

KERR-MCGEE OIL & GAS ONSHORE LP

Location: COLORADO Slot: SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28)
Field: WELD COUNTY (KERR MCGEE) Well: HOWARD 28C-33HZ
Facility: SEC.28-T1N-R67W Wellbore: HOWARD 28C-33HZ PWB

Plot reference wellpath is HOWARD 28C-33HZ (PERMIT REV-1) PWB

True vertical depths are referenced to ENSIGN 145 (RKB)	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
Measured depths are referenced to ENSIGN 145 (RKB)	North Reference: True north
ENSIGN 145 (RKB) to Mean Sea Level: 4996 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28)): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: precin on 5/23/2013

Location Information

FacilityName			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.28-T1N-R67W			316923.760	121463.460	36°32'36.656"N	114°37'52.006"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28)	1416870.46	2716774.57	3170662.569	1253835.548	40°01'42.802"N	104°53'26.034"W
ENSIGN 145 (RKB) to Mud line (At Slot: SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28))					4996ft	
Mean Sea Level to Mud line (At Slot: SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28))					0ft	
ENSIGN 145 (RKB) to Mean Sea Level					4996ft	

Survey Program

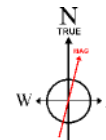
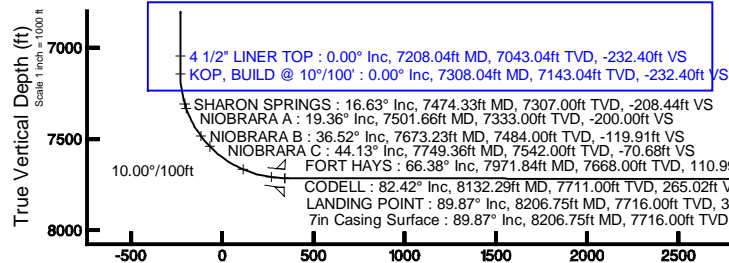
Start MD (ft)	End MD (ft)	Tool	Model	Log Name/Comment	Wellbore
13.00	8206.75	NaviTrak	NaviTrak (MagCorr)		HOWARD 28C-33HZ PWB
8206.75	13065.16	OnTrak	OnTrak (MagCorr)		HOWARD 28C-33HZ PWB

Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
TIE-ON	13.00	0.000	280.450	13.00	0.00	0.00	0.00	0.00
BEGIN NUDGE	1100.00	0.000	280.450	1100.00	0.00	0.00	0.00	0.00
END NUDGE	1900.00	16.000	280.450	1889.64	20.13	-109.14	2.00	-20.66
BEGIN DROP	5624.64	16.000	280.450	5470.00	206.34	-1118.76	0.00	-211.75
END DROP	6424.64	0.000	179.723	6259.64	226.47	-1227.90	2.00	-232.40
KOP, BUILD @ 10°/100'	7308.04	0.000	179.723	7143.04	226.47	-1227.90	0.00	-232.40
LANDING POINT	8206.75	89.870	179.723	7716.00	-345.19	-1225.13	10.00	339.26
TOTAL DEPTH	13065.16	89.870	179.723	7727.00	-5203.53	-1201.65	0.00	5197.66

