HALLIBURTON | Sperry Drilling

PROPRIETARY

DGR Dual Gamma Ray
ALD Azimuthal Lithodensity
XCAL Azimuthal Acoustic Caliper

1 : 240

Country	: **USA**
Field	: **Posey 6912**
Location	: **Lat: 71° 10' 24.06" North** **Long: 163° 28' 18.67" West**
Well	: **OCS-Y-2321 BJ001 ST00BP00**
Company	: **Shell Gulf of Mexico Inc.**
Rig	: **Polar Pioneer**

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Rig : **Polar Pioneer**
Well : **OCS-Y-2321 BJ001 ST00BP00**
Field : **Posey 6912**
Country : **USA**
API Number : **55-352-00004-00**

LOCATION
Latitude : **71° 10' 24.06" North**
Longitude : **163° 28' 18.67" West**
Final UTM Easting = 555,034.550 m
Final UTM Northing = 7,897,425.308 m

Other Services
PWD, DDSr
MRIL-WD

Permanent Datum : **Mean Sea Level** Elevation : **0.00 ft**
Log Measured From : **Drill Floor** **76.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

MD LOG

Elev. KB **N/A**
DF **76.00 ft**
GL **N/A**
WD **146.00 ft**

Depth Logged : **222.00 ft** To **6,800.00 ft**
Date Logged : **30-Jul-15** To **21-Sep-15**
Total Depth MD : **6,800.00 ft** TVD : **6,795.34 ft**
Spud Date : **30-Jul-15**

Unit No. : **1**
Plot Type : **Final**
Plot Date : **01-Nov-15**

Job No. :**AK-XX-0901604700**

Run No.	Borehole Record (MD)			Size	Casing Record (MD)		
	Size	From	To		Weight	From	To
1	8.500 in	222.00 ft	1,512.00 ft	36.000 in	746.00 lbpf	257.00 ft	375.00 ft
5	17.500 in	1,512.00 ft	2,963.00 ft	22.000 in	224.00 lbpf	257.00 ft	1,475.00 ft
6	12.250 in	2,963.00 ft	5,423.00 ft	14.000 in	114.00 lbpf	257.00 ft	2,933.00 ft
7	8.500 in	5,423.00 ft	6,800.00 ft	9.625 in	53.00 lbpf	2,653.00 ft	5,408.00 ft

WELL INFORMATION

MWD Run Number	100	600	700		
Date run completed	01-Aug-15	14-Sep-15	22-Sep-15		
Rig Bit Number	1	6	7		
Bit Size (in)	8.500	12.250	8.500		
Tool Nominal OD (in)	6.75	8.000	6.750		
Log Start Depth (MD, ft)	222.00	2,963.00	5,423.00		
Log End Depth (MD, ft)	1,512.00	5,423.00	6,800.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	30-Jul-15 17:05	12-Sep-15 01:20	20-Sep-15 08:52		
Drill/Wipe End Date and Time	01-Aug-15 11:21	13-Sep-15 16:35	21-Sep-15 23:09		
Min Inc (deg) @ Depth (MD, ft)	0.00 @ 0.00	0.58 @ 3,074.55	3.42 @ 5,980.70		
Max Inc (deg) @ Depth (MD, ft)	0.51 @ 320.88	3.70 @ 5,299.05	3.99 @ 6,745.05		
Bit TFA(in2) / Bit Type	0.71 / Tricone	0.99 / PDC	0.55 / PDC		
Flow Rate (gpm)	449.40	828.00	550.00		
Max AV (fpm) / CV (fpm) @ MWD	774.0 / 984.0	239.0 / 357.0	549.0 / 1,000.0		
Fluid Type	Sea Water	Polymer	Polymer		
Density (ppg) / Viscosity (spqt)	8.55 / 27.00	11.40 / 56.00	12.00 / 79.00		
Filtrate CL (ppm)	35,000.00	100,000.00	135,000.00		
pH / Fluid Loss (mptm)	8.50 / 0	9.10 / 4	9.30 / 6		
PV (cP) / YP (lhf2)	17 / 31.00	20 / 27.00	23 / 33.00		
% Solids / % Sand	.01 / .01	16 / 0.5	18 / 0.5		
% Oil / Oil:Water Ratio	0 / 0:100	0 / 0:84	0 / 0:79		
Rm @ Measured Temp (degF)	0.350 @ 35.60	0.080 @ 88.00	0.070 @ 70.00		
Rmf @ Measured Temp (degF)	N/A @ N/A	0.050 @ 88.00	0.060 @ 70.00		
Rmc @ Measured Temp (degF)	N/A @ N/A	0.120 @ 88.00	0.140 @ 70.00		
Max Tool Temp (degF) / Source	42.60 / HCIM	144.94 / HCIM	152.00 / HCIM		

Rm @ Max Tool Temp (degF)	0.3004 @ 42.60	0.0849 @ 144.94	0.0338 @ 152.00		
Lead MWD Engineer	Nick Weeks	Jack Kleinhans	Jack Kleinhans		
Customer Representative	Doug Sloan	Matt Cazalet	Scott Lapiene		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	HCIM	HCIM	HCIM		
Software Version	88.58	88.58	88.58		
Sub Serial Number	12272466	11902800	11320539		
Insert Serial Number	14776659	12136690	11752800		
Date and Time Initialized	30-Jul-15 10:14	11-Sep-15 01:12	19-Sep-15 15:17		
Date and Time Read	01-Aug-15 18:48	18-Sep-15 18:26	25-Sep-15 08:40		
ECMB SW Version	N/A	N/A	generic 1.1.1 Linux 2.6.23.1		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	16.80	56.82	48.80		
Software Version	6.33	6.33	6.33		
Sub Serial Number	12510194	12606713	12460872		
Sonde Serial Number	12059421	12059488	11902192		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	0.00	208.54	301.32		

Gamma Ray Sensor Information

Tool Type	DGR	DGR	DGR		
Distance From Bit (ft)	6.67	37.22	38.40		
Recorded Sample Period (sec)	14	10	10		
Software Version	N/A	N/A	N/A		
Sub Serial Number	12519619	11651705	12519617		
Insert/Sonde Serial Number	12464236	12351708	12041832		

Density Sensor Information

Tool Type	ALD	ALD	ALD		
Distance From Bit (ft)	79.17	87.77	113.16		
Recorded Sample Period (sec)	14	10	10		
Software Version	3.13	3.12	3.12		
Sub Serial Number	12522518	12279568	10853150		
Insert Serial Number	12541284	10718012	11496392		
Sensor ID Number	32767	32767	2		
Source Serial Number	46836B	39634B	39364b		
Pin Orientation	Down	Down	Down		
Stabilizer Blade O.D. (in)	8.25	11.90	8.20		
DPA Offset	135.00	45.00	135.00		

XBAT Sensor Information

Tool Type	XBAT	XBAT	XBAT		
Dist from Bit	32.85	130.62	64.79		
Recorded Sample Period	20	15	15		
Electronics Insert SN	11215931	12451413	12465296		
Receiver Insert SN	12267657	12405002	12565577		
Transmitter Insert SN	10603805	12277635	12280476		
Collar SN	12323024	12389351	102064794		
CBM SSPROG Version	ssprog 1.0.9-1	ssprog 1.0.9-1	ssprog 1.0.9-1		
CBM Supprt Version	support 1.9.2-1	support 1.9.2-1	support 1.9.2-1		
XBAT Version	xbat 1.2.7-1	xbat 1.2.7-1	xbat 1.2.7-1		

XBAT Caliper ARM Version	122.00	122.00	122.00		
TCM Version	20.08	20.08	20.08		
QXCB DSP Version	52.00	52.00	52.00		
QXDAQ ARM Version	142.00	142.00	121.00		
DAQ DSP Version	53.00	53.00	53.00		
Sequence File Version	120829	131212	131212		
Sequence Selected	13:M9_D5_Q5	8:M9_D9_D4	8:M9_D9_D4		

REMARKS

1. ALL DEPTHS ARE MEASURED DEPTHS (MD), UNLESS OTHERWISE NOTED. THESE DEPTHS ARE BIT DEPTHS AND ARE CALLIBRATED TO THE DRILLERS PIPE TALLY. NO DEPTH CORRECTIONS HAVE BEEN MADE FOR PIPE STRETCH OR COMPRESSION.

2. ALL VERTICAL DEPTHS ARE TRUE VERTICAL DEPTHS (TVD), UNLESS OTHERWISE NOTED. ONLY INVERTED / REVERTED SECTIONS GREATER THAN 30' TVD ARE PRESENTED

3. ALL DATA PRESENTED IS RECORDED DATA UNLESS OTHERWISE STATED.

4. LWD RUN 1 WAS COMPRISED OF DIRECTIONAL, DUAL GAMMA RAY (DGR) UTILIZING GEIGER-MUELLER TUBE TYPE DETECTORS, AZIMUTHAL DEEP ELECTROMAGNETIC WAVE RESISTIVITY (ADR), PRESSURE WHILE DRILLING (PWD) DRILLSTRING DYNAMICS SENSOR (DDSr), AZIMUTHAL LITHODENSITY (ALD), COMPENSATED THERMAL NEUTRON (CTN), MAGNETIC RESONANCE WHILE DRILLING (MRIL-WD), AZIMUTHAL BIMODAL ACOUSTIC TOOL (XBAT), AND THE AZIMUTHAL ACOUSTIC CALIPER TOOL (XCAL).

5. RUN 200 WAS A 36” HOLE OPENING RUN, RUN 300 WAS A 42” HOLE OPENING RUN, RUN 400 WAS A CLEANOUT RUN TO DRILL OUT THE SHOE TRACK AND 30’ OF NEW FORMATION. NO LWD SENSORS WERE UTILIZED. THEREFOR THEY ARE NOT PRESENTED.

6. MWD RUN 500 WAS A 17.5” DRILLING RUN UTILIZING DIRECTIONAL AND PWD. NO LOGGING SENSORS WERE PRESENT, ONLY ROP IS PRESENTED.

7. LWD RUN 6 WAS COMPRISED OF DIRECTIONAL, DUAL GAMMA RAY (DGR) UTILIZING GEIGER-MUELLER TUBE TYPE DETECTORS, ELECTROMAGNETIC WAVE RESISTIVITY PHASE 4 (EWR-P4), PRESSURE WHILE DRILLING (PWD) DRILLSTRING DYNAMICS SENSOR (DDSr), AZIMUTHAL LITHODENSITY (ALD), COMPENSATED THERMAL NEUTRON (CTN), AZIMUTHAL BIMODAL ACOUSTIC TOOL (XBAT), AND THE AZIMUTHAL ACOUSTIC CALIPER TOOL (XCAL).

8. LWD RUN 7 WAS COMPRISED OF DIRECTIONAL, DUAL GAMMA RAY (DGR) UTILIZING GEIGER-MUELLER TUBE TYPE DETECTORS, AZIMUTHAL DEEP ELECTROMAGNETIC WAVE RESISTIVITY (ADR), PRESSURE WHILE DRILLING (PWD) DRILLSTRING DYNAMICS SENSOR (DDSr), AZIMUTHAL LITHODENSITY (ALD), COMPENSATED THERMAL NEUTRON (CTN), MAGNETIC RESONANCE WHILE DRILLING (MRIL-WD), AZIMUTHAL BIMODAL ACOUSTIC TOOL (XBAT), AND THE AZIMUTHAL ACOUSTIC CALIPER TOOL (XCAL).

9. OVER THE COURSE OF THE 12.25” HOLE SECTION THERE ARE SEVERAL INSTANCES WHERE THE BOREHOLE RUGOSITY HAS CREATED “SPIKES” IN THE RESISTIVITY DATA. THIS IS DUE TO ONE RECIEVER READING THE HIGH SALINITY BOREHOLE FLUID (WASHOUT) AND THE OTHER READING THE FORMATION. THERE ARE ALSO AREAS ACROSS THE LOGGED INTERVAL THAT SHOW AN UNDERGAUGE HOLE.

10. LWD RUN 100 XBAT WAS SETUP TO FIRE 3 DIFFERENT ACTIVATIONS. ACTIVATION 1 WAS A 9KHz MONOPOLE FIRING, ACTIVATION 2 WAS A 5KHz DIPOLE FIRING, AND ACTIVATION 3 WAS A 5KHz QUADRAPOLE. THE XCAL WAS SAMPLED BEFORE AND AFTER EACH OF THESE ACTIVATIONS.

11. REGARDING THE LWD RUN 100 XCAL LOG, THIS HOLE SECTION WAS DRILLED RISERLESS, THERE WAS NOT A POINT AT WHICH THE XCAL COULD HAVE BEEN QUANTITATIVLY CALIBRATED. CALIBRATION IS PERFORMED INSIDE CASING PRIOR TO DRILLING AHEAD, AND POST RUN AS A SECONDARY VERIFICATION THAT THE MUD SYSTEM PROPERTIES HAVE NOT CHANGED. AS SUCH, A QUALITATIVE CALIBRATION HAS BEEN MADE OVER SEVERAL SECTIONS OF THE LOG WHERE THERE IS LITTLE CHANGE INFORMATION PROPERTIES. ALD HSI HAS BEEN USED AS A SECONDARY VERIFICATION TO MAKE SURE THE CALIBRATION IS REASONABLE. A FLUID VELOCITY OF 220µSECS/FT HAS BEEN USED IN THE XCAL PROCESSING OF THIS HOLE SECTION.

12. LWD RUN 600 XBAT WAS SETUP TO FIRE 3 DIFFERENT ACTIVATIONS. ACTIVATION 1 WAS A 9KHz MONOPOLE FIRING, ACTIVATION 2 WAS A 9KHz DIPOLE FIRING, AND ACTIVATION 3 WAS A 4KHz DIPOLE. THE XCAL WAS SAMPLED BEFORE

AND AFTER EACH OF THESE ACTIVATIONS. A CASING CALIBRATION WAS PERFORMED AND A FLUID VELOCITY OF 191µSECS/FT HAS BEEN USED IN THE XCAL PROCESSING OF THIS HOLE SECTION.

13. LWD RUN 700 XBAT WAS SETUP TO FIRE 3 DIFFERENT ACTIVATIONS. ACTIVATION 1 WAS A 9KHz MONOPOLE FIRING, ACTIVATION 2 WAS A 9KHz DIPOLE FIRING, AND ACTIVATION 3 WAS A 4KHz DIPOLE. THE XCAL WAS SAMPLED BEFORE AND AFTER EACH OF THESE ACTIVATIONS. A CASING CALIBRATION WAS PERFORMED AND A FLUID VELOCITY OF 209µSECS/FT HAS BEEN USED IN THE XCAL PROCESSING OF THIS HOLE SECTION.

14. ALL XCAL WAVEFORMS WERE SAMPLED AT 0.32µSECS INTERVALS.

15. RUNS 1- 7 REPRESENT THE OCS-Y-2321 BJ001 ST00BP00 WELL WITH AN API# OF 55-352-00004-00. THIS WELL REACHED A TOTAL DEPTH OF 6,800'MD / 6,795'TVD

MNEMONICS	CURVE DESCRIPTION
ROPA	AVERAGE RATE OF PENETRATION
DGRCC	DGR COMBINED GAMMA RAY BC
ARH16PC	ADR AVERAGE 2mhz 16" PHASE RESISTIVITY BC
ARH32PC	ADR AVERAGE 2mhz 32" PHASE RESISTIVITY BC
ARH48PC	ADR AVERAGE 2mhz 48" PHASE RESISTIVITY BC
R09PC	EWR AVERAGE 2mhz 09" PHASE RESISTIVITY BC
R15PC	EWR AVERAGE 2mhz 15" PHASE RESISTIVITY BC
R27PC	EWR AVERAGE 2mhz 27" PHASE RESISTIVITY BC
R39PC	EWR AVERAGE 2mhz 39" PHASE RESISTIVITY BC
ADXT	ADR FORMATION EXPOSURE TIME
EWXT	EWR FORMATION EXPOSURE TIME
TNPS	CTN NEUTRON POROSITY - SANDSTONE
ALCDLC	ALD LOW COUNT RATE BIN DENSITY
ALDCLC	ALD LOW COUNT RATE BIN STAND OFF CORRECTION
ALPELC	ALD LOW COUNT RATE BIN PHOTOELECTRIC FACTOR
XBEDA	XCAL EQUIVALENT HOLE DIAMETER
XBVPVS	XBAT VP/VS RATIO
XBCS	XBAT COMPRESSIONAL SLOWNESS
XBCSS	XBAT COMBINED SHEAR SLOWNESS
XBDFX	XBAT DIPOLE FLEXURAL SLOWNESS
XBSFLAG	XBAT SHEAR FLAG

PARAMETERS USED IN LOG PROCESSING:

HOLE SIZE:	FIXED @ 8.50” AND 12.25”
MUD WEIGHT:	8.6 – 12.0 PPG
WHOLE MUD CHLORIDES:	18,000 PPM Cl- R100, 100,000-125,000 PPM Cl-
FORMATION WATER SALINITY:	21,200 PPM Cl-
FLUID DENSITY:	1.0 g/cc
MATRIX DENSITY:	2.65 g/cc
LITHOLOGY:	SANDSTONE

ALL 1:1200 DATA CURVES ARE PRESENTED AT A STEP OF 1.0', AND SMOOTHED OVER A 3.0' WINDOW. GAP FILL IS SET TO 5'. ALL 1:240 DATA CURVES ARE PRESENTED AT A STEP OF 0.5 FT, WITH A WINDOW OF 0.6FT EXCEPT THE ACOUSTIC CURVES, THEY ARE SMOOTHED TO A STEP OF 0.5 WITH A 1.2FT WINDOW. GAP FILL IS SET TO 3FT FOR ALL CURVES.

