

30-015-44919

22' KB

Chisholm Energy Holdings

Eddy County, NM (NAD 83) Cottonwood 29-32 Fed

API#

WCA 9H

30-015-44919

Wellbore #1

Design: Actual

Sperry Drilling Services Combo Report

12 June, 2018

Well Coordinates: 32° 01' 12.83" N
104° 19' 10.85" W

North American Datum 1983
New Mexico Eastern Zone
371,098.90 N
545,568.70 E

Ground Level: 3,433.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Centered on Well WCA 9H
GE 3433 + 22' KB @ 3455.00usft (22' KB)
N
Grid
API US Survey Feet

Version: 5000.1 Build: 81E

Report Version: Midcon Combo v1.12

HALLIBURTON

Provide Signature Page for
Directional Survey

Design Report for WCA 9H - Actual

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
0.00	0.00	0.00	0.00	0.00 N	0.00 E	371,098.90	545,568.70	0.00	0.00	0.00	
136.00	0.38	187.98	136.00	0.45 S	0.06 W	371,098.45	545,568.64	0.28	0.45	187.98	
235.00	0.28	174.35	235.00	1.01 S	0.08 W	371,097.89	545,568.62	0.13	1.01	-148.55	
295.00	0.44	210.31	295.00	1.36 S	0.19 W	371,097.54	545,568.51	0.45	1.36	73.58	
369.00	0.58	182.38	368.99	1.98 S	0.35 W	371,096.92	545,568.35	0.38	1.98	-75.07	
455.00	0.04	347.16	454.99	2.38 S	0.37 W	371,096.52	545,568.33	0.72	2.38	179.03	
561.00	0.61	306.67	560.99	2.01 S	0.83 W	371,096.89	545,567.87	0.55	2.01	-43.06	
648.00	0.83	285.80	647.98	1.56 S	1.81 W	371,097.34	545,566.89	0.39	1.56	-60.76	
746.00	0.74	129.59	745.98	1.77 S	2.00 W	371,097.13	545,566.70	1.57	1.77	-168.80	
841.00	2.40	112.56	840.94	2.93 S	0.31 E	371,095.97	545,569.01	1.80	2.93	-24.32	
935.00	1.40	56.54	934.90	3.05 S	3.08 E	371,095.85	545,571.78	2.12	3.05	-144.32	
1,030.00	1.96	35.81	1,029.86	1.09 S	5.00 E	371,097.81	545,573.70	0.86	1.09	-58.02	
1,124.00	0.52	346.22	1,123.83	0.63 N	5.84 E	371,099.53	545,574.54	1.78	-0.63	-166.29	
1,219.00	0.96	17.41	1,218.82	1.81 N	5.98 E	371,100.71	545,574.68	0.61	-1.81	58.79	