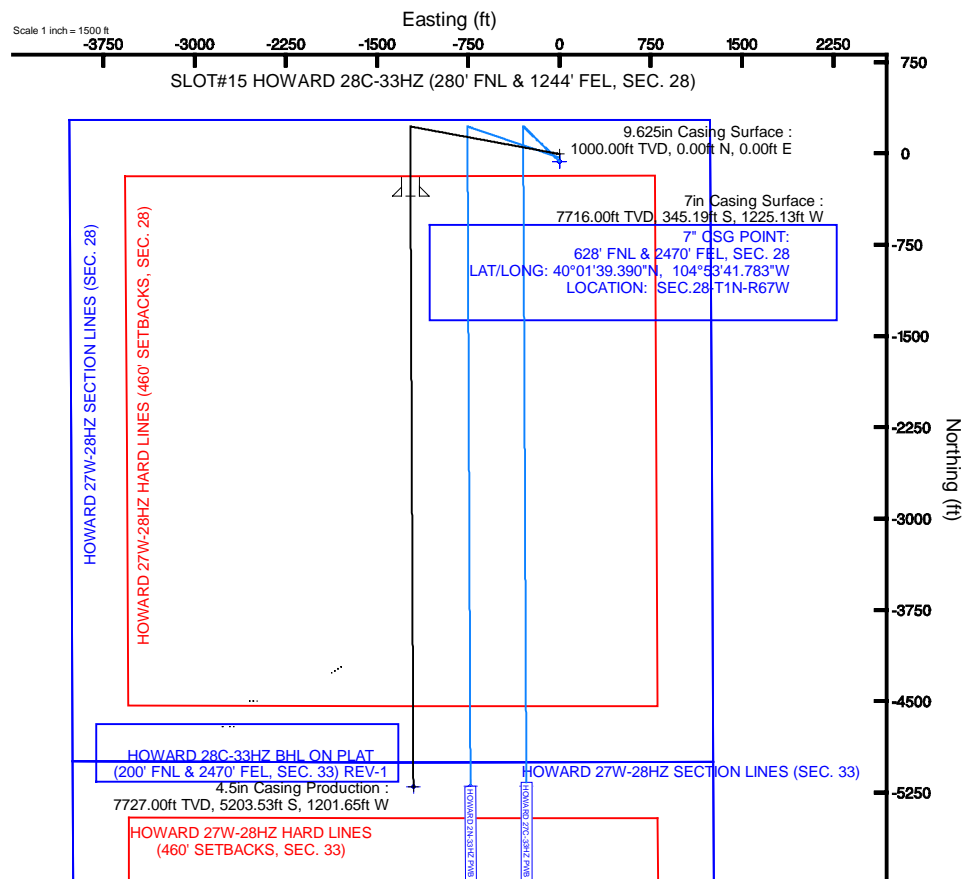
Targets

Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
HOWARD 27W-28HZ HARD LINES (460' SETBACKS, SEC. 28)	4996.00	-59.80	0.00	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	
HOWARD 27W-28HZ HARD LINES (460' SETBACKS, SEC. 33)	4996.00	-59.80	0.00	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	
HOWARD 27W-28HZ SECTION LINES (SEC. 28)	4996.00	-59.80	0.00	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	
HOWARD 27W-28HZ SECTION LINES (SEC. 33)	4996.00	-59.80	0.00	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	
HOWARD 28C-33HZ BHL ON PLAT (200' FNL & 2470' FEL, SEC. 33) REV-1	13065.16	7727.00	-5203.53	-1201.65	3169498.75	1248624.08	40°00'51.379"N	104°53'41.478"W



BGGM (1945.0 to 2014.0) Dip: 66.64° Field: 52617.9 nT
Magnetic North is 8.69 degrees East of True North (at 5/22/2013)

To correct azimuth from Magnetic to True add 8.69 degrees
For example: if the Magnetic North Azimuth = 90 degs, then the True North Azimuth = 90 + 8.69 = 98.69



HOWARD 28C-33HZ BHL ON PLAT (200' FNL & 2470' FEL, SEC. 33) REV-1
TOTAL DEPTH : 89.87° Inc, 13065.16ft MD, 7727.00ft TVD, 5197.66ft VS
4.5in Casing Production : 89.87° Inc, 13065.16ft MD, 7727.00ft TVD, 5197.66ft VS



Planned Wellpath Report

HOWARD 28C-33HZ (PERMIT REV-1) PWP

Page 1 of 7



REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 28C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 28C-33HZ PWB
Facility	SEC.28-T1N-R67W		

REPORT SETUP INFORMATION			
Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect® 3.0.2
North Reference	True	User	Precain
Scale	0.999964	Report Generated	5/23/2013 at 8:44:39 AM
Convergence at slot	0.39° East	Database/Source file	WellArchitectDB/_HOWARD_28C-33HZ_PWB.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	1416870.46	2716774.57	3170662.57	1253835.55	40°01'42.802"N	104°53'26.034"W
Facility Reference Pt			316923.76	121463.46	36°32'36.656"N	114°37'52.006"W
Field Reference Pt			3197771.84	1268891.29	40°04'09.600"N	104°47'36.000"W

WELLPATH DATUM			
Calculation method	Minimum curvature	ENSIGN 145 (RKB) to Facility Vertical Datum	4996.00ft
Horizontal Reference Pt	Slot	ENSIGN 145 (RKB) to Mean Sea Level	4996.00ft
Vertical Reference Pt	ENSIGN 145 (RKB)	ENSIGN 145 (RKB) to Mud Line at Slot (SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28))	4996.00ft
MD Reference Pt	ENSIGN 145 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	179.72°



