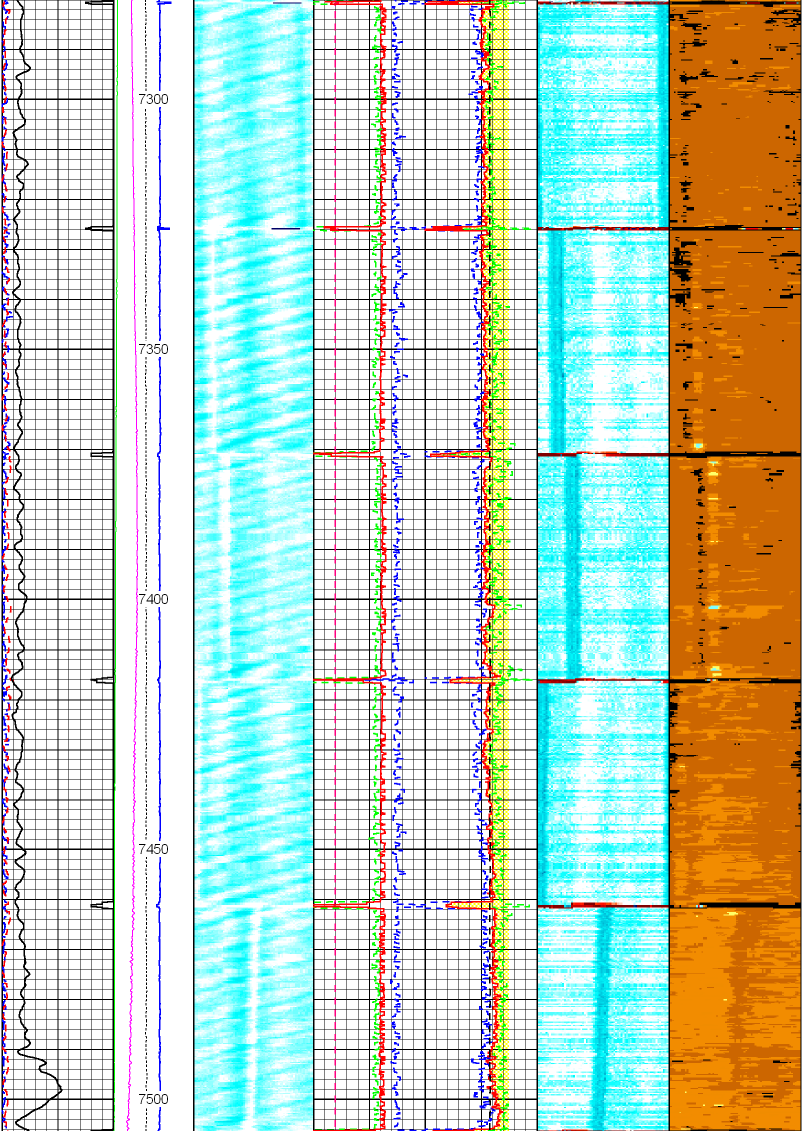
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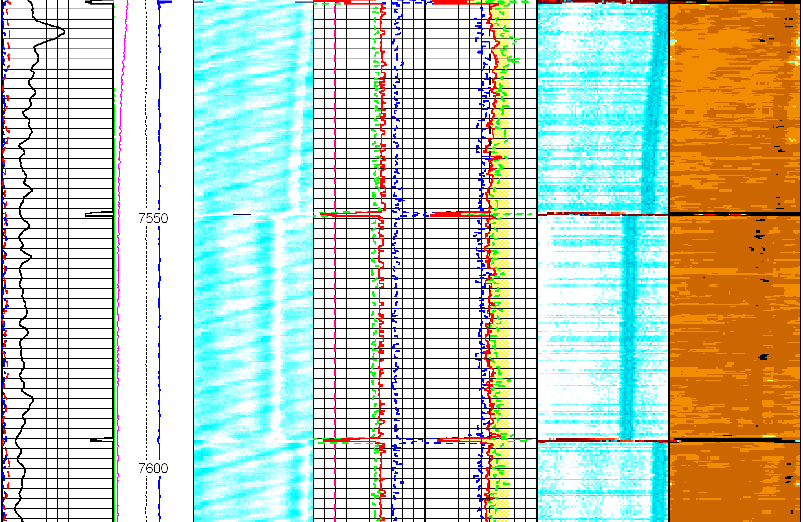
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OVALITY	LTEN	IRC VECTOR	TT AVERAGE	XIMUM IMPEDAN	HICKNESS VECTOR	IMPEDANCE360
0 (in) 0.2	0 (lb) 3000	0 360	25 (usec) 100	10 (MRayl) 0	0 360	0 6.15
ECCENTRICITY	EL BEARIN	2.76 3.26	XIMUM THICKN	NIMUM IMPEDAN	0.36 0.56	
0 (in) 1	0 (°) 360		0.35 (in) 0.55	10 (MRayl) 0		
GR	NCLINATION		NIMUM THICKNE	ERAGE IMPEDAN		
0 (GAPI) 200	0 (°) 90		0.35 (in) 0.55	10 (MRayl) 0		
4 accl 0	ERAGE RAD (in) 2.75 3.25		ERAGE THICKN 0.35 (in) 0.55	UID TRAVEL TIM (usec/ft) 250 150		

