

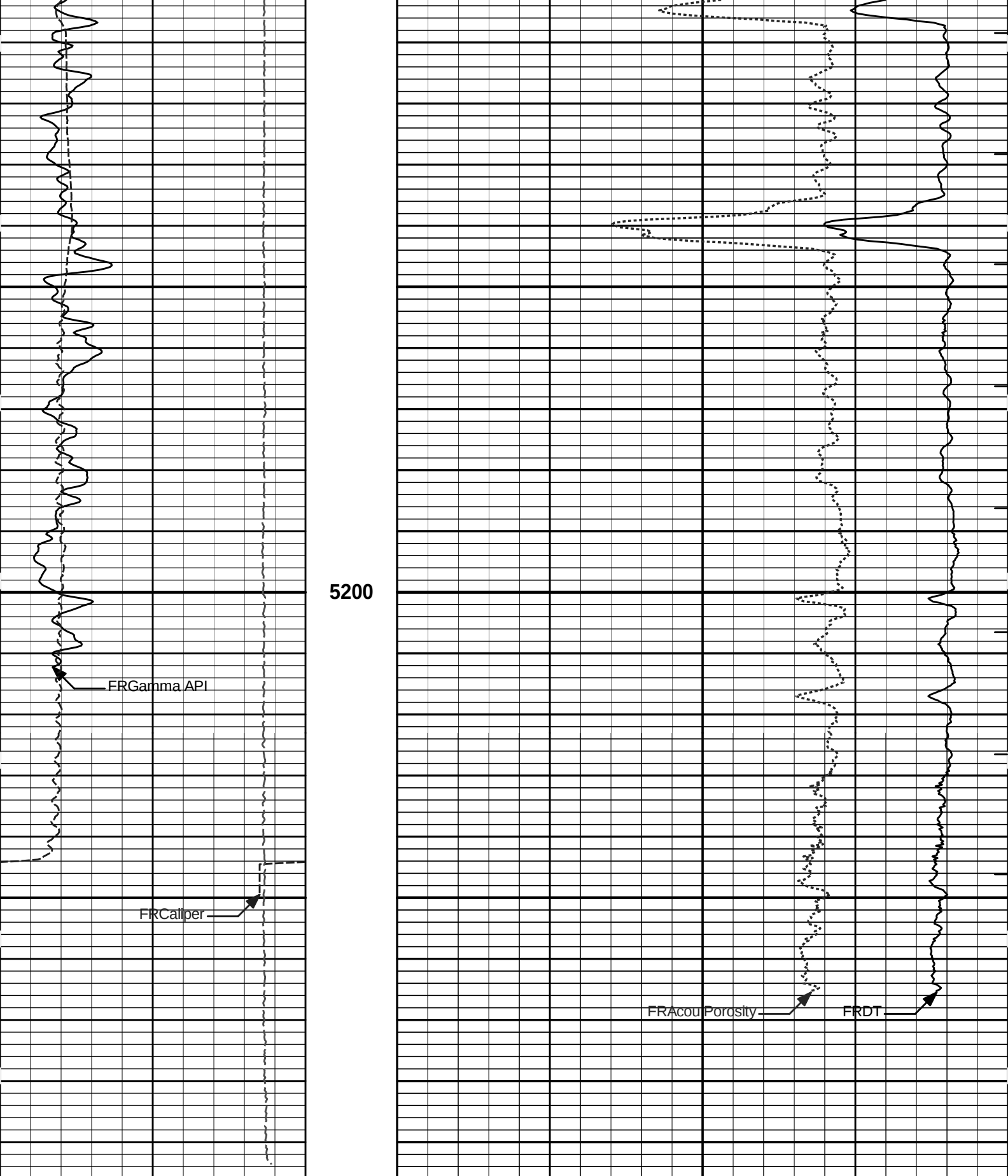
BOREHOLE COMPENSATED SONIC ARRAY LOG