Planned Wellpath Report

HOWARD 28C-33HZ (PERMIT REV-1) PWP

Page 2 of 7



REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 28C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 28C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH DATA (148 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	280.450	0.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	
13.00	0.000	280.450	13.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	TIE-ON
113.00†	0.000	280.450	113.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	
213.00†	0.000	280.450	213.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	
313.00†	0.000	280.450	313.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	
413.00†	0.000	280.450	413.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	
513.00†	0.000	280.450	513.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	
613.00†	0.000	280.450	613.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	
713.00†	0.000	280.450	713.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	
813.00†	0.000	280.450	813.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	
913.00†	0.000	280.450	913.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	
1013.00†	0.000	280.450	1013.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	
1088.00†	0.000	280.450	1088.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	FOX HILLS BASE
1100.00	0.000	280.450	1100.00	0.00	0.00	0.00	40°01'42.802"N	104°53'26.034"W	0.00	BEGIN NUDGE
1113.00†	0.260	280.450	1113.00	-0.01	0.01	-0.03	40°01'42.802"N	104°53'26.034"W	2.00	
1213.00†	2.260	280.450	1212.97	-0.41	0.40	-2.19	40°01'42.806"N	104°53'26.062"W	2.00	
1313.00†	4.260	280.450	1312.80	-1.47	1.44	-7.78	40°01'42.816"N	104°53'26.134"W	2.00	
1413.00†	6.260	280.450	1412.38	-3.18	3.10	-16.80	40°01'42.833"N	104°53'26.250"W	2.00	
1513.00†	8.260	280.450	1511.57	-5.53	5.39	-29.23	40°01'42.855"N	104°53'26.410"W	2.00	
1613.00†	10.260	280.450	1610.26	-8.53	8.31	-45.05	40°01'42.884"N	104°53'26.613"W	2.00	
1713.00†	12.260	280.450	1708.33	-12.16	11.85	-64.25	40°01'42.919"N	104°53'26.860"W	2.00	
1813.00†	14.260	280.450	1805.66	-16.43	16.01	-86.81	40°01'42.960"N	104°53'27.150"W	2.00	
1900.00	16.000	280.450	1889.64	-20.66	20.13	-109.14	40°01'43.001"N	104°53'27.437"W	2.00	END NUDGE
1913.00†	16.000	280.450	1902.14	-21.32	20.78	-112.66	40°01'43.007"N	104°53'27.482"W	0.00	
2013.00†	16.000	280.450	1998.27	-26.45	25.78	-139.77	40°01'43.057"N	104°53'27.831"W	0.00	
2113.00†	16.000	280.450	2094.39	-31.58	30.78	-166.87	40°01'43.106"N	104°53'28.179"W	0.00	
2213.00†	16.000	280.450	2190.52	-36.71	35.78	-193.98	40°01'43.156"N	104°53'28.528"W	0.00	
2313.00†	16.000	280.450	2286.64	-41.84	40.78	-221.09	40°01'43.205"N	104°53'28.876"W	0.00	
2413.00†	16.000	280.450	2382.77	-46.98	45.78	-248.19	40°01'43.254"N	104°53'29.225"W	0.00	
2513.00†	16.000	280.450	2478.90	-52.11	50.78	-275.30	40°01'43.304"N	104°53'29.573"W	0.00	
2613.00†	16.000	280.450	2575.02	-57.24	55.77	-302.41	40°01'43.353"N	104°53'29.921"W	0.00	
2713.00†	16.000	280.450	2671.15	-62.37	60.77	-329.51	40°01'43.403"N	104°53'30.270"W	0.00	
2813.00†	16.000	280.450	2767.27	-67.50	65.77	-356.62	40°01'43.452"N	104°53'30.618"W	0.00	
2913.00†	16.000	280.450	2863.40	-72.63	70.77	-383.73	40°01'43.501"N	104°53'30.967"W	0.00	
3013.00†	16.000	280.450	2959.53	-77.76	75.77	-410.83	40°01'43.551"N	104°53'31.315"W	0.00	
3113.00†	16.000	280.450	3055.65	-82.89	80.77	-437.94	40°01'43.600"N	104°53'31.664"W	0.00	
3213.00†	16.000	280.450	3151.78	-88.02	85.77	-465.05	40°01'43.650"N	104°53'32.012"W	0.00	
3313.00†	16.000	280.450	3247.91	-93.15	90.77	-492.15	40°01'43.699"N	104°53'32.361"W	0.00	
3413.00†	16.000	280.450	3344.03	-98.28	95.77	-519.26	40°01'43.748"N	104°53'32.709"W	0.00	
3513.00†	16.000	280.450	3440.16	-103.41	100.77	-546.37	40°01'43.798"N	104°53'33.058"W	0.00	
3613.00†	16.000	280.450	3536.28	-108.54	105.77	-573.47	40°01'43.847"N	104°53'33.406"W	0.00	
3713.00†	16.000	280.450	3632.41	-113.67	110.77	-600.58	40°01'43.897"N	104°53'33.754"W	0.00	
3813.00†	16.000	280.450	3728.54	-118.80	115.77	-627.68	40°01'43.946"N	104°53'34.103"W	0.00	
3913.00†	16.000	280.450	3824.66	-123.93	120.77	-654.79	40°01'43.995"N	104°53'34.451"W	0.00	
4013.00†	16.000	280.450	3920.79	-129.06	125.77	-681.90	40°01'44.045"N	104°53'34.800"W	0.00	



