

KERR-MCGEE OIL & GAS ONSHORE LP

Location: COLORADO Slot: SLOT#13 HOWARD 27C-33HZ (340' FNL & 1244' FEL, SEC. 28)
Field: WELD COUNTY (KERR MCGEE) Well: HOWARD 27C-33HZ
Facility: SEC.28-T1N-R67W Wellbore: HOWARD 27C-33HZ PWB

Plot reference wellpath is HOWARD 27C-33HZ (PERMIT REV-1) PWP

True vertical depths are referenced to ENSING 145 (RKB)	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
Measured depths are referenced to ENSING 145 (RKB)	North Reference: True north
ENSING 145 (RKB) to Mean Sea Level: 4996 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: SLOT#13 HOWARD 27C-33HZ (340' FNL & 1244' FEL, SEC. 28)): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: precin on 5/22/2013

Location Information

Facility Name			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#13 HOWARD 27C-33HZ (340' FNL & 1244' FEL, SEC. 28)	1416811.14	2716781.11	3170662.980	1253775.747	40°01'42.211"N	104°53'26.034"W
ENSING 145 (RKB) to Mud line (At Slot: SLOT#13 HOWARD 27C-33HZ (340' FNL & 1244' FEL, SEC. 28))					4996ft	
Mean Sea Level to Mud line (At Slot: SLOT#13 HOWARD 27C-33HZ (340' FNL & 1244' FEL, SEC. 28))					0ft	
ENSING 145 (RKB) to Mean Sea Level					4996ft	

Survey Program

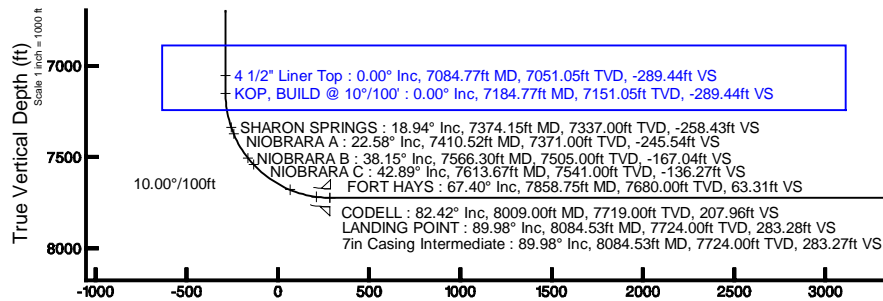
Start MD (ft)	End MD (ft)	Tool	Model	Log Name/Comment	Wellbore
13.00	8084.53	NaviTrak	NaviTrak (MagCorr)		HOWARD 27C-33HZ PWB
8084.53	12943.21	OnTrak	OnTrak (MagCorr)		HOWARD 27C-33HZ PWB

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	314.000	13.00	0.00	0.00	0.00	0.00
BEGIN NUDGE	1100.00	0.000	314.000	1100.00	0.00	0.00	0.00	0.00
END NUDGE	1600.00	10.000	314.000	1597.47	30.23	-31.31	2.00	-30.39
BEGIN DROP	3486.19	10.000	314.000	3455.00	257.76	-266.92	0.00	-259.06
END DROP	3986.19	0.000	179.720	3952.47	287.99	-298.22	2.00	-289.44
KOP, BUILD @ 10°/100'	7184.77	0.000	179.720	7151.05	287.99	-298.22	0.00	-289.44
LANDING POINT	8084.53	89.976	179.720	7724.00	-284.72	-295.43	10.00	283.28
TOTAL DEPTH	12943.21	89.976	179.720	7726.00	-5143.35	-271.70	0.00	5141.96