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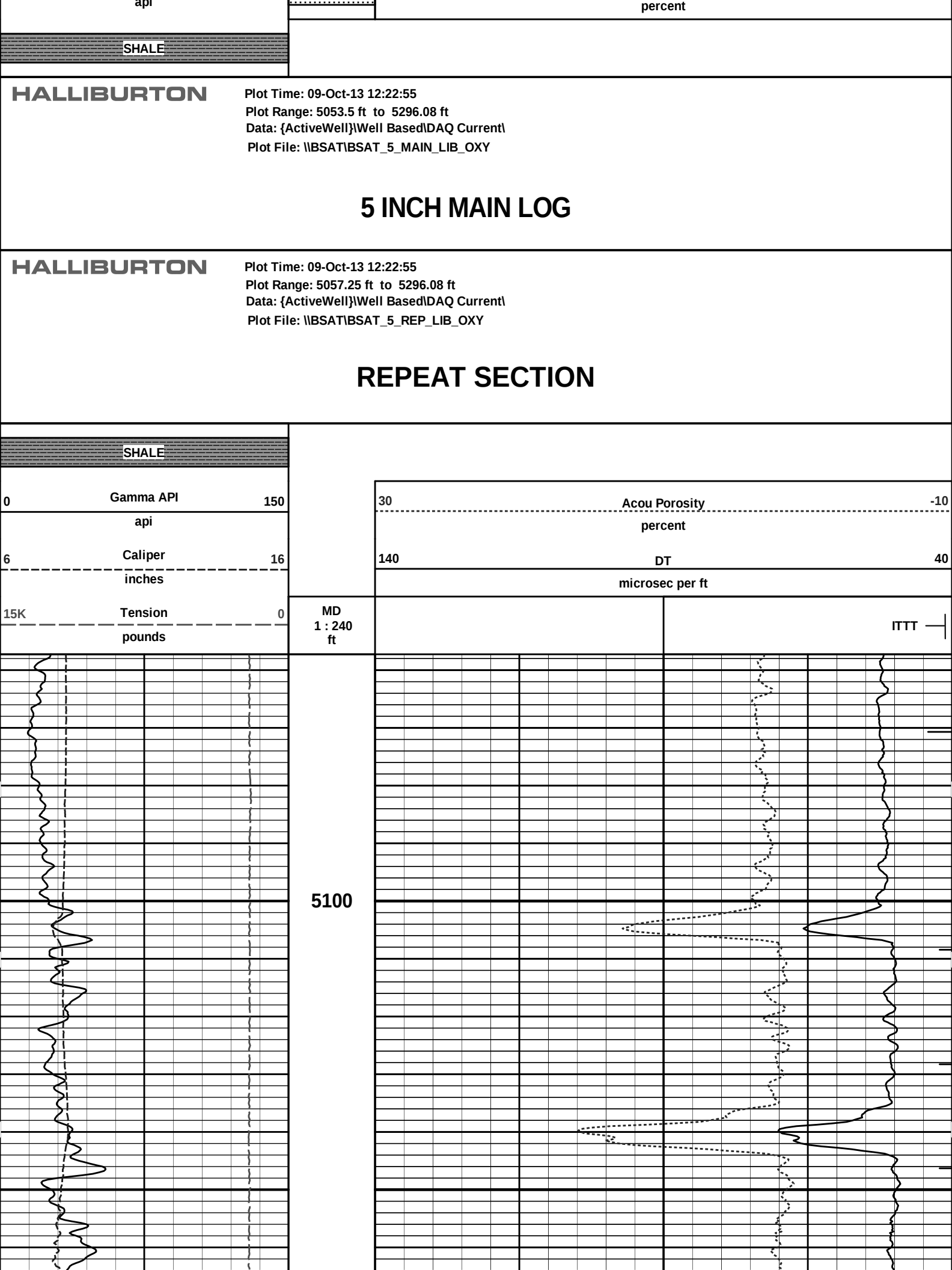
LOGGING DATA