HALLIBURTON

MAIN LOG SECTION

5" = 100'

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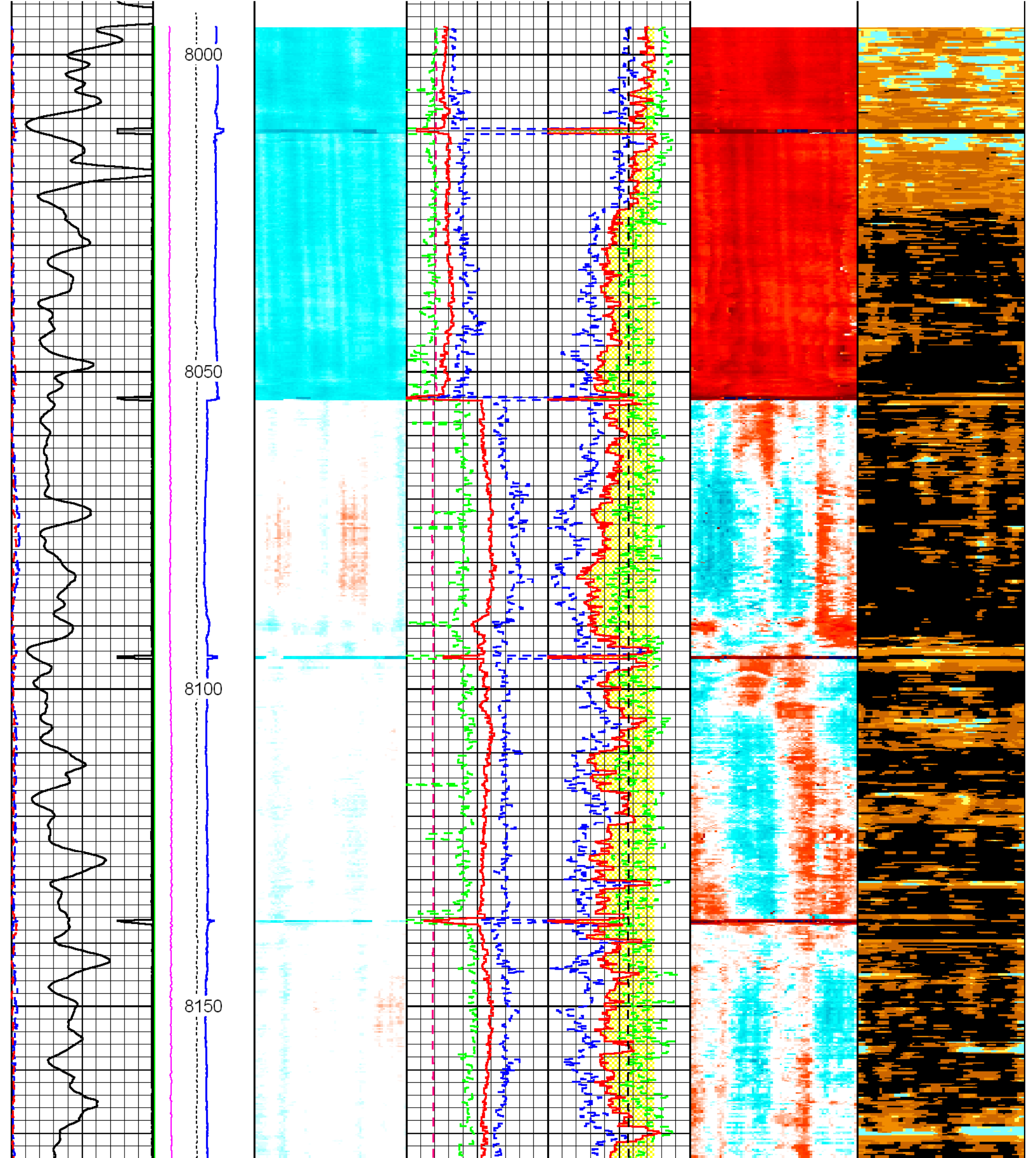
REPEAT LOG SECTION

