



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

PERMANENT DATUM
LOG MEASURED FROM
DRILL. MEAS. FROM

GL
KB
KB
20 FT
ELEVATION
3565.8 FT
ABOVE P.D.

ELEVATIONS:
KB 3565.8 FT
DF 3564.8 FT
GL 3565.8 FT

DATE
09-May-2018

RUN
TRIP
1
1

SERVICE ORDER
128981

DEPTH DRILLER
1680 FT

DEPTH LOGGER
1680 FT

BOTTOM LOGGED INTERVAL
80 FT

TOP LOGGED INTERVAL
50 FT

CASING DRILLER
20 IN

CASING LOGGER
107 FT

BIT SIZE
17.5 IN

TYPE OF FLUID IN HOLE
WBM

DENSITY
10.2 LB/G

PH
10

SOURCE OF SAMPLE
FLOWLINE

RM AT MEAS. TEMP.
0.063 OHMM

RM AT MEAS. TEMP.
0.054 OHMM

RMC AT MEAS. TEMP.
0.085 OHMM

SOURCE OF RMF
MEASURED

RM AT BHT
0.073 OHMM

TIME SINCE CIRCULATION
6 HRS

MAX. RECORDED TEMP.
90 DEGF

EQUIP. NO.
HL6846

RECORDED BY
JKOSKI

LOCATION
MIDLAND, TX

WITNESSED BY
KCOOK

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

CASING RECORD

SIZE	WEIGHT	GRADE	FROM	TO
20 IN			0 FT	80 FT
13.375 IN				

REMARKS

RUN 1 TRIP 1: BOREHOLE AND CEMENT VOLUME PRESENTED (TOTAL VOLUME LESS 13.375" 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	10348286	FREE
1	1	COMM	3514XA	10570247	FREE

1	1	GAMMA	1329XA	2177857	FREE
1	1	ISO	4485XA	12448494	CENTRALIZED
1	1	6CAL	4253XA	12408673	CENTRALIZED
1	1	RTEX	1249XA	13339146	CENTRALIZED
1	1	MLL	1243XA	12650281	PAD DEVICE
1	2	CN	2446XA	10080837	D.CENT
1	2	ZDL	2234XA	12429124	PAD DEVICE

INSTRUMENT CONFIGURATION

Source File: /dat1a/md11798/p87ccwgi~tdg

CABLEHEAD

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

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

DIGITAL SPECTRALOG

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

MASS ISOLATION SUB

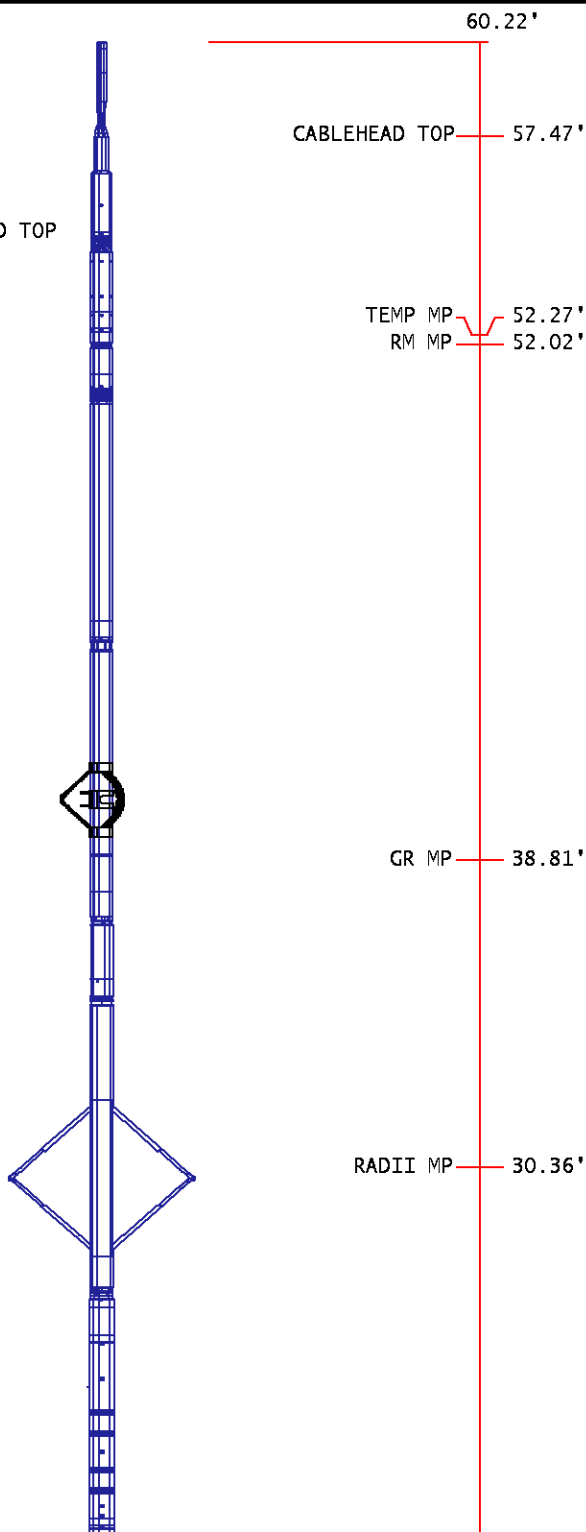
Diameter : 3.63"
Length : 2.09'