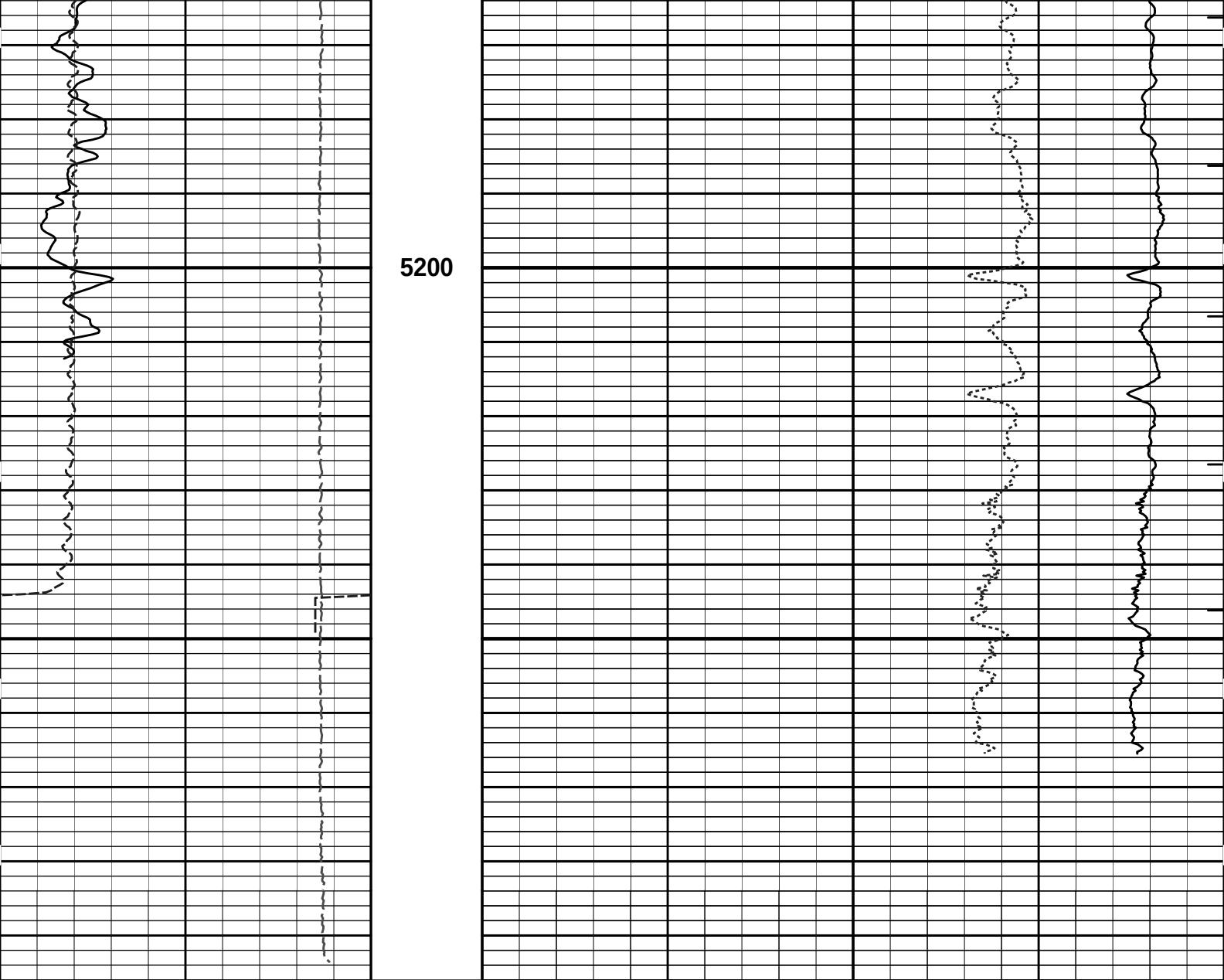
GENERAL			GAMMA		ACOUSTIC			DENSITY			NEUTRON			
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	5293	1640	REC	0	150	30	-10	47.6						
DIRECTIONAL INFORMATION														
Maximum Deviation @								KOP @						
Remarks: ANNULAR HOLE VOLUME CALCULATED FOR 5.5-INCH CASING														
CHLORIDES REPORTED AT 3,000 MG/L														
LCM REPORTED AT 2 LB/BSL														
GTET-HFDT-DSNT-SDLT-BSAT-ACRT RUN IN COMBINATION														
TODAY'S CREW: F. VILLA & V. JAIME														
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KS. 620-624-8123														
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.														
HALLIBURTON														

