



**HEXAGONAL CALIPER LOG
GAMMA RAY LOG**

FILE NO: MD11798	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
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PERMANENT DATUM	GL	ELEVATION	3565.8 FT	ELEVATIONS:
LOG MEASURED FROM	KB	20 FT	ABOVE P.D.	KB 3565.8 FT
DRILL. MEAS. FROM	KB			DF 3584.8 FT
				GL 3565.8 FT

DATE	RUN	TRIP	16-JUN-2018
SERVICE ORDER	2	1	
DEPTH DRILLER	134536		
DEPTH LOGGER	9739 FT		
BOTTOM LOGGED INTERVAL	9740 FT		
TOP LOGGED INTERVAL	9740 FT		
CASING DRILLER	1680 FT		
CASING LOGGER	13.375 IN @ 1680 FT		@
BIT SIZE	1680 FT		
TYPE OF FLUID IN HOLE	12.25 IN		
DENSITY	WBM		
PH	9.8 LB/G	46 CP	
SOURCE OF SAMPLE	10	N/A	
RM AT MEAS. TEMP.	FLOWLINE		
RMF AT MEAS. TEMP.	0.036 OHMM @ 75 DEGF		@
RMC AT MEAS. TEMP.	0.031 OHMM @ 75 DEGF		@
SOURCE OF RMF	0.048 OHMM @ 75 DEGF		@
RM AT BHT	MEASURED		
TIME SINCE CIRCULATION	0.066 OHMM @ 132 DEGF		@
MAX. RECORDED TEMP.	8 HRS		
EQUIP. NO.	135 DEGF		
RECORDED BY	HL6845	MIDLAND, TX	
WITNESSED BY	JKOSKI		
	R 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.

REMARKS

RUN 2 TRIP 1: DATA TIED INTO RUN 1 DATA

BOREHOLE AND CEMENT VOLUME PRESENTED (TOTAL VOLUME LESS 9.625" CASING)
 1 SMALL TICK = 10 CUBIC FEET
 1 MEDIUM TICK = 100 CUBIC FEET
 1 LARGE TICK = 1000 CUBIC FEET

RIG: PATRIOT #4
 CREW: J. ESPINOZA / R. SANCHEZ

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	TTRM	3981XA	10570248	FREE
1	1	COMM	3514XA	Z173226	FREE
1	1	GAMMA	1329XA	Z179409	D.CENT
1	1	CN	2446XA	Z154181	D.CENT
1	1	ZDL	2234XA	10495292	PAD DEVICE
1	1	DBL KNUCK	3939XA	10335551	FREE
1	1	6CAL	4243XA	12408673	CENTRALIZED

1	1	RTEX	1249XA	12554838	CENTRALIZED
1	1	MLL	1243XA	13647991	PAD DEVICE

INSTRUMENT CONFIGURATION

Source File: /dat1a/md11798R2/p87cc~wsp-tdg

CABLEHEAD

Diameter : 3.38"
Length : 5.50'
Weight : 24 lbs
Series : CABL338
Mnemonic : CBLH
Volume Disp. : 9.7 L

TTRM SUB

Diameter : 3.63"
Length : 3.83'
Weight : 62 lbs
Series : 3981XA
Mnemonic : TTRM

WTS COMMON REMOTE

Diameter : 3.63"
Length : 6.36'
Weight : 126 lbs
Series : 3514XB
Mnemonic : WTS
Volume Disp. : 13.0 L

DIGITAL SPECTRALOG

Diameter : 3.63"
Length : 7.31'
Weight : 130 lbs
Series : 1329XA
Mnemonic : DSL
Volume Disp. : 14.9 L
Measure Point: 1.60': GR MP

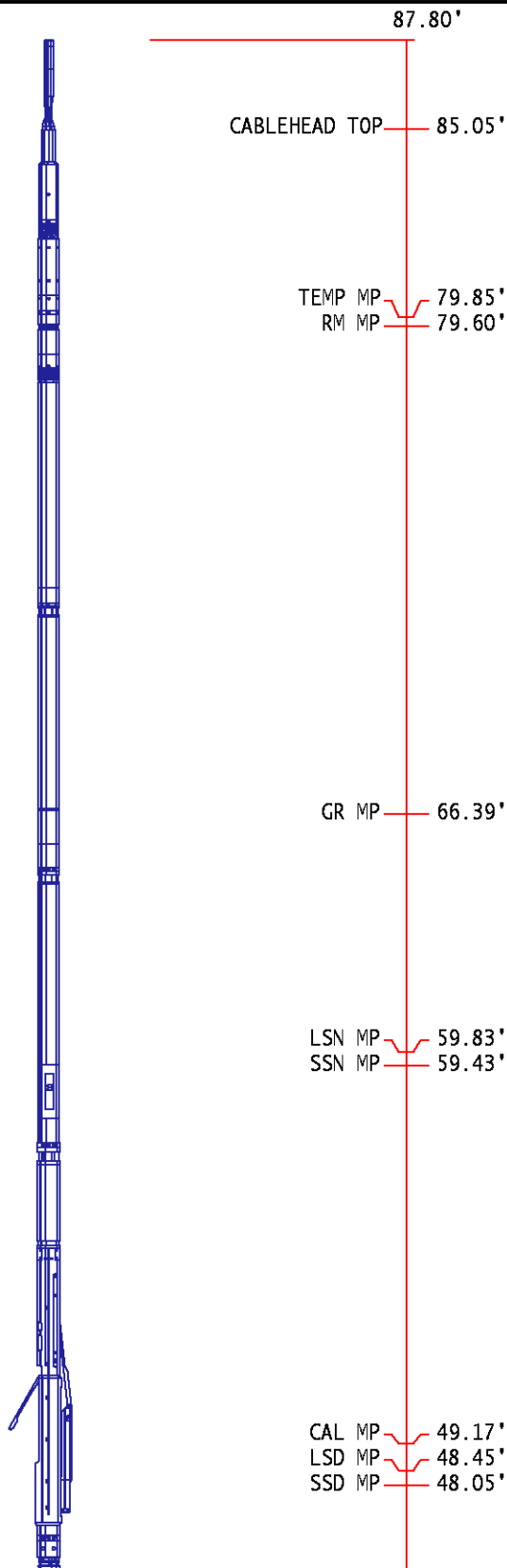
COMPENSATED NEUTRON

Diameter : 3.63"
Length : 7.59'
Weight : 150 lbs
Series : 2446XA
Mnemonic : CN
Volume Disp. : 15.4 L
Measure Point: 2.63': LSN MP
Measure Point: 2.24': SSN MP

Z-DENSILOG

Diameter : 4.88"
Length : 11.22'
Weight : 360 lbs
Series : 2234XA
Mnemonic : ZDL
Volume Disp. : 41.3 L
Measure Point: 3.19': CAL MP
Measure Point: 2.47': LSD MP
Measure Point: 2.07': SSD MP

MASS ISOLATION SUB



MASS ISOLATION SUB
Diameter : 3.63"
Length : 2.09'

KNUCKLE JOINT (DOUBLE)

Diameter : 3.38"
Length : 4.65'
Weight : 90 lbs
Series : 3939XA
Mnemonic : KNJT

4 ARM BOW SPRING CENTRALIZER

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

WELL GEOMETRY INSTRUMENT

Diameter : 3.62"
Length : 7.61'
Weight : 100 lbs
Series : 4253XA
Mnemonic : WGI
Volume Disp. : 15.4 L
Measure Point: 2.85': RADII MP

WTS RT EXPLORER

Diameter : 4.00"
Length : 14.00'
Weight : 246 lbs
Series : 1249XA
Mnemonic : RTEX
Volume Disp. : 34.6 L
Measure Point: 7.09': RTEX MP

WTS MICROLATEROLOG

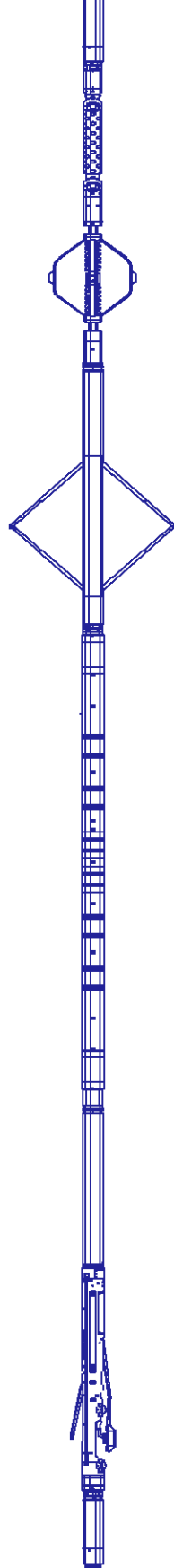
Diameter : 4.00"
Length : 11.25'
Weight : 258 lbs
Series : 1243XA
Mnemonic : MLL
Volume Disp. : 27.8 L
Measure Point: 1.55': MP

MASS ISOLATION SUB

Diameter : 3.63"
Length : 2.09'

BULL PLUG 2 5/6

TOTAL LENGTH: 87.80'
TOTAL WEIGHT: 1720 lbs
MAX DIAMETER: 0'4.88"
TOTAL VOLUME DISPLACEMENT: 203.8 L (1.3 bbl) Est.



RADII MP 30.36'

RTEX MP 20.60'

MP 3.82'

0.00'

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

Updates: 32 Patches: 4

Plotted: Sat Jun 16 17:13:30 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/md11798R2/p87cc03.prm
 LOGGING MODE: DEPTH DIRECTION: UP
 TOP DEPTH: 1626.200 ft BOTTOM DEPTH: 9746.076 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
TENSION	FILTER ()	medium (1)		TOP	BOTTOM
GR	FILTER ()	medium (1)		"	"
	FILTER (.h)	medium (1)		"	"
	FILTER (.i)	medium (1)		"	"
CALIPER	FILTER	medium (1)		"	"

BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	9.625	in	TOP	BOTTOM
CALIPER SELECTION	X-Y VS MULTI-ARM SEL	COMPUTED X-Y CAL		"	"
BIT SIZE	BIT SIZE	12.250	in	"	"

CURVE DESCRIPTION REPORT

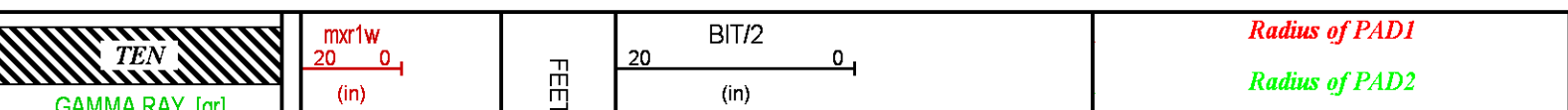
CURVE NAME	CREATION DATE	CURVE DESCRIPTION
F1:BRADW	N/A	BIT RADIUS
F1:BVOL	N/A	BOREHOLE VOLUME
F1:CRADW	N/A	CASING RADIUS
F1:CVOL	N/A	CEMENT VOLUME
F1:DFLGW	N/A	DEAD CROSS-SECTIONAL AREA FLAG
F1:GR	N/A	GAMMA RAY
F1:MAXDW	N/A	MAXIMUM CALIPER DIAMETER
F1:MINDW	N/A	MINIMUM CALIPER DIAMETER
F1:MNR1W	N/A	MINIMUM RADIUS 1
F1:MNR2W	N/A	MINIMUM RADIUS 2
F1:MXR1W	N/A	MAXIMUM RADIUS 1
F1:MXR2W	N/A	MAXIMUM RADIUS 2
F1:OFFSW	N/A	TOOL-TO-CENTROID RADIUS
F1:TEN	N/A	DIFFERENTIAL TENSION

