

HALLIBURTON

DUAL LATEROLOG  
MICRO-SPHERICALLY  
FOCUSED LOG

COMPANY		KINDER MORGAN CO2 Co. L.P.	
WELL		GOODMAN POINT 27	
FIELD/BLOCK		MCELMO DOME	
COUNTY		MONTEZUMA	
STATE		CO	
Permanent Datum Log measured from Drilling measured from		GL KB KB KB	
Date		24-Aug-14	
Run No.		ONE	
Depth - Driller		8125.00 ft	
Depth - Logger		8073.0 ft	
Bottom - Logged Interval		8110.0 ft	
Top - Logged Interval		7400.0 ft	
Casing - Driller		7476.000 in @ 7476.0 ft	
Casing - Logger		7471.0 ft	
Bit Size		6.000 in	
Type Fluid in Hole		Water Based Mud	
Density		8.5 ppq	
Viscosity		29.00 s/qt	
PH		7.40 pH	
Fluid Loss		0.0 cpm	
Source of Sample		MUD TANK	
Rm @ Meas. Temperature		0.28 ohmm @ 65.20 degF	
Rmf @ Meas. Temperature		N/A @ N/A	
Rmc @ Meas. Temperature		N/A @ N/A	
Source Rmf		N/A	
Rmc		N/A	
Rm @ BHT		0.12 ohmm @ 160.0 degF	
Time Since Circulation		24.3 hr	
Time on Bottom		24-Aug-14 21:51	
Max. Rec. Temperature		160.0 degF @ 8073.0 ft	
Equipment		11871076 GJ CO	
Recorded By		P. DIMPFL	
Witnessed By		C. SLAUGH	

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WELL		GOODMAN POINT 27	
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STATE		CO	
Location		SURFACE HOLE LOCATION: 935' FSL & 2105' FEL BOTTOM HOLE LOCATION: 2225' FNL & 1096' FWL LATITUDE: 37.373670 LONGITUDE: -108.761870	
Sect. 18		Twp. 36N Rge. 17W	
Other Services:		TPL CSNG WSTT XRMI	
Elev. 7080.0 ft		Elev.: K.B. 7102.5 ft D.F. 7102.5 ft G.L. 7080.0 ft	

Fold here

Service Ticket No.: 901604134				API Serial No.: 05083067170000				PGM Version: WL INSITE R4.2.0 (Build 2)							
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE						RESISTIVITY SCALE CHANGES									
Date		Sample No.				Type Log		Depth		Scale Up Hole		Scale Down Hole			
Depth-Driller															
Type Fluid in Hole															
Density		Viscosity													
Ph		Fluid Loss													
Source of Sample						RESISTIVITY EQUIPMENT DATA									
Rm @ Meas. Temp		@		@		Run No.		Tool Type & No.		Pad Type		Tool Pos.		Other	
Rmf @ Meas. Temp.		@		@		ONE		DLLT		N/A		CENT		N/A	
Rmc @ Meas. Temp.		@		@				P744M864S19							
Source Rmf		Rmc				ONE		MSFL		SLIM PAD		CENT		N/A	
Rm @ BHT		@		@				10281166							
Rmf @ BHT		@		@											
Rmc @ BHT		@		@											
EQUIPMENT DATA															
GAMMA				ACOUSTIC				DENSITY				NEUTRON			
Run No.		ONE		Run No.				Run No.		ONE		Run No.		ONE	
Serial No.		11005602		Serial No.				Serial No.		10951300		Serial No.		10993888	
Model No.		GTET		Model No.				Model No.		SDLT-I		Model No.		DSNT-I	
Diameter		3.625"		No. of Cent.				Diameter		4.5"		Diameter		3.625"	
Detector Model No.		GTET		Spacing				Log Type		GAMMA-GAMMA		Log Type		NEU-THERM	
Type		SCINT						Source Type		Cs137		Source Type		Am241Be	
Length		8"		LSA [Y/N]				Serial No.		5153GW		Serial No.		DSN-388	
Distance to Source		N/A		FWDA [Y/N]				Strength		1.5 Ci		Strength		15 Ci	
LOGGING DATA															

GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	8110	7430	REC	0 API	150 API				30 %	-10 %	2.71 g/cc	30 %	-10 %	LIME
DIRECTIONAL INFORMATION														
Maximum Deviation						@	KOP						@	
Remarks: RUN ONE: CONNECTORSUB/FLEX/DTDD/HDDS/BRIDLE/CR/SP/BRIDLE/BS/GTET/FLEX/DLLT/MSFL/BN RAN IN COMBINATION														
ANNULAR HOLE VOLUME CALCULATED USING 4.5-INCH CASING														
MSFL CALIPER WAS CLOSED AT 7500FT DUE TO PROXIMITY TO CASING SHOE.														
CHLORIDES REPORTED TO BE 24,000 ppm														
MSFL CALIPER CLOSED AT 7482' DUE TO PROXIMITY TO CASING														
MUD PRESS PERFORMED, NO MUDCAKE/FILTRATE WAS PRODUCED														
DOWNLOG AND REPEAT NOT PERFORMED DUE TO TOOLPUSH CONVEYANCE.														
YOU CREW TODAY: B. CALDWELL, T. RAFF, N. EHLERS														
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, GRAND JUNCTION, CO (970) 523-3600														
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.														
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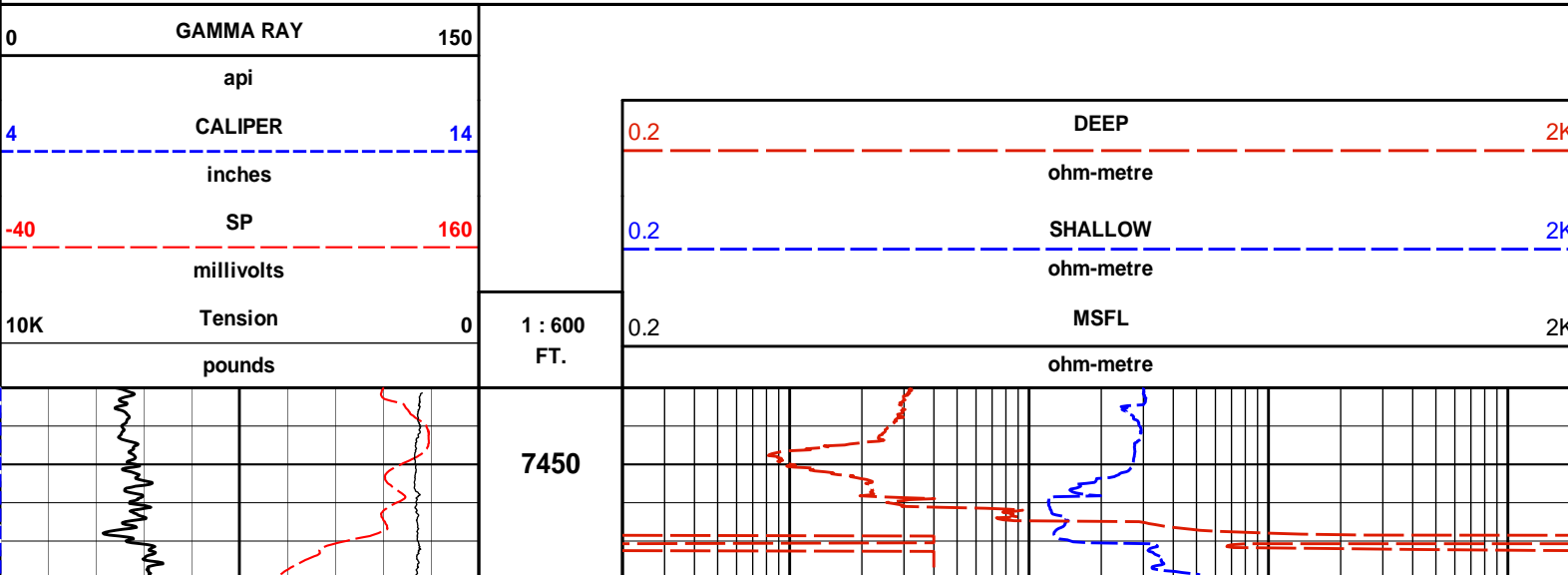
PARAMETERS REPORT

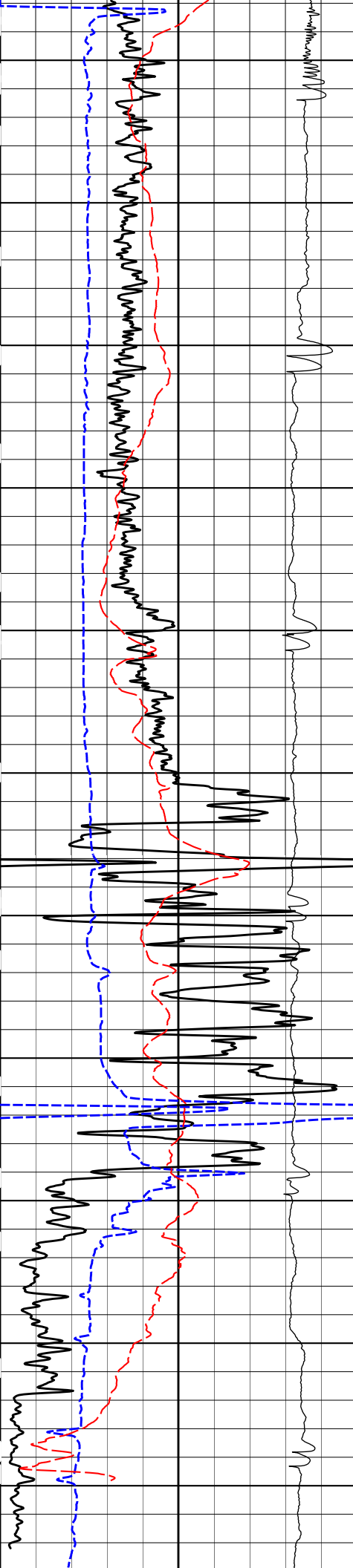
Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	6.000	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	8.500	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	35000.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	0.284	ohmm
	SHARED	TRM	Temperature of Mud	65.2	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	4.500	in
	SHARED	ST	Surface Temperature	65.0	degF
	SHARED	TD	Total Well Depth	8125.00	ft
	SHARED	BHT	Bottom Hole Temperature	180.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
	Rwa / CrossPlot	AFAC	Archie A factor	0.6200	

Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
Rwa / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
Rwa / CrossPlot	BHSM	Borehole Size Source Tool	MSFL	
GTET	GROK	Process Gamma Ray?	Yes	
GTET	GRSO	Gamma Tool Standoff	0.250	in
GTET	GEOK	Process Gamma Ray EVR?	No	
GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
GTET	BHSM	Borehole Size Source Tool	MSFL	
DLLT-I Sonde	DLOK	Process Dual Laterolog?	Yes	
DLLT-I Sonde	DBOK	Process Dual Laterolog Borehole Corrections?	Yes	
DLLT-I Sonde	SBHD	Select Borehole Diam Source	Caliper	
DLLT-I Sonde	TPOS	Tool Position	Standoff	
DLLT-I Sonde	TMPC	Temperature Correction Type	Tool Value	
DLLT-I Sonde	DLOK	Calculate Dual Laterolog DI?	Yes	
DLLT-I Sonde	BHSM	Borehole Size Source Tool	MSFL	
MSFL	DLOK	Process MSFL?	Yes	
MSFL	SLPD	Use MSFL Slim Hole Pad?	Yes	
MSFL	SPDF	MSFL Slim Hole Pad K Factor	1.750	
MSFL	CLOK	Process Caliper Outputs?	Yes	

Plot Time: 25-Aug-14 04:38:58  
 Plot Range: 7430 ft to 8073.83 ft  
 Data: GOODPOINT\_27\Well Based\DLLT\  
 Plot File: \\DLLT2" DLLT

MAIN PASS 2" = 100'





