

# HIGHLANDS NATURAL RESOURCES

Location: COLORADO Slot: SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15)  
Field: ARAPAHOE COUNTY (NAD83/GRID) Well: HAGAR 5-64 15-16-1BHZ  
Facility: SEC.15-T05S-R64W Wellbore: HAGAR 5-64 15-16-1BHZ PWB

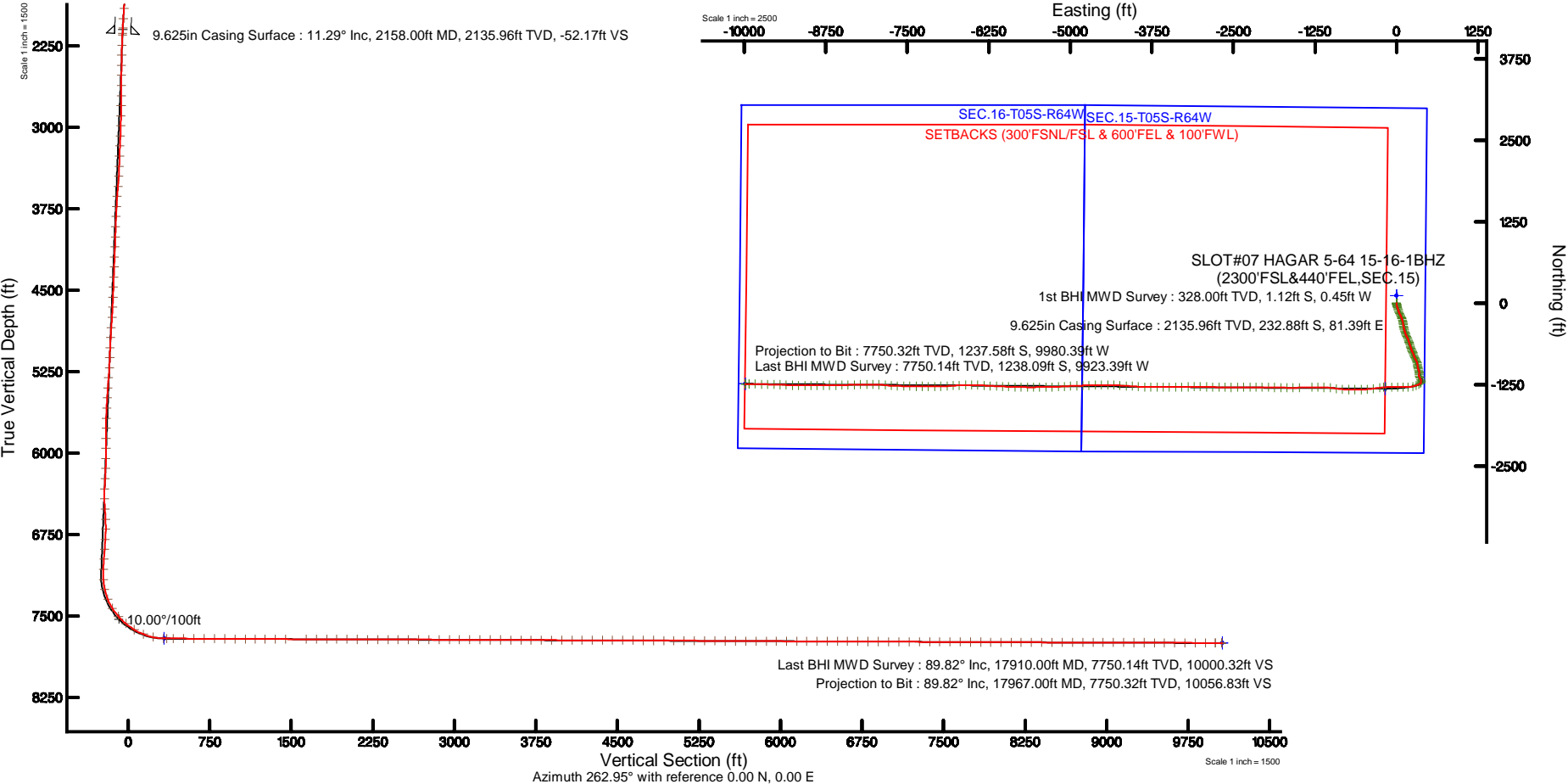
Plot reference wellpath is HAGAR 5-64 15-16-1BHZ (REV-D.0) PWP	Grid System: NAD83 / Lambert Colorado SP, Central Zone (502), US feet
True vertical depths are referenced to Production Rig (27KB) (RKB)	* = Wellpath was transformed from a different geodetic datum
Measured depths are referenced to Production Rig (27KB) (RKB)	North Reference: Grid north
Production Rig (27KB) (RKB) to Mean Sea Level: 5961 feet	Scale: True distance
Mean Sea Level to Ground level (At Slot: SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15) ): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: guenaler on 2018-08-20
	Database: WA_DEN_Denver_Deln

## Location Information

Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.15-T05S-R64W			3272987.577	1650317.104	39°36'53.694"N	104°31'51.568"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15)	-119.82	-0.91	3272986.664	1650197.289	39°36'52.510"N	104°31'51.596"W
Production Rig (27KB) (RKB) to Ground level (At Slot: SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15) )						5961ft
Mean Sea Level to Ground level (At Slot: SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15) )						0ft
Production Rig (27KB) (RKB) to Mean Sea Level						5961ft

