



**SEGMENTED BOND TOOL
GAMMA RAY LOG
CASING COLLAR LOCATOR**

FILE NO: MD11831	COMPANY HOLLY FRONTIER - NAVAJO
API NO: 30-015-44677	WELL NAVAJO REFINING WDW #4
	FIELD ARTESIA
	COUNTY EDDY STATE NEW MEXICO

Ver. 4.10	LOCATION: 1217' FSL & 2443' FWL SECTION 23, T17S, R27E N.M.P.M. SURVEY	OTHER SERVICES TEMP
FINAL PRINT		

PERMANENT DATUM	GL	ELEVATION	KB 3565.8 FT
LOG MEASURED FROM	KB	20 FT	ABOVE P.D.
DRILL. MEAS. FROM	KB		ELEVATIONS: KB 3565.8 FT DF 3584.8 FT GL 3565.8 FT

DATE	RUN	TRIP	1	1
SERVICE ORDER			134525	
DEPTH DRILLER			10317 FT	
DEPTH LOGGER			10346 FT	
BOTTOM LOGGED INTERVAL			10346 FT	
TOP LOGGED INTERVAL			5800 FT	
TIME STARTED			15:00	
TIME FINISHED			20:00	
OPERATOR RIG TIME			5.0 hrs	
TYPE OF FLUID IN HOLE			FRESH WATER	
FLUID DENSITY			8.33 LB/G	
FLUID SALINITY			NA	
FLUID LEVEL			0 FT	
LOGGED CEMENT TOP			NL	
WELLHEAD PRESSURE			0 PSI	
MAXIMUM HOLE DEVIATION			NA	
NOMINAL LOGGING SPEED			30 FMIN	
MAX. RECORDED TEMP.			NA	
REFERENCE LOG			MLL/RTEX/ZDL/CN/GR	
REFERENCE LOG DATE			29-Jun-2018	
EQUIP. NO.		LOCATION	HL6845	MIDLAND, TX
RECORDED BY			O. ROBLES / B. TELLER	
WITNESSED BY			K. COOK	

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE THE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

BOREHOLE RECORD		
BIT SIZE	FROM	TO
17.5 IN	80 FT	1680 FT
12.25 IN	1680 FT	10317 FT

CASING RECORD				
SIZE	WEIGHT	GRADE	FROM	TO
13.375 IN	54.5 LB/F		0 FT	1680 FT
9.625 IN	47 LB/F		0 FT	10317 FT

REMARKS

RUN 1 TRIP 1: CASING OD: 9.625 IN
CASING WEIGHT: 47 LBS/FT
COMPRESSIVE STRENGTH: 2000 (ACTUAL UNKNOWN)

LOG RUN WITH 0 PSI
LOG CORRELATED TO MLL/RTEX/ZDL/CN/SL BAKER HUGHES LOG FROM 29-JUN-2018

RIG: PATRIOT #4
CREW: BECK / TELLER / ROBLES

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	CC	2212361	122722	1680 FT

1	1	CCL	2346XA	120729	4ARMS
1	1	GR	1339XA	13189938	FREE
1	1	SBT EL	1633EA	153310	FREE
1	1	CENT	4341XA	12492924	
1	1	SBT	1424XA	116973	PAD DEVICE
1	1	CENT	4341XA	10063092	PAD DEVICE
1	1	VDL	1424PA	10162718	CENTRALIZED
1	1	CENT	4341XA	10599836	PAD DEVICE

INSTRUMENT CONFIGURATION

Source File: /dat1a/md11831/p331d~OR-tdg

CABLEHEAD

Diameter : 3.38"
Length : 5.50'
Weight : 24 lbs
Series : CABL338
Mnemonic : CBLH
Measure Point: 2.75': CABLEHEAD TOP

CCL

Diameter : 3.38"
Length : 6.78'
Weight : 97 lbs
Series : 2346XA
Mnemonic : CCL
Measure Point: 4.15': CCL MP

GAMMA RAY

Diameter : 3.38"
Length : 5.49'
Weight : 110 lbs
Series : 1339XA
Mnemonic : GR
Measure Point: 1.43': GR MP

ACOUSTIC DIGITIZER

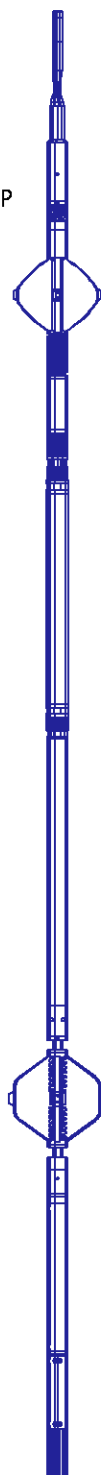
Diameter : 3.38"
Length : 8.00'
Weight : 133 lbs
Series : 1633EA
Mnemonic : AC

4 ARM BOW SPRING CENTRALIZER

Diameter : 3.38"
Length : 4.12'
Weight : 72 lbs
Series : 4341XA
Mnemonic : CENT

SEGMENTED BOND TOOL

Diameter : 3.38"



63.62'

CABLEHEAD TOP 60.88'

CCL MP 55.50'

GR MP 47.28'

Diameter : 3.38"
Length : 17.33'
Weight : 240 lbs
Series : 1424XA
Mnemonic : SBT
Measure Point: 7.54': ATT MP

ATT MP 23.95'

4 ARM BOW SPRING CENTRALIZER

Diameter : 3.38"
Length : 4.12'
Weight : 72 lbs
Series : 4341XA
Mnemonic : CENT

SEGMENTED BOND TOOL VDL SUB

Diameter : 3.38"
Length : 7.89'
Weight : 108 lbs
Series : 1424PA
Mnemonic : SBT
Measure Point: 4.00': SBT MP

SBT MP 8.40'

4 ARM BOW SPRING CENTRALIZER

Diameter : 3.38"
Length : 4.12'
Weight : 72 lbs
Series : 4341XA
Mnemonic : CENT

BULL PLUG 3 3/8

TOTAL LENGTH: 63.62'
TOTAL WEIGHT: 930 lbs
MAX DIAMETER: 0'3.38"

0.00'

MAIN LOG 5"/100FT SCALE

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017

Patches: 3

Plotted: Tue Jul 3 20:10:32 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/md11831/p331dR03.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 8855.500 ft BOTTOM DEPTH: 10351.000 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR	FILTER ()	medium (1)		TOP	BOTTOM
SBT	FILTER, 2pf	medium (1)		"	"
	FILTER, 4pf	medium (1)		"	"
TENSION	FILTER ()	medium (1)		"	"