7500

7550

7600

7650

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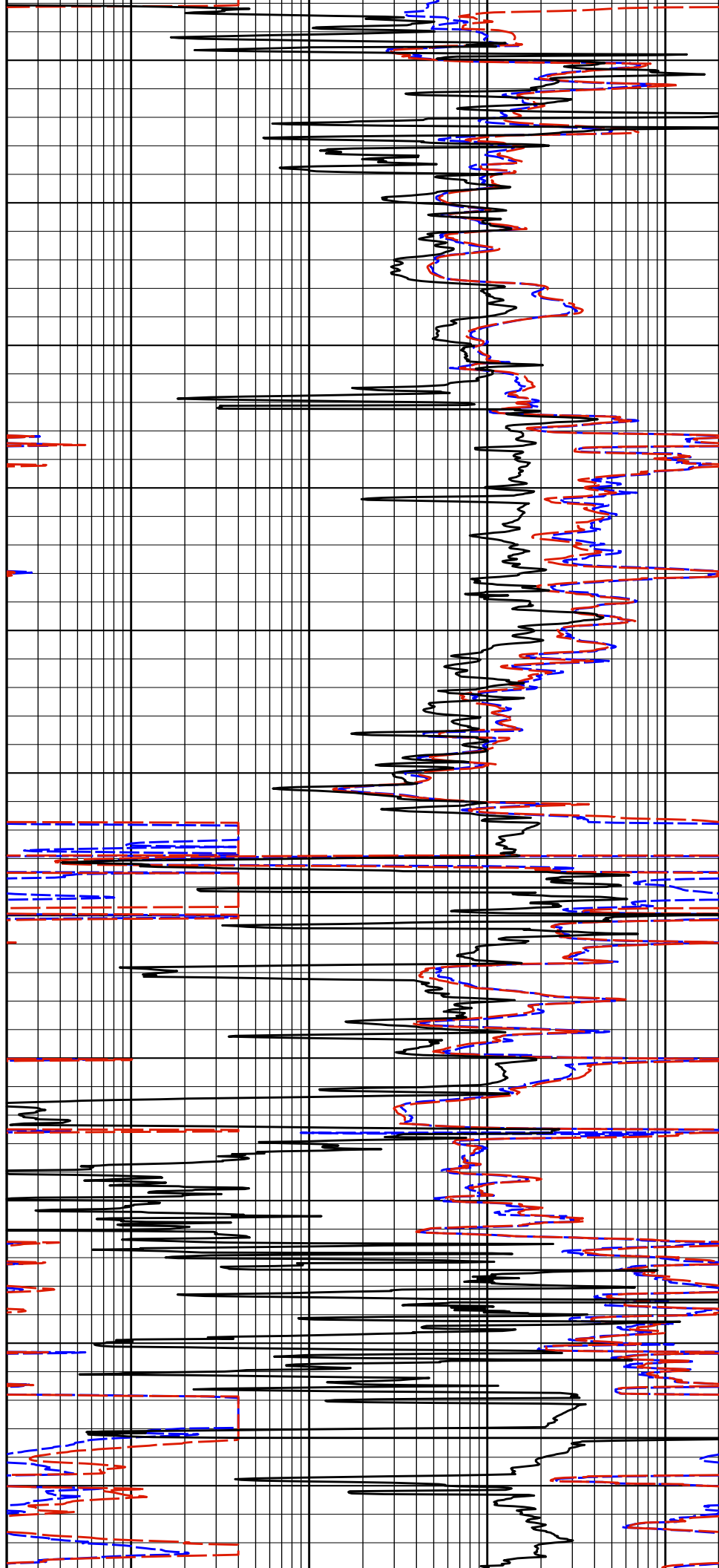
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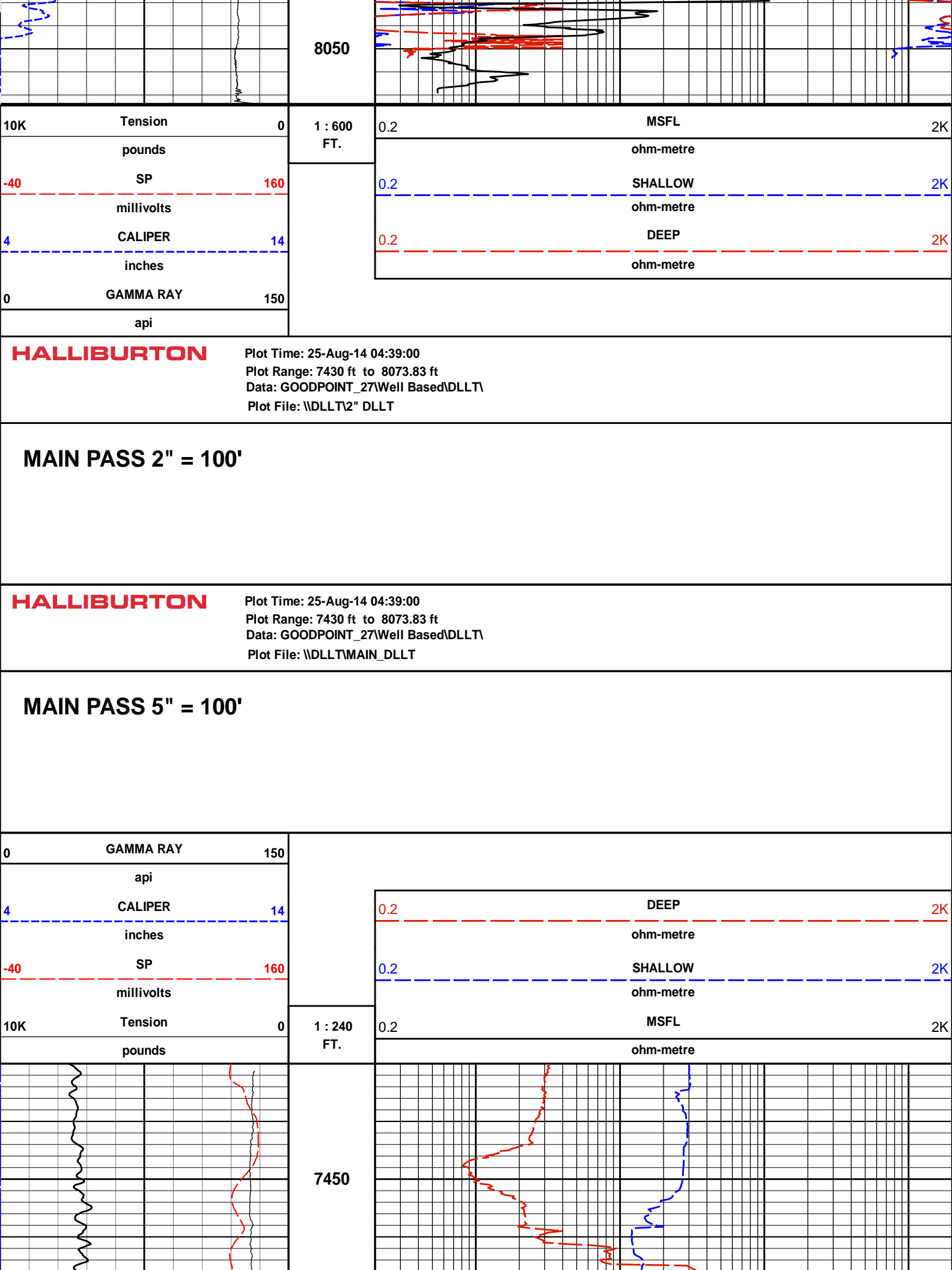
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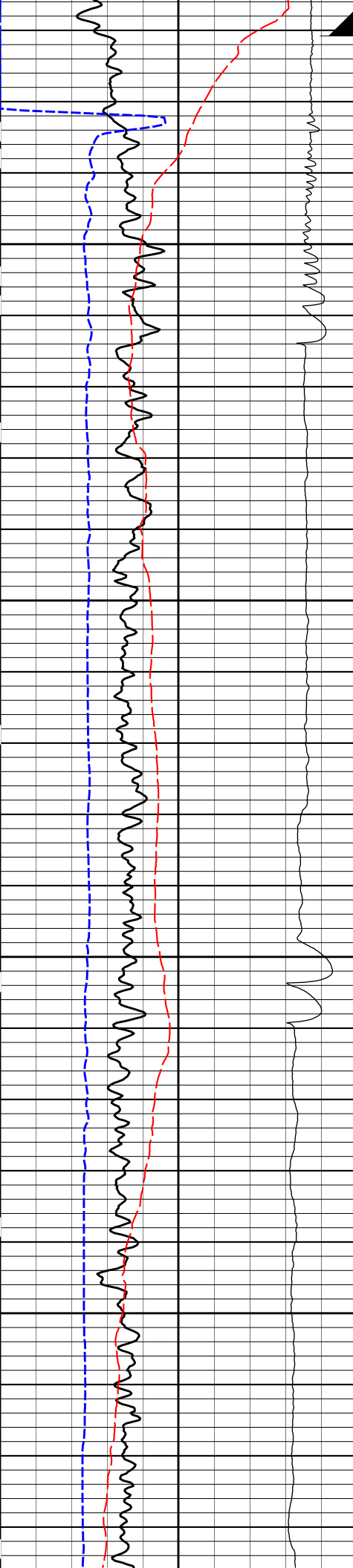