## Survey Program

Start MD (ft)	End MD (ft)	Tool	Model	Log Name/Comment	Wellbore
27.00	2103.00	BHI NaviTrak	BHI NaviTrak (Standard)		HAGAR 5-64 15-16-1BHZ AWB
2103.00	17984.54	BHI AutoTrak Curve	BHI AutoTrak Curve (Short)		HAGAR 5-64 15-16-1BHZ PWB





# Actual Wellpath Report

HAGAR 5-64 15-16-1BHZ AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	HIGHLANDS NATURAL RESOURCES	Slot	SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15)
Area	COLORADO	Well	HAGAR 5-64 15-16-1BHZ
Field	ARAPAHOE COUNTY (NAD83/GRID)	Wellbore	HAGAR 5-64 15-16-1BHZ AWB
Facility	SEC.15-T05S-R64W		

REPORT SETUP INFORMATION			
Projection System	NAD83 / Lambert Colorado SP, Central Zone (502), US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Guenaler
Scale	0.999976	Report Generated	8/20/2018 at 3:06:13 PM
Convergence at slot	0.62° East	Database/Source file	WA_DEN_Denver_Defn/HAGAR_5-64_15-16-1BHZ_AWP.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-119.82	-0.91	3272986.66	1650197.29	39°36'52.510"N	104°31'51.596"W
Facility Reference Pt			3272987.58	1650317.10	39°36'53.694"N	104°31'51.568"W
Field Reference Pt			3272987.61	1650317.11	39°36'53.694"N	104°31'51.568"W

WELLPATH DATUM			
Calculation method	Minimum curvature	Production Rig (27'KB) (RKB) to Facility Vertical Datum	5961.00ft
Horizontal Reference Pt	Slot	Production Rig (27'KB) (RKB) to Mean Sea Level	5961.00ft
Vertical Reference Pt	Production Rig (27'KB) (RKB)	Production Rig (27'KB) (RKB) to Ground Level at Slot (SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15) )	5961.00ft
MD Reference Pt	Production Rig (27'KB) (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	262.95°



Actual Wellpath Report

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Area	COLORADO	Well	HAGAR 5-64 15-16-1BHZ
Field	ARAPAHOE COUNTY (NAD83/GRID)	Wellbore	HAGAR 5-64 15-16-1BHZ AWB
Facility	SEC.15-T05S-R64W		

WELLPATH DATA (190 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
0.00†	0.000	201.670	0.00	0.00	0.00	0.00	39°36'52.510"N	104°31'51.596"W	0.00	
27.00	0.000	201.670	27.00	0.00	0.00	0.00	39°36'52.510"N	104°31'51.596"W	0.00	
328.00	0.460	201.670	328.00	0.58	-1.12	-0.45	39°36'52.499"N	104°31'51.602"W	0.15	1st BHI MWD Survey
421.00	0.150	229.820	421.00	0.86	-1.55	-0.68	39°36'52.495"N	104°31'51.605"W	0.36	
514.00	0.360	202.510	513.99	1.11	-1.90	-0.88	39°36'52.491"N	104°31'51.608"W	0.25	
607.00	1.730	165.140	606.98	1.06	-3.52	-0.63	39°36'52.475"N	104°31'51.605"W	1.57	
701.00	2.680	162.340	700.91	0.46	-6.99	0.40	39°36'52.441"N	104°31'51.592"W	1.02	
794.00	3.710	171.190	793.76	-0.03	-12.03	1.52	39°36'52.391"N	104°31'51.578"W	1.22	
887.00	4.910	173.730	886.50	-0.07	-18.96	2.41	39°36'52.322"N	104°31'51.568"W	1.31	
980.00	6.200	165.880	979.06	-0.63	-27.79	4.07	39°36'52.235"N	104°31'51.548"W	1.61	
1074.00	7.430	165.520	1072.39	-2.04	-38.60	6.83	39°36'52.128"N	104°31'51.514"W	1.31	
1167.00	9.110	165.200	1164.42	-3.81	-51.54	10.22	39°36'52.000"N	104°31'51.472"W	1.81	
1260.00	10.070	161.520	1256.12	-6.41	-66.37	14.67	39°36'51.853"N	104°31'51.418"W	1.22	
1354.00	12.060	160.840	1348.37	-10.10	-83.44	20.50	39°36'51.683"N	104°31'51.345"W	2.12	
1449.00	11.720	162.050	1441.33	-14.00	-102.00	26.73	39°36'51.499"N	104°31'51.268"W	0.44	
1543.00	11.160	162.160	1533.47	-17.51	-119.74	32.46	39°36'51.323"N	104°31'51.198"W	0.60	
1638.00	11.990	157.180	1626.53	-21.91	-137.59	39.11	39°36'51.146"N	104°31'51.115"W	1.37	
1733.00	11.200	156.980	1719.60	-27.13	-155.17	46.54	39°36'50.972"N	104°31'51.022"W	0.83	
1828.00	11.630	154.240	1812.72	-32.74	-172.29	54.31	39°36'50.802"N	104°31'50.926"W	0.73	
1923.00	11.580	151.490	1905.78	-39.30	-189.29	63.02	39°36'50.633"N	104°31'50.817"W	0.58	
2017.00	12.040	158.310	1997.79	-45.23	-206.69	71.15	39°36'50.460"N	104°31'50.715"W	1.56	
2103.00	11.260	158.810	2082.02	-49.54	-222.86	77.50	39°36'50.299"N	104°31'50.636"W	0.91	
2172.00	11.300	158.810	2149.68	-52.84	-235.44	82.38	39°36'50.175"N	104°31'50.576"W	0.06	
2267.00	11.620	161.870	2242.79	-56.95	-253.21	88.72	39°36'49.998"N	104°31'50.497"W	0.72	
2362.00	11.590	166.280	2335.85	-59.90	-271.57	93.96	39°36'49.816"N	104°31'50.432"W	0.93	
2457.00	11.310	168.430	2428.96	-61.74	-289.97	98.09	39°36'49.634"N	104°31'50.382"W	0.54	
2551.00	11.610	171.760	2521.09	-62.66	-308.36	101.30	39°36'49.452"N	104°31'50.344"W	0.77	
2646.00	11.470	171.900	2614.17	-63.03	-327.17	104.00	39°36'49.266"N	104°31'50.312"W	0.15	
2741.00	11.750	171.180	2707.22	-63.50	-346.08	106.81	39°36'49.079"N	104°31'50.278"W	0.33	
2836.00	11.610	167.840	2800.26	-64.65	-364.99	110.31	39°36'48.891"N	104°31'50.236"W	0.73	