SHALE			
0	Gamma API	150	
	api		
6	Caliper	16	
	inches		
15K	Tens	0	
	pounds		
		MD 1 : 240 ft	
		5100	



15K	Tens	0	MD			ITTT
	pounds		1 : 240			
			ft			
6	Caliper	16	Tension Pull	140	DT	40
	inches		10		microsec per ft	
0	Gamma API	150			Acou Porosity	-10
			Tension Pull	30		





15K	Tension	0	MD		
	pounds		1 : 240		ITTT
6	Caliper	16		140	DT
	inches				microsec per ft
0	Gamma API	150		30	Acou Porosity
	api				percent
SHALE					

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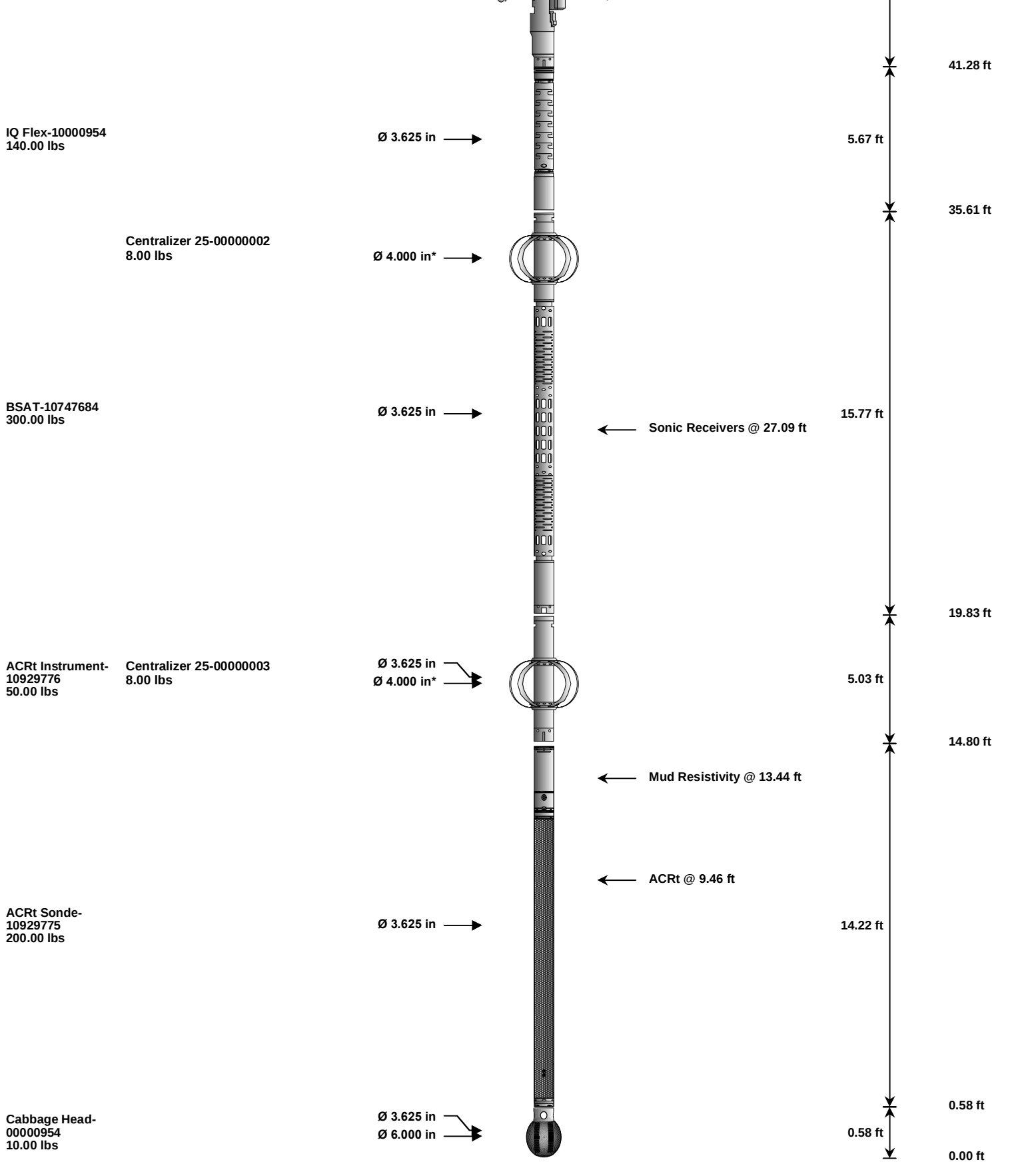
Plot Time: 09-Oct-13 12:22:56
Plot Range: 5057.25 ft to 5296.08 ft
Data: {ActiveWell}\Well Based\DAQ Current\
Plot File: \\BSAT\BSAT_5_REP_LIB_OXY

