

Devon Energy Corporation

North Thistle 15-10 State Com 001H

Lea County, NM (NAD 83)

HOBBS OCD
AUG 29 2019
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Sperry Drilling Services

End Of Well Report

HOBBS OCD
AUG 29 2019
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17 January, 201

HALLIBURTON

End Of Well Report

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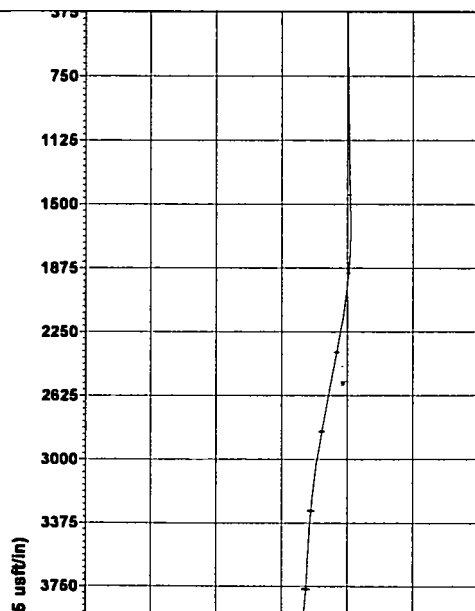
WELL DETAILS: North Thistle 15-10 State Com 001H

RKB (Nabors X05) 33' + GL @ 3743.0usft
3710.0

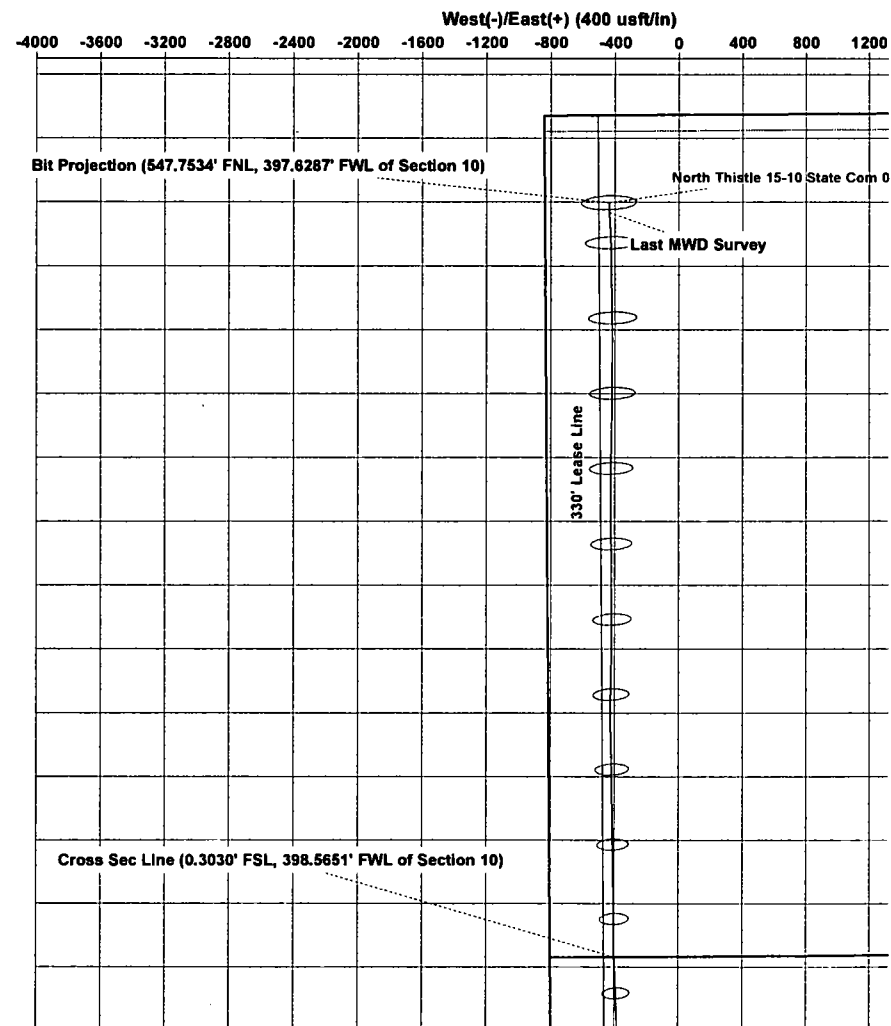
Northing Easting Latitude Longitude
473215.69 778337.06 32° 17' 55.007 N 103° 33' 58.690 W

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	V Sect	Departure	Annotation
268.0	0.22	35.66	268.0	0.4	0.3	0.4	0.5	First MWD Survey
6054.0	5.06	231.65	6028.8	-316.6	-286.5	-316.6	465.3	Cross Perf Line (99.9990' FSL, 470.5445' FWL of Section 15)
9159.0	1.25	323.33	9130.5	-378.7	-348.5	-378.7	564.7	KOP (38.2281' FSL, 407.9539' FWL of Section 15)
9391.0	26.57	357.66	9352.1	-316.9	-351.4	-316.9	626.8	Cross Perf Line (100.0680' FSL, 405.6099' FWL of Section 15)
14720.0	91.26	358.53	9697.0	4864.8	-402.9	4864.8	5809.6	Cross Sec Line (0.3030' FSL, 398.5651' FWL of Section 10)
19393.0	90.37	356.94	9654.3	9536.1	-437.8	9536.1	10481.7	Last MWD Survey
19455.0	90.37	356.94	9653.9	9598.0	-441.1	9598.0	10543.7	Bit Projection (547.7534' FNL, 397.6287' FWL of Section 10)



devon



Devon Energy Corporation

Lea County, NM (NAD 83) North Thistle Pad

API#

North Thistle 15-10 State Com 001H

SHL: (415' FSL - 760' FWL)

