

Noble Energy

Weld County, CO (NAD 83)
Sec. 5-T9N-R58W (Heston PAD)
Reagan LD06-685
05-123-40818
Plan A

Design: Actual Surveys

Sperry Drilling Services

Final Survey Report

08 September, 2016

Surface UWI : 05-123-40818

Well Coordinates: 1,533,212.48 N, 3,448,480.48 E (40° 47' 08.92" N, 103° 52' 49.48" W)
Ground Level: 4,755.00 usft

Local Coordinate Origin:

Centered on Well Reagan LD06-685

Viewing Datum:

KB = 30' @ 4785.00usft (H&P 517)

TVDs to System:

N

North Reference:

Grid

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 81

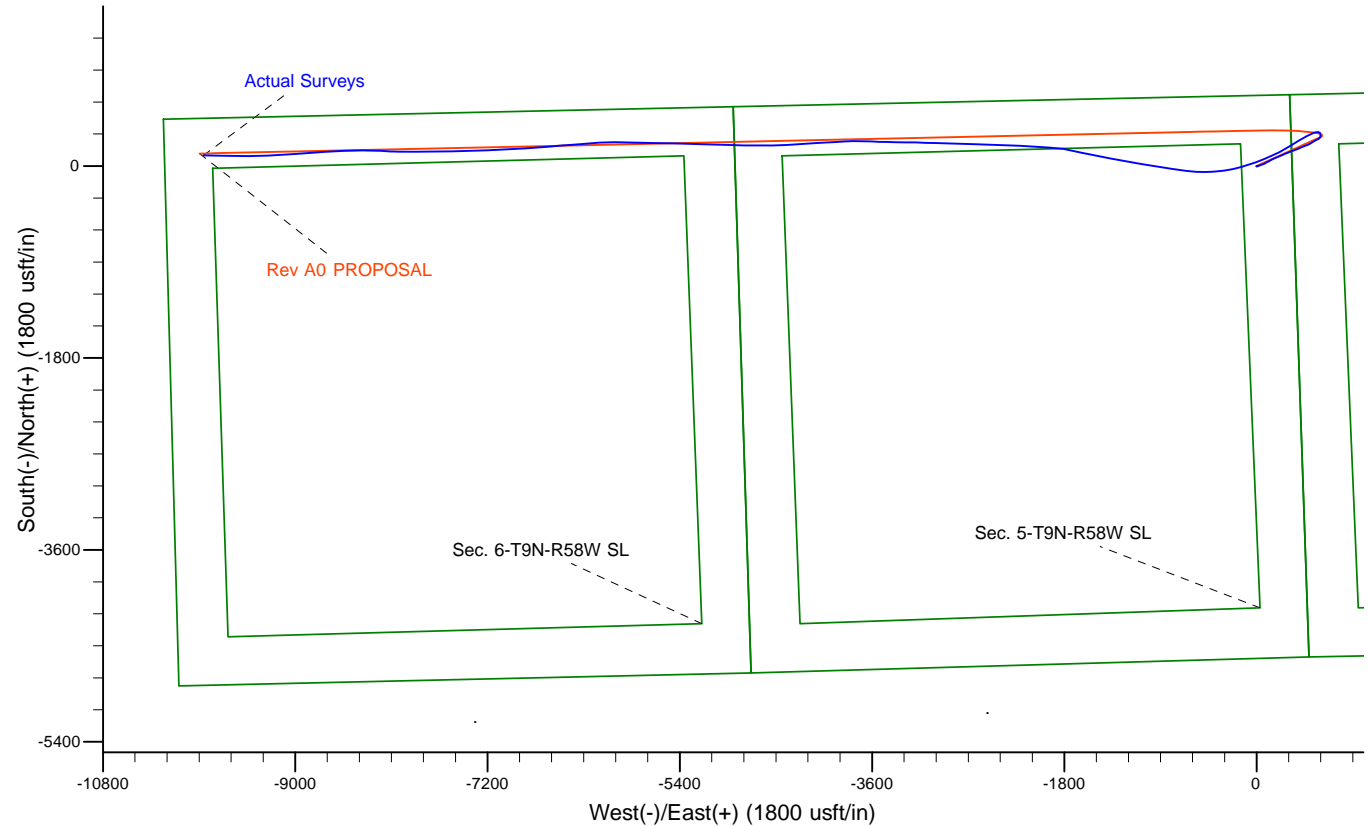
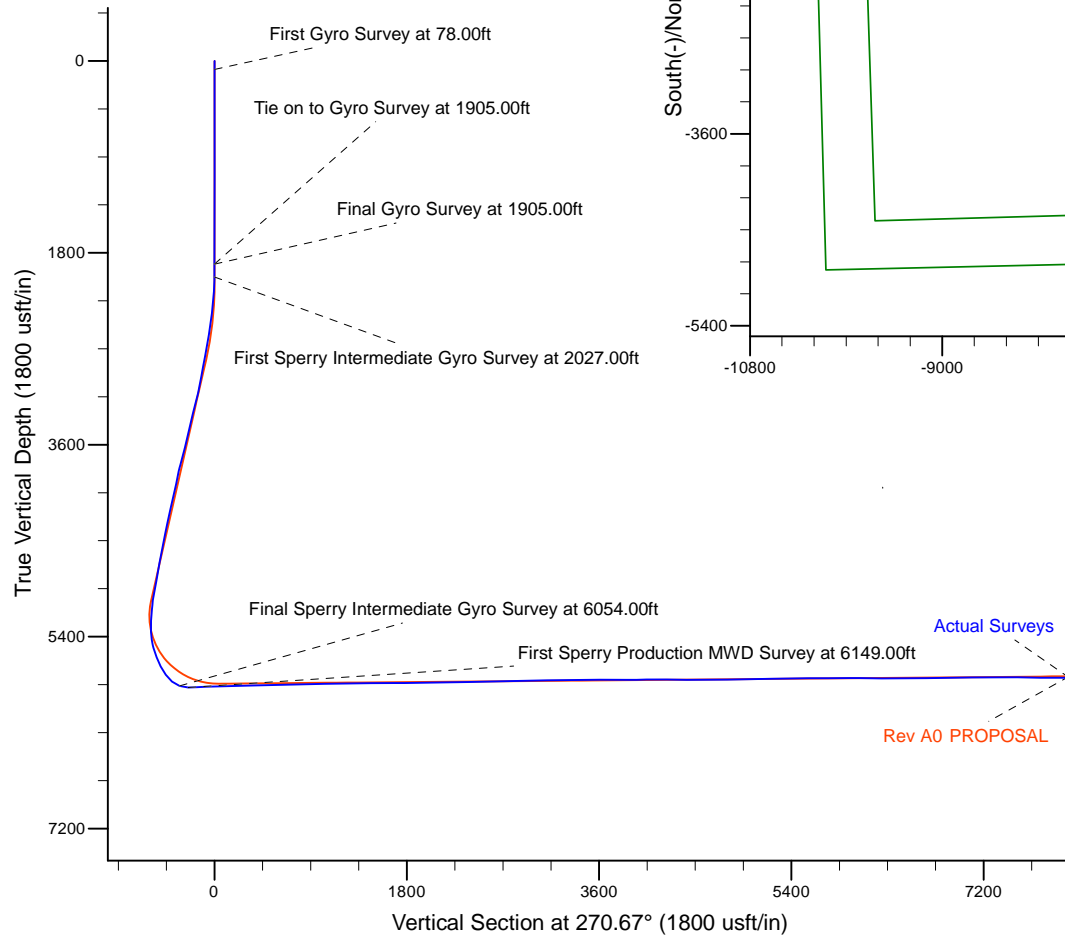
HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 5-T9N-R58W (Heston PAD)
 Well: Reagan LD06-685
 Wellbore: Plan A
 Design: Actual Surveys