1,314.00	1.84	42.81	1,313.80	3.68 N	7.25 E	371,102.58	545,575.95	1.11	-3.68	48.34	
1,409.00	1.27	50.52	1,408.76	5.47 N	9.10 E	371,104.37	545,577.80	0.64	-5.47	163.67	
1,503.00	0.83	51.14	1,502.74	6.56 N	10.43 E	371,105.46	545,579.13	0.47	-6.56	178.83	
1,598.00	0.52	49.41	1,597.74	7.27 N	11.30 E	371,106.17	545,580.00	0.33	-7.27	-177.10	
1,693.00	0.67	55.34	1,692.73	7.87 N	12.08 E	371,106.77	545,580.78	0.17	-7.87	25.30	
1,788.00	0.69	61.95	1,787.73	8.46 N	13.04 E	371,107.36	545,581.74	0.09	-8.46	79.02	
1,883.00	0.61	54.52	1,882.72	9.02 N	13.96 E	371,107.92	545,582.66	0.12	-9.02	-137.18	
1,977.00	0.34	75.46	1,976.72	9.38 N	14.64 E	371,108.28	545,583.34	0.34	-9.38	157.44	
2,073.00	0.33	53.27	2,072.72	9.62 N	15.13 E	371,108.52	545,583.83	0.13	-9.62	-105.45	
2,168.00	0.22	26.34	2,167.71	9.94 N	15.43 E	371,108.84	545,584.13	0.18	-9.94	-143.34	
2,263.00	0.50	258.97	2,262.71	10.03 N	15.11 E	371,108.93	545,583.81	0.69	-10.03	-142.80	
2,358.00	0.33	251.89	2,357.71	9.86 N	14.44 E	371,108.76	545,583.14	0.19	-9.86	-166.73	
2,453.00	0.54	236.58	2,452.71	9.53 N	13.81 E	371,108.43	545,582.51	0.25	-9.53	-36.76	
2,548.00	0.63	256.62	2,547.70	9.16 N	12.93 E	371,108.06	545,581.63	0.23	-9.16	76.49	
2,643.00	0.53	240.29	2,642.70	8.82 N	12.04 E	371,107.72	545,580.74	0.20	-8.82	-129.16	
2,716.00	0.56	222.48	2,715.69	8.39 N	11.50 E	371,107.29	545,580.20	0.23	-8.39	-88.94	
2,798.00	0.58	225.10	2,797.69	7.81 N	10.94 E	371,106.71	545,579.64	0.04	-7.81	53.81	
2,862.00	0.78	220.10	2,861.69	7.24 N	10.43 E	371,106.14	545,579.13	0.33	-7.24	-19.04	
2,957.00	0.81	221.05	2,956.68	6.24 N	9.57 E	371,105.14	545,578.27	0.03	-6.24	24.19	
3,052.00	0.83	225.68	3,051.67	5.26 N	8.64 E	371,104.16	545,577.34	0.07	-5.26	75.53	
3,146.00	0.86	220.83	3,145.66	4.25 N	7.69 E	371,103.15	545,576.39	0.08	-4.25	-69.68	
3,241.00	1.12	231.39	3,240.64	3.13 N	6.50 E	371,102.03	545,575.20	0.33	-3.13	40.41	