Planned Wellpath Report

HOWARD 28C-33HZ (PERMIT REV-1) PWP

Page 3 of 7



REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 28C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 28C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH DATA (148 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
4113.00†	16.000	280.450	4016.91	-134.19	130.77	-709.00	40°01'44.094"N	104°53'35.148"W	0.00	
4213.00†	16.000	280.450	4113.04	-139.32	135.77	-736.11	40°01'44.144"N	104°53'35.497"W	0.00	
4313.00†	16.000	280.450	4209.17	-144.45	140.77	-763.22	40°01'44.193"N	104°53'35.845"W	0.00	
4413.00†	16.000	280.450	4305.29	-149.58	145.76	-790.32	40°01'44.242"N	104°53'36.194"W	0.00	
4513.00†	16.000	280.450	4401.42	-154.71	150.76	-817.43	40°01'44.292"N	104°53'36.542"W	0.00	
4613.00†	16.000	280.450	4497.55	-159.84	155.76	-844.54	40°01'44.341"N	104°53'36.891"W	0.00	
4713.00†	16.000	280.450	4593.67	-164.98	160.76	-871.64	40°01'44.391"N	104°53'37.239"W	0.00	
4813.00†	16.000	280.450	4689.80	-170.11	165.76	-898.75	40°01'44.440"N	104°53'37.588"W	0.00	
4902.68†	16.000	280.450	4776.00	-174.71	170.25	-923.06	40°01'44.484"N	104°53'37.900"W	0.00	SUSEX
4913.00†	16.000	280.450	4785.92	-175.24	170.76	-925.86	40°01'44.489"N	104°53'37.936"W	0.00	
5013.00†	16.000	280.450	4882.05	-180.37	175.76	-952.96	40°01'44.539"N	104°53'38.284"W	0.00	
5113.00†	16.000	280.450	4978.18	-185.50	180.76	-980.07	40°01'44.588"N	104°53'38.633"W	0.00	
5213.00†	16.000	280.450	5074.30	-190.63	185.76	-1007.18	40°01'44.638"N	104°53'38.981"W	0.00	
5313.00†	16.000	280.450	5170.43	-195.76	190.76	-1034.28	40°01'44.687"N	104°53'39.330"W	0.00	
5413.00†	16.000	280.450	5266.56	-200.89	195.76	-1061.39	40°01'44.736"N	104°53'39.678"W	0.00	
5513.00†	16.000	280.450	5362.68	-206.02	200.76	-1088.50	40°01'44.786"N	104°53'40.027"W	0.00	
5613.00†	16.000	280.450	5458.81	-211.15	205.76	-1115.60	40°01'44.835"N	104°53'40.375"W	0.00	
5624.64	16.000	280.450	5470.00	-211.75	206.34	-1118.76	40°01'44.841"N	104°53'40.416"W	0.00	BEGIN DROP
5713.00†	14.233	280.450	5555.30	-216.03	210.52	-1141.42	40°01'44.882"N	104°53'40.707"W	2.00	
5813.00†	12.233	280.450	5652.64	-220.30	214.67	-1163.93	40°01'44.923"N	104°53'40.996"W	2.00	
5913.00†	10.233	280.450	5750.71	-223.92	218.20	-1183.08	40°01'44.958"N	104°53'41.243"W	2.00	
6013.00†	8.233	280.450	5849.41	-226.91	221.11	-1198.86	40°01'44.987"N	104°53'41.445"W	2.00	
6113.00†	6.233	280.450	5948.61	-229.25	223.40	-1211.24	40°01'45.009"N	104°53'41.605"W	2.00	
6213.00†	4.233	280.450	6048.19	-230.95	225.05	-1220.21	40°01'45.026"N	104°53'41.720"W	2.00	
6313.00†	2.233	280.450	6148.03	-232.00	226.07	-1225.76	40°01'45.036"N	104°53'41.791"W	2.00	
6413.00†	0.233	280.450	6248.00	-232.40	226.46	-1227.87	40°01'45.040"N	104°53'41.818"W	2.00	
6424.64	0.000	179.723	6259.64	-232.40	226.47	-1227.90	40°01'45.040"N	104°53'41.819"W	2.00	END DROP
6513.00†	0.000	179.723	6348.00	-232.40	226.47	-1227.90	40°01'45.040"N	104°53'41.819"W	0.00	
6613.00†	0.000	179.723	6448.00	-232.40	226.47	-1227.90	40°01'45.040"N	104°53'41.819"W	0.00	
6713.00†	0.000	179.723	6548.00	-232.40	226.47	-1227.90	40°01'45.040"N	104°53'41.819"W	0.00	
6813.00†	0.000	179.723	6648.00	-232.40	226.47	-1227.90	40°01'45.040"N	104°53'41.819"W	0.00	
6913.00†	0.000	179.723	6748.00	-232.40	226.47	-1227.90	40°01'45.040"N	104°53'41.819"W	0.00	
7013.00†	0.000	179.723	6848.00	-232.40	226.47	-1227.90	40°01'45.040"N	104°53'41.819"W	0.00	
7113.00†	0.000	179.723	6948.00	-232.40	226.47	-1227.90	40°01'45.040"N	104°53'41.819"W	0.00	
7208.04†	0.000	179.723	7043.04	-232.40	226.47	-1227.90	40°01'45.040"N	104°53'41.819"W	0.00	4 1/2" LINER TOP
7213.00†	0.000	179.723	7048.00	-232.40	226.47	-1227.90	40°01'45.040"N	104°53'41.819"W	0.00	
7308.04	0.000	179.723	7143.04	-232.40	226.47	-1227.90	40°01'45.040"N	104°53'41.819"W	0.00	KOP, BUILD @ 10°/100'
7313.00†	0.496	179.723	7148.00	-232.38	226.45	-1227.90	40°01'45.040"N	104°53'41.819"W	10.00	
7413.00†	10.496	179.723	7247.41	-222.82	216.88	-1227.85	40°01'44.945"N	104°53'41.818"W	10.00	
7474.33†	16.628	179.723	7307.00	-208.44	202.51	-1227.78	40°01'44.803"N	104°53'41.817"W	10.00	SHARON SPRINGS
7501.66†	19.362	179.723	7333.00	-200.00	194.06	-1227.74	40°01'44.719"N	104°53'41.817"W	10.00	NIOBRARA A
7513.00†	20.496	179.723	7343.66	-196.13	190.20	-1227.72	40°01'44.681"N	104°53'41.816"W	10.00	
7613.00†	30.496	179.723	7433.80	-153.14	147.21	-1227.51	40°01'44.256"N	104°53'41.814"W	10.00	
7673.23†	36.519	179.723	7484.00	-119.91	113.98	-1227.35	40°01'43.928"N	104°53'41.812"W	10.00	NIOBRARA B
7713.00†	40.496	179.723	7515.12	-95.15	89.22	-1227.23	40°01'43.683"N	104°53'41.810"W	10.00	



