

Schlumberger Survey Report

Tuesday February 9 2015 6:31 Report by MaxWell

-----General Information-----

Client LLC Well name : Berger 2H
Field Northern ; US Feet

-----Survey Calculation Methods-----

Method for positions : Minimum Curvature Method

-----Job Location & Elevation-----

Latitude : 39.8747 degrees Longitude : -80.7546 degrees
Permanent Datum : MSL Log Measured From : DF
Elevation of LMF from MSL : 1319.56 ft Elevation of TIP from MSL: 1319.56 ft
Depth Source :

-----Vertical Section Origin-----

Latitude (+N/S-) : 0.00 ft Departure (+E/W-) : 0.00 ft
Target Azimuth : 318.7800 degrees

-----MWD Survey Reference Criteria-----

----Run1----

Geomag Model: : HDGM 2013 Calculation Date: : 28-Nov-2014
Location G (Override): 999.34 mgn Tolerance G : 2.50 mgn
Location B (Override): 52770.14 nT Tolerance B : 300.00 nT
Magnetic Dip (Override): 67.34 degrees Tolerance Dip : 0.45 degrees

----Run2----

Geomag Model: : BGGM 2014 Calculation Date: : 27-Jan-2015
Location G (Override): 999.34 mgn Tolerance G : 2.50 mgn
Location B (Override): 52747.57 nT Tolerance B : 300.00 nT
Magnetic Dip (Override): 67.32 degrees Tolerance Dip : 0.45 degrees

----Run3----

Geomag Model: : BGGM 2014 Calculation Date: : 29-Jan-2015
Location G (Override): 999.34 mgn Tolerance G : 2.50 mgn
Location B (Override): 52747.57 nT Tolerance B : 300.00 nT
Magnetic Dip (Override): 67.32 degrees Tolerance Dip : 0.45 degrees

-----MWD Survey Azimuth Correction-----

----Run1----

Magnetic dec (+E/W-) : -7.7520 degrees(Override)
Grid convergence (+E/W-) : 0.0000 degrees
GTotal az corr (+E/W-) : -7.7520 degrees

----Run2----

Magnetic dec (+E/W-) : -7.7600 degrees(Override)
Grid convergence (+E/W-) : 0.0000 degrees
GTotal az corr (+E/W-) : -7.7600 degrees

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----Run3----

Magnetic dec (+E/W-) : -7.7600 degrees(Override)

