



# NOBLE ENERGY, INC

Location: COLORADO Slot: SLOT#04 HARPER LD21-675 (1708'FNL & 330'FWL, SEC.22)  
Field: WELD COUNTY (NOBLE NAD 83 GRID) Well: HARPER LD21-675  
Facility: SEC.22-T09N-R58W Wellbore: HARPER LD21-675 PWB

Plot reference wellpath is HARPER LD21-675 (REV-B.0, A-MARL NIO) PWP	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
True vertical depths are referenced to H&P 517 (30'KB) (RKB)	* = Wellpath was transformed from a different geodetic datum
Measured depths are referenced to H&P 517 (30'KB) (RKB)	North Reference: Grid north
H&P 517 (30'KB) (RKB) to Mean Sea Level: 4806 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: SLOT#04 HARPER LD21-675 (1708'FNL & 330'FWL, SEC.22)): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: cookdnam on 2016-09-23
	Database: WA_DEN_Deriver_Defn

### REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY, INC	Slot	SLOT#04 HARPER LD21-675 (1708'FNL & 330'FWL, SEC.22)
Area	COLORADO	Well	HARPER LD21-675
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-675 AWB
Facility	SEC.22-T09N-R58W		

### REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Cookdanm
Scale	0.999993	Report Generated	9/23/16 at 1:23:25 PM
Convergence at slot	1.07° East	Database/Source file	WA_DEN_Denver_Defn/HARPER_LD21-675_AWP.xml

### WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	3078.22	-1032.74	3454901.77	1516400.81	40°44'21.660"N	103°51'30.060"W
Facility Reference Pt			3455934.50	1513322.61	40°43'51.060"N	103°51'17.388"W
Field Reference Pt			3000000.00	4454105.15	48°46'34.315"N	105°30'00.000"W

### WELLPATH DATUM

Calculation method	Minimum curvature	H&P 517 (30'KB) (RKB) to Facility Vertical Datum	4806.00ft
Horizontal Reference Pt	Slot	H&P 517 (30'KB) (RKB) to Mean Sea Level	4806.00ft
Vertical Reference Pt	H&P 517 (30'KB) (RKB)	H&P 517 (30'KB) (RKB) to Mud Line at Slot (SLOT#04 HARPER LD21-675 (1708'FNL & 330'FWL, SEC.22))	4806.00ft
MD Reference Pt	H&P 517 (30'KB) (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	276.41°

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Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-675 AWB
Facility	SEC.22-T09N-R58W		

WELLPATH DATA (98 stations)								
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
1917.00	0.660	149.540	1916.96	3.91	1.08	-3.82	0.13	TIED ITNO GYRODATA SURVEYS
1982.00	0.100	10.420	1981.96	3.68	0.81	-3.62	1.14	
2076.00	0.070	236.680	2075.96	3.72	0.86	-3.65	0.17	
2171.00	2.030	352.700	2170.94	4.17	2.50	-3.91	2.17	
2265.00	3.800	0.450	2264.82	4.88	7.27	-4.10	1.92	
2360.00	5.970	0.180	2359.47	5.75	15.36	-4.06	2.28	
2454.00	8.380	359.220	2452.72	7.13	27.09	-4.14	2.57	
2549.00	9.890	352.110	2546.52	10.02	42.10	-5.35	1.98	
2644.00	11.220	358.400	2639.91	13.32	59.42	-6.73	1.85	
2738.00	11.790	359.260	2732.02	15.79	78.16	-7.11	0.63	
2832.00	11.720	357.780	2824.05	18.41	97.31	-7.60	0.33	
2927.00	12.240	1.020	2916.99	20.81	117.02	-7.80	0.89	
3022.00	12.110	4.280	3009.85	22.12	137.02	-6.87	0.74	
3116.00	12.550	7.530	3101.68	22.29	156.98	-4.80	0.87	
3211.00	12.560	7.060	3194.41	21.97	177.47	-2.18	0.11	
3305.00	12.440	351.200	3286.21	24.51	197.62	-2.47	3.64	
3400.00	12.620	344.500	3378.95	31.07	217.73	-6.81	1.54	
3494.00	12.640	340.530	3470.68	39.39	237.33	-12.98	0.92	
3589.00	12.210	336.110	3563.46	48.99	256.31	-20.51	1.10	
3683.00	12.260	334.920	3655.32	59.22	274.44	-28.77	0.27	
3778.00	12.520	334.890	3748.11	69.87	292.90	-37.41	0.27	
3873.00	12.440	342.980	3840.87	79.32	312.01	-44.78	1.84	
3967.00	12.620	345.890	3932.63	86.95	331.65	-50.25	0.70	
4062.00	12.640	347.140	4025.33	94.02	351.85	-55.09	0.29	
4156.00	12.440	348.660	4117.09	100.50	371.80	-59.37	0.41	
4251.00	12.410	350.250	4209.87	106.46	391.89	-63.11	0.36	
4346.00	12.480	355.220	4302.64	111.29	412.18	-65.70	1.13	
4440.00	12.430	359.110	4394.43	114.55	432.42	-66.70	0.89	
4535.00	12.490	358.540	4487.19	117.25	452.91	-67.12	0.14	
4629.00	12.420	357.760	4578.98	120.16	473.18	-67.77	0.19	

