

DEC 23 2015

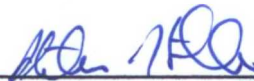
HALLIBURTON

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State of New Mexico, Lea County

I, STEPHEN HATCHER certify that I am employed by Halliburton Energy Services, Inc. (aka Sperry Drilling) and that on the dates of October 09, 2015 through October 30, 2015, I did conduct or supervise the taking of MWD directional surveys for the Red Raider BKS State 5H ST00 well from a depth of 8774' MD to a depth of 13795' MD. This data is true, correct, complete and within the limitations of the tools as set forth by Halliburton Energy Services, Inc. (aka Sperry Drilling). I am authorized and qualified to make this report and these surveys were conducted at the request of Endurance Resources, for the Red Raider BKS State 5H ST00 well in Lea County. I have reviewed this report and find that it confirms to the principles and procedures as set forth by Halliburton Energy Services, Inc. (aka Sperry Drilling.)



STEPHEN HATCHER
Field Engineer

JAN 27 2016

my

Endurance Resources

Red Raider BKS State 5H ST00

Lea County, NM

H&P 490

API# 30-025-42758-0000

October 09, 2015 - October 30, 2015

MO-XX-0902822661

Sperry Drilling MWD Survey Report

Submitted by: STEPHEN HATCHER

3950 Interwood South Parkway Houston, TX 77032

Ph: 281.986.4400

HALLIBURTON

Sperry Drilling



Survey Report for Endurance Resources, LLC

Rig	:	H & P 490
Well Name	:	Red Raider BKS State 5H
Field Name	:	Bone Spring
Country	:	USA
Job Number	:	MO-XX-0902822661
Job Start Date	:	09-Oct-15
API Number	:	30-025-42758-0000

DIRECTIONAL SURVEY DATA

Tie-in

0.00 0.00 0.00 0.00 0.00 N 0.00 E

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
100.00	0.22	34.49	100.00	0.16 N	0.11 E	0.16	0.22
200.00	0.17	225.60	200.00	0.21 N	0.11 E	0.21	0.39
300.00	0.36	19.96	300.00	0.40 N	0.11 E	0.40	0.52
400.00	0.38	16.59	400.00	1.02 N	0.31 E	1.01	0.03
500.00	0.37	286.47	500.00	1.43 N	0.10 E	1.43	0.53
600.00	0.03	26.96	599.99	1.54 N	0.20 W	1.54	0.38
700.00	0.30	261.60	699.99	1.53 N	0.45 W	1.53	0.32
800.00	0.24	2.37	799.99	1.70 N	0.70 W	1.70	0.42
900.00	0.54	295.08	899.99	2.11 N	1.11 W	2.12	0.50
1000.00	0.23	313.05	999.99	2.44 N	1.69 W	2.46	0.33
1100.00	0.30	252.27	1,099.99	2.50 N	2.08 W	2.52	0.27
1200.00	0.20	273.76	1,199.99	2.43 N	2.51 W	2.45	0.14
1300.00	0.25	292.87	1,299.99	2.53 N	2.88 W	2.55	0.09
1400.00	0.85	272.63	1,399.98	2.65 N	3.82 W	2.68	0.62
1500.00	0.56	297.70	1,499.97	2.91 N	5.00 W	2.95	0.42
1600.00	0.81	272.92	1,599.97	3.17 N	6.14 W	3.22	0.38
1700.00	0.51	296.04	1,699.96	3.40 N	7.24 W	3.46	0.40
1800.00	0.61	278.50	1,799.96	3.68 N	8.17 W	3.74	0.20
1900.00	0.47	310.02	1,899.95	4.02 N	9.01 W	4.09	0.32
2000.00	0.31	296.40	1,999.95	4.40 N	9.57 W	4.48	0.18
2100.00	0.49	274.39	2,099.95	4.56 N	10.23 W	4.64	0.23
2200.00	0.27	296.34	2,199.94	4.69 N	10.87 W	4.78	0.26
2300.00	0.40	264.67	2,299.94	4.77 N	11.43 W	4.85	0.22
2400.00	0.31	262.80	2,399.94	4.70 N	12.05 W	4.79	0.09
2500.00	0.05	359.18	2,499.94	4.71 N	12.32 W	4.80	0.32
2600.00	0.20	216.41	2,599.94	4.61 N	12.42 W	4.71	0.24
2700.00	0.18	236.30	2,699.94	4.39 N	12.65 W	4.48	0.07
2800.00	0.19	263.95	2,799.94	4.28 N	12.95 W	4.38	0.09
2900.00	0.50	307.18	2,899.94	4.53 N	13.46 W	4.63	0.38
3000.00	0.45	312.32	2,999.93	5.05 N	14.10 W	5.16	0.07
3100.00	0.41	313.62	3,099.93	5.57 N	14.65 W	5.68	0.04
3200.00	0.52	346.48	3,199.93	6.25 N	15.01 W	6.37	0.28
3300.00	0.46	321.46	3,299.92	7.01 N	15.37 W	7.13	0.22
3400.00	0.27	344.36	3,399.92	7.55 N	15.68 W	7.67	0.24
3500.00	0.85	353.54	3,499.92	8.51 N	15.83 W	8.64	0.59
3600.00	0.65	347.94	3,599.91	9.81 N	16.03 W	9.93	0.21
3700.00	0.74	346.94	3,699.90	10.99 N	16.30 W	11.11	0.09
3800.00	0.37	341.38	3,799.90	11.92 N	16.55 W	12.05	0.37
3900.00	0.40	32.57	3,899.89	12.52 N	16.46 W	12.65	0.33
4000.00	0.48	17.34	3,999.89	13.22 N	16.15 W	13.34	0.14
4100.00	0.33	27.64	4,099.89	13.87 N	15.89 W	14.00	0.17