WELL GEOMETRY INSTRUMENT

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

WTS RT EXPLORER

Diameter : 4.00"
Length : 14.00'



Length : 258.0 lbs
Weight : 246.1 lbs
Series : 1249XA
Mnemonic : RTEX
Measure Point: 7.09': RTEX MP

RTEX MP 20.60'

WTS MICROLATEROLOG

Diameter : 4.00"
Length : 11.25'
Weight : 258.1 lbs
Series : 1243XA
Mnemonic : MLL
Measure Point: 1.55': MP

MASS ISOLATION SUB

Diameter : 3.63"
Length : 2.09'

BULL PLUG 2 5/6

TOTAL LENGTH: 60.22'
TOTAL WEIGHT: 1062.1 lbs
MAX DIAMETER: 0'4.00"



MP 3.82'

0.00'

MAIN LOG 2"/100FT SCALE

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

Patches: 3

Plotted: Wed May 9 18:24:06 2018

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1a/md11798/p87ccwgiR02.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 77.500 ft BOTTOM DEPTH: 1687.391 ft

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ft)	
TENSION GR	FILTER ()	medium (1)		TOP	BOTTOM
	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.	13.375	in	TOP	BOTTOM
CALIPER SELECTION	X-Y VS MULTI-ARM SEL	MULTI-ARM CAL		"	"
BIT SIZE	BIT SIZE	17.500	in	TOP	1657.141
		12.250	in	1657.141	BOTTOM