Grid convergence (+E/W-) : 0.0000 degrees

GTotal az corr (+E/W-) : -7.7600 degrees

-----Survey Quality Index Description-----

0 : Long Survey passed all criteria 1 : Short
9 : Manual 28 : Tie-In Point

-----Survey Correction Index Description-----

0 : No Correction

-----Survey Description Index Description-----

0 : Not Flagged Survey 7 : Projection to Bit

===== Survey List =====

MD (ft)	Incl (deg)	Azim (deg)	TVD (ft)	V Sec (ft)	N/-S (ft)	E/-W (ft)	DLS (deg)	Run	Tool	QI	CI	ID
0	0	0	0	0	0	0	0	0 -	Other	28	0	0
30	0.24	134.78	30	-0.06	-0.04	0.04	0.8	0.8	1 GyroTool	9	0	0
60	0.31	132.04	60	-0.21	-0.14	0.15	0.24	0.24	1 GyroTool	9	0	0
90	0.35	137.41	90	-0.38	-0.26	0.27	0.17	0.17	1 GyroTool	9	0	0
120	0.31	139.69	120	-0.55	-0.39	0.39	0.14	0.14	1 GyroTool	9	0	0
150	0.35	131.53	150	-0.72	-0.52	0.51	0.21	0.21	1 GyroTool	9	0	0
180	0.39	141.52	180	-0.92	-0.66	0.64	0.25	0.25	1 GyroTool	9	0	0
210	0.37	144.77	210	-1.11	-0.82	0.76	0.1	0.1	1 GyroTool	9	0	0
240	0.35	151.74	240	-1.3	-0.98	0.86	0.16	0.16	1 GyroTool	9	0	0
270	0.33	163.18	270	-1.47	-1.14	0.93	0.24	0.24	1 GyroTool	9	0	0
300	0.33	158.13	300	-1.63	-1.3	0.98	0.1	0.1	1 GyroTool	9	0	0
330	0.34	153.87	329.99	-1.8	-1.46	1.06	0.09	0.09	1 GyroTool	9	0	0
360	0.42	158.53	359.99	-1.98	-1.64	1.13	0.29	0.29	1 GyroTool	9	0	0
390	0.36	158.81	389.99	-2.18	-1.84	1.21	0.2	0.2	1 GyroTool	9	0	0
400	0.3	151.01	399.99	-2.23	-1.89	1.23	0.74	0.74	1 Extreme	0	0	0
494	0.44	168.79	493.99	-2.79	-2.46	1.42	0.19	0.19	1 Extreme	0	0	0
589	0.1	140.2	588.99	-3.18	-2.88	1.55	0.38	0.38	1 Extreme	0	0	0
684	0.84	351.14	683.99	-2.68	-2.26	1.49	0.97	0.97	1 Extreme	0	0	0
759	0.38	345.42	758.98	-1.99	-1.47	1.34	0.61	0.61	1 Extreme	0	0	0
798	0.1	315.65	797.98	-1.85	-1.33	1.29	0.77	0.77	1 Extreme	0	0	0
894	0.58	176.78	893.98	-2.15	-1.76	1.26	0.69	0.69	1 Extreme	0	0	0
989	0.82	142.38	988.97	-3.21	-2.78	1.7	0.5	0.5	1 Extreme	0	0	0
1081	1.14	64.68	1080.96	-4.12	-2.91	2.93	1.36	1.36	1 Extreme	0	0	0
1176	3.6	37.89	1175.88	-3.81	-0.15	5.61	2.77	2.77	1 Extreme	0	0	0
1271	4.95	32.68	1270.61	-2.11	5.65	9.66	1.48	1.48	1 Extreme	0	0	0
1365	5.14	26.34	1364.25	0.62	12.84	13.71	0.63	0.63	1 Extreme	0	0	0
1460	5.37	23.7	1458.85	4.13	20.73	17.39	0.35	0.35	1 Extreme	0	0	0
1555	5.42	20.43	1553.43	8.14	29	20.74	0.33	0.33	1 Extreme	0	0	0
1650	5.67	17.74	1647.98	12.7	37.68	23.74	0.38	0.38	1 Extreme	0	0	0
1745	5.73	12.31	1742.51	17.93	46.78	26.18	0.57	0.57	1 Extreme	0	0	0
1840	5.25	8.23	1837.08	23.58	55.72	27.81	0.65	0.65	1 Extreme	0	0	0
1938	5.64	5.48	1934.64	29.79	64.95	28.92	0.48	0.48	1 Extreme	0	0	0
2033	4.41	5.37	2029.27	35.5	73.22	29.7	1.3	1.3	1 Extreme	0	0	0
2127	1.41	346.27	2123.14	39	77.94	29.77	3.31	3.31	1 Extreme	0	0	0
2221	0.91	295.61	2217.12	40.72	79.38	28.82	1.16	1.16	1 Extreme	0	0	0