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
					96.42 ft	
RWCH-11435227 135.00 lbs		Ø 3.625 in →		← Load Cell @ 92.74 ft ← BH Temperature @ 92.17 ft	6.25 ft	
SP Sub-12345678 60.00 lbs		Ø 3.625 in →		← SP @ 88.39 ft	3.74 ft	90.17 ft
						86.43 ft
GTET-10748374 165.00 lbs		Ø 3.625 in →		← GammaRay @ 80.37 ft	8.52 ft	
						77.91 ft
HFDT-I- I258M331P434 435.00 lbs		Ø 4.500 in →			16.14 ft	
		Ø 4.750 in →		Receiver Upper @ 64.93 ft HFDT-I Receiver @ 64.83 ft Receiver Middle @ 64.83 ft HFDT Microlog @ 64.78 ft Receiver Lower @ 64.73 ft HFDT-I Caliper @ 64.59 ft HFDT-I Pad @ 64.06 ft		
	DSN Decentralizer - Large Hole-00000001 6.60 lbs	Ø 5.000 in* →				61.78 ft
DSNT-10735145 174.00 lbs		Ø 3.625 in →		← DSN Far @ 54.84 ft ← DSN Near @ 54.09 ft	9.69 ft	
						52.09 ft
SDLT-10673803 360.00 lbs	SDLT Pad-10673790 65.00 lbs Microlog Pad-10673803 8.00 lbs	Ø 4.500 in → Ø 4.750 in* → Ø 4.750 in* →	Microlog @ 44.28 ft SDL Caliper @ 44.09 ft SDL @ 44.08 ft	10.81 ft		



Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
RWCH		Releasable Wireline Cable Head	11435227	135.00	6.25	90.17	300.00
SP		SP Sub	12345678	60.00	3.74	86.43	300.00
GTET		Gamma Telemetry Tool	10748374	165.00	8.52	77.91	60.00
HFDT		High Frequency Dielectric Tool	I258M331P434	435.00	16.14	61.78	30.00
DSNT		Dual Spaced Neutron	10735145	174.00	9.69	52.09	60.00
DCNT		DSN Decentralizer Large Hole	00000001	6.60	9.42	55.42	300.00
SDLT		Spectral Density Tool	10673803	360.00	10.81	41.28	60.00
MICP		Microlog Pad	10673803	8.00	1.00	43.78	60.00
SDLR		Density Insite Pad	10673790	65.00	2.55	43.49	60.00

