10/15/2014
Accepted for record
NMOCD

HALLIBURTON

3950 Interwood South Parkway • Houston, TX 77032

PHONE 281.986.4400 • FAX 281.986.4499

15-41120

State Of New Mexico, Eddy County

I, Lance Smith, certify that I am employed by Halliburton Energy Services, Inc. (aka Sperry Drilling) and that on the dates of 19-May-14 through 4-June-14. I did conduct or supervise the taking of a DWD directional survey for the well from a depth of 493' MD to a depth of 12211' 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 this survey was conducted at the request of Chevron U.S.A Inc., for the well Hayhurst 16 25 27 1H, API No. 30-015-41120-0000 in Eddy County, Texas. I have reviewed this report and find that it conforms to the principles and procedures as set forth by Halliburton Energy Services, Inc. (aka Sperry Drilling).

Field Engineer
Lance Smith

NM OIL CONSERVATION
ARTESIA DISTRICT
OCT 14 2014
RECEIVED

Chevron U.S.A Inc.
Hayhurst 16 25 27 1H
Eddy County, New Mexico
Ensign 767
API# 30-015-41120-0000

May 19, 2014- June 4, 2014

HD-MJ-0901331874

Sperry Drilling
MWD Survey Report

Submitted by Lance Smith

3950 Interwood South Parkway

Houston, TX 77032

Ph: 281.986.4400

HALLIBURTON

Drilling and Formation Evaluation

TABLE OF CONTENTS

GENERAL INFORMATION

Company	: Chevron USA, Inc
Rig	: Ensign 767
Well	: Hayhurst 16 25 27
Field	: Wildcat
Lease Name	: Hayhurst
State	: New Mexico
County	: Eddy
Country	: USA
API Number	: 30-015-41120
Sperry Drilling Job Number	: HD-XX-0901331874
Job Start Date	: 19-May-14
Job End Date	: 04-Jun-14
North Reference	: Grid
Total Correction (deg)	: 7.556
Dip Angle (deg)	: 59.906
Total Magnetic Field (nT)	: 48196
Date of Magnetic Data	: 20 May, 2014
Well Head coordinates N	: 32 deg. 8 min 12.35 sec North
Well Head coordinates E	: 104 deg. 11 min 45.56 sec West
Vertical section direction (deg)	: 179.80
Unit Number	: 11009812
MWD Engineers	: Lance Smith, Logan Roberts
Company Representatives	: Brad Osburn, John Akin
Company Geologist:	: Ryan Jensen,