Platted SHL: 660 FNL, 330' FEL
 Platted Lat/Long: 40.785810, -103.880410
 Location: Sec. 5-T9N-R58W

Platted BHL: 330' FNL, 330' FWL
 Platted Lat/Long: 40.786573 N, -103.915992 W
 State Planes - CO Northern: 1,533,312.29 N, 3,438,623.62 E
 Sec. 6-T9N-R58W



LEGEND

- Reagan LD06-685, Plan A, Rev A0 PROPOSAL V0
- Actual Surveys

WELL DETAILS: Reagan LD06-685

Ground Level: 4755.00
 KB = 30' @ 4785.00usft (H&P 517)

Created By: Tatiana Gomez
 Created On: 9-8-16

Design Report for Reagan LD06-685 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78.00	0.16	150.07	78.00	-0.09	0.05	-0.06	0.21
First Gyro Survey at 78.00ft							
177.00	0.34	172.89	177.00	-0.51	0.16	-0.17	0.20
271.00	0.34	148.71	271.00	-1.02	0.34	-0.35	0.15
366.00	0.18	127.36	366.00	-1.35	0.60	-0.62	0.19
460.00	0.48	222.40	460.00	-1.73	0.46	-0.48	0.56
555.00	0.11	119.02	554.99	-2.07	0.27	-0.29	0.54
650.00	0.01	288.83	649.99	-2.11	0.34	-0.36	0.13
744.00	0.13	271.90	743.99	-2.11	0.22	-0.25	0.13
839.00	0.20	331.29	838.99	-1.96	0.04	-0.06	0.18
934.00	0.10	334.97	933.99	-1.74	-0.08	0.06	0.11
1,028.00	0.13	49.44	1,027.99	-1.59	-0.03	0.01	0.15
1,123.00	0.15	21.81	1,122.99	-1.41	0.10	-0.11	0.07
1,217.00	0.13	8.04	1,216.99	-1.19	0.16	-0.17	0.04
1,311.00	0.19	79.96	1,310.99	-1.05	0.33	-0.34	0.21
1,406.00	0.19	91.06	1,405.99	-1.03	0.64	-0.65	0.04
1,501.00	0.21	221.88	1,500.99	-1.16	0.68	-0.69	0.38
1,595.00	0.05	103.35	1,594.99	-1.30	0.60	-0.62	0.25
1,689.00	0.76	154.26	1,688.99	-1.87	0.92	-0.94	0.78
1,784.00	0.60	162.04	1,783.98	-2.91	1.34	-1.38	0.19
1,879.00	0.19	134.31	1,878.98	-3.50	1.61	-1.65	0.46
1,905.00	0.15	107.28	1,904.98	-3.54	1.67	-1.71	0.34
Final Gyro Survey at 1905.00ft - Tie on to Gyro Survey at 1905.00ft							
2,027.00	0.35	131.29	2,026.98	-3.83	2.10	-2.15	0.18
First Sperry Intermediate Gyro Survey at 2027.00ft							
2,122.00	2.73	86.85	2,121.94	-3.90	4.58	-4.63	2.62
2,216.00	4.17	66.57	2,215.77	-2.41	9.95	-9.98	1.99
2,310.00	6.72	69.25	2,309.34	0.89	18.23	-18.22	2.73
2,405.00	8.04	69.85	2,403.55	5.15	29.67	-29.61	1.39
2,500.00	10.02	67.92	2,497.37	10.55	43.57	-43.44	2.11
2,594.00	9.61	66.99	2,589.99	16.69	58.37	-58.17	0.47
2,689.00	11.07	64.25	2,683.45	23.75	73.88	-73.60	1.62
2,784.00	12.27	63.44	2,776.48	32.23	91.12	-90.74	1.27
2,878.00	11.50	62.91	2,868.46	40.96	108.40	-107.91	0.83
2,973.00	12.28	58.25	2,961.43	50.59	125.42	-124.82	1.30
3,067.00	12.46	62.07	3,053.25	60.60	142.88	-142.16	0.89
3,162.00	14.70	66.32	3,145.59	70.24	162.98	-162.14	2.58
3,257.00	15.68	67.34	3,237.27	80.03	185.87	-184.91	1.07
3,446.00	14.41	66.94	3,419.78	99.08	231.08	-229.89	0.67
3,540.00	13.78	65.72	3,510.95	108.27	252.04	-250.75	0.74
3,635.00	15.60	66.72	3,602.85	117.97	274.09	-272.68	1.93
3,824.00	15.42	69.92	3,784.97	136.64	321.04	-319.41	0.46
3,918.00	12.99	70.98	3,876.09	144.37	342.76	-341.04	2.60
4,013.00	12.58	68.78	3,968.73	151.60	362.50	-360.69	0.67
4,109.00	13.48	69.20	4,062.26	159.36	382.71	-380.81	0.94
4,202.00	13.68	68.49	4,152.66	167.24	403.07	-401.08	0.28
4,297.00	13.79	66.55	4,244.94	175.86	423.91	-421.81	0.50
4,391.00	12.52	65.91	4,336.47	184.48	443.49	-441.29	1.36
4,486.00	12.61	67.33	4,429.20	192.68	462.46	-460.16	0.34