SBT PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)
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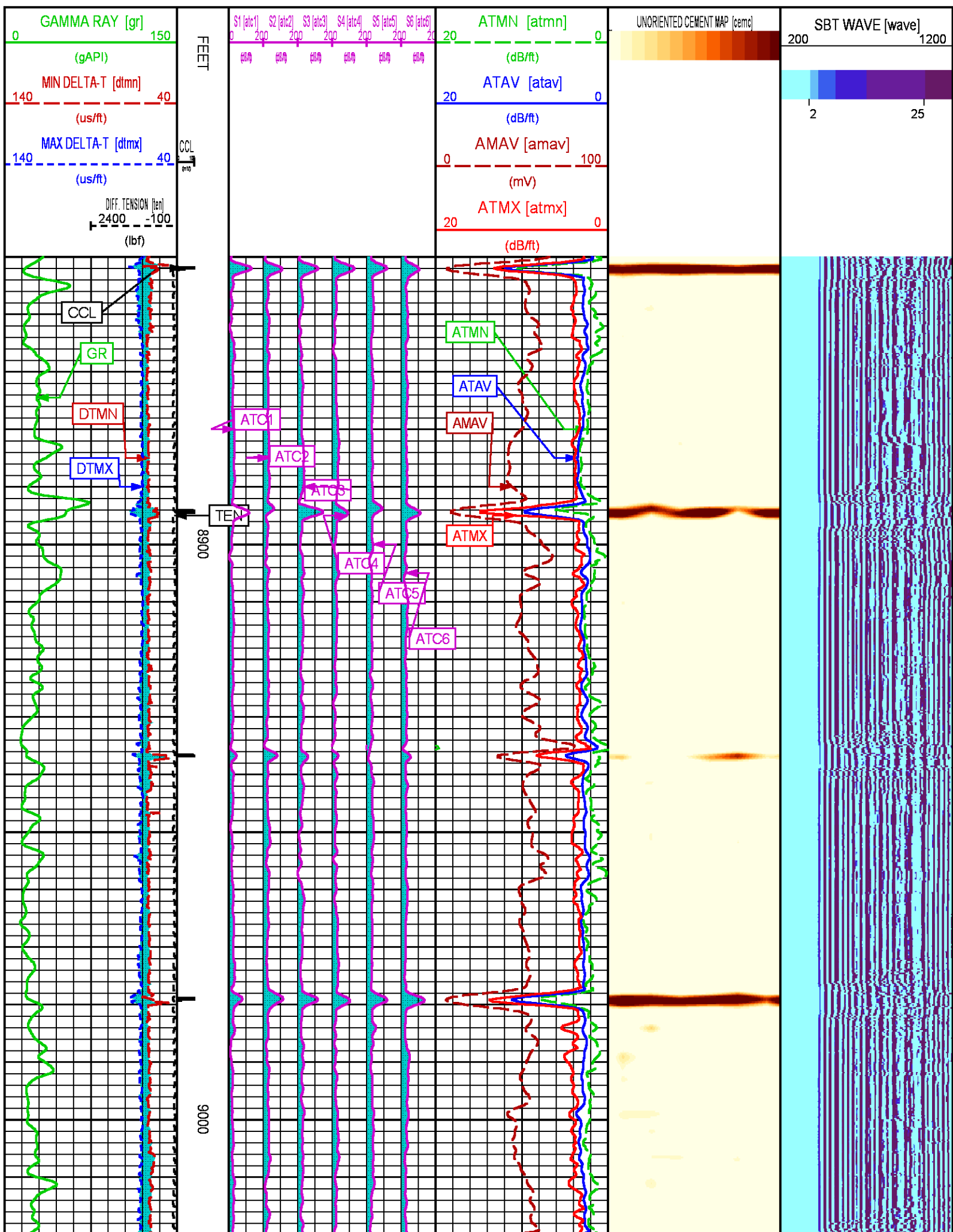
SBT	CASING OD	9.625	in	TOP	BOTTOM
	CASING WT	47.000	lbm/ft	"	"
	FREE PIPE AMP.	57.415	mV	"	"
	FREE PIPE ATTN.	2.580	dB/ft	"	"
	CORR. FACTOR 1 (1424XA 1)	-0.342	dB/ft	"	"
	CORR. FACTOR 2 (1424XA 1)	-0.056	dB/ft	"	"
	CORR. FACTOR 3 (1424XA 1)	-0.142	dB/ft	"	"
	CORR. FACTOR 4 (1424XA 1)	-0.576	dB/ft	"	"
	CORR. FACTOR 5 (1424XA 1)	1.275	dB/ft	"	"
	CORR. FACTOR 6 (1424XA 1)	-0.159	dB/ft	"	"
	SPACING	0.704	ft	"	"
	SPREADING FACTOR	4.262	dB/ft	"	"
	CEMENT STRENGTH	2000	psi	"	"
	HI CUTOFF (1424XA 1)	8.753	dB/ft	"	"
	LOW CUTOFF (1424XA 1)	4.123	dB/ft	"	"

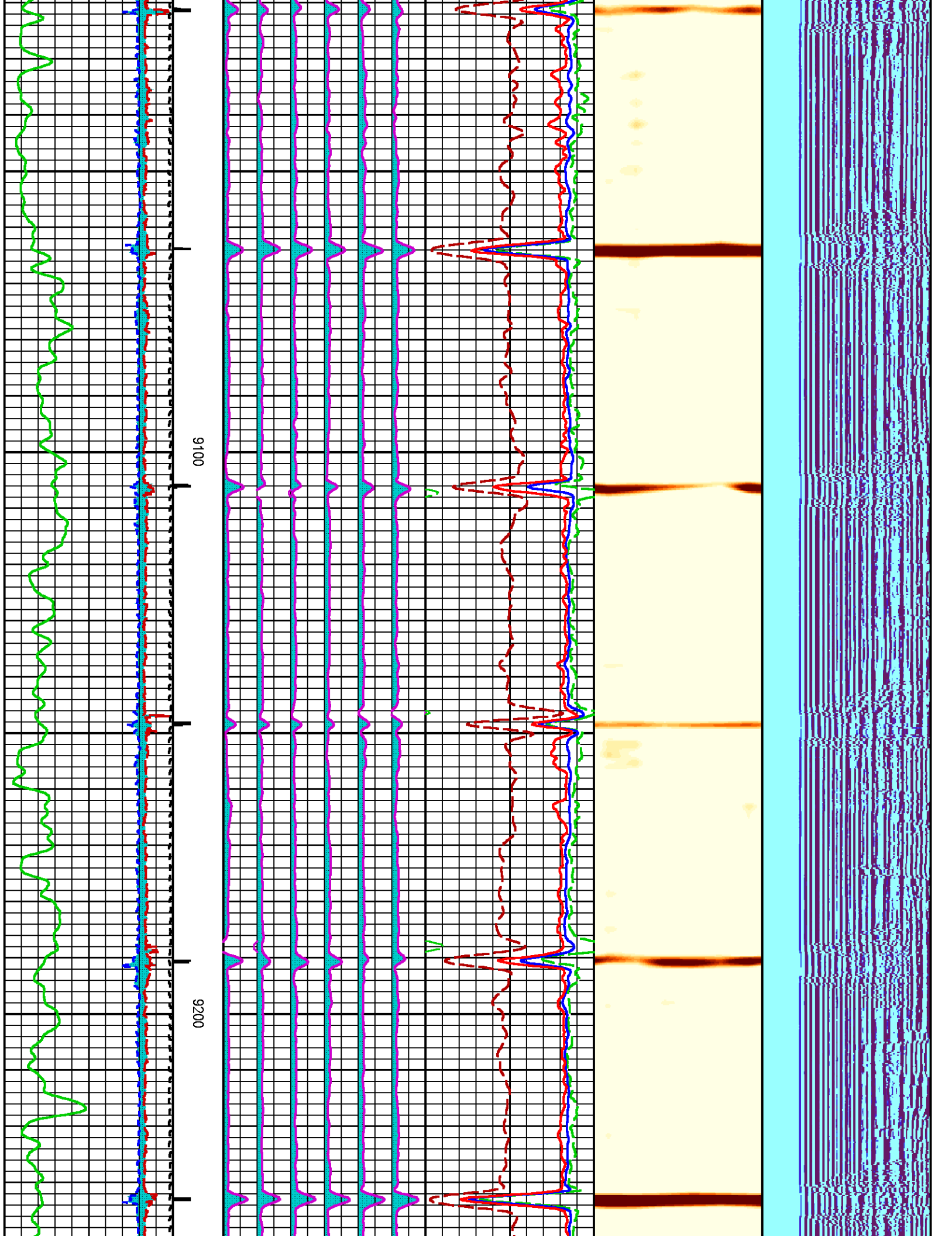
SBT NORMALIZATION RESULTS			
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS
SBT	CORR. FACTOR1	-0.107	dB/ft
	CORR. FACTOR2	-0.005	dB/ft
	CORR. FACTOR3	0.115	dB/ft
	CORR. FACTOR4	-0.281	dB/ft
	CORR. FACTOR5	0.731	dB/ft
	CORR. FACTOR6	-0.453	dB/ft
FILE: /dat1a/md11831/p331dR03.sbt.qc.meta			