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg ($\%100'$)
4200.00	0.14	271.90	4,199.89	14.13 N	15.88 W	14.25	0.41
4300.00	0.14	100.22	4,299.89	14.12 N	15.88 W	14.24	0.28
4400.00	0.13	250.18	4,399.89	14.05 N	15.87 W	14.18	0.26
4500.00	0.35	141.39	4,499.89	13.78 N	15.78 W	13.90	0.41
4600.00	1.11	127.77	4,599.88	12.95 N	14.83 W	13.06	0.77
4700.00	1.04	118.68	4,699.86	11.92 N	13.27 W	12.02	0.18
4800.00	1.34	118.37	4,799.84	10.93 N	11.44 W	11.01	0.30
4900.00	1.64	120.31	4,899.81	9.65 N	9.18 W	9.72	0.30
5000.00	1.98	125.64	4,999.76	7.92 N	6.54 W	7.97	0.38
5100.00	1.25	109.06	5,099.72	6.56 N	4.10 W	6.59	0.86
5200.00	0.25	105.28	5,199.71	6.14 N	2.86 W	6.16	1.00
5300.00	0.26	51.06	5,299.71	6.23 N	2.47 W	6.25	0.23
5400.00	0.54	65.15	5,399.70	6.57 N	1.87 W	6.58	0.29
5500.00	0.56	31.77	5,499.70	7.18 N	1.18 W	7.19	0.32
5600.00	0.42	28.97	5,599.69	7.92 N	0.75 W	7.92	0.14
5700.00	0.44	350.36	5,699.69	8.62 N	0.64 W	8.62	0.28
5800.00	0.34	334.16	5,799.69	9.26 N	0.83 W	9.27	0.15
5900.00	0.53	334.57	5,899.69	9.95 N	1.16 W	9.96	0.19
6000.00	0.44	330.41	5,999.68	10.70 N	1.55 W	10.71	0.10
6100.00	0.56	324.84	6,099.68	11.43 N	2.02 W	11.45	0.13
6200.00	0.40	335.84	6,199.68	12.15 N	2.44 W	12.17	0.18
6300.00	0.48	1.67	6,299.67	12.89 N	2.57 W	12.91	0.21
6400.00	0.59	336.43	6,399.67	13.78 N	2.77 W	13.80	0.26
6500.00	0.39	330.28	6,499.67	14.55 N	3.14 W	14.57	0.21
6600.00	0.58	322.25	6,599.66	15.24 N	3.62 W	15.27	0.20
6700.00	0.46	335.78	6,699.66	16.01 N	4.09 W	16.04	0.17
6800.00	0.57	345.66	6,799.65	16.86 N	4.38 W	16.89	0.14
6900.00	0.41	0.75	6,899.65	17.70 N	4.50 W	17.73	0.20
7000.00	0.53	2.78	6,999.65	18.52 N	4.47 W	18.55	0.12
7100.00	0.46	3.30	7,099.64	19.38 N	4.43 W	19.41	0.07
7200.00	0.44	331.88	7,199.64	20.12 N	4.59 W	20.15	0.24
7300.00	0.42	3.29	7,299.64	20.82 N	4.75 W	20.86	0.23
7400.00	0.20	305.43	7,399.64	21.29 N	4.87 W	21.33	0.36
7500.00	0.28	314.86	7,499.63	21.56 N	5.18 W	21.60	0.09
7600.00	0.40	301.36	7,599.63	21.92 N	5.65 W	21.96	0.14
7700.00	0.33	298.21	7,699.63	22.23 N	6.20 W	22.28	0.07
7800.00	0.20	266.33	7,799.63	22.36 N	6.63 W	22.41	0.19
7900.00	0.08	318.17	7,899.63	22.40 N	6.85 W	22.45	0.16
8000.00	0.17	161.13	7,999.63	22.31 N	6.85 W	22.36	0.25
8100.00	0.05	346.46	8,099.63	22.21 N	6.81 W	22.27	0.22
8200.00	0.22	218.42	8,199.63	22.11 N	6.94 W	22.16	0.25
8300.00	0.29	151.53	8,299.63	21.73 N	6.94 W	21.79	0.29
8400.00	0.37	146.79	8,399.63	21.24 N	6.64 W	21.29	0.08
8500.00	0.12	105.98	8,499.63	20.94 N	6.37 W	20.99	0.29
8600.00	0.34	141.24	8,599.63	20.68 N	6.08 W	20.73	0.25