WARRANTY

LWD R100 - 8.50" PILOT HOLE

XCAL Ellipse Avg Diameter
inches
6.5 16.5

DGR Comb Gamma Ray BCorr
api
0 150

ALD Hole Size Indicator
inches
6.5 16.5

Hole Enlargement
Under | Minor <1" | Medium 1"-2" | Severe >2"

XCAL Ellipse Direction

MD
ft
1 : 240

XCAL Image
4 Inches 5

XCAL 3D Plot Trace South
4 5

XCAL 3D Plot Trace North
4 5

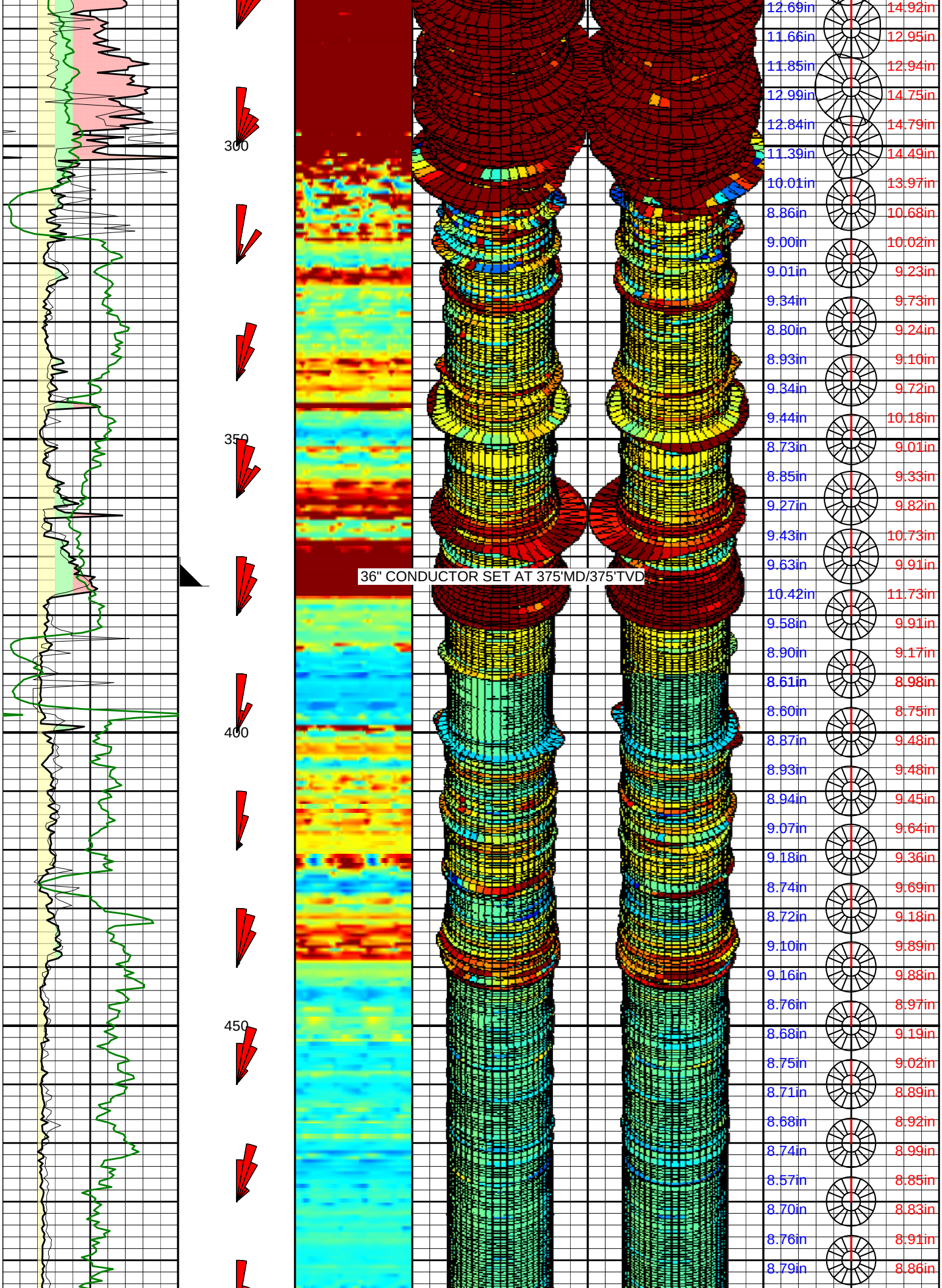
XCAL Max Ellipse Diameter
XCAL Min Ellipse Diameter

150
200
<R1>
250

ALL LWD SENSORS LOGGED IN SEAWATER TO SEA FLOOR @ 222'MD / 222'TVD

<BEGIN RUN 1>

9.63in	10.27in
10.18in	10.85in
10.55in	11.35in
9.29in	9.95in
10.42in	12.26in
10.86in	12.24in
12.43in	12.78in
13.56in	14.93in
13.18in	15.36in
12.38in	14.28in


300
350
400
450
36" CONDUCTOR SET AT 375'MD/375'TVD
12.69in 14.92in
11.66in 12.95in
11.85in 12.94in
12.99in 14.75in
12.84in 14.79in
11.39in 14.49in
10.01in 13.97in
8.86in 10.68in
9.00in 10.02in
9.01in 9.23in
9.34in 9.73in
8.80in 9.24in
8.93in 9.10in
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8.73in 9.01in
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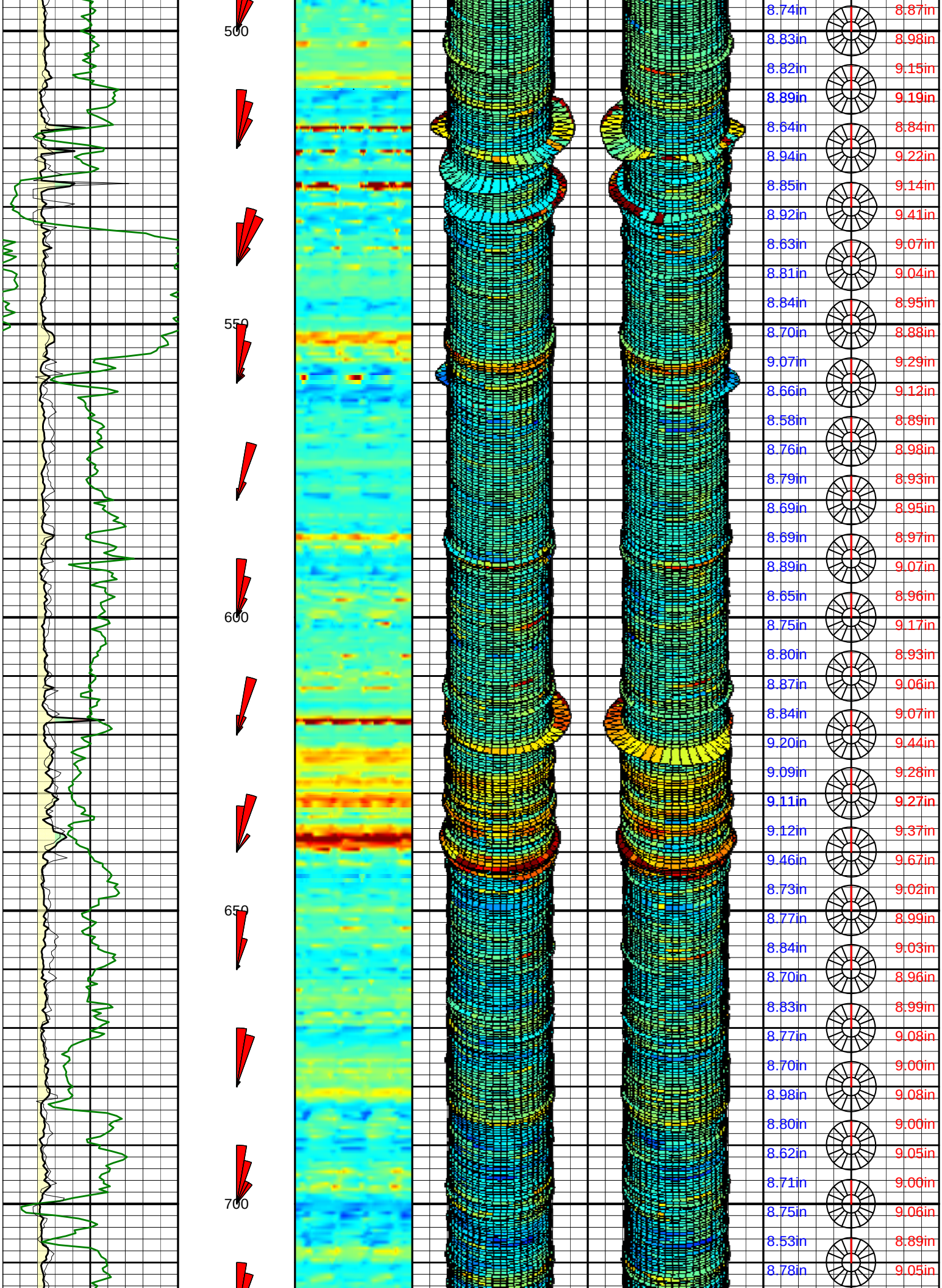
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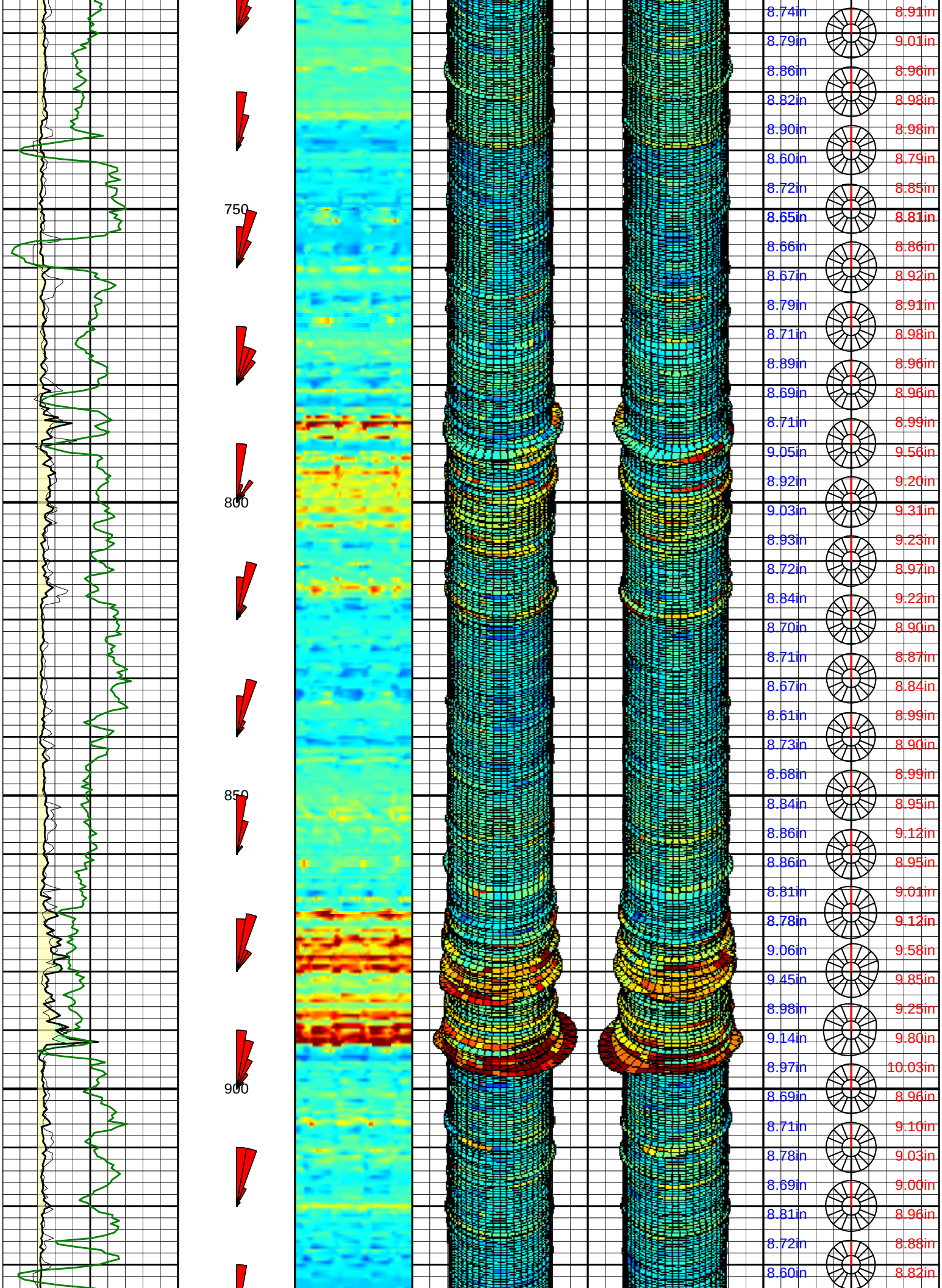
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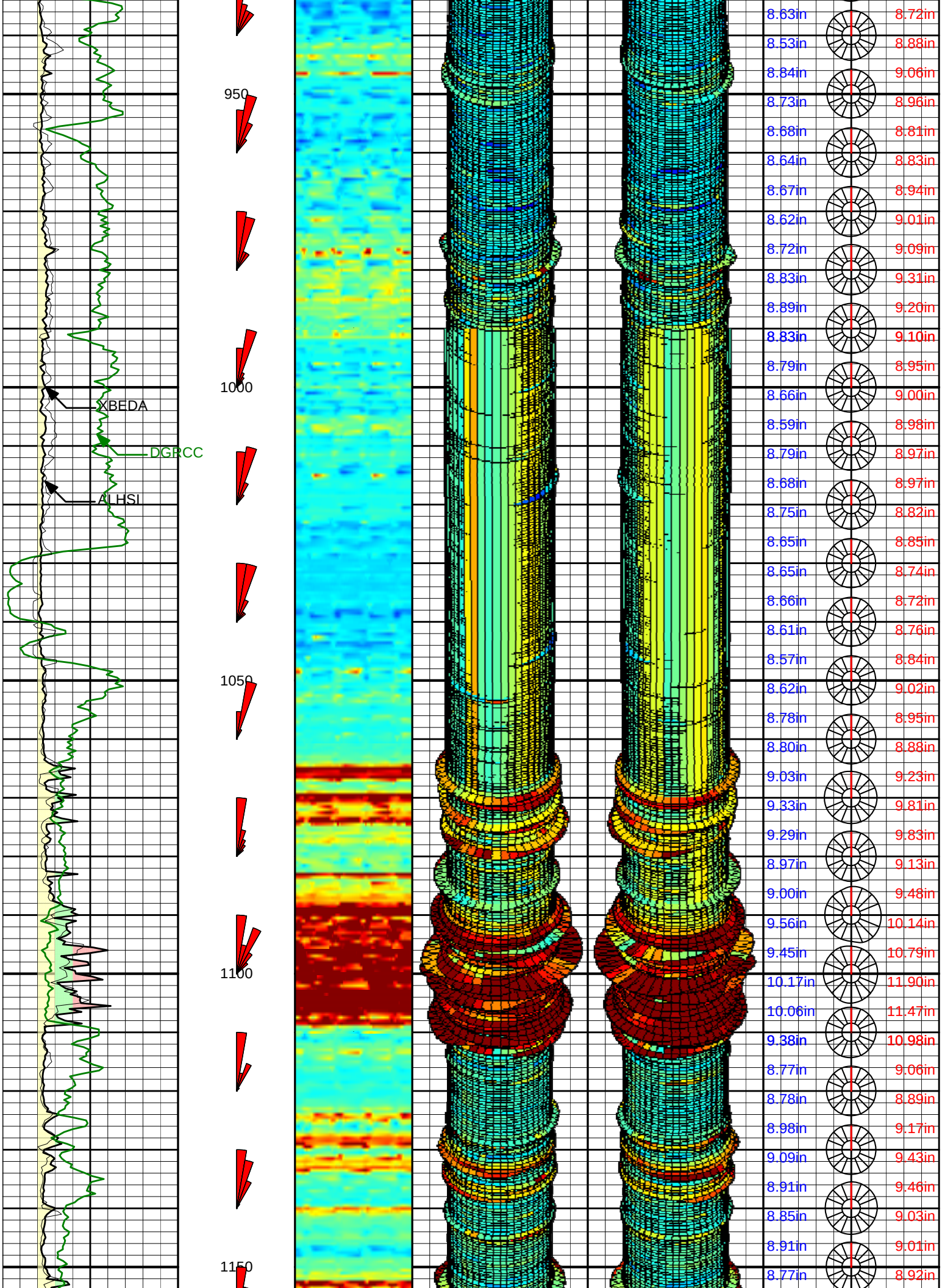
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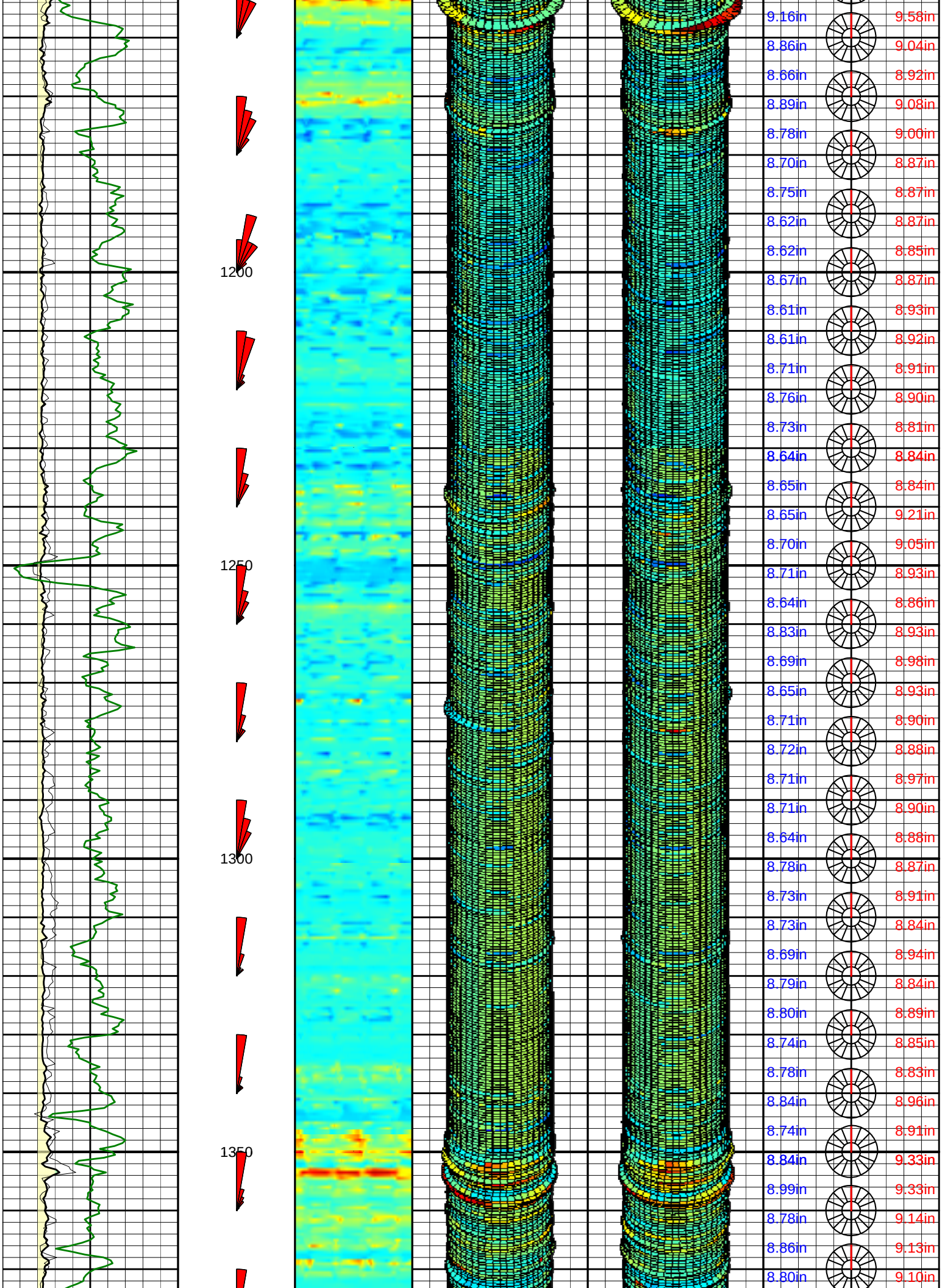
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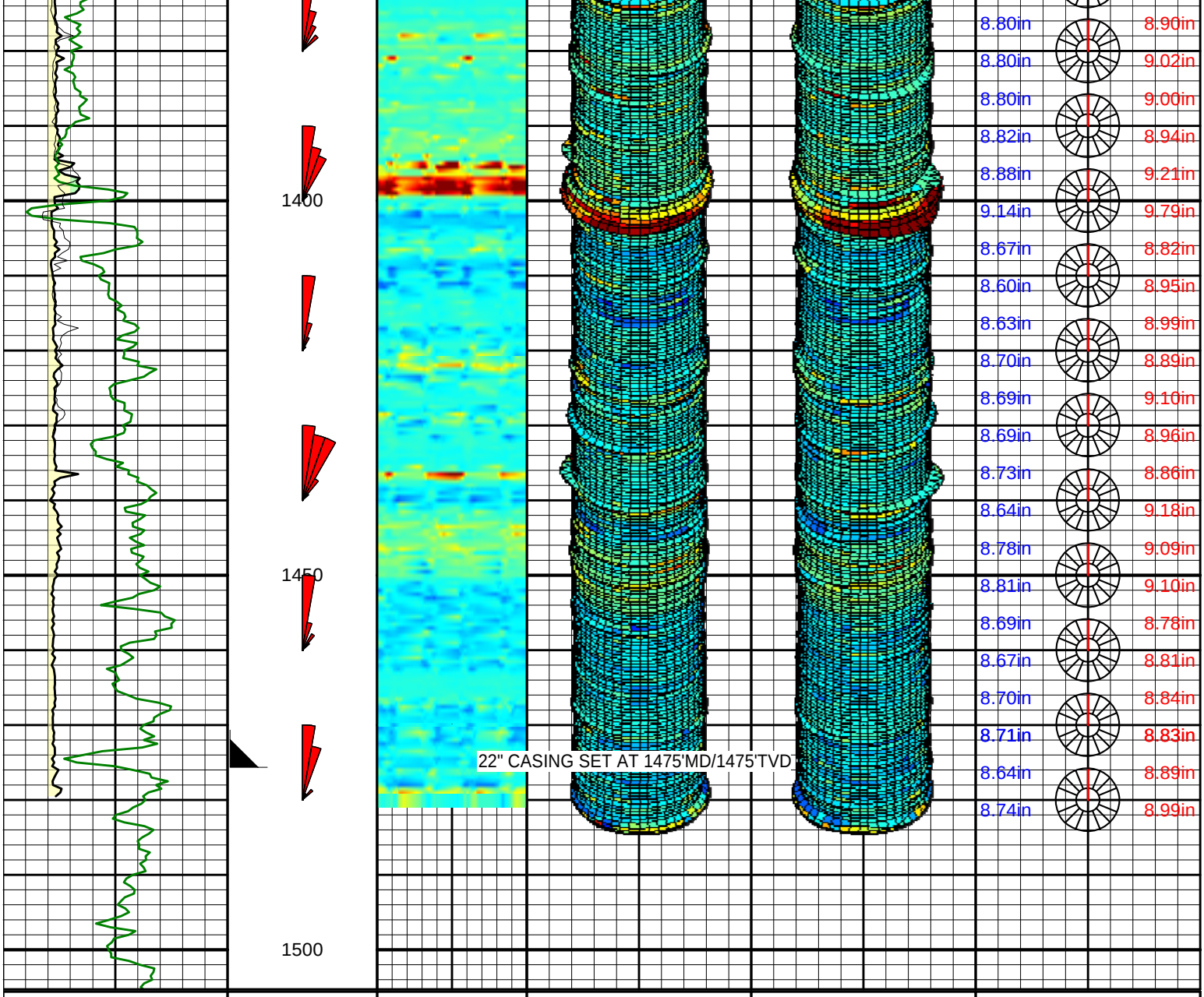
8.84in 8.96in
8.74in 8.91in
8.84in 9.33in
8.99in 9.33in
8.78in 9.14in
8.86in 9.13in
8.80in 9.10in