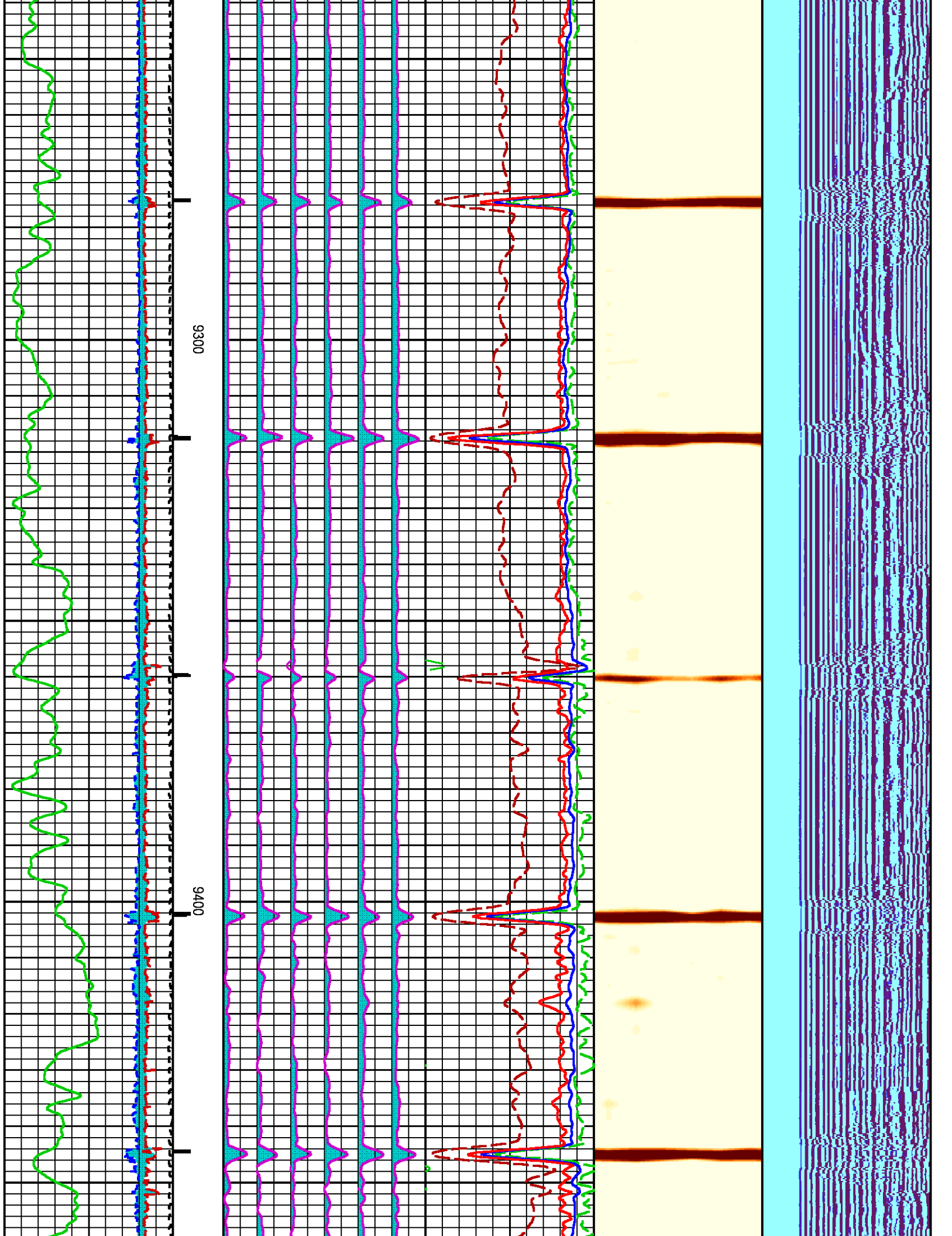
CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AMAV	N/A	AVERAGE AMPLITUDE
F1:ATAV	N/A	AVERAGE ATTENUATION
F1:ATC1	N/A	ATTENUATION PAD 1
F1:ATC2	N/A	ATTENUATION PAD 2
F1:ATC3	N/A	ATTENUATION PAD 3
F1:ATC4	N/A	ATTENUATION PAD 4
F1:ATC5	N/A	ATTENUATION PAD 5
F1:ATC6	N/A	ATTENUATION PAD 6
F1:ATMN	N/A	ATTENUATION MINIMUM
F1:ATMX	N/A	ATTENUATION MAXIMUM
F1:CCL	N/A	CASING COLLAR LOCATOR
F1:CEMC	N/A	CALIBRATED CEMENT MAP
F1:DTMN	N/A	MINIMAL SLOWNESS
F1:DTMX	N/A	MAXIMAL SLOWNESS
F1:GR	N/A	GAMMA RAY
F1:TEN	N/A	DIFFERENTIAL TENSION
F1:WAVE	N/A	DIGITIZED WAVEFORM