Wellbore #1

Design: Actual Drilled

Sperry Drilling Services Combo Report

17 January, 2019

Well Coordinates: 32° 17' 55.007 N
103° 33' 58.690 W

North American Datum 1983
New Mexico Eastern Zone
473,215.69 N
778,337.06 E

Ground Level: 3,710.00 usft

Local Coordinate Origin:

Centered on Well North Thistle 15-10 State Com 001H

Viewing Datum:

RKB (Nabors X05) 33' + GL @ 3743.0usft

TVDs to System:

N

North Reference:

Grid

Unit System:

API - US Survey Feet

Version: 5000.15 Build: 91

Report Version: Midcon Combo v1.13

HALLIBURTON

Design Report for North Thistle 15-10 State Com 001H - Actual Drilled

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)				
0.0	0.00	0.00	0.0	0.00 N	0.00 E	473,215.69	778,337.06	0.00	0.0	0.00	
268.0	0.22	35.66	268.0	0.42 N	0.30 E	473,216.11	778,337.36	0.08	0.4	35.66	First MWD Survey
358.0	0.32	49.87	358.0	0.72 N	0.59 E	473,216.41	778,337.65	0.13	0.7	41.05	
449.0	0.36	56.43	449.0	1.04 N	1.03 E	473,216.73	778,338.09	0.06	1.0	47.53	
540.0	0.14	86.21	540.0	1.21 N	1.37 E	473,216.90	778,338.43	0.27	1.2	163.75	
630.0	0.63	293.81	630.0	1.41 N	1.03 E	473,217.10	778,338.09	0.84	1.4	-157.32	
720.0	0.48	20.80	720.0	1.97 N	0.71 E	473,217.66	778,337.77	0.86	2.0	141.60	
811.0	0.16	45.59	811.0	2.41 N	0.94 E	473,218.10	778,338.00	0.38	2.4	168.67	
902.0	0.22	32.68	902.0	2.65 N	1.12 E	473,218.34	778,338.18	0.08	2.6	-42.08	
994.0	0.55	3.47	994.0	3.24 N	1.25 E	473,218.93	778,338.31	0.41	3.2	-45.90	
1,085.0	0.69	16.10	1,085.0	4.20 N	1.42 E	473,219.89	778,338.48	0.21	4.2	50.74	
1,175.0	0.52	356.91	1,175.0	5.13 N	1.55 E	473,220.82	778,338.61	0.29	5.1	-139.33	
1,266.0	0.55	35.90	1,266.0	5.89 N	1.79 E	473,221.58	778,338.85	0.39	5.9	104.97	
1,356.0	0.87	16.58	1,356.0	6.90 N	2.23 E	473,222.59	778,339.29	0.44	6.9	-46.72	
1,382.0	0.90	17.06	1,382.0	7.28 N	2.35 E	473,222.97	778,339.41	0.12	7.3	14.12	
1,446.0	0.48	18.96	1,446.0	8.02 N	2.59 E	473,223.71	778,339.65	0.66	8.0	177.83	
1,537.0	0.76	16.30	1,537.0	8.96 N	2.88 E	473,224.65	778,339.94	0.31	9.0	-7.20	
1,626.0	0.43	306.52	1,626.0	9.72 N	2.78 E	473,225.41	778,339.84	0.82	9.7	-146.57	
1,717.0	1.41	230.05	1,716.9	9.21 N	1.64 E	473,224.90	778,338.70	1.51	9.2	-94.17	
1,810.0	2.34	219.80	1,809.9	7.01 N	0.45 W	473,222.70	778,336.61	1.06	7.0	-25.00	
1,904.0	3.27	208.63	1,903.8	3.19 N	2.96 W	473,218.88	778,334.10	1.14	3.2	-36.10	
1,996.0	4.05	210.36	1,995.6	1.92 S	5.86 W	473,213.77	778,331.20	0.86	-1.9	8.92	
2,090.0	4.66	213.63	2,089.3	7.96 S	9.65 W	473,207.73	778,327.41	0.70	-8.0	23.79	
2,184.0	5.89	214.54	2,182.9	15.12 S	14.50 W	473,200.57	778,322.56	1.31	-15.1	4.34	
2,278.0	6.55	215.52	2,276.4	23.45 S	20.35 W	473,192.24	778,316.71	0.71	-23.5	9.63	
2,373.0	7.07	218.76	2,370.7	32.42 S	27.16 W	473,183.27	778,309.90	0.68	-32.4	38.07	
2,466.0	7.70	220.35	2,462.9	41.63 S	34.78 W	473,174.06	778,302.28	0.71	-41.6	18.76	
2,560.0	7.54	220.89	2,556.1	51.09 S	42.89 W	473,164.60	778,294.17	0.19	-51.1	156.16	
2,654.0	7.50	224.78	2,649.3	60.11 S	51.25 W	473,155.58	778,285.81	0.54	-60.1	96.42	
2,749.0	7.54	224.36	2,743.5	68.97 S	59.98 W	473,146.72	778,277.08	0.07	-69.0	-54.16	
2,843.0	7.41	224.45	2,836.7	77.71 S	68.53 W	473,137.98	778,268.53	0.14	-77.7	174.90	
2,937.0	7.53	225.66	2,929.9	86.34 S	77.18 W	473,129.35	778,259.88	0.21	-86.3	53.26	
3,031.0	7.39	230.66	3,023.1	94.47 S	86.26 W	473,121.22	778,250.80	0.71	-94.5	104.64	
3,126.0	6.48	237.66	3,117.4	101.22 S	95.52 W	473,114.47	778,241.54	1.31	-101.2	140.55	
3,220.0	6.21	240.83	3,210.8	106.53 S	104.44 W	473,109.16	778,232.62	0.47	-106.5	129.19	
3,313.0	6.36	241.84	3,303.2	111.41 S	113.37 W	473,104.28	778,223.69	0.20	-111.4	36.90	