Hole Enlargement

Under	Minor <1"	Medium 1"-2"	Severe >2"

ALD Hole Size Indicator
inches
6.5 16.5

DGR Comb Gamma Ray BCorr
api
0 150

XCAL Ellipse Avg Diameter
inches
6.5 16.5

MD
ft
1 : 240

XCAL Ellipse Direction

XCAL Image
4 Inches 5

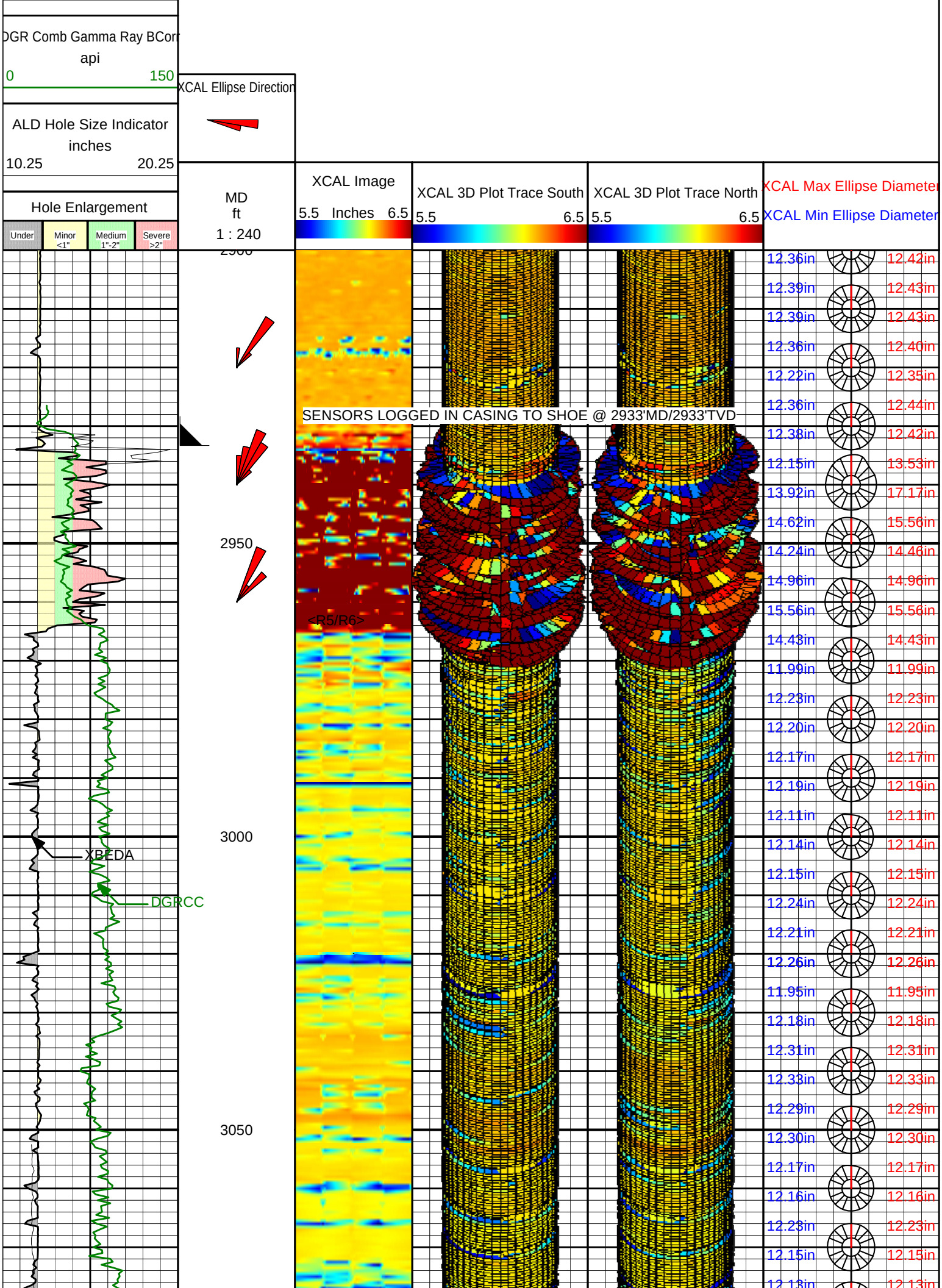
XCAL 3D Plot Trace South
4 5

XCAL 3D Plot Trace North
4 5

XCAL Max Ellipse Diameter
XCAL Min Ellipse Diameter

LWD R600 - 12.25" HOLE SECTION

XCAL Ellipse Avg Diameter
inches
10.25 20.25


DGR Comb Gamma Ray BCorr
api
0
150
XCAL Ellipse Direction
ALD Hole Size Indicator
inches
10.25
20.25
Hole Enlargement
Under
Minor
<1"
Medium
1"-2"
Severe
>2"
MD
ft
1 : 240
XCAL Image
5.5 Inches 6.5
XCAL 3D Plot Trace South
5.5
6.5
XCAL 3D Plot Trace North
5.5
6.5
XCAL Max Ellipse Diameter
XCAL Min Ellipse Diameter
SENSORS LOGGED IN CASING TO SHOE @ 2933'MD/2933'TVD
<R5/R6>
2950
3000
3050
XPEDA
DGRCC
12.36in 12.42in
12.39in 12.43in
12.39in 12.43in
12.36in 12.40in
12.22in 12.35in
12.36in 12.44in
12.38in 12.42in
12.15in 13.53in
13.92in 17.17in
14.62in 15.56in
14.24in 14.46in
14.96in 14.96in
15.56in 15.56in
14.43in 14.43in
11.99in 11.99in
12.23in 12.23in
12.20in 12.20in
12.17in 12.17in
12.19in 12.19in
12.11in 12.11in
12.14in 12.14in
12.15in 12.15in
12.24in 12.24in
12.21in 12.21in
12.26in 12.26in
11.95in 11.95in
12.18in 12.18in
12.31in 12.31in
12.33in 12.33in
12.29in 12.29in
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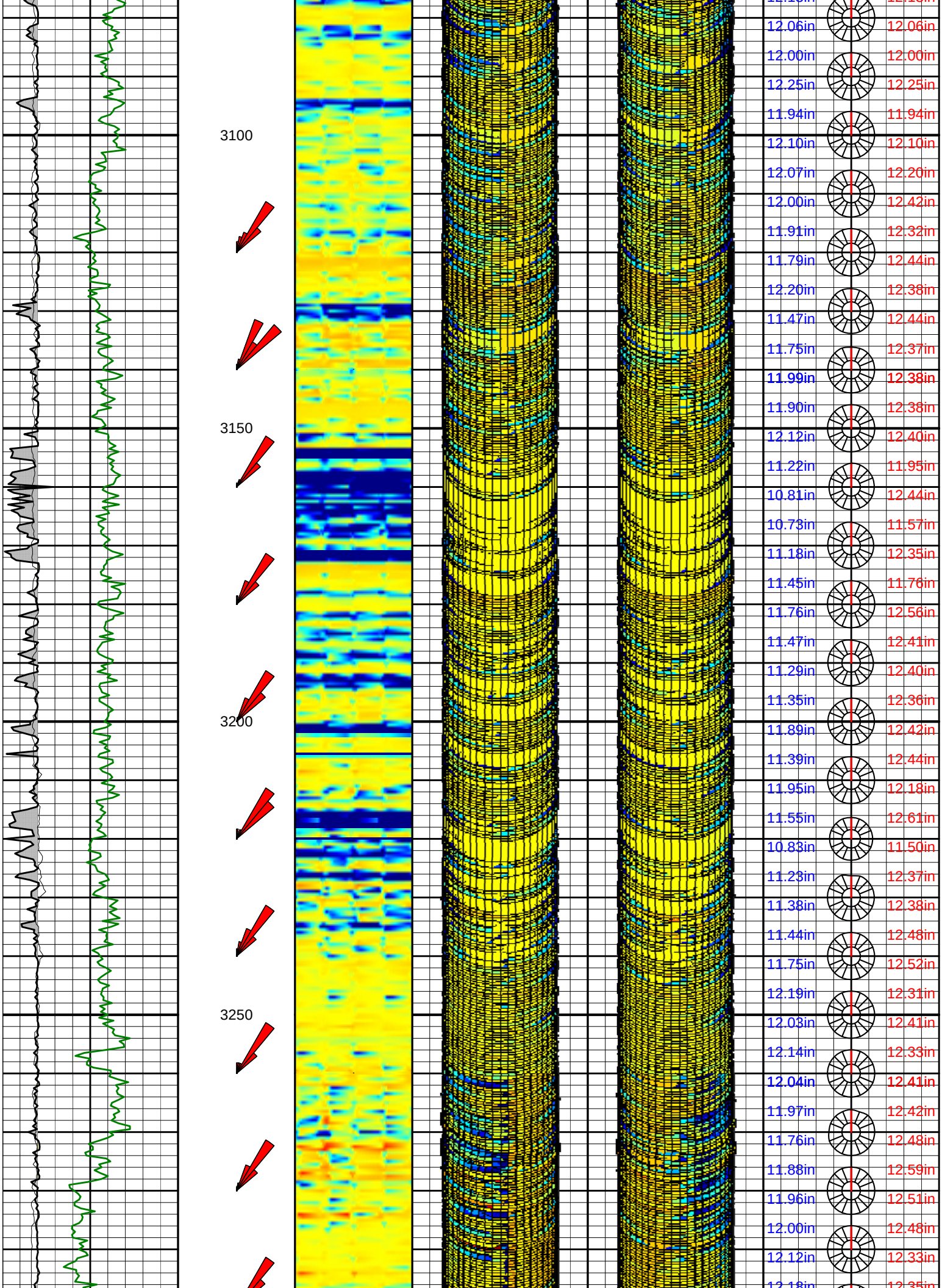
12.16in 12.16in
12.23in 12.23in
12.15in 12.15in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3150
3200
3250
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12.25in 12.25in
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12.07in 12.20in
12.00in 12.42in
11.91in 12.32in
11.79in 12.44in
12.20in 12.38in
11.47in 12.44in
11.75in 12.37in
11.99in 12.38in
11.90in 12.38in
12.12in 12.40in
11.22in 11.95in
10.81in 12.44in
10.73in 11.57in
11.18in 12.35in
11.45in 11.76in
11.76in 12.56in
11.47in 12.41in
11.29in 12.40in
11.35in 12.36in
11.89in 12.42in
11.39in 12.44in
11.95in 12.18in
11.55in 12.61in
10.83in 11.50in
11.23in 12.37in
11.38in 12.38in
11.44in 12.48in
11.75in 12.52in
12.19in 12.31in
12.03in 12.41in
12.14in 12.33in
12.04in 12.41in
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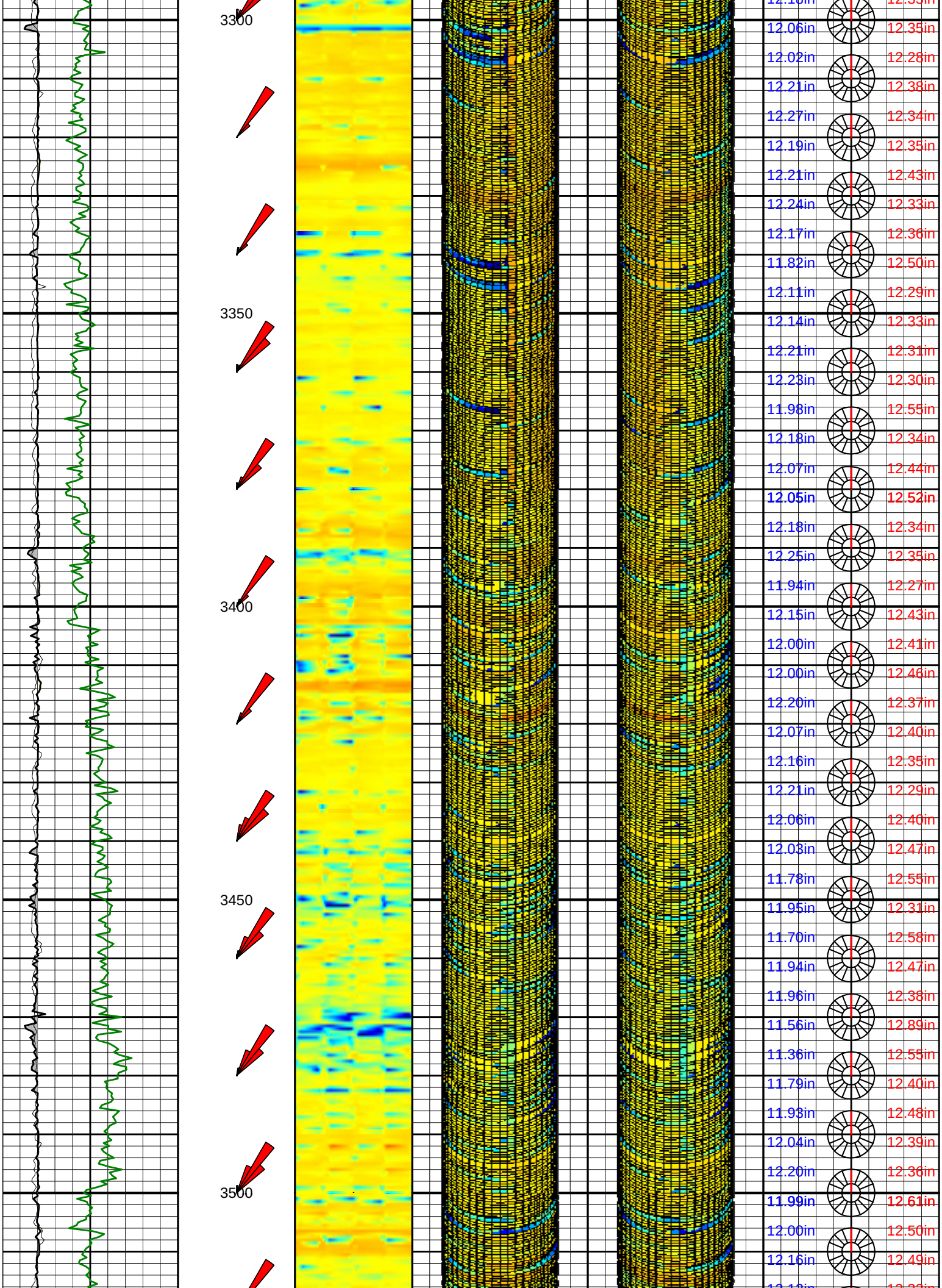
11.76in 12.48in
11.88in 12.59in
11.96in 12.51in
12.00in 12.48in
12.12in 12.33in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3350
3400
3450
3500