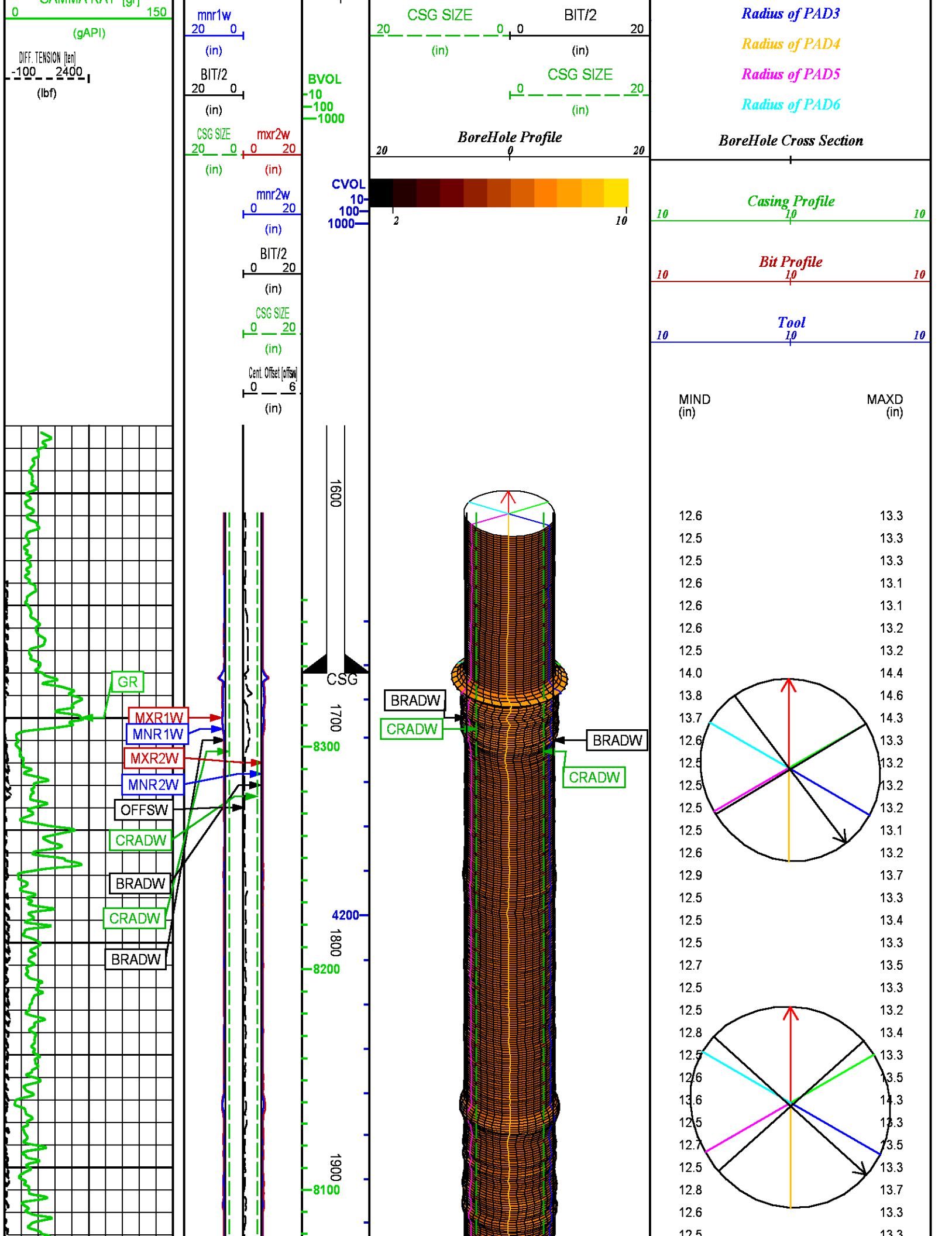
CURVE MEASURE POINT OFFSET

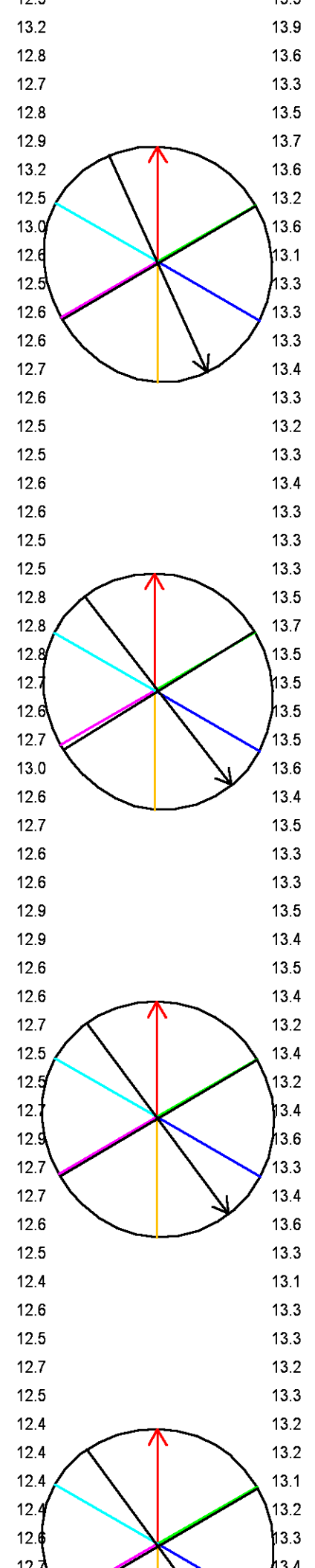
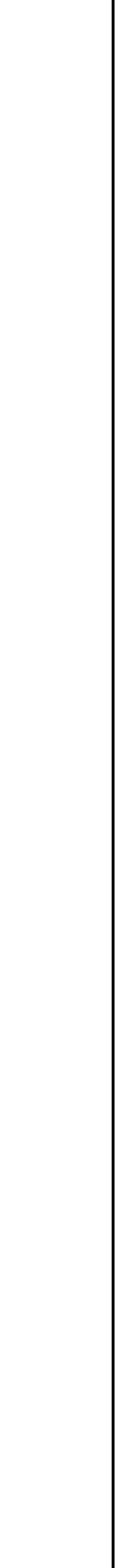
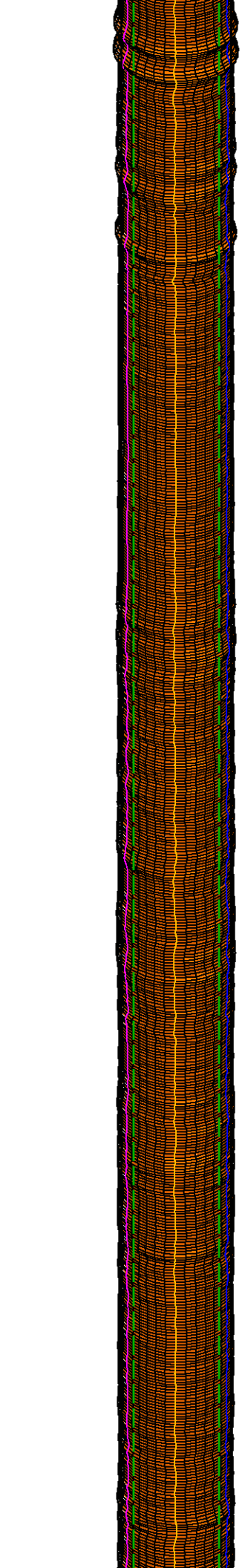
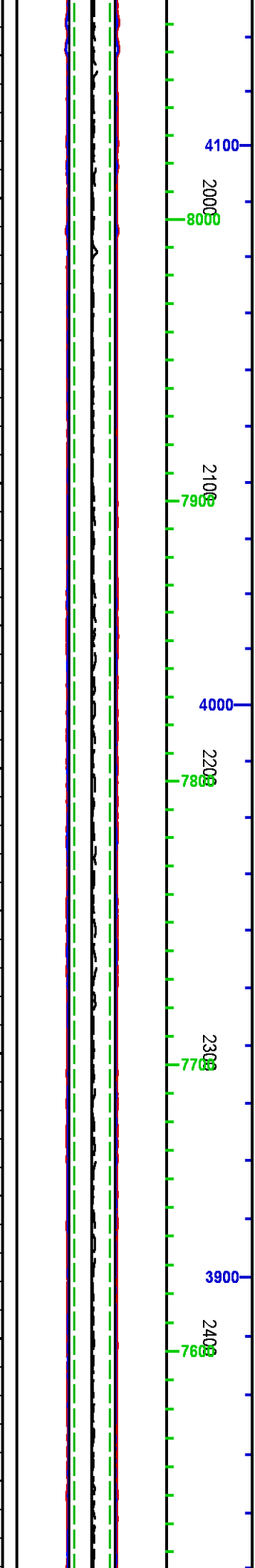
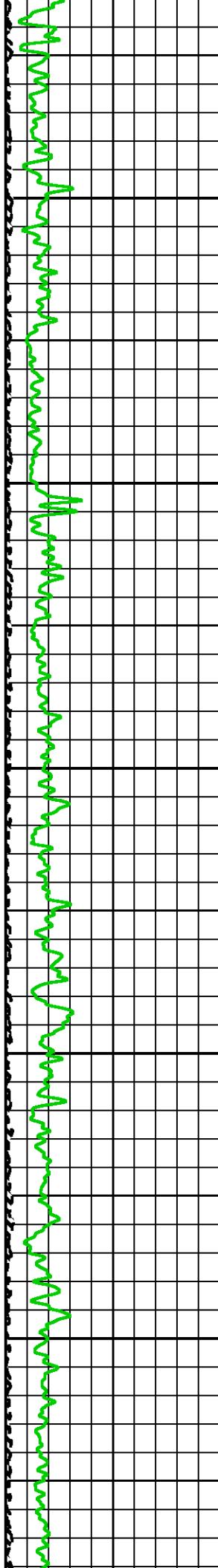
CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)	CURVE	OFFSET (ft)
BRADW	-30.25	GR	-66.25	MXR1W	-30.25	TEN	0.00
CRADW	-30.25	MNR1W	-30.25	MXR2W	-30.25		
DFLGW	-30.25	MNR2W	-30.25	OFFSW	-30.25		