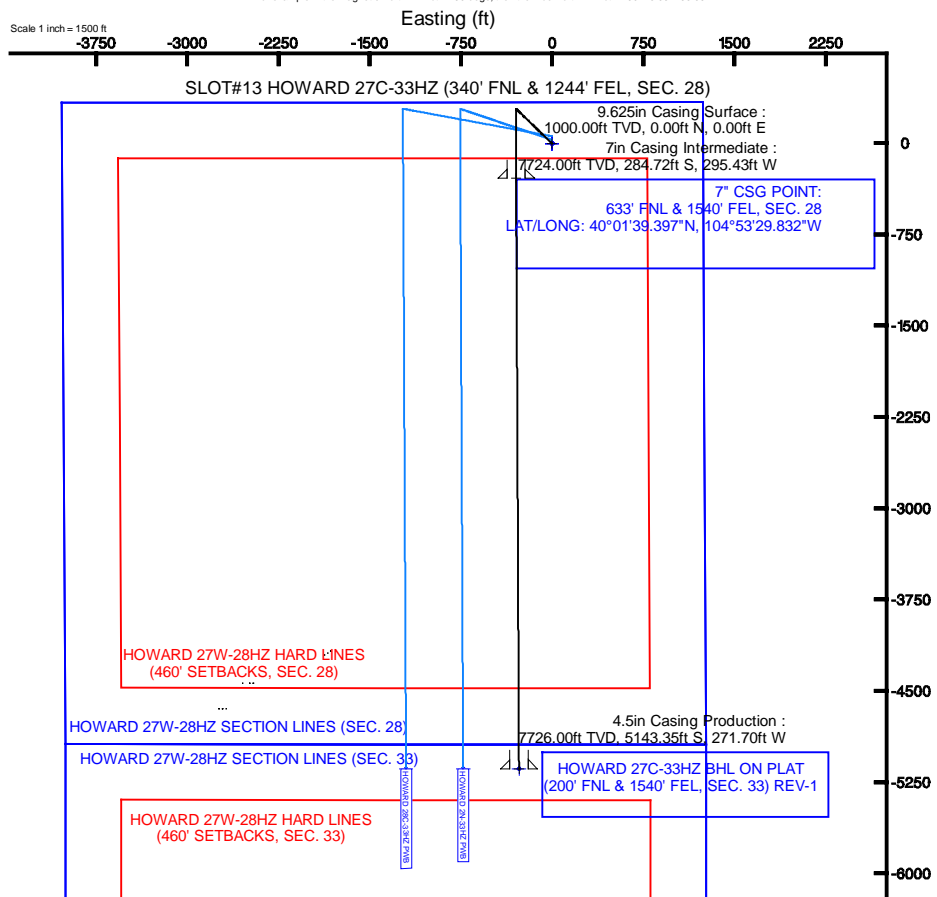
Targets

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	0.00	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	0.00	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	0.00	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	0.00	0.00	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W
HOWARD 27C-33HZ BHL ON PLAT (200' FNL & 1540' FEL, SEC. 33) REV-1	12943.21	7726.00	-5143.35	-271.70	3170426.64	1248630.85	40°05'1.387"N	104°53'29.526"W



BGGM (1945.0 to 2014.0) Dip: 66.64° Field: 52617.8 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



Vertical Section (ft)

Azimuth 179.72° with reference 0.00 N, 0.00 E

Scale 1 inch = 1000 ft





Planned Wellpath Report

HOWARD 27C-33HZ (PERMIT REV-1) PWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 HOWARD 27C-33HZ (340' FNL & 1244' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-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	5/22/2013 at 3:56:39 PM
Convergence at slot	0.39° East	Database/Source file	WellArchitectDB/HOWARD_27C-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	1416811.14	2716781.11	3170662.98	1253775.75	40°01'42.211"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	ENSING 145 (RKB) to Facility Vertical Datum	4996.00ft
Horizontal Reference Pt	Slot	ENSING 145 (RKB) to Mean Sea Level	4996.00ft
Vertical Reference Pt	ENSING 145 (RKB)	ENSING 145 (RKB) to Mud Line at Slot (SLOT#13 HOWARD 27C-33HZ (340' FNL & 1244' FEL, SEC. 28))	4996.00ft
MD Reference Pt	ENSING 145 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	179.72°



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HOWARD 27C-33HZ (PERMIT REV-1) PWP