Planned Wellpath Report

HOWARD 28C-33HZ (PERMIT REV-1) PWP

Page 4 of 7



REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 28C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 28C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH DATA (148 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
7749.36†	44.132	179.723	7542.00	-70.68	64.75	-1227.11	40°01'43.442"N	104°53'41.809"W	10.00	NIOBRARA C
7813.00†	50.496	179.723	7585.12	-23.92	17.99	-1226.89	40°01'42.980"N	104°53'41.806"W	10.00	
7913.00†	60.496	179.723	7641.70	58.38	-64.31	-1226.49	40°01'42.166"N	104°53'41.800"W	10.00	
7971.84†	66.380	179.723	7668.00	110.99	-116.92	-1226.24	40°01'41.646"N	104°53'41.797"W	10.00	FORT HAYS
8013.00†	70.496	179.723	7683.12	149.26	-155.19	-1226.05	40°01'41.268"N	104°53'41.795"W	10.00	
8113.00†	80.496	179.723	7708.14	245.95	-251.88	-1225.58	40°01'40.313"N	104°53'41.789"W	10.00	
8132.29†	82.425	179.723	7711.00	265.02	-270.95	-1225.49	40°01'40.124"N	104°53'41.788"W	10.00	CODELL
8206.75	89.870	179.723	7716.00	339.26	-345.19	-1225.13	40°01'39.390"N	104°53'41.783"W	10.00	LANDING POINT
8213.00†	89.870	179.723	7716.01	345.51	-351.44	-1225.10	40°01'39.329"N	104°53'41.782"W	0.00	
8313.00†	89.870	179.723	7716.24	445.51	-451.44	-1224.62	40°01'38.340"N	104°53'41.776"W	0.00	
8413.00†	89.870	179.723	7716.47	545.51	-551.44	-1224.14	40°01'37.352"N	104°53'41.770"W	0.00	
8513.00†	89.870	179.723	7716.69	645.51	-651.43	-1223.65	40°01'36.364"N	104°53'41.764"W	0.00	
8613.00†	89.870	179.723	7716.92	745.51	-751.43	-1223.17	40°01'35.376"N	104°53'41.757"W	0.00	
8713.00†	89.870	179.723	7717.15	845.51	-851.43	-1222.69	40°01'34.388"N	104°53'41.751"W	0.00	
8813.00†	89.870	179.723	7717.37	945.51	-951.43	-1222.20	40°01'33.399"N	104°53'41.745"W	0.00	
8913.00†	89.870	179.723	7717.60	1045.51	-1051.43	-1221.72	40°01'32.411"N	104°53'41.739"W	0.00	
9013.00†	89.870	179.723	7717.82	1145.51	-1151.43	-1221.24	40°01'31.423"N	104°53'41.732"W	0.00	
9113.00†	89.870	179.723	7718.05	1245.51	-1251.43	-1220.75	40°01'30.435"N	104°53'41.726"W	0.00	
9213.00†	89.870	179.723	7718.28	1345.51	-1351.42	-1220.27	40°01'29.447"N	104°53'41.720"W	0.00	
9313.00†	89.870	179.723	7718.50	1445.51	-1451.42	-1219.79	40°01'28.458"N	104°53'41.713"W	0.00	
9413.00†	89.870	179.723	7718.73	1545.51	-1551.42	-1219.30	40°01'27.470"N	104°53'41.707"W	0.00	