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

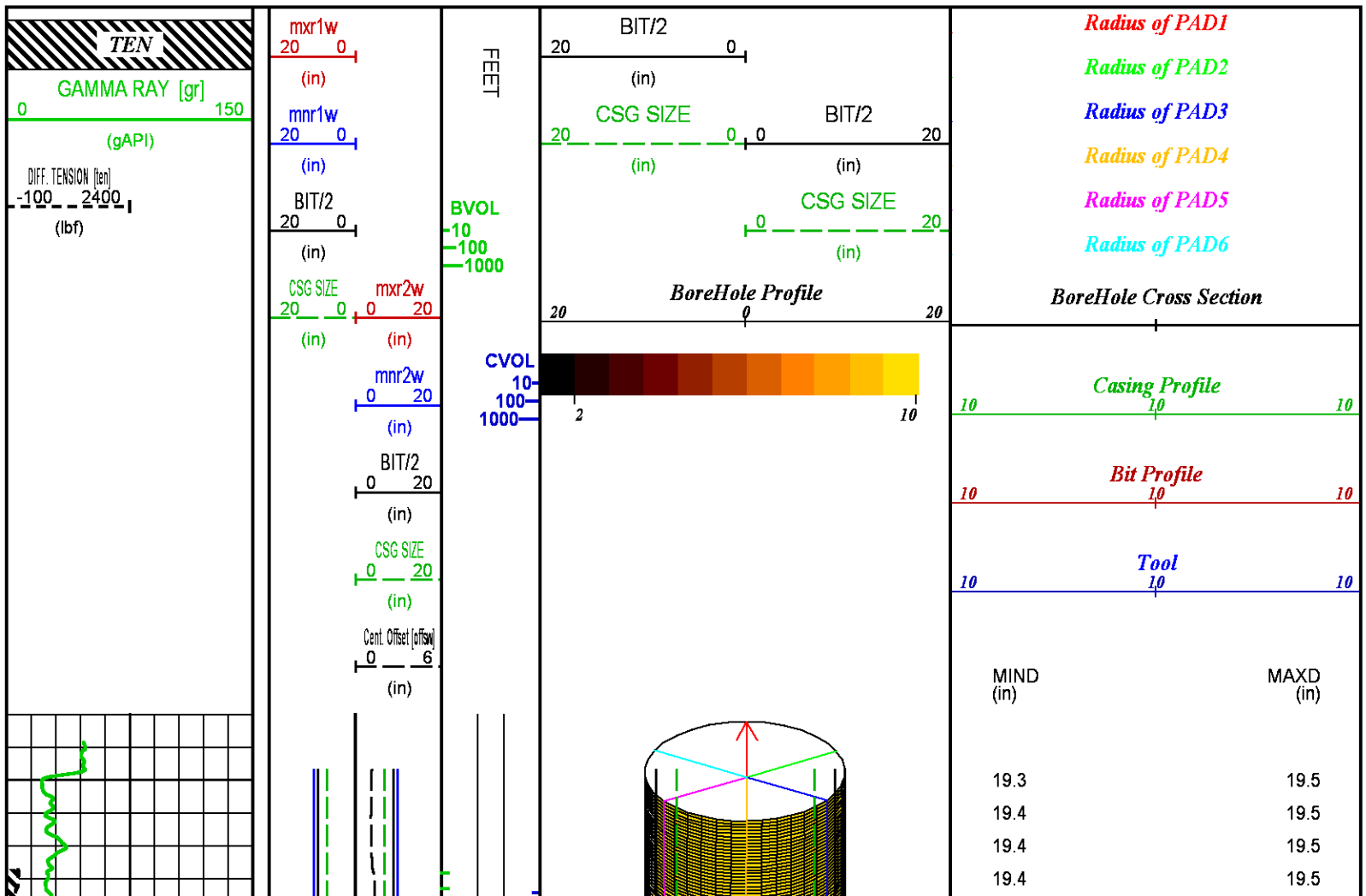
CURVE MEASURE POINT OFFSET

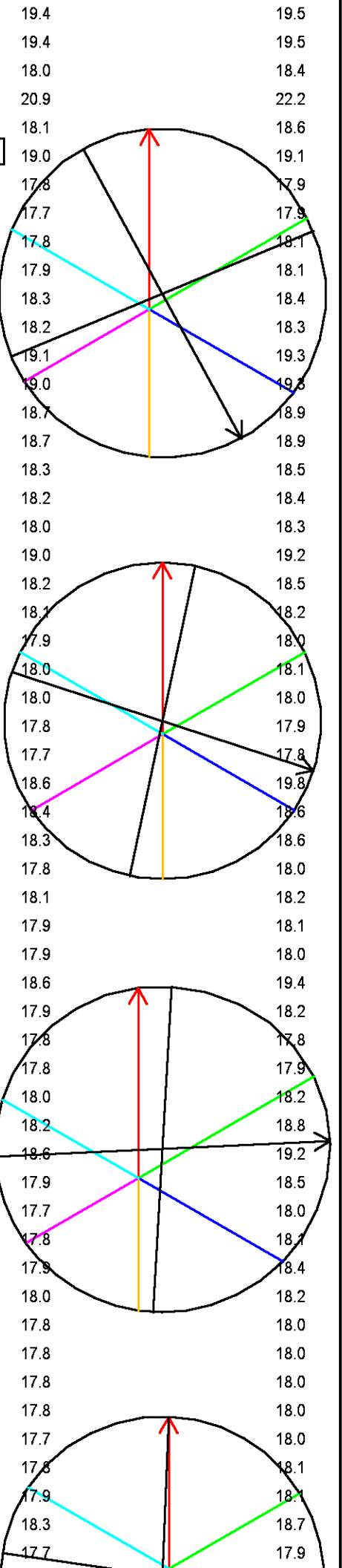
