

KERR-MCGEE OIL & GAS ONSHORE LP

Location: COLORADO Slot: SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22)
 Field: WELD COUNTY (KERR MCGEE) Well: COPPERHEAD 27N-15HZ
 Facility: SEC.22-T2N-R67W Wellbore: COPPERHEAD 27N-15HZX PWB

Plot reference wellpath is COPPERHEAD 27N-15HZX (REV-A.0) PWP

True vertical depths are referenced to XTREME 20 (16KB) (RKB) Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
 Measured depths are referenced to XTREME 20 (16KB) (RKB) North Reference: True north
 XTREME 20 (16KB) (RKB) to Mean Sea Level: 5045 feet Scale: True distance
 Mean Sea Level to Mud line (At Slot: SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22)): 0 feet Depths are in feet
 Coordinates are in feet referenced to Slot Created by: precain on 2/3/2015

Location Information

Facility Name		Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	
SEC.22-T2N-R67W		317370.270	129629.950	40°07'46.204"N	104°52'42.789"W	
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22)	-2368.34	942.46	3174729.405	1288248.377	40°07'22.602"N	104°52'30.637"W
XTREME 20 (16KB) (RKB) to Mud line (At Slot: SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22))						5045R
Mean Sea Level to Mud line (At Slot: SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22))						0ft
XTREME 20 (16KB) (RKB) to Mean Sea Level						5045R

Survey Program

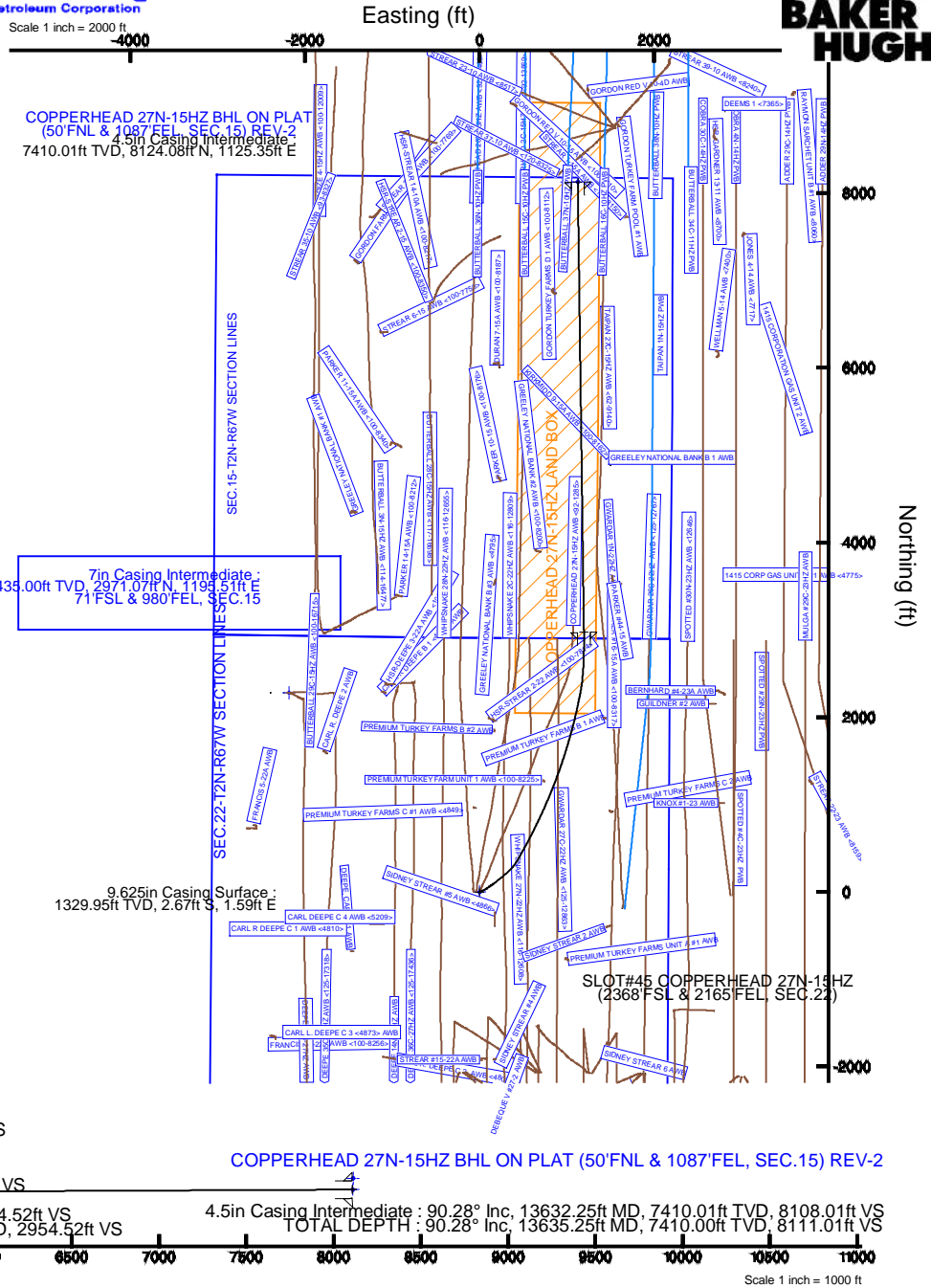
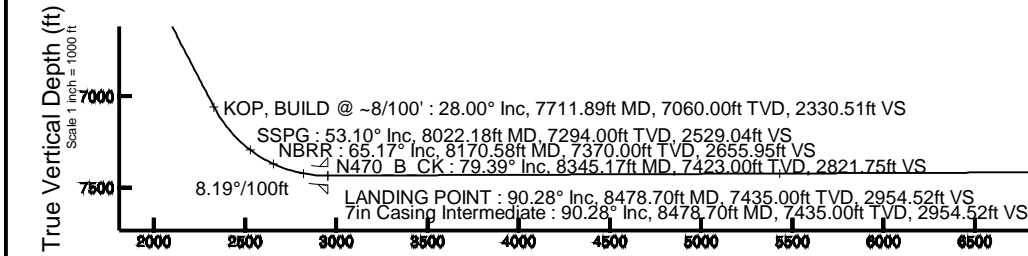
Start MD (ft)	End MD (ft)	Tool	Model	Log Name/Comment	Wellbore
16.00	1285.00	ISCWSA MWD, Rev. 2	ISCWSA MWD, Rev. 2 (Standard)		COPPERHEAD 27N-15HZ AWB <92-1285>
1285.00	1460.00	NavitTrak	NavitTrak (MAGCORR,IFR)		COPPERHEAD 27N-15HZ AWB <92-1285>
1460.00	8478.70	NavitTrak	NavitTrak (MAGCORR,IFR)		COPPERHEAD 27N-15HZX PWB
8478.70	13635.25	NavitTrak	NavitTrak (MAGCORR,IFR)		COPPERHEAD 27N-15HZX PWB

Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
TIE INTO BHI-MWD SURVEYS	1460.00	2.460	25.300	1459.92	-0.94	2.46	2.67	-0.98
BUILD & TURN @ 5.5°/100'	1520.00	4.900	25.000	1519.79	2.54	4.09	4.07	2.49
BUILD & TURN @ 4.5°/100'	1614.00	4.651	90.543	1613.53	6.15	9.61	5.50	6.02
BUILD & TURN @ 2°/100'	1708.00	8.346	71.478	1706.92	8.28	19.89	4.50	8.01
BUILD & TURN @ 2°/100'	1802.00	10.018	66.067	1799.71	13.77	33.83	2.00	13.30
TURN @ 2°/100'	2779.70	29.000	50.000	2717.59	202.44	295.66	2.00	198.39
DROP & TURN	3262.63	29.000	30.000	3140.97	379.48	444.22	2.00	373.40
KOP, BUILD @ ~8°/100'	7711.89	28.000	10.000	7060.00	2346.61	1166.51	0.21	2330.51
LANDING POINT	8478.70	90.278	359.220	7435.00	2971.07	1195.51	8.19	2954.52
TOTAL DEPTH	13635.25	90.278	359.220	7410.00	8127.08	1125.31	0.00	8111.01

Targets

Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.15-T2N-67W SECTION LINES		30.00	12820.29	-1047.10	3173592.05	1301060.42	40°09'29.293"N	104°52'44.123"W
SEC.22-T2N-R67W SECTION LINES		30.00	2280.18	-2182.86	3172830.63	1290513.02	40°07'45.134"N	104°52'58.739"W
COPPERHEAD 27N-15HZ BHL ON PLAT (50'FNL & 1212'FEL, SEC.15) REV-1		7345.00	8127.08	1005.31	3175677.38	1296381.99	40°08'42.914"N	104°52'17.692"W
COPPERHEAD 27N-15HZ LAND BOX		7362.00	0.00	-0.02	3174729.39	1288248.38	40°07'22.602"N	104°52'30.637"W
COPPERHEAD 27N-15HZ BHL ON PLAT (50'FNL & 1087'FEL, SEC.15) REV-2		13635.25	7410.00	8127.08	1125.31	3175797.38	40°08'42.914"N	104°52'16.148"W



COPPERHEAD 27N-15HZ BHL ON PLAT (50'FNL & 1087'FEL, SEC.15) REV-2
 4.5in Casing Intermediate : 90.28° Inc, 13632.25ft MD, 7410.01ft TVD, 8108.01ft VS
 TOTAL DEPTH : 90.28° Inc, 13635.25ft MD, 7410.00ft TVD, 8111.01ft VS

REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22)
Area	COLORADO	Well	COPPERHEAD 27N-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 27N-15HZX PWB
Facility	SEC.22-T2N-R67W	Sidetrack from	COPPERHEAD 27N-15HZ AWB <92-1285> at 1460.00 MD

REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect@ 4.0.0
North Reference	True	User	Precain
Scale	0.999959	Report Generated	2/3/2015 at 4:30:44 PM
Convergence at slot	n/a	Database/Source file	WellArchitectDB/COPPERHEAD_27N-15HZX_PWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-2388.34	942.46	3174729.41	1288248.38	40°07'22.602"N	104°52'30.637"W
Facility Reference Pt			3173770.27	1290629.95	40°07'46.204"N	104°52'42.769"W
Field Reference Pt			3197771.84	1268891.29	40°04'09.600"N	104°47'36.000"W

WELLPATH DATUM

Calculation method	Minimum curvature	XTREME 20 (16'KB) (RKB) to Facility Vertical Datum	5045.00ft
Horizontal Reference Pt	Slot	XTREME 20 (16'KB) (RKB) to Mean Sea Level	5045.00ft
Vertical Reference Pt	XTREME 20 (16'KB) (RKB)	XTREME 20 (16'KB) (RKB) to Mud Line at Slot (SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22))	5045.00ft
MD Reference Pt	XTREME 20 (16'KB) (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	359.22°

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22)
Area	COLORADO	Well	COPPERHEAD 27N-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 27N-15HZX PWB
Facility	SEC.22-T2N-R67W	Sidetrack from	COPPERHEAD 27N-15HZ AWB <92-1285> at 1460.00 MD

WELLPATH DATA (157 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	324.200	0.00	0.00	0.00	0.00	40°07'22.602"N	104°52'30.637"W	0.00	
16.00	0.000	324.200	16.00	0.00	0.00	0.00	40°07'22.602"N	104°52'30.637"W	0.00	
92.00	0.500	324.200	92.00	0.27	0.27	-0.19	40°07'22.605"N	104°52'30.639"W	0.66	
162.00	0.500	330.700	162.00	0.79	0.78	-0.52	40°07'22.610"N	104°52'30.644"W	0.08	
238.00	0.400	332.400	237.99	1.32	1.31	-0.81	40°07'22.615"N	104°52'30.647"W	0.13	
319.00	0.200	8.000	318.99	1.71	1.70	-0.92	40°07'22.619"N	104°52'30.649"W	0.33	
399.00	0.200	257.800	398.99	1.82	1.81	-1.04	40°07'22.620"N	104°52'30.650"W	0.41	
479.00	0.400	243.800	478.99	1.67	1.65	-1.42	40°07'22.618"N	104°52'30.655"W	0.26	
559.00	0.600	235.200	558.99	1.32	1.29	-2.02	40°07'22.615"N	104°52'30.663"W	0.27	
639.00	0.600	214.500	638.98	0.74	0.71	-2.60	40°07'22.609"N	104°52'30.670"W	0.27	
717.02†	0.696	187.466	717.00	-0.06	-0.10	-2.89	40°07'22.601"N	104°52'30.674"W	0.41	Base Fox Hills
719.00	0.700	186.900	718.98	-0.08	-0.12	-2.89	40°07'22.601"N	104°52'30.674"W	0.41	
799.00	0.700	140.800	798.97	-0.95	-0.99	-2.64	40°07'22.592"N	104°52'30.671"W	0.69	
879.00	1.000	108.800	878.97	-1.57	-1.59	-1.67	40°07'22.586"N	104°52'30.659"W	0.69	
959.00	0.800	109.400	958.96	-1.99	-2.00	-0.49	40°07'22.582"N	104°52'30.643"W	0.25	
1039.00	0.300	98.400	1038.95	-2.22	-2.22	0.25	40°07'22.580"N	104°52'30.634"W	0.64	