SDLP	Density Inside Pad	10073790	65.00	2.33	45.49	60.00
IQF	IQ Flex tool	10000954	140.00	5.67	35.61	300.00
BSAT	Borehole Sonic Array Tool	10747684	300.00	15.77	19.83	60.00
OBCEN	Centralizer - 25 in. Overbody	00000002	8.00	2.08 *	32.75	300.00
ACRt	Array Compensated True Resistivity Instrument Section	10929776	50.00	5.03	14.80	300.00
OBCEN	Centralizer - 25 in. Overbody	00000003	8.00	2.08 *	16.12	300.00
ACRt	Array Compensated True Resistivity Sonde Section	10929775	200.00	14.22	0.58	300.00
CBHD	Cabbage Head	00000954	10.00	0.58	0.00	300.00
Total			2,124.60	96.42		
* Not included in Total Length and Length Accumulation.						
Data: DRUSSEL_E-4I0001 SP-GTET-HFDT-DSN-SDL-FLEX-BSAT-ACRT-CHMDLE					Date: 09-Oct-13 08:49:41	

HALLIBURTON						
PARAMETERS REPORT						
Depth (ft)	Tool Name	Mnemonic	Description	Value	Units	
TOP						
	SHARED	BS	Bit Size	7.875	in	
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No		
	SHARED	MDBS	Mud Base	Water		
	SHARED	MDWT	Borehole Fluid Weight	10.000	ppg	
	SHARED	WAGT	Weighting Agent	Natural		
	SHARED	BSAL	Borehole salinity	0.00	ppm	
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm	
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%	
	SHARED	RMUD	Mud Resistivity	2.000	ohmm	
	SHARED	TRM	Temperature of Mud	75.0	degF	
	SHARED	CSD	Logging Interval is Cased?	No		
	SHARED	ICOD	AHV Casing OD	5.500	in	
	SHARED	ST	Surface Temperature	75.0	degF	
	SHARED	TD	Total Well Depth	5293.00	ft	
	SHARED	BHT	Bottom Hole Temperature	200.0	degF	
	SHARED	SVTM	Navigation and Survey Master Tool	NONE		
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET		
	SHARED	TEMM	Temperature Master Tool	NONE		
	SHARED	BHSM	Borehole Size 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		
	GTET	GROK	Process Gamma Ray?	Yes		
	GTET	GRSO	Gamma Tool Standoff	0.000	in	
	GTET	GEOK	Process Gamma Ray EVR?	No		
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered		
	HFDT-I	HFOK	Do HFDT Calculations?	Yes		

HFDT-I	RMF	Mud Filtrate Resistivity	0.70	ohmm
HFDT-I	RMFT	Temperature of Mud Filtrate	132.00	degF
HFDT-I	MDIL	Matrix Dielectric Constant	8.000	
HFDT-I	HRTC	HFDT Insite Temperature Correction Source	PADTEMP1	
HFDT-I	CLOK	Process Caliper Outputs?	Yes	
HFDT-I	SAO	SDL Backup Arm Offset	0.00	in
HFDT-I	PAO	Pad Arm Offset	0.00	in
HFDT-I	MLOK	Process MicroLog Outputs?	Yes	
HFDT-I	MINO	Microlog Lateral Offset	0.00	ohmm
HFDT-I	MNOO	Microlog Normal Offset	0.00	ohmm
DSNT	DNOK	Process DSN?	Yes	
DSNT	DEOK	Process DSN EVR?	No	
DSNT	NLIT	Neutron Lithology	Limestone	
DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
DSNT	DNTP	Temperature Correction Type	None	
DSNT	DPRS	DSN Pressure Correction Type	None	
DSNT	SHCO	View More Correction Options	No	
DSNT	UTVD	Use TVD for Gradient Corrections?	No	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	No	
SDLT Pad	CB	Logging Calibration Blocks?	No	
SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta -T Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	User define	
BSAT	DTMA	Delta -T Matrix	47.60	uspf
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
ACRt Sonde	TPOS	Tool Position	Free Hanging	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
ACRt Sonde	MRFX	Fixed mud resistivity	2000	ohmm
BOTTOM_____				
Data: DRUSSEL_E-4I0001 SP-GTET-HFDT-DSN-SDL-FLEX-BSAT-ACRT-CH1DLE				Date: 09-Oct-13 10:20:56