Design Report for Reagan LD06-685 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,581.00	12.58	67.99	4,521.91	200.55	481.62	-479.23	0.15
4,676.00	11.94	62.29	4,614.75	209.00	499.91	-497.42	1.44
4,770.00	12.36	54.73	4,706.65	219.33	516.74	-514.12	1.75
4,865.00	11.97	58.05	4,799.52	230.42	533.40	-530.65	0.84
4,960.00	12.39	61.77	4,892.38	240.45	550.74	-547.87	0.94
5,054.00	11.87	68.12	4,984.28	248.82	568.59	-565.63	1.52
5,149.00	8.12	53.24	5,077.84	256.48	583.04	-579.99	4.76
5,243.00	10.04	30.20	5,170.69	267.54	592.49	-589.30	4.33
5,338.00	10.81	8.75	5,264.16	283.51	598.01	-594.63	4.14
5,432.00	10.63	344.69	5,356.56	300.60	597.06	-593.48	4.73
5,487.00	9.72	328.52	5,410.71	309.45	593.30	-589.61	5.43
5,582.00	16.16	277.53	5,503.52	318.06	575.93	-572.15	13.16
5,676.00	22.15	254.76	5,592.39	315.11	545.80	-542.05	10.08
5,771.00	29.89	244.87	5,677.74	300.32	507.01	-503.44	9.31
5,865.00	38.02	239.33	5,755.66	275.55	460.82	-457.55	9.25
5,960.00	54.67	240.27	5,821.01	241.17	401.58	-398.72	17.54
6,054.00	72.72	237.46	5,862.50	197.65	329.85	-327.50	19.39
Final Sperry Intermediate Gyro Survey at 6054.00ft							
6,149.00	91.20	241.57	5,875.74	150.21	249.12	-247.33	19.91
First Sperry Production MWD Survey at 6149.00ft							
6,244.00	92.71	244.82	5,872.50	107.40	164.39	-163.11	3.77
6,338.00	91.85	246.19	5,868.76	68.46	78.92	-78.11	1.72
6,433.00	91.42	251.94	5,866.05	34.54	-9.74	10.14	6.07
6,527.00	90.06	251.56	5,864.83	5.11	-99.00	99.05	1.50
6,622.00	91.54	256.23	5,863.50	-21.23	-190.23	189.97	5.16
6,716.00	91.94	261.68	5,860.65	-39.23	-282.42	281.93	5.81
6,811.00	91.79	264.97	5,857.56	-50.26	-376.71	376.09	3.46
6,905.00	90.77	268.91	5,855.45	-55.28	-470.53	469.85	4.33
7,000.00	92.80	272.69	5,852.49	-53.95	-565.45	564.78	4.51
7,094.00	92.62	277.41	5,848.05	-45.69	-658.96	658.37	5.02
7,189.00	89.72	278.82	5,846.11	-32.28	-752.97	752.54	3.39
7,284.00	90.40	279.09	5,846.01	-17.50	-846.82	846.55	0.77
7,378.00	91.26	279.08	5,844.65	-2.66	-939.63	939.53	0.91
7,473.00	91.79	278.91	5,842.12	12.19	-1,033.42	1,033.50	0.59
7,567.00	92.34	278.90	5,838.73	26.73	-1,126.23	1,126.47	0.59
7,662.00	89.57	279.97	5,837.15	42.30	-1,219.92	1,220.33	3.13
7,756.00	89.48	281.10	5,837.93	59.49	-1,312.33	1,312.94	1.21
7,851.00	90.13	281.39	5,838.25	78.01	-1,405.51	1,406.33	0.75
7,946.00	90.74	281.96	5,837.53	97.24	-1,498.54	1,499.58	0.88
8,040.00	91.45	282.06	5,835.73	116.79	-1,590.46	1,591.73	0.76
8,135.00	89.97	281.21	5,834.56	135.95	-1,683.50	1,684.98	1.80
8,230.00	90.00	281.19	5,834.58	154.40	-1,776.69	1,778.38	0.04
8,324.00	90.58	275.11	5,834.10	167.72	-1,869.70	1,871.54	6.50
8,419.00	90.89	273.37	5,832.89	174.75	-1,964.43	1,966.34	1.86
8,514.00	91.20	273.13	5,831.15	180.13	-2,059.26	2,061.23	0.41
8,608.00	91.75	273.03	5,828.73	185.18	-2,153.09	2,155.12	0.59
8,703.00	90.96	273.01	5,826.49	190.18	-2,247.93	2,250.01	0.83
8,892.00	91.88	272.27	5,821.80	198.89	-2,436.67	2,438.84	0.62
8,986.00	90.06	271.52	5,820.21	201.99	-2,530.60	2,532.80	2.09
9,081.00	90.62	271.32	5,819.65	204.35	-2,625.57	2,627.79	0.63
9,175.00	91.94	271.54	5,817.55	206.69	-2,719.51	2,721.76	1.42

Design Report for Reagan LD06-685 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
9,270.00	91.85	271.86	5,814.41	209.51	-2,814.42	2,816.69	0.35
9,364.00	89.78	272.09	5,813.07	212.75	-2,908.35	2,910.65	2.22
9,459.00	90.62	271.59	5,812.74	215.80	-3,003.30	3,005.63	1.03
9,554.00	91.97	271.51	5,810.59	218.37	-3,098.24	3,100.59	1.42
9,648.00	90.83	271.01	5,808.30	220.43	-3,192.18	3,194.56	1.32
9,743.00	90.71	271.09	5,807.02	222.17	-3,287.16	3,289.54	0.15
9,837.00	92.15	271.05	5,804.67	223.93	-3,381.11	3,383.51	1.53
9,932.00	90.46	271.22	5,802.51	225.81	-3,476.06	3,478.48	1.79
10,026.00	89.51	272.31	5,802.53	228.71	-3,570.02	3,572.46	1.54
10,121.00	89.20	271.96	5,803.60	232.24	-3,664.94	3,667.42	0.49
10,216.00	89.63	269.44	5,804.57	233.41	-3,759.92	3,762.41	2.69
10,310.00	90.22	266.82	5,804.70	230.34	-3,853.87	3,856.31	2.86
10,405.00	91.05	266.75	5,803.64	225.01	-3,948.71	3,951.08	0.88
10,500.00	91.75	266.66	5,801.32	219.55	-4,043.52	4,045.83	0.74
10,594.00	89.57	267.00	5,800.24	214.35	-4,137.37	4,139.60	2.35
10,689.00	88.99	266.40	5,801.43	208.89	-4,232.20	4,234.37	0.88
10,783.00	89.04	265.64	5,803.05	202.36	-4,325.96	4,328.04	0.81
10,878.00	88.99	266.67	5,804.68	195.99	-4,420.73	4,422.73	1.09
10,973.00	90.09	269.93	5,805.45	193.18	-4,515.67	4,517.63	3.62
11,067.00	90.89	269.89	5,804.64	193.03	-4,609.67	4,611.62	0.85
11,162.00	91.51	269.94	5,802.65	192.89	-4,704.65	4,706.59	0.65
11,257.00	91.14	270.66	5,800.46	193.38	-4,799.62	4,801.56	0.85
11,351.00	89.75	272.07	5,799.73	195.62	-4,893.59	4,895.55	2.11
11,446.00	90.34	271.60	5,799.65	198.67	-4,988.54	4,990.53	0.79
11,541.00	91.26	271.56	5,798.32	201.29	-5,083.49	5,085.51	0.97
11,635.00	92.16	271.65	5,795.52	203.92	-5,177.41	5,179.45	0.96
11,730.00	91.20	272.23	5,792.73	207.13	-5,272.31	5,274.38	1.18
11,825.00	89.42	271.36	5,792.22	210.11	-5,367.26	5,369.36	2.09
11,919.00	90.34	271.42	5,792.42	212.39	-5,461.23	5,463.35	0.98
12,014.00	91.48	271.12	5,790.91	214.49	-5,556.19	5,558.33	1.24
12,108.00	90.31	271.18	5,789.44	216.38	-5,650.16	5,652.32	1.25
12,203.00	89.51	271.31	5,789.59	218.44	-5,745.14	5,747.31	0.85
12,392.00	90.92	271.31	5,788.88	222.76	-5,934.08	5,936.29	0.75
12,487.00	88.89	269.50	5,789.04	223.44	-6,029.07	6,031.28	2.86
12,581.00	89.26	266.73	5,790.56	220.34	-6,123.00	6,125.17	2.97
12,676.00	89.54	265.99	5,791.55	214.31	-6,217.80	6,219.89	0.83
12,770.00	89.94	265.69	5,791.98	207.49	-6,311.55	6,313.56	0.53
12,865.00	90.31	265.32	5,791.77	200.05	-6,406.26	6,408.17	0.55
12,959.00	90.83	265.32	5,790.83	192.38	-6,499.94	6,501.76	0.55
13,054.00	91.23	265.03	5,789.13	184.39	-6,594.59	6,596.30	0.52
13,149.00	91.75	264.98	5,786.66	176.12	-6,689.20	6,690.81	0.55
13,243.00	90.58	266.54	5,784.75	169.17	-6,782.92	6,784.44	2.07
13,388.00	89.66	267.18	5,784.44	161.23	-6,927.70	6,929.11	0.77
13,432.00	90.20	267.20	5,784.50	159.07	-6,971.64	6,973.03	1.23
13,527.00	90.66	266.88	5,783.78	154.17	-7,066.51	7,067.84	0.59
13,621.00	90.94	267.01	5,782.47	149.16	-7,160.37	7,161.63	0.33
13,716.00	90.47	268.42	5,781.30	145.37	-7,255.28	7,256.49	1.56
13,811.00	89.98	268.24	5,780.93	142.60	-7,350.24	7,351.41	0.55
13,905.00	90.19	267.94	5,780.79	139.47	-7,444.19	7,445.32	0.39
14,000.00	88.56	269.14	5,781.82	137.05	-7,539.15	7,540.24	2.13
14,095.00	89.11	269.82	5,783.76	136.19	-7,634.12	7,635.20	0.92