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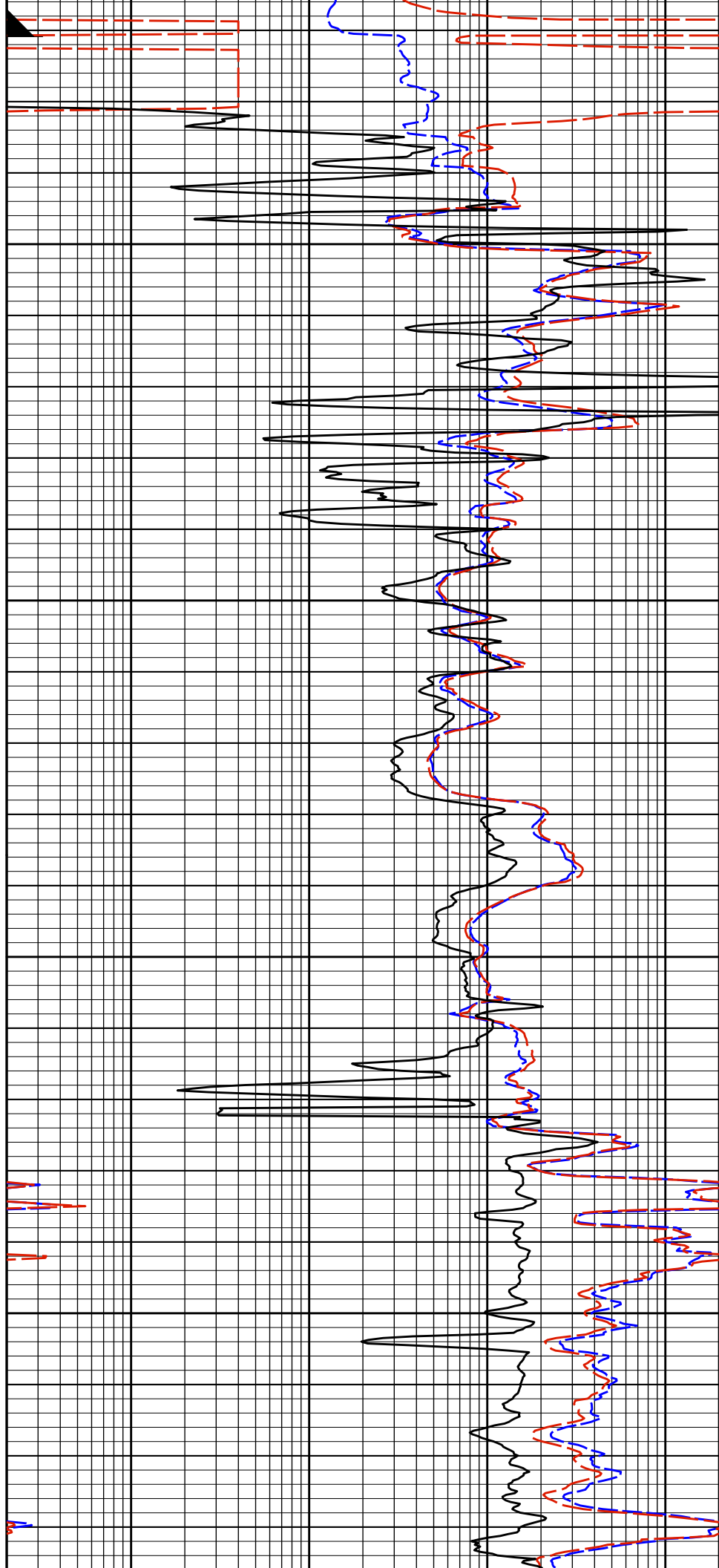
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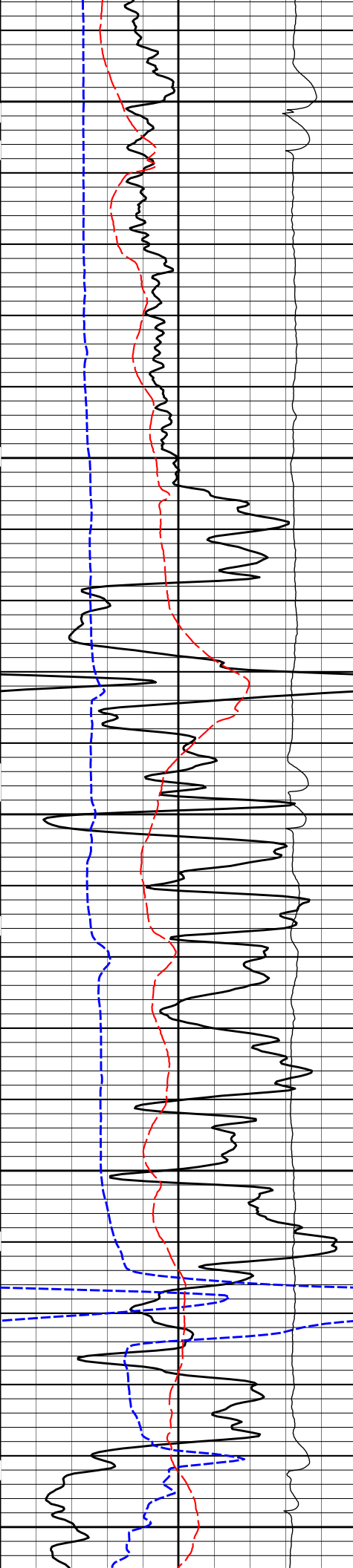
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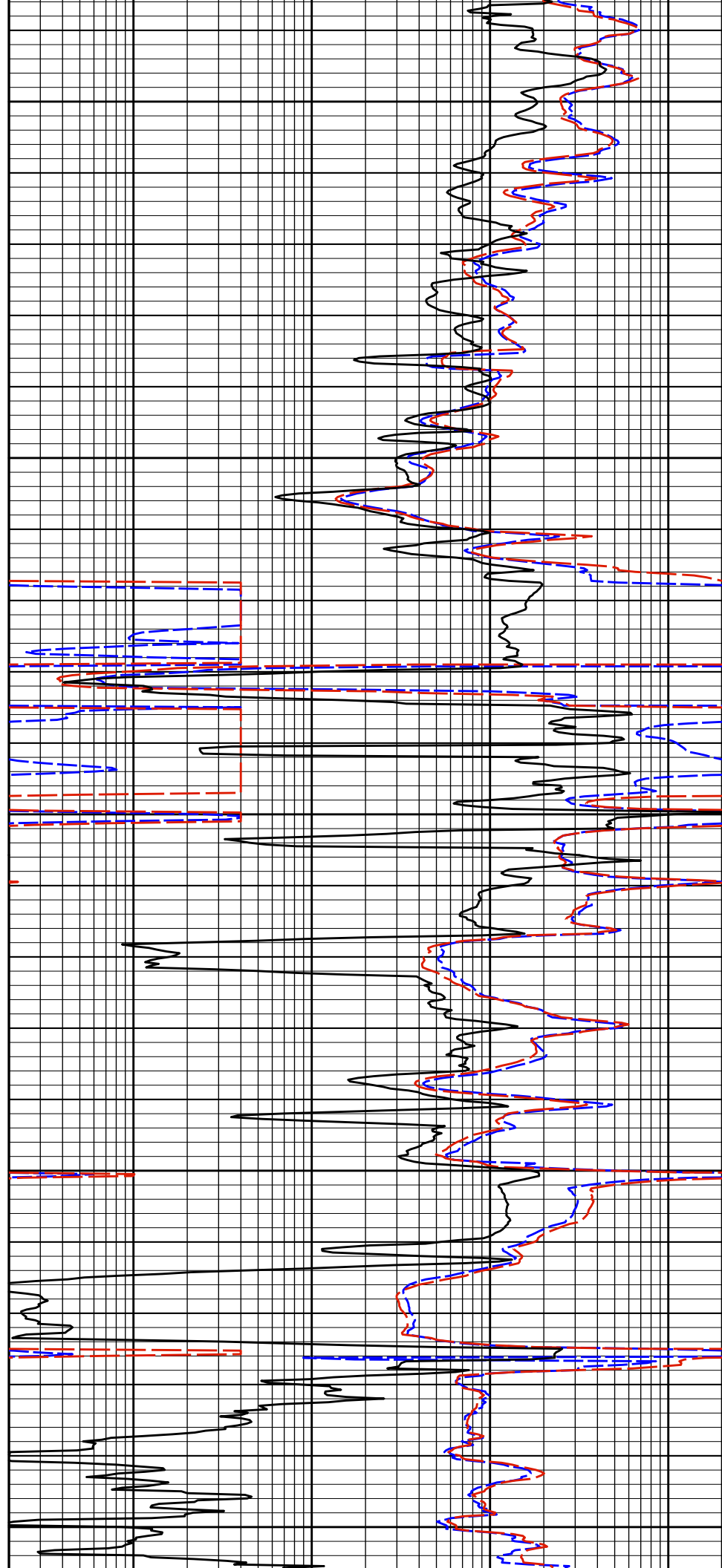