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2316	1	263.9	2312.11	41.89	79.62	27.31	0.56	1 Extreme	0	0	0
2411	1.42	259.01	2407.09	42.96	79.31	25.33	0.45	1 Extreme	0	0	0
2505	1.86	258.52	2501.05	44.3	78.78	22.69	0.47	1 Extreme	0	0	0
2600	2.01	262.64	2596	46	78.26	19.52	0.22	1 Extreme	0	0	0
2660	2.21	269.43	2655.95	47.34	78.12	17.32	0.53	1 Extreme	0	0	0
2796	1.79	271.31	2791.87	50.48	78.14	12.58	0.31	2 Extreme	0	0	0
2891	1.82	275.39	2886.82	52.58	78.31	9.6	0.14	2 Extreme	0	0	0
2986	0.97	259.73	2981.8	54.09	78.31	7.31	0.97	2 Extreme	0	0	0
3175	0.77	267.77	3170.77	55.71	77.98	4.46	0.12	2 Extreme	0	0	0
3269	0.77	274.24	3264.77	56.56	78	3.2	0.09	2 Extreme	0	0	0
3364	0.9	271.45	3359.76	57.52	78.07	1.81	0.14	2 Extreme	0	0	0
3459	0.69	277.36	3454.75	58.46	78.16	0.49	0.24	2 Extreme	0	0	0
3554	0.62	284.94	3549.74	59.32	78.37	-0.58	0.12	2 Extreme	1	0	0
3648	0.8	288.68	3643.73	60.31	78.71	-1.69	0.2	2 Extreme	0	0	0
3743	0.74	286.76	3738.72	61.4	79.1	-2.91	0.07	2 Extreme	0	0	0
3838	0.8	293.15	3833.72	62.52	79.53	-4.1	0.12	2 Extreme	0	0	0
3933	0.8	300.62	3928.71	63.75	80.13	-5.29	0.11	2 Extreme	1	0	0
4028	0.75	312.4	4023.7	65.01	80.89	-6.32	0.17	2 Extreme	0	0	0
4123	0.75	306.91	4118.69	66.24	81.69	-7.28	0.08	2 Extreme	0	0	0
4218	0.76	305.07	4213.68	67.46	82.42	-8.29	0.03	2 Extreme	0	0	0
4313	0.81	308.17	4308.67	68.73	83.2	-9.34	0.07	2 Extreme	0	0	0
4408	0.7	308.36	4403.66	69.97	83.98	-10.33	0.12	2 Extreme	0	0	0
4503	0.7	304.24	4498.66	71.11	84.67	-11.26	0.05	2 Extreme	0	0	0
4597	0.81	289.08	4592.65	72.24	85.21	-12.36	0.24	2 Extreme	0	0	0
4691	1.09	289.05	4686.64	73.59	85.72	-13.83	0.29	2 Extreme	0	0	0
4881	1.03	284.45	4876.6	76.56	86.73	-17.19	0.05	2 Extreme	0	0	0
4976	1.08	281.89	4971.59	77.98	87.13	-18.89	0.07	2 Extreme	0	0	0
5165	1.08	292.45	5160.55	81	88.17	-22.27	0.11	2 Extreme	0	0	0
5260	1.03	293.09	5255.54	82.57	88.85	-23.88	0.06	2 Extreme	0	0	0
5355	0.99	297.8	5350.52	84.1	89.57	-25.39	0.09	2 Extreme	0	0	0
5459	3.35	69.31	5454.47	83.88	91.06	-23.35	3.91	3 SlimPulse	0	0	0