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
8700.00	0.21	116.81	8,699.62	20.37 N	5.73 W	20.41	0.17
8774.00	0.26	165.67	8,773.62	20.14 N	5.57 W	20.18	0.27
8837.00	0.09	32.91	8,836.62	20.04 N	5.51 W	20.08	0.52
8869.00	2.79	352.94	8,868.61	20.83 N	5.59 W	20.88	8.52
8900.00	6.57	351.23	8,899.50	23.34 N	5.95 W	23.38	12.18
8931.00	10.47	352.45	8,930.15	27.88 N	6.59 W	27.93	12.61
8963.00	13.82	354.65	8,961.43	34.57 N	7.33 W	34.63	10.57
8994.00	17.16	356.32	8,991.30	42.83 N	7.97 W	42.89	10.88
9026.00	19.59	356.91	9,021.67	52.90 N	8.56 W	52.96	7.60
9057.00	22.55	358.07	9,050.59	64.03 N	9.04 W	64.10	9.65
9089.00	25.13	358.42	9,079.86	76.95 N	9.44 W	77.02	8.06
9120.00	27.63	358.60	9,107.63	90.72 N	9.79 W	90.79	8.08
9151.00	30.31	358.96	9,134.75	105.73 N	10.11 W	105.81	8.66
9183.00	33.45	359.78	9,161.92	122.63 N	10.29 W	122.70	9.92
9214.00	36.92	359.63	9,187.25	140.49 N	10.39 W	140.56	11.18
9246.00	39.59	358.40	9,212.38	160.29 N	10.73 W	160.37	8.67
9277.00	42.40	356.99	9,235.78	180.61 N	11.56 W	180.69	9.56
9308.00	45.04	356.31	9,258.18	201.99 N	12.81 W	202.09	8.63
9340.00	47.87	356.69	9,280.22	225.14 N	14.23 W	225.25	8.91
9371.00	50.35	357.21	9,300.51	248.54 N	15.47 W	248.66	8.08
9403.00	53.01	356.96	9,320.35	273.61 N	16.75 W	273.73	8.33
9434.00	55.67	356.20	9,338.42	298.75 N	18.25 W	298.88	8.82
9465.00	58.52	355.44	9,355.26	324.71 N	20.15 W	324.85	9.41
9497.00	62.06	355.20	9,371.12	352.40 N	22.42 W	352.57	11.10
9528.00	65.61	355.03	9,384.79	380.12 N	24.79 W	380.30	11.44
9560.00	69.24	355.08	9,397.07	409.56 N	27.34 W	409.75	11.36
9591.00	71.92	355.17	9,407.38	438.68 N	29.82 W	438.90	8.64
9622.00	74.94	355.08	9,416.22	468.28 N	32.35 W	468.52	9.76
9654.00	78.05	355.43	9,423.69	499.29 N	34.92 W	499.54	9.77
9685.00	81.12	355.80	9,429.29	529.69 N	37.25 W	529.96	9.97
9717.00	83.86	356.39	9,433.48	561.33 N	39.41 W	561.62	8.75
9748.00	85.96	357.05	9,436.23	592.16 N	41.18 W	592.46	7.10
9779.00	88.55	357.49	9,437.71	623.09 N	42.66 W	623.40	8.48
9811.00	91.57	358.08	9,437.68	655.06 N	43.89 W	655.38	9.62
9905.00	91.17	358.46	9,435.43	748.99 N	46.73 W	749.32	0.59
9999.00	91.82	358.15	9,432.98	842.91 N	49.50 W	843.27	0.76
10094.00	90.40	358.53	9,431.14	937.85 N	52.25 W	938.23	1.54
10188.00	90.43	358.69	9,430.45	1,031.82 N	54.53 W	1032.21	0.17
10282.00	91.17	359.59	9,429.14	1,125.80 N	55.94 W	1126.20	1.23
10376.00	91.20	0.10	9,427.19	1,219.78 N	56.20 W	1220.18	0.54
10470.00	91.70	0.13	9,424.82	1,313.75 N	56.02 W	1314.14	0.53
10563.00	91.66	0.68	9,422.09	1,406.71 N	55.36 W	1407.09	0.59
10657.00	89.94	0.52	9,420.78	1,500.69 N	54.38 W	1501.06	1.84
10752.00	90.92	0.37	9,420.06	1,595.68 N	53.65 W	1596.05	1.05
10846.00	90.46	0.45	9,418.92	1,689.67 N	52.98 W	1690.03	0.50