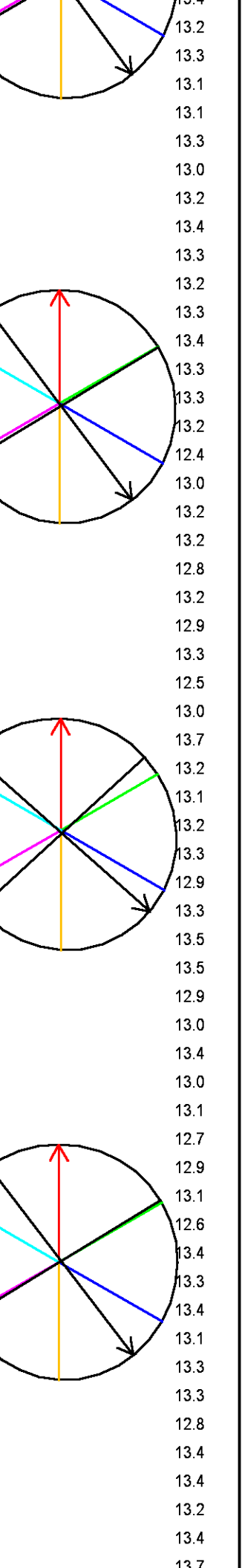
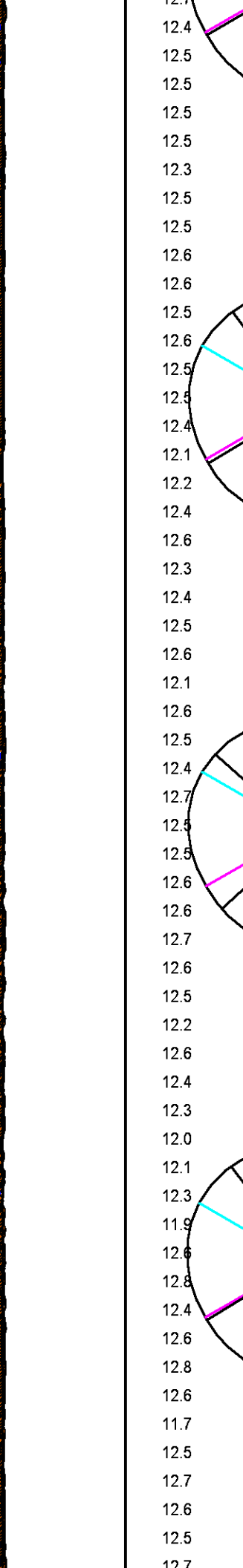
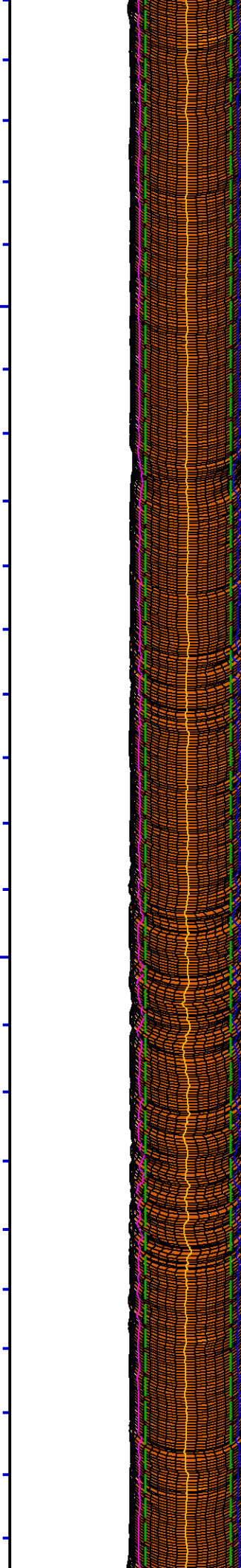
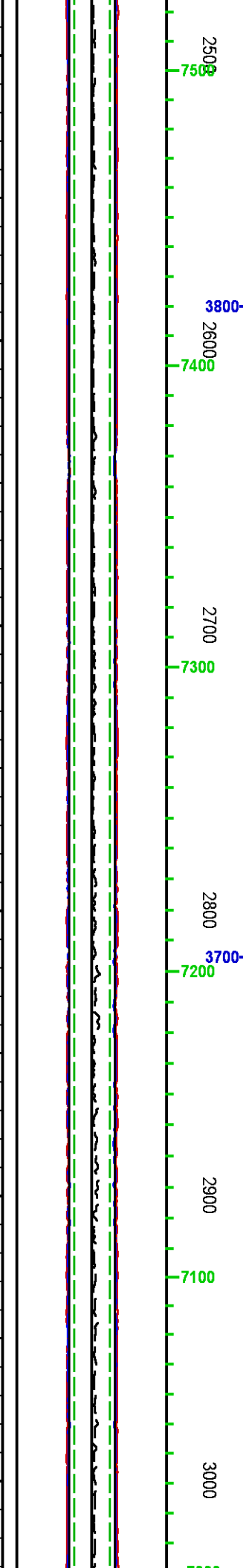
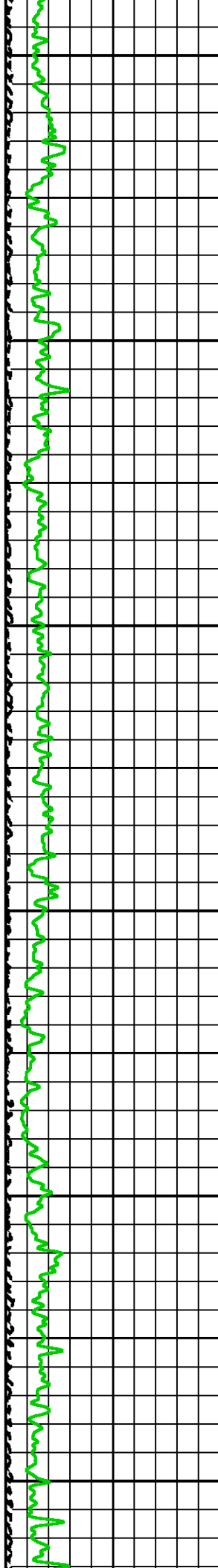
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 Plot Interval : 1573 - 9758 Feet

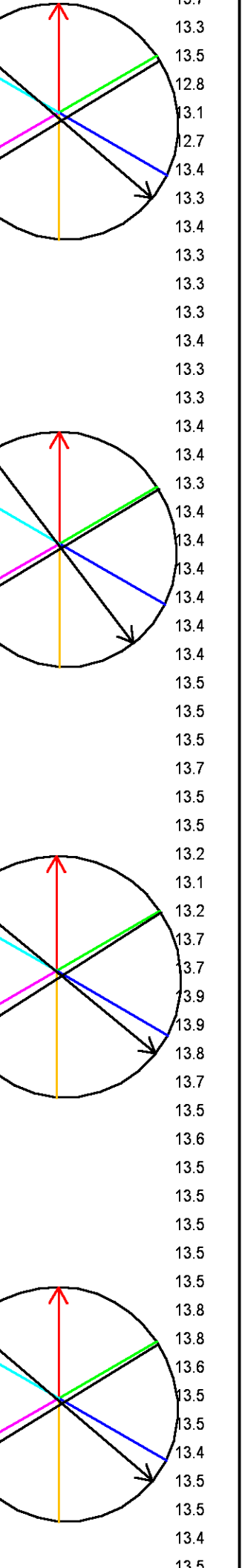
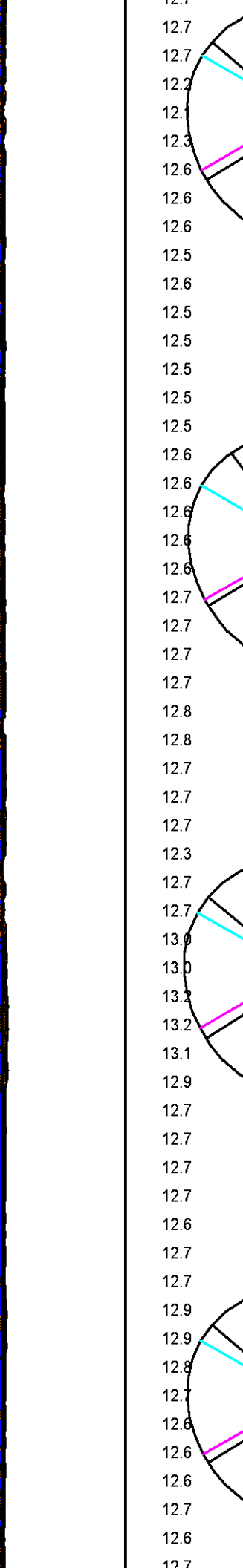
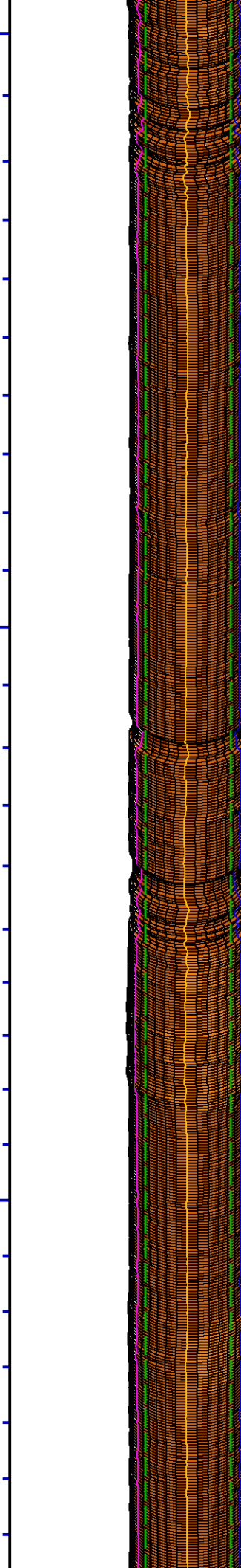
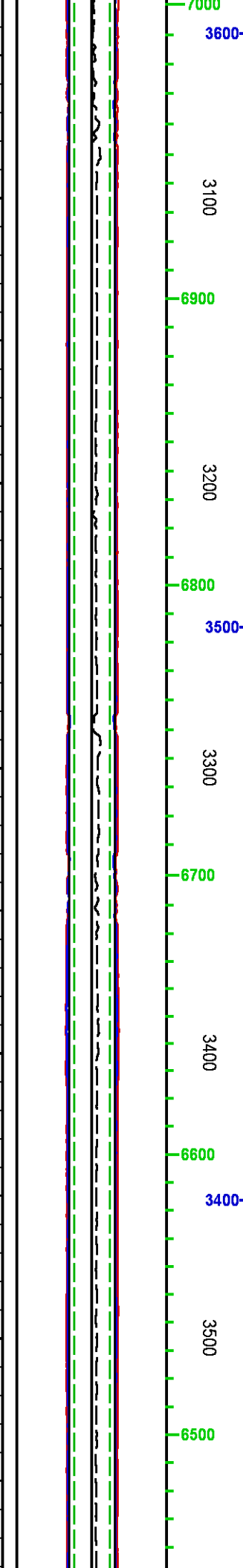
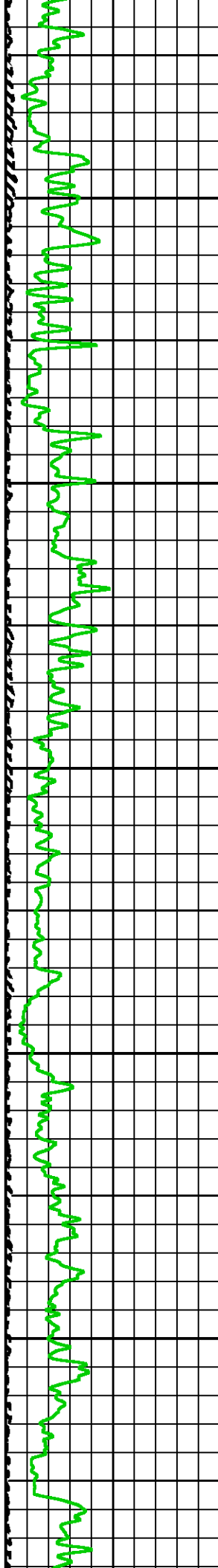
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 Created On : N/A
 Company : HOLLY FRONTIER - NAVAJO
 Well : NAVAJO REFINING WDW #4
 Field : ARTESIA
 File Interval : 1558.5 - 9758 Feet
 OCT : p87cc