Actual Wellpath Report

HAGAR 5-64 15-16-1BHZ AWP



REFERENCE WELLPATH IDENTIFICATION			
Operator	HIGHLANDS NATURAL RESOURCES	Slot	SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15)
Area	COLORADO	Well	HAGAR 5-64 15-16-1BHZ
Field	ARAPAHOE COUNTY (NAD83/GRID)	Wellbore	HAGAR 5-64 15-16-1BHZ AWB
Facility	SEC.15-T05S-R64W		

WELLPATH DATA (190 stations)										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
2931.00	11.650	166.720	2893.31	-66.54	-383.67	114.53	39°36'48.706"N	104°31'50.185"W	0.24	
3026.00	11.560	167.910	2986.37	-68.42	-402.31	118.72	39°36'48.522"N	104°31'50.134"W	0.27	
3120.00	11.710	160.790	3078.44	-71.25	-420.53	123.83	39°36'48.341"N	104°31'50.071"W	1.53	
3215.00	11.740	157.090	3171.46	-75.92	-438.54	130.77	39°36'48.162"N	104°31'49.985"W	0.79	
3310.00	11.770	165.800	3264.47	-79.77	-456.83	136.91	39°36'47.981"N	104°31'49.909"W	1.87	
3405.00	11.700	163.790	3357.49	-82.51	-475.48	141.97	39°36'47.796"N	104°31'49.847"W	0.44	
3500.00	11.660	154.590	3450.53	-87.06	-493.40	148.78	39°36'47.618"N	104°31'49.762"W	1.96	
3595.00	11.680	149.210	3543.57	-93.96	-510.33	157.83	39°36'47.450"N	104°31'49.649"W	1.15	
3689.00	11.650	152.330	3635.63	-101.13	-526.91	167.10	39°36'47.285"N	104°31'49.533"W	0.67	
3784.00	11.490	157.120	3728.70	-107.09	-544.12	175.24	39°36'47.114"N	104°31'49.431"W	1.02	
3879.00	11.660	161.600	3821.77	-111.56	-561.95	181.95	39°36'46.937"N	104°31'49.348"W	0.96	
3974.00	11.640	162.060	3914.81	-115.25	-580.18	187.93	39°36'46.757"N	104°31'49.274"W	0.10	
4069.00	11.670	162.420	4007.85	-118.82	-598.45	193.78	39°36'46.575"N	104°31'49.202"W	0.08	
4164.00	11.710	164.080	4100.88	-122.06	-616.88	199.33	39°36'46.393"N	104°31'49.133"W	0.36	
4259.00	11.860	161.920	4193.88	-125.41	-635.43	205.00	39°36'46.209"N	104°31'49.063"W	0.49	
4353.00	11.620	162.050	4285.91	-129.05	-653.62	210.92	39°36'46.028"N	104°31'48.990"W	0.26	
4448.00	11.680	161.340	4378.96	-132.79	-671.84	216.94	39°36'45.848"N	104°31'48.916"W	0.16	
4543.00	11.570	163.510	4472.01	-136.29	-690.08	222.72	39°36'45.667"N	104°31'48.844"W	0.47	
4638.00	11.620	161.080	4565.07	-139.82	-708.27	228.53	39°36'45.487"N	104°31'48.773"W	0.52	
4732.00	11.580	158.680	4657.15	-144.09	-726.01	235.03	39°36'45.310"N	104°31'48.692"W	0.52	
4827.00	11.690	154.990	4750.20	-149.41	-743.62	242.57	39°36'45.136"N	104°31'48.598"W	0.79	
4922.00	11.580	152.910	4843.25	-155.64	-760.83	250.98	39°36'44.965"N	104°31'48.493"W	0.46	
5016.00	11.660	157.610	4935.32	-161.38	-778.01	258.89	39°36'44.794"N	104°31'48.394"W	1.01	
5111.00	11.590	159.920	5028.38	-166.07	-795.85	265.82	39°36'44.617"N	104°31'48.308"W	0.50	
5206.00	11.810	162.030	5121.40	-170.07	-814.06	272.10	39°36'44.436"N	104°31'48.230"W	0.51	
5301.00	11.660	158.250	5214.42	-174.34	-832.22	278.66	39°36'44.256"N	104°31'48.149"W	0.82	
5395.00	11.680	151.710	5306.48	-180.20	-849.43	286.69	39°36'44.085"N	104°31'48.049"W	1.41	
5490.00	11.640	150.000	5399.52	-187.42	-866.19	296.04	39°36'43.919"N	104°31'47.932"W	0.37	
5585.00	11.660	155.190	5492.57	-194.08	-883.21	304.86	39°36'43.750"N	104°31'47.821"W	1.10	
5680.00	11.540	159.440	5585.63	-199.23	-900.82	312.22	39°36'43.575"N	104°31'47.730"W	0.91	