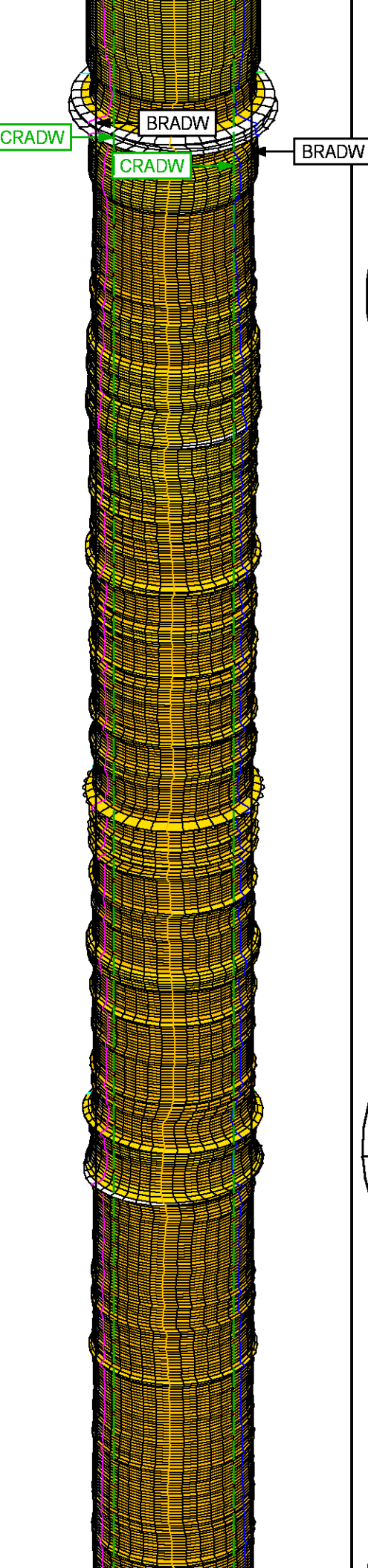
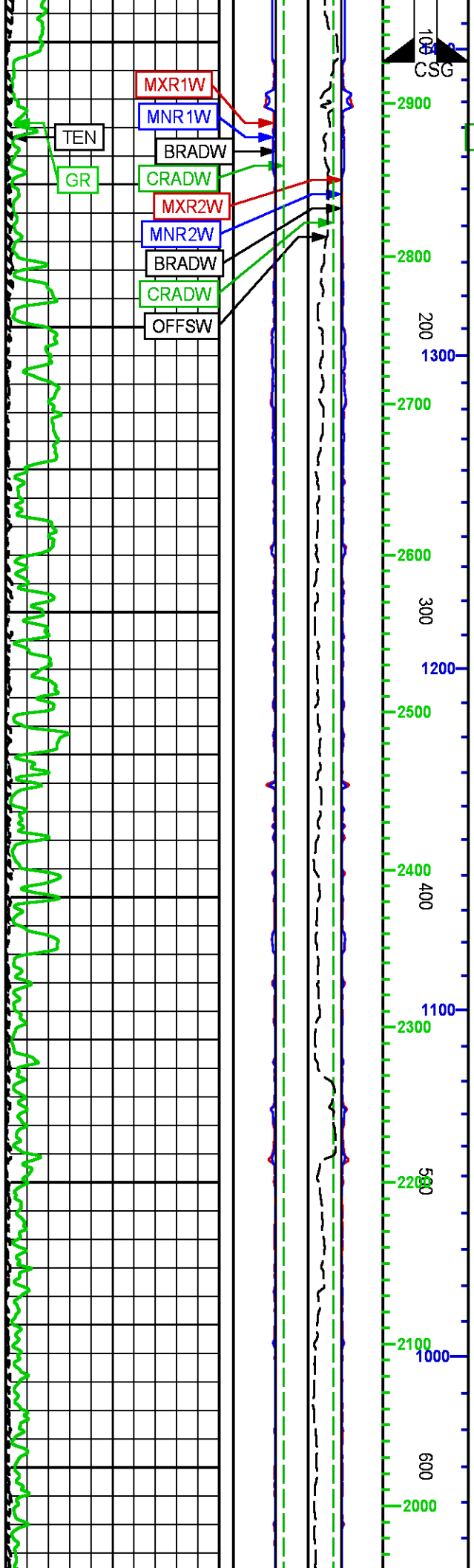
CURVE **OFFSET (ft)** **CURVE** **OFFSET (ft)** **CURVE** **OFFSET (ft)** **CURVE** **OFFSET (ft)**

