

KERR-MCGEE OIL & GAS ONSHORE LP

Location: COLORADO Slot: SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07)
Field: WELD COUNTY (KERR MCGEE) Well: THOMSEN 2N-31HZ
Facility: SEC.07-T2N-R65W Wellbore: THOMSEN 2N-31HZ PWB

Plot reference wellpath is THOMSEN 2N-31HZ (PERMIT REV-1) PWP

True vertical depths are referenced to PERMIT (17KB) (RKB)	Grid System: NAD83 / Lambert Colorado SP, Northern Zone (501), US feet
Measured depths are referenced to PERMIT (17KB) (RKB)	North Reference: True north
PERMIT (17KB) (RKB) to Mean Sea Level: 4965 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07)): 0 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: robaki01 on 9/9/2014

Location Information

Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.07-T2N-R65W			3219721.272	1297490.241	40°08'50.395"N	104°42'50.411"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07)	2340.62	938.15	3220638.596	1299838.984	40°09'13.525"N	104°42'38.329"W
PERMIT (17KB) (RKB) to Mud line (At Slot: SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07))					4965ft	
Mean Sea Level to Mud line (At Slot: SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07))					0ft	
PERMIT (17KB) (RKB) to Mean Sea Level					4965ft	

Survey Program

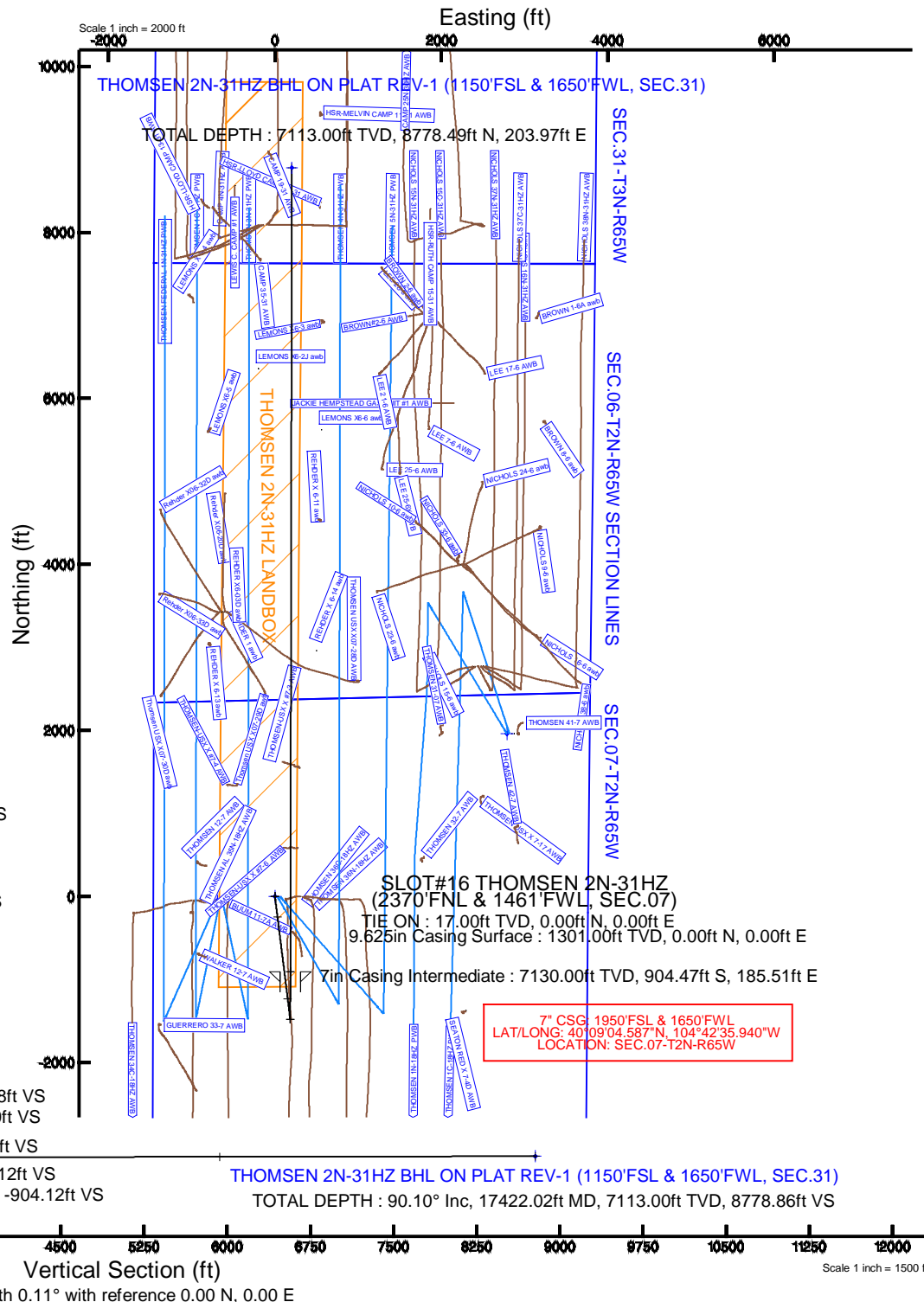
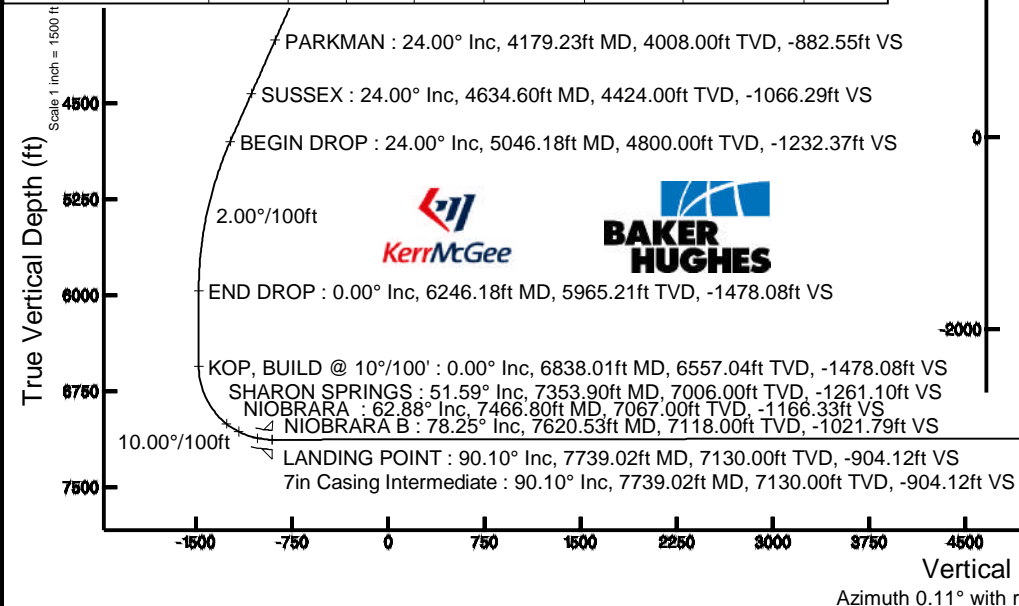
Start MD (ft)	End MD (ft)	Tool	Model	Log Name/Comment	Wellbore
17.00	17422.02	NaviTrak	NaviTrak	(MAGCORR, IFR)	THOMSEN 2N-31HZ PWB