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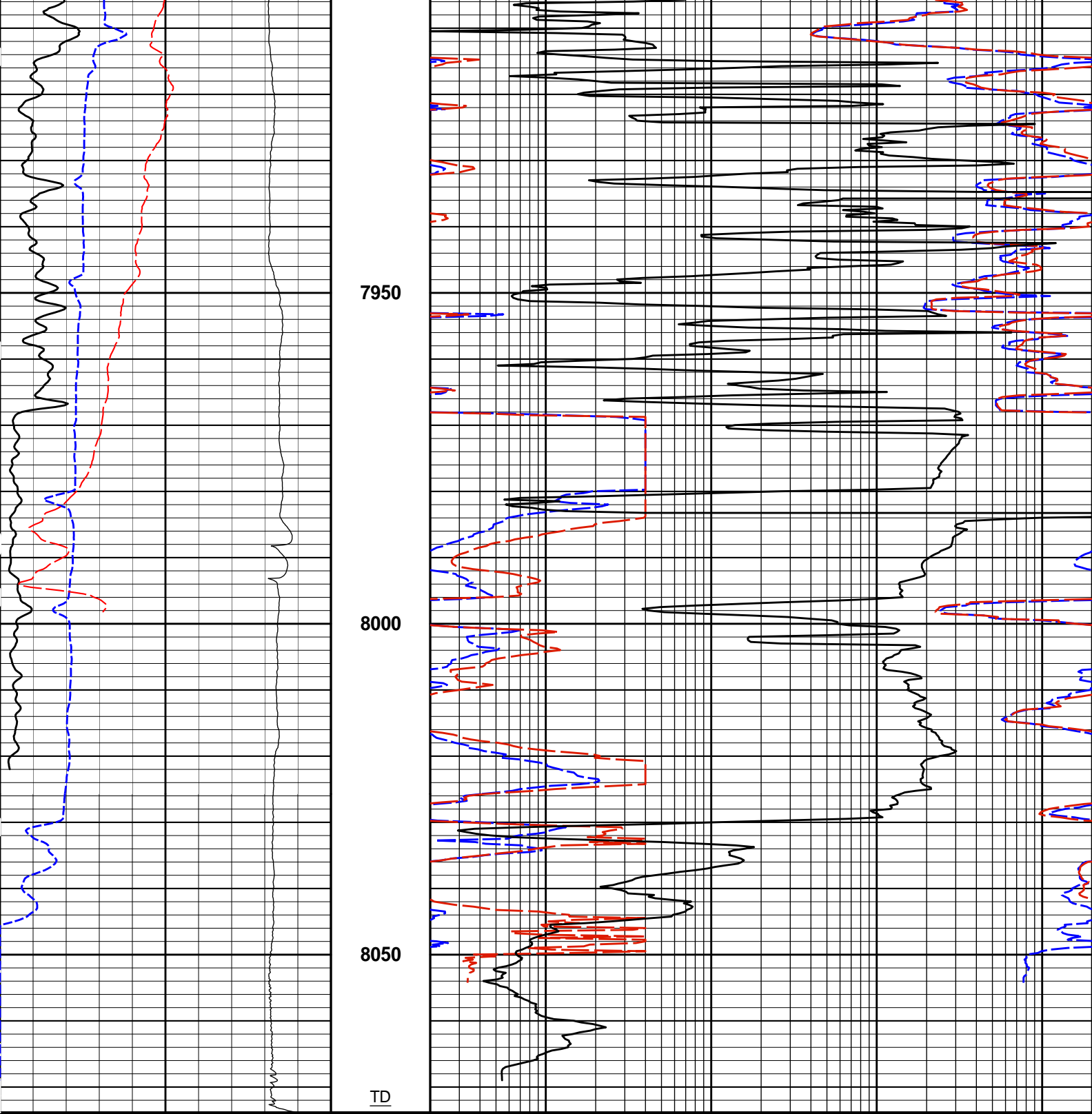
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10K	Tension	0	1 : 240	0.2	MSFL	2K
	pounds		FT.		ohm-metre	
-40	SP	160		0.2	SHALLOW	2K
	millivolts				ohm-metre	
4	CALIPER	14		0.2	DEEP	2K
	inches				ohm-metre	
0	GAMMA RAY	150				
	api					