5553	10.71	60.99	5547.7	81.06	96.27	-13.13	7.89	3 SlimPulse	0	0	0
5649	15.18	32.94	5641.33	82.6	111.17	1.54	7.91	3 SlimPulse	0	0	0
5744	18.83	27.41	5732.16	91.59	135.23	15.36	4.2	3 SlimPulse	0	0	0
5839	24.88	32.57	5820.3	102.76	165.72	33.2	6.68	3 SlimPulse	0	0	0
5889	28.75	31.3	5864.92	109.31	184.86	45.11	7.83	3 SlimPulse	0	0	0
5934	32.72	33	5903.59	115.87	204.32	57.36	9.02	3 SlimPulse	0	0	0
6029	41.33	36.24	5979.37	129.69	251.25	89.95	9.29	3 SlimPulse	0	0	0
6123	50.3	38.29	6044.82	143.04	304.78	130.79	9.67	3 SlimPulse	0	0	0
6218	59.67	34.96	6099.28	159.52	367.22	177.04	10.27	3 SlimPulse	0	0	0
6312	68.35	36.31	6140.43	178.68	435.8	226.25	9.32	3 SlimPulse	0	0	0
6407	71.79	30.39	6172.83	202.46	510.38	275.27	6.88	3 SlimPulse	0	0	0
6502	70.41	24.67	6203.63	235	590.03	316.81	5.88	3 SlimPulse	0	0	0
6597	70.2	15.99	6235.71	277.54	673.8	347.85	8.61	3 SlimPulse	0	0	0
6692	69.86	8.36	6268.19	330.73	761	366.67	7.56	3 SlimPulse	0	0	0
6787	69.57	0.64	6301.17	392.88	849.75	373.65	7.62	3 SlimPulse	0	0	0
6882	69.31	347.94	6334.65	465.09	938.03	364.84	12.51	3 SlimPulse	0	0	0
6976	75.12	339.41	6363.39	546.2	1023.77	339.61	10.63	3 SlimPulse	0	0	0
7071	85.98	333.8	6378.97	635.26	1109.59	302.41	12.82	3 SlimPulse	0	0	0
7166	85.25	334.28	6386.24	726.64	1194.75	260.94	0.92	3 SlimPulse	0	0	0
7261	85.39	333.68	6393.99	818.01	1279.84	219.41	0.65	3 SlimPulse	0	0	0
7356	85.01	333.46	6401.94	909.53	1364.61	177.28	0.46	3 SlimPulse	0	0	0
7451	85.98	331.01	6409.4	1001.63	1448.41	133.17	2.77	3 SlimPulse	0	0	0
7546	89.48	328.76	6413.16	1094.76	1530.5	85.55	4.39	3 SlimPulse	0	0	0
7640	91	329.31	6412.77	1187.25	1611.1	37.18	1.71	3 SlimPulse	0	0	0
7735	90.52	330.81	6411.51	1280.4	1693.41	-10.23	1.66	3 SlimPulse	0	0	0
7830	91	327.03	6410.26	1373.89	1774.75	-59.26	4	3 SlimPulse	0	0	0
7925	91.03	327.44	6408.58	1467.84	1854.63	-110.66	0.43	3 SlimPulse	0	0	0
8020	90	325.57	6407.73	1561.97	1933.85	-163.08	2.25	3 SlimPulse	0	0	0
8114	90.27	326.88	6407.5	1655.17	2011.98	-215.34	1.42	3 SlimPulse	0	0	0
8209	90.82	324.42	6406.59	1749.48	2090.4	-268.94	2.65	3 SlimPulse	0	0	0