Design Report for North Thistle 15-10 State Com 001H - Actual Drilled

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate	Vertical Section	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)	(°/100usft)	(usft)		
3,406.0	6.33	249.26	3,395.7	115.66 S	122.71 W	473,100.03	778,214.35	0.88	-115.7	95.78	
3,501.0	5.21	252.20	3,490.2	118.83 S	131.71 W	473,096.86	778,205.35	1.22	-118.8	166.68	
3,596.0	4.08	247.69	3,584.9	121.43 S	138.95 W	473,094.26	778,198.11	1.25	-121.4	-164.33	
3,687.0	3.43	236.62	3,675.7	124.16 S	144.22 W	473,091.53	778,192.84	1.07	-124.2	-137.31	
3,779.0	3.38	230.26	3,767.5	127.40 S	148.59 W	473,088.29	778,188.47	0.42	-127.4	-103.69	
3,872.0	3.50	223.31	3,860.4	131.21 S	152.63 W	473,084.48	778,184.43	0.47	-131.2	-74.88	
3,965.0	4.56	210.00	3,953.1	136.47 S	156.43 W	473,079.22	778,180.63	1.51	-136.5	-48.19	
4,059.0	5.14	203.74	4,046.8	143.57 S	159.99 W	473,072.12	778,177.07	0.83	-143.6	-45.53	
4,153.0	5.91	204.92	4,140.4	151.81 S	163.72 W	473,063.88	778,173.34	0.83	-151.8	8.98	
4,246.0	6.24	202.96	4,232.8	160.80 S	167.71 W	473,054.89	778,169.35	0.42	-160.8	-33.13	
4,339.0	5.99	193.81	4,325.3	170.17 S	170.84 W	473,045.52	778,166.22	1.08	-170.2	-108.91	
4,432.0	6.69	186.89	4,417.7	180.26 S	172.65 W	473,035.43	778,164.41	1.11	-180.3	-50.98	
4,527.0	7.16	186.59	4,512.0	191.64 S	173.99 W	473,024.05	778,163.07	0.50	-191.6	-4.55	
4,621.0	7.66	201.44	4,605.3	203.29 S	176.96 W	473,012.40	778,160.10	2.10	-203.3	82.81	
4,716.0	7.68	203.09	4,699.4	215.02 S	181.76 W	473,000.67	778,155.30	0.23	-215.0	85.63	
4,809.0	8.06	206.17	4,791.5	226.59 S	187.07 W	472,989.10	778,149.99	0.61	-226.6	49.51	
4,903.0	8.79	212.45	4,884.5	238.56 S	193.83 W	472,977.13	778,143.23	1.25	-238.6	54.71	
4,997.0	8.42	218.59	4,977.5	250.00 S	201.98 W	472,965.69	778,135.08	1.05	-250.0	114.95	
5,093.0	7.63	231.33	5,072.5	259.48 S	211.34 W	472,956.21	778,125.72	2.02	-259.5	120.17	
5,188.0	6.03	242.53	5,166.9	265.72 S	220.69 W	472,949.97	778,116.37	2.18	-265.7	145.69	
5,282.0	5.51	244.44	5,260.4	269.95 S	229.14 W	472,945.74	778,107.92	0.59	-269.9	160.68	
5,443.0	5.32	237.86	5,420.7	277.26 S	242.44 W	472,938.43	778,094.62	0.40	-277.3	-110.27	
5,538.0	5.43	222.62	5,515.3	282.91 S	249.21 W	472,932.78	778,087.85	1.50	-282.9	-93.21	
5,631.0	5.35	216.18	5,607.8	289.64 S	254.75 W	472,926.05	778,082.31	0.66	-289.6	-100.73	
5,725.0	5.83	230.55	5,701.4	296.21 S	261.02 W	472,919.48	778,076.04	1.57	-296.2	78.32	
5,819.0	6.00	232.19	5,794.9	302.26 S	268.59 W	472,913.43	778,068.47	0.25	-302.3	45.65	
5,913.0	5.73	231.38	5,888.4	308.20 S	276.14 W	472,907.49	778,060.92	0.30	-308.2	-163.36	
6,007.0	5.30	230.50	5,982.0	313.89 S	283.16 W	472,901.80	778,053.90	0.47	-313.9	-169.31	
6,054.0	5.06	231.65	6,028.8	316.56 S	286.46 W	472,899.13	778,050.60	0.55	-316.6	156.87	Cross Perf Line (99.9990' FSL, 470.5445' FWL of Section 15)
6,099.0	4.84	232.85	6,073.6	318.94 S	289.53 W	472,896.75	778,047.53	0.55	-318.9	155.73	
6,194.0	4.98	230.24	6,168.3	324.00 S	295.89 W	472,891.69	778,041.17	0.28	-324.0	-59.23	
6,287.0	5.07	228.68	6,260.9	329.29 S	302.08 W	472,886.40	778,034.98	0.18	-329.3	-57.41	
6,381.0	4.98	228.27	6,354.6	334.75 S	308.25 W	472,880.94	778,028.81	0.10	-334.7	-158.45	
6,476.0	4.89	226.35	6,449.2	340.29 S	314.25 W	472,875.40	778,022.81	0.20	-340.3	-119.54	
6,570.0	5.02	226.88	6,542.8	345.86 S	320.15 W	472,869.83	778,016.91	0.15	-345.9	19.66	
6,663.0	4.66	221.10	6,635.5	351.49 S	325.61 W	472,864.20	778,011.45	0.65	-351.5	-129.29	

