



Software Integrated Solutions Data Services

Casing Integrity Evaluation

Company:	Xcel Energy
Well:	STORAGE UNIT #32
Field:	Roundup
Logging Date:	07-Aug-2019
Log Analyst:	Melissa Shuck
Peer Reviewer:	Daniel Amyotte
Report Date:	13-Aug-2019

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Executive Summary

Objectives

The objective of the logging was to examine the condition of the 5.5" casing.

Recorded Data

A UCIT log was recorded in the STORAGE UNIT #32 well on the 07-Aug-2019. Due to the high resolution of the UCI tool, the tool readings are very sensitive to the rugosity in the pipe as signals are heavily attenuated.

The wireline log was recorded over the 5.5" K-55 [15.5, 17.0] lbm/ft casing from 6384.75ft – 64.875ft. The data quality is generally good. The well was reported to contain 8.34lb/gal WATER at the time of logging.

Observations

All passes logged were evaluated in this interpretation. Repeat passes were compared to the main pass to aid in the interpretation.

A total of **149** joints were analyzed in this log.

5.5" Casing

- The interpretation results show that there is no apparent sign of any significant casing damage / pittings / ovality over the logged interval.
- Two different weights of casing were observed throughout the logged interval. Joints [38, 43, 51, 54, 71, 76, 91] are observed to be 17 lbm/ft rather than the 15.5 lbm/ft the wellsketch reported.

The minimum thickness found in **5.5"** casing was joint **49** at **2099.25ft** with a value of **0.208"**. Minimum burst pressure was calculated at **4155.4 psi** using a yield value of **55000.0 psi**.

*(Burst is calculated using the following API formula: $Burst = 2 * Yp * Minimum\ Thickness / OD$)*

Joint Summary

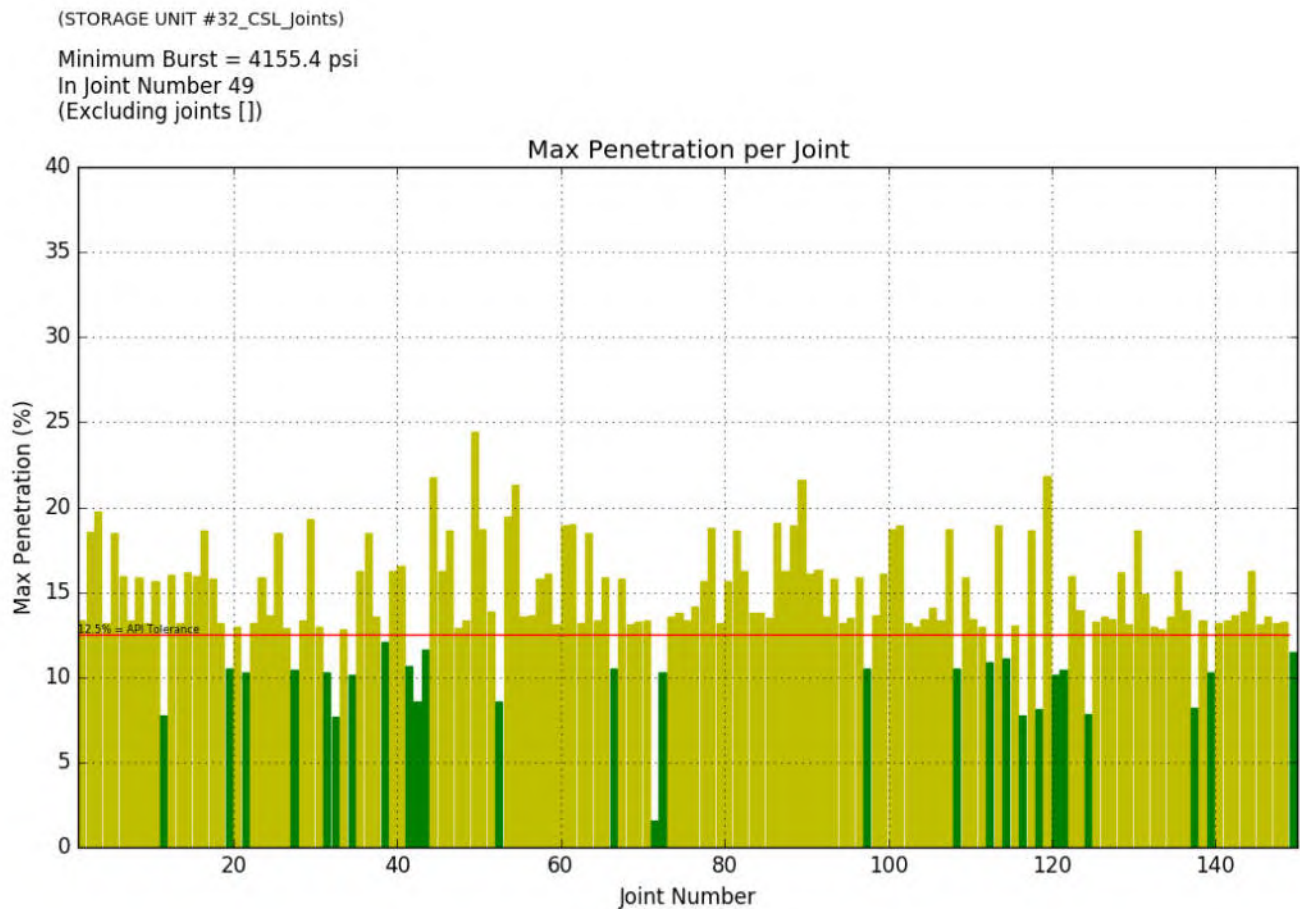
Number of joints below 12.5% Penetration	27
Number of joints between 12.5 and 40 Penetration	122
Number of joints above 40% Penetration	0

Joints No	1 - 149
Casing Size Used For Minimum Burst Computation (in)	5.5"
Yield Strength Used For Minimum Burst Computation (psi)	55000.0
Minimum Burst Strength Found In Joint	49
Minimum Burst Pressure (psi)	4155.4
Minimum Thickness (in)	0.208"

Charts:

The barchart of max penetration vs joint number provides a quicklook overview of the whole well, enabling trouble areas to be quickly recognized. The bars are color coded as above.

The histogram of casing measurements can be used to quickly see if the casing is all one weight of pipe. The histogram of all casing measurements gives an indication of the casing quality (ERW pipe will typically show a very narrow distribution of radii/thicknesses, whilst older milled casing will have a broader distribution).



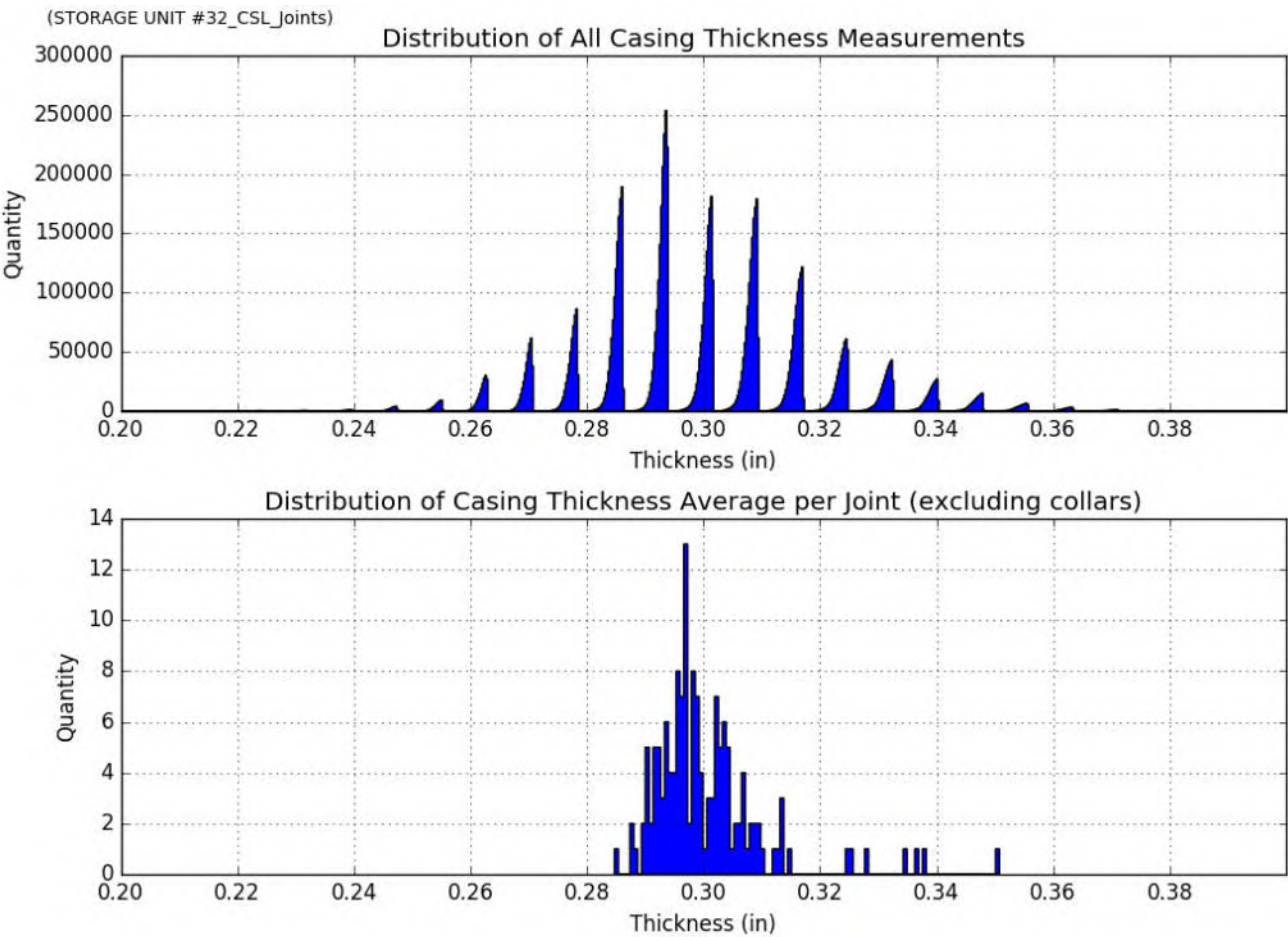


Table:

The table of yearly corrosion rate vs joint number provides a worst case scenario of the thickness change per year. THMN_COR_Rate_Joint was calculated using the formula $[(\text{THMN_Joint_older} - \text{THMN_Joint_newer})/\text{number of years}]$.

Joint_No	Joint Top	Joint Btm	2013_THMN_Joint	2019_THMN_Joint	THMN_CR_Joint
	2019	2019			2013-2019
	ft	ft	in	in	in/year
1	65	78	0.2750	0.2384	0.0061
2	78	121	0.2650	0.2239	0.0069
3	121	165	0.2430	0.2208	0.0037
4	165	209	0.2710	0.2388	0.0054
5	209	250	0.2650	0.2243	0.0068
6	250	294	0.2640	0.2311	0.0055
7	294	335	0.2660	0.2383	0.0046
8	335	378	0.2660	0.2314	0.0058
9	378	420	0.2640	0.2387	0.0042
10	420	462	0.2660	0.2319	0.0057
11	462	505	0.2740	0.2536	0.0034
12	505	546	0.2690	0.2309	0.0064
13	546	588	0.2640	0.2387	0.0042
14	588	628	0.2530	0.2306	0.0037
15	628	671	0.2650	0.2311	0.0056
16	671	712	0.2580	0.2237	0.0057
17	712	756	0.2540	0.2316	0.0037
18	756	798	0.2670	0.2388	0.0047
19	798	836	0.2690	0.2461	0.0038
20	836	880	0.2650	0.2393	0.0043
21	880	924	0.2710	0.2467	0.0040
22	924	968	0.2630	0.2387	0.0041
23	968	1012	0.2560	0.2314	0.0041
24	1012	1055	0.2550	0.2376	0.0029
25	1055	1097	0.2520	0.2242	0.0046
26	1097	1139	0.2630	0.2395	0.0039
27	1139	1182	0.2680	0.2464	0.0036
28	1182	1223	0.2650	0.2384	0.0044
29	1223	1260	0.2500	0.2220	0.0047
30	1260	1304	0.2770	0.2394	0.0063
31	1304	1346	0.2730	0.2467	0.0044