Actual Wellpath Report

HAGAR 5-64 15-16-1BHZ AWP



REFERENCE WELLPATH IDENTIFICATION			
Operator	HIGHLANDS NATURAL RESOURCES	Slot	SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15)
Area	COLORADO	Well	HAGAR 5-64 15-16-1BHZ
Field	ARAPAHOE COUNTY (NAD83/GRID)	Wellbore	HAGAR 5-64 15-16-1BHZ AWB
Facility	SEC.15-T05S-R64W		

WELLPATH DATA (190 stations)										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
5775.00	11.640	166.010	5678.69	-202.61	-919.02	317.88	39°36'43.394"N	104°31'47.660"W	1.39	
5869.00	11.370	170.800	5770.81	-204.10	-937.36	321.65	39°36'43.213"N	104°31'47.614"W	1.06	
5964.00	11.390	172.770	5863.94	-204.48	-955.91	324.33	39°36'43.029"N	104°31'47.582"W	0.41	
6059.00	11.440	171.690	5957.06	-204.71	-974.54	326.87	39°36'42.845"N	104°31'47.552"W	0.23	
6154.00	11.300	169.940	6050.20	-205.41	-993.03	329.86	39°36'42.662"N	104°31'47.517"W	0.39	
6248.00	11.330	161.840	6142.38	-207.67	-1010.87	334.34	39°36'42.485"N	104°31'47.462"W	1.69	
6343.00	11.450	157.270	6235.51	-212.01	-1028.44	340.90	39°36'42.311"N	104°31'47.381"W	0.96	
6438.00	11.310	154.520	6328.64	-217.51	-1045.54	348.55	39°36'42.141"N	104°31'47.285"W	0.59	
6532.00	7.560	188.220	6421.42	-218.79	-1060.00	351.63	39°36'41.998"N	104°31'47.248"W	6.94	
6627.00	9.580	197.760	6515.36	-213.83	-1073.72	348.33	39°36'41.862"N	104°31'47.292"W	2.59	
6722.00	12.240	183.800	6608.65	-208.61	-1091.30	345.25	39°36'41.689"N	104°31'47.334"W	3.93	
6817.00	13.320	171.750	6701.31	-206.94	-1112.18	346.15	39°36'41.482"N	104°31'47.325"W	3.02	
6912.00	13.220	157.470	6793.80	-210.07	-1133.05	351.88	39°36'41.276"N	104°31'47.254"W	3.44	
7006.00	13.170	150.150	6885.32	-217.09	-1152.27	361.33	39°36'41.085"N	104°31'47.136"W	1.78	
7101.00	12.650	158.020	6977.93	-223.96	-1171.30	370.61	39°36'40.896"N	104°31'47.020"W	1.93	
7196.00	11.660	162.090	7070.80	-228.45	-1190.08	377.46	39°36'40.709"N	104°31'46.935"W	1.38	
7291.00	11.240	187.120	7163.97	-227.99	-1208.42	379.27	39°36'40.528"N	104°31'46.915"W	5.21	
7385.00	16.350	223.590	7255.39	-215.49	-1227.14	368.98	39°36'40.344"N	104°31'47.049"W	10.47	
7480.00	22.130	244.130	7345.15	-188.15	-1244.66	343.61	39°36'40.173"N	104°31'47.375"W	9.28	
7575.00	32.310	251.200	7429.54	-146.24	-1260.70	303.36	39°36'40.019"N	104°31'47.892"W	11.23	
7670.00	41.800	258.460	7505.30	-89.66	-1275.26	248.15	39°36'39.881"N	104°31'48.599"W	10.99	
7765.00	50.660	266.180	7571.01	-21.23	-1284.06	180.29	39°36'39.801"N	104°31'49.467"W	11.01	
7860.00	58.230	270.670	7626.22	55.60	-1286.04	103.12	39°36'39.790"N	104°31'50.454"W	8.84	
7955.00	68.500	270.020	7668.76	139.70	-1285.55	18.31	39°36'39.804"N	104°31'51.537"W	10.83	
8049.00	78.120	270.730	7695.72	228.88	-1284.95	-71.62	39°36'39.819"N	104°31'52.686"W	10.26	
8144.00	88.120	266.480	7707.09	322.60	-1287.28	-165.76	39°36'39.806"N	104°31'53.889"W	11.42	
8176.00	89.510	263.990	7707.75	354.56	-1289.94	-197.64	39°36'39.783"N	104°31'54.297"W	8.91	
8237.00	89.570	262.830	7708.24	415.56	-1296.94	-258.24	39°36'39.720"N	104°31'55.072"W	1.90	
8332.00	89.600	263.230	7708.93	510.55	-1308.46	-352.53	39°36'39.616"N	104°31'56.279"W	0.42	
8427.00	89.510	264.690	7709.67	605.53	-1318.46	-447.00	39°36'39.528"N	104°31'57.487"W	1.54	