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12.27in 12.34in
12.19in 12.35in
12.21in 12.43in
12.24in 12.33in
12.17in 12.36in
11.82in 12.50in
12.11in 12.29in
12.14in 12.33in
12.21in 12.31in
12.23in 12.30in
11.98in 12.55in
12.18in 12.34in
12.07in 12.44in
12.05in 12.52in
12.18in 12.34in
12.25in 12.35in
11.94in 12.27in
12.15in 12.43in
12.00in 12.41in
12.00in 12.46in
12.20in 12.37in
12.07in 12.40in
12.16in 12.35in
12.21in 12.29in
12.06in 12.40in
12.03in 12.47in
11.78in 12.55in
11.95in 12.31in
11.70in 12.58in
11.94in 12.47in
11.96in 12.38in
11.56in 12.89in
11.36in 12.55in
11.79in 12.40in
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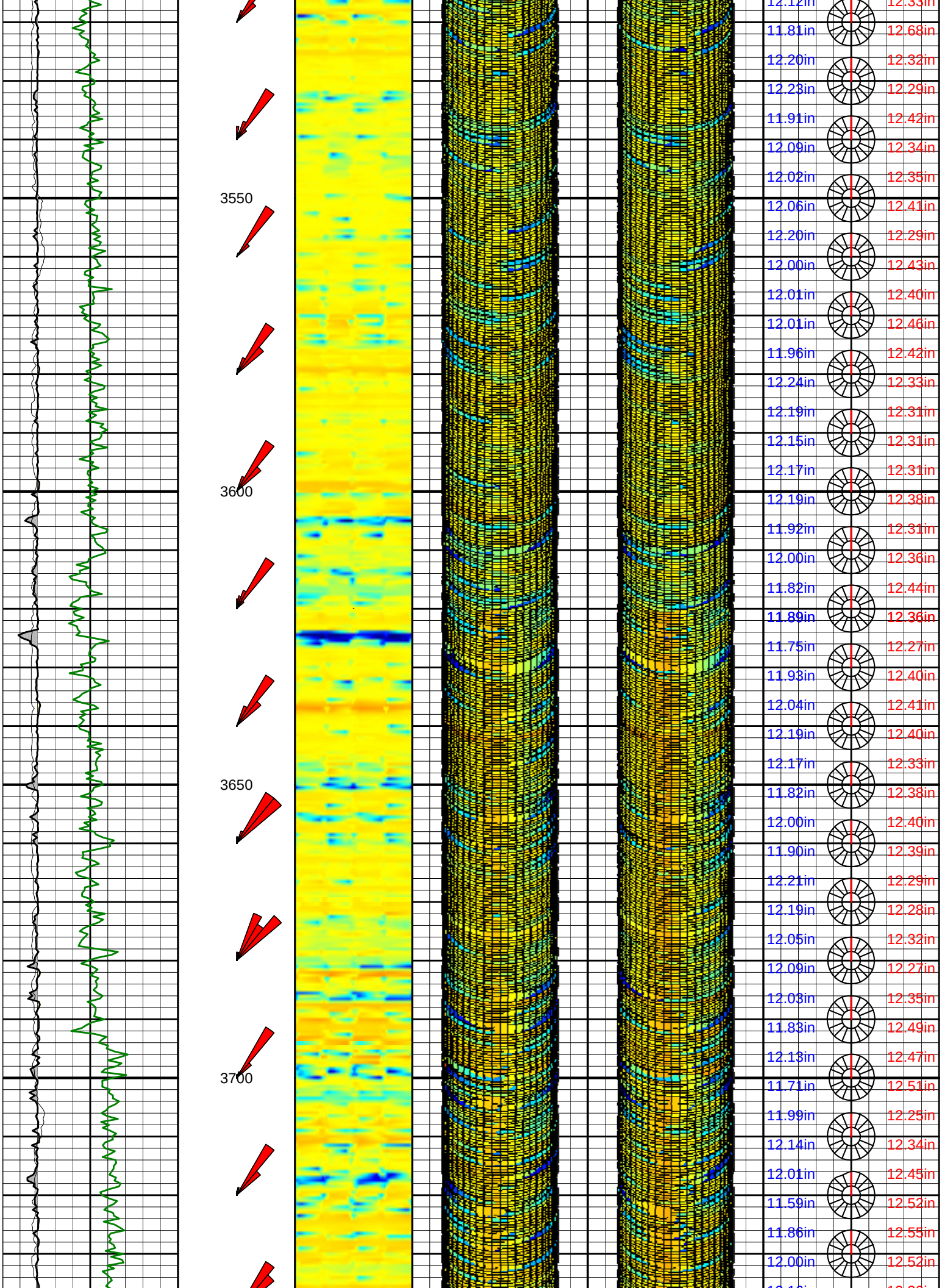
11.99in 12.61in
12.00in 12.50in
12.16in 12.49in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3600
3650
3700
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12.20in 12.32in
12.23in 12.29in
11.91in 12.42in
12.09in 12.34in
12.02in 12.35in
12.06in 12.41in
12.20in 12.29in
12.00in 12.43in
12.01in 12.40in
12.01in 12.46in
11.96in 12.42in
12.24in 12.33in
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12.17in 12.31in
12.19in 12.38in
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12.00in 12.36in
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11.89in 12.36in
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12.04in 12.41in
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12.00in 12.40in
11.90in 12.39in
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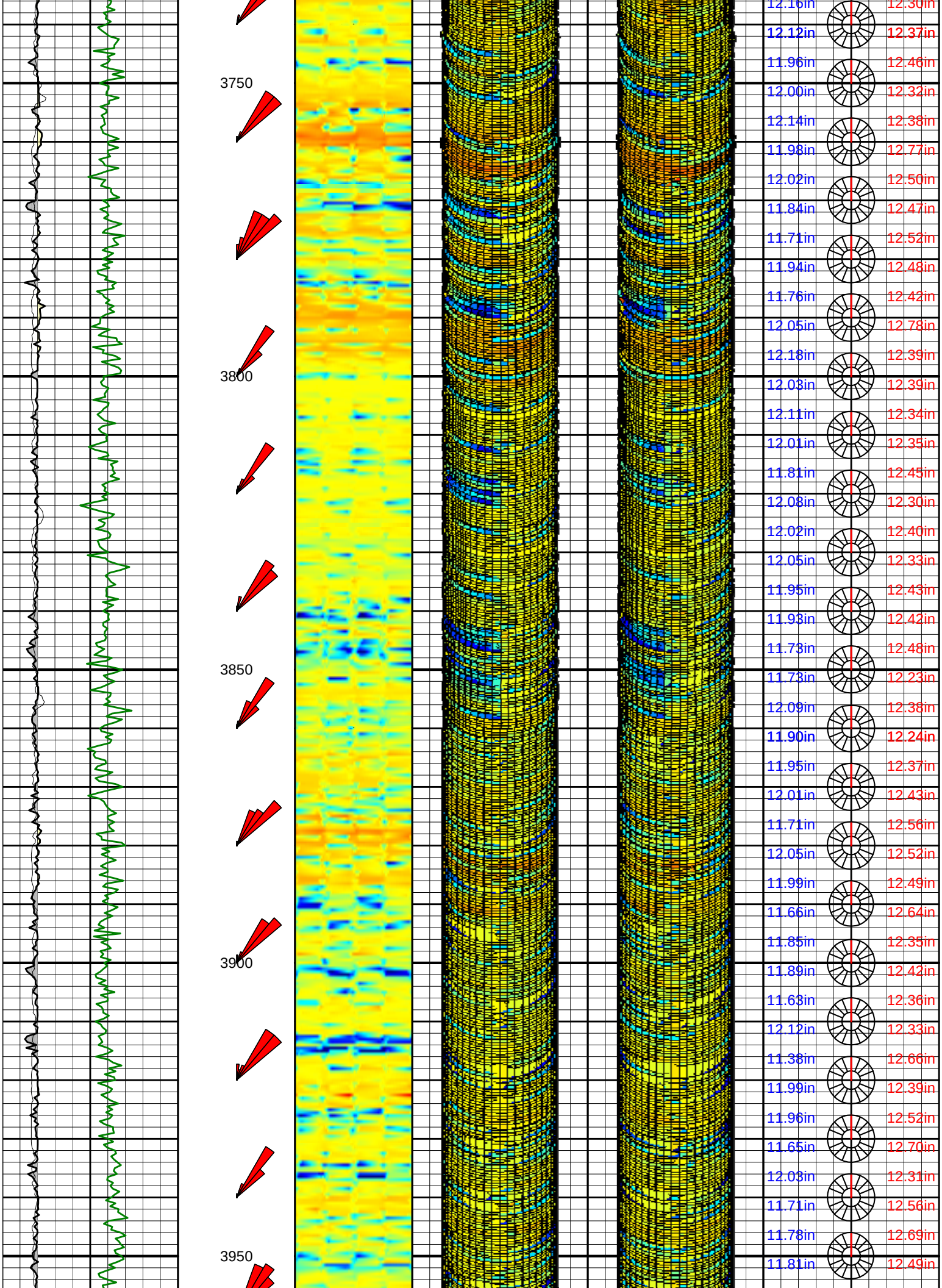
3750
3800
3850
3900
3950
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12.12in 12.37in
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12.00in 12.32in
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11.98in 12.77in
12.02in 12.50in
11.84in 12.47in
11.71in 12.52in
11.94in 12.48in
11.76in 12.42in
12.05in 12.78in
12.18in 12.39in
12.03in 12.39in
12.11in 12.34in
12.01in 12.35in
11.81in 12.45in
12.08in 12.30in
12.02in 12.40in
12.05in 12.33in
11.95in 12.43in
11.93in 12.42in
11.73in 12.48in
11.73in 12.23in
12.09in 12.38in
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12.01in 12.43in
11.71in 12.56in
12.05in 12.52in
11.99in 12.49in
11.66in 12.64in
11.85in 12.35in
11.89in 12.42in
11.63in 12.36in
12.12in 12.33in
11.38in 12.66in
11.99in 12.39in
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12.03in 12.31in
11.71in 12.56in
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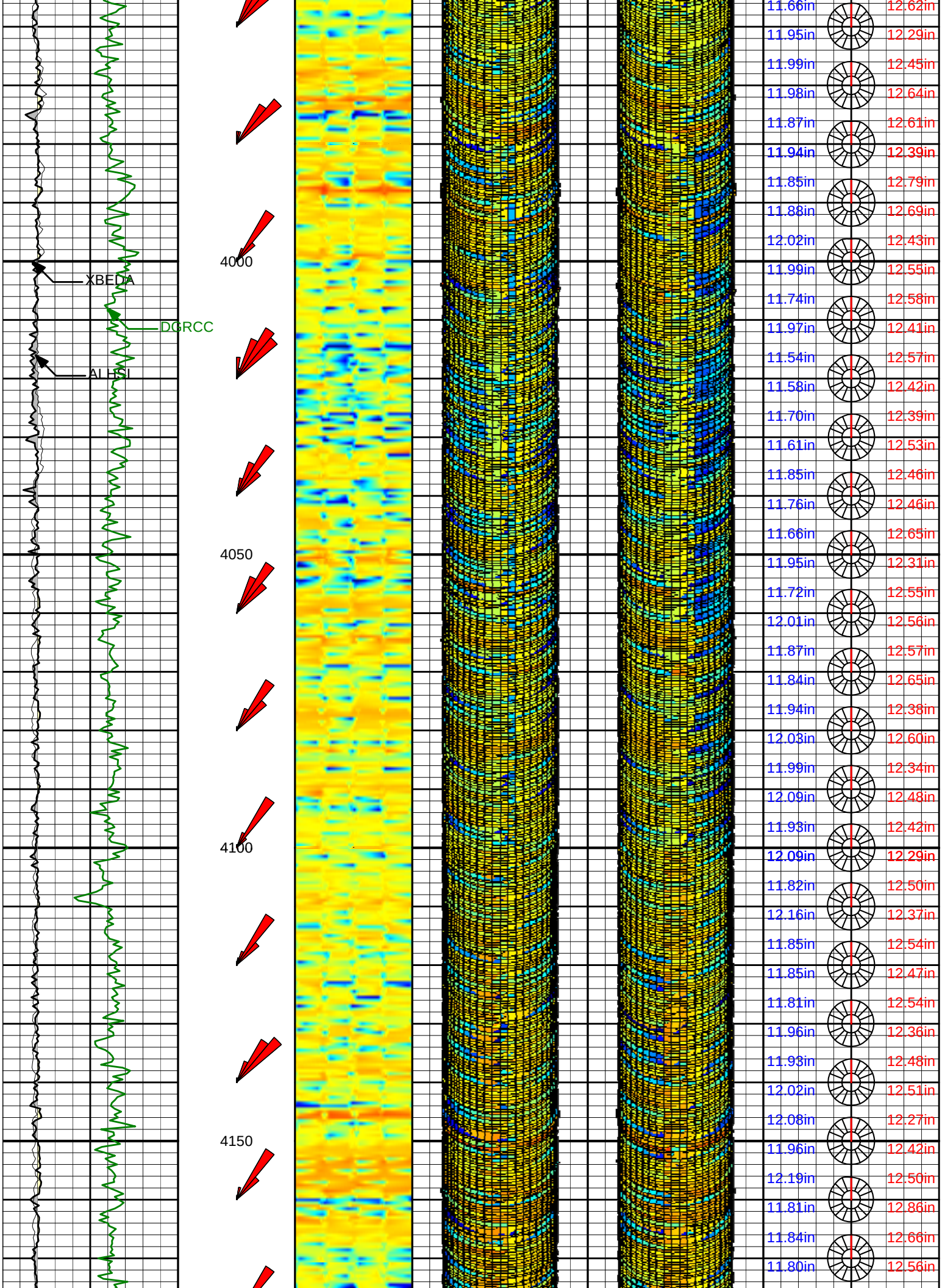
11.81in 12.49in