Design Report for Reagan LD06-685 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
14,189.00	89.51	269.72	5,784.89	135.82	-7,728.12	7,729.18	0.44
14,284.00	89.91	269.97	5,785.37	135.56	-7,823.11	7,824.17	0.50
14,379.00	89.97	269.59	5,785.47	135.20	-7,918.11	7,919.16	0.40
14,473.00	90.65	270.05	5,784.96	134.90	-8,012.11	8,013.14	0.87
14,568.00	91.17	272.63	5,783.45	137.12	-8,107.06	8,108.12	2.77
14,662.00	91.42	272.86	5,781.33	141.63	-8,200.93	8,202.03	0.36
14,757.00	91.29	271.33	5,779.08	145.10	-8,295.84	8,296.97	1.62
14,852.00	91.67	269.20	5,776.63	145.54	-8,390.80	8,391.93	2.28
14,946.00	91.85	268.57	5,773.74	143.71	-8,484.74	8,485.84	0.70
15,041.00	91.29	267.61	5,771.14	140.54	-8,579.65	8,580.71	1.17
15,135.00	91.57	267.36	5,768.79	136.42	-8,673.53	8,674.53	0.40
15,230.00	90.68	266.68	5,766.93	131.48	-8,768.38	8,769.32	1.18
15,325.00	90.43	265.92	5,766.00	125.35	-8,863.18	8,864.04	0.84
15,419.00	89.60	263.55	5,765.98	116.73	-8,956.77	8,957.53	2.67
15,514.00	90.21	266.05	5,766.14	108.12	-9,051.37	9,052.02	2.71
15,608.00	90.58	266.65	5,765.49	102.13	-9,145.18	9,145.75	0.75
15,703.00	90.98	267.97	5,764.20	97.68	-9,240.07	9,240.57	1.45
15,797.00	91.54	269.31	5,762.13	95.44	-9,334.01	9,334.49	1.54
15,892.00	91.97	269.09	5,759.22	94.12	-9,428.96	9,429.41	0.51
15,986.00	90.61	270.59	5,757.10	93.86	-9,522.93	9,523.38	2.15
16,081.00	90.30	271.01	5,756.35	95.18	-9,617.92	9,618.37	0.55
16,176.00	90.49	271.01	5,755.69	96.86	-9,712.90	9,713.37	0.20
16,259.00	90.92	271.24	5,754.67	98.49	-9,795.88	9,796.36	0.59
Final Sperry Production MWD Survey at 16259.00ft							
16,320.00	90.92	271.24	5,753.69	99.81	-9,856.86	9,857.35	0.00
Straight Line Projection to TD at 16320.00ft							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
78.00	78.00	-0.09	0.05	First Gyro Survey at 78.00ft
1,905.00	1,904.98	-3.54	1.67	Final Gyro Survey at 1905.00ft
1,905.00	1,904.98	-3.54	1.67	Tie on to Gyro Survey at 1905.00ft
2,027.00	2,026.98	-3.83	2.10	First Sperry Intermediate Gyro Survey at 2027.00ft
6,054.00	5,862.50	197.65	329.85	Final Sperry Intermediate Gyro Survey at 6054.00ft
6,149.00	5,875.74	150.21	249.12	First Sperry Production MWD Survey at 6149.00ft
16,259.00	5,754.67	98.49	-9,795.88	Final Sperry Production MWD Survey at 16259.00ft
16,320.00	5,753.69	99.81	-9,856.86	Straight Line Projection to TD at 16320.00ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
Target	Reagan LD06-685_Rev A0_BHL	270.67	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
78.00	1,905.00	Gyro Data Surveys	NS-GYRO-MS
2,027.00	6,054.00	Intermediate Sperry MWD Surveys	MWD

Design Report for Reagan LD06-685 - Actual Surveys

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
6,149.00	16,320.00	Production Sperry MWD Surveys	MWD

Wellbore Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Reagan LD06-685_Re - actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	0.01	0.00	1,533,212.49	3,448,480.48	40.785810	-103.880410
Reagan LD06-685_Re - actual wellpath misses target center by 42.01usft at 16320.00usft MD (5753.69 TVD, 99.81 N, -9856.86 E) - Point	0.00	0.00	5,755.00	116.41	-9,895.42	1,533,328.89	3,438,585.05	40.786620	-103.916130
Reagan LD06-685_Re - actual wellpath misses target center by 276.18usft at 6303.12usft MD (5869.98 TVD, 82.67 N, 110.74 E) - Point	0.00	0.00	5,840.00	333.00	-2.00	1,533,545.48	3,448,478.48	40.786724	-103.880395

Directional Difficulty Index

Average Dogleg over Survey:	1.89 °/100usft	Maximum Dogleg over Survey:	19.91 °/100usft at 6,149.00 usft
Net Tortosity applicable to Plans:	1.16 °/100usft	Directional Difficulty Index:	6.985

Audit Info

North Reference Sheet for Sec. 5-T9N-R58W (Heston PAD) - Reagan LD06-685 - Plan A

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to KB = 30' @ 4785.00usft (H&P 517). Northing and Easting are relative to Reagan LD06-685