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INPUTS, DELAYS AND FILTERS TABLE

Mnemonic	Input Description	Delay (ft)	Filter Type	Filter Length (ft)
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Depth Panel				
TENS	Tension	0.00	NO	
RWCH				
DHTN	DownholeTension	0.00	BLK	0.000
SP Sub				
PLTC	Plot Control Mask	88.39	NO	
SP	Spontaneous Potential	88.39	BLK	1.250
SPR	Raw Spontaneous Potential	88.39	NO	
SPO	Spontaneous Potential Offset	88.39	NO	
GTET				
TPUL	Tension Pull	80.37	NO	
GR	Natural Gamma Ray API	80.37	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API	80.37	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution	80.37	W	1.416 , 0.750
ACCZ	Accelerometer Z	0.00	BLK	0.083
DEVI	Inclination	0.00	NO	
HFDT-I				
TPUL	Tension Pull	64.83	NO	
IUXU	HFDT Insite In-phase Component of Upper Receiver - TXUon TXLoff	64.83	NO	
QUXU	HFDT Insite Quadrture Component of Upper Receiver - TXUon TXLof	64.83	NO	
IMXU	HFDT Insite In-phase Component of Middle Receiver TXUon TXLoff	64.83	NO	
QMXU	HFDT Insite Quadrture Component of Middle Receiver TXUon TXLof	64.83	NO	
ILXU	HFDT Insite In-phase Component of Lower Receiver TXUon TXLoff	64.83	NO	
QLXU	HFDT Insite Quadrture Component of Lower Receiver TXUon TXLoff	64.83	NO	
IUXL	HFDT Insite In-phase Component of Upper Receiver TXUoff TXLon	64.83	NO	
QUXL	HFDT Insite Quadrture Component of Upper Receiver TXUoff TXLon	64.83	NO	
IMXL	HFDT Insite In-phase Component of Middle Receiver TXUoff TXLon	64.83	NO	
QMXL	HFDT Insite Quadrture Component of Middle Receiver TXUoff TXLo	64.83	NO	
ILXL	HFDT Insite In-phase Component of Lower Receiver TXUoff TXLon	64.83	NO	
QLXL	HFDT Insite Quadrture Component of Lower Receiver TXUoff TXLon	64.83	NO	
TEX1	HFDTInsite External Pad Temperature Measurement 1	64.06	NO	
TEX2	HFDTInsite External Pad Temperature Measurement 2	64.06	NO	
STAT	HFDT Insite Pad Status Word	64.83	NO	
TPUL	Tension Pull	64.59	NO	
PCAL	Pad Caliper	64.59	TRI	0.250
ACAL	Arm Caliper	64.59	TRI	0.250
TPUL	Tension Pull	64.78	NO	
MINV	Microlog Lateral	64.78	BLK	0.750
MNOR	Microlog Normal	64.78	BLK	0.750
DSNT				
TPUL	Tension Pull	53.99	NO	
RNDS	Near Detector Telemetry Counts	54.09	BLK	1.417
RFDS	Far Detector Telemetry Counts	54.84	TRI	0.583
DNTT	DSN Tool Temperature	54.09	NO	
DSNS	DSN Tool Status	53.99	NO	