XBEDA
DGRCC
ALHSI
4000
4050
4100
4150
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11.99in 12.45in
11.98in 12.64in
11.87in 12.61in
11.94in 12.39in
11.85in 12.79in
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12.02in 12.43in
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11.74in 12.58in
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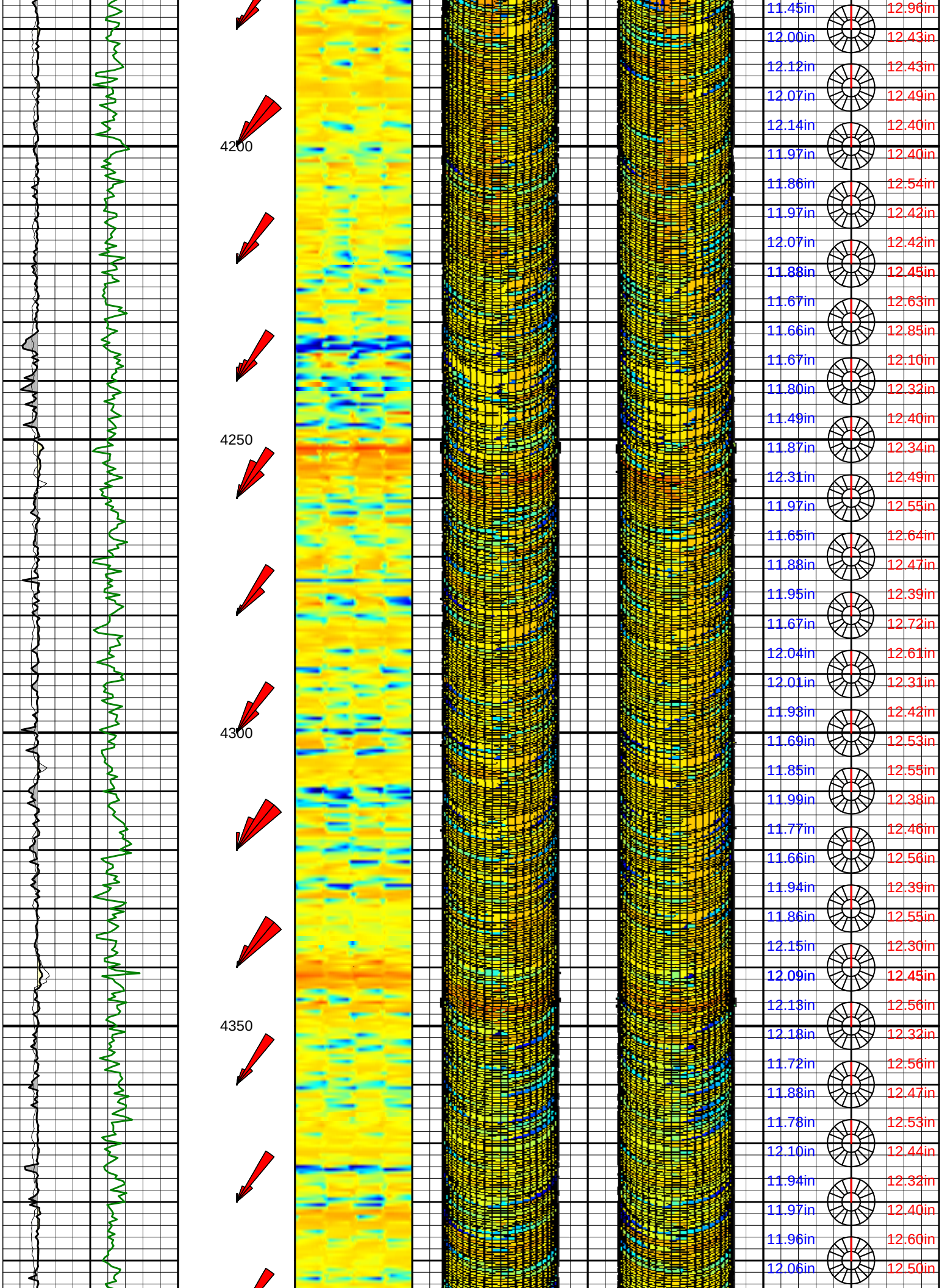
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12.07in 12.42in
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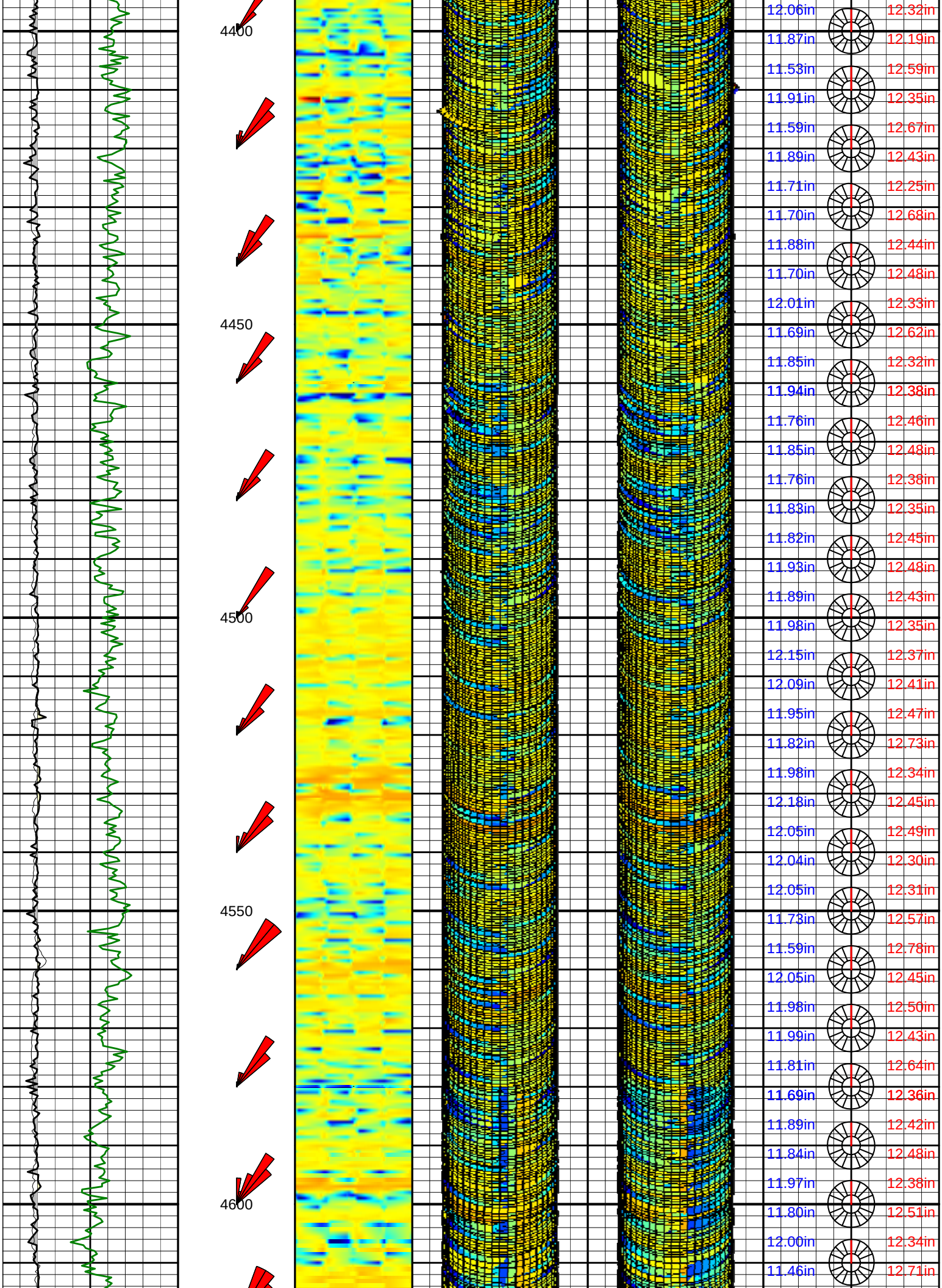
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11.93in 12.48in
11.89in 12.43in
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12.15in 12.37in
12.09in 12.41in
11.95in 12.47in
11.82in 12.73in
11.98in 12.34in
12.18in 12.45in
12.05in 12.49in
12.04in 12.30in
12.05in 12.31in
11.73in 12.57in
11.59in 12.78in
12.05in 12.45in
11.98in 12.50in
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11.81in 12.64in
11.69in 12.36in
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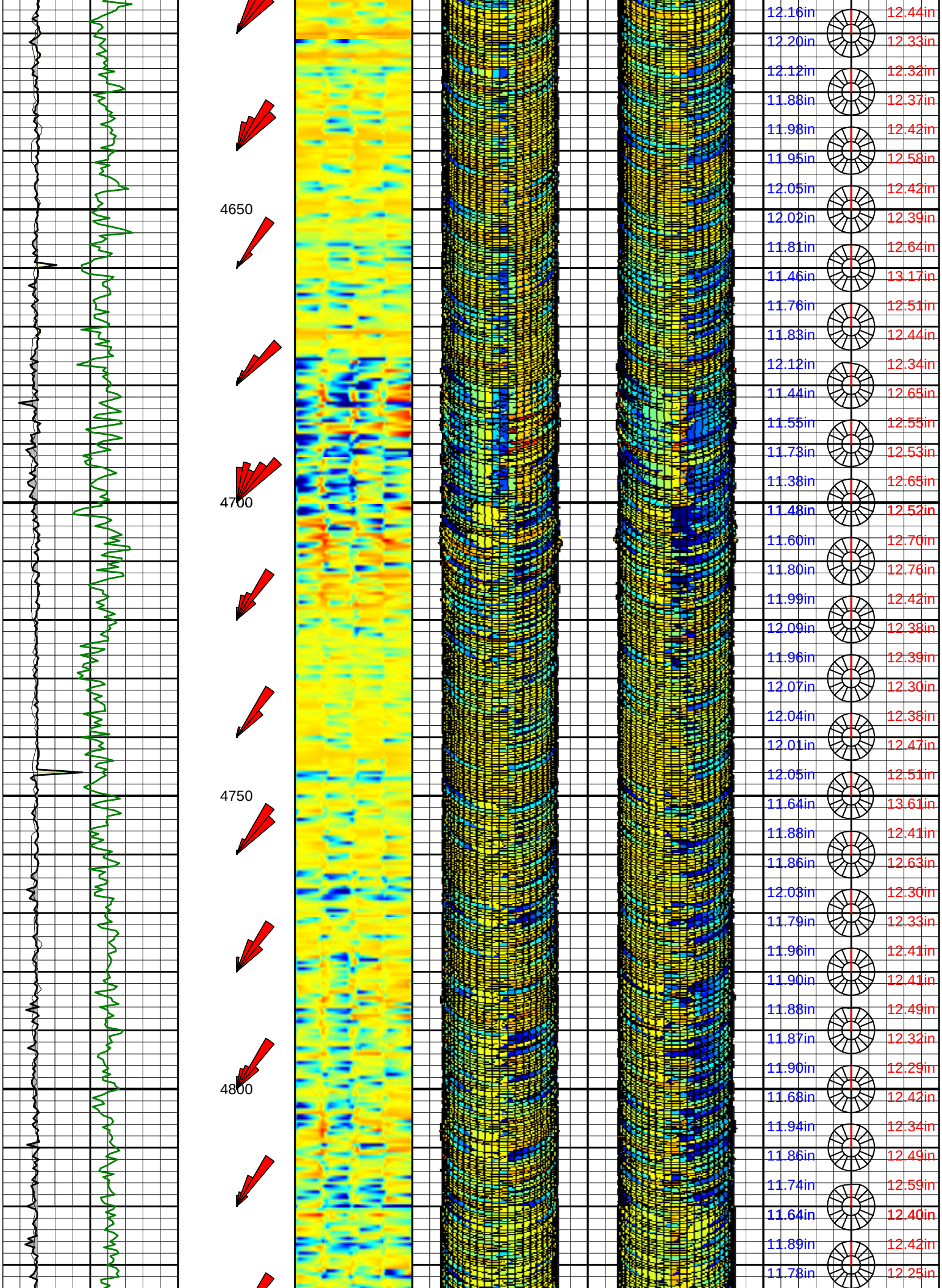
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11.46in 13.17in
11.76in 12.51in
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12.12in 12.34in
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11.55in 12.55in
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11.48in 12.52in
11.60in 12.70in
11.80in 12.76in
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12.09in 12.38in
11.96in 12.39in
12.07in 12.30in
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12.01in 12.47in
12.05in 12.51in
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11.88in 12.41in
11.86in 12.63in
12.03in 12.30in
11.79in 12.33in
11.96in 12.41in
11.90in 12.41in
11.88in 12.49in
11.87in 12.32in
11.90in 12.29in
11.68in 12.42in
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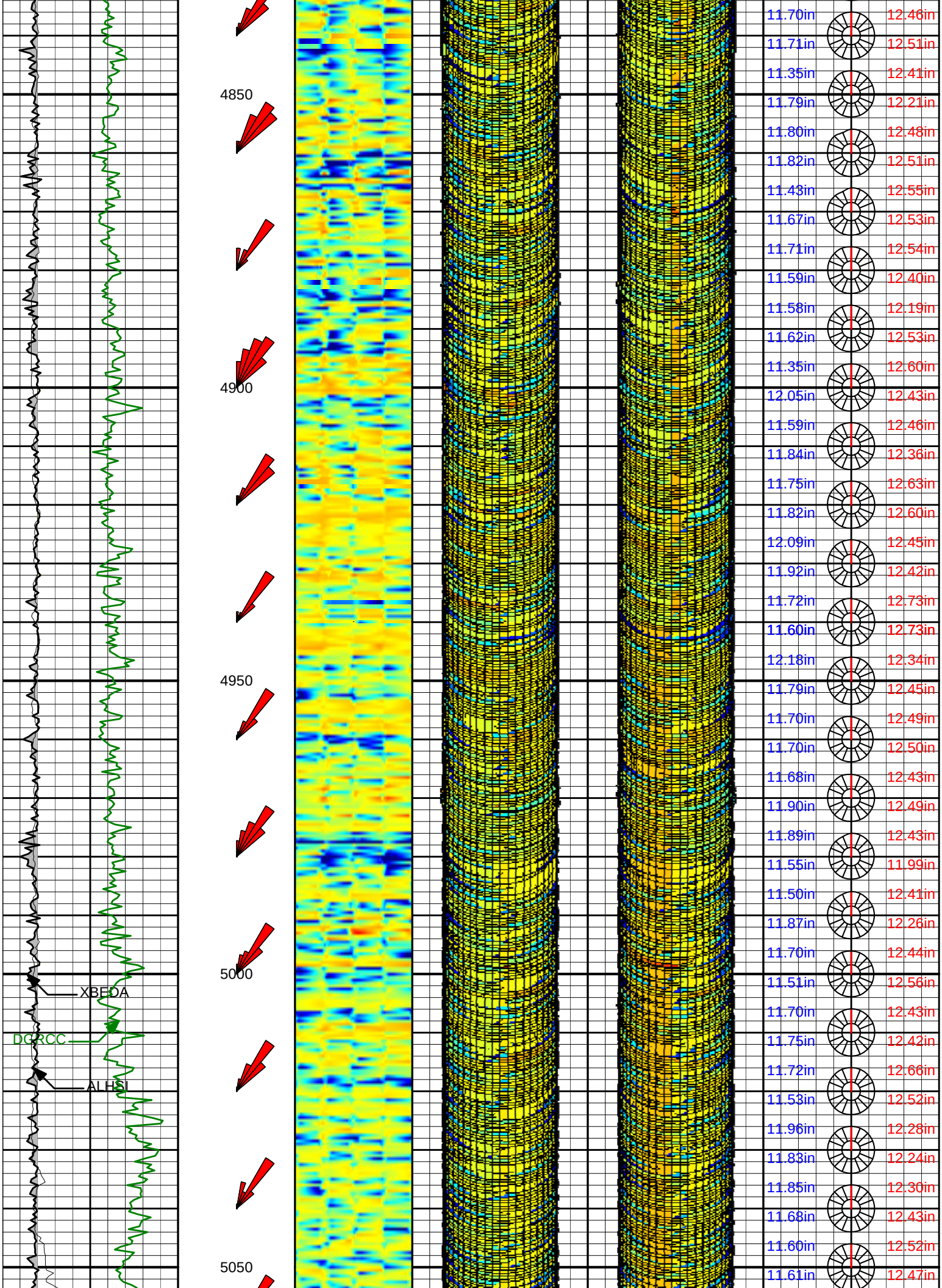
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DGRCC
ALHSI
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11.79in 12.21in
11.80in 12.48in
11.82in 12.51in
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11.59in 12.40in
11.58in 12.19in
11.62in 12.53in
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12.09in 12.45in
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11.68in 12.43in
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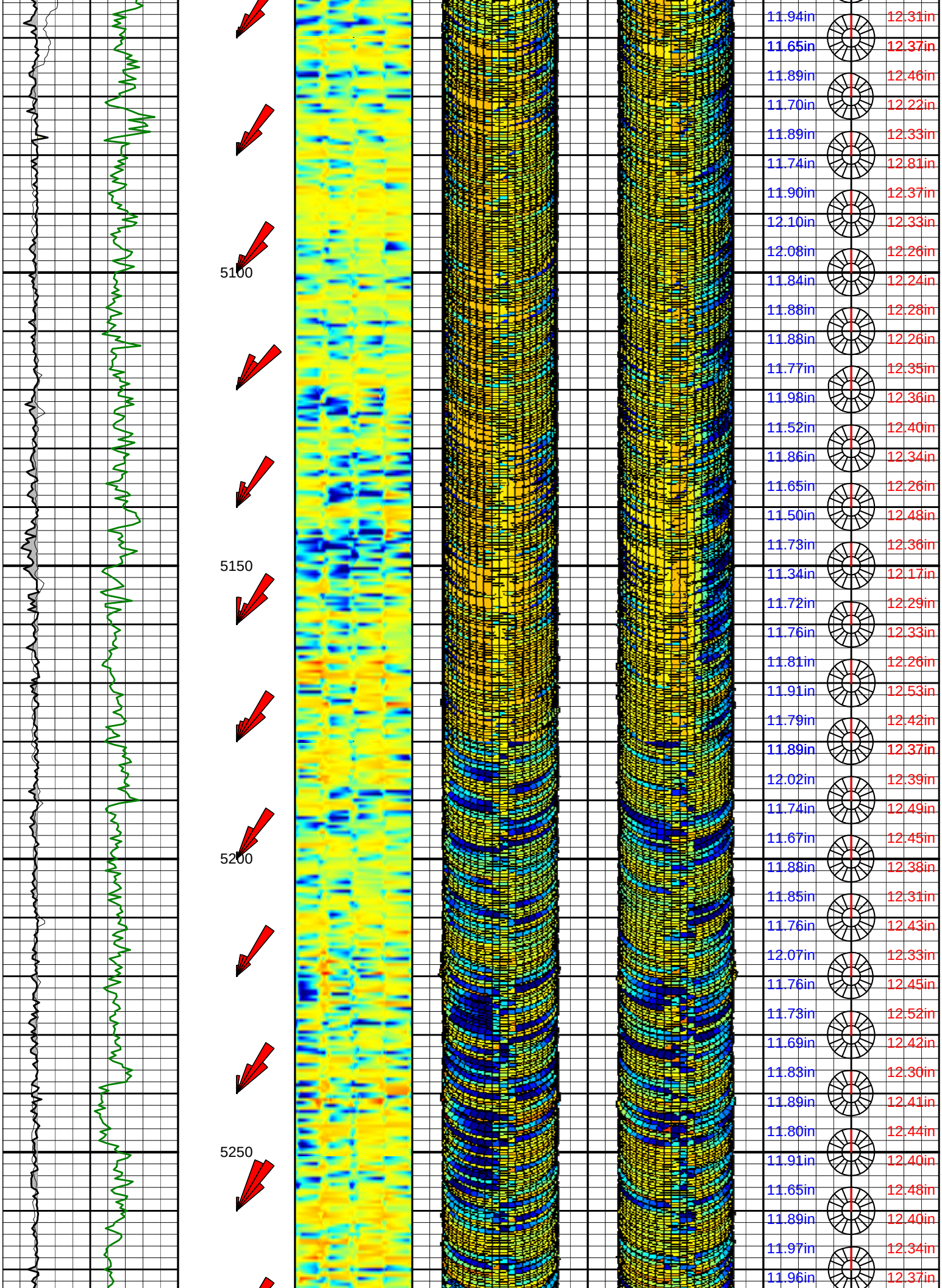
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11.74in 12.81in
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12.08in 12.26in
11.84in 12.24in
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11.98in 12.36in
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11.65in 12.26in
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11.89in 12.41in
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11.89in 12.40in
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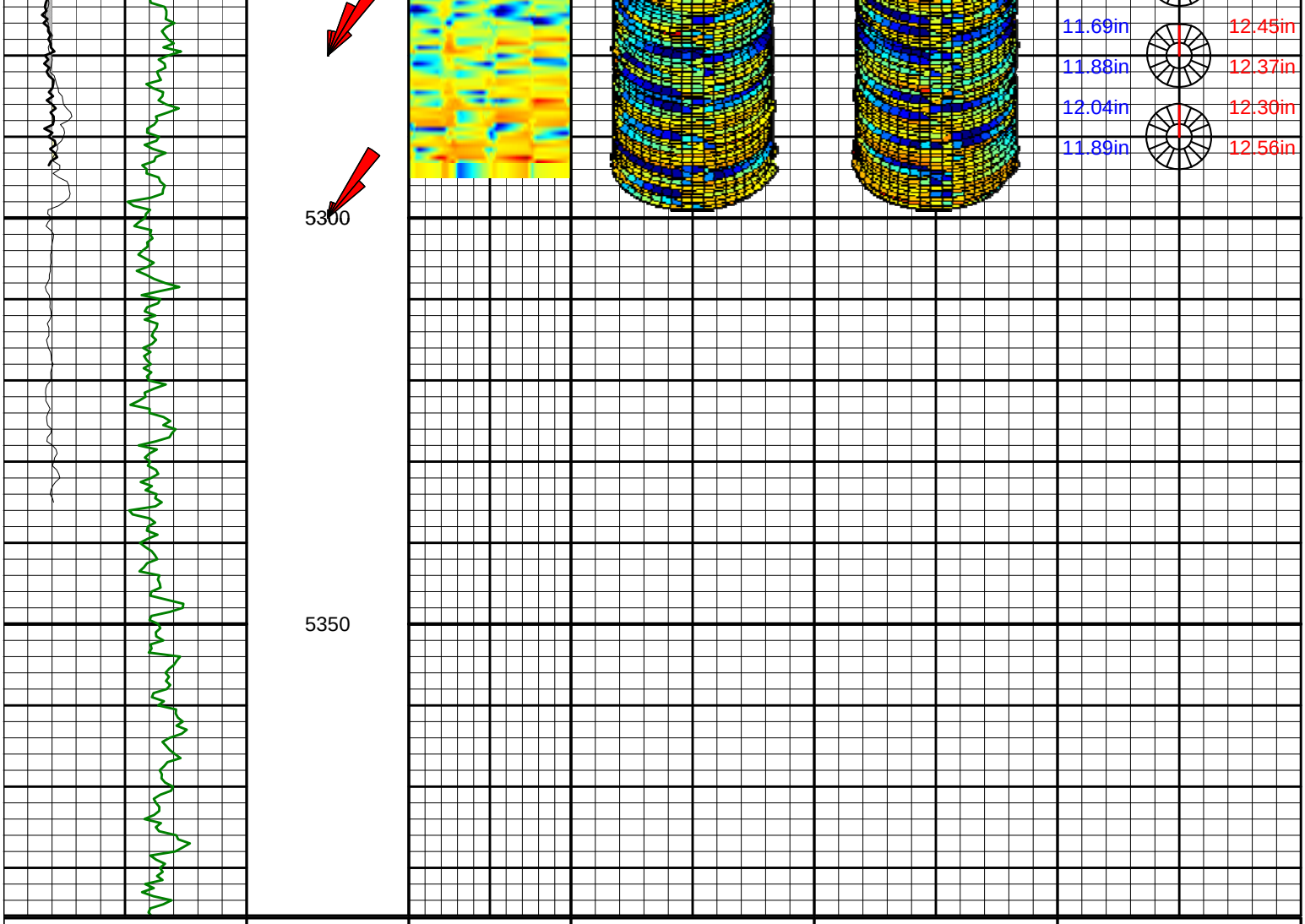