Design Report for WCA 9H - Actual

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toothface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
3,335.00	1.02	231.49	3,334.63	2.03 N	5.12 E	371,100.93	545,573.82	0.11	-2.03	178.98	
3,429.00	1.05	230.99	3,428.61	0.97 N	3.80 E	371,099.87	545,572.50	0.03	-0.97	-17.00	
3,524.00	1.03	233.18	3,523.60	0.09 S	2.44 E	371,098.81	545,571.14	0.05	0.09	117.80	
3,619.00	0.96	218.34	3,618.58	1.23 S	1.26 E	371,097.67	545,569.96	0.28	1.23	-112.53	
3,713.00	1.10	223.42	3,712.57	2.50 S	0.15 E	371,096.40	545,568.85	0.18	2.50	35.67	
3,807.00	0.70	285.21	3,806.56	3.00 S	1.02 W	371,095.90	545,567.68	1.05	3.00	141.27	
3,901.00	0.44	297.12	3,900.55	2.69 S	1.90 W	371,096.21	545,566.80	0.30	2.69	161.38	
3,996.00	0.32	294.88	3,995.55	2.41 S	2.46 W	371,096.49	545,566.24	0.13	2.41	-174.06	
4,090.00	0.39	253.42	4,089.55	2.39 S	3.01 W	371,096.51	545,565.69	0.28	2.39	-96.13	
4,185.00	0.38	243.04	4,184.55	2.63 S	3.60 W	371,096.27	545,565.10	0.07	2.63	-103.33	
4,279.00	0.44	249.96	4,278.54	2.89 S	4.21 W	371,096.01	545,564.49	0.08	2.89	43.03	
4,374.00	0.42	218.43	4,373.54	3.29 S	4.77 W	371,095.61	545,563.93	0.25	3.29	-110.47	
4,467.00	0.44	217.76	4,466.54	3.84 S	5.20 W	371,095.06	545,563.50	0.02	3.84	-14.45	
4,562.00	0.29	232.16	4,561.54	4.27 S	5.62 W	371,094.63	545,563.08	0.18	4.27	155.62	
4,656.00	0.09	14.44	4,655.54	4.35 S	5.79 W	371,094.55	545,562.91	0.39	4.35	171.33	
4,750.00	0.14	76.59	4,749.54	4.25 S	5.66 W	371,094.65	545,563.04	0.13	4.25	101.24	
4,844.00	0.20	104.35	4,843.54	4.26 S	5.39 W	371,094.64	545,563.31	0.11	4.26	68.35	
4,936.00	0.17	207.09	4,935.54	4.43 S	5.29 W	371,094.47	545,563.41	0.31	4.43	145.08	
5,030.00	0.28	235.85	5,029.53	4.68 S	5.55 W	371,094.22	545,563.15	0.16	4.68	60.75	
5,127.00	0.80	226.61	5,126.53	5.28 S	6.23 W	371,093.62	545,562.47	0.54	5.28	-14.15	
5,222.00	0.98	37.61	5,221.53	5.09 S	6.22 W	371,093.81	545,562.48	1.87	5.09	175.04	
5,317.00	0.73	69.80	5,316.52	4.24 S	5.16 W	371,094.66	545,563.54	0.56	4.24	132.96	
5,411.00	0.43	179.75	5,410.51	4.38 S	4.59 W	371,094.52	545,564.11	1.03	4.38	155.25	
5,505.00	1.35	206.71	5,504.50	5.72 S	5.09 W	371,093.18	545,563.61	1.05	5.72	38.36	
5,600.00	0.31	153.62	5,599.49	6.95 S	5.48 W	371,091.95	545,563.22	1.25	6.95	-167.98	
5,695.00	0.25	148.55	5,694.49	7.36 S	5.26 W	371,091.54	545,563.44	0.07	7.36	-160.08	
5,790.00	1.19	198.43	5,789.48	8.47 S	5.46 W	371,090.43	545,563.24	1.10	8.47	60.40	
5,884.00	0.62	176.98	5,883.47	9.91 S	5.74 W	371,088.99	545,562.96	0.70	9.91	-159.70	
5,979.00	1.22	128.90	5,978.46	11.06 S	4.93 W	371,087.84	545,563.77	0.98	11.06	-77.87	
6,074.00	1.70	150.54	6,073.43	12.92 S	3.45 W	371,085.98	545,565.25	0.76	12.92	60.11	
6,169.00	1.23	193.86	6,168.40	15.14 S	3.00 W	371,083.76	545,565.70	1.23	15.14	133.65	
6,264.00	1.06	297.19	6,263.39	15.72 S	4.02 W	371,083.18	545,564.68	1.89	15.72	145.02	
6,358.00	1.70	295.58	6,357.36	14.72 S	6.05 W	371,084.18	545,562.65	0.68	14.72	-4.27	
6,453.00	0.63	15.49	6,452.34	13.61 S	7.19 W	371,085.29	545,561.51	1.80	13.61	158.68	
6,548.00	0.72	52.90	6,547.34	12.75 S	6.57 W	371,086.15	545,562.13	0.46	12.75	97.56	
6,643.00	1.05	95.63	6,642.33	12.47 S	5.23 W	371,086.43	545,563.47	0.75	12.47	85.88	
6,736.00	0.44	156.19	6,735.32	12.88 S	4.24 W	371,086.02	545,564.46	0.99	12.88	155.32	