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 1.00000040

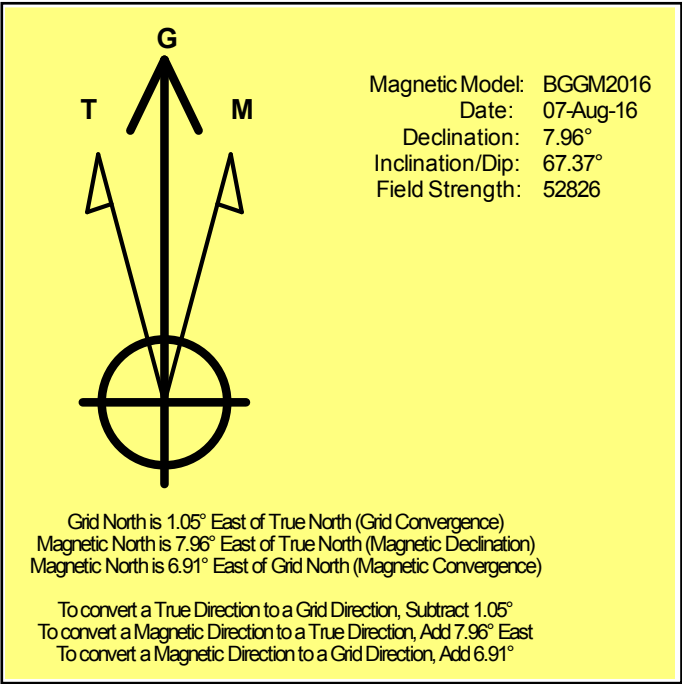
Grid Coordinates of Well: 1,533,212.48 usft N, 3,448,480.48 usft E

Geographical Coordinates of Well: 40° 47' 08.92" N, 103° 52' 49.48" W

Grid Convergence at Surface is: 1.05°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,320.00usft the Bottom Hole Displacement is 9,857.36usft in the Direction of 270.58° (Grid).

Magnetic Convergence at surface is: -6.91° (7 August 2016, , BGGM2016)



Noble Energy

Weld County, CO (NAD 83)

Sec. 5-T9N-R58W (Heston PAD)

Reagan LD06-685

05-123-40818

Plan A

Design: Actual Surveys

Sperry Drilling Services

Geodetic Report

08 September, 2016

Well Coordinates: 1,533,212.48 N, 3,448,480.48 E (40° 47' 08.92" N, 103° 52' 49.48" W)

Ground Level: 4,755.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 81

Centered on Well Reagan LD06-685

KB = 30' @ 4785.00usft (H&P 517)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for Reagan LD06-685 - Actual Surveys

Measured			Vertical	Local Coordinates		Geographic Coordinates		UTM Coordinates	
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	40.785810	-103.880410	1,533,212.48	3,448,480.48
78.00	0.16	150.07	78.00	-0.09	0.05	40.785810	-103.880410	1,533,212.39	3,448,480.53
177.00	0.34	172.89	177.00	-0.51	0.16	40.785809	-103.880410	1,533,211.98	3,448,480.64
271.00	0.34	148.71	271.00	-1.02	0.34	40.785807	-103.880409	1,533,211.46	3,448,480.82
366.00	0.18	127.36	366.00	-1.35	0.60	40.785806	-103.880408	1,533,211.13	3,448,481.08
460.00	0.48	222.40	460.00	-1.73	0.46	40.785805	-103.880409	1,533,210.75	3,448,480.93
555.00	0.11	119.02	554.99	-2.07	0.27	40.785804	-103.880409	1,533,210.41	3,448,480.75
650.00	0.01	288.83	649.99	-2.11	0.34	40.785804	-103.880409	1,533,210.37	3,448,480.82
744.00	0.13	271.90	743.99	-2.11	0.22	40.785804	-103.880410	1,533,210.37	3,448,480.70
839.00	0.20	331.29	838.99	-1.96	0.04	40.785805	-103.880410	1,533,210.52	3,448,480.52
934.00	0.10	334.97	933.99	-1.74	-0.08	40.785805	-103.880411	1,533,210.74	3,448,480.40
1,028.00	0.13	49.44	1,027.99	-1.59	-0.03	40.785806	-103.880410	1,533,210.89	3,448,480.45
1,123.00	0.15	21.81	1,122.99	-1.41	0.10	40.785806	-103.880410	1,533,211.07	3,448,480.58
1,217.00	0.13	8.04	1,216.99	-1.19	0.16	40.785807	-103.880410	1,533,211.29	3,448,480.64
1,311.00	0.19	79.96	1,310.99	-1.05	0.33	40.785807	-103.880409	1,533,211.43	3,448,480.81
1,406.00	0.19	91.06	1,405.99	-1.03	0.64	40.785807	-103.880408	1,533,211.45	3,448,481.12
1,501.00	0.21	221.88	1,500.99	-1.16	0.68	40.785807	-103.880408	1,533,211.32	3,448,481.16
1,595.00	0.05	103.35	1,594.99	-1.30	0.60	40.785806	-103.880408	1,533,211.18	3,448,481.08
1,689.00	0.76	154.26	1,688.99	-1.87	0.92	40.785805	-103.880407	1,533,210.61	3,448,481.39
1,784.00	0.60	162.04	1,783.98	-2.91	1.34	40.785802	-103.880406	1,533,209.57	3,448,481.82
1,879.00	0.19	134.31	1,878.98	-3.50	1.61	40.785800	-103.880405	1,533,208.99	3,448,482.09
1,905.00	0.15	107.28	1,904.98	-3.54	1.67	40.785800	-103.880404	1,533,208.95	3,448,482.15
2,027.00	0.35	131.29	2,026.98	-3.83	2.10	40.785799	-103.880403	1,533,208.65	3,448,482.58
2,122.00	2.73	86.85	2,121.94	-3.90	4.58	40.785799	-103.880394	1,533,208.58	3,448,485.06
2,216.00	4.17	66.57	2,215.77	-2.41	9.95	40.785803	-103.880374	1,533,210.07	3,448,490.43
2,310.00	6.72	69.25	2,309.34	0.89	18.23	40.785812	-103.880344	1,533,213.37	3,448,498.71
2,405.00	8.04	69.85	2,403.55	5.15	29.67	40.785823	-103.880303	1,533,217.63	3,448,510.15
2,500.00	10.02	67.92	2,497.37	10.55	43.57	40.785837	-103.880252	1,533,223.03	3,448,524.04
2,594.00	9.61	66.99	2,589.99	16.69	58.37	40.785853	-103.880198	1,533,229.17	3,448,538.84
2,689.00	11.07	64.25	2,683.45	23.75	73.88	40.785872	-103.880142	1,533,236.23	3,448,554.36
2,784.00	12.27	63.44	2,776.48	32.23	91.12	40.785894	-103.880079	1,533,244.71	3,448,571.60
2,878.00	11.50	62.91	2,868.46	40.96	108.40	40.785917	-103.880016	1,533,253.44	3,448,588.88
2,973.00	12.28	58.25	2,961.43	50.59	125.42	40.785943	-103.879954	1,533,263.07	3,448,605.90
3,067.00	12.46	62.07	3,053.25	60.60	142.88	40.785969	-103.879890	1,533,273.08	3,448,623.36
3,162.00	14.70	66.32	3,145.59	70.24	162.98	40.785995	-103.879817	1,533,282.72	3,448,643.46
3,257.00	15.68	67.34	3,237.27	80.03	185.87	40.786020	-103.879734	1,533,292.51	3,448,666.35
3,446.00	14.41	66.94	3,419.78	99.08	231.08	40.786070	-103.879569	1,533,311.56	3,448,711.55
3,540.00	13.78	65.72	3,510.95	108.27	252.04	40.786095	-103.879493	1,533,320.75	3,448,732.52
3,635.00	15.60	66.72	3,602.85	117.97	274.09	40.786120	-103.879413	1,533,330.45	3,448,754.57
3,824.00	15.42	69.92	3,784.97	136.64	321.04	40.786169	-103.879242	1,533,349.12	3,448,801.51
3,918.00	12.99	70.98	3,876.09	144.37	342.76	40.786189	-103.879163	1,533,356.86	3,448,823.24
4,013.00	12.58	68.78	3,968.73	151.60	362.50	40.786208	-103.879091	1,533,364.08	3,448,842.98