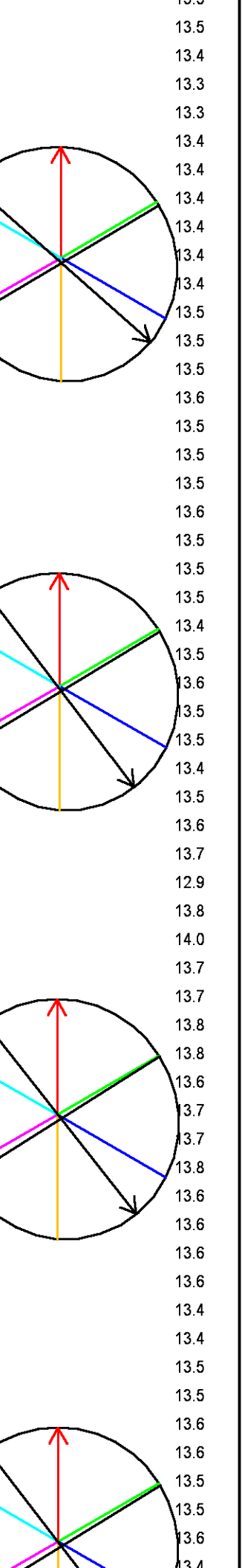
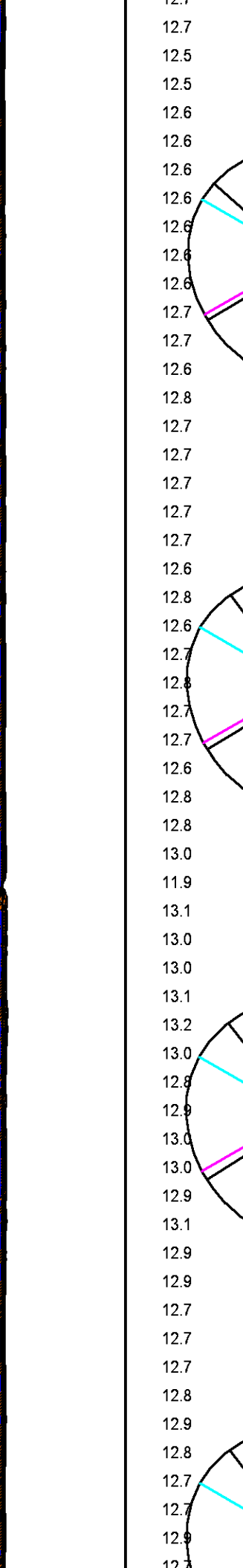
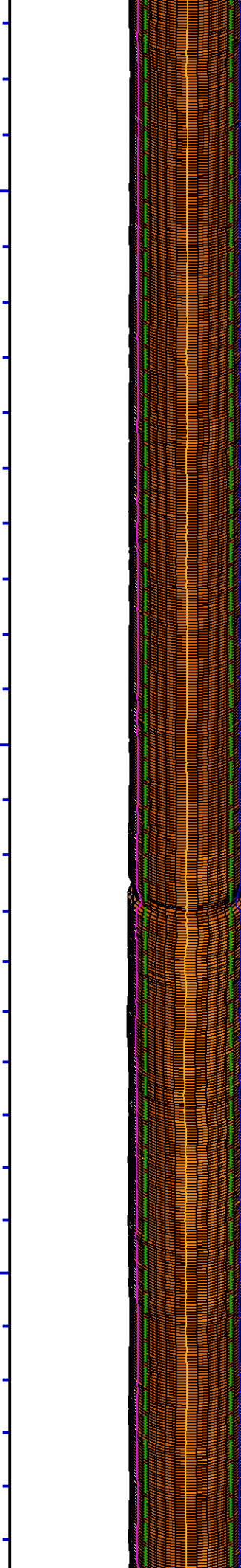
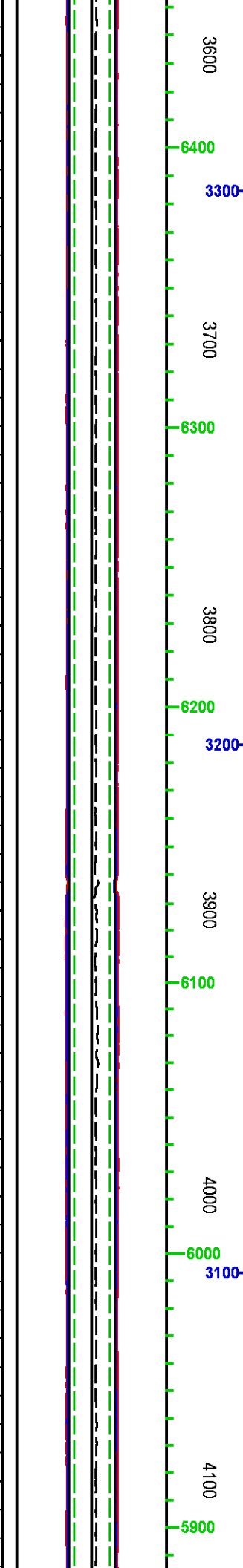
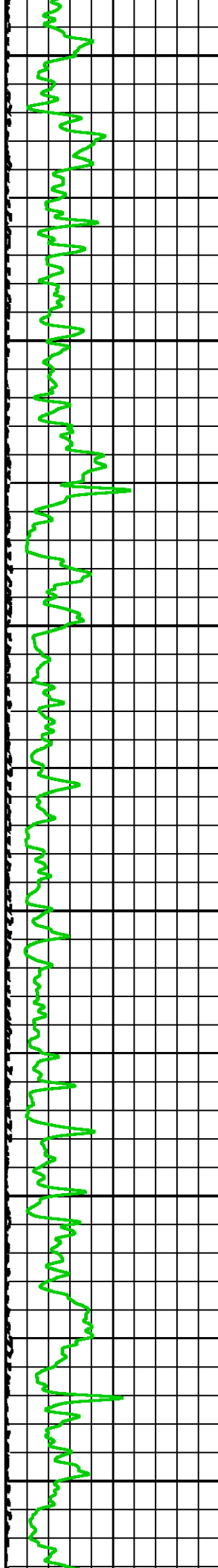


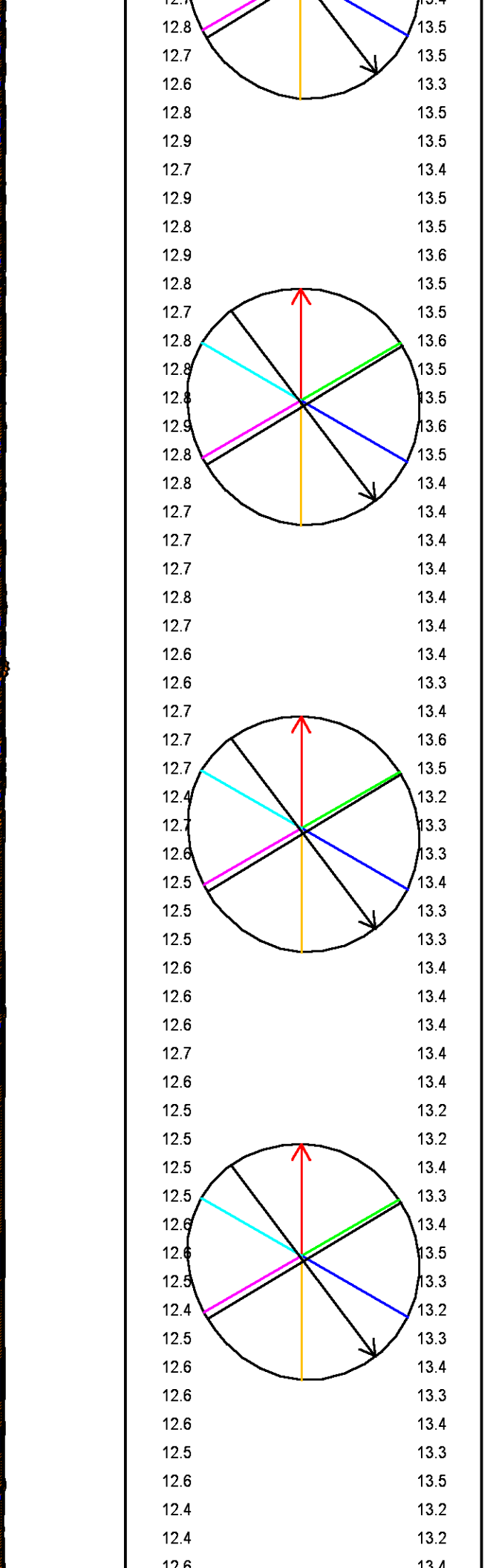
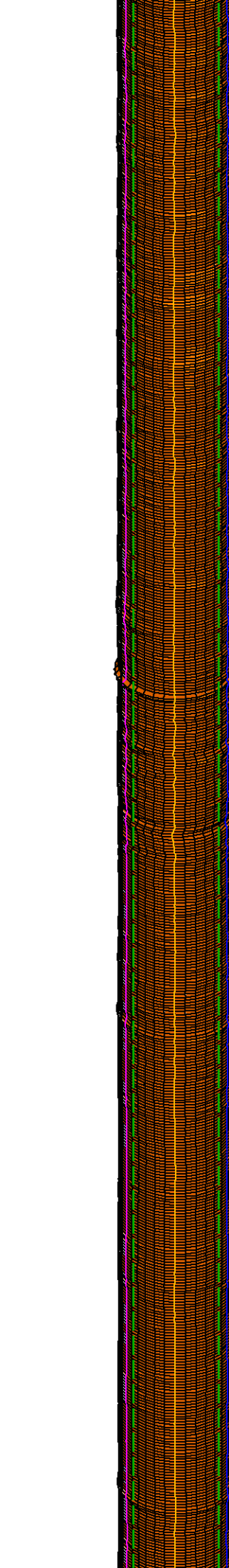
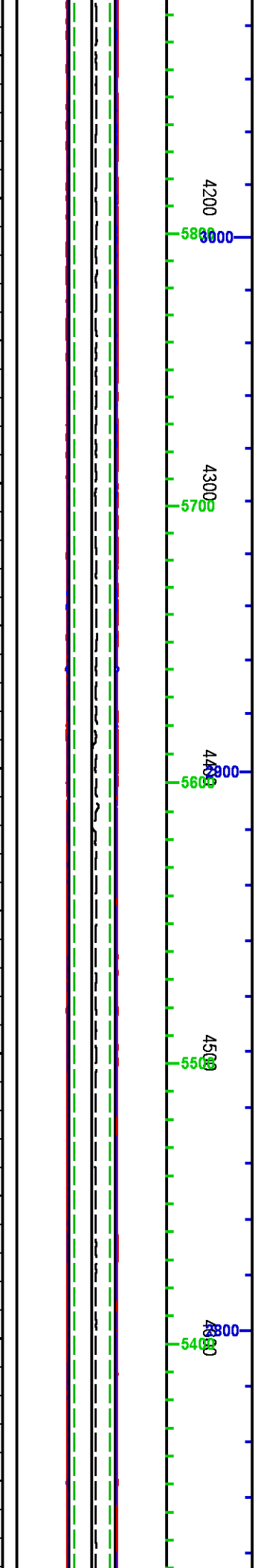
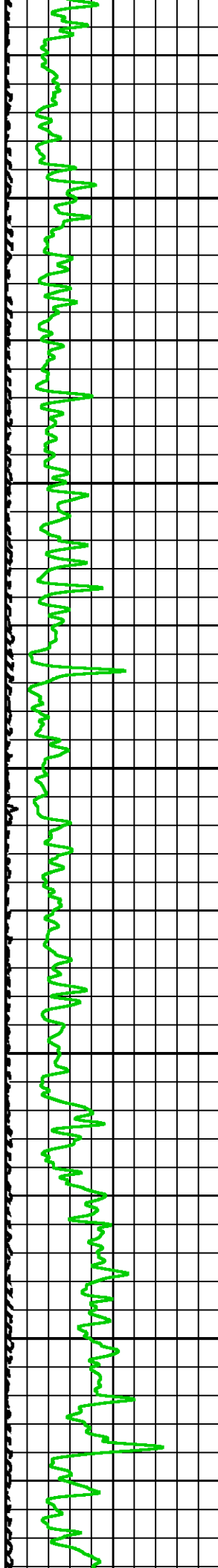