Joint_No	Joint Top	Joint Btm	2013_THMN_Joint	2019_THMN_Joint	THMN_CR_Joint
	2019	2019			2013-2019
	ft	ft	in	in	in/year
32	1346	1388	0.2800	0.2538	0.0044
33	1388	1426	0.2650	0.2397	0.0042
34	1426	1470	0.2700	0.2472	0.0038
35	1470	1512	0.2680	0.2304	0.0063
36	1512	1554	0.2600	0.2242	0.0060
37	1554	1597	0.2640	0.2377	0.0044
38	1597	1636	0.2950	0.2673	0.0046
39	1636	1677	0.2660	0.2303	0.0059
40	1677	1720	0.2640	0.2294	0.0058
41	1720	1763	0.2650	0.2457	0.0032
42	1763	1806	0.2690	0.2515	0.0029
43	1806	1850	0.2990	0.2687	0.0050
44	1850	1892	0.2500	0.2151	0.0058
45	1892	1935	0.2590	0.2303	0.0048
46	1935	1978	0.2540	0.2237	0.0050
47	1978	2017	0.2760	0.2396	0.0061
48	2017	2059	0.2680	0.2384	0.0049
49	2059	2103	0.2420	0.2078	0.0057
50	2103	2145	0.2420	0.2237	0.0031
51	2145	2183	0.2790	0.2618	0.0029
52	2183	2225	0.2750	0.2514	0.0039
53	2225	2267	0.2460	0.2216	0.0041
54	2267	2311	0.2830	0.2393	0.0073
55	2311	2354	0.2640	0.2378	0.0044
56	2354	2397	0.2630	0.2375	0.0042
57	2397	2437	0.2560	0.2315	0.0041
58	2437	2481	0.2420	0.2307	0.0019
59	2481	2524	0.2620	0.2390	0.0038
60	2524	2567	0.2530	0.2229	0.0050
61	2567	2611	0.2530	0.2227	0.0051
62	2611	2653	0.2650	0.2387	0.0044
63	2653	2697	0.2610	0.2241	0.0061
64	2697	2740	0.2630	0.2384	0.0041
65	2740	2781	0.2680	0.2314	0.0061
66	2781	2825	0.2730	0.2461	0.0045
67	2825	2868	0.2630	0.2315	0.0052

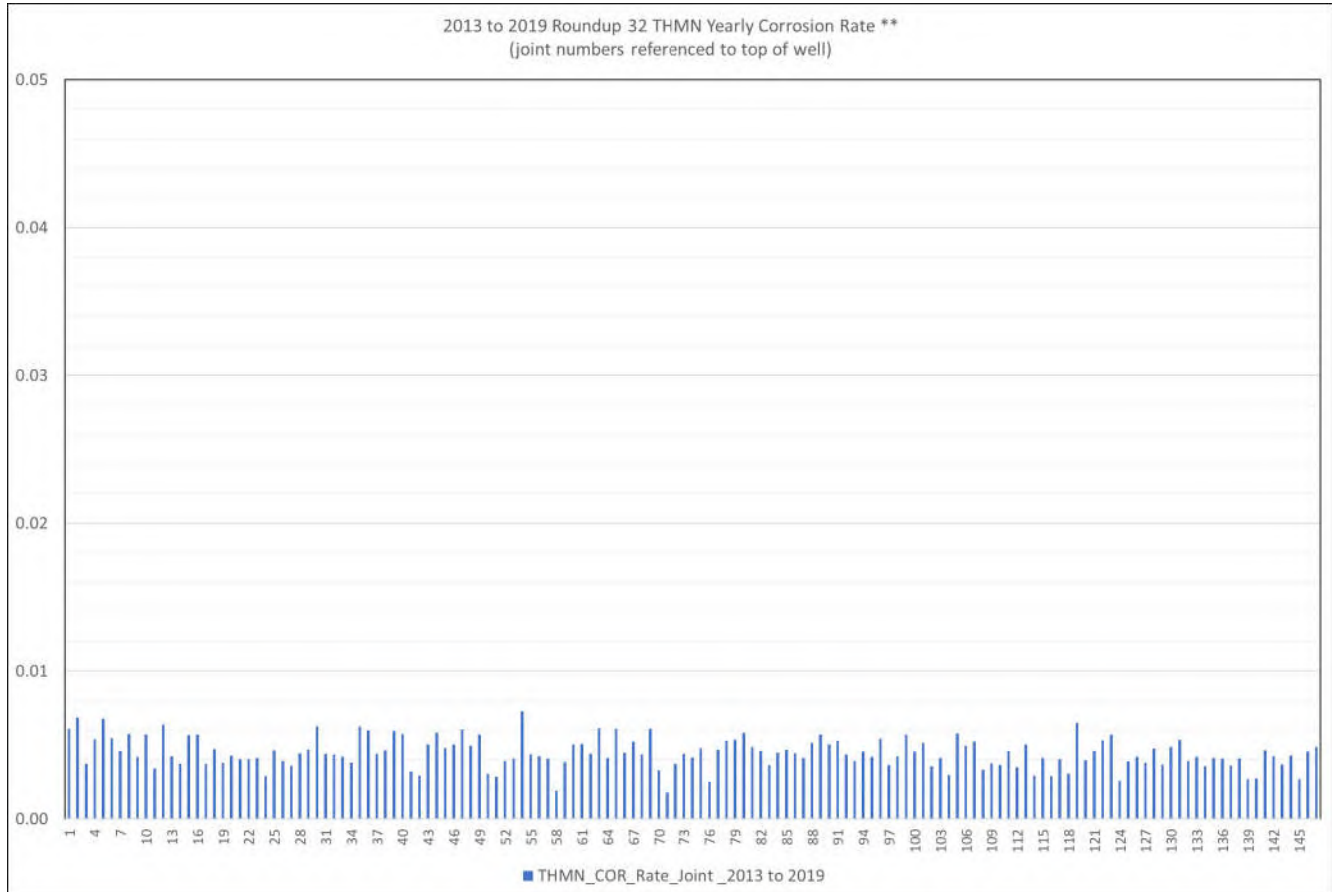
Joint_No	Joint Top	Joint Btm	2013_THMN_Joint	2019_THMN_Joint	THMN_CR_Joint
	2019	2019			2013-2019
	ft	ft	in	in	in/year
68	2868	2912	0.2650	0.2389	0.0043
69	2912	2954	0.2750	0.2384	0.0061
70	2954	2997	0.2580	0.2383	0.0033
71	2997	3038	0.3100	0.2993	0.0018
72	3038	3076	0.2690	0.2468	0.0037
73	3076	3118	0.2640	0.2377	0.0044
74	3118	3161	0.2620	0.2370	0.0042
75	3161	3204	0.2670	0.2383	0.0048
76	3204	3246	0.2760	0.2610	0.0025
77	3246	3288	0.2600	0.2320	0.0047
78	3288	3333	0.2550	0.2233	0.0053
79	3333	3375	0.2710	0.2388	0.0054
80	3375	3420	0.2670	0.2320	0.0058
81	3420	3464	0.2530	0.2238	0.0049
82	3464	3509	0.2580	0.2304	0.0046
83	3509	3553	0.2590	0.2370	0.0037
84	3553	3596	0.2640	0.2370	0.0045
85	3596	3639	0.2660	0.2380	0.0047
86	3639	3684	0.2490	0.2225	0.0044
87	3684	3728	0.2550	0.2303	0.0041
88	3728	3769	0.2540	0.2231	0.0052
89	3769	3814	0.2500	0.2157	0.0057
90	3814	3858	0.2610	0.2307	0.0050
91	3858	3899	0.2860	0.2545	0.0052
92	3899	3943	0.2640	0.2378	0.0044
93	3943	3987	0.2550	0.2315	0.0039
94	3987	4030	0.2660	0.2387	0.0046
95	4030	4075	0.2630	0.2378	0.0042
96	4075	4118	0.2640	0.2314	0.0054
97	4118	4161	0.2680	0.2462	0.0036
98	4161	4203	0.2630	0.2375	0.0042
99	4203	4247	0.2650	0.2307	0.0057
100	4247	4291	0.2510	0.2237	0.0046
101	4291	4336	0.2540	0.2230	0.0052
102	4336	4381	0.2600	0.2387	0.0036
103	4381	4424	0.2640	0.2393	0.0041

Joint_No	Joint Top	Joint Btm	2013_THMN_Joint	2019_THMN_Joint	THMN_CR_Joint
	2019	2019			2013-2019
	ft	ft	in	in	in/year
104	4424	4465	0.2560	0.2381	0.0030
105	4465	4508	0.2710	0.2363	0.0058
106	4508	4551	0.2680	0.2384	0.0049
107	4551	4596	0.2550	0.2237	0.0052
108	4596	4640	0.2660	0.2461	0.0033
109	4640	4683	0.2540	0.2314	0.0038
110	4683	4728	0.2600	0.2381	0.0036
111	4728	4771	0.2670	0.2393	0.0046
112	4771	4814	0.2660	0.2451	0.0035
113	4814	4859	0.2530	0.2229	0.0050
114	4859	4903	0.2620	0.2444	0.0029
115	4903	4946	0.2640	0.2392	0.0041
116	4946	4986	0.2710	0.2537	0.0029
117	4986	5030	0.2480	0.2238	0.0040
118	5030	5071	0.2710	0.2527	0.0030
119	5071	5114	0.2540	0.2150	0.0065
120	5114	5157	0.2710	0.2471	0.0040
121	5157	5200	0.2740	0.2464	0.0046
122	5200	5243	0.2630	0.2312	0.0053
123	5243	5286	0.2710	0.2368	0.0057
124	5286	5330	0.2690	0.2534	0.0026
125	5330	5375	0.2620	0.2386	0.0039
126	5375	5420	0.2630	0.2378	0.0042
127	5420	5463	0.2610	0.2381	0.0038
128	5463	5508	0.2590	0.2306	0.0047
129	5508	5551	0.2610	0.2390	0.0037
130	5551	5596	0.2530	0.2237	0.0049
131	5596	5641	0.2660	0.2340	0.0053
132	5641	5684	0.2630	0.2394	0.0039
133	5684	5726	0.2650	0.2397	0.0042
134	5726	5772	0.2590	0.2377	0.0035
135	5772	5817	0.2550	0.2303	0.0041
136	5817	5860	0.2610	0.2366	0.0041
137	5860	5903	0.2740	0.2525	0.0036
138	5903	5947	0.2630	0.2384	0.0041
139	5947	5989	0.2630	0.2468	0.0027

Joint_No	Joint Top	Joint Btm	2013_THMN_Joint	2019_THMN_Joint	THMN_CR_Joint
	2019	2019			2013-2019
	ft	ft	in	in	in/year
140	5989	6032	0.2550	0.2387	0.0027
141	6032	6075	0.2660	0.2383	0.0046
142	6075	6119	0.2630	0.2375	0.0042
143	6119	6163	0.2590	0.2369	0.0037
144	6163	6206	0.2560	0.2304	0.0043
145	6206	6250	0.2550	0.2389	0.0027
146	6250	6292	0.2650	0.2377	0.0045
147	6292	6334	0.2680	0.2387	0.0049
148	6334	6377		0.2385	
149	6377	6384		0.2435	

The graph below shows a yearly corrosion rate vs joint number from 2013 to 2019.

- The overall trend in the corrosion rate has increased from 2013 to 2019.
- The Joint with the highest yearly corrosion rate from 2013 to 2019 (>0.007 in/yr) is [54].