Hole Enlargement

Under | Minor <1" | Medium 1"-2" | Severe >2"

MD
ft
1 : 240

XCAL Image
5.5 Inches 6.5

XCAL 3D Plot Trace South
5.5 6.5

XCAL 3D Plot Trace North
5.5 6.5

XCAL Max Ellipse Diameter
XCAL Min Ellipse Diameter

ALD Hole Size Indicator
inches
10.25 20.25

XCAL Ellipse Direction

DGR Comb Gamma Ray BCorr
api
0 150

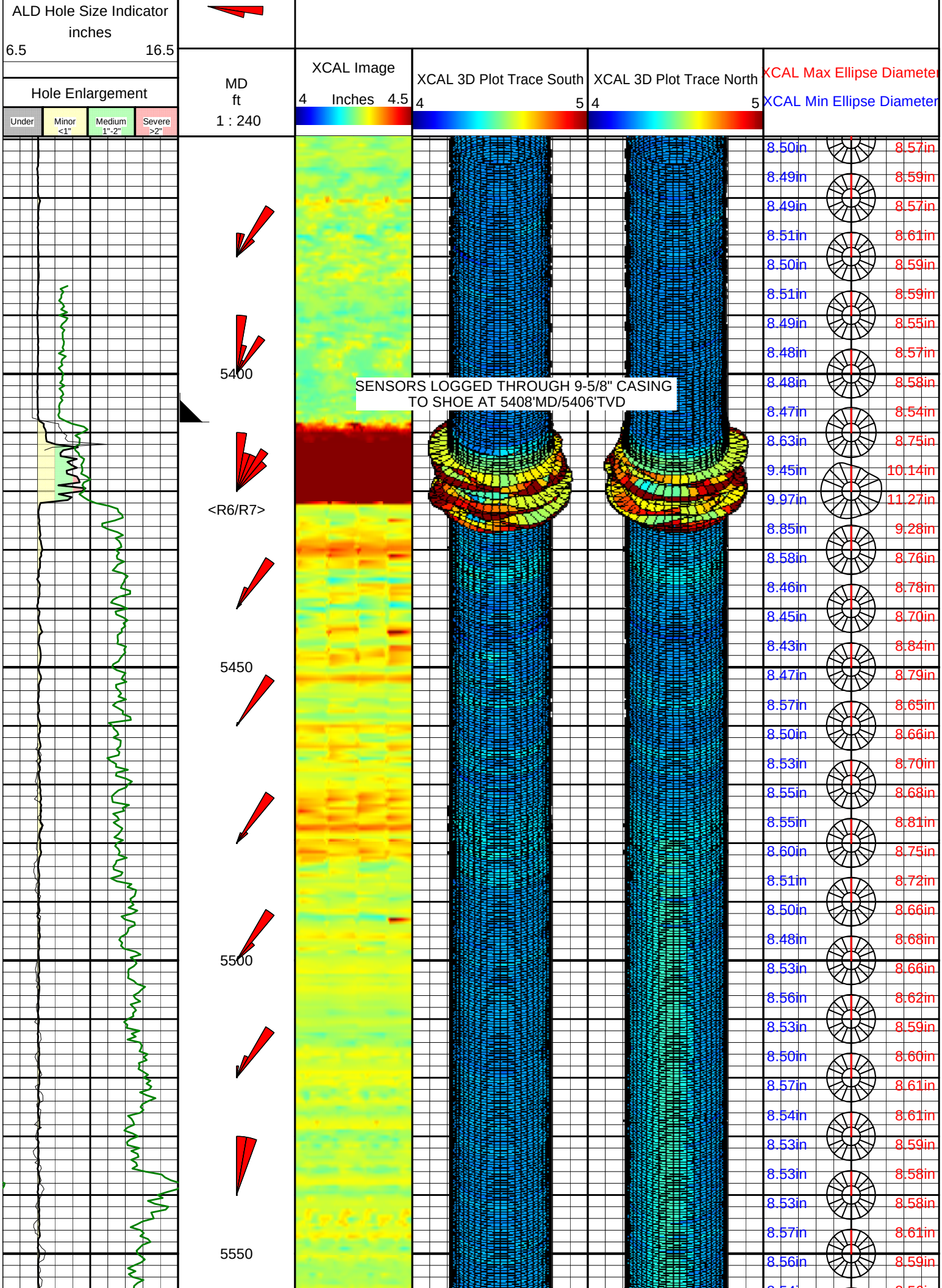
XCAL Ellipse Avg Diameter
inches
10.25 20.25