9513.00†	89.870	179.723	7718.96	1645.51	-1651.42	-1218.82	40°01'26.482"N	104°53'41.701"W	0.00	
9613.00†	89.870	179.723	7719.18	1745.51	-1751.42	-1218.34	40°01'25.494"N	104°53'41.695"W	0.00	
9713.00†	89.870	179.723	7719.41	1845.51	-1851.42	-1217.85	40°01'24.505"N	104°53'41.688"W	0.00	
9813.00†	89.870	179.723	7719.64	1945.51	-1951.42	-1217.37	40°01'23.517"N	104°53'41.682"W	0.00	
9913.00†	89.870	179.723	7719.86	2045.51	-2051.41	-1216.89	40°01'22.529"N	104°53'41.676"W	0.00	
10013.00†	89.870	179.723	7720.09	2145.51	-2151.41	-1216.40	40°01'21.541"N	104°53'41.669"W	0.00	
10113.00†	89.870	179.723	7720.32	2245.51	-2251.41	-1215.92	40°01'20.553"N	104°53'41.663"W	0.00	
10213.00†	89.870	179.723	7720.54	2345.51	-2351.41	-1215.44	40°01'19.564"N	104°53'41.657"W	0.00	
10313.00†	89.870	179.723	7720.77	2445.51	-2451.41	-1214.95	40°01'18.576"N	104°53'41.651"W	0.00	
10413.00†	89.870	179.723	7720.99	2545.51	-2551.41	-1214.47	40°01'17.588"N	104°53'41.644"W	0.00	
10513.00†	89.870	179.723	7721.22	2645.51	-2651.41	-1213.99	40°01'16.600"N	104°53'41.638"W	0.00	
10613.00†	89.870	179.723	7721.45	2745.51	-2751.40	-1213.50	40°01'15.612"N	104°53'41.632"W	0.00	
10713.00†	89.870	179.723	7721.67	2845.51	-2851.40	-1213.02	40°01'14.623"N	104°53'41.626"W	0.00	
10813.00†	89.870	179.723	7721.90	2945.51	-2951.40	-1212.54	40°01'13.635"N	104°53'41.619"W	0.00	
10913.00†	89.870	179.723	7722.13	3045.50	-3051.40	-1212.05	40°01'12.647"N	104°53'41.613"W	0.00	
11013.00†	89.870	179.723	7722.35	3145.50	-3151.40	-1211.57	40°01'11.659"N	104°53'41.607"W	0.00	
11113.00†	89.870	179.723	7722.58	3245.50	-3251.40	-1211.09	40°01'10.670"N	104°53'41.600"W	0.00	
11213.00†	89.870	179.723	7722.81	3345.50	-3351.40	-1210.60	40°01'09.682"N	104°53'41.594"W	0.00	
11313.00†	89.870	179.723	7723.03	3445.50	-3451.39	-1210.12	40°01'08.694"N	104°53'41.588"W	0.00	
11413.00†	89.870	179.723	7723.26	3545.50	-3551.39	-1209.64	40°01'07.706"N	104°53'41.582"W	0.00	
11513.00†	89.870	179.723	7723.49	3645.50	-3651.39	-1209.15	40°01'06.718"N	104°53'41.575"W	0.00	
11613.00†	89.870	179.723	7723.71	3745.50	-3751.39	-1208.67	40°01'05.729"N	104°53'41.569"W	0.00	
11713.00†	89.870	179.723	7723.94	3845.50	-3851.39	-1208.19	40°01'04.741"N	104°53'41.563"W	0.00	
11813.00†	89.870	179.723	7724.16	3945.50	-3951.39	-1207.70	40°01'03.753"N	104°53'41.557"W	0.00	