Design Report for North Thistle 15-10 State Com 001H - Actual Drilled

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)				
6,758.0	4.64	220.47	6,730.2	357.32 S	330.64 W	472,858.37	778,006.42	0.06	-357.3	-111.70	
6,852.0	4.46	219.15	6,823.9	363.05 S	335.41 W	472,852.64	778,001.65	0.22	-363.1	-150.47	
6,946.0	3.19	218.74	6,917.7	367.92 S	339.36 W	472,847.77	777,997.70	1.35	-367.9	-178.97	
7,041.0	1.18	221.85	7,012.6	370.72 S	341.66 W	472,844.97	777,995.40	2.12	-370.7	178.18	
7,134.0	0.59	204.50	7,105.6	371.86 S	342.50 W	472,843.83	777,994.56	0.69	-371.9	-164.08	
7,229.0	0.59	213.22	7,200.6	372.72 S	342.97 W	472,842.97	777,994.09	0.09	-372.7	94.36	
7,321.0	0.36	212.80	7,292.6	373.36 S	343.39 W	472,842.33	777,993.67	0.25	-373.4	-179.34	
7,415.0	0.34	239.93	7,386.6	373.75 S	343.79 W	472,841.94	777,993.27	0.18	-373.7	110.32	
7,508.0	0.48	234.22	7,479.6	374.11 S	344.35 W	472,841.58	777,992.71	0.16	-374.1	-19.14	
7,600.0	0.69	207.83	7,571.6	374.83 S	344.92 W	472,840.86	777,992.14	0.37	-374.8	-65.76	
7,694.0	1.14	186.76	7,665.6	376.26 S	345.29 W	472,839.43	777,991.77	0.59	-376.3	-47.63	
7,787.0	0.47	36.80	7,758.6	376.87 S	345.17 W	472,838.82	777,991.89	1.68	-376.9	-171.35	
7,881.0	0.78	23.59	7,852.6	375.97 S	344.68 W	472,839.72	777,992.38	0.36	-376.0	-31.63	
7,975.0	0.71	44.98	7,946.6	374.98 S	344.02 W	472,840.71	777,993.04	0.30	-375.0	114.66	
8,068.0	0.56	65.73	8,039.6	374.38 S	343.19 W	472,841.31	777,993.87	0.29	-374.4	133.20	
8,161.0	0.31	87.96	8,132.6	374.19 S	342.53 W	472,841.50	777,994.53	0.32	-374.2	156.75	
8,253.0	0.19	101.94	8,224.6	374.21 S	342.13 W	472,841.48	777,994.93	0.15	-374.2	159.93	
8,345.0	0.03	196.30	8,316.6	374.26 S	341.99 W	472,841.43	777,995.07	0.21	-374.3	171.16	
8,438.0	0.22	140.17	8,409.6	374.42 S	341.88 W	472,841.27	777,995.18	0.22	-374.4	-63.12	
8,531.0	0.25	227.78	8,502.6	374.70 S	341.92 W	472,840.99	777,995.14	0.35	-374.7	130.00	
8,625.0	0.48	219.74	8,596.6	375.14 S	342.32 W	472,840.55	777,994.74	0.25	-375.1	-16.59	
8,719.0	0.82	233.32	8,690.5	375.84 S	343.11 W	472,839.85	777,993.95	0.39	-375.8	31.27	
8,814.0	0.82	236.67	8,785.5	376.62 S	344.22 W	472,839.07	777,992.84	0.05	-376.6	91.67	
8,907.0	0.84	242.76	8,878.5	377.30 S	345.39 W	472,838.39	777,991.67	0.10	-377.3	80.28	
9,002.0	0.87	228.24	8,973.5	378.10 S	346.54 W	472,837.59	777,990.52	0.23	-378.1	-89.42	
9,098.0	0.87	236.50	9,067.5	378.97 S	347.67 W	472,836.72	777,989.39	0.13	-379.0	94.13	
9,159.0	1.25	323.33	9,130.5	378.68 S	348.48 W	472,837.01	777,988.58	2.35	-378.7	122.88	KOP (38.2281' FSL, 407.9539' FWL of Section 15)
9,189.0	5.11	357.64	9,160.4	377.08 S	348.73 W	472,838.61	777,988.33	13.79	-377.1	44.09	
9,221.0	10.70	358.04	9,192.1	372.69 S	348.89 W	472,843.00	777,988.17	17.47	-372.7	0.76	
9,251.0	13.93	357.10	9,221.4	366.30 S	349.17 W	472,849.39	777,987.89	10.79	-366.3	-4.01	
9,284.0	18.38	357.95	9,253.1	357.12 S	349.56 W	472,858.57	777,987.50	13.50	-357.1	3.45	
9,316.0	20.49	357.68	9,283.3	346.48 S	349.96 W	472,869.21	777,987.10	6.60	-346.5	-2.57	
9,348.0	22.74	357.03	9,313.0	334.71 S	350.51 W	472,880.98	777,986.55	7.07	-334.7	-6.38	
9,379.0	25.33	357.13	9,341.4	322.10 S	351.15 W	472,893.59	777,985.91	8.36	-322.1	0.95	
9,391.0	26.57	357.66	9,352.1	316.86 S	351.39 W	472,898.83	777,985.67	10.51	-316.9	10.85	Cross Perf Line (100.0680' FSL, 405.6099' FWL of Section 15)
9,411.0	28.64	358.45	9,369.9	307.60 S	351.70 W	472,908.09	777,985.36	10.51	-307.6	10.37	