Design Report for WCA 9H - Actual

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toothface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
6,831.00	0.65	7.50	6,830.32	12.68 S	4.02 W	371,086.22	545,564.68	1.11	12.68	-161.25	
6,925.00	0.86	39.77	6,924.31	11.61 S	3.50 W	371,087.29	545,565.20	0.50	11.61	80.46	
7,020.00	0.09	35.54	7,019.31	11.00 S	3.00 W	371,087.90	545,565.70	0.81	11.00	-179.51	
7,116.00	1.16	202.51	7,115.30	11.84 S	3.33 W	371,087.06	545,565.37	1.30	11.84	167.90	
7,211.00	1.18	221.23	7,210.28	13.47 S	4.34 W	371,085.43	545,564.36	0.40	13.47	96.39	
7,306.00	0.74	267.43	7,305.27	14.23 S	5.60 W	371,084.67	545,563.10	0.90	14.23	141.35	
7,401.00	1.41	245.40	7,400.25	14.74 S	7.27 W	371,084.16	545,561.43	0.82	14.74	-43.00	
7,453.00	0.91	229.54	7,452.24	15.28 S	8.17 W	371,083.62	545,560.53	1.13	15.28	-155.05	
7,484.00	1.81	123.89	7,483.23	15.71 S	7.95 W	371,083.19	545,560.75	7.21	15.71	-128.73	
7,516.00	5.56	103.83	7,515.16	16.36 S	6.02 W	371,082.54	545,562.68	12.22	16.36	-29.17	
7,547.00	9.76	101.12	7,545.88	17.23 S	1.99 W	371,081.67	545,566.71	13.59	17.23	-6.26	
7,579.00	9.49	109.58	7,577.43	18.64 S	3.16 E	371,080.26	545,571.86	4.50	18.64	104.96	
7,610.00	9.93	133.32	7,608.00	21.33 S	7.52 E	371,077.57	545,576.22	12.90	21.33	95.52	
7,642.00	12.79	148.05	7,639.37	26.16 S	11.50 E	371,072.74	545,580.20	11.84	26.16	47.61	
7,673.00	16.44	157.40	7,669.37	33.06 S	15.11 E	371,065.84	545,583.81	14.91	33.06	43.71	
7,705.00	19.78	165.13	7,699.79	42.48 S	18.24 E	371,056.42	545,586.94	12.84	42.48	39.45	
7,737.00	22.87	173.25	7,729.60	53.89 S	20.36 E	371,045.01	545,589.06	13.34	53.89	47.54	
7,768.00	25.84	171.81	7,757.84	66.56 S	22.03 E	371,032.34	545,590.73	9.77	66.56	-11.96	
7,800.00	30.05	166.95	7,786.10	81.28 S	24.83 E	371,017.62	545,593.53	14.95	81.28	-30.58	
7,831.00	33.83	166.12	7,812.41	97.22 S	28.66 E	371,001.68	545,597.36	12.28	97.22	-6.98	
7,863.00	35.93	167.07	7,838.66	115.02 S	32.90 E	370,983.88	545,601.60	6.78	115.02	14.90	
7,895.00	38.40	168.18	7,864.15	133.91 S	37.03 E	370,964.99	545,605.73	8.00	133.91	15.63	
7,927.00	41.33	170.13	7,888.71	154.05 S	40.88 E	370,944.85	545,609.58	9.95	154.05	23.86	
7,958.00	45.12	171.43	7,911.30	175.00 S	44.27 E	370,923.90	545,612.97	12.56	175.00	13.70	
7,990.00	47.77	172.51	7,933.35	197.96 S	47.51 E	370,900.94	545,616.21	8.63	197.96	16.83	
8,021.00	50.46	172.60	7,953.64	221.20 S	50.55 E	370,877.70	545,619.25	8.68	221.20	1.48	
8,053.00	52.25	172.11	7,973.62	245.97 S	53.87 E	370,852.93	545,622.57	5.72	245.97	-12.22	
8,084.00	54.41	172.33	7,992.13	270.60 S	57.24 E	370,828.30	545,625.94	6.99	270.60	4.74	
8,116.00	56.39	171.55	8,010.30	296.68 S	60.93 E	370,802.22	545,629.63	6.50	296.68	-18.19	
8,147.00	58.10	170.95	8,027.07	322.45 S	64.90 E	370,776.45	545,633.60	5.75	322.45	-16.60	
8,179.00	60.22	171.49	8,043.48	349.60 S	69.09 E	370,749.30	545,637.79	6.78	349.60	12.48	
8,211.00	62.83	172.92	8,058.73	377.47 S	72.90 E	370,721.43	545,641.60	9.05	377.47	26.06	
8,242.00	66.39	174.58	8,072.02	405.30 S	75.94 E	370,693.60	545,644.64	12.46	405.30	23.20	
8,274.00	70.69	175.94	8,083.73	434.97 S	78.40 E	370,663.93	545,647.10	14.01	434.97	16.66	
8,305.00	73.14	176.04	8,093.35	464.37 S	80.46 E	370,634.53	545,649.16	7.91	464.37	2.24	
8,337.00	73.83	176.21	8,102.45	494.98 S	82.53 E	370,603.92	545,651.23	2.22	494.98	13.31	
8,368.00	75.21	176.34	8,110.72	524.79 S	84.47 E	370,574.11	545,653.17	4.47	524.79	5.20	