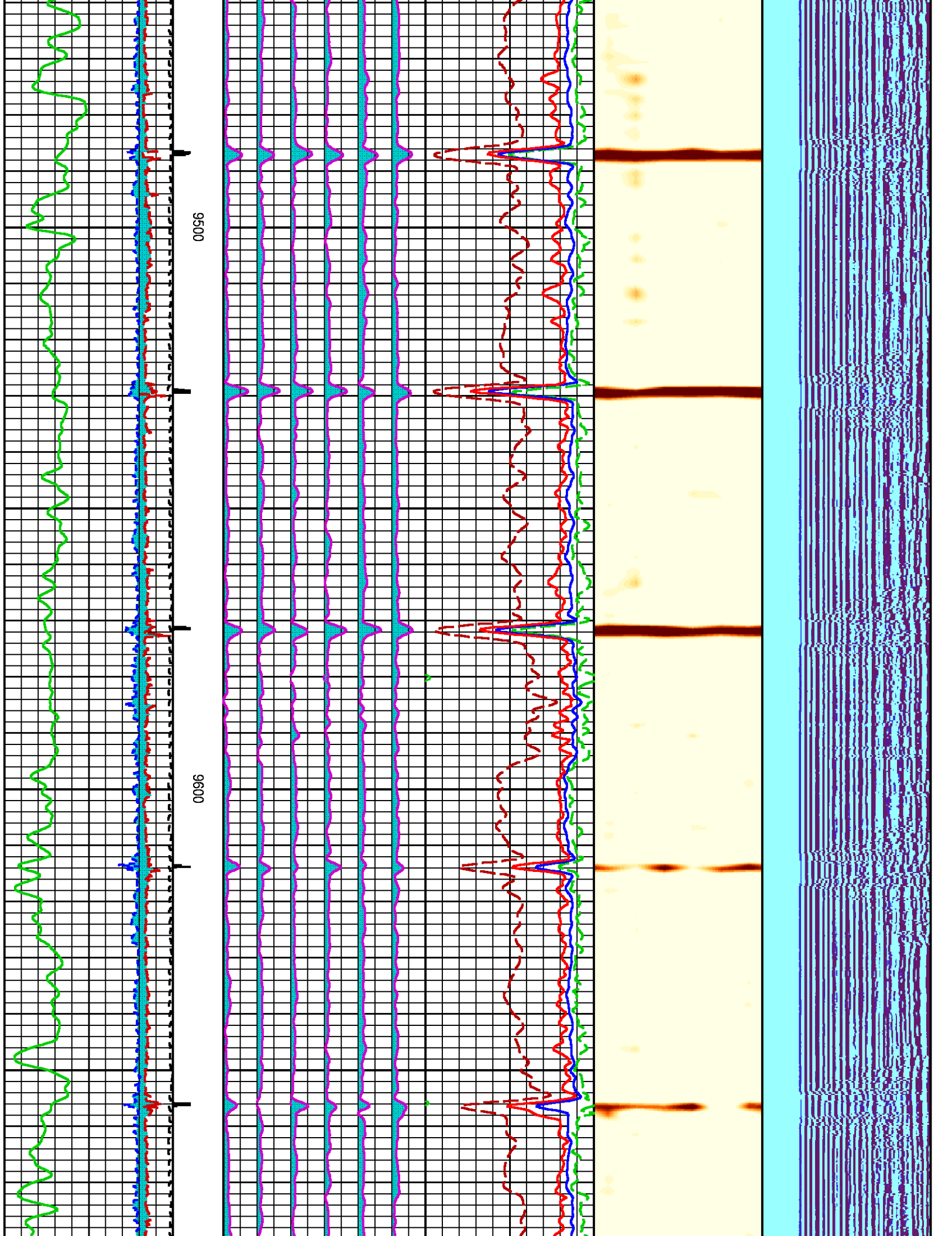
CURVE MEASURE POINT OFFSET							
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AMAV	-23.75	ATC3	-23.75	ATMN	-23.75	DTMX	-23.75
ATAV	-23.75	ATC4	-23.75	ATMX	-23.75	GR	-47.00
ATC1	-23.75	ATC5	-23.75	CCL	0.00	TEN	0.00
ATC2	-23.75	ATC6	-23.75	DTMN	-23.75		

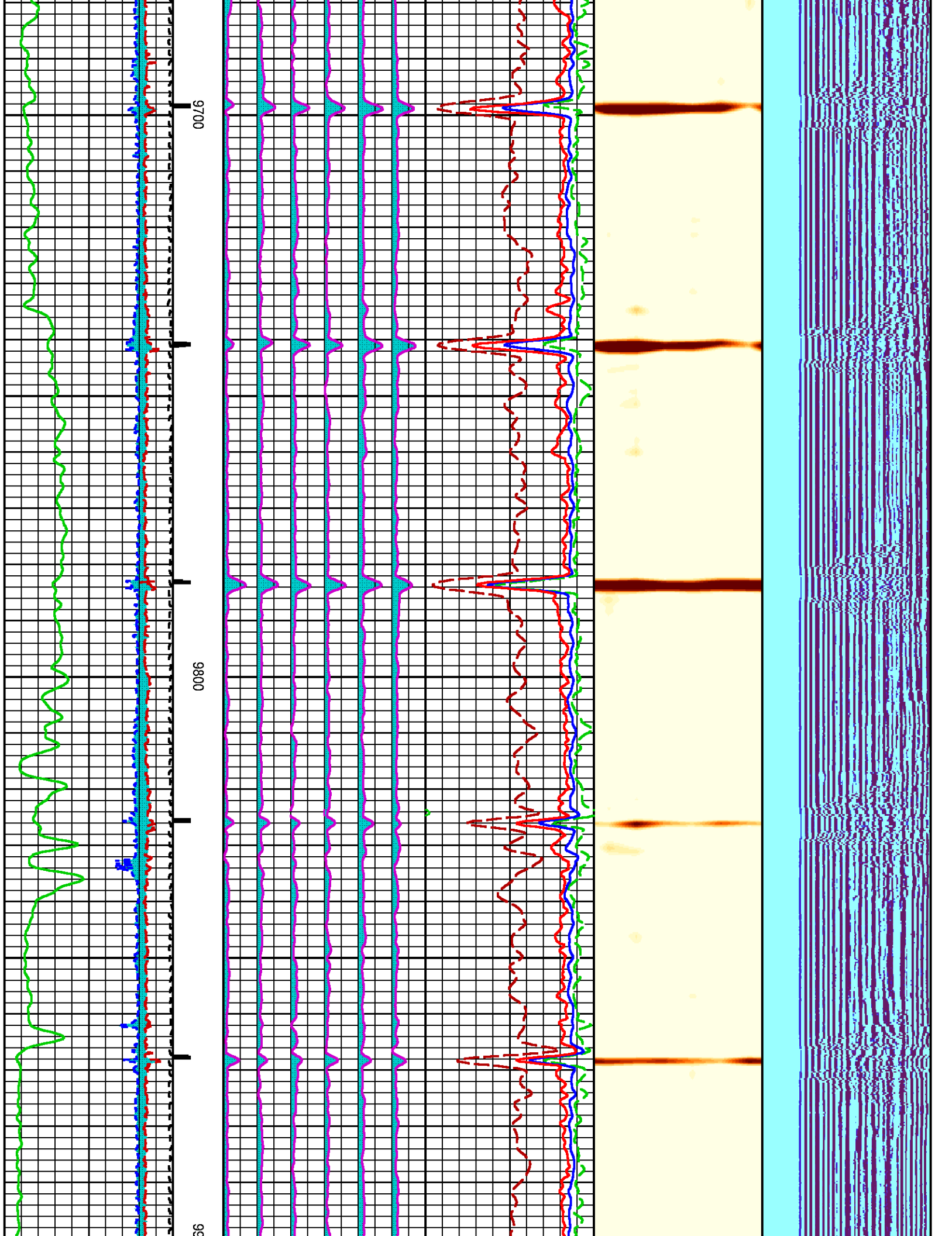
Presentation	: SysA:/dat1a/md11831/MAIN.fvpdf [5"/100' Scale]
Plot Interval	: 8850 - 10351 Feet
Data File 1	: F1 : SysA:/dat1a/md11831/MAIN.xtf
Created On	: N/A
Company	: HOLLY FRONTIER - NAVAJO
Well	: NAVAJO REFINING WDW #4
Field	: ARTESIA
File Interval	: 4 - 10351 Feet