Design Report for North Thistle 15-10 State Com 001H - Actual Drilled

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)				
9,442.0	31.89	0.88	9,396.6	291.98 S	351.78 W	472,923.71	777,985.28	11.20	-292.0	21.70	
9,474.0	35.56	1.62	9,423.3	274.22 S	351.39 W	472,941.47	777,985.67	11.54	-274.2	6.70	
9,506.0	38.27	1.12	9,448.8	255.00 S	350.93 W	472,960.69	777,986.13	8.52	-255.0	-6.52	
9,538.0	40.71	0.44	9,473.5	234.66 S	350.66 W	472,981.03	777,986.40	7.74	-234.7	-10.31	
9,569.0	42.77	0.76	9,496.7	214.02 S	350.44 W	473,001.67	777,986.62	6.68	-214.0	6.02	
9,601.0	45.51	1.59	9,519.6	191.74 S	349.98 W	473,023.95	777,987.08	8.75	-191.7	12.21	
9,633.0	47.60	1.97	9,541.6	168.52 S	349.25 W	473,047.17	777,987.81	6.59	-168.5	7.65	
9,664.0	48.64	1.62	9,562.3	145.45 S	348.53 W	473,070.24	777,988.53	3.46	-145.5	-14.18	
9,696.0	50.39	1.06	9,583.1	121.12 S	347.96 W	473,094.57	777,989.10	5.63	-121.1	-13.86	
9,728.0	54.19	1.39	9,602.7	95.82 S	347.42 W	473,119.87	777,989.64	11.90	-95.8	4.03	
9,759.0	58.70	0.41	9,619.8	69.99 S	347.02 W	473,145.70	777,990.04	14.78	-70.0	-10.54	
9,790.0	62.01	0.07	9,635.1	43.08 S	346.91 W	473,172.63	777,990.15	10.72	-43.1	-5.19	
9,822.0	63.39	358.87	9,649.8	14.62 S	347.18 W	473,201.07	777,989.88	5.45	-14.6	-37.97	
9,853.0	64.01	359.07	9,663.5	13.16 N	347.67 W	473,228.85	777,989.39	2.08	13.2	16.17	
9,885.0	66.36	0.63	9,677.0	42.21 N	347.75 W	473,257.90	777,989.31	8.57	42.2	31.40	
9,917.0	68.59	3.54	9,689.2	71.74 N	346.67 W	473,287.43	777,990.39	10.91	71.7	50.89	
9,948.0	70.55	3.95	9,700.1	100.72 N	344.77 W	473,316.41	777,992.29	6.44	100.7	11.16	
9,979.0	71.25	3.76	9,710.2	129.95 N	342.80 W	473,345.64	777,994.26	2.33	130.0	-14.42	
10,011.0	73.44	1.04	9,719.9	160.41 N	341.53 W	473,376.10	777,995.53	10.60	160.4	-50.22	
10,046.0	77.77	358.89	9,728.6	194.30 N	341.55 W	473,409.99	777,995.51	13.73	194.3	-25.96	
10,077.0	79.97	358.15	9,734.6	224.71 N	342.34 W	473,440.40	777,994.72	7.47	224.7	-18.34	
10,109.0	82.51	358.28	9,739.5	256.32 N	343.32 W	473,472.01	777,993.74	7.95	256.3	2.91	
10,141.0	82.96	358.07	9,743.5	288.04 N	344.34 W	473,503.73	777,992.72	1.55	288.0	-24.85	
10,204.0	88.89	357.18	9,748.0	350.80 N	346.94 W	473,566.49	777,990.12	9.52	350.8	-8.55	
10,297.0	89.47	359.23	9,749.3	443.74 N	349.85 W	473,659.43	777,987.21	2.29	443.7	74.22	
10,392.0	90.06	359.21	9,749.7	538.73 N	351.15 W	473,754.42	777,985.91	0.62	538.7	-1.94	
10,485.0	90.19	358.85	9,749.5	631.72 N	352.72 W	473,847.41	777,984.34	0.41	631.7	-70.14	
10,580.0	90.62	359.36	9,748.8	726.70 N	354.20 W	473,942.39	777,982.86	0.70	726.7	49.86	
10,673.0	91.63	358.32	9,747.0	819.66 N	356.09 W	474,035.35	777,980.97	1.56	819.7	-45.82	
10,767.0	89.29	359.16	9,746.2	913.63 N	358.15 W	474,129.32	777,978.91	2.64	913.6	160.25	
10,862.0	89.51	358.99	9,747.2	1,008.61 N	359.69 W	474,224.30	777,977.37	0.29	1,008.6	-37.69	
10,954.0	88.25	358.96	9,749.0	1,100.58 N	361.33 W	474,316.27	777,975.73	1.37	1,100.6	-178.64	
11,045.0	89.81	359.63	9,750.6	1,191.56 N	362.45 W	474,407.25	777,974.61	1.87	1,191.6	23.25	
11,136.0	90.68	359.96	9,750.2	1,282.55 N	362.78 W	474,498.24	777,974.28	1.02	1,282.6	20.77	
11,226.0	90.18	358.92	9,749.5	1,372.54 N	363.66 W	474,588.23	777,973.40	1.28	1,372.5	-115.67	
11,316.0	89.66	358.33	9,749.6	1,462.52 N	365.82 W	474,678.21	777,971.24	0.87	1,462.5	-131.39	
11,407.0	90.77	358.29	9,749.3	1,553.48 N	368.50 W	474,769.17	777,968.56	1.22	1,553.5	-2.06	