Design Report for WCA 9H - Actual

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)								
8,400.00	79.57	176.33	8,117.71	555.94 S	86.47 E	370,542.96	545,655.17	13.63	555.94	-0.13	
8,432.00	82.65	176.86	8,122.65	587.50 S	88.35 E	370,511.40	545,657.05	9.76	587.50	9.69	
8,463.00	85.81	177.28	8,125.77	618.30 S	89.92 E	370,480.60	545,658.62	10.28	618.30	7.56	
8,495.00	88.83	177.62	8,127.26	650.23 S	91.34 E	370,448.67	545,660.04	9.50	650.23	6.43	
8,564.00	90.43	177.47	8,127.71	719.16 S	94.30 E	370,379.74	545,663.00	2.33	719.16	-5.36	
8,658.00	93.95	178.48	8,124.12	813.02 S	97.62 E	370,285.88	545,666.32	3.90	813.02	15.98	
8,752.00	90.25	177.62	8,120.67	906.88 S	100.81 E	370,192.02	545,669.51	4.04	906.88	-166.91	
8,846.00	89.75	177.30	8,120.67	1,000.79 S	104.98 E	370,098.11	545,673.68	0.63	1,000.79	-147.38	
8,941.00	91.73	177.59	8,119.45	1,095.68 S	109.22 E	370,003.22	545,677.92	2.11	1,095.68	8.33	
9,036.00	87.10	177.37	8,120.42	1,190.56 S	113.39 E	369,908.34	545,682.09	4.88	1,190.56	-177.28	
9,131.00	88.39	178.71	8,124.15	1,285.43 S	116.64 E	369,813.47	545,685.34	1.96	1,285.43	46.10	
9,225.00	91.42	180.92	8,124.31	1,379.41 S	116.94 E	369,719.49	545,685.64	3.99	1,379.41	36.11	
9,320.00	90.74	179.73	8,122.52	1,474.39 S	116.40 E	369,624.51	545,685.10	1.44	1,474.39	-119.74	
9,414.00	92.16	179.82	8,120.14	1,568.36 S	116.77 E	369,530.54	545,685.47	1.51	1,568.36	3.62	
9,509.00	94.70	180.20	8,114.46	1,663.18 S	116.75 E	369,435.72	545,685.45	2.70	1,663.18	8.48	
9,604.00	91.54	178.34	8,109.29	1,758.01 S	117.97 E	369,340.89	545,686.67	3.86	1,758.01	-149.50	
9,699.00	90.62	178.53	8,107.50	1,852.96 S	120.56 E	369,245.94	545,689.26	0.99	1,852.96	168.33	
9,793.00	94.14	178.55	8,103.59	1,946.83 S	122.95 E	369,152.07	545,691.65	3.74	1,946.83	0.32	
9,888.00	93.21	177.56	8,097.50	2,041.58 S	126.17 E	369,057.32	545,694.87	1.43	2,041.58	-133.24	
9,982.00	93.34	177.24	8,092.13	2,135.33 S	130.43 E	368,963.57	545,699.13	0.37	2,135.33	-67.85	
10,077.00	93.33	176.27	8,086.61	2,230.02 S	135.80 E	368,868.88	545,704.50	1.02	2,230.02	-90.56	
10,172.00	92.66	177.52	8,081.64	2,324.75 S	140.93 E	368,774.15	545,709.63	1.49	2,324.75	118.19	
10,267.00	91.85	179.07	8,077.91	2,419.63 S	143.76 E	368,679.27	545,712.46	1.84	2,419.63	117.58	
10,364.00	90.74	179.40	8,075.71	2,516.59 S	145.05 E	368,582.31	545,713.75	1.19	2,516.59	163.44	
10,458.00	89.94	178.81	8,075.16	2,610.58 S	146.52 E	368,488.32	545,715.22	1.06	2,610.58	-143.59	
10,553.00	89.26	178.18	8,075.82	2,705.54 S	149.02 E	368,393.36	545,717.72	0.98	2,705.54	-137.19	
10,648.00	90.31	178.72	8,076.18	2,800.50 S	151.58 E	368,298.40	545,720.28	1.24	2,800.50	27.22	
10,743.00	91.17	180.07	8,074.95	2,895.49 S	152.59 E	368,203.41	545,721.29	1.68	2,895.49	57.49	
10,836.00	90.56	179.46	8,073.54	2,988.48 S	152.97 E	368,110.42	545,721.67	0.93	2,988.48	-135.00	
10,931.00	89.51	179.90	8,073.49	3,083.47 S	153.50 E	368,015.43	545,722.20	1.20	3,083.47	157.26	
11,026.00	92.16	181.06	8,072.10	3,178.45 S	152.70 E	367,920.45	545,721.40	3.04	3,178.45	23.63	
11,118.00	93.52	181.07	8,067.54	3,270.32 S	151.00 E	367,828.58	545,719.70	1.48	3,270.32	0.42	
11,213.00	93.46	179.47	8,061.76	3,365.14 S	150.55 E	367,733.76	545,719.25	1.68	3,365.14	-92.10	
11,308.00	92.22	180.26	8,057.05	3,460.02 S	150.77 E	367,638.88	545,719.47	1.55	3,460.02	147.51	
11,403.00	93.77	181.87	8,052.09	3,554.87 S	149.01 E	367,544.03	545,717.71	2.35	3,554.87	46.01	
11,498.00	90.25	179.98	8,048.76	3,649.78 S	147.48 E	367,449.12	545,716.18	4.20	3,649.78	-151.74	