5" = 100'

Database File: cs1_cast.db
Dataset Pathname: RPT1
Presentation Format: cast_m
Dataset Creation: Thu Mar 27 15:27:15 2014 by Log Halliburton Casedho
Charted by: Depth in Feet scaled 1:240

OVALITY	LTEN	IRC VECTOR	TT AVERAGE	XIMUM IMPEDAN	HICKNESS VECTOR	IMPEDANCE360
0 (in) 0.2	0 (lb) 3000	0 360	25 (usec) 100	10 (MRayl) 0	0 360	0 6.15
ECCENTRICITY	EL BEARIN	2.76 3.26	XIMUM THICKN	NIMUM IMPEDAN	0.36 0.56	
0 (in) 1	0 (°) 360		0.35 (in) 0.55	10 (MRayl) 0		
GR	NCLINATION		NIMUM THICKNE	ERAGE IMPEDAN		
0 (GAPI) 200	0 (°) 90		0.35 (in) 0.55	10 (MRayl) 0		
4 accl 0	ERAGE RAD (in) 2.75 3.25		ERAGE THICKN 0.35 (in) 0.55	UID TRAVEL TIM (usec/ft) 250 150		



OVALITY	LTEN	IRC VECTOR	TT AVERAGE	XIMUM IMPEDAN	HICKNESS VECTOR	IMPEDANCE360
0 (in) 0.2	0 (lb) 3000	0 360	25 (usec) 100	10 (MRayl) 0	0 360	0 6.15
ECCENTRICITY	EL BEARIN	2.76 3.26	XIMUM THICKN	NIMUM IMPEDAN	0.36 0.56	
0 (in) 1	0 (°) 360		0.35 (in) 0.55	10 (MRayl) 0		
GR	NCLINATION		NIMUM THICKNE	ERAGE IMPEDAN		
0 (GAPI) 200	0 (°) 90		0.35 (in) 0.55	10 (MRayl) 0		
4 accl 0	ERAGE RAD (in) 2.75 3.25		ERAGE THICKN 0.35 (in) 0.55	UID TRAVEL TIM (usec/ft) 250 150		

HALLIBURTON

REPEAT LOG SECTION

5" = 100'

Calibration Report

Database File: cs1_cast.db
Dataset Pathname: MAIN1
Dataset Creation: Thu Mar 27 15:37:31 2014 by Log Halliburton Casedho

Circumferential Acoustic Scanning Tool Shop Calibration Report

Serial-Model: 438_12030243-4 3/8 SCAN
Calibration Performed: Wed Mar 26 13:36:24 2014

	Mudcell Transducer		Main Transducer		
	Measured	Expected	Measured	Expected	Units
W/O Calibrator	48.20	44.00	N/A	N/A	usec
W Calibrator	39.40	35.00	55.65	50.00	usec

Calibrated Offsets

Name	Value	Units
TCAL	5.6459	usec
MCAL	4.1990	usec

XY Accelerometers Calibration Report

Performed: Not Performed

	Low Read.	High Read.		Low Ref.	High Ref.	
X Accelerometer	0.000	1.000	gee	0.000	1.000	gee
Y Accelerometer	0.000	1.000	gee	0.000	1.000	gee