Actual Wellpath Report

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Area	COLORADO	Well	HAGAR 5-64 15-16-1BHZ
Field	ARAPAHOE COUNTY (NAD83/GRID)	Wellbore	HAGAR 5-64 15-16-1BHZ AWB
Facility	SEC.15-T05S-R64W		

WELLPATH DATA (190 stations)										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
8522.00	89.540	269.200	7710.46	700.27	-1323.52	-541.84	39°36'39.487"N	104°31'58.699"W	4.75	
8617.00	89.720	269.870	7711.07	794.64	-1324.29	-636.83	39°36'39.490"N	104°31'59.913"W	0.73	
8712.00	89.660	270.540	7711.59	888.88	-1323.95	-731.83	39°36'39.503"N	104°32'01.127"W	0.71	
8808.00	89.630	274.750	7712.18	983.49	-1319.52	-827.70	39°36'39.557"N	104°32'02.351"W	4.39	
8903.00	89.690	278.150	7712.74	1075.84	-1308.85	-922.08	39°36'39.672"N	104°32'03.556"W	3.58	
8997.00	90.030	275.760	7712.97	1167.04	-1297.47	-1015.39	39°36'39.795"N	104°32'04.746"W	2.57	
9092.00	89.880	271.760	7713.05	1260.34	-1291.24	-1110.16	39°36'39.866"N	104°32'05.956"W	4.21	
9187.00	89.690	270.610	7713.41	1354.35	-1289.28	-1205.14	39°36'39.896"N	104°32'07.169"W	1.23	
9282.00	89.660	268.780	7713.94	1448.69	-1289.78	-1300.13	39°36'39.901"N	104°32'08.383"W	1.93	
9472.00	89.720	268.520	7714.97	1637.74	-1294.26	-1490.08	39°36'39.876"N	104°32'10.811"W	0.14	
9567.00	89.660	269.890	7715.49	1732.17	-1295.58	-1585.06	39°36'39.873"N	104°32'12.024"W	1.44	
9662.00	89.940	270.800	7715.82	1826.38	-1295.01	-1680.06	39°36'39.889"N	104°32'13.238"W	1.00	
9756.00	89.880	271.740	7715.97	1919.39	-1292.92	-1774.04	39°36'39.919"N	104°32'14.439"W	1.00	
9851.00	89.880	271.420	7716.16	2013.31	-1290.30	-1869.00	39°36'39.955"N	104°32'15.652"W	0.34	
9946.00	89.600	269.840	7716.60	2107.46	-1289.26	-1963.99	39°36'39.975"N	104°32'16.865"W	1.69	
10041.00	89.750	270.440	7717.13	2201.71	-1289.03	-2058.99	39°36'39.988"N	104°32'18.079"W	0.65	
10136.00	89.690	270.870	7717.60	2295.85	-1287.94	-2153.98	39°36'40.008"N	104°32'19.292"W	0.46	
10230.00	89.940	269.760	7717.90	2389.07	-1287.42	-2247.98	39°36'40.023"N	104°32'20.493"W	1.21	
10325.00	89.940	269.040	7718.00	2483.47	-1288.42	-2342.97	39°36'40.023"N	104°32'21.707"W	0.76	
10420.00	89.750	269.170	7718.26	2577.92	-1289.90	-2437.96	39°36'40.018"N	104°32'22.921"W	0.24	
10515.00	89.750	269.800	7718.67	2672.30	-1290.76	-2532.95	39°36'40.020"N	104°32'24.135"W	0.66	
10610.00	89.850	271.290	7719.01	2766.46	-1289.85	-2627.95	39°36'40.039"N	104°32'25.348"W	1.57	
10705.00	89.940	271.190	7719.18	2860.47	-1287.80	-2722.92	39°36'40.069"N	104°32'26.562"W	0.14	
10799.00	89.780	272.010	7719.41	2953.39	-1285.17	-2816.89	39°36'40.105"N	104°32'27.762"W	0.89	
10894.00	89.720	271.480	7719.82	3047.27	-1282.28	-2911.84	39°36'40.143"N	104°32'28.975"W	0.56	
10989.00	89.750	270.350	7720.26	3141.35	-1280.76	-3006.83	39°36'40.168"N	104°32'30.188"W	1.19	
11084.00	89.690	269.250	7720.73	3235.67	-1281.09	-3101.82	39°36'40.175"N	104°32'31.402"W	1.16	
11179.00	89.630	268.810	7721.29	3330.14	-1282.70	-3196.81	39°36'40.169"N	104°32'32.616"W	0.47	
11274.00	89.690	269.250	7721.85	3424.60	-1284.31	-3291.79	39°36'40.163"N	104°32'33.829"W	0.47	
11368.00	89.570	270.420	7722.46	3517.92	-1284.58	-3385.79	39°36'40.170"N	104°32'35.030"W	1.25	