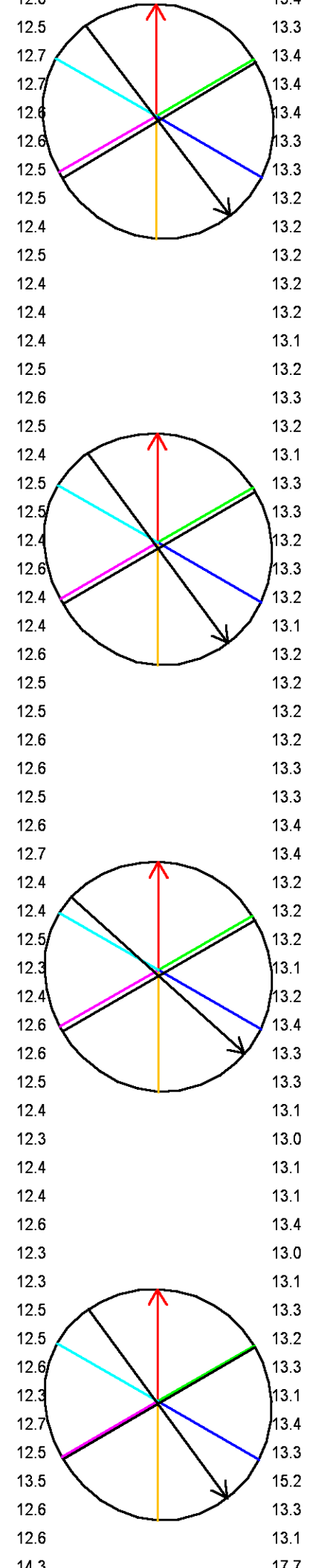
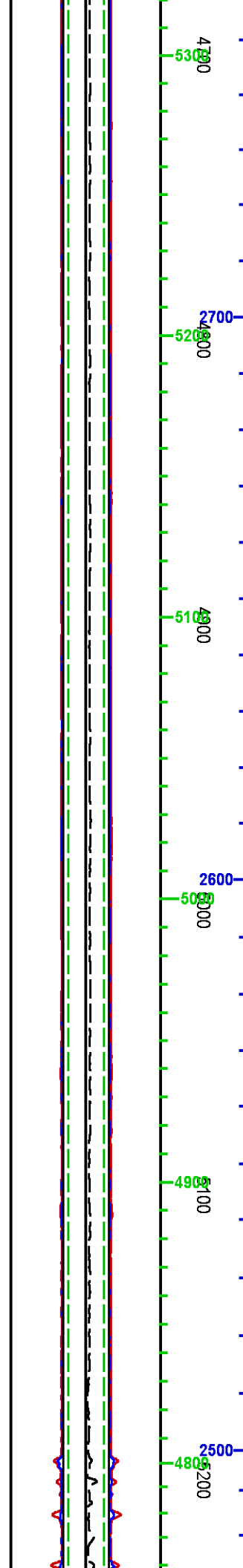
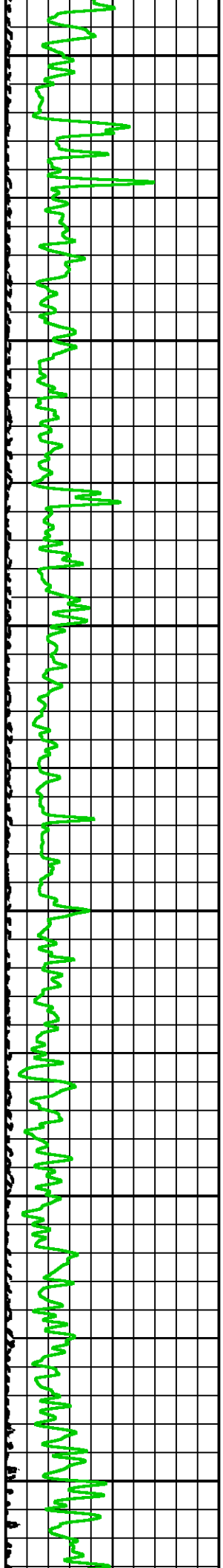


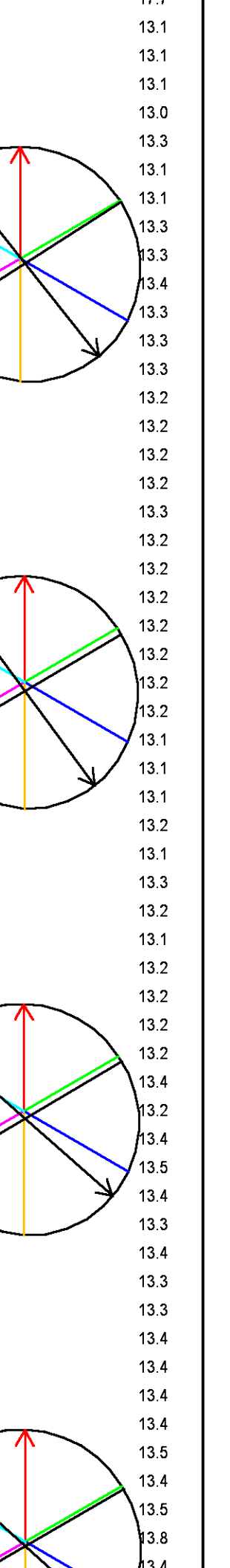
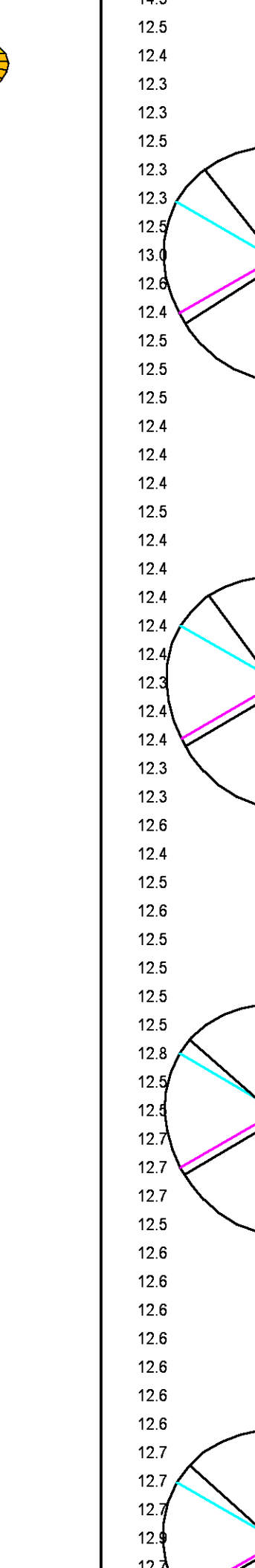
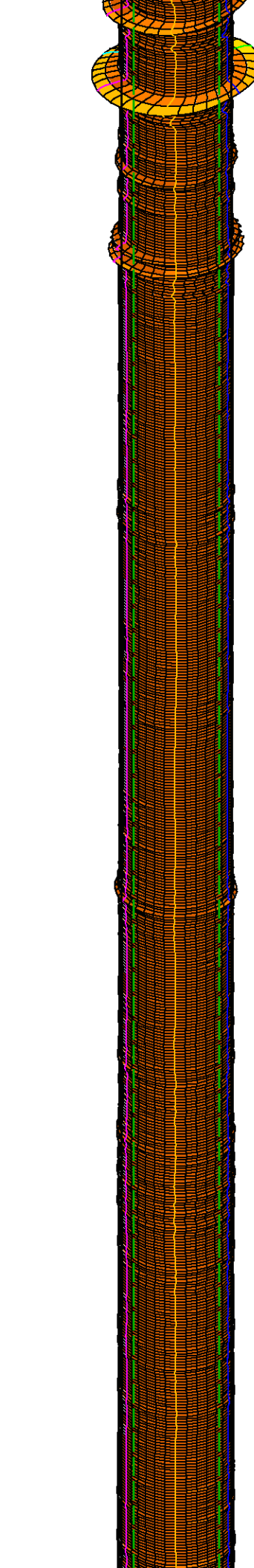
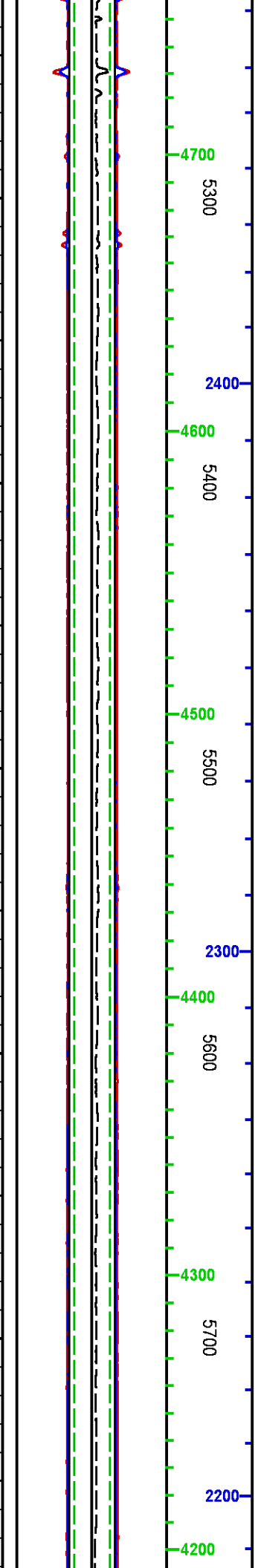
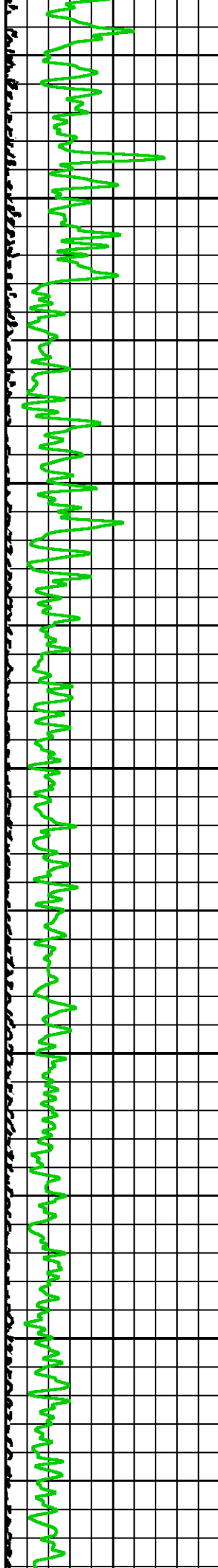


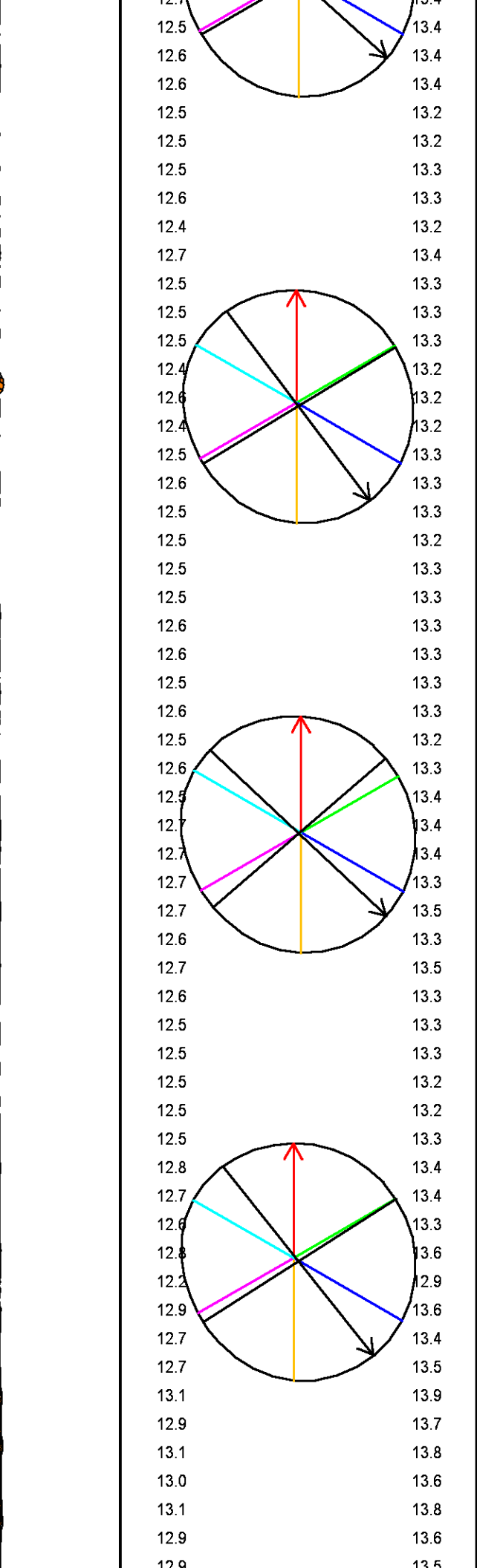
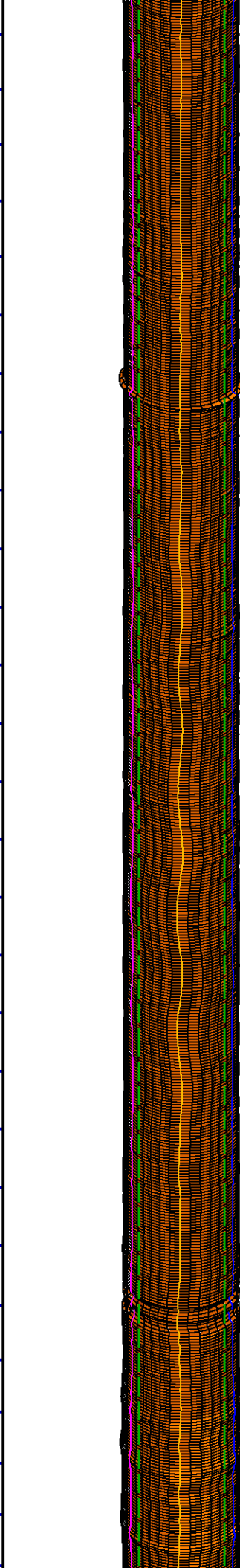
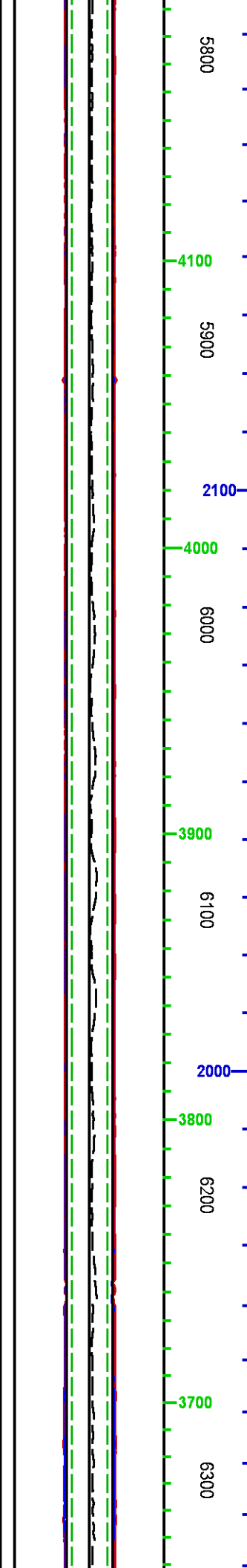
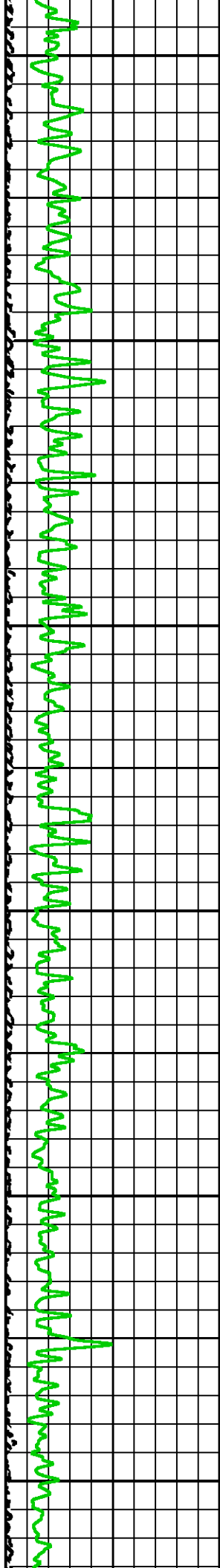