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REFERENCE WELLPATH IDENTIFICATION			
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Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH DATA (147 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	314.000	0.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	
13.00	0.000	314.000	13.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	TIE-ON
113.00†	0.000	314.000	113.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	
213.00†	0.000	314.000	213.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	
313.00†	0.000	314.000	313.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	
413.00†	0.000	314.000	413.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	
513.00†	0.000	314.000	513.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	
613.00†	0.000	314.000	613.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	
713.00†	0.000	314.000	713.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	
813.00†	0.000	314.000	813.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	
913.00†	0.000	314.000	913.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	
1013.00†	0.000	314.000	1013.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	
1088.00†	0.000	314.000	1088.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	FOX HILLS BASE
1100.00	0.000	314.000	1100.00	0.00	0.00	0.00	40°01'42.211"N	104°53'26.034"W	0.00	BEGIN NUDGE
1113.00†	0.260	314.000	1113.00	-0.02	0.02	-0.02	40°01'42.211"N	104°53'26.034"W	2.00	
1213.00†	2.260	314.000	1212.97	-1.56	1.55	-1.60	40°01'42.226"N	104°53'26.055"W	2.00	
1313.00†	4.260	314.000	1312.80	-5.53	5.50	-5.69	40°01'42.265"N	104°53'26.107"W	2.00	
1413.00†	6.260	314.000	1412.38	-11.93	11.87	-12.29	40°01'42.328"N	104°53'26.192"W	2.00	
1513.00†	8.260	314.000	1511.57	-20.75	20.64	-21.38	40°01'42.415"N	104°53'26.309"W	2.00	
1600.00	10.000	314.000	1597.47	-30.39	30.23	-31.31	40°01'42.510"N	104°53'26.436"W	2.00	END NUDGE
1613.00†	10.000	314.000	1610.27	-31.96	31.80	-32.93	40°01'42.525"N	104°53'26.457"W	0.00	
1713.00†	10.000	314.000	1708.75	-44.09	43.86	-45.42	40°01'42.644"N	104°53'26.618"W	0.00	
1813.00†	10.000	314.000	1807.23	-56.21	55.93	-57.91	40°01'42.764"N	104°53'26.778"W	0.00	
1913.00†	10.000	314.000	1905.71	-68.33	67.99	-70.40	40°01'42.883"N	104°53'26.939"W	0.00	
2013.00†	10.000	314.000	2004.19	-80.46	80.05	-82.90	40°01'43.002"N	104°53'27.100"W	0.00	
2113.00†	10.000	314.000	2102.67	-92.58	92.11	-95.39	40°01'43.121"N	104°53'27.260"W	0.00	
2213.00†	10.000	314.000	2201.15	-104.70	104.18	-107.88	40°01'43.241"N	104°53'27.421"W	0.00	
2313.00†	10.000	314.000	2299.63	-116.83	116.24	-120.37	40°01'43.360"N	104°53'27.581"W	0.00	
2413.00†	10.000	314.000	2398.11	-128.95	128.30	-132.86	40°01'43.479"N	104°53'27.742"W	0.00	
2513.00†	10.000	314.000	2496.59	-141.07	140.37	-145.35	40°01'43.598"N	104°53'27.903"W	0.00	
2613.00†	10.000	314.000	2595.08	-153.20	152.43	-157.84	40°01'43.717"N	104°53'28.063"W	0.00	
2713.00†	10.000	314.000	2693.56	-165.32	164.49	-170.33	40°01'43.837"N	104°53'28.224"W	0.00	
2813.00†	10.000	314.000	2792.04	-177.44	176.55	-182.83	40°01'43.956"N	104°53'28.384"W	0.00	
2913.00†	10.000	314.000	2890.52	-189.57	188.62	-195.32	40°01'44.075"N	104°53'28.545"W	0.00	
3013.00†	10.000	314.000	2989.00	-201.69	200.68	-207.81	40°01'44.194"N	104°53'28.705"W	0.00	
3113.00†	10.000	314.000	3087.48	-213.81	212.74	-220.30	40°01'44.313"N	104°53'28.866"W	0.00	
3213.00†	10.000	314.000	3185.96	-225.94	224.80	-232.79	40°01'44.433"N	104°53'29.027"W	0.00	
3313.00†	10.000	314.000	3284.44	-238.06	236.87	-245.28	40°01'44.552"N	104°53'29.187"W	0.00	
3413.00†	10.000	314.000	3382.92	-250.19	248.93	-257.77	40°01'44.671"N	104°53'29.348"W	0.00	
3486.19	10.000	314.000	3455.00	-259.06	257.76	-266.92	40°01'44.758"N	104°53'29.465"W	0.00	BEGIN DROP
3513.00†	9.464	314.000	3481.42	-262.22	260.91	-270.18	40°01'44.789"N	104°53'29.507"W	2.00	
3613.00†	7.464	314.000	3580.33	-272.50	271.13	-280.76	40°01'44.890"N	104°53'29.643"W	2.00	
3713.00†	5.464	314.000	3679.69	-280.36	278.95	-288.86	40°01'44.968"N	104°53'29.747"W	2.00	
3813.00†	3.464	314.000	3779.38	-285.79	284.36	-294.46	40°01'45.021"N	104°53'29.819"W	2.00	
3913.00†	1.464	314.000	3879.28	-288.79	287.34	-297.55	40°01'45.051"N	104°53'29.859"W	2.00	