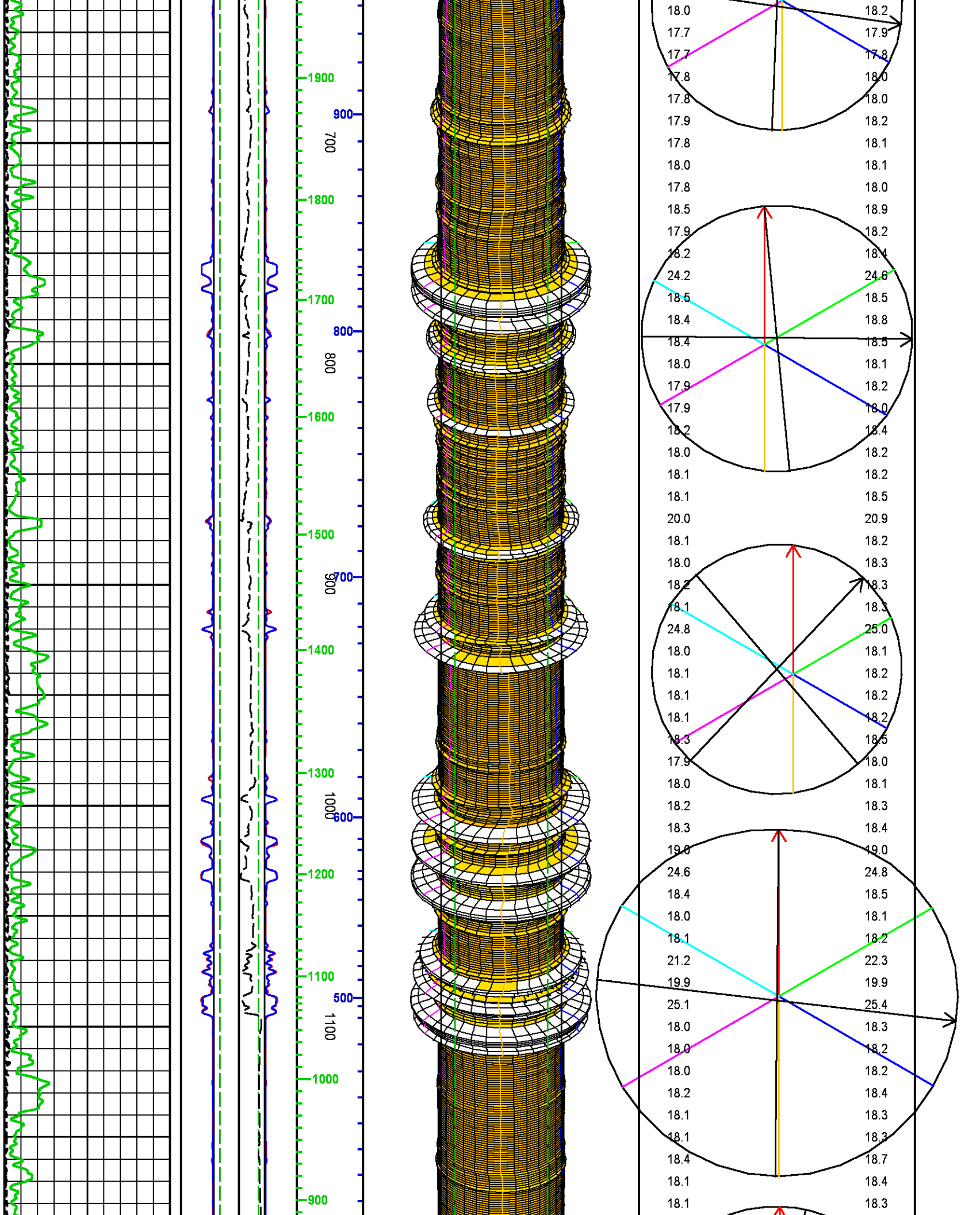
BRADW	-30.25	GR	-38.62	MXR1W	-30.25	TEN	0.00
CRADW	-30.25	MNR1W	-30.25	MXR2W	-30.25		
DFLGW	-30.25	MNR2W	-30.25	OFFSW	-30.25		