Design Report for North Thistle 15-10 State Com 001H - Actual Drilled

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)				
11,499.0	91.79	357.73	9,747.2	1,645.40 N	371.69 W	474,861.09	777,965.37	1.26	1,645.4	-28.76	
11,590.0	91.42	358.00	9,744.7	1,736.30 N	375.08 W	474,951.99	777,961.98	0.50	1,736.3	143.89	
11,681.0	91.48	357.92	9,742.4	1,827.21 N	378.32 W	475,042.90	777,958.74	0.11	1,827.2	-53.12	
11,771.0	91.32	358.10	9,740.2	1,917.13 N	381.44 W	475,132.82	777,955.62	0.27	1,917.1	131.64	
11,862.0	91.39	359.62	9,738.0	2,008.08 N	383.25 W	475,223.77	777,953.81	1.67	2,008.1	87.34	
11,952.0	91.36	359.97	9,735.9	2,098.06 N	383.58 W	475,313.75	777,953.48	0.39	2,098.1	94.90	
12,044.0	91.11	0.11	9,733.9	2,190.04 N	383.51 W	475,405.73	777,953.55	0.31	2,190.0	150.76	
12,133.0	91.51	359.80	9,731.9	2,279.01 N	383.58 W	475,494.70	777,953.48	0.57	2,279.0	-37.77	
12,224.0	91.79	359.85	9,729.2	2,369.97 N	383.86 W	475,585.66	777,953.20	0.31	2,370.0	10.12	
12,318.0	91.64	359.83	9,726.4	2,463.93 N	384.12 W	475,679.62	777,952.94	0.16	2,463.9	-172.41	
12,413.0	92.19	0.41	9,723.3	2,558.88 N	383.92 W	475,774.57	777,953.14	0.84	2,558.9	46.50	
12,507.0	92.92	0.58	9,719.1	2,652.78 N	383.11 W	475,868.47	777,953.95	0.80	2,652.8	13.09	
12,601.0	91.38	1.09	9,715.5	2,746.70 N	381.74 W	475,962.39	777,955.32	1.73	2,746.7	161.68	
12,696.0	91.36	1.08	9,713.3	2,841.66 N	379.94 W	476,057.35	777,957.12	0.02	2,841.7	-153.44	
12,790.0	92.13	1.17	9,710.4	2,935.59 N	378.10 W	476,151.28	777,958.96	0.82	2,935.6	6.66	
12,884.0	92.66	0.38	9,706.5	3,029.50 N	376.83 W	476,245.19	777,960.23	1.01	3,029.5	-56.10	
12,979.0	90.62	0.35	9,703.8	3,124.46 N	376.22 W	476,340.15	777,960.84	2.15	3,124.5	-179.16	
13,074.0	90.18	0.35	9,703.1	3,219.45 N	375.64 W	476,435.14	777,961.42	0.46	3,219.5	180.00	
13,169.0	90.15	0.04	9,702.8	3,314.45 N	375.32 W	476,530.14	777,961.74	0.33	3,314.5	-95.53	
13,263.0	89.78	0.13	9,702.9	3,408.45 N	375.18 W	476,624.14	777,961.88	0.41	3,408.4	166.33	
13,357.0	88.95	359.68	9,703.9	3,502.44 N	375.34 W	476,718.13	777,961.72	1.00	3,502.4	-151.54	
13,452.0	91.02	0.34	9,703.9	3,597.44 N	375.32 W	476,813.13	777,961.74	2.29	3,597.4	17.69	
13,546.0	91.20	359.27	9,702.1	3,691.42 N	375.64 W	476,907.11	777,961.42	1.15	3,691.4	-80.44	
13,641.0	92.71	359.28	9,698.9	3,786.35 N	376.84 W	477,002.04	777,960.22	1.59	3,786.4	0.38	
13,736.0	91.02	357.85	9,695.8	3,881.27 N	379.22 W	477,096.96	777,957.84	2.33	3,881.3	-139.75	
13,831.0	90.74	0.68	9,694.3	3,976.24 N	380.44 W	477,191.93	777,956.62	2.99	3,976.2	95.63	
13,926.0	89.78	359.95	9,693.9	4,071.23 N	379.92 W	477,286.92	777,957.14	1.27	4,071.2	-142.75	
14,021.0	90.28	359.79	9,693.9	4,166.23 N	380.13 W	477,381.92	777,956.93	0.55	4,166.2	-17.74	
14,114.0	88.89	359.09	9,694.5	4,259.22 N	381.04 W	477,474.91	777,956.02	1.67	4,259.2	-153.27	
14,208.0	89.11	358.63	9,696.2	4,353.19 N	382.91 W	477,568.88	777,954.15	0.54	4,353.2	-64.44	
14,302.0	89.82	358.43	9,697.0	4,447.15 N	385.32 W	477,662.84	777,951.74	0.78	4,447.2	-15.73	
14,396.0	89.69	357.76	9,697.4	4,541.10 N	388.45 W	477,756.79	777,948.61	0.73	4,541.1	-100.98	
14,491.0	89.66	356.99	9,698.0	4,636.00 N	392.80 W	477,851.69	777,944.26	0.81	4,636.0	-92.23	
14,585.0	89.60	357.45	9,698.6	4,729.89 N	397.36 W	477,945.58	777,939.70	0.49	4,729.9	97.43	
14,680.0	91.30	357.50	9,697.8	4,824.79 N	401.54 W	478,040.48	777,935.52	1.79	4,824.8	1.68	
14,720.0	91.26	358.53	9,697.0	4,864.75 N	402.93 W	478,080.44	777,934.13	2.58	4,864.8	92.31	Cross Sec Line (0.3030' FSL, 398.5651' FWL of Section 10)