1119.00	0.400	104.800	1118.95	-2.33	-2.32	0.72	40°07'22.579"N	104°52'30.628"W	0.13	
1199.00	0.100	98.400	1198.95	-2.41	-2.40	1.06	40°07'22.578"N	104°52'30.623"W	0.38	
1285.00	0.400	117.700	1284.95	-2.57	-2.55	1.40	40°07'22.577"N	104°52'30.619"W	0.36	
1365.00	0.080	209.920	1364.95	-2.75	-2.73	1.62	40°07'22.575"N	104°52'30.616"W	0.51	
1460.00	2.460	25.300	1459.92	-0.98	-0.94	2.46	40°07'22.593"N	104°52'30.605"W	2.67	TIE INTO BHI+MWD SURVEYS
1520.00	4.900	25.000	1519.79	2.49	2.54	4.09	40°07'22.627"N	104°52'30.584"W	4.07	BUILD & TURN @ 5.5°/100'
1560.00†	4.059	51.375	1559.67	4.89	4.98	5.92	40°07'22.651"N	104°52'30.561"W	5.50	
1614.00	4.651	90.543	1613.53	6.02	6.15	9.61	40°07'22.663"N	104°52'30.513"W	5.50	BUILD & TURN @ 4.5°/100'
1660.00†	6.377	78.477	1659.32	6.45	6.64	13.97	40°07'22.668"N	104°52'30.457"W	4.50	
1708.00	8.346	71.478	1706.92	8.01	8.28	19.89	40°07'22.684"N	104°52'30.381"W	4.50	BUILD & TURN @ 2°/100'
1760.00†	9.261	68.245	1758.31	10.66	11.03	27.36	40°07'22.711"N	104°52'30.285"W	2.00	
1802.00	10.018	66.067	1799.71	13.30	13.77	33.83	40°07'22.738"N	104°52'30.201"W	2.00	BUILD & TURN @ 2°/100'
1860.00†	11.090	63.649	1856.73	17.69	18.29	43.44	40°07'22.783"N	104°52'30.078"W	2.00	
1960.00†	12.974	60.418	1954.53	27.26	28.10	61.83	40°07'22.880"N	104°52'29.841"W	2.00	
2060.00†	14.888	58.000	2051.58	39.32	40.45	82.49	40°07'23.002"N	104°52'29.575"W	2.00	
2160.00†	16.822	56.124	2147.78	53.88	55.32	105.40	40°07'23.149"N	104°52'29.280"W	2.00	
2260.00†	18.769	54.626	2242.99	70.92	72.70	130.53	40°07'23.320"N	104°52'28.957"W	2.00	
2360.00†	20.725	53.402	2337.10	90.41	92.57	157.85	40°07'23.517"N	104°52'28.605"W	2.00	
2460.00†	22.690	52.380	2430.01	112.33	114.89	187.34	40°07'23.737"N	104°52'28.225"W	2.00	
2560.00†	24.659	51.514	2521.59	136.66	139.65	218.95	40°07'23.982"N	104°52'27.819"W	2.00	
2660.00†	26.633	50.768	2611.73	163.36	166.81	252.64	40°07'24.250"N	104°52'27.385"W	2.00	
2760.00†	28.610	50.118	2700.33	192.40	196.34	288.38	40°07'24.542"N	104°52'26.925"W	2.00	
2779.70	29.000	50.000	2717.59	198.39	202.44	295.66	40°07'24.602"N	104°52'26.831"W	2.00	TURN @ 2°/100'
2860.00†	28.795	46.703	2787.90	223.77	228.21	324.65	40°07'24.857"N	104°52'26.458"W	2.00	
2960.00†	28.654	42.552	2875.60	257.49	262.40	358.39	40°07'25.195"N	104°52'26.023"W	2.00	
3060.00†	28.639	38.379	2963.37	293.52	298.85	389.49	40°07'25.555"N	104°52'25.623"W	2.00	
3160.00†	28.753	34.220	3051.10	331.81	337.53	417.90	40°07'25.937"N	104°52'25.257"W	2.00	
3260.00†	28.992	30.107	3138.68	372.31	378.38	443.58	40°07'26.341"N	104°52'24.927"W	2.00	
3262.63	29.000	30.000	3140.97	373.40	379.48	444.22	40°07'26.352"N	104°52'24.919"W	2.00	DROP & TURN

REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22)
Area	COLORADO	Well	COPPERHEAD 27N-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 27N-15HZX PWB
Facility	SEC.22-T2N-R67W	Sidetrack from	COPPERHEAD 27N-15HZ AWB <92-1285> at 1460.00 MD

WELLPATH DATA (157 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
3360.00†	28.947	29.582	3226.16	414.01	420.42	467.65	40°07'26.757"N	104°52'24.617"W	0.21	
3460.00†	28.895	29.151	3313.69	455.83	462.56	491.37	40°07'27.173"N	104°52'24.312"W	0.21	
3560.00†	28.844	28.719	3401.26	497.76	504.82	514.73	40°07'27.591"N	104°52'24.011"W	0.21	
3660.00†	28.794	28.286	3488.88	539.81	547.18	537.73	40°07'28.009"N	104°52'23.715"W	0.21	
3760.00†	28.745	27.851	3576.53	581.96	589.65	560.38	40°07'28.429"N	104°52'23.423"W	0.21	
3860.00†	28.698	27.415	3664.23	624.23	632.22	582.67	40°07'28.850"N	104°52'23.136"W	0.21	
3960.00†	28.653	26.978	3751.96	666.61	674.90	604.60	40°07'29.271"N	104°52'22.854"W	0.21	
4060.00†	28.608	26.539	3839.74	709.09	717.69	626.17	40°07'29.694"N	104°52'22.576"W	0.21	
4160.00†	28.565	26.099	3927.55	751.69	760.57	647.39	40°07'30.118"N	104°52'22.303"W	0.21	
4260.00†	28.524	25.658	4015.39	794.39	803.57	668.24	40°07'30.543"N	104°52'22.035"W	0.21	
4360.00†	28.484	25.216	4103.27	837.21	846.66	688.74	40°07'30.969"N	104°52'21.771"W	0.21	
4396.10†	28.470	25.056	4135.00	852.69	862.24	696.05	40°07'31.123"N	104°52'21.677"W	0.21	Parkman
4460.00†	28.446	24.772	4191.18	880.13	889.86	708.88	40°07'31.396"N	104°52'21.511"W	0.21	
4560.00†	28.408	24.328	4279.12	923.15	933.16	728.66	40°07'31.823"N	104°52'21.257"W	0.21	
4660.00†	28.373	23.883	4367.10	966.29	976.56	748.08	40°07'32.252"N	104°52'21.007"W	0.21	
4760.00†	28.339	23.436	4455.10	1009.53	1020.06	767.13	40°07'32.682"N	104°52'20.761"W	0.21	
4860.00†	28.306	22.989	4543.13	1052.87	1063.67	785.83	40°07'33.113"N	104°52'20.521"W	0.21	
4879.16†	28.300	22.903	4560.00	1061.19	1072.03	789.38	40°07'33.196"N	104°52'20.475"W	0.21	Sussex
4960.00†	28.274	22.540	4631.18	1096.32	1107.37	804.17	40°07'33.545"N	104°52'20.285"W	0.21	
5060.00†	28.245	22.091	4719.26	1139.87	1151.17	822.15	40°07'33.978"N	104°52'20.053"W	0.21	
5160.00†	28.216	21.641	4807.37	1183.52	1195.07	839.77	40°07'34.412"N	104°52'19.826"W	0.21	
5260.00†	28.189	21.190	4895.50	1227.28	1239.06	857.02	40°07'34.846"N	104°52'19.604"W	0.21	
5360.00†	28.164	20.738	4983.65	1271.14	1283.16	873.92	40°07'35.282"N	104°52'19.387"W	0.21	
5460.00†	28.140	20.286	5071.82	1315.10	1327.34	890.45	40°07'35.719"N	104°52'19.174"W	0.21	
5560.00†	28.118	19.833	5160.01	1359.16	1371.63	906.62	40°07'36.156"N	104°52'18.966"W	0.21	
5660.00†	28.097	19.379	5248.21	1403.32	1416.01	922.43	40°07'36.595"N	104°52'18.762"W	0.21	
5760.00†	28.077	18.925	5336.44	1447.58	1460.49	937.87	40°07'37.035"N	104°52'18.563"W	0.21	
5860.00†	28.059	18.470	5424.68	1491.94	1505.05	952.96	40°07'37.475"N	104°52'18.369"W	0.21	
5960.00†	28.043	18.014	5512.93	1536.40	1549.72	967.68	40°07'37.916"N	104°52'18.180"W	0.21	
6060.00†	28.028	17.558	5601.19	1580.96	1594.47	982.04	40°07'38.359"N	104°52'17.995"W	0.21	
6160.00†	28.014	17.102	5689.47	1625.61	1639.32	996.03	40°07'38.802"N	104°52'17.815"W	0.21	
6260.00†	28.003	16.645	5777.76	1670.36	1684.26	1009.66	40°07'39.246"N	104°52'17.639"W	0.21	
6360.00†	27.992	16.188	5866.06	1715.20	1729.29	1022.93	40°07'39.691"N	104°52'17.468"W	0.21	
6460.00†	27.983	15.731	5954.36	1760.14	1774.40	1035.83	40°07'40.137"N	104°52'17.302"W	0.21	
6560.00†	27.976	15.273	6042.67	1805.17	1819.61	1048.37	40°07'40.583"N	104°52'17.141"W	0.21	
6660.00†	27.970	14.816	6130.99	1850.30	1864.91	1060.55	40°07'41.031"N	104°52'16.984"W	0.21	
6760.00†	27.966	14.358	6219.31	1895.52	1910.30	1072.36	40°07'41.480"N	104°52'16.832"W	0.21	
6860.00†	27.963	13.900	6307.64	1940.83	1955.77	1083.80	40°07'41.929"N	104°52'16.684"W	0.21	
6960.00†	27.961	13.442	6395.96	1986.24	2001.33	1094.88	40°07'42.379"N	104°52'16.542"W	0.21	
7060.00†	27.962	12.984	6484.29	2031.74	2046.98	1105.60	40°07'42.830"N	104°52'16.404"W	0.21	
7160.00†	27.963	12.525	6572.61	2077.32	2092.71	1115.95	40°07'43.282"N	104°52'16.270"W	0.21	
7260.00†	27.967	12.067	6660.94	2123.00	2138.52	1125.94	40°07'43.735"N	104°52'16.142"W	0.21	
7360.00†	27.971	11.610	6749.26	2168.77	2184.43	1135.56	40°07'44.188"N	104°52'16.018"W	0.21	
7460.00†	27.978	11.152	6837.57	2214.62	2230.41	1144.82	40°07'44.643"N	104°52'15.899"W	0.21	
7560.00†	27.985	10.694	6925.88	2260.56	2276.48	1153.71	40°07'45.098"N	104°52'15.784"W	0.21	

REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22)
Area	COLORADO	Well	COPPERHEAD 27N-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 27N-15HZX PWB
Facility	SEC.22-T2N-R67W	Sidetrack from	COPPERHEAD 27N-15HZ AWB <92-1285> at 1460.00 MD