ERND	Near Detector Telemetry Counts EVR	54.09	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	54.84	BLK	0.000
ENTM	DSN Tool Temperature EVR	54.09	NO	
SDLT				
TPUL	Tension Pull	44.09	NO	
PCAL	Pad Caliper	44.09	TRI	0.250
ACAL	Arm Caliper	44.09	TRI	0.250
BSAT				
TPUL	Tension Pull	27.09	NO	
STAT	Status	27.09	NO	
DLYT	Delay Time	27.09	NO	
SI	Sample Interval	27.09	NO	
TXRX	Raw Telemetry 10 Receivers	27.09	NO	
FRMC	Tool Frame Count	27.09	NO	
GMOD	Gain processing mode	19.83	NO	
ACRt Sonde				
TPUL	Tension Pull	2.97	NO	
F1R1	ACRT 12KHz - 80in R value	9.22	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	9.22	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.72	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.72	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	5.22	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	5.22	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	4.22	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	4.22	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.72	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.72	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.47	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.47	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	9.22	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	9.22	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.72	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.72	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	5.22	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	5.22	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	4.22	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	4.22	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.72	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.72	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.47	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.47	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	9.22	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	9.22	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.72	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.72	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	5.22	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	5.22	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	4.22	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	4.22	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.72	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.72	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.47	BLK	0.000
F3X6	ACRT 72KHz - 6in X value	3.47	BLK	0.000

3XX6	ACRT 72KHZ - 6in X Value	3.47	BLK	0.000
RMUD	Mud Resistivity	12.76	BLK	0.000
F1RT	Transmitter Current Raw 12K X Receiver	2.97	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.97	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.97	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.97	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.97	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.97	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.97	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.97	BLK	0.000
ITMP	Instrument Temperature	2.97	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.97	NO	
TIDV	Instrument Temperature Derivative	2.97	NO	
TUDV	Upper Temperature Derivative	2.97	NO	
TLDV	Lower Temperature Derivative	2.97	NO	
TRBD	Receiver Board Temperature	2.97	NO	
SDLT Pad				
TPUL	Tension Pull	44.08	NO	
NAB	Near Above	43.90	BLK	0.920
NHI	Near Cesium High	43.90	BLK	0.920
NLO	Near Cesium Low	43.90	BLK	0.920
NVA	Near Valley	43.90	BLK	0.920
NBA	Near Barite	43.90	BLK	0.920
NDE	Near Density	43.90	BLK	0.920
NPK	Near Peak	43.90	BLK	0.920
NLI	Near Lithology	43.90	BLK	0.920
NBAU	Near Barite Unfiltered	43.90	BLK	0.250
NLIU	Near Lithology Unfiltered	43.90	BLK	0.250
FAB	Far Above	44.26	BLK	0.250
FHI	Far Cesium High	44.26	BLK	0.250
FLO	Far Cesium Low	44.26	BLK	0.250
FVA	Far Valley	44.26	BLK	0.250
FBA	Far Barite	44.26	BLK	0.250
FDE	Far Density	44.26	BLK	0.250
FPK	Far Peak	44.26	BLK	0.250
FLI	Far Lithology	44.26	BLK	0.250
PTMP	Pad Temperature	44.09	BLK	0.920
NHV	Near Detector High Voltage	43.49	NO	
FHV	Far Detector High Voltage	43.49	NO	
ITMP	Instrument Temperature	43.49	NO	
DDHV	Detector High Voltage	43.49	NO	
Microlog Pad				
TPUL	Tension Pull	44.28	NO	
MINV	Microlog Lateral	44.28	BLK	0.750
MNOR	Microlog Normal	44.28	BLK	0.750
Data: DRUSSEL_E-4I0001 SP-GTET-HFDT-DSN-SDL-FLEX-BSAT-ACRT-CHIIDLE			Date: 09-Oct-13 08:50:08	

COMPANY	OXY USA INC.
WELL	DRUSSEL E-4
FIELD	HUGOTON GAS AREA

COUNTY	FINNEY	STATE	KANSAS
HALLIBURTON		BOREHOLE COMPENSATED SONIC ARRAY LOG	