HALLIBURTON**Design Report for North Thistle 15-10 State Com 001H - Actual Drilled**

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)				
14,775.0	91.20	359.95	9,695.8	4,919.73 N	403.65 W	478,135.42	777,933.41	2.58	4,919.7	92.33	
14,867.0	92.06	359.33	9,693.2	5,011.69 N	404.23 W	478,227.38	777,932.83	1.15	5,011.7	-35.77	
14,960.0	91.29	0.29	9,690.4	5,104.65 N	404.54 W	478,320.34	777,932.52	1.32	5,104.7	128.73	
15,052.0	89.94	359.85	9,689.4	5,196.64 N	404.43 W	478,412.33	777,932.63	1.54	5,196.6	-161.95	
15,146.0	88.95	359.20	9,690.4	5,290.63 N	405.21 W	478,506.32	777,931.85	1.26	5,290.6	-146.72	
15,240.0	88.86	358.23	9,692.2	5,384.59 N	407.32 W	478,600.28	777,929.74	1.04	5,384.6	-95.31	
15,334.0	89.07	358.13	9,693.9	5,478.53 N	410.30 W	478,694.22	777,926.76	0.25	5,478.5	-25.46	
15,429.0	89.29	358.85	9,695.2	5,573.49 N	412.80 W	478,789.18	777,924.26	0.79	5,573.5	73.01	
15,524.0	89.85	359.30	9,695.9	5,668.47 N	414.34 W	478,884.16	777,922.72	0.76	5,668.5	38.79	
15,618.0	90.15	359.25	9,695.9	5,762.46 N	415.53 W	478,978.15	777,921.53	0.32	5,762.5	-9.46	
15,713.0	91.08	359.46	9,694.9	5,857.45 N	416.60 W	479,073.14	777,920.46	1.00	5,857.5	12.72	
15,808.0	91.44	358.68	9,692.8	5,952.41 N	418.14 W	479,168.10	777,918.92	0.90	5,952.4	-65.21	
15,902.0	90.25	359.23	9,691.4	6,046.39 N	419.85 W	479,262.08	777,917.21	1.39	6,046.4	155.19	
15,997.0	90.12	358.46	9,691.1	6,141.37 N	421.77 W	479,357.06	777,915.29	0.82	6,141.4	-99.58	
16,091.0	91.14	358.26	9,690.1	6,235.32 N	424.46 W	479,451.01	777,912.60	1.11	6,235.3	-11.09	
16,184.0	90.19	359.43	9,689.0	6,328.29 N	426.33 W	479,543.98	777,910.73	1.62	6,328.3	129.07	
16,278.0	89.63	0.35	9,689.2	6,422.29 N	426.51 W	479,637.98	777,910.55	1.15	6,422.3	121.33	
16,372.0	90.49	0.20	9,689.1	6,516.29 N	426.06 W	479,731.98	777,911.00	0.93	6,516.3	-9.89	
16,466.0	90.19	1.89	9,688.5	6,610.27 N	424.35 W	479,825.96	777,912.71	1.83	6,610.3	100.06	
16,560.0	89.48	1.25	9,688.8	6,704.23 N	421.77 W	479,919.92	777,915.29	1.02	6,704.2	-137.97	
16,654.0	89.41	0.59	9,689.7	6,798.21 N	420.26 W	480,013.90	777,916.80	0.71	6,798.2	-96.06	
16,749.0	89.41	0.22	9,690.7	6,893.21 N	419.59 W	480,108.90	777,917.47	0.39	6,893.2	-90.00	
16,843.0	89.45	359.61	9,691.6	6,987.20 N	419.73 W	480,202.89	777,917.33	0.65	6,987.2	-86.25	
16,937.0	89.91	359.39	9,692.1	7,081.20 N	420.55 W	480,296.89	777,916.51	0.54	7,081.2	-25.56	
17,032.0	90.09	359.28	9,692.1	7,176.19 N	421.65 W	480,391.88	777,915.41	0.22	7,176.2	-31.43	
17,127.0	91.39	359.96	9,690.9	7,271.18 N	422.28 W	480,486.87	777,914.78	1.54	7,271.2	27.61	
17,221.0	90.77	0.04	9,689.1	7,365.16 N	422.28 W	480,580.85	777,914.78	0.67	7,365.2	172.65	
17,316.0	91.60	357.82	9,687.2	7,460.12 N	424.05 W	480,675.81	777,913.01	2.49	7,460.1	-69.48	
17,410.0	91.85	358.73	9,684.3	7,554.03 N	426.88 W	480,769.72	777,910.18	1.00	7,554.0	74.62	
17,504.0	91.42	0.13	9,681.6	7,647.98 N	427.82 W	480,863.67	777,909.24	1.56	7,648.0	107.06	
17,599.0	89.51	0.84	9,680.9	7,742.97 N	427.01 W	480,958.66	777,910.05	2.14	7,743.0	159.61	
17,694.0	89.20	0.57	9,681.9	7,837.96 N	425.84 W	481,053.65	777,911.22	0.43	7,838.0	-138.95	
17,789.0	89.23	0.64	9,683.2	7,932.94 N	424.84 W	481,148.63	777,912.22	0.08	7,932.9	66.80	
17,883.0	89.41	0.85	9,684.4	8,026.93 N	423.62 W	481,242.62	777,913.44	0.29	8,026.9	49.40	
17,977.0	89.66	0.78	9,685.1	8,120.92 N	422.28 W	481,336.61	777,914.78	0.28	8,120.9	-15.64	
18,070.0	90.52	1.06	9,685.0	8,213.90 N	420.79 W	481,429.59	777,916.27	0.97	8,213.9	18.03	
18,165.0	91.33	0.31	9,683.4	8,308.88 N	419.65 W	481,524.57	777,917.41	1.16	8,308.9	-42.79	