Design Report for WCA 9H - Actual

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
11,592.00	91.30	180.24	8,047.49	3,743.77 S	147.30 E	367,355.13	545,716.00	1.15	3,743.77	13.91	
11,687.00	91.73	180.75	8,044.97	3,838.73 S	146.48 E	367,260.17	545,715.18	0.70	3,838.73	49.85	
11,782.00	90.49	181.51	8,043.13	3,933.69 S	144.61 E	367,165.21	545,713.31	1.53	3,933.69	148.49	
11,876.00	89.51	181.05	8,043.13	4,027.66 S	142.51 E	367,071.24	545,711.21	1.15	4,027.66	-154.85	
11,971.00	89.63	180.35	8,043.85	4,122.65 S	141.35 E	366,976.25	545,710.05	0.75	4,122.65	-80.27	
12,066.00	88.46	179.97	8,045.43	4,217.64 S	141.08 E	366,881.26	545,709.78	1.29	4,217.64	-162.01	
12,160.00	87.84	179.39	8,048.47	4,311.59 S	141.61 E	366,787.31	545,710.31	0.90	4,311.59	-136.93	
12,255.00	89.51	179.15	8,050.66	4,406.55 S	142.82 E	366,692.35	545,711.52	1.78	4,406.55	-8.18	
12,349.00	91.85	178.05	8,049.55	4,500.51 S	145.11 E	366,598.39	545,713.81	2.75	4,500.51	-25.17	
12,444.00	92.41	178.73	8,046.02	4,595.40 S	147.78 E	366,503.50	545,716.48	0.93	4,595.40	50.50	
12,538.00	90.99	179.30	8,043.23	4,689.35 S	149.39 E	366,409.55	545,718.09	1.63	4,689.35	158.13	
12,633.00	91.24	179.65	8,041.38	4,784.32 S	150.26 E	366,314.58	545,718.96	0.45	4,784.32	54.45	
12,728.00	89.81	178.88	8,040.51	4,879.31 S	151.48 E	366,219.59	545,720.18	1.71	4,879.31	-151.70	
12,822.00	89.69	178.76	8,040.92	4,973.29 S	153.42 E	366,125.61	545,722.12	0.18	4,973.29	-135.00	
12,917.00	90.80	179.54	8,040.51	5,068.27 S	154.83 E	366,030.63	545,723.53	1.43	5,068.27	35.09	
13,012.00	92.16	180.01	8,038.06	5,163.24 S	155.20 E	365,935.66	545,723.90	1.51	5,163.24	19.05	
13,107.00	89.69	179.15	8,036.52	5,258.22 S	155.90 E	365,840.68	545,724.60	2.75	5,258.22	-160.80	
13,202.00	89.38	179.35	8,037.30	5,353.21 S	157.14 E	365,745.69	545,725.84	0.39	5,353.21	147.17	