Planned Wellpath Report

HOWARD 27C-33HZ (PERMIT REV-1) PWP

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Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH DATA (147 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
3986.19	0.000	179.720	3952.47	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	2.00	END DROP
4013.00†	0.000	179.720	3979.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
4113.00†	0.000	179.720	4079.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
4213.00†	0.000	179.720	4179.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
4313.00†	0.000	179.720	4279.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
4413.00†	0.000	179.720	4379.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
4513.00†	0.000	179.720	4479.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
4613.00†	0.000	179.720	4579.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
4713.00†	0.000	179.720	4679.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
4809.72†	0.000	179.720	4776.00	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	SUSSEX
4813.00†	0.000	179.720	4779.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
4913.00†	0.000	179.720	4879.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
5013.00†	0.000	179.720	4979.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
5113.00†	0.000	179.720	5079.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
5213.00†	0.000	179.720	5179.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
5313.00†	0.000	179.720	5279.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
5413.00†	0.000	179.720	5379.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
5513.00†	0.000	179.720	5479.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
5613.00†	0.000	179.720	5579.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
5713.00†	0.000	179.720	5679.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
5813.00†	0.000	179.720	5779.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
5913.00†	0.000	179.720	5879.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
6013.00†	0.000	179.720	5979.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
6113.00†	0.000	179.720	6079.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
6213.00†	0.000	179.720	6179.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
6313.00†	0.000	179.720	6279.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
6413.00†	0.000	179.720	6379.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
6513.00†	0.000	179.720	6479.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
6613.00†	0.000	179.720	6579.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
6713.00†	0.000	179.720	6679.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
6813.00†	0.000	179.720	6779.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
6913.00†	0.000	179.720	6879.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
7013.00†	0.000	179.720	6979.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
7084.77†	0.000	179.720	7051.05	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	4 1/2" Liner Top
7113.00†	0.000	179.720	7079.28	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	
7184.77	0.000	179.720	7151.05	-289.44	287.99	-298.22	40°01'45.057"N	104°53'29.868"W	0.00	KOP, BUILD @ 10°/100'
7213.00†	2.823	179.720	7179.26	-288.75	287.30	-298.22	40°01'45.050"N	104°53'29.868"W	10.00	
7313.00†	12.823	179.720	7278.21	-275.16	273.70	-298.15	40°01'44.916"N	104°53'29.867"W	10.00	
7374.15†	18.938	179.720	7337.00	-258.43	256.98	-298.07	40°01'44.750"N	104°53'29.866"W	10.00	SHARON SPRINGS
7410.52†	22.575	179.720	7371.00	-245.54	244.09	-298.01	40°01'44.623"N	104°53'29.865"W	10.00	NIOBRARA A
7413.00†	22.823	179.720	7373.29	-244.59	243.13	-298.00	40°01'44.614"N	104°53'29.865"W	10.00	
7513.00†	32.823	179.720	7461.61	-197.97	196.52	-297.78	40°01'44.153"N	104°53'29.862"W	10.00	
7566.30†	38.153	179.720	7505.00	-167.04	165.59	-297.63	40°01'43.847"N	104°53'29.860"W	10.00	NIOBRARA B
7613.00†	42.823	179.720	7540.51	-136.73	135.27	-297.48	40°01'43.548"N	104°53'29.858"W	10.00	
7613.67†	42.890	179.720	7541.00	-136.27	134.82	-297.47	40°01'43.543"N	104°53'29.858"W	10.00	NIOBRARA C