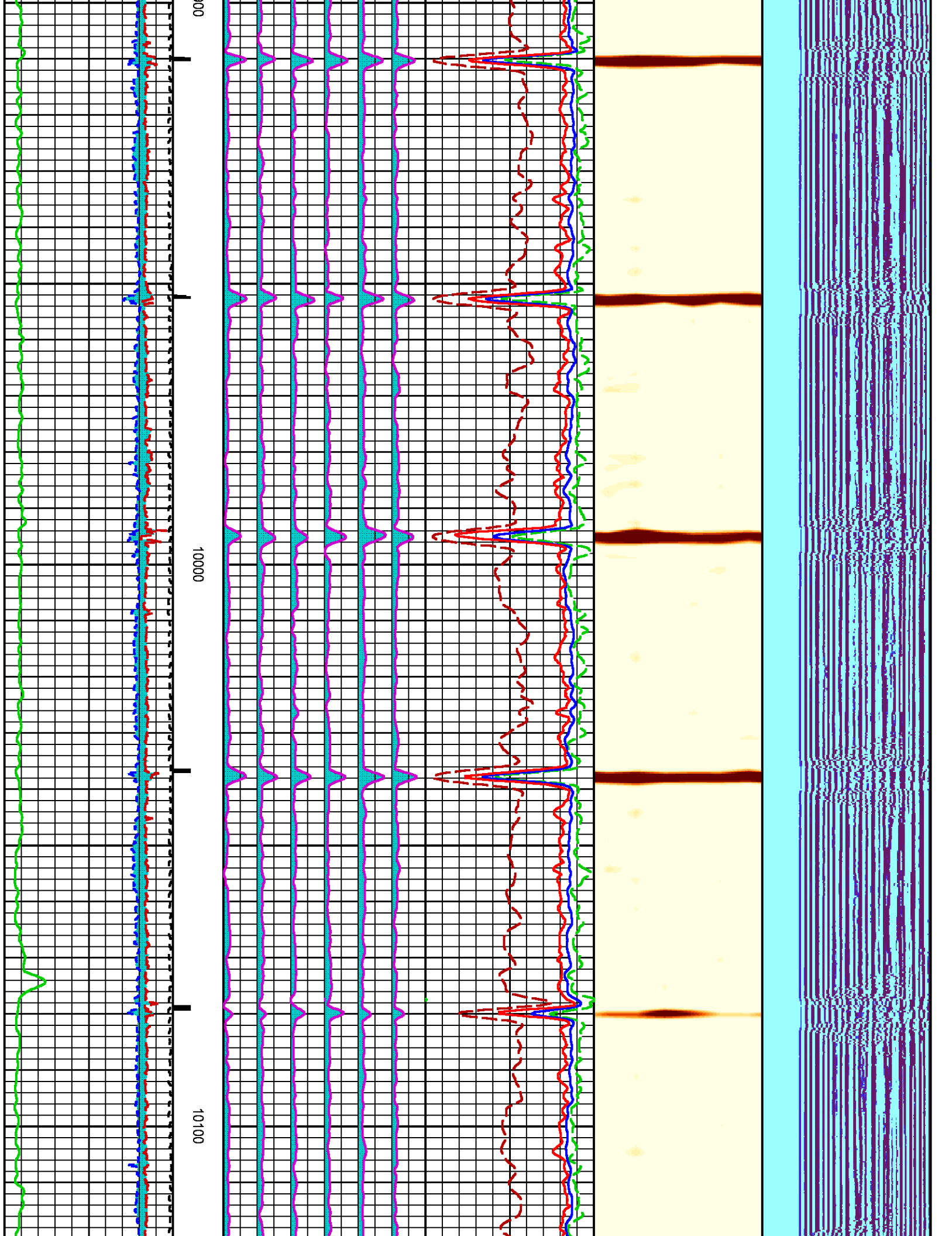


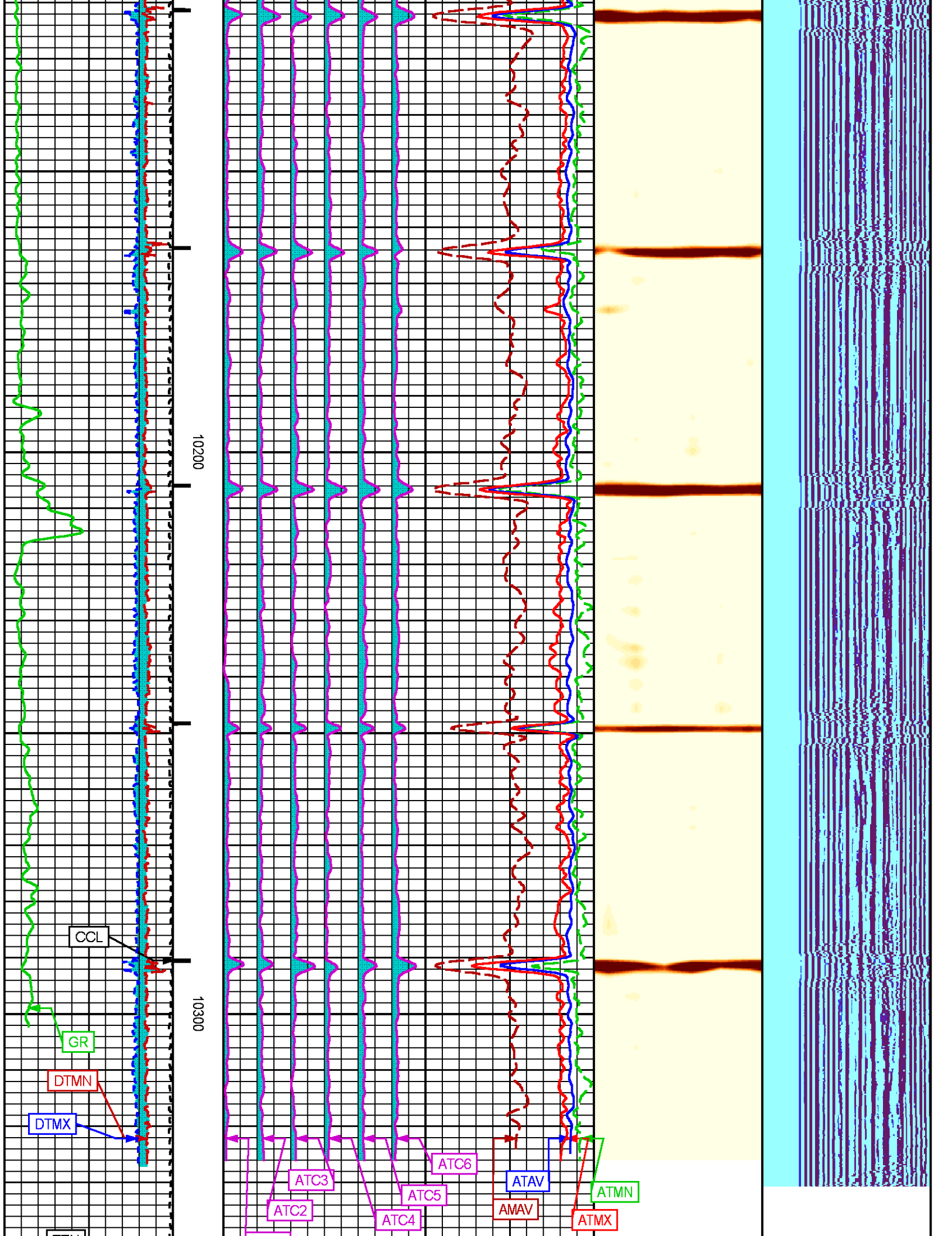


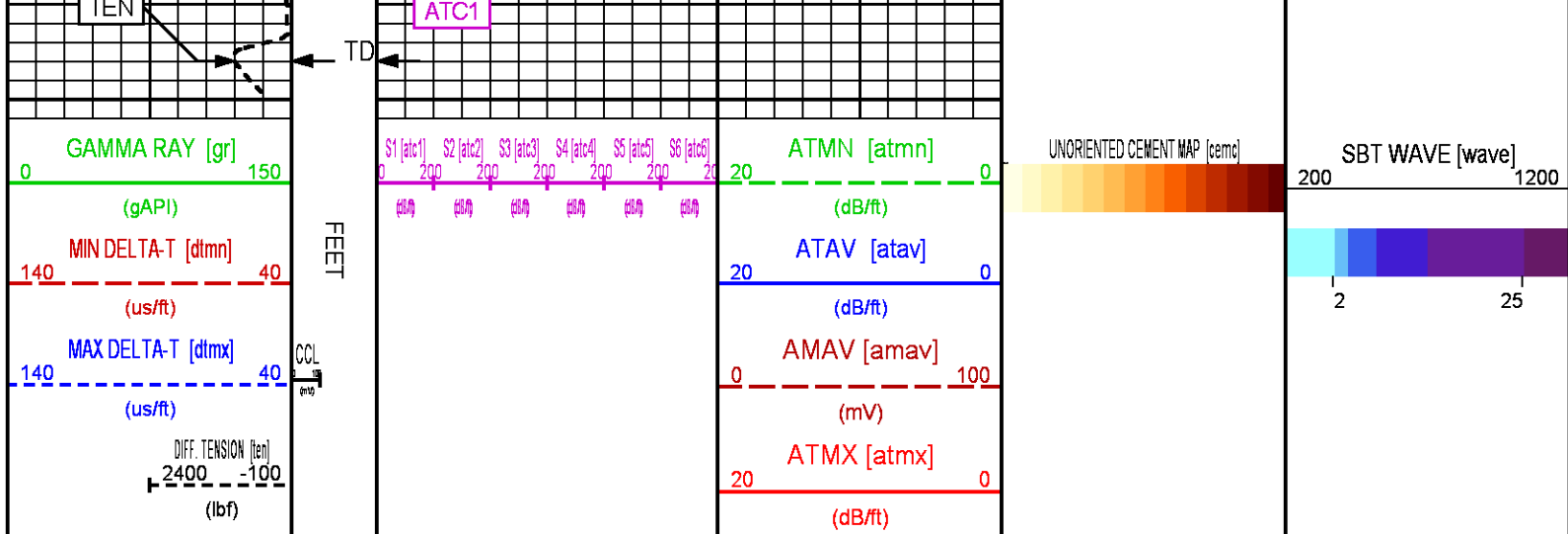












REPEAT LOG

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017
Patches: 3

Plotted: Tue Jul 3 20:09:26 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/md11831/p331dR02.prm
LOGGING MODE: DEPTH
TOP DEPTH: 10083.250 ft
DIRECTION: UP
BOTTOM DEPTH: 10334.500 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
GR	FILTER ()	medium (1)		TOP	BOTTOM
SBT	FILTER, 2pf	medium (1)		"	"
	FILTER, 4pf	medium (1)		"	"
TENSION	FILTER ()	medium (1)		"	"

SBT PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
SBT	CASING OD	9.625	in	TOP	BOTTOM
	CASING WT	47.000	lbm/ft	"	"
	FREE PIPE AMP.	57.415	mV	"	"
	FREE PIPE ATTN.	2.580	dB/ft	"	"
	CORR. FACTOR 1 (1424XA 1)	-0.342	dB/ft	"	"
	CORR. FACTOR 2 (1424XA 1)	-0.056	dB/ft	"	"
	CORR. FACTOR 3 (1424XA 1)	-0.142	dB/ft	"	"
	CORR. FACTOR 4 (1424XA 1)	-0.576	dB/ft	"	"
	CORR. FACTOR 5 (1424XA 1)	1.275	dB/ft	"	"
	CORR. FACTOR 6 (1424XA 1)	-0.159	dB/ft	"	"
	SPACING	0.704	ft	"	"
	SPREADING FACTOR	4.262	dB/ft	"	"
	CEMENT STRENGTH	2000	psi	"	"
	HI CUTOFF (1424XA 1)	8.753	dB/ft	"	"
	LOW CUTOFF (1424XA 1)	4.123	dB/ft	"	"