Planned Wellpath Report

HOWARD 28C-33HZ (PERMIT REV-1) PWP

Page 5 of 7



REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 28C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 28C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH DATA (148 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
11913.00†	89.870	179.723	7724.39	4045.50	-4051.39	-1207.22	40°01'02.765"N	104°53'41.550"W	0.00	
12013.00†	89.870	179.723	7724.62	4145.50	-4151.38	-1206.74	40°01'01.777"N	104°53'41.544"W	0.00	
12113.00†	89.870	179.723	7724.84	4245.50	-4251.38	-1206.25	40°01'00.788"N	104°53'41.538"W	0.00	
12213.00†	89.870	179.723	7725.07	4345.50	-4351.38	-1205.77	40°00'59.800"N	104°53'41.531"W	0.00	
12313.00†	89.870	179.723	7725.30	4445.50	-4451.38	-1205.29	40°00'58.812"N	104°53'41.525"W	0.00	
12413.00†	89.870	179.723	7725.52	4545.50	-4551.38	-1204.80	40°00'57.824"N	104°53'41.519"W	0.00	
12513.00†	89.870	179.723	7725.75	4645.50	-4651.38	-1204.32	40°00'56.835"N	104°53'41.513"W	0.00	
12613.00†	89.870	179.723	7725.98	4745.50	-4751.38	-1203.84	40°00'55.847"N	104°53'41.506"W	0.00	
12713.00†	89.870	179.723	7726.20	4845.50	-4851.37	-1203.35	40°00'54.859"N	104°53'41.500"W	0.00	
12813.00†	89.870	179.723	7726.43	4945.50	-4951.37	-1202.87	40°00'53.871"N	104°53'41.494"W	0.00	
12913.00†	89.870	179.723	7726.66	5045.50	-5051.37	-1202.39	40°00'52.883"N	104°53'41.488"W	0.00	
13013.00†	89.870	179.723	7726.88	5145.50	-5151.37	-1201.90	40°00'51.894"N	104°53'41.481"W	0.00	
13065.16	89.870	179.723	7727.00 [†]	5197.66	-5203.53	-1201.65	40°00'51.379"N	104°53'41.478"W	0.00	TOTAL DEPTH