Design Report for North Thistle 15-10 State Com 001H - Actual Drilled

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)				
18,260.0	89.85	0.26	9,682.5	8,403.87 N	419.18 W	481,619.56	777,917.88	1.56	8,403.9	-178.06	
18,354.0	90.06	0.28	9,682.5	8,497.87 N	418.74 W	481,713.56	777,918.32	0.22	8,497.9	5.44	
18,448.0	90.80	0.68	9,681.8	8,591.87 N	417.95 W	481,807.56	777,919.11	0.89	8,591.9	28.39	
18,543.0	91.42	359.93	9,680.0	8,686.85 N	417.45 W	481,902.54	777,919.61	1.02	8,686.8	-50.41	
18,638.0	91.97	359.97	9,677.2	8,781.80 N	417.53 W	481,997.49	777,919.53	0.58	8,781.8	4.16	
18,732.0	92.22	358.85	9,673.7	8,875.74 N	418.50 W	482,091.43	777,918.56	1.22	8,875.7	-77.39	
18,827.0	93.49	358.91	9,669.0	8,970.60 N	420.35 W	482,186.29	777,916.71	1.34	8,970.6	2.70	
18,922.0	92.06	358.75	9,664.4	9,065.46 N	422.29 W	482,281.15	777,914.77	1.51	9,065.5	-173.62	
19,016.0	91.69	359.05	9,661.3	9,159.40 N	424.09 W	482,375.09	777,912.97	0.51	9,159.4	140.97	
19,110.0	91.05	358.50	9,659.1	9,253.35 N	426.10 W	482,469.04	777,910.96	0.90	9,253.3	-139.33	
19,204.0	91.70	357.51	9,656.8	9,347.26 N	429.37 W	482,562.95	777,907.69	1.26	9,347.3	-56.69	
19,298.0	90.53	357.88	9,655.0	9,441.16 N	433.31 W	482,656.85	777,903.75	1.26	9,441.2	171.73	
19,393.0	90.37	356.94	9,654.3	9,536.05 N	437.77 W	482,751.74	777,899.29	0.80	9,536.1	-102.20	Last MWD Survey
19,455.0	90.37	356.94	9,653.9	9,597.96 N	441.08 W	482,813.65	777,895.98	0.00	9,598.0	0.00	Projection to TD (547.7534' FNL, 397.6287' FWL of Section 10) - PBHL North Thistle 1H (20' FNL - 380' FWL)

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
268.0	268.0	0.4	0.3	First MWD Survey
6,054.0	6,028.8	-316.6	-286.5	Cross Perf Line (99.9990' FSL, 470.5445' FWL of Section 15)
9,159.0	9,130.5	-378.7	-348.5	KOP (38.2281' FSL, 407.9539' FWL of Section 15)
9,391.0	9,352.1	-316.9	-351.4	Cross Perf Line (100.0680' FSL, 405.6099' FWL of Section 15)
14,720.0	9,697.0	4,864.8	-402.9	Cross Sec Line (0.3030' FSL, 398.5651' FWL of Section 10)
19,393.0	9,654.3	9,536.1	-437.8	Last MWD Survey
19,455.0	9,653.9	9,598.0	-441.1	Projection to TD (547.7534' FNL, 397.6287' FWL of Section 10)

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	+N/-S (usft)	+E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.00	Spot	0.0	0.0	0.0

Design Report for North Thistle 15-10 State Com 001H - Actual Drilled

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
268.0	19,393.0	MWD	2_MWD
19,455.0	19,455.0	Projection to Bit	2_Blind

Design Targets

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

Directional Difficulty Index

Average Dogleg over Survey:	1.26 °/100usft	Maximum Dogleg over Survey:	17.47 °/100usft at 9,221.0 usft
Net Tortousity applicable to Plans:	0.37 °/100usft	Directional Difficulty Index:	6.711

Audit Info

North Reference Sheet for North Thistle Pad - North Thistle 15-10 State Com 001H - 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 RKB (Nabors X05) 33' + GL @ 3743.0usft. Northing and Easting are relative to North Thistle 15-10 State Com 001H

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: 0.99997342

Grid Coordinates of Well: 473,215.69 usft N, 778,337.06 usft E

Geographical Coordinates of Well: 32° 17' 55.01" N, 103° 33' 58.69" W

Grid Convergence at Surface is: 0.41°

Based upon Minimum Curvature type calculations, at a Measured Depth of 19,455.00usft

the Bottom Hole Displacement is 9,608.09usft in the Direction of 357.37° (Grid).

Magnetic Convergence at surface is: -6.46° (29 November 2018, , BGGM2018)