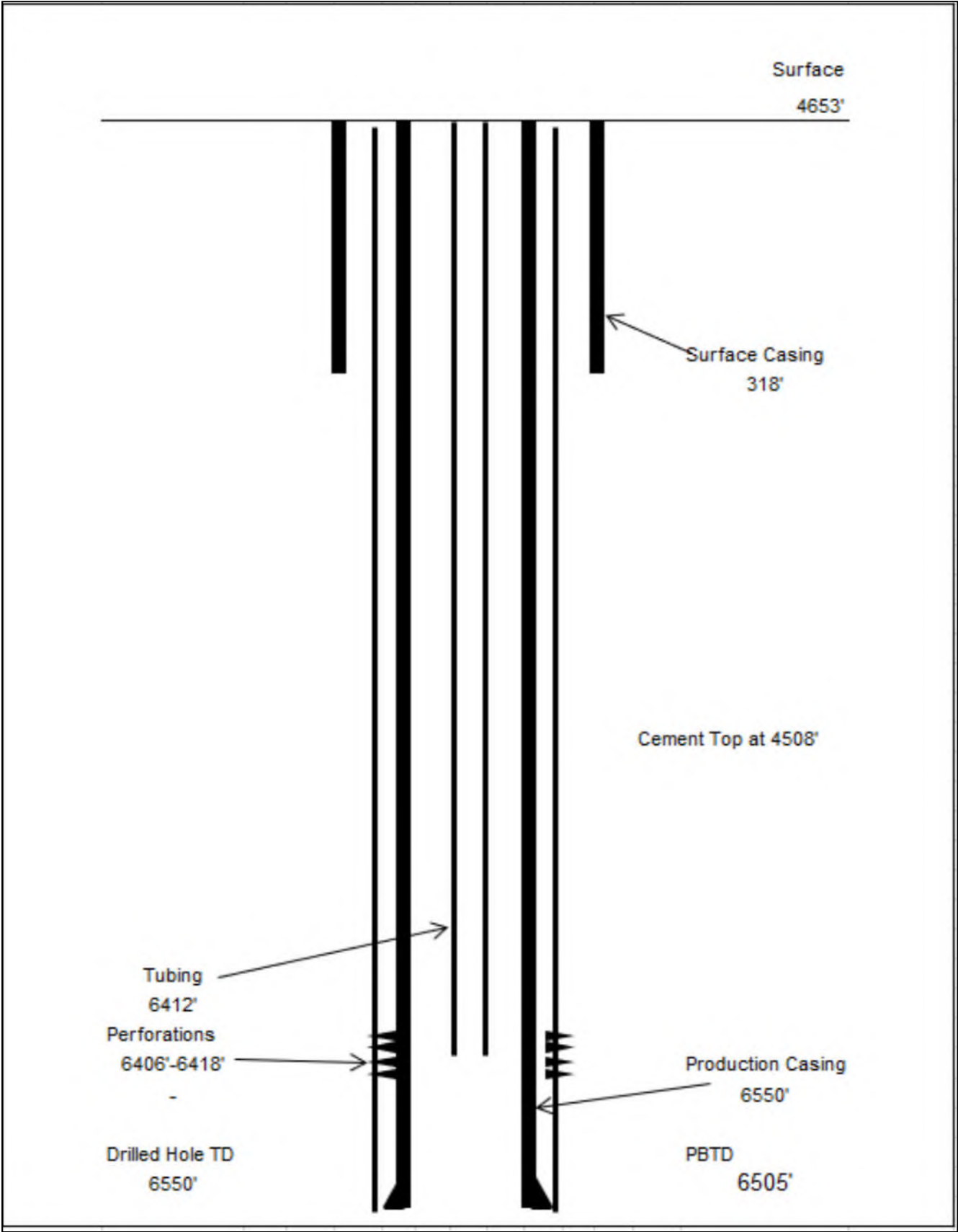


**This well was evaluated with two different technologies between 2013 and 2019. In 2013 the ultrasonic imager (USIT) was logged, which uses a resonance-based approach to determine wall thickness. In 2019, a change to the Ultrasonic Corrosion Imager (UCI) was made, which uses a focused reflection approach to determine wall thickness in high-resolution. The UCI is advantageous in areas with small defects below 1.1" (USI spot size) vs UCI (0.12").

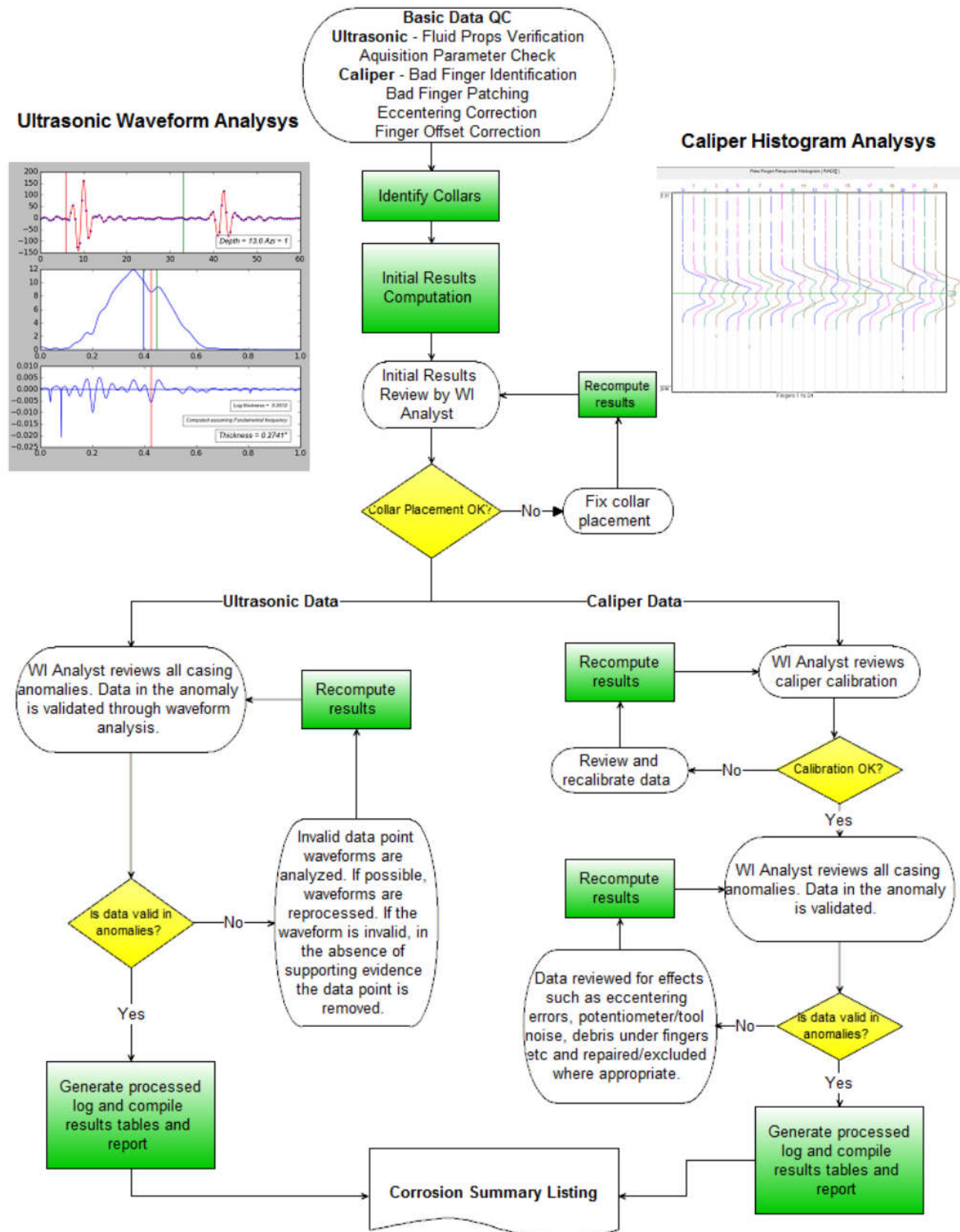
Field Log Header Summary

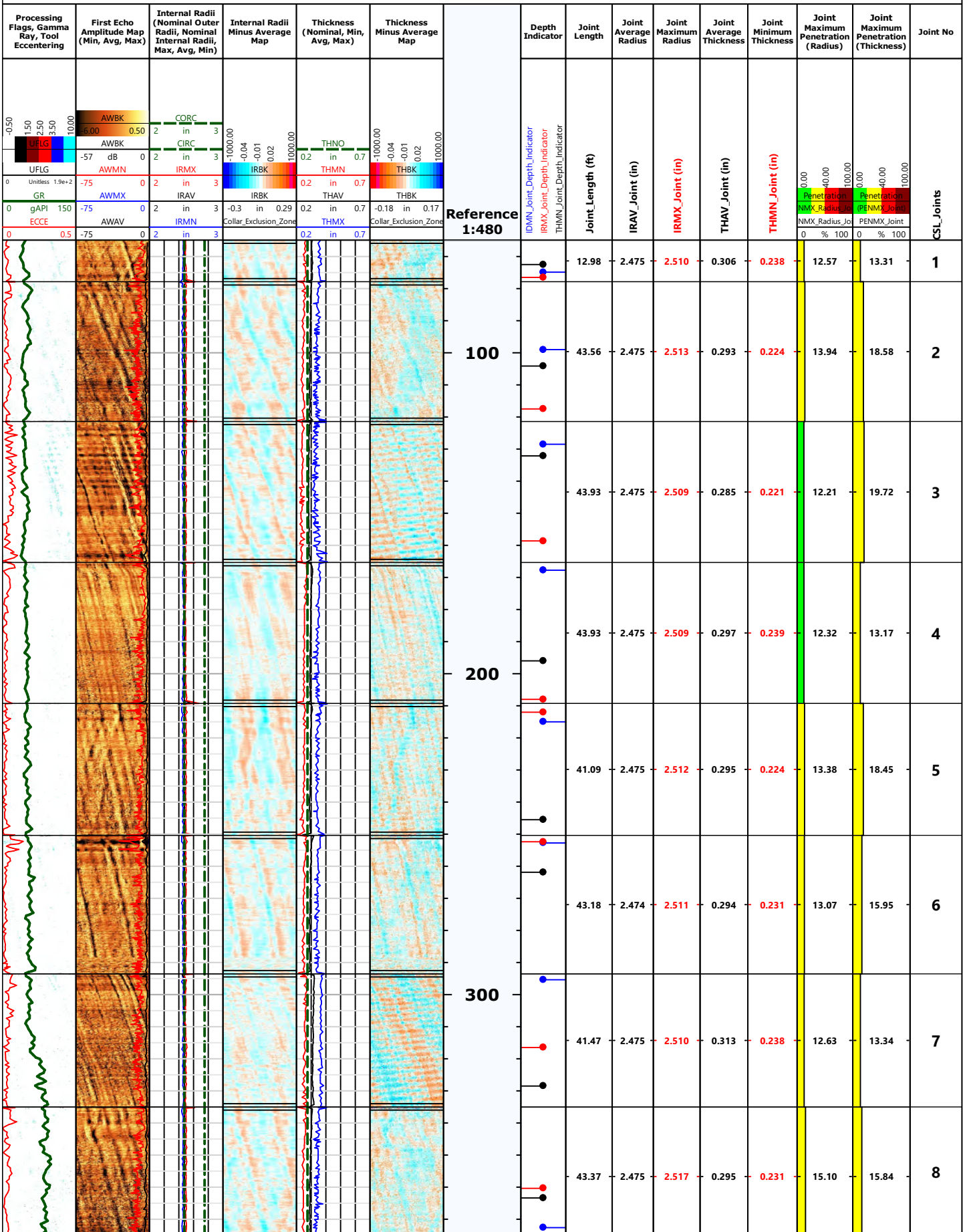
Company:	Xcel Energy
Well:	STORAGE UNIT #32
Field:	Roundup
County:	Morgan
State:	Colorado
Logging Date	07-Aug-2019
Run Number	ONE
Depth Driller	6550 ft
Schlumberger Depth	6550 ft
Bottom Log Interval	6385 ft
Top Log Interval	65 ft
Casing Fluid Type	WATER
Salinity	0 ppm
Density	8.34 lbm/gal
Fluid Level	8 ft
Bit Size	7.875 in
From	319
To	6550
Casing/Tubing Size	5.5 in
Weight	15.5 lbm/ft
Grade	K-55
From	0 ft
To	6550 ft
Max Recorded Temperature	160 degF
Logged on Bottom / Time	07-Aug-2019 11:28:00
Unit Number	9108
Recorded By	Morris Moore
Witnessed By	Jeff Schneider