Actual Wellpath Report

HAGAR 5-64 15-16-1BHZ AWP



REFERENCE WELLPATH IDENTIFICATION			
Operator	HIGHLANDS NATURAL RESOURCES	Slot	SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15)
Area	COLORADO	Well	HAGAR 5-64 15-16-1BHZ
Field	ARAPAHOE COUNTY (NAD83/GRID)	Wellbore	HAGAR 5-64 15-16-1BHZ AWB
Facility	SEC.15-T05S-R64W		

WELLPATH DATA (190 stations)										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
11463.00	89.780	270.630	7723.00	3612.09	-1283.71	-3480.78	39°36'40.188"N	104°32'36.244"W	0.31	
11558.00	89.850	269.880	7723.31	3706.31	-1283.29	-3575.78	39°36'40.202"N	104°32'37.458"W	0.79	
11653.00	89.630	269.220	7723.74	3800.68	-1284.03	-3670.78	39°36'40.205"N	104°32'38.672"W	0.73	
11747.00	90.030	269.420	7724.02	3894.10	-1285.15	-3764.77	39°36'40.204"N	104°32'39.873"W	0.48	
11842.00	89.720	272.030	7724.22	3988.22	-1283.95	-3859.75	39°36'40.225"N	104°32'41.086"W	2.77	
11937.00	89.940	273.570	7724.51	4081.81	-1279.31	-3954.64	39°36'40.281"N	104°32'42.298"W	1.64	
12032.00	89.820	273.750	7724.71	4175.15	-1273.24	-4049.44	39°36'40.351"N	104°32'43.508"W	0.23	
12126.00	89.820	273.360	7725.00	4267.55	-1267.41	-4143.26	39°36'40.418"N	104°32'44.706"W	0.41	
12221.00	89.970	274.600	7725.17	4360.79	-1260.82	-4238.03	39°36'40.493"N	104°32'45.916"W	1.31	
12316.00	89.880	270.800	7725.30	4454.40	-1256.35	-4332.91	39°36'40.547"N	104°32'47.128"W	4.00	
12411.00	89.780	271.000	7725.58	4548.48	-1254.85	-4427.89	39°36'40.572"N	104°32'48.341"W	0.24	
12505.00	89.780	269.530	7725.94	4641.71	-1254.42	-4521.89	39°36'40.586"N	104°32'49.542"W	1.56	
12600.00	89.750	268.830	7726.33	4736.15	-1255.78	-4616.88	39°36'40.582"N	104°32'50.756"W	0.74	
12695.00	89.690	268.140	7726.80	4830.71	-1258.29	-4711.84	39°36'40.567"N	104°32'51.970"W	0.73	
12790.00	89.780	267.900	7727.24	4925.33	-1261.57	-4806.79	39°36'40.545"N	104°32'53.183"W	0.27	
12884.00	89.690	267.750	7727.67	5018.99	-1265.14	-4900.72	39°36'40.519"N	104°32'54.384"W	0.19	
12979.00	89.660	267.030	7728.21	5113.70	-1269.47	-4995.62	39°36'40.486"N	104°32'55.597"W	0.76	
13074.00	89.480	266.510	7728.92	5208.49	-1274.82	-5090.46	39°36'40.443"N	104°32'56.809"W	0.58	
13169.00	89.510	266.570	7729.76	5303.30	-1280.55	-5185.28	39°36'40.396"N	104°32'58.022"W	0.07	
13263.00	89.380	269.420	7730.67	5396.92	-1283.84	-5279.21	39°36'40.374"N	104°32'59.222"W	3.03	
13358.00	89.820	269.330	7731.33	5491.32	-1284.88	-5374.21	39°36'40.373"N	104°33'00.436"W	0.47	
13453.00	89.850	269.370	7731.61	5585.73	-1285.95	-5469.20	39°36'40.372"N	104°33'01.650"W	0.05	
13548.00	89.540	269.700	7732.11	5680.10	-1286.73	-5564.19	39°36'40.375"N	104°33'02.864"W	0.48	
13643.00	89.720	270.370	7732.73	5774.37	-1286.67	-5659.19	39°36'40.385"N	104°33'04.077"W	0.73	
13738.00	89.720	270.030	7733.19	5868.61	-1286.34	-5754.19	39°36'40.398"N	104°33'05.291"W	0.36	
13832.00	89.630	271.190	7733.72	5961.76	-1285.33	-5848.18	39°36'40.418"N	104°33'06.492"W	1.24	
13927.00	89.850	273.830	7734.15	6055.43	-1281.17	-5943.08	39°36'40.469"N	104°33'07.704"W	2.79	
14022.00	89.660	272.770	7734.56	6148.88	-1275.71	-6037.92	39°36'40.532"N	104°33'08.915"W	1.13	
14117.00	89.850	272.250	7734.97	6242.56	-1271.55	-6132.83	39°36'40.583"N	104°33'10.127"W	0.58	
14212.00	89.880	273.200	7735.19	6336.18	-1267.03	-6227.72	39°36'40.638"N	104°33'11.339"W	1.00	



Actual Wellpath Report

HAGAR 5-64 15-16-1BHZ AWP



REFERENCE WELLPATH IDENTIFICATION			
Operator	HIGHLANDS NATURAL RESOURCES	Slot	SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15)
Area	COLORADO	Well	HAGAR 5-64 15-16-1BHZ
Field	ARAPAHOE COUNTY (NAD83/GRID)	Wellbore	HAGAR 5-64 15-16-1BHZ AWB
Facility	SEC.15-T05S-R64W		