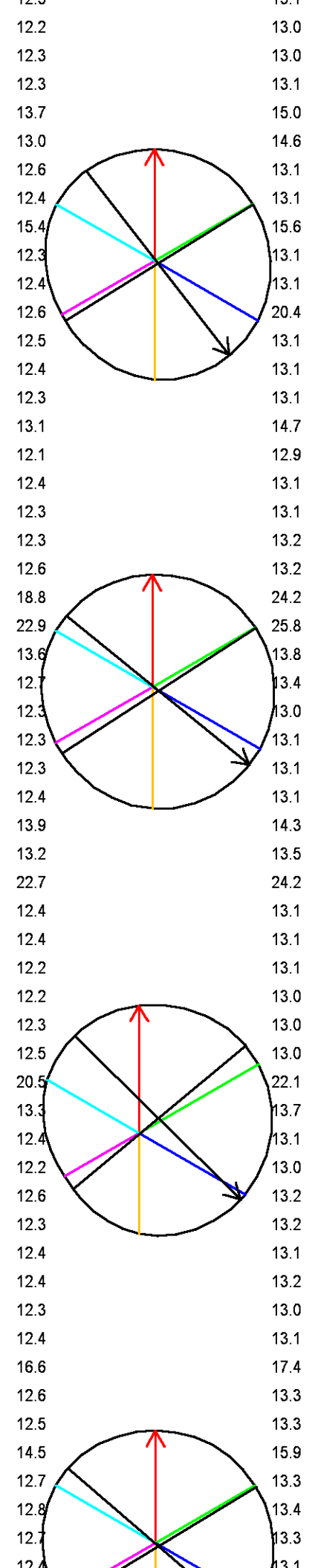
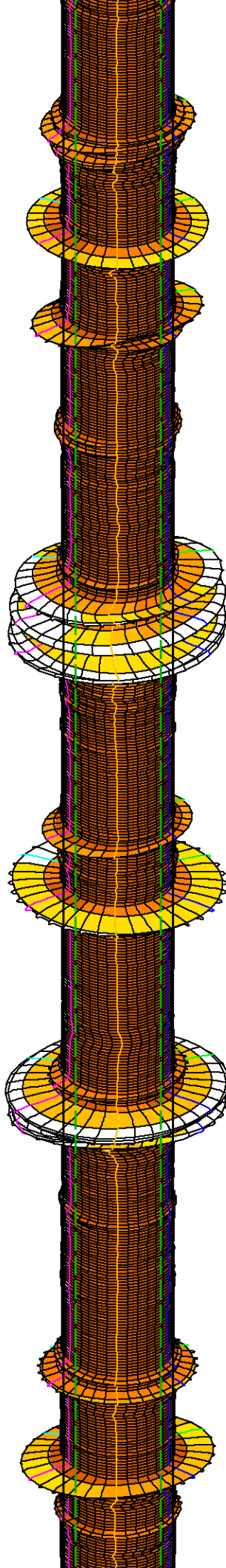
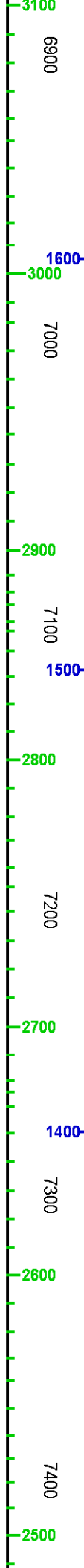
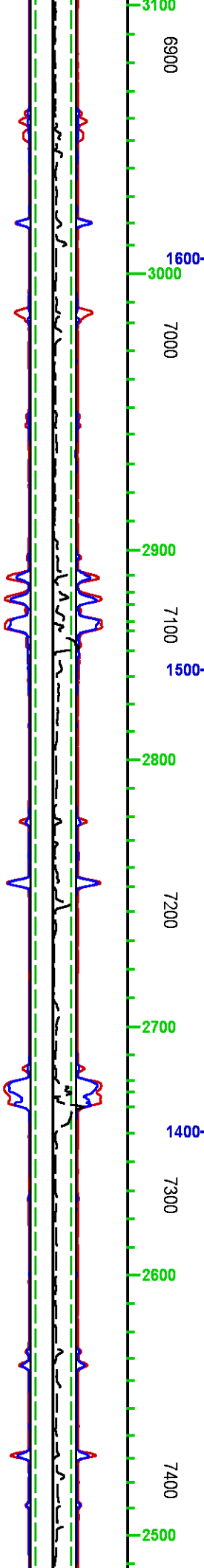
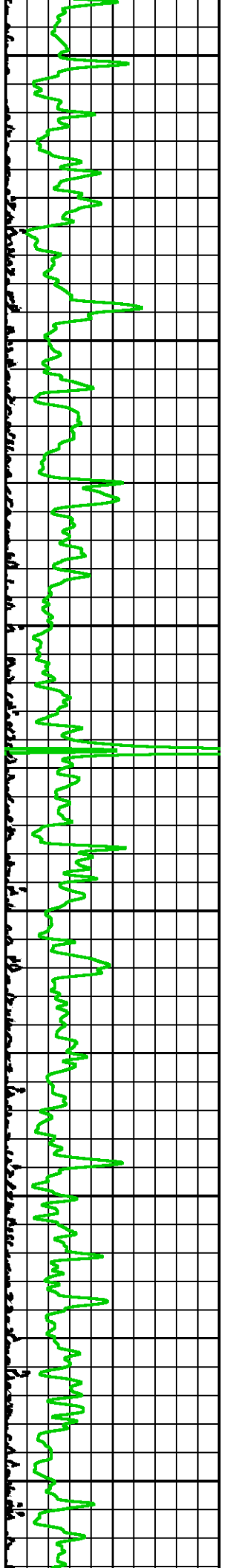