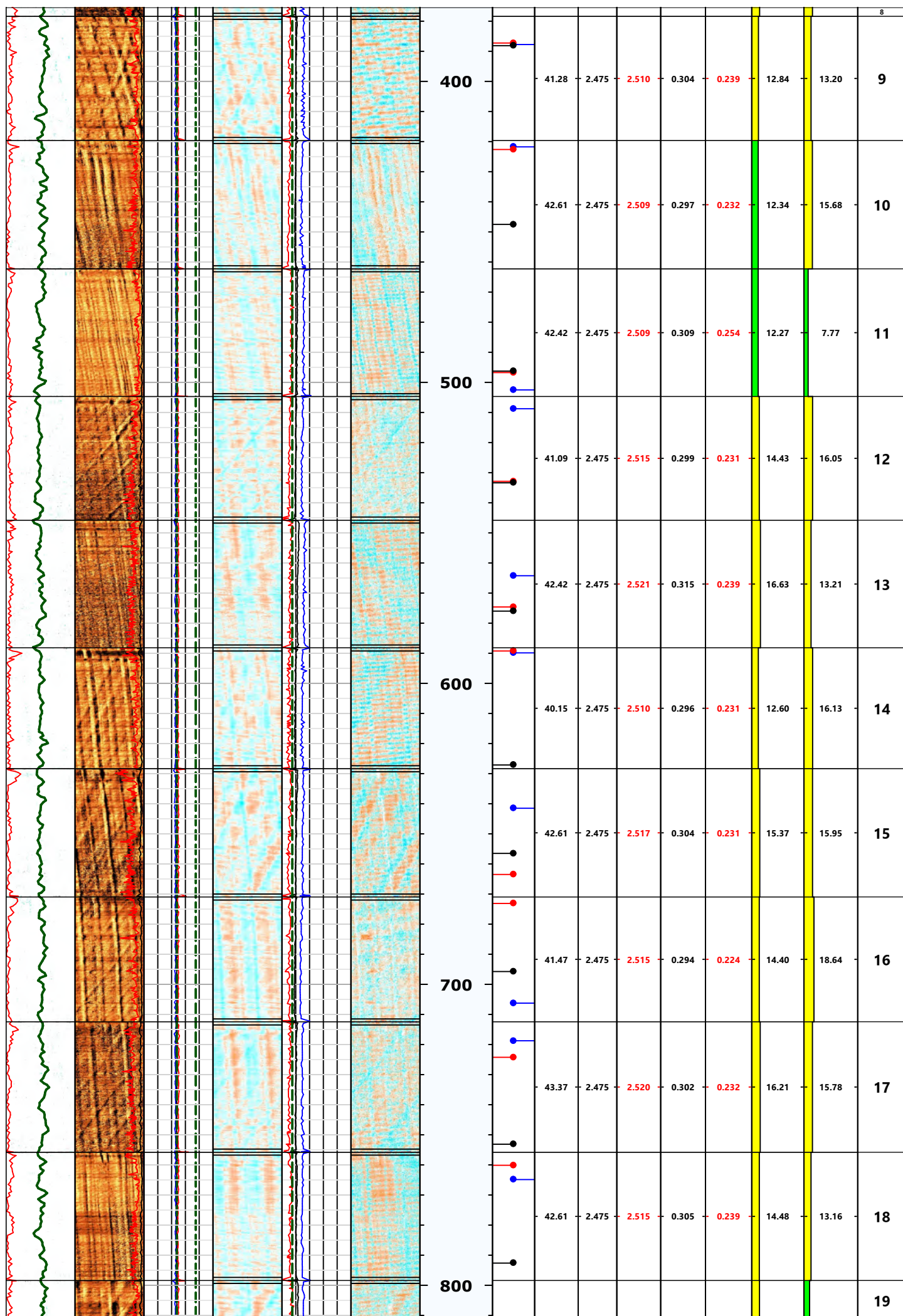
Well Diagram

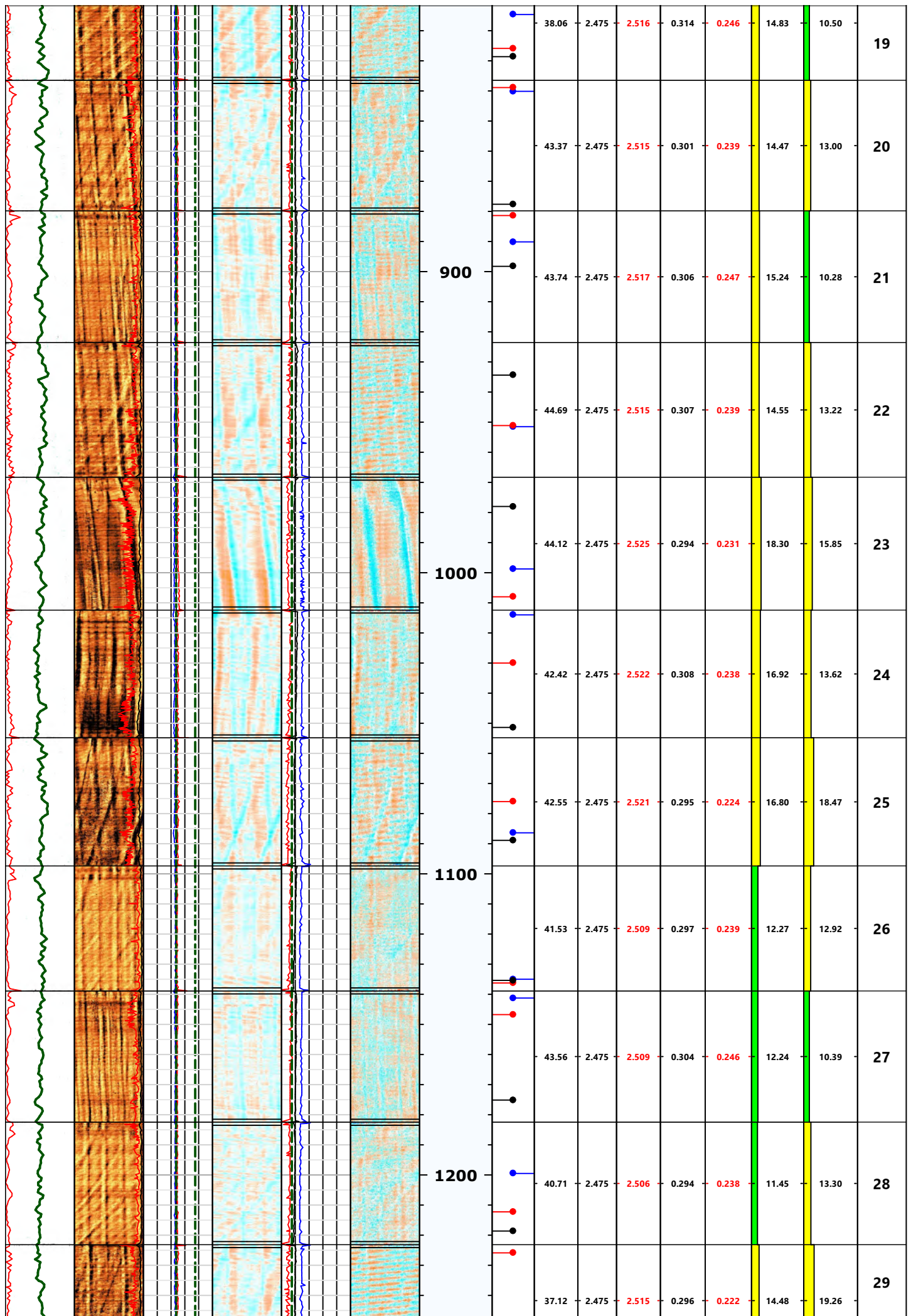


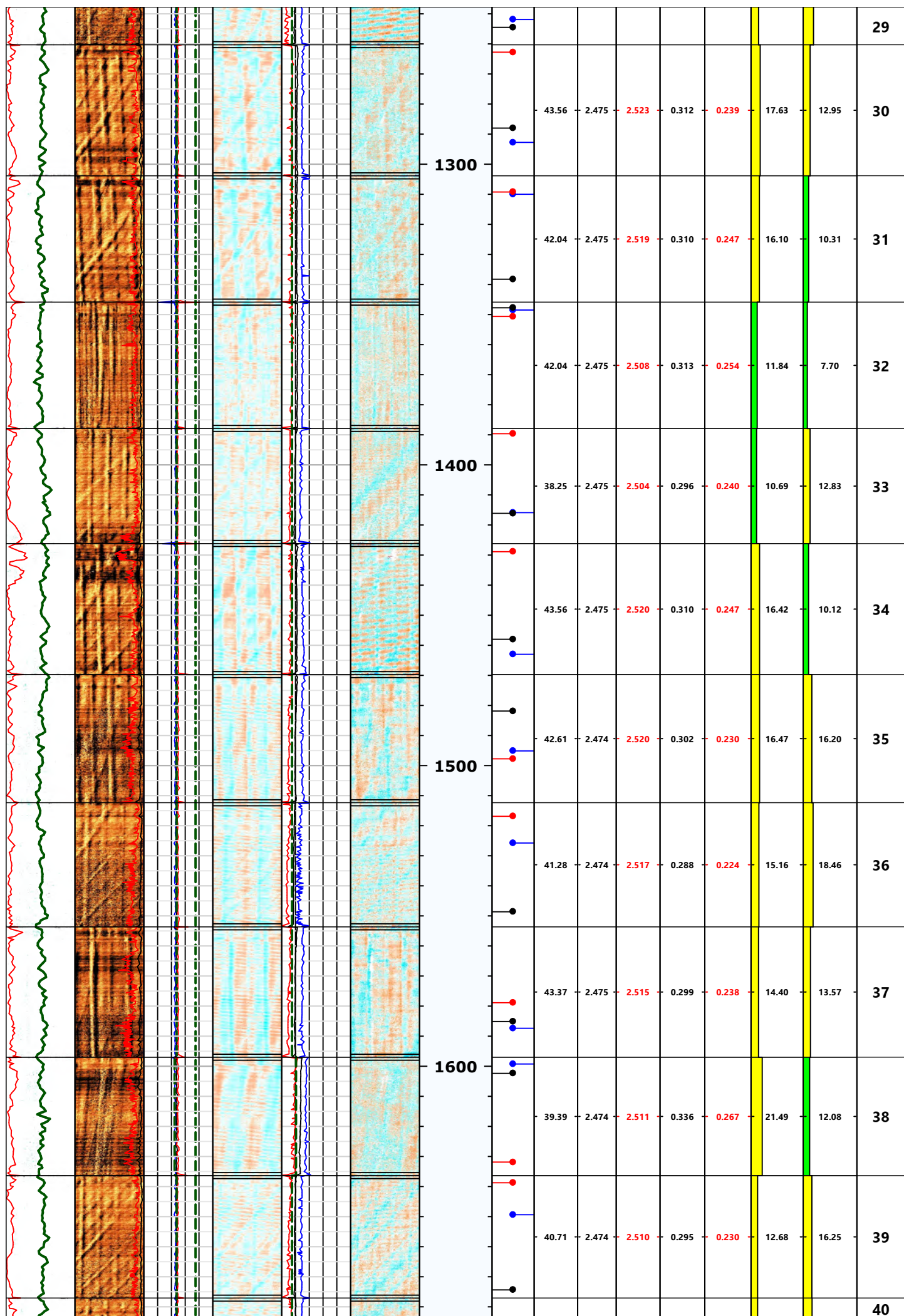
CSL Workflow Diagram

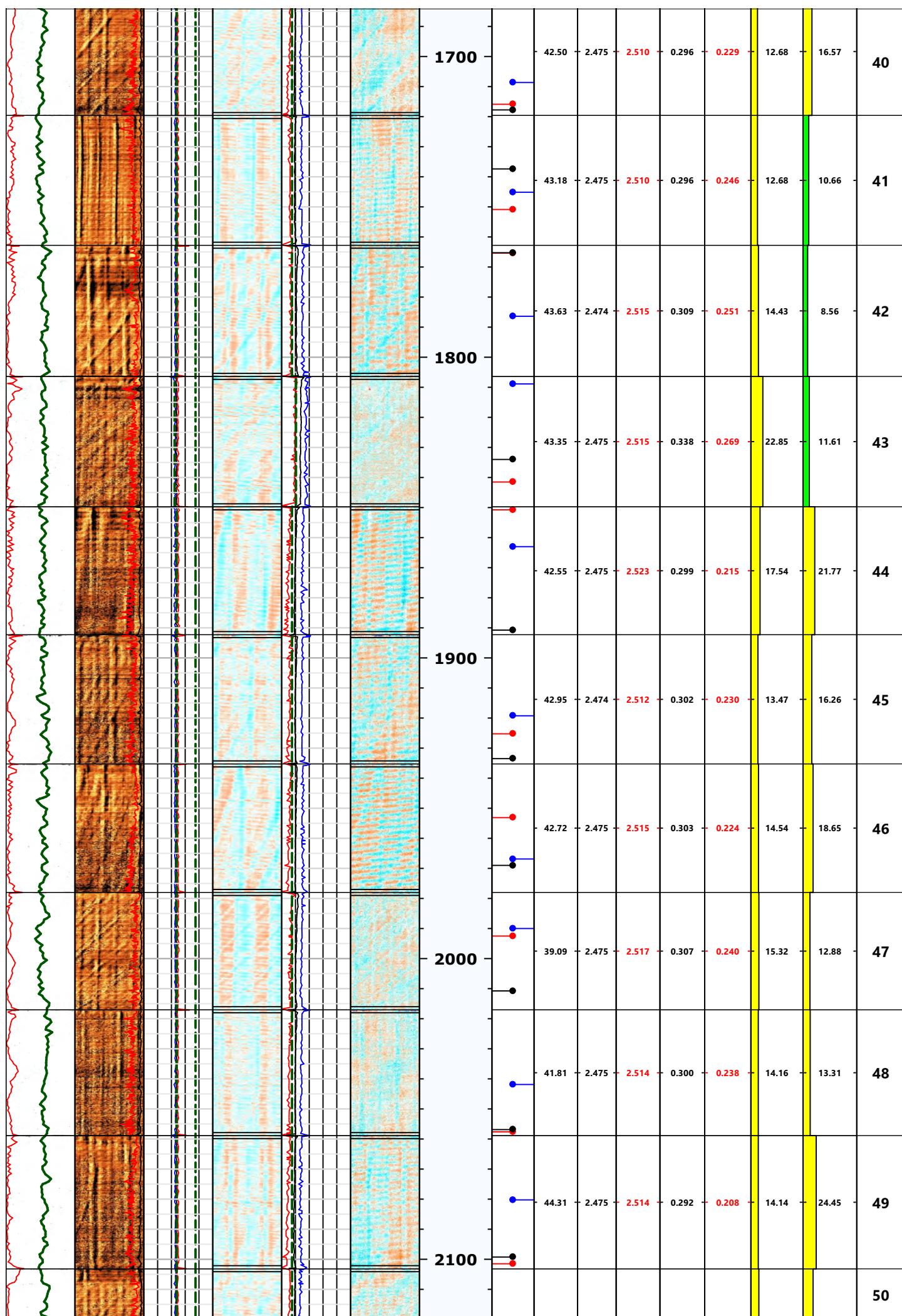


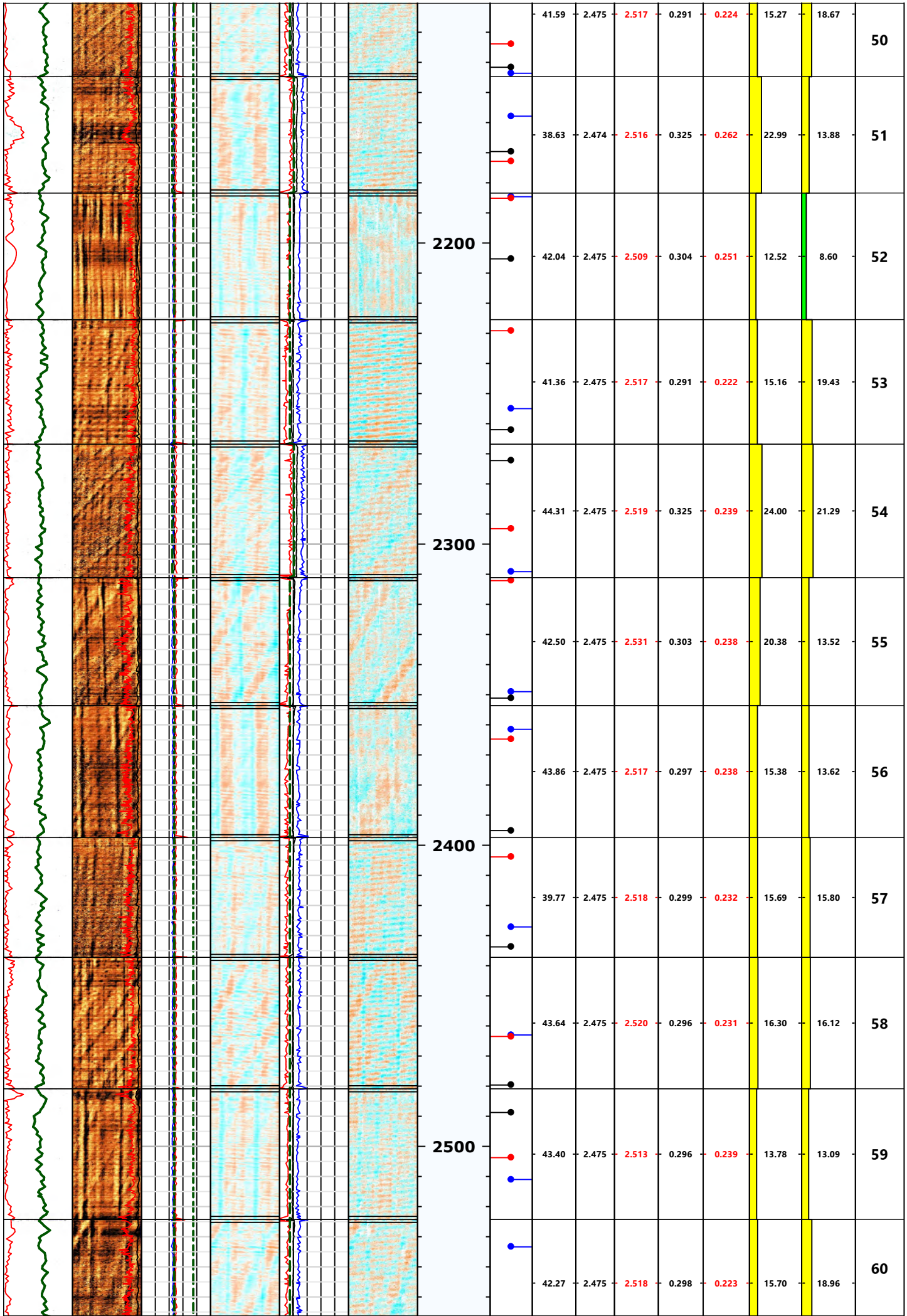


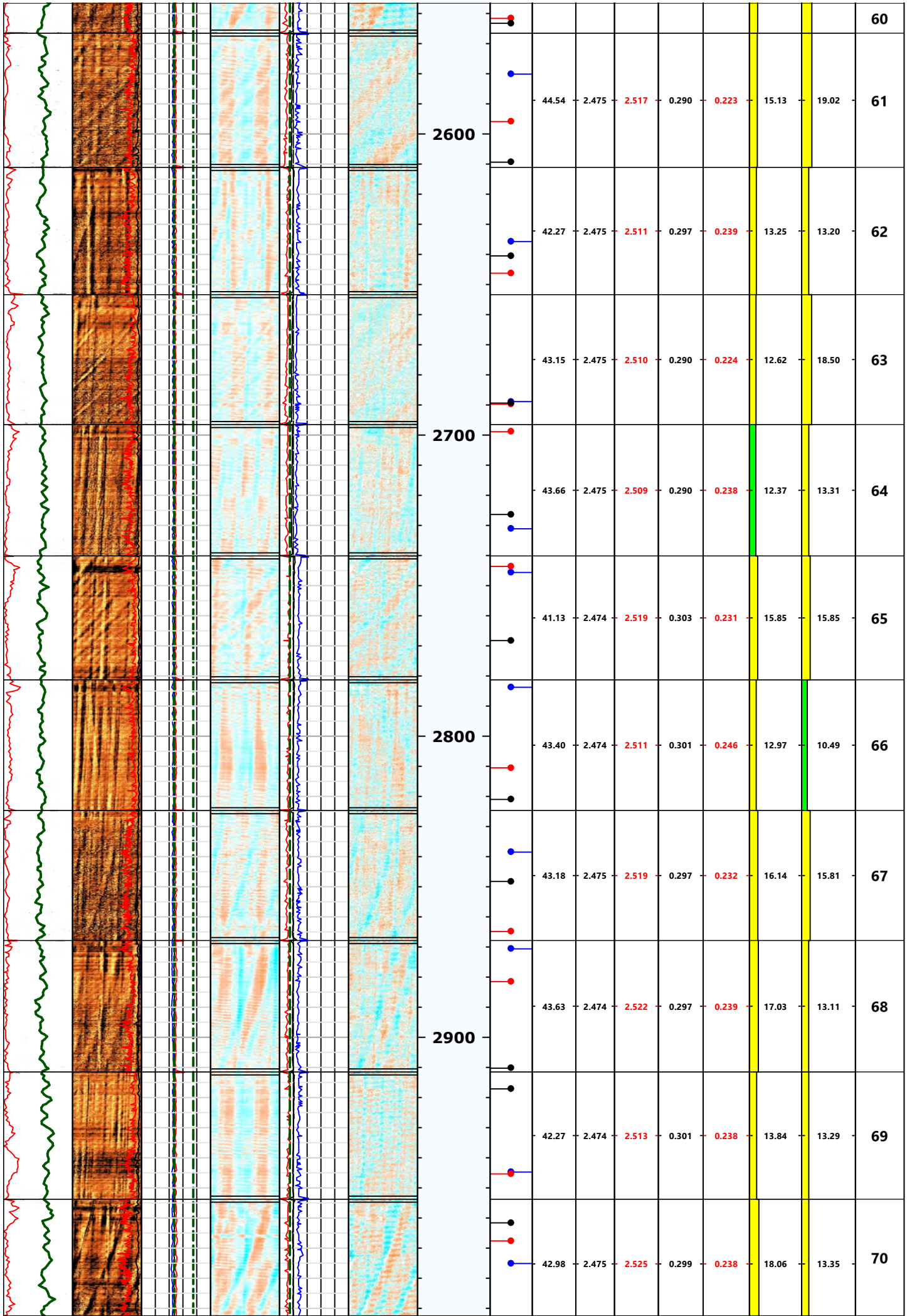


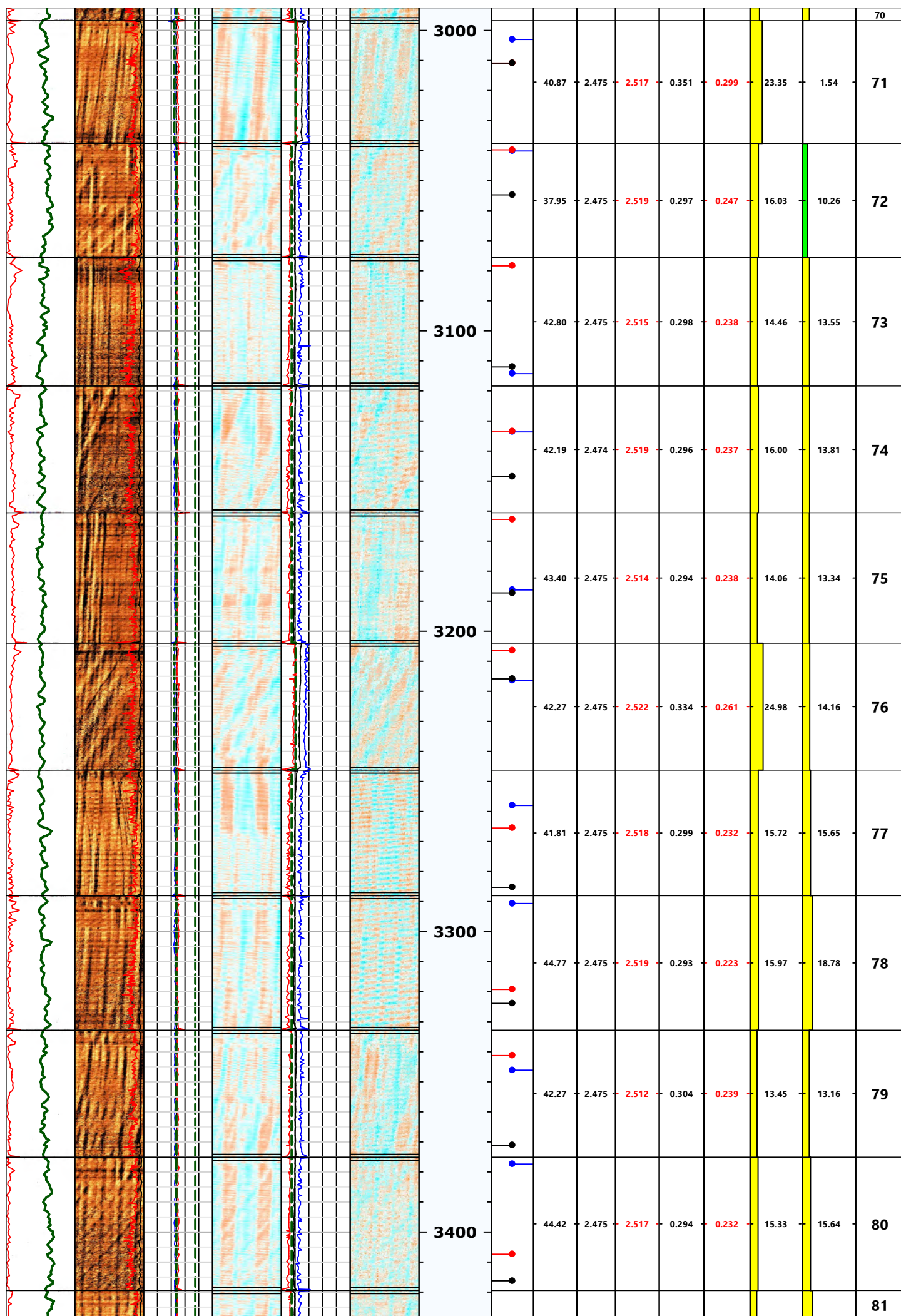


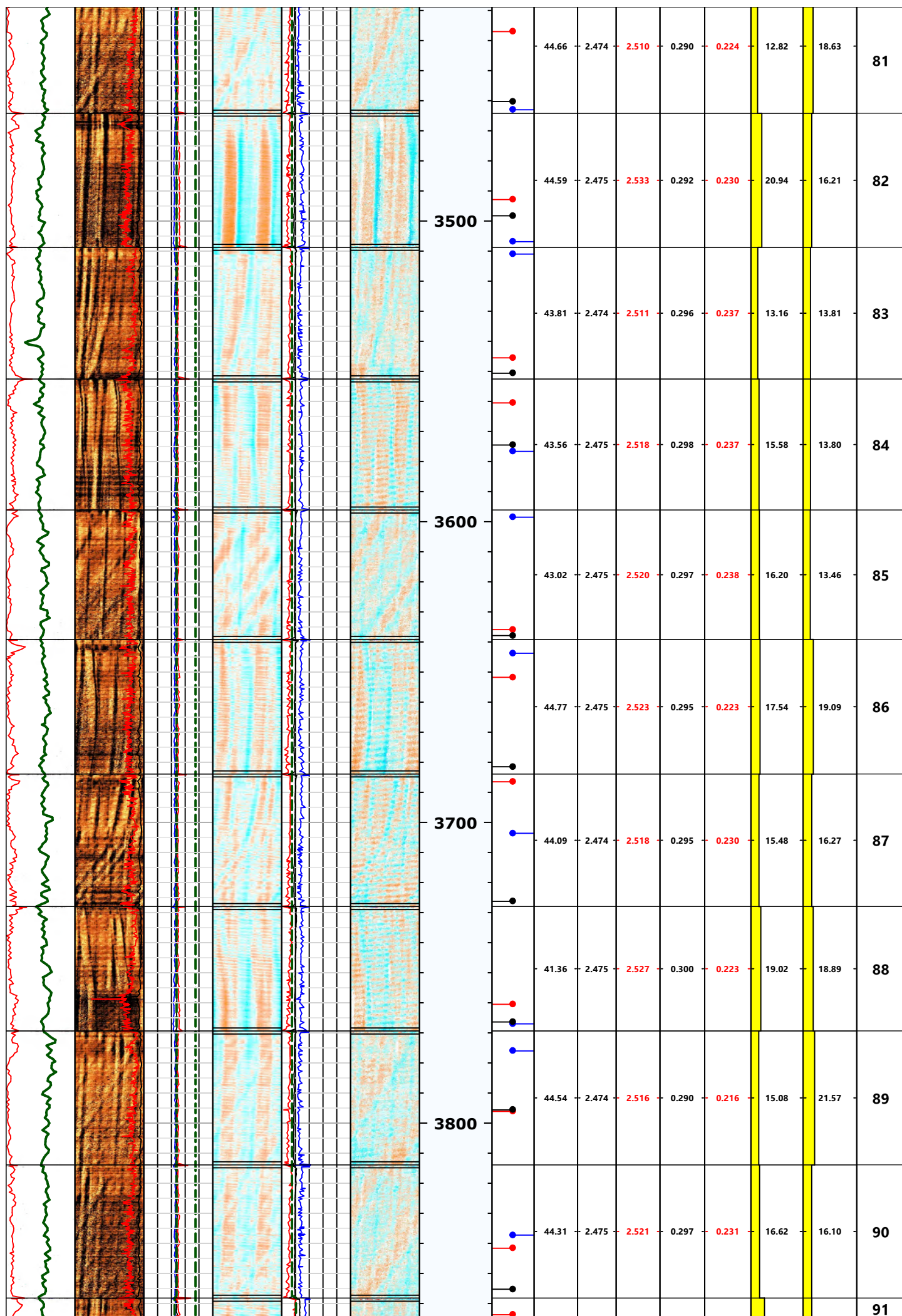


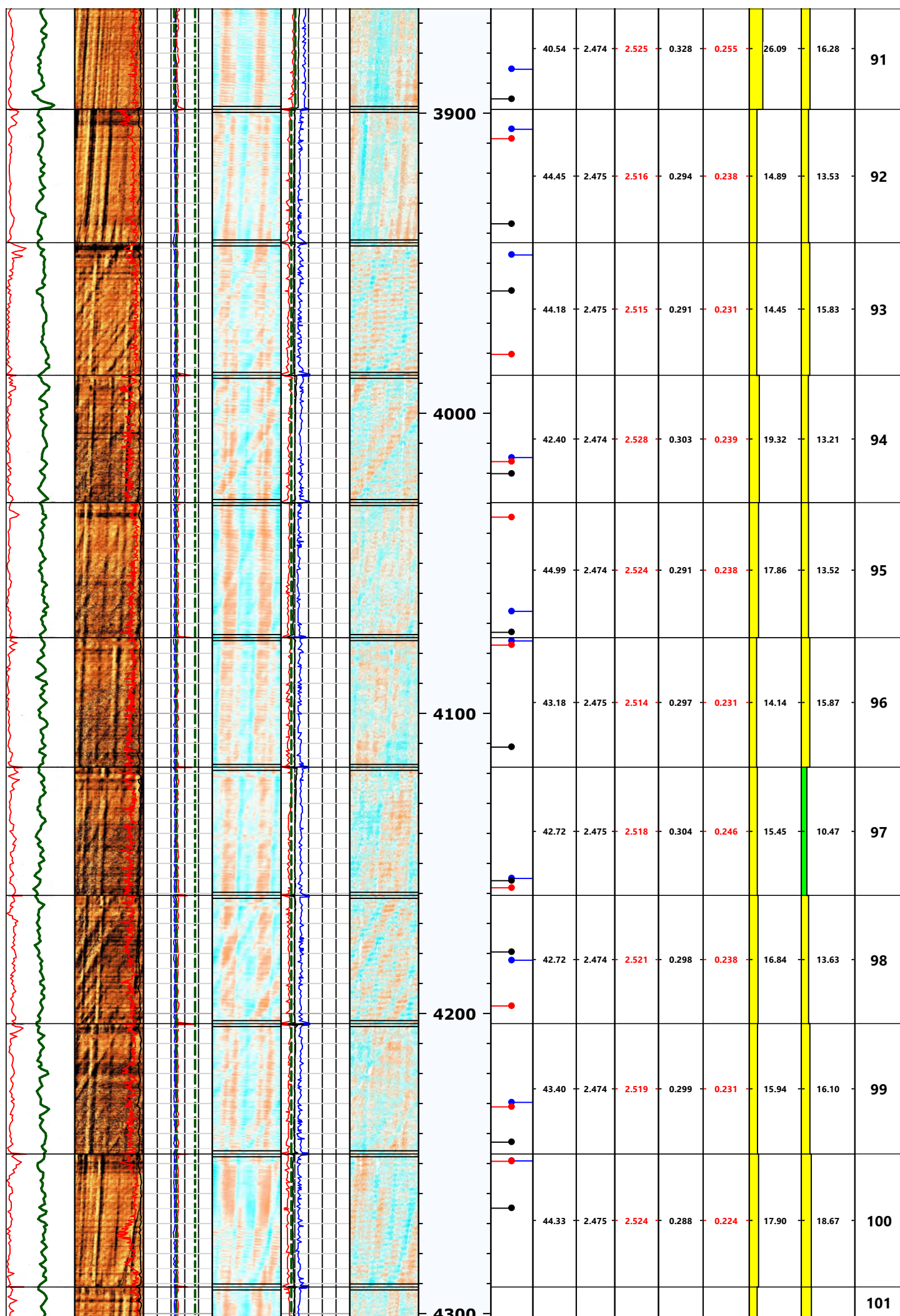


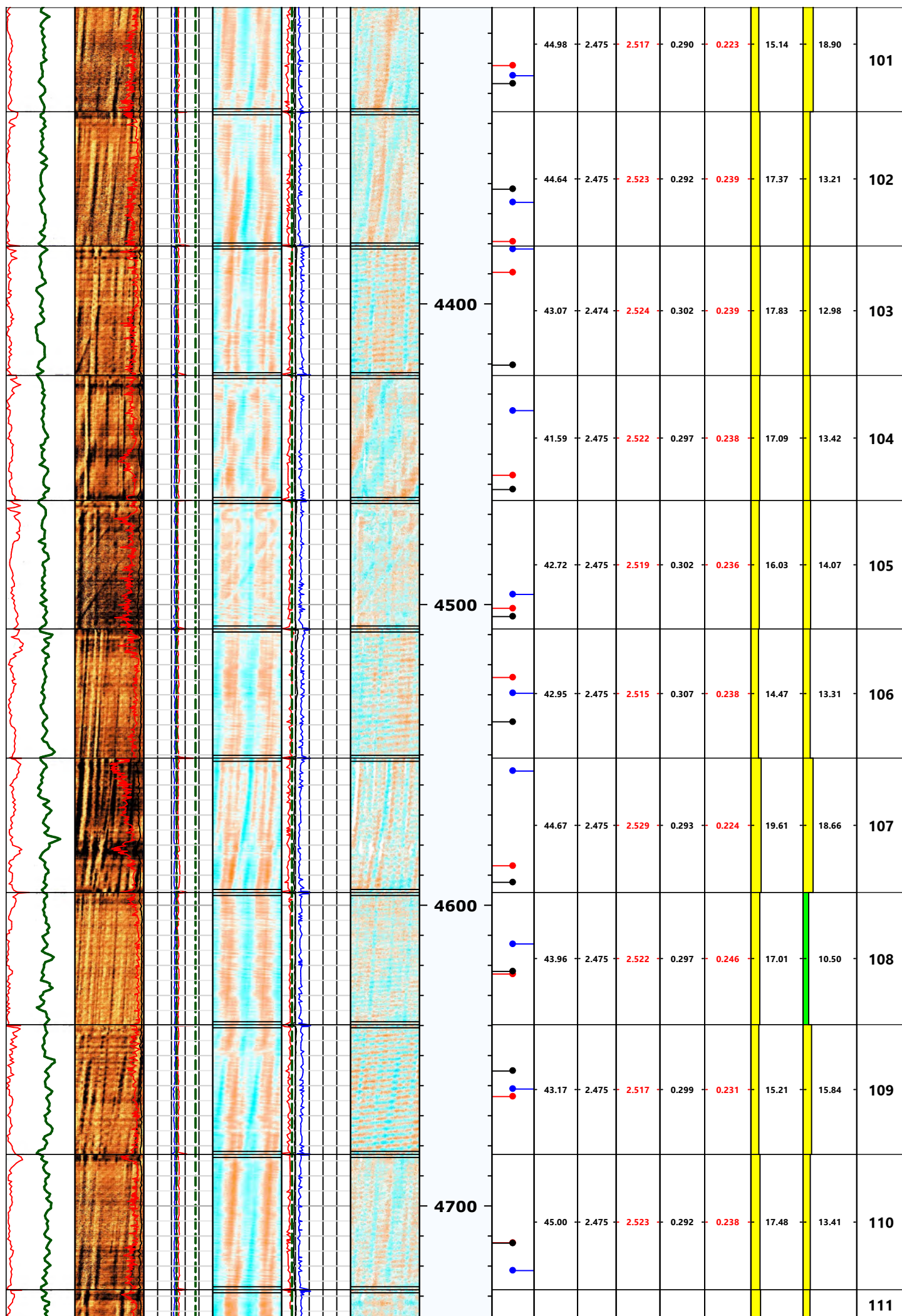


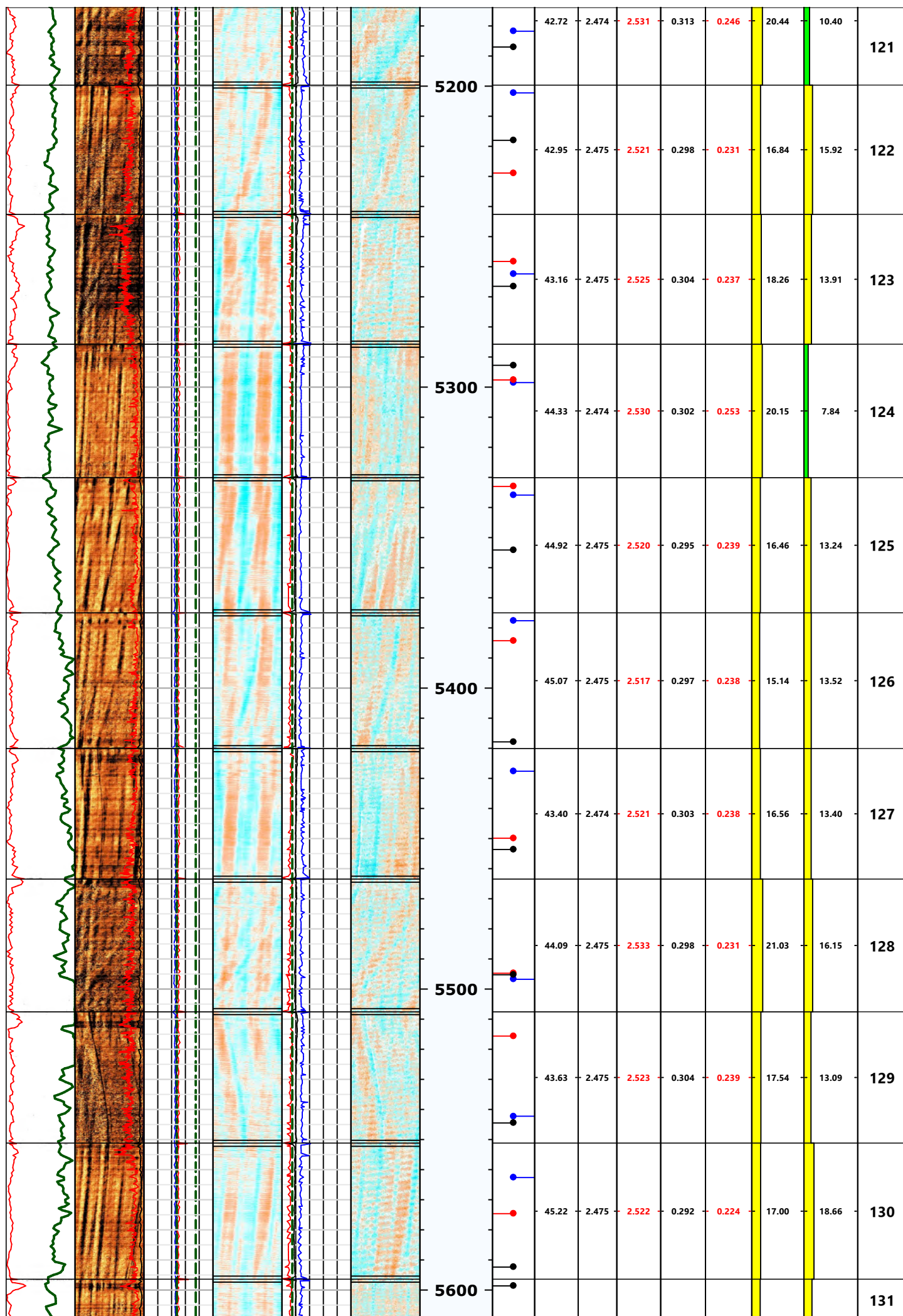


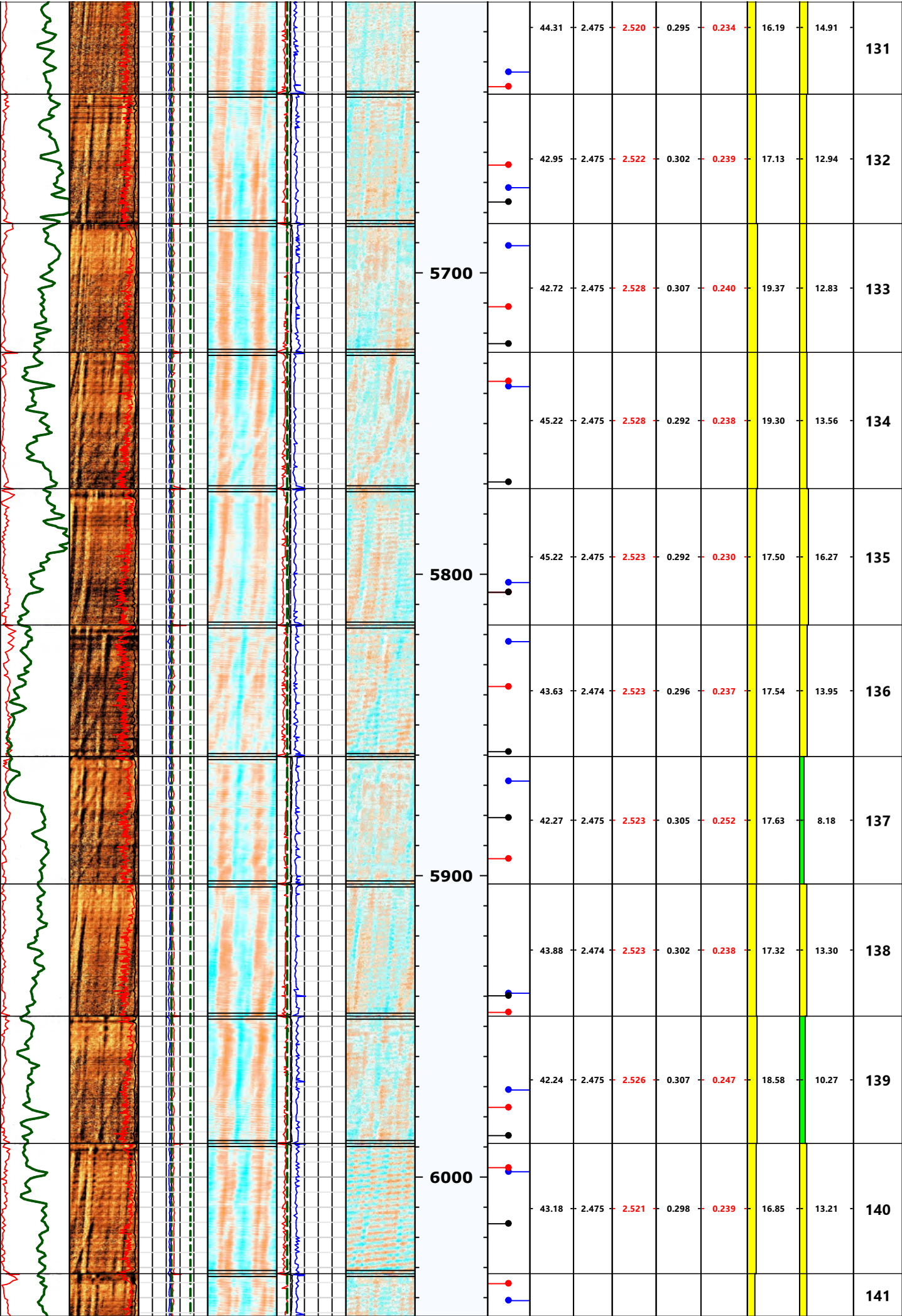


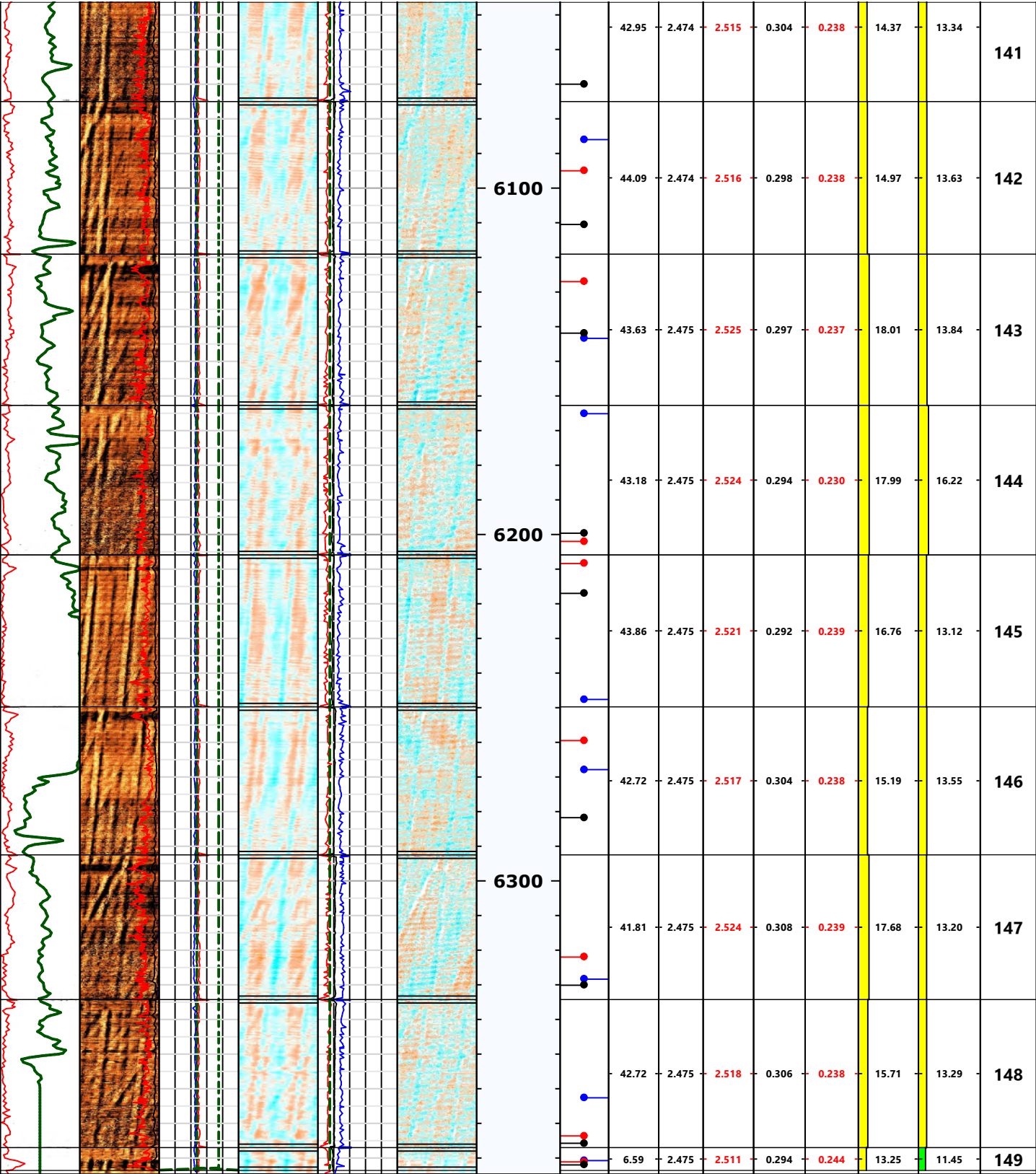














Casing Inspection

Xcel Energy

STORAGE UNIT #32

Roundup

Date Recorded: 07-Aug-2019

Date Analyzed: 8/13/2019

Project: Xcel_Energy_Roundup_32_UCI_12Aug2019

Intepreter: Melissa Shuck

Joint No	Joint Top	Joint Length	Nominal Casing Size	Casing Weight	Nominal Casing Thickness	Nominal Casing Yield Strength	Joint Average Radius	Joint Minimum Radius	Joint Minimum Radius Depth	Joint Maximum Radius	Joint Maximum Radius Depth	Joint Average Thickness	Joint Minimum Thickness	Joint Minimum Thickness Depth	Joint Minimum Internal Diameter	Joint Minimum Internal Diameter Depth	Joint Maximum Penetration (Radius)	Joint Maximum Penetration (Thickness)	Joint Minimum Burst Rating (Thickness) - API 5C3	Joint Minimum Collapse Rating (Thickness) - API 5C3	Joint Minimum Collapse Rating (Burst) - API 5C3	Joint Minimum Collapse Rating (Radius) - API 5C3	Collar Minimum Internal Diameter	Collar Maximum Radius
	Joint_Top (FT)	Joint_Length (FT)	CSTZ_Joint	CWEL_Joint (lb/ft)	THNO_Joint	YIELD_Joint (psi)	IRAV_Joint (in)	IRMIN_Joint (in)	IRMIN_Joint_Depth (ft)	IRMAX_Joint (in)	IRMAX_Joint_Depth (ft)	THAV_Joint (in)	THMIN_Joint (in)	THMIN_Joint_Depth (ft)	IDMIN_Joint (in)	IDMIN_Joint_Depth (ft)	<div><div><div>0.00</div><div>40.00</div><div>100.00</div></div><div>Penetration</div><div>NMX_Radius_Joint</div><div>NMX_Radius_Joint</div><div>0</div><div>%</div><div>100</div></div> <div><div><div>0.00</div><div>40.00</div><div>100.00</div></div><div>Penetration</div><div>PENMX_Joint</div><div>PENMX_Joint</div><div>0</div><div>%</div><div>100</div></div>	BUISMIN_Joint (psi)	COLLAPSEMIN_Joint (psi)	BUISMIN_Radius_Joint (psi)	COLLAPSEMIN_Radius_Joint (psi)	IDMIN_Collar (in)	IRMAX_Collar (in)	