Targets

Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
SEC.06-T2N-R65W SECTION LINES		1.00	-49.47	-691.30	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W
SEC.31-T3N-R65W SECTION LINES		1.00	-49.47	-691.30	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W
SEC.07-T2N-R65W SECTION LINES		36.00	1960.78	2788.68	3223408.59	1301824.42	40°09'32.900"N	104°42'02.412"W
THOMSEN 2N-31HZ BHL ON PLAT REV-1 (1150'FSL & 1650'FWL, SEC.31)	17422.02	7113.00	8778.49	203.97	3220764.41	1308616.56	40°10'40.274"N	104°42'35.701"W
THOMSEN 2N-31HZ LANDBOX		7113.00	0.00	0.00	3220638.60	1299838.98	40°09'13.525"N	104°42'38.329"W

Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
TIE ON	17.00	0.000	172.890	17.00	0.00	0.00	0.00	0.00
BEGIN NUDGE	1401.00	0.000	172.890	1401.00	0.00	0.00	0.00	0.00
END NUDGE	2601.00	24.000	172.890	2566.21	-245.77	30.66	2.00	-245.71
BEGIN DROP	5046.18	24.000	172.890	4800.00	-1232.67	153.76	0.00	-1232.37
END DROP	6246.18	0.000	0.109	5965.21	-1478.44	184.41	2.00	-1478.08
KOP, BUILD @ 10°/100'	6838.01	0.000	0.109	6557.04	-1478.44	184.41	0.00	-1478.08
LANDING POINT	7739.02	90.101	0.109	7130.00	-904.47	185.51	10.00	-904.12
TOTAL DEPTH	17422.02	90.101	0.109	7113.00	8778.49	203.97	0.00	8778.86



Planned Wellpath Report

THOMSEN 2N-31HZ (PERMIT REV-1) PWP

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REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN 2N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN 2N-31HZ PWB
Facility	SEC.07-T2N-R65W		

REPORT SETUP INFORMATION			
Projection System	NAD83 / Lambert Colorado SP, Northern Zone (501), US feet	Software System	WellArchitect® 4.0.0
North Reference	True	User	Robiale01
Scale	0.999958	Report Generated	9/9/2014 at 9:35:36 AM
Convergence at slot	n/a	Database/Source file	WellArchitectDB/THOMSEN_2N-31HZ_PWB.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	2340.62	938.15	3220638.60	1299838.98	40°09'13.525"N	104°42'38.329"W
Facility Reference Pt			3219721.27	1297490.24	40°08'50.395"N	104°42'50.411"W
Field Reference Pt			3197771.84	1268891.29	40°04'09.600"N	104°47'36.000"W

WELLPATH DATUM			
Calculation method	Minimum curvature	PERMIT (17'KB) (RKB) to Facility Vertical Datum	4965.00ft
Horizontal Reference Pt	Slot	PERMIT (17'KB) (RKB) to Mean Sea Level	4965.00ft
Vertical Reference Pt	PERMIT (17'KB) (RKB)	PERMIT (17'KB) (RKB) to Mud Line at Slot (SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07))	4965.00ft
MD Reference Pt	PERMIT (17'KB) (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	0.11°

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN 2N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN 2N-31HZ PWB
Facility	SEC.07-T2N-R65W		