**MAIN PASS 5" = 100'****HALLIBURTON****CALIBRATION REPORT****NATURAL GAMMA RAY TOOL SHOP CALIBRATION****Tool Name:** GTET - 11005602**Reference Calibration Date:** 07-Jun-14 11:26:04**Engineer:** P. DIMPFL**Calibration Date:** 13-Jul-14 18:28:44**Software Version:** WL INSITE R4.2.0 (Build 2)**Calibration Version:** 1

Calibrator Source S/N: MP051807-04

Calibrator API Reference:239.00 api

Equivalent Calibrator API Reference:243.2 api

Measurement	Measured	Calibrated	Units
Background	41.1	40.0	api
Background + Calibrator	291.4	283.2	api
Calibrator	250.2	243.2	api

**DUAL LATEROLOG SHOP CALIBRATION****Tool Name:** DLLT-I Sonde - P744M864S419**Reference Calibration Date:** 21-Jul-14 16:05:35**Engineer:** K. NORMAND**Calibration Date:** 21-Jul-14 16:10:23**Software Version:** WL INSITE R4.2.0 (Build 2)**Calibration Version:** 1**Host Tool Name:** DLLT-I Measurement - 10281396**Extra Host Tool Name1:** DLLT-I Power and Telemetry - 11280790

Measurement	Deep Measured	Deep Calibrated	Shallow Measured	Shallow Calibrated	Units
External Cal Point #1	1.02	1.04	0.97	1.00	ohmm
External Cal Point #2	119.47	119.47	99.93	99.63	ohmm
External Cal Point #3	1538.10	1541.79	1024.08	1019.96	ohmm
External Check Point	1535.53	1539.21	1023.21	1019.09	ohmm
Internal Reference	15.87	15.87	20.23	20.20	ohmm