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')
493.00	4.48	242.54	492.50	8.89 S	17.10 W	8.83	0.91
583.00	3.47	234.72	582.28	12.09 S	22.45 W	12.01	1.27
674.00	2.34	220.84	673.16	15.09 S	25.92 W	15.00	1.45
768.00	2.79	229.70	767.07	18.02 S	28.92 W	17.92	0.64
857.00	2.16	224.87	855.98	20.61 S	31.76 W	20.50	0.75
949.00	2.00	227.12	947.92	22.93 S	34.16 W	22.81	0.20
1047.00	2.07	229.11	1,045.86	25.25 S	36.74 W	25.12	0.10
1144.00	2.45	232.98	1,142.79	27.64 S	39.72 W	27.51	0.42
1239.00	2.65	238.95	1,237.69	30.00 S	43.22 W	29.85	0.35
1335.00	3.55	245.06	1,333.55	32.40 S	47.82 W	32.23	1.00
1430.00	2.69	223.23	1,428.41	35.26 S	52.01 W	35.08	1.53
1526.00	1.77	145.80	1,524.36	38.12 S	52.72 W	37.94	3.00
1621.00	2.97	104.90	1,619.28	39.97 S	49.51 W	39.80	2.11
1716.00	2.51	100.13	1,714.17	40.97 S	45.09 W	40.81	0.54
1811.00	3.95	104.46	1,809.02	42.15 S	39.87 W	42.01	1.53
1905.00	3.94	100.98	1,902.80	43.58 S	33.57 W	43.46	0.25
2000.00	3.33	97.55	1,997.61	44.56 S	27.63 W	44.46	0.69
2096.00	1.97	99.04	2,093.50	45.19 S	23.24 W	45.10	1.41
2191.00	0.88	104.33	2,188.47	45.62 S	20.92 W	45.55	1.16
2281.00	0.85	106.41	2,278.46	45.98 S	19.60 W	45.92	0.05
2376.00	1.01	102.67	2,373.45	46.37 S	18.11 W	46.30	0.18
2472.00	0.66	113.96	2,469.44	46.78 S	16.78 W	46.72	0.40
2661.00	0.84	124.15	2,658.42	48.00 S	14.63 W	47.95	0.12
2851.00	0.70	124.90	2,848.40	49.45 S	12.52 W	49.41	0.07
3041.00	0.49	105.85	3,038.39	50.34 S	10.77 W	50.30	0.15
3232.00	0.68	96.15	3,229.38	50.69 S	8.85 W	50.66	0.11
3420.00	0.66	111.26	3,417.37	51.20 S	6.71 W	51.18	0.09
3515.00	1.94	285.45	3,512.36	50.98 S	7.75 W	50.95	2.73
3705.00	2.10	277.16	3,702.24	49.69 S	14.30 W	49.64	0.18
3896.00	2.14	270.16	3,893.11	49.24 S	21.35 W	49.17	0.14
4086.00	2.79	295.88	4,082.94	47.21 S	29.06 W	47.11	0.67
4181.00	3.06	339.98	4,177.82	43.82 S	32.01 W	43.71	2.33
4370.00	1.64	21.13	4,366.67	36.55 S	32.76 W	36.43	1.12
4560.00	0.90	7.76	4,556.62	32.54 S	31.58 W	32.43	0.42
4750.00	0.73	7.47	4,746.60	29.86 S	31.22 W	29.75	0.09
4940.00	0.58	357.55	4,936.59	27.71 S	31.11 W	27.60	0.10
5130.00	0.25	356.45	5,126.59	26.34 S	31.17 W	26.23	0.17
5319.00	0.37	355.35	5,315.58	25.32 S	31.25 W	25.21	0.07
5510.00	0.07	148.84	5,506.58	24.80 S	31.24 W	24.69	0.23
5700.00	0.58	232.31	5,696.58	25.49 S	31.94 W	25.38	0.30
5891.00	1.84	176.21	5,887.54	29.13 S	32.50 W	29.02	0.83