WELLPATH DATA (157 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
7660.00†	27.995	10.237	7014.19	2306.59	2322.63	1162.23	40°07'45.554"N	104°52'15.674"W	0.21	
7711.89	28.000	10.000	7060.00	2330.51	2346.61	1166.51	40°07'45.791"N	104°52'15.619"W	0.21	KOP, BUILD @ ~8/100'
7760.00†	31.863	8.431	7101.69	2354.15	2370.30	1170.34	40°07'46.025"N	104°52'15.570"W	8.19	
7860.00†	39.936	6.052	7182.63	2412.17	2428.43	1177.60	40°07'46.600"N	104°52'15.477"W	8.19	
7960.00†	48.044	4.364	7254.52	2481.19	2497.54	1183.83	40°07'47.283"N	104°52'15.396"W	8.19	
8022.18†	53.095	3.520	7294.00	2529.04	2545.44	1187.12	40°07'47.756"N	104°52'15.354"W	8.19	SSPG
8060.00†	56.171	3.059	7315.89	2559.80	2576.22	1188.88	40°07'48.060"N	104°52'15.331"W	8.19	
8160.00†	64.309	1.983	7365.48	2646.39	2662.88	1192.67	40°07'48.917"N	104°52'15.282"W	8.19	
8170.58†	65.170	1.878	7370.00	2655.95	2672.44	1192.99	40°07'49.011"N	104°52'15.278"W	8.19	NBRR
8260.00†	72.454	1.045	7402.30	2739.21	2755.73	1195.10	40°07'49.834"N	104°52'15.251"W	8.19	
8345.17†	79.394	0.312	7423.00	2821.75	2838.29	1196.07	40°07'50.650"N	104°52'15.239"W	8.19	N470_B_CK
8360.00†	80.603	0.188	7425.57	2836.34	2852.89	1196.13	40°07'50.794"N	104°52'15.238"W	8.19	
8460.00†	88.754	359.371	7434.84	2935.82	2952.37	1195.74	40°07'51.777"N	104°52'15.243"W	8.19	
8478.70	90.278	359.220	7435.00	2954.52	2971.07	1195.51	40°07'51.962"N	104°52'15.246"W	8.19	LANDING POINT
8560.00†	90.278	359.220	7434.61	3035.82	3052.36	1194.41	40°07'52.765"N	104°52'15.260"W	0.00	
8660.00†	90.278	359.220	7434.12	3135.82	3152.35	1193.05	40°07'53.754"N	104°52'15.277"W	0.00	
8760.00†	90.278	359.220	7433.64	3235.82	3252.34	1191.68	40°07'54.742"N	104°52'15.295"W	0.00	
8860.00†	90.278	359.220	7433.15	3335.82	3352.33	1190.32	40°07'55.730"N	104°52'15.312"W	0.00	
8960.00†	90.278	359.220	7432.66	3435.82	3452.32	1188.96	40°07'56.718"N	104°52'15.330"W	0.00	
9060.00†	90.278	359.220	7432.18	3535.82	3552.31	1187.60	40°07'57.706"N	104°52'15.347"W	0.00	
9160.00†	90.278	359.220	7431.69	3635.81	3652.30	1186.24	40°07'58.694"N	104°52'15.365"W	0.00	
9260.00†	90.278	359.220	7431.21	3735.81	3752.29	1184.88	40°07'59.682"N	104°52'15.382"W	0.00	
9360.00†	90.278	359.220	7430.72	3835.81	3852.28	1183.52	40°08'00.670"N	104°52'15.400"W	0.00	
9460.00†	90.278	359.220	7430.24	3935.81	3952.27	1182.16	40°08'01.658"N	104°52'15.417"W	0.00	
9560.00†	90.278	359.220	7429.75	4035.81	4052.26	1180.79	40°08'02.647"N	104°52'15.434"W	0.00	
9660.00†	90.278	359.220	7429.27	4135.81	4152.25	1179.43	40°08'03.635"N	104°52'15.452"W	0.00	
9760.00†	90.278	359.220	7428.78	4235.81	4252.24	1178.07	40°08'04.623"N	104°52'15.469"W	0.00	
9860.00†	90.278	359.220	7428.30	4335.81	4352.23	1176.71	40°08'05.611"N	104°52'15.487"W	0.00	
9960.00†	90.278	359.220	7427.81	4435.80	4452.22	1175.35	40°08'06.599"N	104°52'15.504"W	0.00	
10060.00†	90.278	359.220	7427.33	4535.80	4552.21	1173.99	40°08'07.587"N	104°52'15.522"W	0.00	
10160.00†	90.278	359.220	7426.84	4635.80	4652.20	1172.63	40°08'08.575"N	104°52'15.539"W	0.00	
10260.00†	90.278	359.220	7426.36	4735.80	4752.19	1171.26	40°08'09.563"N	104°52'15.557"W	0.00	
10360.00†	90.278	359.220	7425.87	4835.80	4852.18	1169.90	40°08'10.551"N	104°52'15.574"W	0.00	
10460.00†	90.278	359.220	7425.39	4935.80	4952.17	1168.54	40°08'11.540"N	104°52'15.592"W	0.00	
10560.00†	90.278	359.220	7424.90	5035.80	5052.15	1167.18	40°08'12.528"N	104°52'15.609"W	0.00	
10660.00†	90.278	359.220	7424.42	5135.80	5152.14	1165.82	40°08'13.516"N	104°52'15.627"W	0.00	
10760.00†	90.278	359.220	7423.93	5235.80	5252.13	1164.46	40°08'14.504"N	104°52'15.644"W	0.00	
10860.00†	90.278	359.220	7423.45	5335.79	5352.12	1163.10	40°08'15.492"N	104°52'15.662"W	0.00	
10952.83†	90.278	359.220	7423.00	5428.63	5444.95	1161.83	40°08'16.409"N	104°52'15.678"W	0.00	N470_B_CK
10960.00†	90.278	359.220	7422.97	5435.79	5452.11	1161.73	40°08'16.480"N	104°52'15.679"W	0.00	
11060.00†	90.278	359.220	7422.48	5535.79	5552.10	1160.37	40°08'17.468"N	104°52'15.696"W	0.00	
11160.00†	90.278	359.220	7422.00	5635.79	5652.09	1159.01	40°08'18.456"N	104°52'15.714"W	0.00	
11260.00†	90.278	359.220	7421.51	5735.79	5752.08	1157.65	40°08'19.444"N	104°52'15.731"W	0.00	
11360.00†	90.278	359.220	7421.03	5835.79	5852.07	1156.29	40°08'20.432"N	104°52'15.749"W	0.00	
11460.00†	90.278	359.220	7420.54	5935.79	5952.06	1154.93	40°08'21.421"N	104°52'15.766"W	0.00	

REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22)
Area	COLORADO	Well	COPPERHEAD 27N-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 27N-15HZX PWB
Facility	SEC.22-T2N-R67W	Sidetrack from	COPPERHEAD 27N-15HZ AWB <92-1285> at 1460.00 MD

WELLPATH DATA (157 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
11560.00†	90.278	359.220	7420.06	6035.79	6052.05	1153.57	40°08'22.409"N	104°52'15.784"W	0.00	
11660.00†	90.278	359.220	7419.57	6135.78	6152.04	1152.20	40°08'23.397"N	104°52'15.801"W	0.00	
11760.00†	90.278	359.220	7419.09	6235.78	6252.03	1150.84	40°08'24.385"N	104°52'15.819"W	0.00	
11860.00†	90.278	359.220	7418.60	6335.78	6352.02	1149.48	40°08'25.373"N	104°52'15.836"W	0.00	
11960.00†	90.278	359.220	7418.12	6435.78	6452.01	1148.12	40°08'26.361"N	104°52'15.854"W	0.00	
12060.00†	90.278	359.220	7417.63	6535.78	6552.00	1146.76	40°08'27.349"N	104°52'15.871"W	0.00	
12160.00†	90.278	359.220	7417.15	6635.78	6651.99	1145.40	40°08'28.337"N	104°52'15.889"W	0.00	
12260.00†	90.278	359.220	7416.66	6735.78	6751.98	1144.04	40°08'29.325"N	104°52'15.906"W	0.00	
12360.00†	90.278	359.220	7416.18	6835.78	6851.97	1142.67	40°08'30.314"N	104°52'15.924"W	0.00	
12460.00†	90.278	359.220	7415.69	6935.78	6951.96	1141.31	40°08'31.302"N	104°52'15.941"W	0.00	
12560.00†	90.278	359.220	7415.21	7035.77	7051.95	1139.95	40°08'32.290"N	104°52'15.959"W	0.00	
12660.00†	90.278	359.220	7414.73	7135.77	7151.94	1138.59	40°08'33.278"N	104°52'15.976"W	0.00	
12760.00†	90.278	359.220	7414.24	7235.77	7251.92	1137.23	40°08'34.266"N	104°52'15.993"W	0.00	
12860.00†	90.278	359.220	7413.76	7335.77	7351.91	1135.87	40°08'35.254"N	104°52'16.011"W	0.00	
12960.00†	90.278	359.220	7413.27	7435.77	7451.90	1134.50	40°08'36.242"N	104°52'16.028"W	0.00	
13060.00†	90.278	359.220	7412.79	7535.77	7551.89	1133.14	40°08'37.230"N	104°52'16.046"W	0.00	
13160.00†	90.278	359.220	7412.30	7635.77	7651.88	1131.78	40°08'38.218"N	104°52'16.063"W	0.00	
13260.00†	90.278	359.220	7411.82	7735.77	7751.87	1130.42	40°08'39.207"N	104°52'16.081"W	0.00	
13360.00†	90.278	359.220	7411.33	7835.76	7851.86	1129.06	40°08'40.195"N	104°52'16.098"W	0.00	
13460.00†	90.278	359.220	7410.85	7935.76	7951.85	1127.70	40°08'41.183"N	104°52'16.116"W	0.00	
13560.00†	90.278	359.220	7410.36	8035.76	8051.84	1126.33	40°08'42.171"N	104°52'16.133"W	0.00	
13635.25	90.278	359.220	7410.00 ¹	8111.01	8127.08	1125.31	40°08'42.914"N	104°52'16.146"W	0.00	TOTAL DEPTH