**DUAL LATEROLOG FIELD CALIBRATION****Tool Name:** DLLT-I Sonde - P744M864S419**Reference Calibration Date:** 21-Jul-14 16:10:23**Engineer:** P. DIMPFL**Calibration Date:** 24-Aug-14 11:25:42**Software Version:** WL INSITE R4.2.0 (Build 2)**Calibration Version:** 1

Measurement	Deep Shop	Deep Field	Shallow Shop	Shallow Field	Units
Internal Reference	15.87	15.86	20.20	20.20	ohmm

**PASS/FAIL SUMMARY**

Measurement	Difference	Tolerance	Pass/Fail
Internal Deep	0.02	+/- 0.8	Passed
Internal Shallow	0.00	+/- 0.8	Passed

**MICRO SPHERICALLY FOCUSED LOG SHOP CALIBRATION****Tool Name:** MSEL - 10281166**Reference Calibration Date:** 21-Jul-14 16:16:00

Tool Name: MSFL - 10281166		Reference Calibration Date: 21-Jul-14 16:16:00				
Engineer: K. NORMAND	Calibration Date: 21-Jul-14 16:18:21					
Software Version: WL INSITE R4.2.0 (Build 2)	Calibration Version: 1					
Measurement		Measured	Calibrated	Units		
External Cal Point #1		0.20	0.20	ohmm		
External Cal Point #2		20.00	20.00	ohmm		
External Cal Point #3		2003.86	2000.00	ohmm		
Internal Reference		20.62	20.61	ohmm		
MICRO SPHERICALLY FOCUSED LOG FIELD CALIBRATION						
Tool Name: MSFL - 10281166		Reference Calibration Date: 21-Jul-14 16:18:21				
Engineer: P. DIMPFL		Calibration Date: 24-Aug-14 11:26:02				
Software Version: WL INSITE R4.2.0 (Build 2)		Calibration Version: 1				
Measurement	Shop	Field	Change	Control Limit On	Units	
Internal Reference	20.61	20.61	-0.005	0.800	ohmm	
PASS/FAIL SUMMARY						
Internal Reference:			Passed			
CALIPER SHOP CALIBRATION						
Tool Name: MSFL - 10281166		Reference Calibration Date: 21-Jul-14 16:22:02				
Engineer: K. NORMAND		Calibration Date: 21-Jul-14 16:24:02				
Software Version: WL INSITE R4.2.0 (Build 2)		Calibration Version: 1				
CALIBRATION RINGS AND INTERNAL						
Measurement		Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change		
RING DIAMETER:						
Ring #1 (in)		8.27	8.25	0.0200		
Ring #2 (in)		15.00	15.00	0.0000		
Hi/Lo Internal:						
Lo Internal (in)		3.27	3.24	0.0300		
Hi Internal (in)		12.62	12.61	0.0100		
CALIPER FIELD CALIBRATION						
Tool Name: MSFL - 10281166		Reference Calibration Date: 21-Jul-14 16:24:02				
Engineer: P. DIMPFL		Calibration Date: 24-Aug-14 11:26:33				
Software Version: WL INSITE R4.2.0 (Build 2)		Calibration Version: 1				
MEASURED CALIPER VALUES						
Measurement	Shop	Field	Change	Control Limit On New Value		
Lo Internal (in)	3.24	3.24	-0.008	+/- 0.500		
Hi Internal (in)	12.61	12.61	0.002	+/- 0.500		
PASS/FAIL SUMMARY						
Lo Internal Check:			Passed			
Hi Internal Check:			Passed			
CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11005602						
Gamma Ray Calibrator	243.2	-----	-----	0.0	+/- 9.00	api

# DLLT-I Sonde-P744M864S419

Deep Internal Ref.	15.87	15.86	-----	0.01	+/- 0.8	ohmm
Shallow Internal Ref.	20.20	20.20	-----	0.00	+/- 0.8	ohmm
MSFL-10281166						
MSFL Internal Ref.	20.61	20.61	-----	0.00	+/- 0.800	ohmm
Caliper Lo. Internal	3.24	3.24	-----	0.00	+/- 0.500	in
Caliper Hi. Internal	12.61	12.61	-----	0.00	+/- 0.500	in
Data: GOODPOINT_27\0001 TPL_DLLT\002 24-Aug-14 21:51 Up @8074.0f						
Date: 25-Aug-14 04:24:27						

## HALLIBURTON

### TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
Spacer-12345678 100.00 lbs		Ø 3.625 in →			5.70 ft	113.47 ft
Flex Joint - Pressure Comp- 10566136 140.00 lbs		Ø 3.625 in →			5.97 ft	107.77 ft
DTDD-11411576 90.00 lbs		Ø 3.625 in →		← Load Cell @ 100.71 ft ← Pad Locator @ 99.12 ft	3.66 ft	101.80 ft
HDDS-A-11736444 125.00 lbs		Ø 4.060 in →			4.13 ft	98.14 ft
						94.02 ft
Isolator Assy.- 12345671 274.00 lbs		Ø 3.625 in →			15.00 ft	
Return Electrode- 10900836 57.00 lbs		Ø 3.625 in →			2.50 ft	79.02 ft
SP Sub-11253522		Ø 3.625 in →		SP @ 74.74 ft		76.52 ft