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
6082.00	1.51	208.84	6,078.46	34.39 S	33.51 W	34.27	0.52
6272.00	0.82	185.14	6,268.42	37.94 S	34.84 W	37.82	0.44
6462.00	0.70	142.37	6,458.41	40.21 S	34.26 W	40.09	0.30
6652.00	0.56	296.59	6,648.40	40.71 S	34.38 W	40.59	0.64
6842.00	1.19	283.48	6,838.38	39.84 S	37.12 W	39.71	0.35
6969.00	0.41	349.36	6,965.37	39.08 S	38.48 W	38.94	0.85
7059.00	0.20	36.62	7,055.37	38.63 S	38.45 W	38.50	0.35
7076.00	0.50	98.43	7,072.37	38.62 S	38.36 W	38.49	2.61
7139.00	3.21	178.52	7,135.33	40.42 S	38.04 W	40.29	5.02
7171.00	6.82	190.86	7,167.20	43.19 S	38.38 W	43.05	11.72
7203.00	11.77	191.29	7,198.77	48.26 S	39.38 W	48.12	15.45
7234.00	16.27	190.21	7,228.84	55.64 S	40.77 W	55.49	14.55
7266.00	20.10	186.03	7,259.24	65.52 S	42.14 W	65.37	12.62
7298.00	24.56	183.93	7,288.83	77.63 S	43.17 W	77.48	14.16
7329.00	29.16	183.57	7,316.48	91.60 S	44.08 W	91.45	14.87
7361.00	32.86	185.64	7,343.91	108.03 S	45.42 W	107.87	12.02
7393.00	36.88	187.74	7,370.16	126.19 S	47.57 W	126.02	13.11
7425.00	40.44	187.90	7,395.14	145.99 S	50.29 W	145.81	11.12
7456.00	44.44	185.60	7,418.02	166.76 S	52.73 W	166.57	13.84
7487.00	49.06	184.97	7,439.25	189.24 S	54.81 W	189.04	14.99
7519.00	53.17	183.72	7,459.33	214.07 S	56.69 W	213.87	13.20
7550.00	56.76	181.97	7,477.13	239.41 S	57.94 W	239.21	12.45
7582.00	59.02	179.61	7,494.14	266.51 S	58.31 W	266.31	9.44
7614.00	60.77	178.51	7,510.19	294.19 S	57.85 W	293.99	6.22
7645.00	62.92	178.17	7,524.82	321.51 S	57.06 W	321.31	7.01
7677.00	66.86	177.86	7,538.40	350.46 S	56.06 W	350.26	12.34
7709.00	69.90	178.00	7,550.18	380.19 S	54.98 W	379.99	9.52
7740.00	71.15	178.09	7,560.52	409.39 S	53.98 W	409.20	4.02
7772.00	73.33	178.15	7,570.28	439.85 S	52.98 W	439.66	6.81
7803.00	76.38	179.18	7,578.38	469.76 S	52.28 W	469.58	10.36
7835.00	78.79	179.11	7,585.26	501.01 S	51.82 W	500.82	7.54
7867.00	81.07	179.20	7,590.85	532.51 S	51.36 W	532.33	7.13
7899.00	84.22	179.10	7,594.95	564.24 S	50.89 W	564.06	9.86
7931.00	88.03	179.53	7,597.11	596.16 S	50.51 W	595.98	11.96
8026.00	92.34	178.54	7,596.81	691.12 S	48.91 W	690.94	4.66
8095.00	91.97	178.83	7,594.21	760.05 S	47.33 W	759.88	0.68
8121.00	91.94	178.92	7,593.32	786.03 S	46.82 W	785.86	0.36
8217.00	90.71	177.97	7,591.10	881.97 S	44.21 W	881.81	1.62
8312.00	91.76	177.97	7,589.06	976.89 S	40.85 W	976.74	1.11
8407.00	90.86	176.30	7,586.88	1,071.74 S	36.10 W	1071.60	2.00
8502.00	90.00	175.39	7,586.17	1,166.48 S	29.21 W	1166.37	1.32
8598.00	91.08	175.06	7,585.26	1,262.14 S	21.22 W	1262.06	1.17
8693.00	89.51	173.78	7,584.78	1,356.69 S	11.98 W	1356.64	2.13
8788.00	90.77	173.84	7,584.55	1,451.13 S	1.74 W	1451.12	1.33
8883.00	89.01	174.53	7,584.73	1,545.64 S	7.89 E	1545.66	1.99