LWD R700 - 8.50" ZONE OF INTEREST

XCAL Ellipse Avg Diameter
inches
6.5 16.5

DGR Comb Gamma Ray BCorr
api
0 150

XCAL Ellipse Direction


ALD Hole Size Indicator
inches
6.5
16.5
Hole Enlargement
Under
Minor
<1"
Medium
1"-2"
Severe
>2"
MD
ft
1 : 240
XCAL Image
4
Inches
4.5
XCAL 3D Plot Trace South
4
5
XCAL 3D Plot Trace North
4
5
XCAL Max Ellipse Diameter
XCAL Min Ellipse Diameter
5400
<R6/R7>
5450
5500
5550
SENSORS LOGGED THROUGH 9-5/8" CASING
TO SHOE AT 5408'MD/5406'TVD
8.50in 8.57in
8.49in 8.59in
8.49in 8.57in
8.51in 8.61in
8.50in 8.59in
8.51in 8.59in
8.49in 8.55in
8.48in 8.57in
8.48in 8.58in
8.47in 8.54in
8.63in 8.75in
9.45in 10.14in
9.97in 11.27in
8.85in 9.28in
8.58in 8.76in
8.46in 8.78in
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8.56in 8.62in
8.53in 8.59in
8.50in 8.60in
8.57in 8.61in
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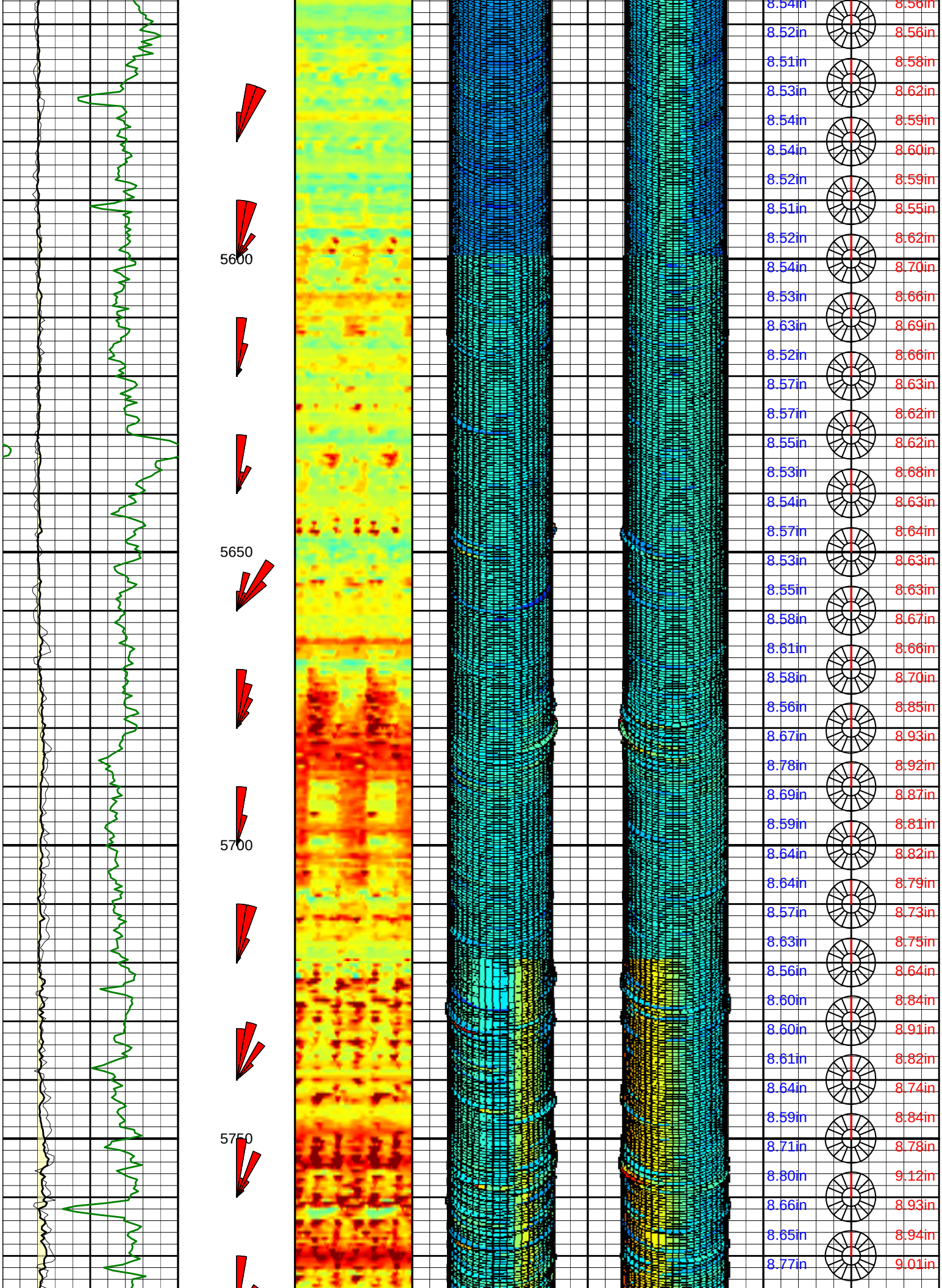
8.53in 8.58in
8.57in 8.61in
8.56in 8.59in


5600
5650
5700
5750
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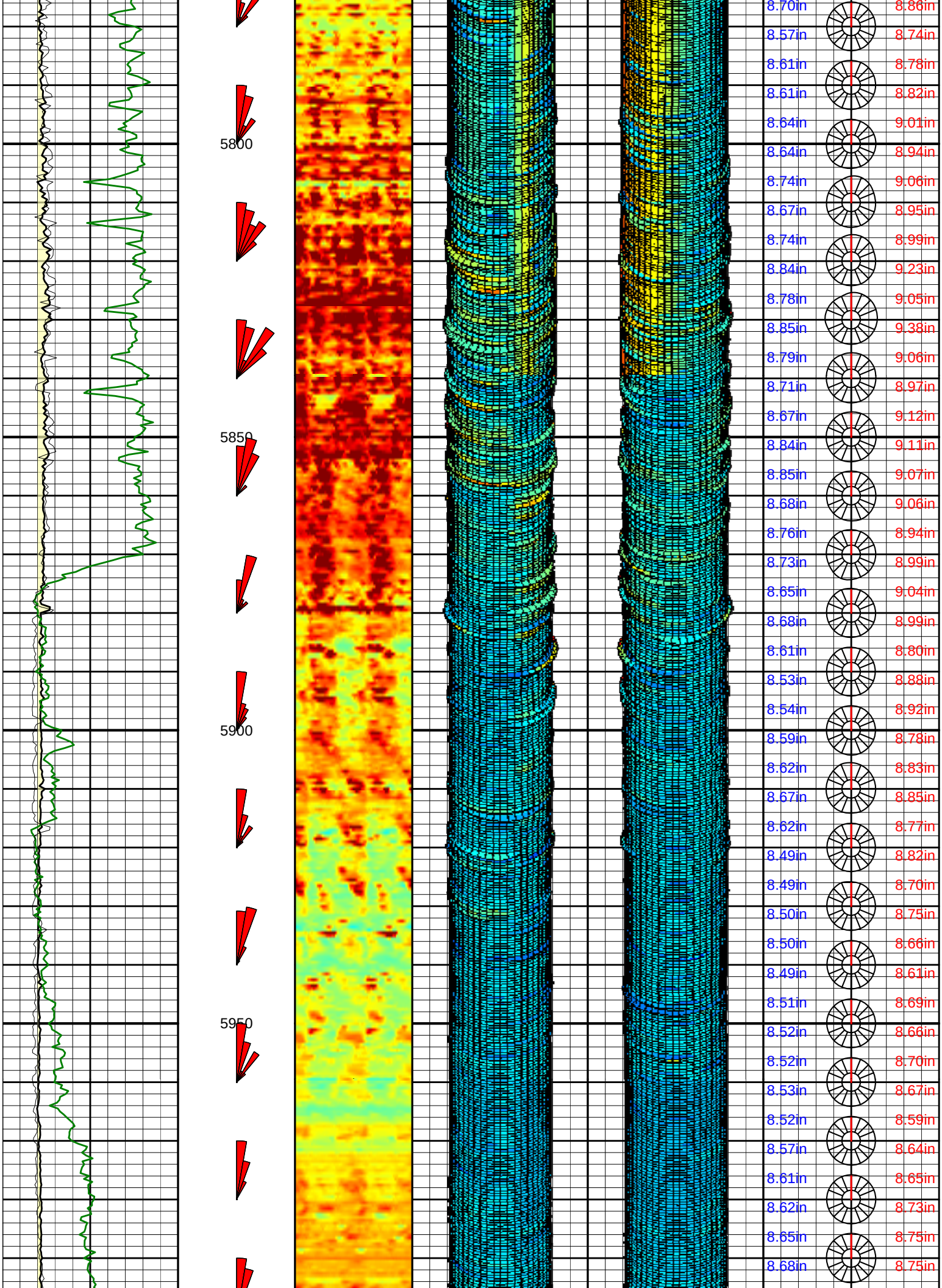
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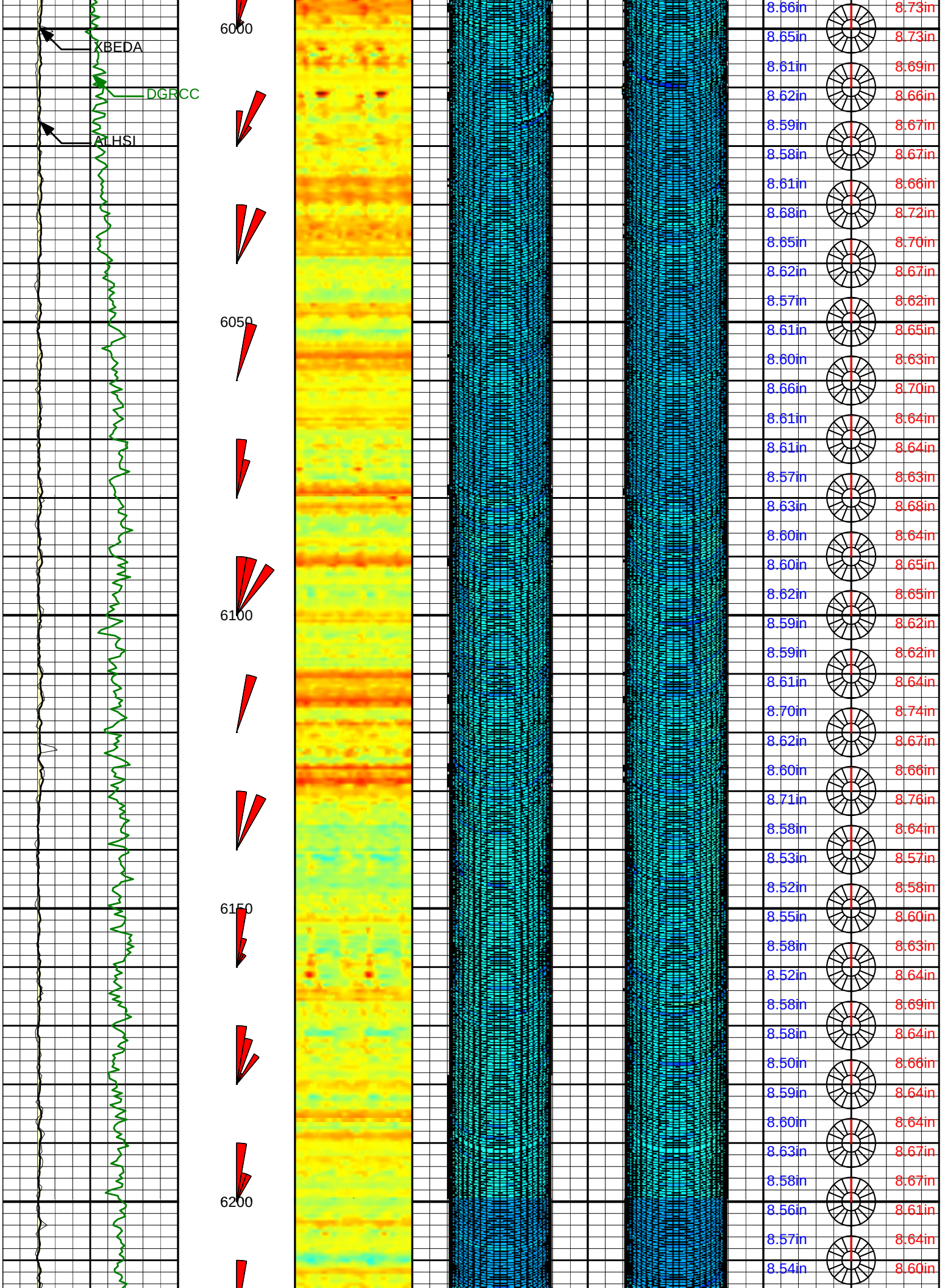
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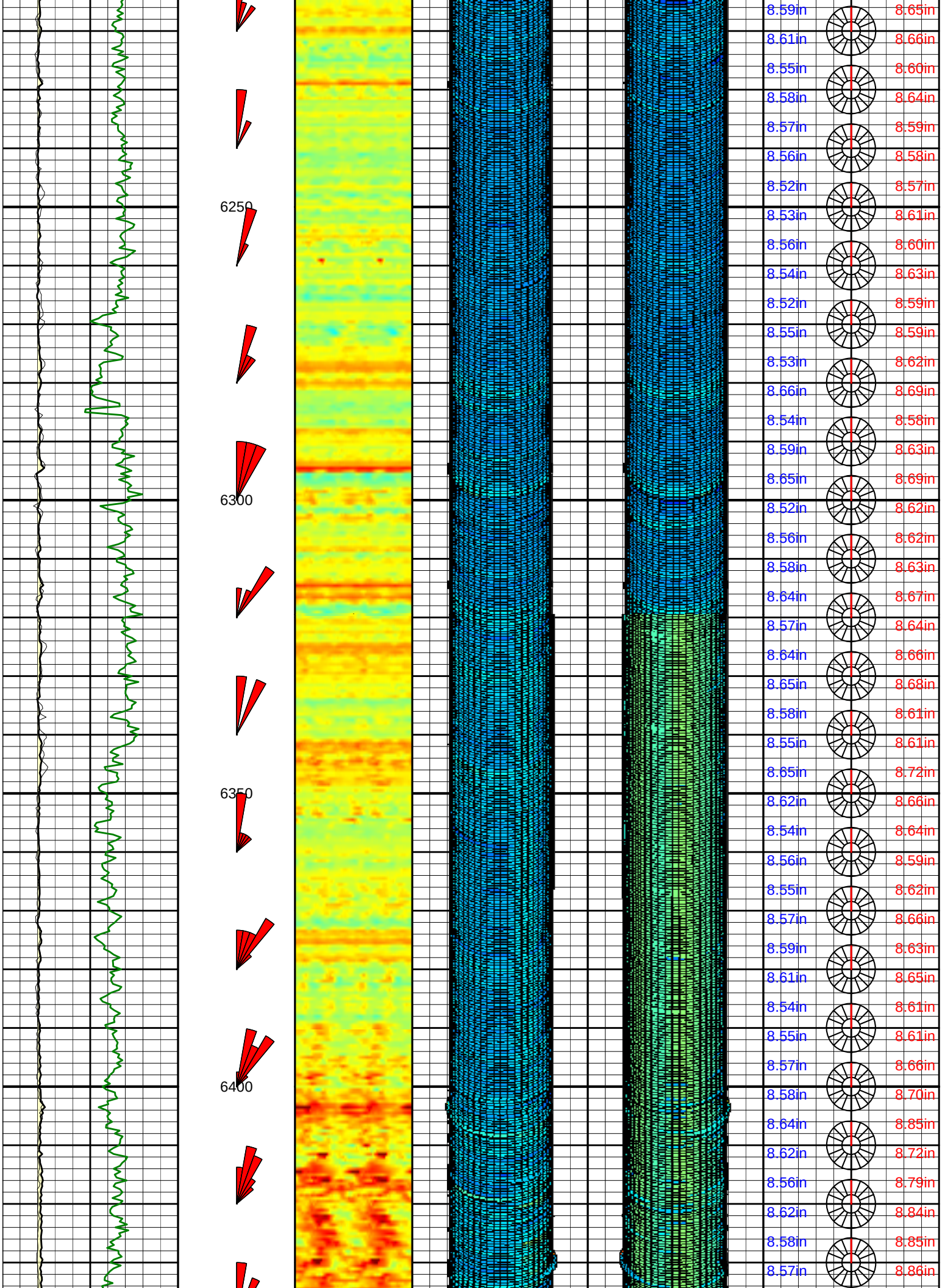
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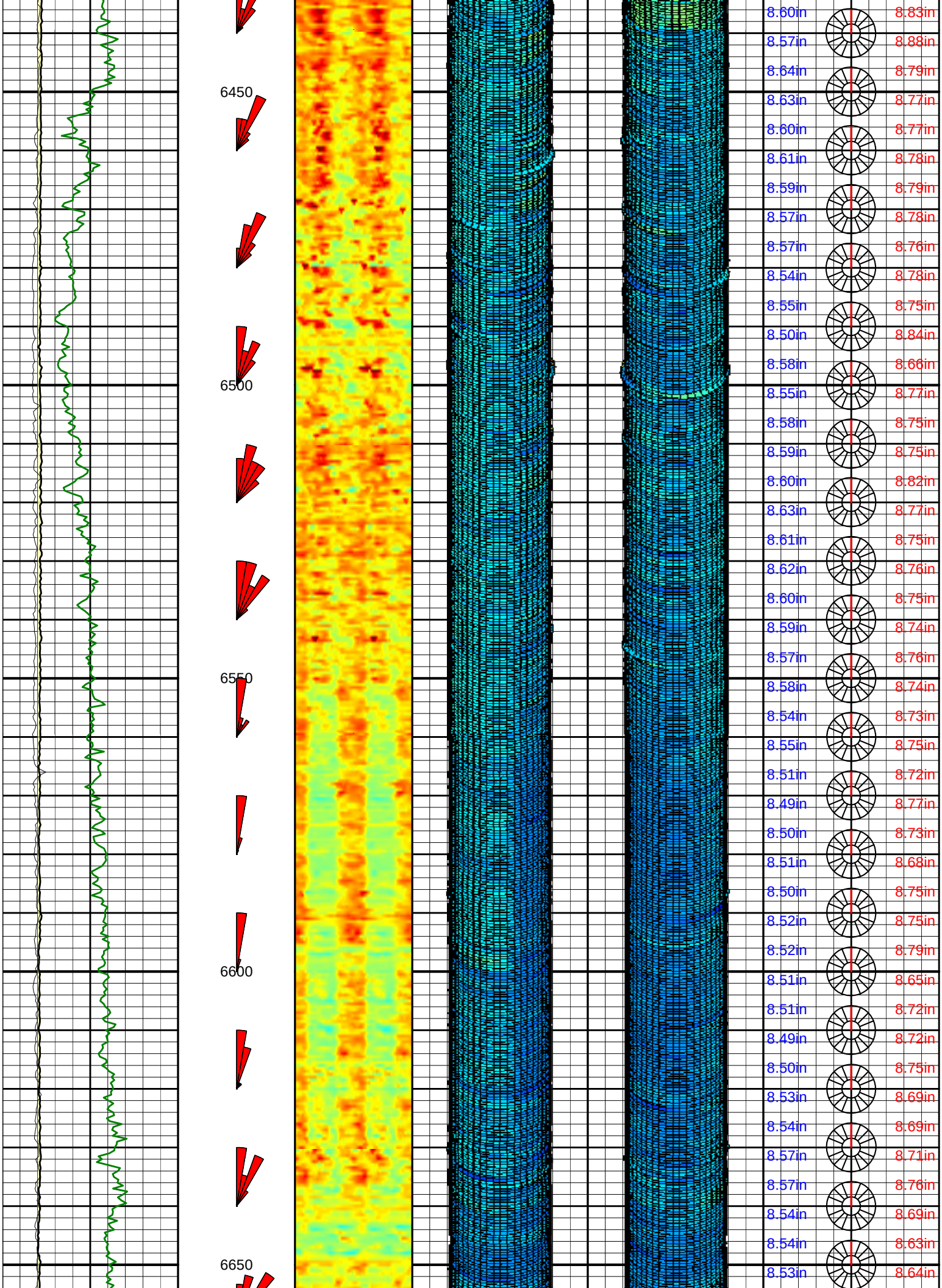
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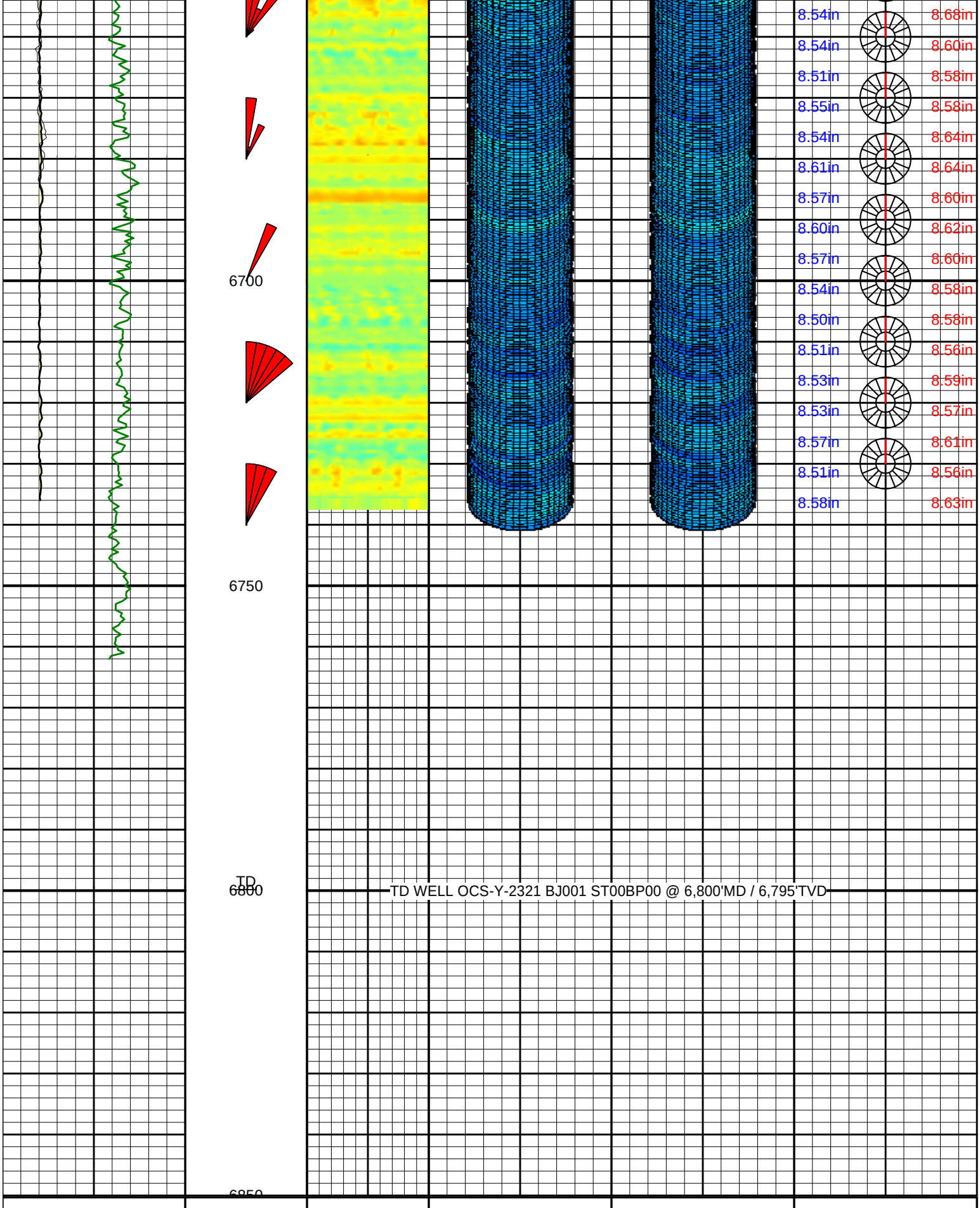