HOLE & CASING SECTIONS - Ref Wellbore: COPPERHEAD 27N-15HZX PWB Ref Wellpath: COPPERHEAD 27N-15HZX (REV-A.0) PWP

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	16.00	1340.00	1324.00	16.00	1339.95	0.00	0.00	-2.69	1.61
9.625in Casing Surface	16.00	1330.00	1314.00	16.00	1329.95	0.00	0.00	-2.67	1.59
8.75in Open Hole	1340.00	8478.70	7138.70	1339.95	7435.00	-2.69	1.61	2971.07	1195.51
7in Casing Intermediate	16.00	8478.70	8462.70	16.00	7435.00	0.00	0.00	2971.07	1195.51
6.125in Open Hole	8478.70	13635.25	5156.55	7435.00	NA	2971.07	1195.51	NA	NA
4.5in Casing Intermediate	16.00	13632.25	13616.25	16.00	7410.01	0.00	0.00	8124.08	1125.35

REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22)
Area	COLORADO	Well	COPPERHEAD 27N-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 27N-15HZX PWB
Facility	SEC.22-T2N-R67W	Sidetrack from	COPPERHEAD 27N-15HZ AWB <92-1285> at 1460.00 MD

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
SEC.15-T2N-67W SECTION LINES		30.00	12820.29	-1047.10	3173592.05	1301060.42	40°09'29.293"N	104°52'44.123"W	polygon
SEC.22-T2N-R67W SECTION LINES		30.00	2280.18	-2182.86	3172530.63	1290513.02	40°07'45.134"N	104°52'58.739"W	polygon
COPPERHEAD 27N-15HZ BHL ON PLAT (50'FNL & 1212'FEL, SEC.15) REV-1		7345.00	8127.08	1005.31	3175677.38	1296381.99	40°08'42.914"N	104°52'17.692"W	point
COPPERHEAD 27N-15HZ LAND BOX		7362.00	0.00	-0.02	3174729.39	1288248.38	40°07'22.602"N	104°52'30.637"W	polygon
1) COPPERHEAD 27N-15HZ BHL ON PLAT (50'FNL & 1087'FEL, SEC.15) REV-2	13635.25	7410.00	8127.08	1125.31	3175797.38	1296382.84	40°08'42.914"N	104°52'16.146"W	point

SURVEY PROGRAM - Ref Wellbore: COPPERHEAD 27N-15HZX PWB Ref Wellpath: COPPERHEAD 27N-15HZX (REV-A.0) PWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
16.00	1285.00	ISCWSA MWD, Rev. 2 (Standard)		COPPERHEAD 27N-15HZ AWB <92-1285>
1285.00	1460.00	NaviTrak (MAGCORR,IFR)		COPPERHEAD 27N-15HZ AWB <92-1285>
1460.00	8478.70	NaviTrak (MAGCORR,IFR)		COPPERHEAD 27N-15HZX PWB
8478.70	13635.25	NaviTrak (MAGCORR,IFR)		COPPERHEAD 27N-15HZX PWB

REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#45 COPPERHEAD 27N-15HZ (2368'FSL & 2165'FEL, SEC.22)
Area	COLORADO	Well	COPPERHEAD 27N-15HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	COPPERHEAD 27N-15HZX PWB
Facility	SEC.22-T2N-R67W	Sidetrack from	COPPERHEAD 27N-15HZ AWB <92-1285> at 1460.00 MD

WELLPATH COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
717.02	0.696	187.466	717.00	Base Fox Hills
4396.10	28.470	25.056	4135.00	Parkman
4879.16	28.300	22.903	4560.00	Sussex
8022.18	53.095	3.520	7294.00	SSPG
8170.58	65.170	1.878	7370.00	NBRR
8345.17	79.394	0.312	7423.00	N470_B_CK
10952.83	90.278	359.220	7423.00	N470_B_CK

DESIGN COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
1460.00	2.460	25.300	1459.92	TIE INTO BHI+MWD SURVEYS
1520.00	4.900	25.000	1519.79	BUILD & TURN @ 5.5°/100'
1614.00	4.651	90.543	1613.53	BUILD & TURN @ 4.5°/100'
1708.00	8.346	71.478	1706.92	BUILD & TURN @ 2°/100'
1802.00	10.018	66.067	1799.71	BUILD & TURN @ 2°/100'
2779.70	29.000	50.000	2717.59	TURN @ 2°/100'
3262.63	29.000	30.000	3140.97	DROP & TURN
7711.89	28.000	10.000	7060.00	KOP, BUILD @ ~8/100'
8478.70	90.278	359.220	7435.00	LANDING POINT
13635.25	90.278	359.220	7410.00	TOTAL DEPTH