HOLE & CASING SECTIONS - Ref Wellbore: HOWARD 28C-33HZ PWB Ref Wellpath: HOWARD 28C-33HZ (PERMIT REV-1) 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	13.00	1000.00	987.00	13.00	1000.00	0.00	0.00	0.00	0.00	
9.625in Casing Surface	13.00	1000.00	987.00	13.00	1000.00	0.00	0.00	0.00	0.00	
8.75in Open Hole	1000.00	8206.75	7206.75	1000.00	7716.00	0.00	0.00	-345.19	-1225.13	
7in Casing Surface	13.00	8206.75	8193.75	13.00	7716.00	0.00	0.00	-345.19	-1225.13	
6.125in Open Hole	8206.75	13065.16	4858.41	7716.00	7727.00	-345.19	-1225.13	-5203.53	-1201.65	
4.5in Casing Production	13.00	13065.16	13052.16	13.00	7727.00	0.00	0.00	-5203.53	-1201.65	



Planned Wellpath Report

HOWARD 28C-33HZ (PERMIT REV-1) PWP

Page 6 of 7



REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 28C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 28C-33HZ PWB
Facility	SEC.28-T1N-R67W		

TARGETS									
Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
HOWARD 27W-28HZ HARD LINES (460' SETBACKS, SEC. 28)		4996.00	-59.80	0.00	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	polygon
HOWARD 27W-28HZ HARD LINES (460' SETBACKS, SEC. 33)		4996.00	-59.80	0.00	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	polygon
HOWARD 27W-28HZ SECTION LINES (SEC. 28)		4996.00	-59.80	0.00	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	polygon
HOWARD 27W-28HZ SECTION LINES (SEC. 33)		4996.00	-59.80	0.00	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	polygon
1) HOWARD 28C-33HZ BHL ON PLAT (200' FNL & 2470' FEL, SEC. 33) REV-1	13065.16	7727.00	-5203.53	-1201.65	3169496.75	1248624.08	40°00'51.379"N	104°53'41.478"W	point

SURVEY PROGRAM - Ref Wellbore: HOWARD 28C-33HZ PWB Ref Wellpath: HOWARD 28C-33HZ (PERMIT REV-1) PWP				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
13.00	8206.75	NaviTrak (MagCorr)		HOWARD 28C-33HZ PWB
8206.75	13065.16	OnTrak (MagCorr)		HOWARD 28C-33HZ PWB



Planned Wellpath Report

HOWARD 28C-33HZ (PERMIT REV-1) PWP

Page 7 of 7



REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#15 HOWARD 28C-33HZ (280' FNL & 1244' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 28C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 28C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH COMMENTS				
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
1088.00	0.000	280.450	1088.00	FOX HILLS BASE
4902.68	16.000	280.450	4776.00	SUSEX
7208.04	0.000	179.723	7043.04	4 1/2" LINER TOP
7474.33	16.628	179.723	7307.00	SHARON SPRINGS
7501.66	19.362	179.723	7333.00	NIOBRARA A
7673.23	36.519	179.723	7484.00	NIOBRARA B
7749.36	44.132	179.723	7542.00	NIOBRARA C
7971.84	66.380	179.723	7668.00	FORT HAYS
8132.29	82.425	179.723	7711.00	CODELL

DESIGN COMMENTS				
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
13.00	0.000	280.450	13.00	TIE-ON
1100.00	0.000	280.450	1100.00	BEGIN NUDGE
1900.00	16.000	280.450	1889.64	END NUDGE
5624.64	16.000	280.450	5470.00	BEGIN DROP
6424.64	0.000	179.723	6259.64	END DROP
7308.04	0.000	179.723	7143.04	KOP, BUILD @ 10°/100'
8206.75	89.870	179.723	7716.00	LANDING POINT
13065.16	89.870	179.723	7727.00	TOTAL DEPTH