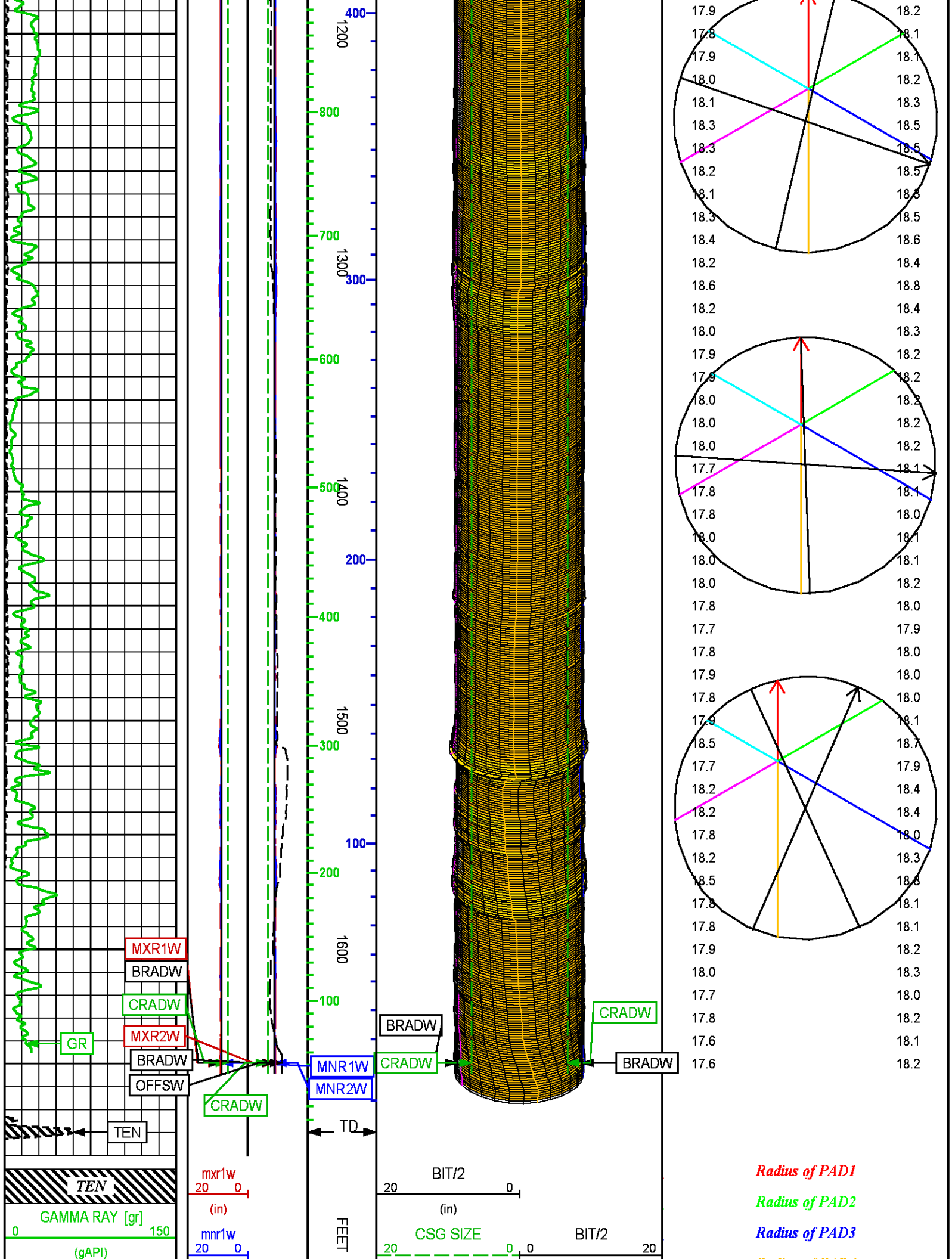
Presentation : SysA:/dat1a/md11798/bhp_align-6calwgi-noOrit.fvpdf [2"/100' Scale]
Plot Interval : 38.5 - 1685.5 Feet