13,296.00	90.06	179.03	8,037.76	5,447.19 S	158.47 E	365,651.71	545,727.17	0.80	5,447.19	-25.20	
13,391.00	89.75	178.19	8,037.91	5,542.16 S	160.77 E	365,556.74	545,729.47	0.94	5,542.16	-110.26	
13,486.00	90.49	178.95	8,037.71	5,637.13 S	163.14 E	365,461.77	545,731.84	1.12	5,637.13	45.76	
13,580.00	89.94	179.09	8,037.36	5,731.12 S	164.75 E	365,367.78	545,733.45	0.60	5,731.12	165.72	
13,675.00	91.54	180.28	8,036.13	5,826.10 S	165.27 E	365,272.80	545,733.97	2.10	5,826.10	36.63	
13,769.00	91.17	180.71	8,033.91	5,920.07 S	164.46 E	365,178.83	545,733.16	0.60	5,920.07	130.71	
13,863.00	89.57	182.01	8,033.30	6,014.04 S	162.23 E	365,084.86	545,730.93	2.19	6,014.04	140.90	
13,957.00	88.89	182.85	8,034.57	6,107.95 S	158.25 E	364,990.95	545,726.95	1.15	6,107.95	129.00	
14,052.00	90.80	183.30	8,034.82	6,202.80 S	153.15 E	364,896.10	545,721.85	2.07	6,202.80	13.26	
14,146.00	91.67	183.16	8,032.80	6,296.63 S	147.86 E	364,802.27	545,716.56	0.94	6,296.63	-9.14	
14,241.00	89.81	182.94	8,031.57	6,391.49 S	142.80 E	364,707.41	545,711.50	1.97	6,391.49	-173.25	
14,336.00	89.07	182.96	8,032.50	6,486.36 S	137.91 E	364,612.54	545,706.61	0.78	6,486.36	178.45	
14,431.00	87.77	183.00	8,035.12	6,581.19 S	132.98 E	364,517.71	545,701.68	1.37	6,581.19	178.24	
14,525.00	86.42	182.75	8,039.88	6,674.95 S	128.27 E	364,423.95	545,696.97	1.46	6,674.95	-169.53	
14,620.00	85.74	181.71	8,046.38	6,769.65 S	124.58 E	364,329.25	545,693.28	1.31	6,769.65	-123.27	
14,714.00	84.00	180.13	8,054.78	6,863.26 S	123.07 E	364,235.64	545,691.77	2.50	6,863.26	-137.94	
14,784.00	83.13	179.94	8,062.63	6,932.81 S	123.03 E	364,166.09	545,691.73	1.27	6,932.81	-167.77	Last MWD Survey - 14784.00' MD
14,848.00	83.13	179.94	8,070.28	6,996.35 S	123.10 E	364,102.55	545,691.80	0.00	6,996.35	0.00	Projection to TD - 14848.00' MD