REFERENCE WELLPATH IDENTIFICATION			
Operator	NOBLE ENERGY, INC	Slot	SLOT#04 HARPER LD21-675 (1708'FNL & 330'FWL, SEC.22)
Area	COLORADO	Well	HARPER LD21-675
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-675 AWB
Facility	SEC.22-T09N-R58W		

WELLPATH DATA (98 stations) † = interpolated/extrapolated station								
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
4724.00	12.460	1.740	4671.75	122.53	493.63	-67.86	0.90	
4818.00	12.580	2.590	4763.51	124.04	513.99	-67.09	0.23	
4913.00	12.420	359.360	4856.26	125.98	534.54	-66.74	0.75	
5007.00	12.400	359.180	4948.07	128.49	554.74	-67.00	0.05	
5102.00	12.540	357.980	5040.83	131.29	575.25	-67.50	0.31	
5196.00	12.460	359.720	5132.60	133.96	595.59	-67.91	0.41	
5291.00	12.820	357.870	5225.30	136.72	616.37	-68.36	0.57	
5385.00	18.450	330.440	5315.90	147.03	639.78	-76.10	9.73	
5480.00	23.250	308.790	5404.79	171.74	664.65	-98.17	9.48	
5575.00	31.480	288.150	5489.27	212.02	684.20	-136.51	13.11	
5669.00	40.630	282.840	5565.20	266.59	698.68	-189.80	10.28	
5764.00	49.630	278.080	5632.17	333.66	710.67	-255.94	10.11	
5858.00	61.020	272.310	5685.60	410.76	717.39	-332.77	13.12	
5953.00	68.940	268.880	5725.75	496.31	718.20	-418.77	8.95	
6048.00	77.750	269.600	5752.95	586.53	717.00	-509.68	9.30	
6142.00	86.730	269.030	5765.63	678.86	715.89	-602.72	9.57	
6217.00†	89.919	268.604	5767.83	753.16	714.34	-677.66	4.29	CROSS 460' SETBACK
6237.00	90.770	268.490	5767.71	772.97	713.83	-697.66	4.29	
6331.00	90.550	268.390	5766.62	866.05	711.27	-791.61	0.26	
6426.00	90.740	268.670	5765.55	960.15	708.83	-886.58	0.36	
6520.00	90.400	268.110	5764.62	1053.23	706.19	-980.54	0.70	
6614.00	90.830	267.570	5763.61	1146.17	702.65	-1074.46	0.73	
6709.00	90.710	267.210	5762.33	1239.99	698.33	-1169.36	0.40	
6804.00	90.620	268.300	5761.23	1333.90	694.60	-1264.27	1.15	
6898.00	90.460	269.140	5760.34	1427.05	692.50	-1358.25	0.91	
6993.00	90.340	270.630	5759.68	1521.43	692.31	-1453.24	1.57	
7088.00	90.400	270.990	5759.07	1615.98	693.66	-1548.23	0.38	
7182.00	90.250	272.730	5758.53	1709.67	696.71	-1642.17	1.86	
7277.00	90.370	273.100	5758.02	1804.50	701.54	-1737.05	0.41	
7371.00	90.340	271.020	5757.44	1898.22	704.92	-1830.98	2.21	