1	64.88	12.98	5.500	15.5	0.275	55000	2.475	2.444	75.88	2.510	76.50	0.306	0.238	72.50	4.895	74.88	12.57	13.31	4767.74	2949.10	4808.65	3010.26	4.89	2.62
2	77.85	43.56	5.500	15.5	0.275	55000	2.475	2.433	99.00	2.513	117.50	0.293	0.224	104.13	4.879	99.00	13.94	18.58	4477.84	2515.63	4733.21	2897.46	4.90	2.64
3	121.41	43.93	5.500	15.5	0.275	55000	2.475	2.434	128.50	2.509	158.63	0.285	0.221	132.13	4.877	128.50	12.21	19.72	4415.41	2422.28	4828.65	3040.17	4.86	2.62
4	165.34	43.93	5.500	15.5	0.275	55000	2.475	2.437	167.75	2.509	208.00	0.297	0.239	196.00	4.879	167.75	12.32	13.17	4775.43	2960.60	4822.37	3030.78	4.89	2.67
5	209.28	41.09	5.500	15.5	0.275	55000	2.475	2.429	211.63	2.512	212.00	0.295	0.224	245.50	4.875	215.00	13.38	18.45	4485.26	2526.72	4764.26	2943.89	4.90	2.61
6	250.37	43.18	5.500	15.5	0.275	55000	2.474	2.430	252.75	2.511	252.38	0.294	0.231	261.88	4.874	252.75	13.07	15.95	4622.53	2731.98	4781.42	2969.55	4.86	2.59
7	293.55	41.47	5.500	15.5	0.275	55000	2.475	2.438	296.00	2.510	316.50	0.313	0.238	328.50	4.891	295.38	12.63	13.34	4766.55	2947.32	4805.23	3005.15	4.91	2.61
8	335.02	43.37	5.500	15.5	0.275	55000	2.475	2.437	372.63	2.517	360.38	0.295	0.231	363.38	4.879	372.63	15.10	15.84	4628.74	2741.26	4669.66	2802.44	4.88	2.60
9	378.39	41.28	5.500	15.5	0.275	55000	2.475	2.438	387.75	2.510	387.25	0.304	0.239	388.13	4.889	387.75	12.84	13.20	4774.08	2958.58	4793.78	2988.03	4.89	2.60
10	419.67	42.61	5.500	15.5	0.275	55000	2.475	2.446	421.75	2.509	422.63	0.297	0.232	447.50	4.895	421.75	12.34	15.68	4637.87	2754.91	4821.04	3028.79	4.88	2.57
11	462.28	42.42	5.500	15.5	0.275	55000	2.475	2.444	502.50	2.509	496.75	0.309	0.254	496.25	4.893	502.50	12.27	7.77	5072.70	3405.09	4825.18	3034.99		

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76	3203.97	42.27	5.500	17	0.304	55000	2.475	2.434	3238.88	2.522	3206.38	0.334	0.261	3215.88	4.887	3216.38	24.98	14.16	5219.37	3624.40	4561.19	2640.25	4.89	2.60