Planned Wellpath Report

HOWARD 27C-33HZ (PERMIT REV-1) PWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 HOWARD 27C-33HZ (340' FNL & 1244' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH DATA (147 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
7713.00†	52.823	179.720	7607.56	-62.71	61.26	-297.12	40°01'42.816"N	104°53'29.853"W	10.00	
7813.00†	62.823	179.720	7660.75	21.82	-23.27	-296.70	40°01'41.981"N	104°53'29.848"W	10.00	
7858.75†	67.398	179.720	7680.00	63.31	-64.76	-296.50	40°01'41.571"N	104°53'29.845"W	10.00	FORT HAYS
7913.00†	72.823	179.720	7698.45	114.30	-115.75	-296.25	40°01'41.067"N	104°53'29.842"W	10.00	
8009.00†	82.423	179.720	7719.00	207.96	-209.41	-295.79	40°01'40.142"N	104°53'29.836"W	10.00	CODELL
8013.00†	82.823	179.720	7719.51	211.93	-213.38	-295.77	40°01'40.102"N	104°53'29.836"W	10.00	
8084.53	89.976	179.720	7724.00	283.28	-284.72	-295.43	40°01'39.397"N	104°53'29.832"W	10.00	LANDING POINT
8113.00†	89.976	179.720	7724.01	311.74	-313.19	-295.29	40°01'39.116"N	104°53'29.830"W	0.00	
8213.00†	89.976	179.720	7724.06	411.74	-413.19	-294.80	40°01'38.128"N	104°53'29.824"W	0.00	
8313.00†	89.976	179.720	7724.10	511.74	-513.19	-294.31	40°01'37.140"N	104°53'29.817"W	0.00	
8413.00†	89.976	179.720	7724.14	611.74	-613.19	-293.82	40°01'36.151"N	104°53'29.811"W	0.00	
8513.00†	89.976	179.720	7724.18	711.74	-713.19	-293.33	40°01'35.163"N	104°53'29.805"W	0.00	
8613.00†	89.976	179.720	7724.22	811.74	-813.18	-292.85	40°01'34.175"N	104°53'29.798"W	0.00	
8713.00†	89.976	179.720	7724.26	911.74	-913.18	-292.36	40°01'33.187"N	104°53'29.792"W	0.00	
8813.00†	89.976	179.720	7724.30	1011.74	-1013.18	-291.87	40°01'32.198"N	104°53'29.786"W	0.00	
8913.00†	89.976	179.720	7724.34	1111.74	-1113.18	-291.38	40°01'31.210"N	104°53'29.780"W	0.00	
9013.00†	89.976	179.720	7724.38	1211.74	-1213.18	-290.89	40°01'30.222"N	104°53'29.773"W	0.00	
9113.00†	89.976	179.720	7724.43	1311.74	-1313.18	-290.40	40°01'29.234"N	104°53'29.767"W	0.00	
9213.00†	89.976	179.720	7724.47	1411.74	-1413.18	-289.92	40°01'28.246"N	104°53'29.761"W	0.00	
9313.00†	89.976	179.720	7724.51	1511.74	-1513.18	-289.43	40°01'27.257"N	104°53'29.754"W	0.00	
9413.00†	89.976	179.720	7724.55	1611.74	-1613.17	-288.94	40°01'26.269"N	104°53'29.748"W	0.00	
9513.00†	89.976	179.720	7724.59	1711.74	-1713.17	-288.45	40°01'25.281"N	104°53'29.742"W	0.00	
9613.00†	89.976	179.720	7724.63	1811.74	-1813.17	-287.96	40°01'24.293"N	104°53'29.735"W	0.00	
9713.00†	89.976	179.720	7724.67	1911.74	-1913.17	-287.47	40°01'23.305"N	104°53'29.729"W	0.00	
9813.00†	89.976	179.720	7724.71	2011.74	-2013.17	-286.99	40°01'22.316"N	104°53'29.723"W	0.00	
9913.00†	89.976	179.720	7724.75	2111.74	-2113.17	-286.50	40°01'21.328"N	104°53'29.717"W	0.00	
10013.00†	89.976	179.720	7724.80	2211.74	-2213.17	-286.01	40°01'20.340"N	104°53'29.710"W	0.00	
10113.00†	89.976	179.720	7724.84	2311.74	-2313.17	-285.52	40°01'19.352"N	104°53'29.704"W	0.00	
10213.00†	89.976	179.720	7724.88	2411.74	-2413.16	-285.03	40°01'18.363"N	104°53'29.698"W	0.00	
10313.00†	89.976	179.720	7724.92	2511.74	-2513.16	-284.55	40°01'17.375"N	104°53'29.691"W	0.00	
10413.00†	89.976	179.720	7724.96	2611.74	-2613.16	-284.06	40°01'16.387"N	104°53'29.685"W	0.00	
10513.00†	89.976	179.720	7725.00	2711.74	-2713.16	-283.57	40°01'15.399"N	104°53'29.679"W	0.00	
10613.00†	89.976	179.720	7725.04	2811.74	-2813.16	-283.08	40°01'14.411"N	104°53'29.673"W	0.00	
10713.00†	89.976	179.720	7725.08	2911.74	-2913.16	-282.59	40°01'13.422"N	104°53'29.666"W	0.00	
10813.00†	89.976	179.720	7725.12	3011.74	-3013.16	-282.10	40°01'12.434"N	104°53'29.660"W	0.00	
10913.00†	89.976	179.720	7725.17	3111.74	-3113.16	-281.62	40°01'11.446"N	104°53'29.654"W	0.00	
11013.00†	89.976	179.720	7725.21	3211.74	-3213.16	-281.13	40°01'10.458"N	104°53'29.647"W	0.00	
11113.00†	89.976	179.720	7725.25	3311.74	-3313.15	-280.64	40°01'09.469"N	104°53'29.641"W	0.00	
11213.00†	89.976	179.720	7725.29	3411.74	-3413.15	-280.15	40°01'08.481"N	104°53'29.635"W	0.00	
11313.00†	89.976	179.720	7725.33	3511.74	-3513.15	-279.66	40°01'07.493"N	104°53'29.629"W	0.00	
11413.00†	89.976	179.720	7725.37	3611.74	-3613.15	-279.17	40°01'06.505"N	104°53'29.622"W	0.00	
11513.00†	89.976	179.720	7725.41	3711.74	-3713.15	-278.69	40°01'05.517"N	104°53'29.616"W	0.00	
11613.00†	89.976	179.720	7725.45	3811.74	-3813.15	-278.20	40°01'04.528"N	104°53'29.610"W	0.00	
11713.00†	89.976	179.720	7725.49	3911.74	-3913.15	-277.71	40°01'03.540"N	104°53'29.603"W	0.00	
11813.00†	89.976	179.720	7725.54	4011.74	-4013.15	-277.22	40°01'02.552"N	104°53'29.597"W	0.00	