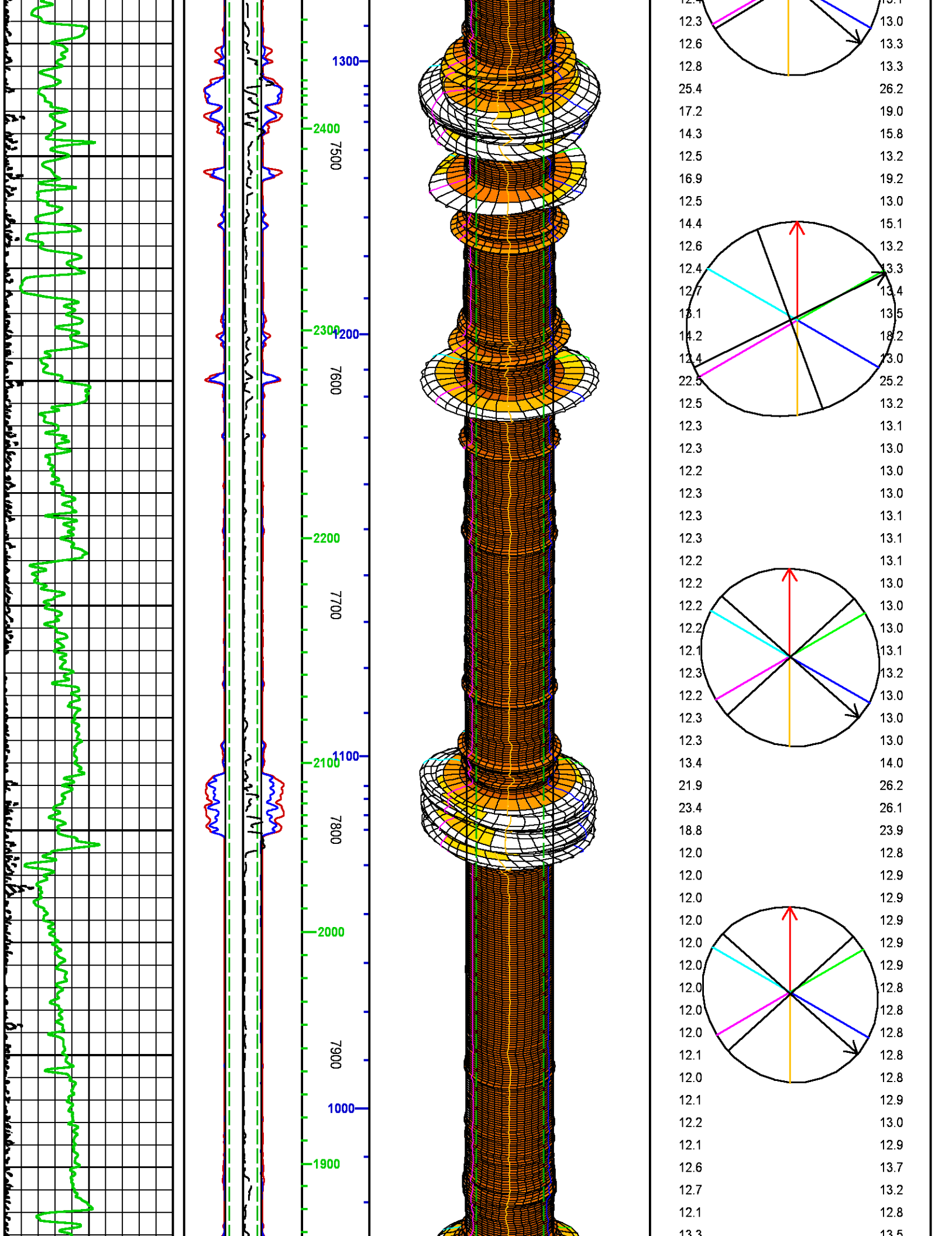


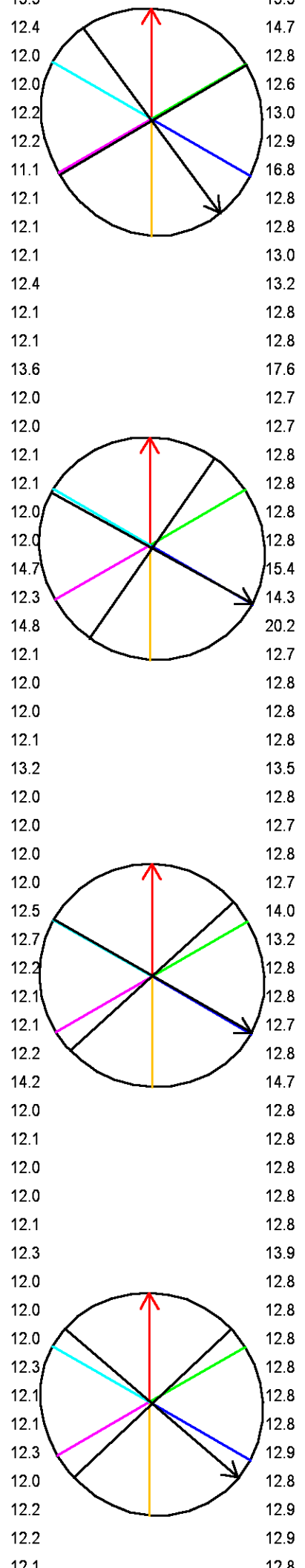
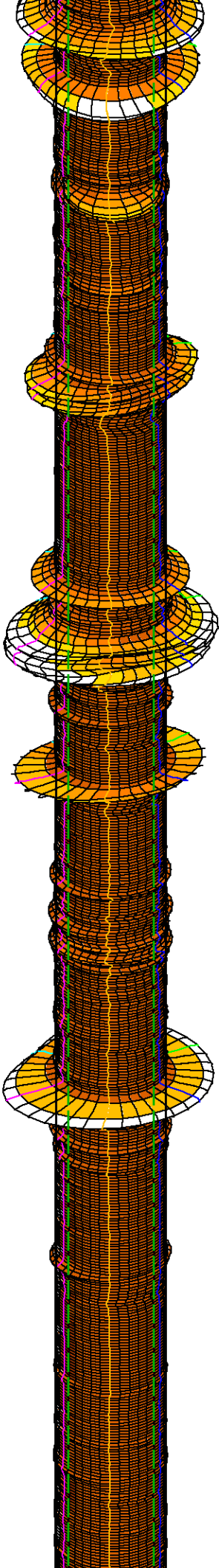
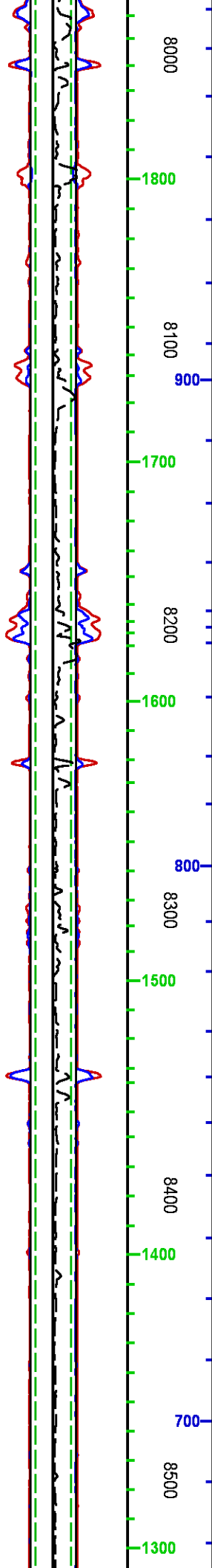
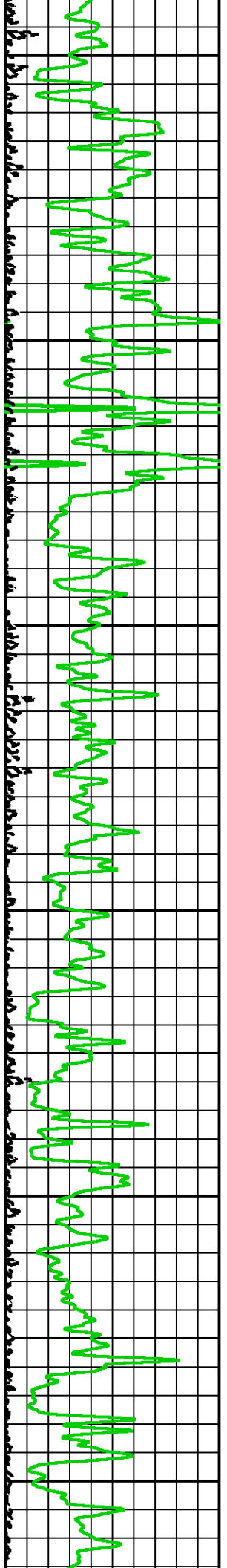


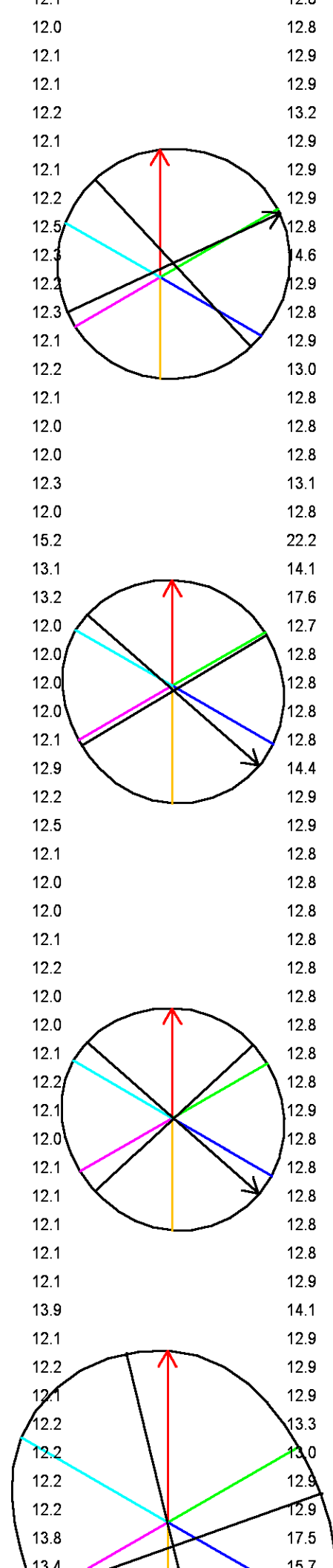
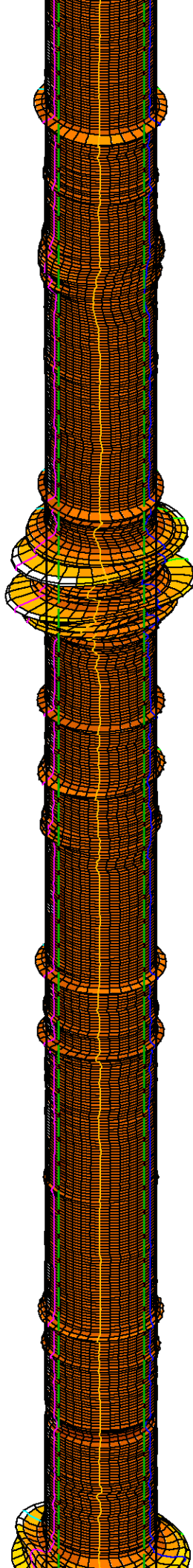
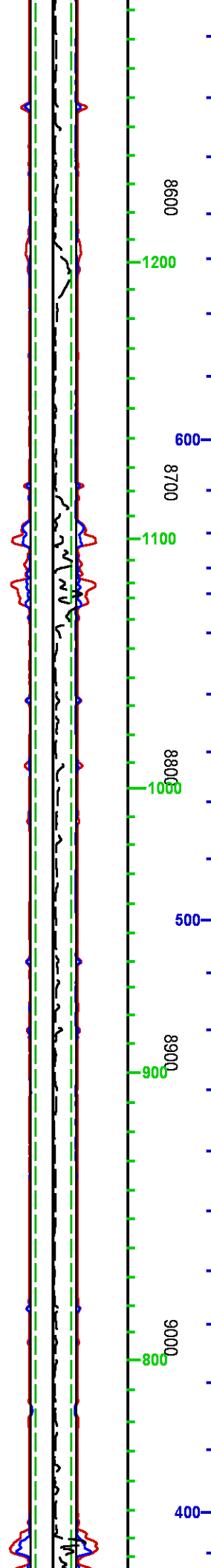
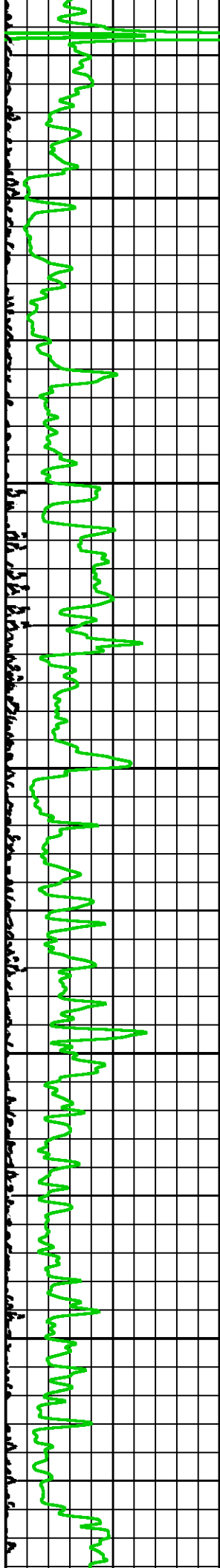