WELLPATH DATA (190 stations)										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
14307.00	90.250	274.050	7735.08	6429.53	-1261.02	-6322.53	39°36'40.707"N	104°33'12.549"W	0.98	
14402.00	89.970	273.000	7734.90	6522.92	-1255.18	-6417.35	39°36'40.774"N	104°33'13.760"W	1.14	
14496.00	89.690	269.270	7735.18	6615.94	-1253.32	-6511.31	39°36'40.802"N	104°33'14.960"W	3.98	
14591.00	89.570	267.860	7735.79	6710.48	-1255.70	-6606.28	39°36'40.789"N	104°33'16.174"W	1.49	
14686.00	89.630	267.830	7736.46	6805.13	-1259.27	-6701.21	39°36'40.763"N	104°33'17.387"W	0.07	
14781.00	89.820	265.950	7736.91	6899.90	-1264.43	-6796.06	39°36'40.722"N	104°33'18.600"W	1.99	
14876.00	89.660	266.780	7737.34	6994.73	-1270.45	-6890.87	39°36'40.672"N	104°33'19.812"W	0.89	
14971.00	89.720	269.100	7737.86	7089.36	-1273.86	-6985.80	39°36'40.648"N	104°33'21.026"W	2.44	
15066.00	89.540	269.700	7738.47	7183.76	-1274.86	-7080.79	39°36'40.648"N	104°33'22.239"W	0.66	
15160.00	89.690	270.070	7739.10	7277.07	-1275.05	-7174.79	39°36'40.656"N	104°33'23.440"W	0.42	
15255.00	89.600	270.560	7739.69	7371.28	-1274.52	-7269.79	39°36'40.671"N	104°33'24.654"W	0.52	
15350.00	89.630	270.680	7740.33	7465.43	-1273.50	-7364.78	39°36'40.691"N	104°33'25.868"W	0.13	
15445.00	89.780	270.710	7740.82	7559.56	-1272.34	-7459.77	39°36'40.712"N	104°33'27.081"W	0.16	
15539.00	89.910	271.290	7741.07	7652.63	-1270.70	-7553.76	39°36'40.738"N	104°33'28.282"W	0.63	
15634.00	89.750	271.080	7741.36	7746.65	-1268.74	-7648.73	39°36'40.767"N	104°33'29.495"W	0.28	
15729.00	89.820	273.850	7741.71	7840.33	-1264.65	-7743.64	39°36'40.817"N	104°33'30.707"W	2.92	
15824.00	89.850	276.130	7741.99	7933.23	-1256.39	-7838.27	39°36'40.908"N	104°33'31.915"W	2.40	
15919.00	89.660	272.690	7742.39	8026.32	-1249.09	-7932.97	39°36'40.990"N	104°33'33.124"W	3.63	
16014.00	89.780	269.700	7742.86	8120.33	-1247.11	-8027.94	39°36'41.019"N	104°33'34.337"W	3.15	
16108.00	89.750	270.370	7743.24	8213.61	-1247.05	-8121.94	39°36'41.030"N	104°33'35.538"W	0.71	
16203.00	89.720	269.180	7743.68	8307.93	-1247.42	-8216.94	39°36'41.036"N	104°33'36.752"W	1.25	
16298.00	89.820	267.780	7744.06	8402.49	-1249.94	-8311.90	39°36'41.020"N	104°33'37.966"W	1.48	
16393.00	89.630	268.240	7744.52	8497.11	-1253.24	-8406.84	39°36'40.997"N	104°33'39.179"W	0.52	
16488.00	89.780	268.920	7745.01	8591.65	-1255.59	-8501.81	39°36'40.984"N	104°33'40.393"W	0.73	
16583.00	90.000	269.400	7745.19	8686.09	-1256.99	-8596.80	39°36'40.980"N	104°33'41.607"W	0.56	
16678.00	90.000	269.650	7745.19	8780.47	-1257.77	-8691.80	39°36'40.982"N	104°33'42.821"W	0.26	
16772.00	89.940	270.000	7745.24	8873.79	-1258.06	-8785.80	39°36'40.988"N	104°33'44.022"W	0.38	
16867.00	89.880	270.010	7745.39	8968.07	-1258.05	-8880.80	39°36'40.998"N	104°33'45.235"W	0.06	
16962.00	89.660	269.190	7745.77	9062.43	-1258.72	-8975.79	39°36'41.001"N	104°33'46.449"W	0.89	
17057.00	89.970	269.440	7746.08	9156.84	-1259.85	-9070.78	39°36'41.000"N	104°33'47.663"W	0.42	



Actual Wellpath Report

HAGAR 5-64 15-16-1BHZ AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	HIGHLANDS NATURAL RESOURCES	Slot	SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15)
Area	COLORADO	Well	HAGAR 5-64 15-16-1BHZ
Field	ARAPAHOE COUNTY (NAD83/GRID)	Wellbore	HAGAR 5-64 15-16-1BHZ AWB
Facility	SEC.15-T05S-R64W		