77	3246.23	41.81	5.500	15.5	0.275	55000	2.475	2.440	3284.63	2.518	3265.50	0.299	0.232	3285.25	4.893	3258.00	15.72	15.65	4639.33	2757.09	4635.32	2751.10	4.90	2.61
78	3288.05	44.77	5.500	15.5	0.275	55000	2.475	2.432	3290.63	2.519	3319.25	0.293	0.223	3323.88	4.879	3290.63	15.97	18.78	4466.89	2499.25	4621.55	2730.51	4.90	2.59
79	3332.82	42.27	5.500	15.5	0.275	55000	2.475	2.438	3346.13	2.512	3341.25	0.304	0.239	3371.13	4.883	3346.13	13.45	13.16	4776.31	2961.92	4760.46	2938.22	4.90	2.63
80	3375.08	44.42	5.500	15.5	0.275	55000	2.475	2.434	3377.38	2.517	3407.38	0.294	0.232	3416.25	4.885	3377.38	15.33	15.64	4639.75	2757.73	4656.92	2783.40	4.89	2.55
81	3419.50	44.66	5.500	15.5	0.275	55000	2.474	2.437	3462.75	2.510	3437.00	0.290	0.224	3460.25	4.893	3463.00	12.82	18.63	4475.13	2511.57	4794.86	2989.65	4.89	2.62
82	3464.16	44.59	5.500	15.5	0.275	55000	2.475	2.418	3506.88	2.533	3492.88	0.292	0.230	3498.25	4.845	3506.88	20.94	16.21	4608.60	2711.14	4348.37	2347.15	4.87	2.63
83	3508.75	43.81	5.500	15.5	0.275	55000	2.474	2.431	3511.00	2.511	3545.50	0.296	0.237	3550.63	4.875	3511.00	13.16	13.81	4740.51	2908.38	4776.08	2961.57	4.89	2.66
84	3552.56	43.56	5.500	15.5	0.275	55000	2.475	2.432	3573.63	2.518	3560.50	0.298	0.237	3574.50	4.877	3576.63	15.58	13.80	4740.80	2908.82	4643.15	2762.81	4.86	2.64
85	3596.13	43.02	5.500	15.5	0.275	55000	2.475	2.417	3598.50	2.520	3635.88	0.297	0.238	3637.88	4.863	3598.50	16.20	13.46	4759.70	2937.08	4608.77	2711.40	4.90	2.60
86	3639.14	44.77	5.500	15.5	0.275	55000	2.475	2.422	3643.75	2.523	3651.75	0.295	0.223	3681.50	4.868	3643.75	17.54	19.09	4450.10	2474.15	4535.50	2601.84	4.87	2.62
87	3683.91	44.09	5.500	15.5	0.275	55000	2.474	2.436	3694.25	2.518	3686.50	0.295	0.230	3726.25	4.885	3703.63	15.48	16.27	4605.32	2706.24	4648.44	2770.71	4.89	2.60
88	3728.00	41.36	5.500	15.5	0.275	55000	2.475	2.422	3758.00	2.527	3760.50	0.300	0.223	3766.38	4.863	3767.00	19.02	18.89	4461.31	2490.90	4453.95	2479.89		