Design Report for Reagan LD06-685 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
4,109.00	13.48	69.20	4,062.26	159.36	382.71	40.786228	-103.879018	1,533,371.84	3,448,863.19
4,202.00	13.68	68.49	4,152.66	167.24	403.07	40.786249	-103.878944	1,533,379.72	3,448,883.55
4,297.00	13.79	66.55	4,244.94	175.86	423.91	40.786271	-103.878868	1,533,388.34	3,448,904.39
4,391.00	12.52	65.91	4,336.47	184.48	443.49	40.786294	-103.878797	1,533,396.96	3,448,923.97
4,486.00	12.61	67.33	4,429.20	192.68	462.46	40.786316	-103.878728	1,533,405.16	3,448,942.94
4,581.00	12.58	67.99	4,521.91	200.55	481.62	40.786336	-103.878658	1,533,413.03	3,448,962.10
4,676.00	11.94	62.29	4,614.75	209.00	499.91	40.786359	-103.878592	1,533,421.48	3,448,980.39
4,770.00	12.36	54.73	4,706.65	219.33	516.74	40.786386	-103.878530	1,533,431.81	3,448,997.22
4,865.00	11.97	58.05	4,799.52	230.42	533.40	40.786416	-103.878469	1,533,442.90	3,449,013.88
4,960.00	12.39	61.77	4,892.38	240.45	550.74	40.786442	-103.878406	1,533,452.93	3,449,031.22
5,054.00	11.87	68.12	4,984.28	248.82	568.59	40.786464	-103.878341	1,533,461.31	3,449,049.07
5,149.00	8.12	53.24	5,077.84	256.48	583.04	40.786485	-103.878288	1,533,468.97	3,449,063.52
5,243.00	10.04	30.20	5,170.69	267.54	592.49	40.786515	-103.878253	1,533,480.02	3,449,072.97
5,338.00	10.81	8.75	5,264.16	283.51	598.01	40.786558	-103.878232	1,533,495.99	3,449,078.49
5,432.00	10.63	344.69	5,356.56	300.60	597.06	40.786605	-103.878235	1,533,513.08	3,449,077.54
5,487.00	9.72	328.52	5,410.71	309.45	593.30	40.786630	-103.878248	1,533,521.93	3,449,073.78
5,582.00	16.16	277.53	5,503.52	318.06	575.93	40.786654	-103.878310	1,533,530.54	3,449,056.41
5,676.00	22.15	254.76	5,592.39	315.11	545.80	40.786647	-103.878419	1,533,527.59	3,449,026.28
5,771.00	29.89	244.87	5,677.74	300.32	507.01	40.786609	-103.878560	1,533,512.80	3,448,987.49
5,865.00	38.02	239.33	5,755.66	275.55	460.82	40.786543	-103.878728	1,533,488.04	3,448,941.30
5,960.00	54.67	240.27	5,821.01	241.17	401.58	40.786452	-103.878944	1,533,453.65	3,448,882.06
6,054.00	72.72	237.46	5,862.50	197.65	329.85	40.786336	-103.879206	1,533,410.13	3,448,810.33
6,149.00	91.20	241.57	5,875.74	150.21	249.12	40.786210	-103.879501	1,533,362.69	3,448,729.59
6,244.00	92.71	244.82	5,872.50	107.40	164.39	40.786097	-103.879810	1,533,319.88	3,448,644.87
6,338.00	91.85	246.19	5,868.76	68.46	78.92	40.785994	-103.880121	1,533,280.94	3,448,559.40
6,433.00	91.42	251.94	5,866.05	34.54	-9.74	40.785905	-103.880443	1,533,247.02	3,448,470.74
6,527.00	90.06	251.56	5,864.83	5.11	-99.00	40.785829	-103.880767	1,533,217.59	3,448,381.48
6,622.00	91.54	256.23	5,863.50	-21.23	-190.23	40.785761	-103.881098	1,533,191.25	3,448,290.24
6,716.00	91.94	261.68	5,860.65	-39.23	-282.42	40.785717	-103.881433	1,533,173.25	3,448,198.06
6,811.00	91.79	264.97	5,857.56	-50.26	-376.71	40.785691	-103.881774	1,533,162.22	3,448,103.77
6,905.00	90.77	268.91	5,855.45	-55.28	-470.53	40.785682	-103.882113	1,533,157.20	3,448,009.95
7,000.00	92.80	272.69	5,852.49	-53.95	-565.45	40.785690	-103.882455	1,533,158.53	3,447,915.03
7,094.00	92.62	277.41	5,848.05	-45.69	-658.96	40.785718	-103.882792	1,533,166.79	3,447,821.52
7,189.00	89.72	278.82	5,846.11	-32.28	-752.97	40.785759	-103.883131	1,533,180.20	3,447,727.50
7,284.00	90.40	279.09	5,846.01	-17.50	-846.82	40.785804	-103.883469	1,533,194.98	3,447,633.66
7,378.00	91.26	279.08	5,844.65	-2.66	-939.63	40.785850	-103.883803	1,533,209.82	3,447,540.85
7,473.00	91.79	278.91	5,842.12	12.19	-1,033.42	40.785895	-103.884141	1,533,224.67	3,447,447.05
7,567.00	92.34	278.90	5,838.73	26.73	-1,126.23	40.785940	-103.884475	1,533,239.21	3,447,354.25
7,662.00	89.57	279.97	5,837.15	42.30	-1,219.92	40.785987	-103.884812	1,533,254.78	3,447,260.56
7,756.00	89.48	281.10	5,837.93	59.49	-1,312.33	40.786039	-103.885145	1,533,271.97	3,447,168.15
7,851.00	90.13	281.39	5,838.25	78.01	-1,405.51	40.786094	-103.885480	1,533,290.49	3,447,074.97
7,946.00	90.74	281.96	5,837.53	97.24	-1,498.54	40.786152	-103.885814	1,533,309.72	3,446,981.94