SBT NORMALIZATION RESULTS

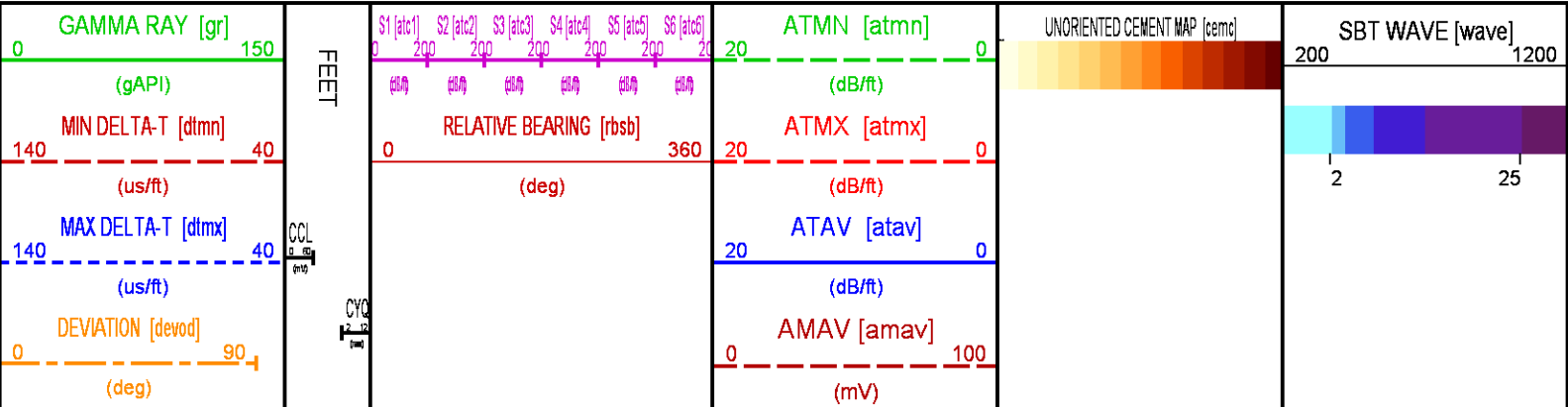
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS
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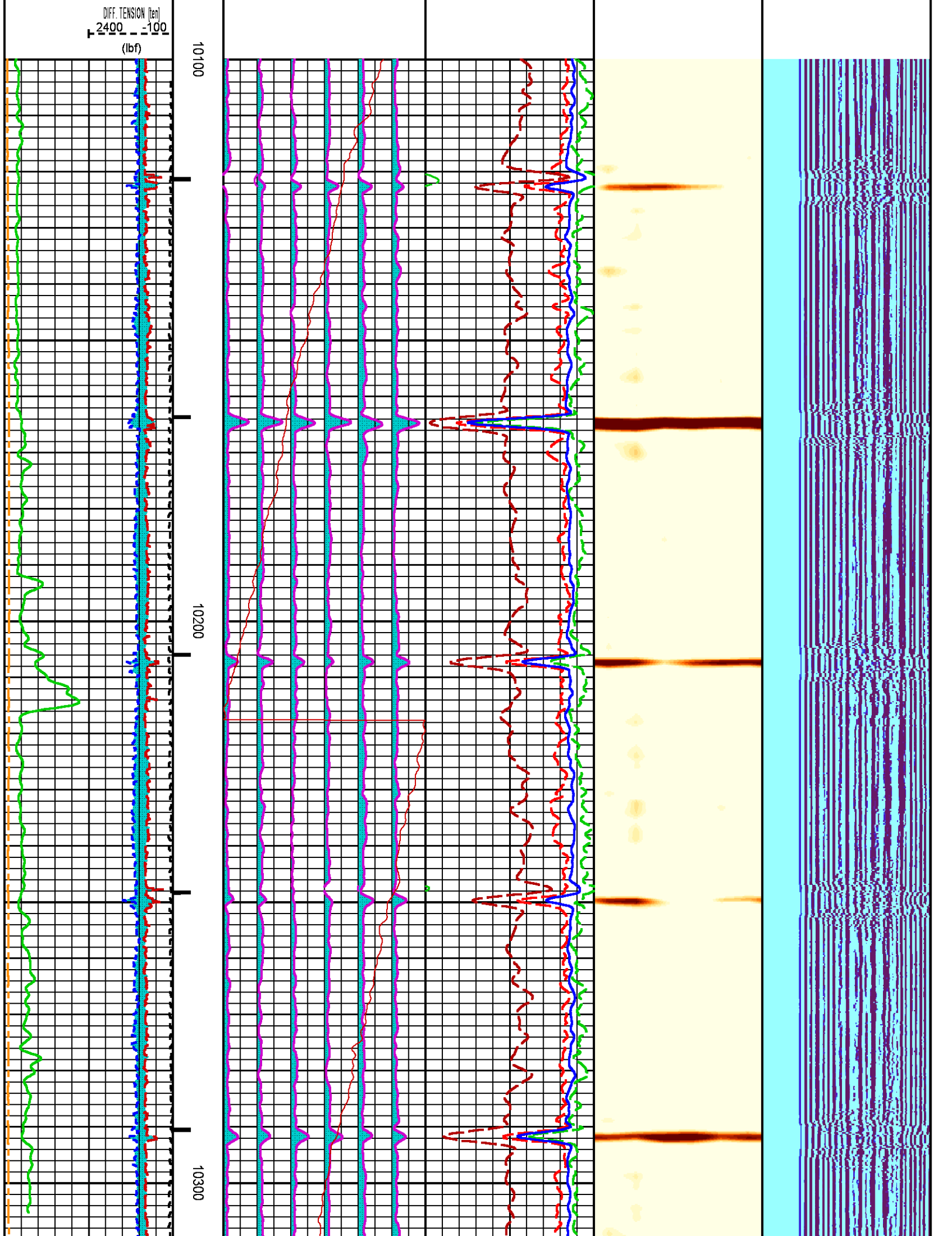
SBT	CORR. FACTOR1	-0.103	dB/ft
	CORR. FACTOR2	-0.070	dB/ft
	CORR. FACTOR3	0.299	dB/ft
	CORR. FACTOR4	-0.376	dB/ft
	CORR. FACTOR5	0.597	dB/ft
	CORR. FACTOR6	-0.347	dB/ft
FILE: /dat1a/md11831/p331dR02.sbt.qc.meta			