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101	4291.13	44.98	5.500	15.5	0.275	55000	2.475	2.442	4329.13	2.517	4320.75	0.290	0.223	4326.75	4.886	4324.13	15.14	18.90	4460.49	2489.68	4667.31	2798.93	4.88	2.62
102	4336.11	44.64	5.500	15.5	0.275	55000	2.475	2.429	4372.50	2.523	4379.25	0.292	0.239	4361.88	4.862	4366.25	17.37	13.21	4773.56	2957.81	4544.91	2615.91	4.84	2.66
103	4380.75	43.07	5.500	15.5	0.275	55000	2.474	2.434	4411.50	2.524	4389.50	0.302	0.239	4420.38	4.876	4381.75	17.83	12.98	4785.90	2976.26	4519.29	2577.60	4.88	2.61
104	4423.82	41.59	5.500	15.5	0.275	55000	2.475	2.437	4460.13	2.522	4457.00	0.297	0.238	4461.75	4.890	4435.50	17.09	13.42	4761.75	2940.14	4560.09	2638.61	4.91	2.69
105	4465.41	42.72	5.500	15.5	0.275	55000	2.475	2.431	4496.63	2.519	4501.25	0.302	0.236	4504.00	4.868	4496.63	16.03	14.07	4726.38	2887.26	4618.39	2725.78	4.87	2.61
106	4508.13	42.95	5.500	15.5	0.275	55000	2.475	2.430	4529.50	2.515	4524.25	0.307	0.238	4539.00	4.867	4529.50	14.47	13.31	4768.15	2949.72	4703.99	2853.78	4.86	2.72
107	4551.08	44.67	5.500	15.5	0.275	55000	2.475	2.423	4555.38	2.529	4586.88	0.293	0.224	4592.38	4.855	4555.38	19.61	18.66	4473.66	2509.37	4421.18	2430.90	4.88	2.63
108	4595.75	43.96	5.500	15.5	0.275	55000	2.475	2.437	4612.88	2.522	4622.88	0.297	0.246	4622.00	4.879	4612.88	17.01	10.50	4922.27	3180.16	4564.25	2644.82	4.88	2.71
109	4639.71	43.17	5.500	15.5	0.275	55000	2.475	2.425	4661.13	2.517	4663.63	0.299	0.231	4655.13	4.857	4661.13	15.21	15.84	4628.54	2740.95	4663.72	2793.56	4.87	2.62
110	4682.88	45.00	5.500	15.5	0.275	55000	2.475	2.434	4721.50	2.523	4712.25	0.292	0.238	4712.38	4.874	4721.50	17.48	13.41	4762.28	2940.94	4538.78	2606.75	4.87	2.64
111	4727.88	42.95	5.500	15.5	0.275	55000	2.475	2.432	4735.50	2.526	4762.63	0.300	0.239	4768.88	4.869	4751.00	18.48	12.97	4786.89	2977.74	4483.39	2523.92	4.88	2.62
112	4770.83	43.18	5.500	15.5	0.275	55000	2.475	2.435	4772.88	2.517	4805.88	0.297	0.245	4802.38	4.877	4772.88	15.18	10.87	4901.88	3149.67	4665.33	2795.97	4.90	2.63
113	4814.01	44.54	5.500	15.5	0.275	55000	2.474	2.434	4852.75	2.521	4815.00	0.292	0.223	4853.50	4.879	4852.75	16.62	18.95	4457.94	2485.87	4586.07	2677.46		