Design Report for Reagan LD06-685 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
8,040.00	91.45	282.06	5,835.73	116.79	-1,590.46	40.786210	-103.886145	1,533,329.27	3,446,890.02
8,135.00	89.97	281.21	5,834.56	135.95	-1,683.50	40.786267	-103.886480	1,533,348.43	3,446,796.98
8,230.00	90.00	281.19	5,834.58	154.40	-1,776.69	40.786323	-103.886815	1,533,366.88	3,446,703.79
8,324.00	90.58	275.11	5,834.10	167.72	-1,869.70	40.786364	-103.887150	1,533,380.20	3,446,610.78
8,419.00	90.89	273.37	5,832.89	174.75	-1,964.43	40.786388	-103.887491	1,533,387.23	3,446,516.05
8,514.00	91.20	273.13	5,831.15	180.13	-2,059.26	40.786407	-103.887833	1,533,392.61	3,446,421.22
8,608.00	91.75	273.03	5,828.73	185.18	-2,153.09	40.786426	-103.888172	1,533,397.66	3,446,327.39
8,703.00	90.96	273.01	5,826.49	190.18	-2,247.93	40.786444	-103.888514	1,533,402.66	3,446,232.55
8,892.00	91.88	272.27	5,821.80	198.89	-2,436.67	40.786478	-103.889195	1,533,411.37	3,446,043.81
8,986.00	90.06	271.52	5,820.21	201.99	-2,530.60	40.786491	-103.889534	1,533,414.47	3,445,949.88
9,081.00	90.62	271.32	5,819.65	204.35	-2,625.57	40.786502	-103.889876	1,533,416.83	3,445,854.91
9,175.00	91.94	271.54	5,817.55	206.69	-2,719.51	40.786513	-103.890215	1,533,419.17	3,445,760.97
9,270.00	91.85	271.86	5,814.41	209.51	-2,814.42	40.786526	-103.890558	1,533,421.99	3,445,666.06
9,364.00	89.78	272.09	5,813.07	212.75	-2,908.35	40.786539	-103.890897	1,533,425.23	3,445,572.13
9,459.00	90.62	271.59	5,812.74	215.80	-3,003.30	40.786552	-103.891239	1,533,428.28	3,445,477.18
9,554.00	91.97	271.51	5,810.59	218.37	-3,098.24	40.786564	-103.891582	1,533,430.85	3,445,382.24
9,648.00	90.83	271.01	5,808.30	220.43	-3,192.18	40.786574	-103.891921	1,533,432.91	3,445,288.29
9,743.00	90.71	271.09	5,807.02	222.17	-3,287.16	40.786584	-103.892264	1,533,434.66	3,445,193.32
9,837.00	92.15	271.05	5,804.67	223.93	-3,381.11	40.786593	-103.892603	1,533,436.41	3,445,099.37
9,932.00	90.46	271.22	5,802.51	225.81	-3,476.06	40.786603	-103.892946	1,533,438.29	3,445,004.41
10,026.00	89.51	272.31	5,802.53	228.71	-3,570.02	40.786616	-103.893285	1,533,441.19	3,444,910.46
10,121.00	89.20	271.96	5,803.60	232.24	-3,664.94	40.786630	-103.893627	1,533,444.73	3,444,815.53
10,216.00	89.63	269.44	5,804.57	233.41	-3,759.92	40.786638	-103.893970	1,533,445.89	3,444,720.55
10,310.00	90.22	266.82	5,804.70	230.34	-3,853.87	40.786635	-103.894310	1,533,442.82	3,444,626.61
10,405.00	91.05	266.75	5,803.64	225.01	-3,948.71	40.786625	-103.894652	1,533,437.49	3,444,531.77
10,500.00	91.75	266.66	5,801.32	219.55	-4,043.52	40.786614	-103.894995	1,533,432.03	3,444,436.95
10,594.00	89.57	267.00	5,800.24	214.35	-4,137.37	40.786605	-103.895334	1,533,426.84	3,444,343.11
10,689.00	88.99	266.40	5,801.43	208.89	-4,232.20	40.786594	-103.895677	1,533,421.37	3,444,248.28
10,783.00	89.04	265.64	5,803.05	202.36	-4,325.96	40.786581	-103.896016	1,533,414.84	3,444,154.52
10,878.00	88.99	266.67	5,804.68	195.99	-4,420.73	40.786568	-103.896358	1,533,408.47	3,444,059.75
10,973.00	90.09	269.93	5,805.45	193.18	-4,515.67	40.786565	-103.896701	1,533,405.66	3,443,964.80
11,067.00	90.89	269.89	5,804.64	193.03	-4,609.67	40.786570	-103.897041	1,533,405.51	3,443,870.81
11,162.00	91.51	269.94	5,802.65	192.89	-4,704.65	40.786574	-103.897384	1,533,405.37	3,443,775.83
11,257.00	91.14	270.66	5,800.46	193.38	-4,799.62	40.786580	-103.897727	1,533,405.87	3,443,680.86
11,351.00	89.75	272.07	5,799.73	195.62	-4,893.59	40.786591	-103.898066	1,533,408.10	3,443,586.89
11,446.00	90.34	271.60	5,799.65	198.67	-4,988.54	40.786604	-103.898408	1,533,411.15	3,443,491.94
11,541.00	91.26	271.56	5,798.32	201.29	-5,083.49	40.786616	-103.898751	1,533,413.77	3,443,396.99
11,635.00	92.16	271.65	5,795.52	203.92	-5,177.41	40.786628	-103.899090	1,533,416.40	3,443,303.07
11,730.00	91.20	272.23	5,792.73	207.13	-5,272.31	40.786641	-103.899432	1,533,419.61	3,443,208.16
11,825.00	89.42	271.36	5,792.22	210.11	-5,367.26	40.786654	-103.899775	1,533,422.59	3,443,113.22
11,919.00	90.34	271.42	5,792.42	212.39	-5,461.23	40.786665	-103.900114	1,533,424.87	3,443,019.25
12,014.00	91.48	271.12	5,790.91	214.49	-5,556.19	40.786675	-103.900457	1,533,426.97	3,442,924.28