Design Report for WCA 9H - Actual

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
14,784.00	8,062.63	-6,932.81	123.03	Last MWD Survey - 14784.00' MD
14,848.00	8,070.28	-6,996.35	123.10	Projection to TD - 14848.00' MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	180.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
136.00	14,784.00	HAL MWD	MWD
14,848.00	14,848.00	Projection to TD	Blind (OWSG)

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (°)	+N/-S (°)	+E/-W (°)	Northing (°)	Easting (°)	Latitude	Longitude
()									

Directional Difficulty Index

Average Dogleg over Survey:	1.69 °/100usft	Maximum Dogleg over Survey:	14.95 °/100usft at 7,800.00 usft
Net Tortousity applicable to Plans:	0.25 °/100usft	Directional Difficulty Index:	6.512

Audit Info

North Reference Sheet for Cottonwood 29-32 Fed - WCA 9H - Wellbore #1

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

Vertical Depths are relative to GE 3433 + 22' KB @ 3455.00usft (22' KB). Northing and Easting are relative to WCA 9H

Coordinate System is US State Plane 1983, New Mexico Eastern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is 104° 20' 0.000 W*, Longitude Origin: 0° 0' 0.000 E*, Latitude Origin: 0° 0' 0.000 N*

False Easting: 541,337.50usft, False Northing: 0.00usft, Scale Reduction: 0.99990911

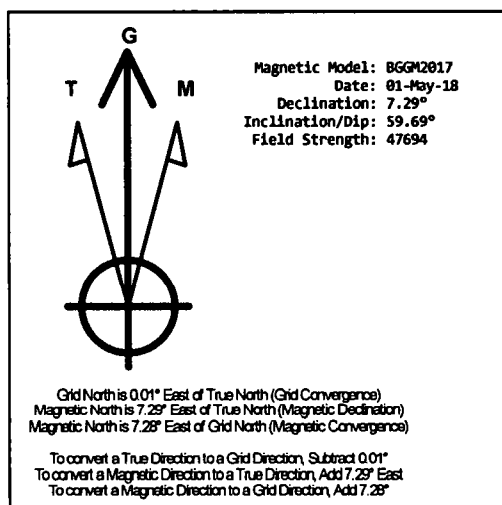
Grid Coordinates of Well: 371,098.90 usft N, 545,568.70 usft E

Geographical Coordinates of Well: 32° 01' 12.83" N, 104° 19' 10.85" W

Grid Convergence at Surface is: 0.01°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,848.00usft
the Bottom Hole Displacement is 6,997.44usft in the Direction of 178.99° (Grid).

Magnetic Convergence at surface is: -7.28° (1 May 2018, , BGGM2017)





Chisholm Energy Holdings

GE 3433 + 22' KB @ 3455.00usft (22' KB)
Ground Level: 3433.00

Project: Eddy County, NM (HAD 83)
Site: Cottonwood 29-32 Fed
Well: WCA 8H
Wellbore: Wellbore #1
Design: Actual
Rig: 22' KB



Azimuth to Grid North:
True North: -0.61°
Magnetic North: 7.28°
Magnetic Field
Strength: 47853.9nT
Dip Angle: 68.43°
Date: 5/1/2018
Model: BGGM2017

Map System: US State Plane 1683
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone Name: New Mexico Eastern Zone

WELL DETAILS

	•N/-S	•E/-W	Northing	Ground Level	Easting	Latitude	Longitude
	0.00	0.00	371098.90	3433.00	545568.70	32° 1' 12.829 N	104° 19' 10.851 W