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8304	90.31	327.99	6405.65	1843.66	2169.33	-321.76	3.8	3 SlimPulse	0	0	0
8399	90.72	326.84	6404.79	1937.58	2249.37	-372.92	1.29	3 SlimPulse	0	0	0
8494	90.82	324.52	6403.51	2031.87	2327.82	-426.48	2.44	3 SlimPulse	0	0	0
8589	90.58	325.14	6402.34	2126.33	2405.47	-481.19	0.7	3 SlimPulse	0	0	0
8683	90.72	325.48	6401.27	2219.72	2482.76	-534.69	0.39	3 SlimPulse	0	0	0
8778	91.44	324.03	6399.48	2314.18	2560.33	-589.49	1.7	3 SlimPulse	0	0	0
8873	89.86	324.67	6398.39	2408.72	2637.52	-644.85	1.79	3 SlimPulse	0	0	0
8968	92.41	325.42	6396.51	2503.13	2715.36	-699.26	2.79	3 SlimPulse	0	0	0
9062	92.85	325.69	6392.2	2596.37	2792.8	-752.38	0.56	3 SlimPulse	0	0	0
9157	92.72	322.17	6387.59	2690.86	2869.49	-808.23	3.7	3 SlimPulse	0	0	0
9252	93.16	323.3	6382.71	2785.5	2944.99	-865.68	1.27	3 SlimPulse	0	0	0
9347	93.78	324.32	6376.96	2879.96	3021.52	-921.66	1.26	3 SlimPulse	0	0	0
9442	91.51	323.77	6372.57	2974.45	3098.33	-977.38	2.46	3 SlimPulse	0	0	0
9536	92.03	322.05	6369.67	3068.16	3173.28	-1034.04	1.9	3 SlimPulse	0	0	0
9631	91	322.42	6367.16	3162.95	3248.35	-1092.2	1.15	3 SlimPulse	0	0	0
9726	89.59	322.23	6366.68	3257.77	3323.55	-1150.25	1.5	3 SlimPulse	0	0	0
9821	89.04	320.85	6367.82	3352.65	3397.93	-1209.33	1.57	3 SlimPulse	0	0	0
9916	88.76	324.84	6369.64	3447.37	3473.61	-1266.69	4.2	3 SlimPulse	0	0	0
10011	90.24	324.19	6370.47	3541.89	3550.96	-1321.83	1.7	3 SlimPulse	0	0	0
10106	89.76	320.05	6370.47	3636.7	3625.93	-1380.15	4.38	3 SlimPulse	0	0	0
10201	89.28	325.38	6371.27	3731.44	3701.48	-1437.68	5.63	3 SlimPulse	0	0	0
10295	89.14	323.77	6372.56	3824.95	3778.07	-1492.16	1.72	3 SlimPulse	0	0	0
10390	89.21	323.03	6373.93	3919.63	3854.33	-1548.8	0.78	3 SlimPulse	0	0	0
10485	89.24	324.31	6375.21	4014.27	3930.85	-1605.08	1.35	3 SlimPulse	0	0	0
10580	89.97	326.1	6375.87	4108.67	4008.86	-1659.28	2.03	3 SlimPulse	0	0	0
10675	90.03	325.83	6375.87	4202.92	4087.59	-1712.44	0.29	3 SlimPulse	0	0	0
10769	89.79	325.84	6376.01	4296.21	4165.37	-1765.23	0.26	3 SlimPulse	0	0	0
10864	89.93	326.21	6376.24	4390.45	4244.15	-1818.32	0.42	3 SlimPulse	0	0	0
10959	90.1	326.32	6376.21	4484.64	4323.15	-1871.08	0.22	3 SlimPulse	0	0	0
11054	91.27	326.59	6375.07	4578.78	4402.33	-1923.57	1.26	3 SlimPulse	0	0	0
11148	90.65	326.18	6373.49	4671.93	4480.6	-1975.6	0.79	3 SlimPulse	0	0	0
11243	91.03	326.16	6372.1	4766.13	4559.5	-2028.48	0.4	3 SlimPulse	0	0	0
11338	90.93	325.89	6370.47	4860.36	4638.27	-2081.56	0.3	3 SlimPulse	0	0	0
11433	90.62	326.72	6369.19	4954.53	4717.31	-2134.26	0.94	3 SlimPulse	0	0	0
11528	90.93	327.04	6367.91	5048.57	4796.87	-2186.16	0.46	3 SlimPulse	0	0	0
11623	91.1	326.82	6366.23	5142.6	4876.46	-2237.99	0.29	3 SlimPulse	0	0	0
11718	91.34	325.54	6364.2	5236.78	4955.37	-2290.85	1.38	3 SlimPulse	0	0	0
11813	90.82	327.55	6362.41	5330.89	5034.61	-2343.22	2.19	3 SlimPulse	0	0	0
11908	90.69	326.53	6361.16	5424.89	5114.31	-2394.9	1.08	3 SlimPulse	0	0	0
12002	90.17	326.78	6360.45	5518	5192.83	-2446.56	0.61	3 SlimPulse	0	0	0
12097	90.48	327.15	6359.91	5612.03	5272.47	-2498.35	0.5	3 SlimPulse	0	0	0
12192	90.17	338.02	6359.37	5704.15	5356.68	-2542.03	11.45	3 SlimPulse	0	0	0
12287	90.76	330.21	6358.6	5795.69	5442.07	-2583.47	8.24	3 SlimPulse	0	0	0
12381	92.27	327.96	6356.12	5888.13	5522.68	-2631.75	2.89	3 SlimPulse	0	0	0
12476	91.99	325.36	6352.58	5982.16	5601.98	-2683.93	2.75	3 SlimPulse	0	0	0
12571	91.44	324.16	6349.74	6076.6	5679.53	-2738.72	1.39	3 SlimPulse	0	0	0
12666	91.65	317.7	6347.17	6171.44	5753.22	-2798.54	6.8	3 SlimPulse	0	0	0
12761	90.38	320.96	6345.49	6266.41	5825.26	-2860.43	3.69	3 SlimPulse	0	0	0
12856	90.82	322.67	6344.49	6361.27	5899.92	-2919.16	1.85	3 SlimPulse	0	0	0
12947	90.48	323.61	6343.45	6452	5972.72	-2973.74	1.1	3 SlimPulse	0	0	0
12989	90.48	323.61	6343.1	6493.85	6006.53	-2998.66	0.01	3 Other	9	0	7

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