Design Report for Reagan LD06-685 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
12,108.00	90.31	271.18	5,789.44	216.38	-5,650.16	40.786685	-103.900796	1,533,428.86	3,442,830.31
12,203.00	89.51	271.31	5,789.59	218.44	-5,745.14	40.786696	-103.901139	1,533,430.92	3,442,735.34
12,392.00	90.92	271.31	5,788.88	222.76	-5,934.08	40.786717	-103.901821	1,533,435.24	3,442,546.39
12,487.00	88.89	269.50	5,789.04	223.44	-6,029.07	40.786723	-103.902164	1,533,435.92	3,442,451.40
12,581.00	89.26	266.73	5,790.56	220.34	-6,123.00	40.786720	-103.902503	1,533,432.82	3,442,357.48
12,676.00	89.54	265.99	5,791.55	214.31	-6,217.80	40.786708	-103.902846	1,533,426.79	3,442,262.67
12,770.00	89.94	265.69	5,791.98	207.49	-6,311.55	40.786694	-103.903185	1,533,419.97	3,442,168.92
12,865.00	90.31	265.32	5,791.77	200.05	-6,406.26	40.786678	-103.903527	1,533,412.53	3,442,074.22
12,959.00	90.83	265.32	5,790.83	192.38	-6,499.94	40.786661	-103.903866	1,533,404.86	3,441,980.53
13,054.00	91.23	265.03	5,789.13	184.39	-6,594.59	40.786644	-103.904208	1,533,396.87	3,441,885.89
13,149.00	91.75	264.98	5,786.66	176.12	-6,689.20	40.786626	-103.904550	1,533,388.60	3,441,791.28
13,243.00	90.58	266.54	5,784.75	169.17	-6,782.92	40.786612	-103.904889	1,533,381.65	3,441,697.56
13,388.00	89.66	267.18	5,784.44	161.23	-6,927.70	40.786597	-103.905412	1,533,373.71	3,441,552.78
13,432.00	90.20	267.20	5,784.50	159.07	-6,971.64	40.786593	-103.905571	1,533,371.55	3,441,508.83
13,527.00	90.66	266.88	5,783.78	154.17	-7,066.51	40.786585	-103.905914	1,533,366.65	3,441,413.96
13,621.00	90.94	267.01	5,782.47	149.16	-7,160.37	40.786575	-103.906253	1,533,361.64	3,441,320.11
13,716.00	90.47	268.42	5,781.30	145.37	-7,255.28	40.786570	-103.906596	1,533,357.85	3,441,225.19
13,811.00	89.98	268.24	5,780.93	142.60	-7,350.24	40.786567	-103.906939	1,533,355.08	3,441,130.23
13,905.00	90.19	267.94	5,780.79	139.47	-7,444.19	40.786563	-103.907278	1,533,351.95	3,441,036.29
14,000.00	88.56	269.14	5,781.82	137.05	-7,539.15	40.786561	-103.907621	1,533,349.53	3,440,941.33
14,095.00	89.11	269.82	5,783.76	136.19	-7,634.12	40.786563	-103.907964	1,533,348.67	3,440,846.35
14,189.00	89.51	269.72	5,784.89	135.82	-7,728.12	40.786567	-103.908304	1,533,348.30	3,440,752.36
14,284.00	89.91	269.97	5,785.37	135.56	-7,823.11	40.786571	-103.908647	1,533,348.04	3,440,657.36
14,379.00	89.97	269.59	5,785.47	135.20	-7,918.11	40.786574	-103.908990	1,533,347.68	3,440,562.36
14,473.00	90.65	270.05	5,784.96	134.90	-8,012.11	40.786578	-103.909329	1,533,347.38	3,440,468.36
14,568.00	91.17	272.63	5,783.45	137.12	-8,107.06	40.786589	-103.909672	1,533,349.61	3,440,373.41
14,662.00	91.42	272.86	5,781.33	141.63	-8,200.93	40.786606	-103.910011	1,533,354.11	3,440,279.54
14,757.00	91.29	271.33	5,779.08	145.10	-8,295.84	40.786620	-103.910353	1,533,357.58	3,440,184.64
14,852.00	91.67	269.20	5,776.63	145.54	-8,390.80	40.786626	-103.910696	1,533,358.02	3,440,089.67
14,946.00	91.85	268.57	5,773.74	143.71	-8,484.74	40.786626	-103.911035	1,533,356.19	3,439,995.74
15,041.00	91.29	267.61	5,771.14	140.54	-8,579.65	40.786622	-103.911378	1,533,353.02	3,439,900.83
15,135.00	91.57	267.36	5,768.79	136.42	-8,673.53	40.786615	-103.911717	1,533,348.90	3,439,806.95
15,230.00	90.68	266.68	5,766.93	131.48	-8,768.38	40.786606	-103.912060	1,533,343.96	3,439,712.09
15,325.00	90.43	265.92	5,766.00	125.35	-8,863.18	40.786594	-103.912403	1,533,337.83	3,439,617.30
15,419.00	89.60	263.55	5,765.98	116.73	-8,956.77	40.786575	-103.912741	1,533,329.21	3,439,523.70
15,514.00	90.21	266.05	5,766.14	108.12	-9,051.37	40.786556	-103.913083	1,533,320.60	3,439,429.10
15,608.00	90.58	266.65	5,765.49	102.13	-9,145.18	40.786544	-103.913422	1,533,314.61	3,439,335.29
15,703.00	90.98	267.97	5,764.20	97.68	-9,240.07	40.786537	-103.913765	1,533,310.16	3,439,240.41
15,797.00	91.54	269.31	5,762.13	95.44	-9,334.01	40.786535	-103.914105	1,533,307.93	3,439,146.46
15,892.00	91.97	269.09	5,759.22	94.12	-9,428.96	40.786536	-103.914448	1,533,306.60	3,439,051.52
15,986.00	90.61	270.59	5,757.10	93.86	-9,522.93	40.786540	-103.914787	1,533,306.34	3,438,957.54
16,081.00	90.30	271.01	5,756.35	95.18	-9,617.92	40.786548	-103.915130	1,533,307.66	3,438,862.56

Design Report for Reagan LD06-685 - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
16,176.00	90.49	271.01	5,755.69	96.86	-9,712.90	40.786557	-103.915473	1,533,309.34	3,438,767.57
16,259.00	90.92	271.24	5,754.67	98.49	-9,795.88	40.786566	-103.915772	1,533,310.97	3,438,684.60
16,320.00	90.92	271.24	5,753.69	99.81	-9,856.86	40.786573	-103.915992	1,533,312.29	3,438,623.62

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,054.00	5,862.50	197.65	329.85	Final Sperry Intermediate Gyro Survey at 6054.00ft
6,149.00	5,875.74	150.21	249.12	First Sperry Production MWD Survey at 6149.00ft
16,259.00	5,754.67	98.49	-9,795.88	Final Sperry Production MWD Survey at 16259.00ft
16,320.00	5,753.69	99.81	-9,856.86	Straight Line Projection to TD at 16320.00ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Reagan LD06-685_Rev A0_BHL	270.67	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
78.00	1,905.00	Gyro Data Surveys	NS-GYRO-MS
2,027.00	6,054.00	Intermediate Sperry MWD Surveys	MWD
6,149.00	16,320.00	Production Sperry MWD Surveys	MWD

Design Report for Reagan LD06-685 - Actual Surveys

Design Targets

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated
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Directional Difficulty Index

Average Dogleg over Survey:	1.89 °/100usft	Maximum Dogleg over Survey:	19.91 °/100usft at 6,149.00 usft
Net Tortousity applicable to Plans:	1.16 °/100usft	Directional Difficulty Index:	6.985

Audit Info

North Reference Sheet for Sec. 5-T9N-R58W (Heston PAD) - Reagan LD06-685 - Plan A

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to KB = 30' @ 4785.00usft (H&P 517). Northing and Easting are relative to Reagan LD06-685

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 1.00000040

Grid Coordinates of Well: 1,533,212.48 usft N, 3,448,480.48 usft E

Geographical Coordinates of Well: 40° 47' 08.92" N, 103° 52' 49.48" W

Grid Convergence at Surface is: 1.05°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,320.00usft

the Bottom Hole Displacement is 9,857.36usft in the Direction of 270.58° (Grid).

Magnetic Convergence at surface is: -6.91° (7 August 2016, , BGGM2016)