REFERENCE WELLPATH IDENTIFICATION			
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Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-675 AWB
Facility	SEC.22-T09N-R58W		

WELLPATH DATA (98 stations)									
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments	
7466.00	90.460	270.040	5756.77	1992.72	705.80	-1925.97	1.04		
7561.00	90.620	269.430	5755.88	2087.07	705.36	-2020.97	0.66		
7656.00	90.620	267.660	5754.85	2181.17	702.94	-2115.93	1.86		
7750.00	90.740	267.160	5753.73	2274.00	698.70	-2209.83	0.55		
7845.00	90.620	267.690	5752.61	2367.83	694.43	-2304.72	0.57		
7939.00	90.370	267.640	5751.80	2460.73	690.60	-2398.64	0.27		
8034.00	90.710	266.510	5750.90	2554.47	685.75	-2493.51	1.24		
8128.00	90.650	266.930	5749.78	2647.12	680.37	-2587.35	0.45		
8223.00	90.620	266.370	5748.73	2740.74	674.82	-2682.18	0.59		
8317.00	90.310	267.980	5747.97	2833.52	670.19	-2776.06	1.74		
8412.00	90.310	267.820	5747.45	2927.47	666.71	-2871.00	0.17		
8507.00	90.150	266.890	5747.07	3021.29	662.33	-2965.89	0.99		
8601.00	90.220	266.300	5746.77	3113.91	656.74	-3059.73	0.63		
8696.00	90.120	264.860	5746.49	3207.21	649.42	-3154.44	1.52		
8791.00	90.150	265.260	5746.26	3300.36	641.24	-3249.09	0.42		
8885.00	90.280	265.310	5745.91	3392.59	633.51	-3342.77	0.15		
8980.00	90.310	266.130	5745.42	3485.94	626.43	-3437.50	0.86		
9074.00	90.460	267.160	5744.79	3578.58	620.92	-3531.34	1.11		
9169.00	90.430	268.930	5744.05	3672.56	617.68	-3626.28	1.86		
9264.00	90.680	271.520	5743.13	3766.99	618.06	-3721.26	2.74		
9358.00	90.550	271.950	5742.12	3860.68	620.90	-3815.21	0.48		
9453.00	90.980	271.540	5740.85	3955.35	623.80	-3910.16	0.63		
9547.00	90.490	270.690	5739.65	4048.94	625.62	-4004.13	1.04		
9642.00	90.650	269.380	5738.70	4143.35	625.68	-4099.13	1.39		
9736.00	90.370	270.650	5737.87	4236.76	625.71	-4193.12	1.38		
9831.00	90.250	272.910	5737.35	4331.44	628.66	-4288.07	2.38		
9926.00	90.370	271.290	5736.84	4426.17	632.14	-4383.00	1.71		
10020.00	90.580	268.820	5736.06	4519.58	632.23	-4476.99	2.64		
10115.00	90.460	267.250	5735.20	4613.56	628.97	-4571.93	1.66		
10209.00	90.580	266.330	5734.34	4706.23	623.71	-4665.77	0.99		

### REFERENCE WELLPATH IDENTIFICATION

Operator	NOBLE ENERGY, INC	Slot	SLOT#04 HARPER LD21-675 (1708'FNL & 330'FWL, SEC.22)
Area	COLORADO	Well	HARPER LD21-675
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-675 AWB
Facility	SEC.22-T09N-R58W		