Hole Enlargement

Under	Minor <1"	Medium 1"-2"	Severe >2"

ALD Hole Size Indicator
inches
6.5 16.5

MD
ft
1 : 240

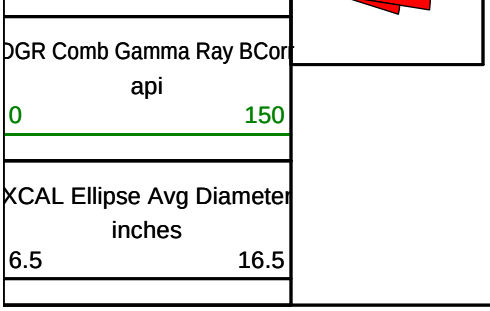
XCAL Ellipse Direction

XCAL Image
4 Inches 4.5

XCAL 3D Plot Trace South
4 5

XCAL 3D Plot Trace North
4 5

XCAL Max Ellipse Diameter
XCAL Min Ellipse Diameter



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Shell Gulf of Mexico Inc.
OCS-Y-2321 BJ001 ST00BP00
Posey 6912
Alaska
USA
AK-XX-0901604700
Final Survey is projected to well TD

Measured Depth (feet)	*Inclination (degrees)*	*Direction (degrees)*	*Vertical Depth (feet)*	*Latitude (feet)*	*Departure (feet)*	*Vertical Section (feet)*	*Dogleg (deg/100ft)*
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
220.00	0.00	0.00	220.00	0.00 N	0.00 E	0.00	0.00
320.88	0.51	129.60	320.88	0.29 S	0.35 E	-0.29	0.50
406.77	0.31	89.93	406.76	0.53 S	0.88 E	-0.53	0.39
495.25	0.99	122.22	495.24	0.93 S	1.76 E	-0.93	0.84
590.43	0.31	82.72	590.41	1.34 S	2.71 E	-1.34	0.81
684.05	0.64	327.24	684.03	0.87 S	2.68 E	-0.87	0.88
866.10	0.28	101.20	866.08	0.09 S	2.55 E	-0.09	0.47
957.99	0.00	269.46	957.97	0.13 S	2.77 E	-0.13	0.30
1051.65	0.14	176.72	1051.63	0.24 S	2.78 E	-0.24	0.15
1144.54	0.26	120.65	1144.52	0.46 S	2.97 E	-0.46	0.23
1235.66	0.41	134.11	1235.63	0.80 S	3.38 E	-0.80	0.19
1328.60	0.51	59.75	1328.58	0.83 S	3.98 E	-0.83	0.61
1378.50	0.25	111.62	1378.48	0.76 S	4.27 E	-0.76	0.81
1540.18	0.12	50.83	1540.15	0.78 S	4.74 E	-0.78	0.14
1723.74	0.39	34.99	1723.71	0.14 S	5.26 E	-0.14	0.15
1818.58	0.58	50.01	1818.55	0.43 N	5.81 E	0.43	0.24
2003.18	1.06	39.81	2003.12	2.35 N	7.62 E	2.35	0.27
2095.93	0.87	35.51	2095.87	3.57 N	8.57 E	3.57	0.22
2186.15	0.69	72.12	2186.07	4.30 N	9.49 E	4.30	0.57
2373.34	0.75	76.36	2373.25	4.93 N	11.76 E	4.93	0.04
2463.93	0.78	75.65	2463.83	5.23 N	12.93 E	5.23	0.03
2555.30	0.79	70.25	2555.19	5.59 N	14.13 E	5.59	0.08
2646.22	0.79	76.51	2646.11	5.95 N	15.33 E	5.95	0.10
2743.03	0.70	74.08	2742.91	6.27 N	16.55 E	6.27	0.10
2837.42	0.74	67.59	2837.29	6.66 N	17.68 E	6.66	0.10
2875.38	0.64	69.95	2875.25	6.83 N	18.10 E	6.83	0.27
2978.31	0.74	64.69	2978.17	7.31 N	19.25 E	7.31	0.11
3074.55	0.58	52.33	3074.40	7.88 N	20.20 E	7.88	0.22
3169.04	0.67	47.05	3168.89	8.55 N	20.99 E	8.55	0.11
3258.93	0.77	27.36	3258.77	9.44 N	21.65 E	9.44	0.30
3351.80	0.94	33.05	3351.63	10.64 N	22.35 E	10.64	0.21
3445.40	0.89	33.34	3445.22	11.90 N	23.18 E	11.90	0.06
3537.90	0.88	39.68	3537.71	13.05 N	24.03 E	13.05	0.11
3630.29	0.86	29.57	3630.09	14.20 N	24.82 E	14.20	0.17
3724.13	1.05	46.97	3723.91	15.40 N	25.80 E	15.40	0.37
3815.47	1.16	37.46	3815.23	16.71 N	26.98 E	16.71	0.24
3909.95	1.11	27.77	3909.70	18.28 N	27.99 E	18.28	0.21
4001.96	1.54	18.87	4001.69	20.24 N	28.80 E	20.24	0.52
4095.18	1.55	21.22	4094.87	22.60 N	29.67 E	22.60	0.07
4189.17	1.52	19.27	4188.83	24.97 N	30.54 E	24.97	0.06
4280.67	1.73	13.84	4280.29	27.46 N	31.27 E	27.46	0.28

4373.26	2.11	22.24	4372.83	30.39 N	32.25 E	30.39	0.51
4465.71	1.69	19.56	4465.23	33.26 N	33.35 E	33.26	0.46
4559.04	2.02	19.56	4558.51	36.11 N	34.37 E	36.11	0.35
4651.17	2.19	23.91	4650.58	39.24 N	35.62 E	39.24	0.25
4743.27	2.64	25.07	4742.59	42.77 N	37.23 E	42.77	0.49
4836.87	3.09	32.03	4836.08	46.87 N	39.49 E	46.87	0.61
4929.20	3.15	34.87	4928.26	51.06 N	42.26 E	51.06	0.18
5021.52	3.28	37.85	5020.45	55.22 N	45.33 E	55.22	0.23
5113.59	3.34	39.69	5112.36	59.37 N	48.66 E	59.37	0.13
5206.14	3.59	47.76	5204.74	63.39 N	52.52 E	63.39	0.59
5299.05	3.70	48.27	5297.46	67.34 N	56.92 E	67.34	0.12
5364.19	3.45	52.11	5362.48	69.95 N	60.04 E	69.95	0.54
5429.81	3.65	46.91	5427.97	72.59 N	63.12 E	72.59	0.58
5518.31	3.73	45.18	5516.29	76.55 N	67.22 E	76.55	0.15
5612.70	3.58	42.26	5610.48	80.90 N	71.39 E	80.90	0.25
5704.09	3.56	42.97	5701.70	85.09 N	75.24 E	85.09	0.06
5795.19	3.47	41.51	5792.62	89.22 N	79.00 E	89.22	0.13
5889.32	3.48	42.48	5886.58	93.46 N	82.82 E	93.46	0.06
5980.70	3.42	42.67	5977.80	97.52 N	86.54 E	97.52	0.07
6075.07	3.43	41.69	6072.00	101.69 N	90.33 E	101.69	0.06
6167.81	3.55	39.12	6164.57	105.99 N	93.98 E	105.99	0.21
6259.59	3.53	39.52	6256.17	110.37 N	97.57 E	110.37	0.03
6346.61	3.75	37.26	6343.02	114.70 N	100.99 E	114.70	0.30
6445.34	3.99	34.54	6441.52	120.10 N	104.89 E	120.10	0.31
6536.48	3.96	35.37	6532.44	125.27 N	108.51 E	125.27	0.07
6628.63	3.92	37.01	6624.37	130.38 N	112.25 E	130.38	0.13
6721.62	3.89	35.41	6717.15	135.49 N	115.99 E	135.49	0.12
6745.05	3.99	35.86	6740.52	136.80 N	116.93 E	136.80	0.46
6800.00	3.99	35.86	6795.34	139.90 N	119.17 E	139.90	0.00

CALCULATION BASED ON MINIMUM CURVATURE METHOD

SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT

VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 0.00 DEGREES (GRID)
A TOTAL CORRECTION OF 10.95 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6800.00 FEET
IS 183.78 FEET ALONG 40.42 DEGREES (GRID)

Map System: NAD 83 UTM Zones
Geo Datum: North American Datum of 1983
Map Zone: Universal Transverse Mercator Zone 03N

Date Printed:01 November 2015