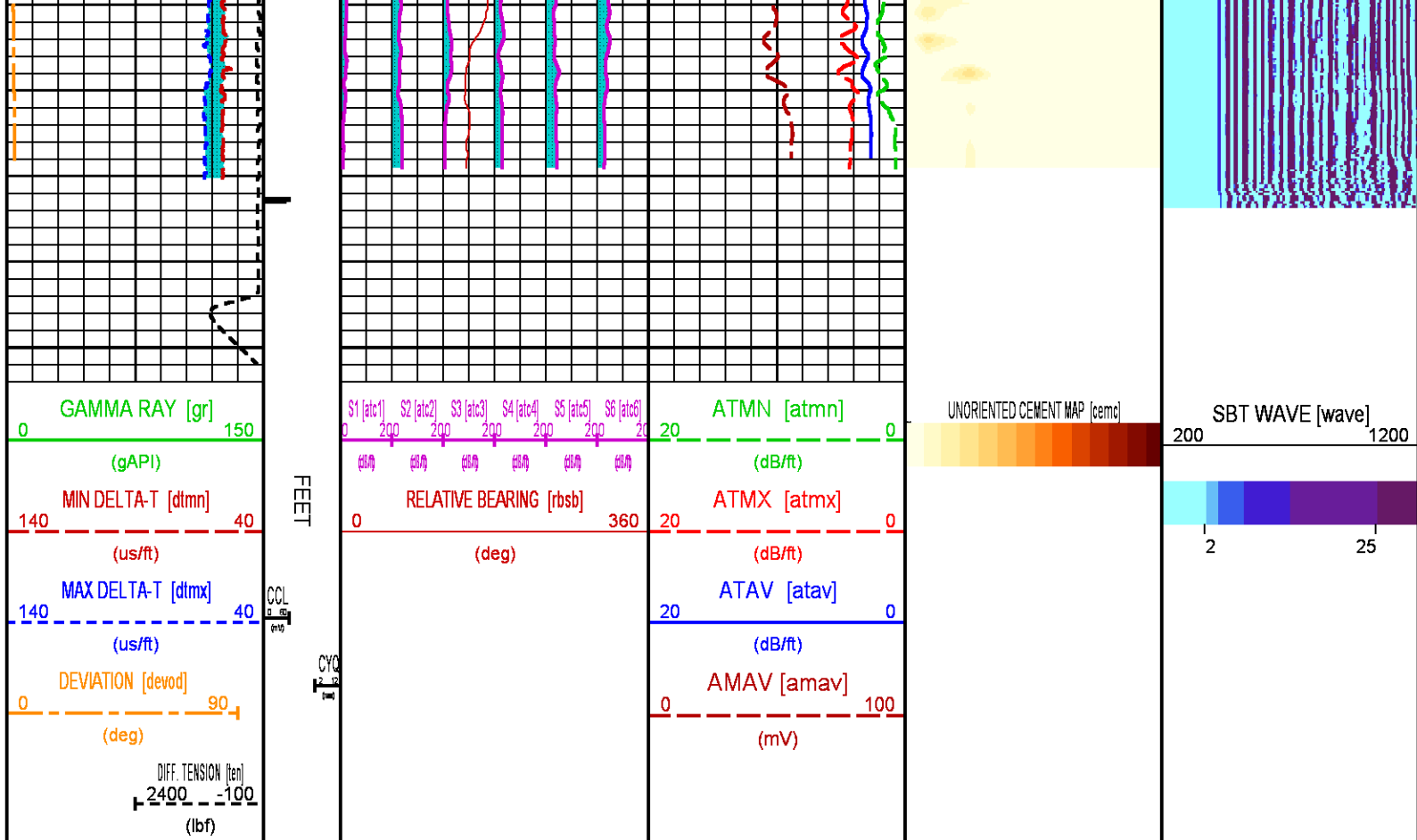
CURVE DESCRIPTION REPORT		
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:AMAV	N/A	AVERAGE AMPLITUDE
F1:ATAV	N/A	AVERAGE ATTENUATION
F1:ATC1	N/A	ATTENUATION PAD 1
F1:ATC2	N/A	ATTENUATION PAD 2
F1:ATC3	N/A	ATTENUATION PAD 3
F1:ATC4	N/A	ATTENUATION PAD 4
F1:ATC5	N/A	ATTENUATION PAD 5
F1:ATC6	N/A	ATTENUATION PAD 6
F1:ATMN	N/A	ATTENUATION MINIMUM
F1:ATMX	N/A	ATTENUATION MAXIMUM
F1:CCL	N/A	CASING COLLAR LOCATOR
F1:CEMC	N/A	CALIBRATED CEMENT MAP
F1:CYQ	N/A	CYCLE QUALITY
F1:DEVOD	N/A	DEVIATION
F1:DTMN	N/A	MINIMAL SLOWNESS
F1:DTMX	N/A	MAXIMAL SLOWNESS
F1:GR	N/A	GAMMA RAY
F1:RBSB	N/A	RELATIVE BEARING (RELATIVE TO BOREHOLE LOW SIDE) FOR SBT
F1:TEN	N/A	DIFFERENTIAL TENSION
F1:WAVE	N/A	DIGITIZED WAVEFORM

CURVE MEASURE POINT OFFSET					
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
AMAV	-23.75	ATC4	-23.75	CCL	0.00
ATAV	-23.75	ATC5	-23.75	CYQ	-23.75
ATC1	-23.75	ATC6	-23.75	DEVOD	-23.75
ATC2	-23.75	ATMN	-23.75	DTMN	-23.75
ATC3	-23.75	ATMX	-23.75	DTMX	-23.75
				GR	-47.00
				RBSB	-23.75
				TEN	0.00

Presentation	: SysA:/dat1a/md11831/REP.fvpdf [5"/100' Scale]
Plot Interval	: 10100 - 10352.8 Feet
Data File 1	: F1 : SysA:/dat1a/md11831/REPEAT.xtf
Created On	: N/A
Company	: HOLLY FRONTIER - NAVAJO
Well	: NAVAJO REFINING WDW #4
Field	: ARTESIA
File Interval	: 4 - 10354 Feet
OCT	: p331d







CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/md11831/p331d_1.tp1

RB PRIMARY CALIBRATION SUMMARY

TOOL #: 1424XA 116973

DATE/TIME PERFORMED: Wed Jun 20 11:15:02 2018

UNIT #: 5753XD 10215900

	X-ATT (raw)	Y-ATT (raw)	OFFSET (deg)	X-MAX	Y-MAX	RB (deg)
PAD 2	-149.2	-458.2				0.00
						355.00 5.00
PAD 3	-474.6	-62.4				64.55
						55.00 65.00
			-72.10	-485.38	481.51	

SBT PRIMARY CALIBRATION SUMMARY

GE FPM117 CALIBRATION SUMMARY

TOOL #: 1424XA 116973

DATE/TIME PERFORMED: Tue Jul 3 16:20:20 2018

UNIT #: 5753XD 10215900

	PAD 1	PAD 2	PAD 3	PAD 4	PAD 5	PAD 6
NOISE LEVEL	1.8 10.0	4.8 10.0	6.2 10.0	6.5 10.0	4.9 10.0	5.0 10.0
PAD SENS	298.8 150.0	288.0 150.0	208.1 150.0	304.0 150.0	230.8 150.0	328.2 150.0

**BAKER
HUGHES**
a GE company



ECLIPS

COMPANY

HOLLY FRONTIER - NAVAJO

WELL

NAVAJO REFINING WDW #4

FIELD

ARTESIA

COUNTY

EDDY

STATE

NEW MEXICO

LOCATION:

1217' FSL & 2443' FWL
SECTION 23, T17S, R27E
N.M.P.M. SURVEY

ELEVATIONS:

KB 3585.8 FT
DF 3584.8 FT
GL 3565.8 FT

DATE

03-Jul-2018

FILE NO:

MD11831

API NO:

30-015-44677

FINAL PRINT