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HOWARD 27C-33HZ (PERMIT REV-1) PWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 HOWARD 27C-33HZ (340' FNL & 1244' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH DATA (147 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
11913.00†	89.976	179.720	7725.58	4111.74	-4113.14	-276.73	40°01'01.564"N	104°53'29.591"W	0.00	
12013.00†	89.976	179.720	7725.62	4211.74	-4213.14	-276.24	40°01'00.576"N	104°53'29.585"W	0.00	
12113.00†	89.976	179.720	7725.66	4311.74	-4313.14	-275.76	40°00'59.587"N	104°53'29.578"W	0.00	
12213.00†	89.976	179.720	7725.70	4411.74	-4413.14	-275.27	40°00'58.599"N	104°53'29.572"W	0.00	
12313.00†	89.976	179.720	7725.74	4511.74	-4513.14	-274.78	40°00'57.611"N	104°53'29.566"W	0.00	
12413.00†	89.976	179.720	7725.78	4611.74	-4613.14	-274.29	40°00'56.623"N	104°53'29.559"W	0.00	
12513.00†	89.976	179.720	7725.82	4711.74	-4713.14	-273.80	40°00'55.634"N	104°53'29.553"W	0.00	
12613.00†	89.976	179.720	7725.86	4811.74	-4813.14	-273.31	40°00'54.646"N	104°53'29.547"W	0.00	
12713.00†	89.976	179.720	7725.91	4911.74	-4913.13	-272.83	40°00'53.658"N	104°53'29.540"W	0.00	
12813.00†	89.976	179.720	7725.95	5011.74	-5013.13	-272.34	40°00'52.670"N	104°53'29.534"W	0.00	
12913.00†	89.976	179.720	7725.99	5111.74	-5113.13	-271.85	40°00'51.682"N	104°53'29.528"W	0.00	
12943.21	89.976	179.720	7726.00 ¹	5141.96	-5143.35	-271.70	40°00'51.383"N	104°53'29.526"W	0.00	TOTAL DEPTH