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126	5375.00	45.07	5.500	15.5	0.275	55000	2.475	2.433	5397.13	2.517	5384.25	0.297	0.238	5417.88	4.872	5377.63	15.14	13.52	4756.35	2932.07	4667.23	2798.80
127	5420.07	43.40	5.500	15.5	0.275	55000	2.474	2.434	5427.50	2.521	5449.88	0.303	0.238	5453.63	4.879	5427.63	16.56	13.40	4762.91	2941.88	4588.97	2681.79
128	5463.48	44.09	5.500	15.5	0.275	55000	2.475	2.425	5496.75	2.533	5494.75	0.298	0.231	5495.25	4.872	5496.75	21.03	16.15	4611.65	2715.70	4343.19	2341.99
129	5507.56	43.63	5.500	15.5	0.275	55000	2.475	2.435	5517.00	2.523	5515.63	0.304	0.239	5544.50	4.884	5542.25	17.54	13.09	4780.11	2967.60	4535.51	2601.86
130	5551.19	45.22	5.500	15.5	0.275	55000	2.475	2.437	5562.63	2.522	5574.63	0.292	0.224	5592.38	4.885	5562.63	17.00	18.66	4473.92	2509.77	4565.08	2646.06
131	5596.42	44.31	5.500	15.5	0.275	55000	2.475	2.427	5633.38	2.520	5638.25	0.295	0.234	5598.63	4.870	5633.38	16.19	14.91	4679.84	2817.67	4609.49	2712.47
132	5640.73	42.95	5.500	15.5	0.275	55000	2.475	2.433	5682.00	2.522	5664.25	0.302	0.239	5676.50	4.869	5671.75	17.13	12.94	4788.13	2979.59	4557.79	2635.16
133	5683.68	42.72	5.500	15.5	0.275	55000	2.475	2.429	5691.00	2.528	5711.25	0.307	0.240	5723.50	4.864	5691.00	19.37	12.83	4794.19	2988.65	4434.39	2450.65
134	5726.40	45.22	5.500	15.5	0.275	55000	2.475	2.431	5741.00	2.528	5736.00	0.292	0.238	5769.38	4.876	5737.75	19.30	13.56	4754.34	2929.07	4438.71	2457.11
135	5771.62	45.22	5.500	15.5	0.275	55000	2.475	2.431	5802.88	2.523	5806.00	0.292	0.230	5806.00	4.871	5802.75	17.50	16.27	4605.04	2705.82	4537.73	2605.17
136	5816.84	43.63	5.500	15.5	0.275	55000	2.474	2.422	5822.38	2.523	5837.25	0.296	0.237	5858.88	4.849	5822.38	17.54	13.95	4732.58	2896.53	4535.29	2601.53
137	5860.48	42.27	5.500	15.5	0.275	55000	2.475	2.435	5867.88	2.523	5894.38	0.305	0.252	5880.75	4.874	5868.63	17.63	8.18	5049.87	3370.96	4530.56	2594.45
138	5902.74	43.88	5.500	15.5	0.275	55000	2.474	2.425	5939.00	2.523	5945.38	0.302	0.238	5939.88	4.864	5939.00	17.32	13.30	4768.55	2950.30	4547.18	2619.30

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