WELLPATH DATA (190 stations)										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
17152.00	89.720	270.210	7746.33	9251.16	-1260.14	-9165.78	39°36'41.007"N	104°33'48.877"W	0.85	
17247.00	89.690	272.600	7746.82	9345.12	-1257.81	-9260.75	39°36'41.039"N	104°33'50.090"W	2.52	
17342.00	89.720	272.910	7747.31	9438.73	-1253.25	-9355.63	39°36'41.094"N	104°33'51.302"W	0.33	
17436.00	89.660	271.830	7747.82	9531.45	-1249.36	-9449.55	39°36'41.142"N	104°33'52.501"W	1.15	
17531.00	89.630	270.790	7748.41	9625.44	-1247.19	-9544.52	39°36'41.173"N	104°33'53.714"W	1.10	
17626.00	89.850	272.570	7748.84	9719.33	-1244.40	-9639.48	39°36'41.210"N	104°33'54.927"W	1.89	
17721.00	89.690	271.110	7749.22	9813.19	-1241.35	-9734.43	39°36'41.250"N	104°33'56.140"W	1.55	
17816.00	89.690	271.170	7749.74	9907.22	-1239.46	-9829.40	39°36'41.279"N	104°33'57.353"W	0.06	
17910.00	89.820	270.510	7750.14	10000.32	-1238.09	-9923.39	39°36'41.302"N	104°33'58.554"W	0.72	Last BHI MWD Survey
17967.00	89.820	270.510	7750.32	10056.83	-1237.58	-9980.39	39°36'41.313"N	104°33'59.282"W	0.00	Projection to Bit

HOLE & CASING SECTIONS - Ref Wellbore: HAGAR 5-64 15-16-1BHZ AWB      Ref Wellpath: HAGAR 5-64 15-16-1BHZ 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]
13.5in Open Hole	27.00	2158.00	2131.00	27.00	2135.96	0.00	0.00	-232.88	81.39
9.625in Casing Surface	27.00	2158.00	2131.00	27.00	2135.96	0.00	0.00	-232.88	81.39
8.5in Open Hole	2158.00	17910.00	15752.00	2135.96	7750.14	-232.88	81.39	-1238.09	-9923.39



Actual Wellpath Report

HAGAR 5-64 15-16-1BHZ AWP



REFERENCE WELLPATH IDENTIFICATION			
Operator	HIGHLANDS NATURAL RESOURCES	Slot	SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15)
Area	COLORADO	Well	HAGAR 5-64 15-16-1BHZ
Field	ARAPAHOE COUNTY (NAD83/GRID)	Wellbore	HAGAR 5-64 15-16-1BHZ AWB
Facility	SEC.15-T05S-R64W		

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
SEC.15-T05S-R64W	-3.00	119.82	0.94	3272987.61	1650317.10	39°36'53.694"N	104°31'51.568"W	polygon
SEC.16-T05S-R64W	-3.00	119.82	0.94	3272987.61	1650317.10	39°36'53.694"N	104°31'51.568"W	polygon
HAGAR 5-64 15-16-1BHZ Landing Point (990'FSL&600'FEL,SEC.15)	7704.00	-1308.91	-171.19	3272815.48	1648888.41	39°36'39.593"N	104°31'53.962"W	point
HAGAR 5-64 15-16-1BHZ REV-2 Landing Point (990'FSL&600'FEL,SEC.15)	7709.00	-1308.91	-171.22	3272815.45	1648888.41	39°36'39.593"N	104°31'53.962"W	point
HAGAR 5-64 15-16-1BHZ REV-1 BHL(990'FSL&100'FWL,SEC.16)	7746.00	-1235.70	-9985.41	3263001.51	1648961.62	39°36'41.332"N	104°33'59.346"W	point
HAGAR 5-64 15-16-1BHZ REV-2 BHL(990'FSL&100'FWL,SEC.16)	7751.00	-1235.66	-9985.41	3263001.51	1648961.66	39°36'41.332"N	104°33'59.346"W	point
SEC.15/16-T05S-R64W SETBACKS (300'FSNL/FSL & 600'FEL & 100'FWL)	7825.00	119.82	0.94	3272987.61	1650317.10	39°36'53.694"N	104°31'51.568"W	polygon

WELLPATH COMPOSITION - Ref Wellbore: HAGAR 5-64 15-16-1BHZ AWB      Ref Wellpath: HAGAR 5-64 15-16-1BHZ AWP				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
27.00	2103.00	BHI NaviTrak (Standard)	BHI/Navitrak MWD 13.5" Surface <328'-2103'>	HAGAR 5-64 15-16-1BHZ AWB
2103.00	17910.00	BHI AutoTrak Curve (Short)	BH/ATC 8.5" Short Spacing <2172'-17910'>	HAGAR 5-64 15-16-1BHZ AWB
17910.00	17967.00	Blind Drilling (std)	Projection to bit	HAGAR 5-64 15-16-1BHZ AWB



Actual Wellpath Report

HAGAR 5-64 15-16-1BHZ AWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	HIGHLANDS NATURAL RESOURCES	Slot	SLOT#07 HAGAR 5-64 15-16-1BHZ (2300'FSL&440'FEL,SEC.15)
Area	COLORADO	Well	HAGAR 5-64 15-16-1BHZ
Field	ARAPAHOE COUNTY (NAD83/GRID)	Wellbore	HAGAR 5-64 15-16-1BHZ AWB
Facility	SEC.15-T05S-R64W		

WELLPATH COMMENTS				
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
328.00	0.460	201.670	328.00	1st BHI MWD Survey
17910.00	89.820	270.510	7750.14	Last BHI MWD Survey
17967.00	89.820	270.510	7750.32	Projection to Bit