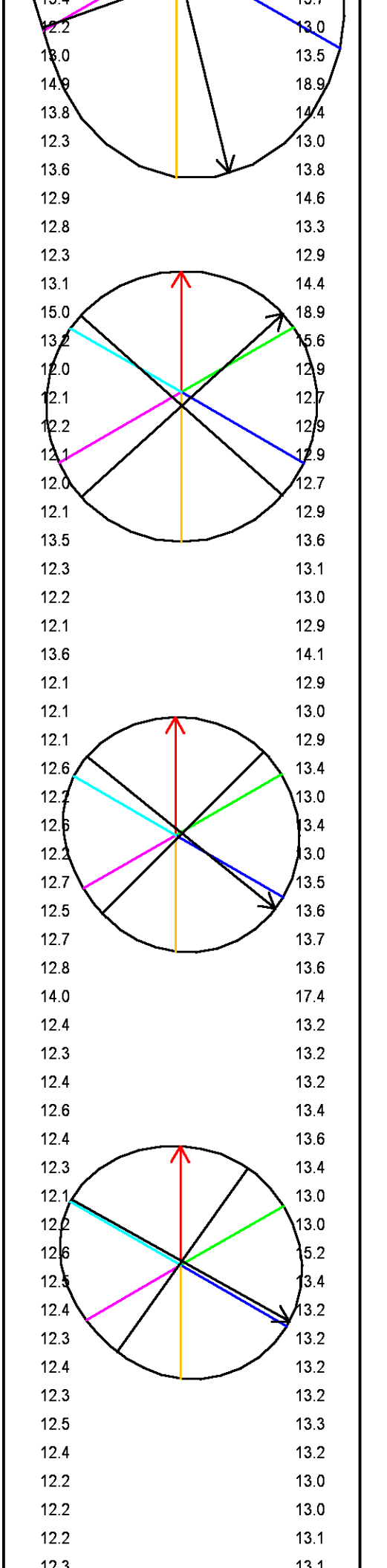
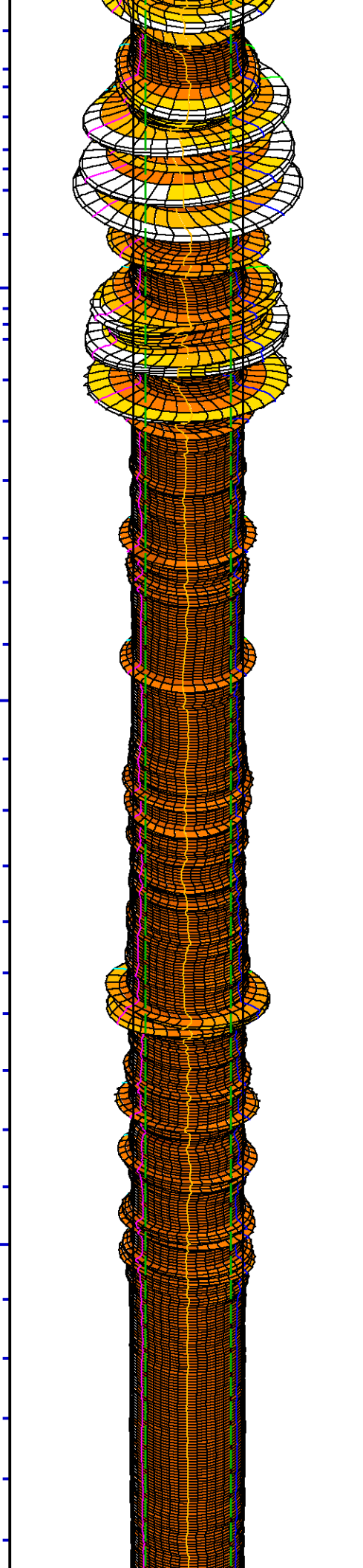
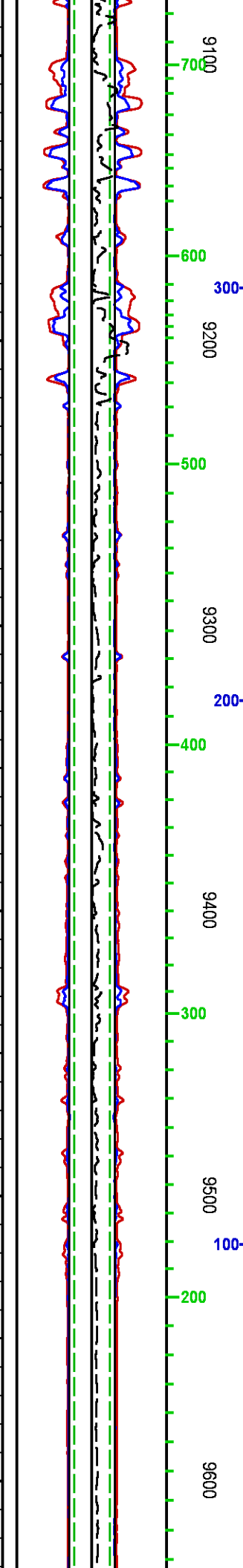
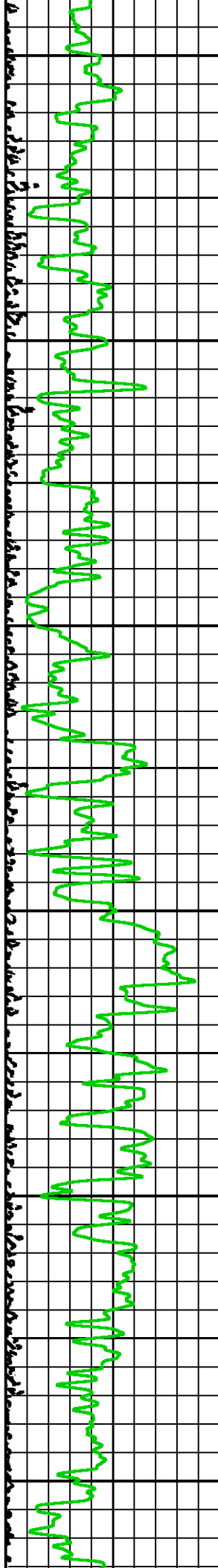


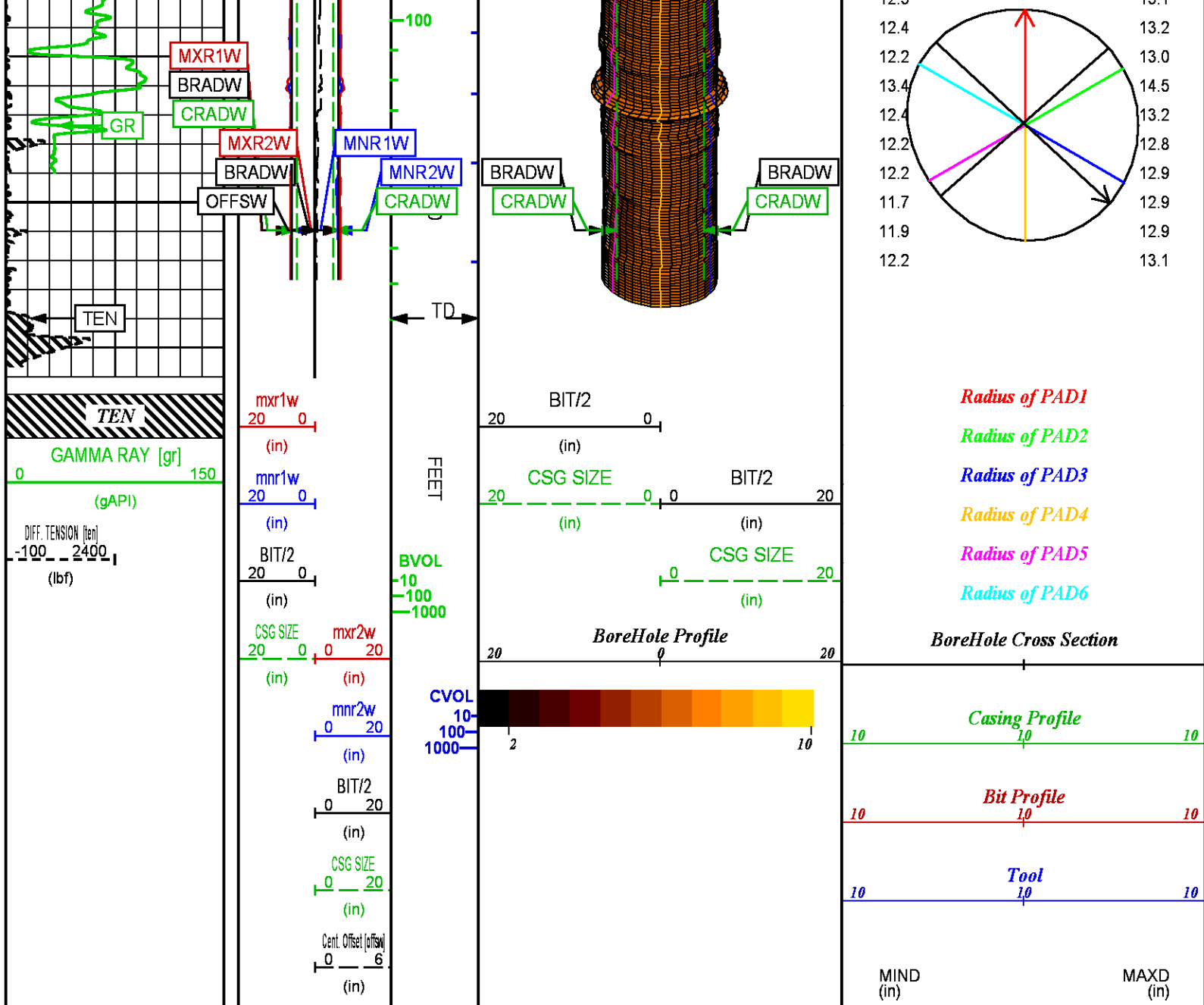












CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/md11798R2/p87cc.tp1

GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1329XA 179409

DATE/TIME PERFORMED: Wed May 23 12:06:32 2018

UNIT #: 3882TD HL6690

CALB JIG #: 4702NK DA-434

BACKGROUND CALBTR ON

(cts/s)

CR DIFF

(cts/s)

MULT

BACKGROUND CALBTR ON

(gAPI)

CALBTR

(gAPI)

GR

278.00

1100.00

0.12.0

0.164

15.00

105.00

150

GR	278.98	1190.93	912.0	0.164	45.89	195.89	150
			830.0	980.0			

GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1329XA 179409

DATE/TIME PERFORMED: Wed May 23 12:12:49 2018

UNIT #: 3882TD HL6690

VERI JIG #: 4702NK DA-434

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	282.71	1184.62	0.164	46.50	194.85	148.35
						140.00 160.00

WGI PRIMARY CALIBRATION SUMMARY

TOOL #: 4253XA 12408673

DATE/TIME PERFORMED: Fri Jun 15 06:07:15 2018

UNIT #: 5753XD 10215900

DIAMETER	SM RING (in)	LG RING (in)	TEMPERATURE (degF)
	7.000	21.800	68.551

COS/SIN/ ANGLE DATA	SM RING COS (mV)	SM RING SIN (mV)	LG RING COS (mV)	LG RING SIN (mV)	OFFSET COS (mV)	OFFSET SIN (mV)	OFFSET ANG (deg)
ARM 1 LOWER	208.7	-1301.2	-358.1	1164.5	-74.7	-68.3	12.289
					-500.0 500.0	-500.0 500.0	
ARM 1 UPPER	1150.9	-622.7	-939.4	890.0	105.7	133.7	8.173
					-500.0 500.0	-500.0 500.0	
ARM 2 LOWER	1222.1	-310.6	-1209.0	206.3	6.5	-52.1	5.784
					-500.0 500.0	-500.0 500.0	
ARM 2 UPPER	-168.3	-1204.0	436.5	1165.9	134.1	-19.1	15.016
					-500.0 500.0	-500.0 500.0	
ARM 3 LOWER	1373.3	-425.2	-1285.3	362.4	44.0	-31.4	6.234
					-500.0 500.0	-500.0 500.0	
ARM 3 UPPER	27.7	1411.8	-223.3	-1281.8	-97.8	65.0	-3.884
					-500.0 500.0	-500.0 500.0	
ARM 4 LOWER	-715.3	-1052.8	588.8	1263.3	-63.2	105.3	16.522
					-500.0 500.0	-500.0 500.0	
ARM 4 UPPER	-1193.9	-357.7	1353.1	202.9	79.6	-77.4	21.343
					-500.0 500.0	-500.0 500.0	
ARM 5 LOWER	1330.4	73.1	-1320.3	-60.5	5.0	6.3	4.296
					-500.0 500.0	-500.0 500.0	
ARM 5 UPPER	1313.9	12.8	-1257.5	143.3	28.2	78.1	4.875
					-500.0 500.0	-500.0 500.0	
ARM 6 LOWER	727.4	1083.7	-582.2	-1302.9	72.6	-109.6	-1.540
					-500.0 500.0	-500.0 500.0	
ARM 6 UPPER	664.8	-1083.4	-457.2	1167.0	103.8	41.8	10.934
					-500.0 500.0	-500.0 500.0	

WGI BEFORE LOG VERIFICATION SUMMARY

TOOL #: 4253XA 12408673

DATE/TIME PERFORMED: Sat Jun 16 10:15:18 2018

DAYS SINCE CAL: 1

UNIT #: 3882TD HL6690

DIAMETER	TRUE ID (in)	CHAD (in)	MIND (in)	MAXD (in)	TEMPERATURE (degF)
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	12.615	12.765	12.632	12.912	96.237
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12.415	12.815
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	RADIUS (in)	RADIUS (in)	DIAMETER (in)
ARM 1 & 4	5.483	7.165	12.648
ARM 2 & 5	5.972	6.669	12.640
ARM 3 & 6	6.954	5.877	12.831

**BAKER
HUGHES**
a GE company



COMPANY
WELL
FIELD
COUNTY

HOLLY FRONTIER - NAVAJO
NAVAJO REFINING WDW #4
ARTESIA
EDDY **STATE** **NEW MEXICO**

FILE NO:

MD11798

API NO:

30-015-44677

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

16-JUN-2018

ECLIPS