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
8978.00	90.31	174.93	7,585.29	1,640.23 S	16.62 E	1640.28	1.43
9072.00	88.40	176.45	7,586.35	1,733.95 S	23.69 E	1734.02	2.60
9167.00	87.91	178.38	7,589.41	1,828.80 S	27.98 E	1828.89	2.10
9263.00	88.61	180.97	7,592.33	1,924.75 S	28.52 E	1924.83	2.80
9358.00	89.48	183.21	7,593.92	2,019.66 S	25.06 E	2019.74	2.53
9454.00	90.89	183.67	7,593.60	2,115.49 S	19.29 E	2115.54	1.55
9548.00	89.69	182.62	7,593.12	2,209.34 S	14.13 E	2209.38	1.70
9642.00	90.77	182.27	7,592.75	2,303.25 S	10.12 E	2303.27	1.21
9737.00	90.92	181.85	7,591.34	2,398.18 S	6.71 E	2398.19	0.48
9832.00	89.54	181.77	7,590.96	2,493.13 S	3.71 E	2493.13	1.46
9926.00	90.96	181.83	7,590.55	2,587.08 S	0.76 E	2587.07	1.51
10021.00	92.10	182.21	7,588.02	2,681.99 S	2.58 W	2681.96	1.27
10115.00	90.09	182.32	7,586.23	2,775.89 S	6.29 W	2775.85	2.14
10211.00	90.86	182.97	7,585.43	2,871.78 S	10.72 W	2871.73	1.05
10305.00	89.54	183.25	7,585.10	2,965.64 S	15.83 W	2965.57	1.44
10400.00	88.70	183.27	7,586.56	3,060.48 S	21.23 W	3060.38	0.88
10495.00	89.78	183.33	7,587.81	3,155.31 S	26.70 W	3155.20	1.14
10590.00	91.14	183.83	7,587.04	3,250.12 S	32.63 W	3249.99	1.52
10685.00	89.88	182.53	7,586.20	3,344.96 S	37.89 W	3344.81	1.91
10779.00	91.11	182.70	7,585.39	3,438.86 S	42.18 W	3438.69	1.33
10875.00	90.71	182.54	7,583.87	3,534.75 S	46.57 W	3534.57	0.45
10976.00	89.26	181.96	7,583.90	3,635.67 S	50.54 W	3635.47	1.54
11071.00	88.58	182.55	7,585.68	3,730.58 S	54.28 W	3730.36	0.94
11166.00	86.13	181.79	7,590.07	3,825.40 S	57.87 W	3825.17	2.71
11261.00	85.96	181.28	7,596.63	3,920.14 S	60.41 W	3919.90	0.57
11356.00	85.57	180.63	7,603.64	4,014.87 S	61.98 W	4014.62	0.80
11452.00	87.75	178.65	7,609.23	4,110.69 S	61.37 W	4110.45	3.06
11547.00	88.21	176.64	7,612.58	4,205.54 S	57.47 W	4205.32	2.17
11642.00	89.69	176.71	7,614.32	4,300.37 S	51.95 W	4300.16	1.56
11737.00	89.88	177.24	7,614.68	4,395.23 S	46.94 W	4395.04	0.60
11831.00	89.75	176.60	7,614.98	4,489.10 S	41.89 W	4488.92	0.70
11926.00	90.68	176.57	7,614.62	4,583.93 S	36.23 W	4583.77	0.97
12021.00	90.28	176.39	7,613.83	4,678.74 S	30.40 W	4678.61	0.46
12116.00	89.69	176.40	7,613.86	4,773.55 S	24.42 W	4773.44	0.62
12211.00	88.30	177.09	7,615.52	4,868.38 S	19.03 W	4868.29	1.63
12304.00	88.30	177.09	7,618.27	4,961.22 S	14.31 W	4961.14	0.01

SURVEY FOOTER

SURVEYS CALCULATED USING THE SHORT COLLAR METHOD.
WELL ASSUMED VERTICAL AT SURFACE .
SURVEYS FROM 493' MD TO 12211' MD PROVIDED BY SPERRY DRILLING SERVICES.
SURVEY AT 12211' MD IS PROJECTED TO TD AT 12304' MD.
SPERRY DRILLING ENGINEERS: LANCE SMITH, LOGAN ROBERTS

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 179.80 degrees (Grid)
- A total correction of 7.56 deg from Magnetic north to Grid north has been applied
- Horizontal displacement is relative to the well head.
- Horizontal displacement (closure) at 12,304.00 feet is 4,961.24 feet along 180.17 degrees (Grid)

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