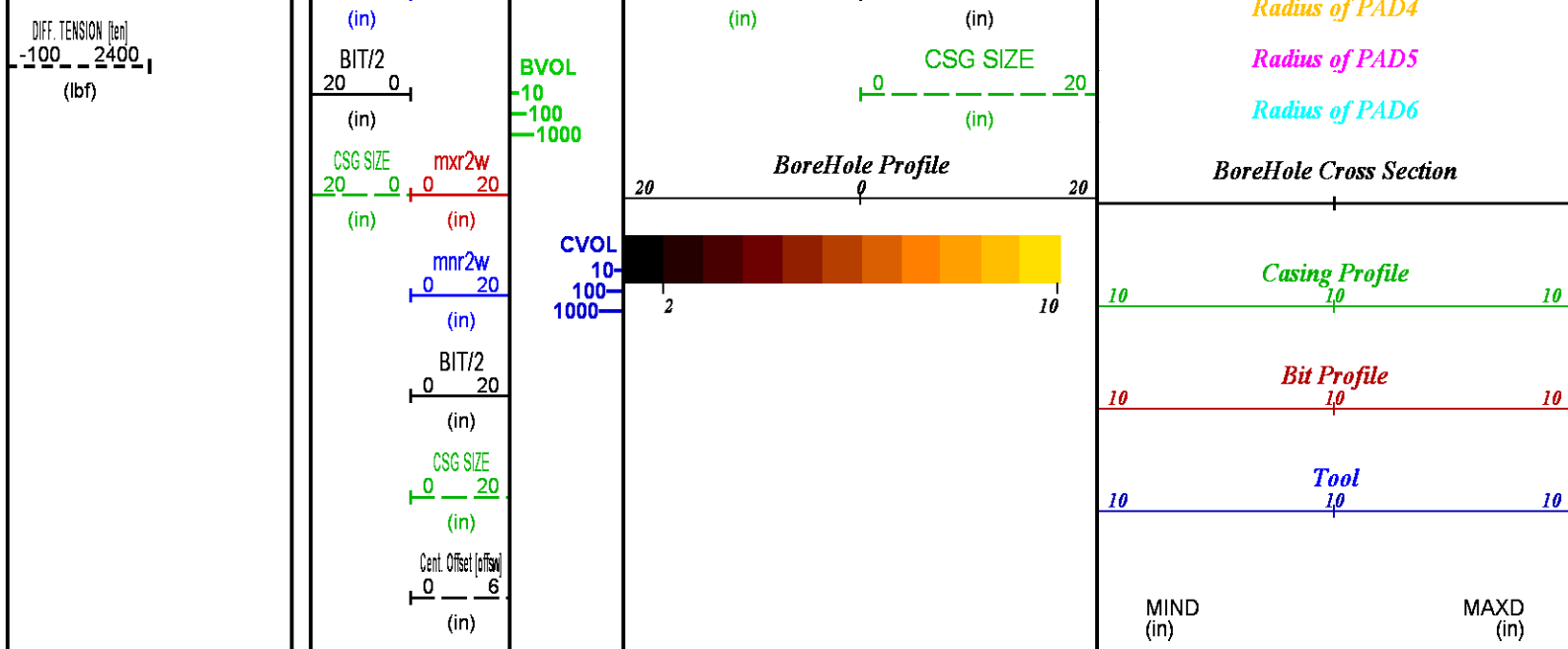
Data File 1 : F1 : SysA:/dat1a/md11798/p87ccwgiR02.aff
Created On : N/A
Company : 3 BEAR DELAWARE OPERATING NM LLC
Well : LIBBY BERRY SWD #1
Field : WILDCAT
File Interval : 24 - 1685.5 Feet
OCT : p87ccwgi











CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/md11798/WGL.tp1

GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1329XA 177857

DATE/TIME PERFORMED: Sun Apr 15 11:40:17 2018

UNIT #: 5753XD 10215900

CALB JIG #: 4702NK DA-486

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	GR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	248.51	1177.36	928.8 830.0 980.0	0.161	40.13	190.13	150

GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1329XA 177857

DATE/TIME PERFORMED: Sun Apr 15 11:44:46 2018

UNIT #: 5753XD 10215900

VERI JIG #: 4702NK DA-486

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	255.31	1181.49	0.161	41.23	190.80	149.57 140.00 160.00

WGI PRIMARY CALIBRATION SUMMARY

TOOL #: 4253XA 12408673

DATE/TIME PERFORMED: Wed May 9 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 -500.0 500.0	-68.3 -500.0 500.0	12.289
ARM 1 UPPER	1150.9	-622.7	-939.4	890.0	105.7 -500.0 500.0	133.7 -500.0 500.0	8.173
ARM 2 LOWER	1222.1	-310.6	-1209.0	206.3	6.5 -500.0 500.0	-52.1 -500.0 500.0	5.784
ARM 2 UPPER	-168.3	-1204.0	436.5	1165.9	134.1 -500.0 500.0	-19.1 -500.0 500.0	15.016
ARM 3 LOWER	1373.3	-425.2	-1285.3	362.4	44.0 -500.0 500.0	-31.4 -500.0 500.0	6.234
ARM 3 UPPER	27.7	1411.8	-223.3	-1281.8	-97.8 -500.0 500.0	65.0 -500.0 500.0	-3.884
ARM 4 LOWER	-715.3	-1052.8	588.8	1263.3	-63.2 -500.0 500.0	105.3 -500.0 500.0	16.522
ARM 4 UPPER	-1193.9	-357.7	1353.1	202.9	79.6 -500.0 500.0	-77.4 -500.0 500.0	21.343
ARM 5 LOWER	1330.4	73.1	-1320.3	-60.5	5.0 -500.0 500.0	6.3 -500.0 500.0	4.296
ARM 5 UPPER	1313.9	12.8	-1257.5	143.3	28.2 -500.0 500.0	78.1 -500.0 500.0	4.875
ARM 6 LOWER	727.4	1083.7	-582.2	-1302.9	72.6 -500.0 500.0	-109.6 -500.0 500.0	-1.540
ARM 6 UPPER	664.8	-1083.4	-457.2	1167.0	103.8 -500.0 500.0	41.8 -500.0 500.0	10.934



COMPANY
WELL
FIELD
COUNTY

HOLLY FRONTIER - NAVAJO
NAVAJO REFINING WDW #4
ARTESIA
EDDY

STATE NEW MEXICO

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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

09-May-2018