HOLE & CASING SECTIONS - Ref Wellbore: HOWARD 27C-33HZ PWB Ref Wellpath: HOWARD 27C-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	8084.53	7084.53	1000.00	7724.00	0.00	0.00	-284.72	-295.43
7in Casing Intermediate	13.00	8084.53	8071.53	13.00	7724.00	0.00	0.00	-284.72	-295.43
6.125in Open Hole	8084.53	12943.21	4858.68	7724.00	7726.00	-284.72	-295.43	-5143.35	-271.70
4.5in Casing Production	13.00	12943.21	12930.21	13.00	7726.00	0.00	0.00	-5143.35	-271.70



Planned Wellpath Report

HOWARD 27C-33HZ (PERMIT REV-1) PWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 HOWARD 27C-33HZ (340' FNL & 1244' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-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	0.00	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	0.00	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	0.00	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	0.00	0.00	3170662.98	1253775.75	40°01'42.211"N	104°53'26.034"W	polygon
1) HOWARD 27C-33HZ BHL ON PLAT (200' FNL & 1540' FEL, SEC. 33) REV-1	12943.21	7726.00	-5143.35	-271.70	3170426.64	1248630.85	40°00'51.383"N	104°53'29.526"W	point

SURVEY PROGRAM - Ref Wellbore: HOWARD 27C-33HZ PWB Ref Wellpath: HOWARD 27C-33HZ (PERMIT REV-1) PWP				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
13.00	8084.53	NaviTrak (MagCorr)		HOWARD 27C-33HZ PWB
8084.53	12943.21	OnTrak (MagCorr)		HOWARD 27C-33HZ PWB



Planned Wellpath Report

HOWARD 27C-33HZ (PERMIT REV-1) PWP

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REFERENCE WELLPATH IDENTIFICATION

Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#13 HOWARD 27C-33HZ (340' FNL & 1244' FEL, SEC. 28)
Area	COLORADO	Well	HOWARD 27C-33HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	HOWARD 27C-33HZ PWB
Facility	SEC.28-T1N-R67W		

WELLPATH COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
1088.00	0.000	314.000	1088.00	FOX HILLS BASE
4809.72	0.000	179.720	4776.00	SUSSEX
7084.77	0.000	179.720	7051.05	4 1/2" Liner Top
7374.15	18.938	179.720	7337.00	SHARON SPRINGS
7410.52	22.575	179.720	7371.00	NIOBRARA A
7566.30	38.153	179.720	7505.00	NIOBRARA B
7613.67	42.890	179.720	7541.00	NIOBRARA C
7858.75	67.398	179.720	7680.00	FORT HAYS
8009.00	82.423	179.720	7719.00	CODELL

DESIGN COMMENTS

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
13.00	0.000	314.000	13.00	TIE-ON
1100.00	0.000	314.000	1100.00	BEGIN NUDGE
1600.00	10.000	314.000	1597.47	END NUDGE
3486.19	10.000	314.000	3455.00	BEGIN DROP
3986.19	0.000	179.720	3952.47	END DROP
7184.77	0.000	179.720	7151.05	KOP, BUILD @ 10°/100'
8084.53	89.976	179.720	7724.00	LANDING POINT
12943.21	89.976	179.720	7726.00	TOTAL DEPTH