### WELLPATH DATA (98 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	DLS [°/100ft]	Comments
10304.00	90.430	265.300	5733.51	4799.61	616.78	-4760.52	1.10	
10398.00	90.340	265.750	5732.88	4891.92	609.44	-4854.23	0.49	
10493.00	90.370	266.390	5732.29	4985.37	602.93	-4949.00	0.67	
10587.00	90.460	267.570	5731.61	5078.10	597.98	-5042.87	1.26	
10682.00	90.460	268.810	5730.84	5172.12	594.98	-5137.81	1.31	
10774.00	90.370	268.010	5730.18	5263.22	592.43	-5229.78	0.88	
10801.00	90.400	267.520	5730.00	5289.91	591.37	-5256.75	1.82	LAST BHI MWD SURVEY
10825.00	90.400	267.520	5729.83	5313.62	590.33	-5280.73	0.00	PROJECTION TO BIT

### HOLE & CASING SECTIONS - Ref Wellbore: HARPER LD21-675 AWB Ref Wellpath: HARPER LD21-675 AWP

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
9.625in Casing Surface	0.00	1924.00	1924.00	0.00	1923.96	0.00	0.00	1.02	-3.78
8.5in Open Hole	1924.00	10825.00	8901.00	1923.96	5729.83	1.02	-3.78	590.33	-5280.73

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Operator	NOBLE ENERGY, INC	Slot	SLOT#04 HARPER LD21-675 (1708'FNL & 330'FWL, SEC.22)
Area	COLORADO	Well	HARPER LD21-675
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-675 AWB
Facility	SEC.22-T09N-R58W		

### TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
SEC.21-T09N-R58W	-1.00	-109.33	-0.75	3454901.02	1516291.47	40°44'20.580"N	103°51'30.096"W	polygon
HARPER LD21-675 BHL ON PLAT REV-2 (990'FNL & 330'FWL, SEC.21)	5728.10	594.86	-5296.42	3449605.39	1516995.66	40°44'28.500"N	103°52'38.712"W	point
HARPER LD21-675 BHL ON PLAT REV-1 (990'FNL & 330'FWL, SEC.21)	5728.12	594.86	-5296.42	3449605.39	1516995.66	40°44'28.500"N	103°52'38.712"W	point
HARPER LD21-675 LANDING POINT REV-1 (990'FNL & 330'FEL, SEC.21)	5757.21	718.00	-660.00	3454241.78	1517118.80	40°44'28.874"N	103°51'38.460"W	point
HARPER LD21-675 LANDING POINT REV-2 (990'FNL & 330'FEL, SEC.21)	5768.46	718.00	-673.00	3454228.78	1517118.80	40°44'28.876"N	103°51'38.629"W	point
SEC.21-T09N-R58W HARDLINES (330' SETBACKS)	5826.00	-109.33	-0.75	3454901.02	1516291.47	40°44'20.580"N	103°51'30.096"W	polygon

### WELLPATH COMPOSITION - Ref Wellbore: HARPER LD21-675 AWB Ref Wellpath: HARPER LD21-675 AWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
0.00	1917.00	Approximation of GYD GC+DROP+OH	13 1/2" GYRODATA SURFACE SURVEYS <78 - 1917>	HARPER LD21-675 AWB
1917.00	10801.00	OWSG MWD rev2 + IFR1 + Multi-Station Correction	8 1/2" BHI MWD AUTOTRAK CURVE MONOBORE (MSA CORRECTED) <1917 - 10801>	HARPER LD21-675 AWB
10801.00	10825.00	Blind Drilling (std)	Projection to bit	HARPER LD21-675 AWB

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Area	COLORADO	Well	HARPER LD21-675
Field	WELD COUNTY (NOBLE NAD 83 GRID)	Wellbore	HARPER LD21-675 AWB
Facility	SEC.22-T09N-R58W		

WELLPATH COMMENTS				
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
1917.00	0.660	149.540	1916.96	TIED ITNO GYRODATA SURVEYS
6217.00	89.919	268.604	5767.83	CROSS 460' SETBACK
10801.00	90.400	267.520	5730.00	LAST BHI MWD SURVEY
10825.00	90.400	267.520	5729.83	PROJECTION TO BIT