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (%100')
10940.00	90.65	0.19	9,418.01	1,783.67 N	52.45 W	1784.02	0.34
11035.00	91.66	359.89	9,416.10	1,878.65 N	52.38 W	1878.99	1.12
11129.00	91.17	359.76	9,413.77	1,972.62 N	52.67 W	1972.96	0.54
11223.00	90.34	359.63	9,412.53	2,066.61 N	53.16 W	2066.96	0.90
11317.00	89.75	0.27	9,412.46	2,160.61 N	53.25 W	2160.95	0.92
11411.00	91.51	0.37	9,411.42	2,254.60 N	52.73 W	2254.93	1.87
11506.00	92.78	0.87	9,407.86	2,349.52 N	51.70 W	2349.85	1.44
11600.00	93.76	0.65	9,402.50	2,443.36 N	50.46 W	2443.67	1.07
11694.00	92.83	359.94	9,397.09	2,537.20 N	49.98 W	2537.51	1.24
11788.00	93.02	359.45	9,392.29	2,631.08 N	50.48 W	2631.39	0.55
11882.00	93.70	359.41	9,386.78	2,724.91 N	51.41 W	2725.22	0.72
11976.00	92.68	359.43	9,381.55	2,818.76 N	52.36 W	2819.08	1.08
12070.00	93.36	359.37	9,376.60	2,912.62 N	53.34 W	2912.95	0.72
12165.00	92.84	359.11	9,371.47	3,007.47 N	54.60 W	3007.80	0.61
12259.00	91.42	358.26	9,367.98	3,101.38 N	56.75 W	3101.73	1.76
12353.00	91.79	358.37	9,365.35	3,195.30 N	59.52 W	3195.67	0.41
12447.00	92.06	358.95	9,362.19	3,289.22 N	61.72 W	3289.60	0.68
12541.00	92.81	0.47	9,358.20	3,383.14 N	62.19 W	3383.51	1.80
12635.00	91.05	0.31	9,355.04	3,477.08 N	61.55 W	3477.45	1.88
12729.00	91.66	0.46	9,352.81	3,571.05 N	60.92 W	3571.41	0.67
12824.00	90.89	0.71	9,350.69	3,666.02 N	59.95 W	3666.37	0.85
12918.00	91.82	0.57	9,348.47	3,759.98 N	58.91 W	3760.33	1.00
13012.00	90.52	0.31	9,346.55	3,853.96 N	58.19 W	3854.29	1.40
13106.00	91.39	0.29	9,344.98	3,947.94 N	57.70 W	3948.27	0.92
13200.00	90.71	0.07	9,343.26	4,041.93 N	57.40 W	4042.25	0.75
13295.00	90.99	359.55	9,341.86	4,136.92 N	57.72 W	4137.24	0.62
13389.00	91.69	359.36	9,339.66	4,230.89 N	58.61 W	4231.21	0.78
13483.00	90.89	359.83	9,337.54	4,324.86 N	59.28 W	4325.19	0.99
13578.00	91.94	0.09	9,335.19	4,419.83 N	59.35 W	4420.15	1.14
13672.00	90.59	0.56	9,333.11	4,513.80 N	58.81 W	4514.12	1.53
13766.00	90.55	359.52	9,332.18	4,607.80 N	58.74 W	4608.11	1.12
13795.00	90.80	359.66	9,331.83	4,636.79 N	58.95 W	4637.11	0.99
13855.00	90.80	359.66	9,331.00	4,696.79 N	59.30 W	4697.10	0.01

SURVEY FOOTER

SURVEYS CALCULATED USING THE SHORT COLLAR METHOD.

WELL ASSUMED VERTICAL AT SURFACE.

SURVEYS FROM 100' MD TO 8700' MD PROVIDED BY VAUGH ENERGY SERVICES

SURVEYS FROM 8774' MD TO 13855' MD PROVIDED BY SPERRY DRILLING

SURVEY AT 13795' MD IS PROJECTED TO TD AT 13855' MD

SPERRY DRILLING ENGINEERS: S. HATCHER AND M. TALBOT

DIRECTIONAL SURVEY DATA NOTES

- 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 359.56 degrees (Grid)
- A total correction of 6.77 deg from Magnetic north to Grid north has been applied
- Horizontal displacement is relative to the well head.
- Horizontal displacement (closure) at 13,855.00 feet is 4,697.16 feet along 359.28 degrees (Grid)

WARRANTY

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