Cement Bond Log Shop Calibration Report

Serial-Model: 11858780-A
Calibration Performed: Thu Mar 27 14:37:31 2014

Free Pipe Calibration

	Measured	Units
TT	287.6	usec
Amplitude	413.5	mV
Log Base Line	1.2	mV

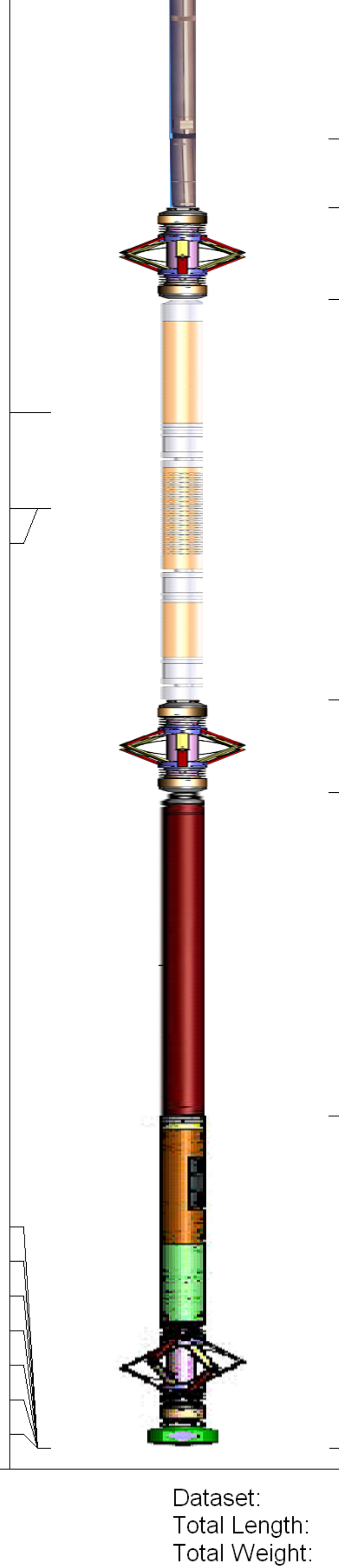
Calibration References and Gain

Name	Value	Units
Pipe O.D.	7.000	in
Pipe Weight	29.0	lb/ft
Pipe Ref. Amp.	62.2	mV
Amp. Gain	0.151	

Gamma Ray Calibration Report

Type / Serial: 002 / 11510512

	Counts/Sec.	Gain	Offset	Jig	Units
SHOP CALIBRATION	Thu Mar 27 13:46:07 2014				
Background	21.6				cps
Calibrator	217.3				cps
		2.2123			GAPI/cps
PRIMARY VERIFICATION	Thu Mar 27 13:49:18 2014				
Background	43.0				cps
Calibrator	480.5				cps
Difference				437.4	GAPI
BEFORE SURVEY VERIFICATION					
Background	0.0				cps
Calibrator	0.0				cps
Difference				0.0	GAPI
AFTER SURVEY VERIFICATION					
Background	0.0				cps
Calibrator	0.0				cps
Difference				0.0	GAPI

Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
			STND_CH 1.4375 IN CABLE HEAD	1.50	1.44	1.00
CCL	36.22					
GR	33.96		TTTCU-002 (11510512) Through Tubing Telemetry Cartridge - Ultrawire	7.66	1.69	37.00
			XHU-003 (12218041) Crossover Halliburton 1553 to Ultrawire	1.58	1.69	7.00
			CASTM-CENT CAST M INLINE CENTRALIZER	2.16	3.13	25.00
Temp	24.25					
AMP3FT	22.00		HCBLM-A (11858780) Halliburton HCBLM Tool	9.38	2.75	116.00
TT3FT	22.00					
			CASTM-CENT CAST M INLINE CENTRALIZER	2.16	3.13	25.00
			HAL-CAST-M-ELECT-CAST-M-Elect (1203 CAST M ELECTRONIC	7.58	2.75	30.00
LLMTEN	0.00					
LOCTIM	0.00		HAL-CAST-M-4 3/8 SCAN (438_120302 4 3/8 SCAN CASTM	7.78	4.38	276.00
SCAN	0.00					
AccX1	0.00					
AccY1	0.00					
AccX2	0.00					
AccY2	0.00					

Dataset: cs1_cast.db: field/well/run1/MAIN1
Total Length: 39.80 ft
Total Weight: 517.00 lb
O.D. 4.38 in

Company	KINDER MORGAN CO2 CO LP
Well	COW CANYON CS #1
Field	MCELMO DOME
County	MONTEZUMA
State	CO

HALLIBURTON

CIRCUMFERENTIAL
ACOUSTIC SCANNING
TOOL - MONOCABLE