WELLPATH DATA (191 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	172.890	0.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
17.00	0.000	172.890	17.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	TIE ON
117.00†	0.000	172.890	117.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
217.00†	0.000	172.890	217.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
317.00†	0.000	172.890	317.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
417.00†	0.000	172.890	417.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
517.00†	0.000	172.890	517.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
617.00†	0.000	172.890	617.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
717.00†	0.000	172.890	717.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
817.00†	0.000	172.890	817.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
917.00†	0.000	172.890	917.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
950.00†	0.000	172.890	950.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	BASE FOX HILLS
1017.00†	0.000	172.890	1017.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
1117.00†	0.000	172.890	1117.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
1217.00†	0.000	172.890	1217.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
1301.00†	0.000	172.890	1301.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	SURFACE CSG SETTING DEPTH
1317.00†	0.000	172.890	1317.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	
1401.00	0.000	172.890	1401.00	0.00	0.00	0.00	40°09'13.525"N	104°42'38.329"W	0.00	BEGIN NUDGE
1417.00†	0.320	172.890	1417.00	-0.04	-0.04	0.01	40°09'13.525"N	104°42'38.329"W	2.00	
1517.00†	2.320	172.890	1516.97	-2.33	-2.33	0.29	40°09'13.502"N	104°42'38.325"W	2.00	
1617.00†	4.320	172.890	1616.80	-8.07	-8.08	1.01	40°09'13.445"N	104°42'38.316"W	2.00	
1717.00†	6.320	172.890	1716.36	-17.27	-17.28	2.15	40°09'13.354"N	104°42'38.301"W	2.00	
1817.00†	8.320	172.890	1815.54	-29.91	-29.92	3.73	40°09'13.229"N	104°42'38.281"W	2.00	
1917.00†	10.320	172.890	1914.21	-45.98	-45.99	5.74	40°09'13.071"N	104°42'38.255"W	2.00	
2017.00†	12.320	172.890	2012.26	-65.45	-65.47	8.17	40°09'12.878"N	104°42'38.224"W	2.00	
2117.00†	14.320	172.890	2109.57	-88.30	-88.33	11.02	40°09'12.652"N	104°42'38.187"W	2.00	
2217.00†	16.320	172.890	2206.01	-114.52	-114.54	14.29	40°09'12.393"N	104°42'38.145"W	2.00	
2317.00†	18.320	172.890	2301.47	-144.05	-144.08	17.97	40°09'12.101"N	104°42'38.098"W	2.00	
2417.00†	20.320	172.890	2395.84	-176.87	-176.91	22.07	40°09'11.777"N	104°42'38.045"W	2.00	
2517.00†	22.320	172.890	2488.99	-212.94	-212.99	26.57	40°09'11.420"N	104°42'37.987"W	2.00	
2601.00	24.000	172.890	2566.21	-245.71	-245.77	30.66	40°09'11.096"N	104°42'37.934"W	2.00	END NUDGE
2617.00†	24.000	172.890	2580.83	-252.17	-252.23	31.46	40°09'11.032"N	104°42'37.924"W	0.00	
2717.00†	24.000	172.890	2672.19	-292.52	-292.59	36.50	40°09'10.634"N	104°42'37.859"W	0.00	
2817.00†	24.000	172.890	2763.54	-332.87	-332.95	41.53	40°09'10.235"N	104°42'37.794"W	0.00	
2917.00†	24.000	172.890	2854.90	-373.22	-373.31	46.56	40°09'09.836"N	104°42'37.729"W	0.00	
3017.00†	24.000	172.890	2946.25	-413.57	-413.67	51.60	40°09'09.437"N	104°42'37.664"W	0.00	
3117.00†	24.000	172.890	3037.60	-453.92	-454.03	56.63	40°09'09.038"N	104°42'37.600"W	0.00	
3217.00†	24.000	172.890	3128.96	-494.27	-494.39	61.67	40°09'08.639"N	104°42'37.535"W	0.00	
3317.00†	24.000	172.890	3220.31	-534.63	-534.75	66.70	40°09'08.241"N	104°42'37.470"W	0.00	
3417.00†	24.000	172.890	3311.67	-574.98	-575.11	71.74	40°09'07.842"N	104°42'37.405"W	0.00	
3517.00†	24.000	172.890	3403.02	-615.33	-615.48	76.77	40°09'07.443"N	104°42'37.340"W	0.00	
3617.00†	24.000	172.890	3494.38	-655.68	-655.84	81.80	40°09'07.044"N	104°42'37.275"W	0.00	
3717.00†	24.000	172.890	3585.73	-696.03	-696.20	86.84	40°09'06.645"N	104°42'37.211"W	0.00	
3817.00†	24.000	172.890	3677.09	-736.38	-736.56	91.87	40°09'06.246"N	104°42'37.146"W	0.00	
3917.00†	24.000	172.890	3768.44	-776.73	-776.92	96.91	40°09'05.847"N	104°42'37.081"W	0.00	

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Area	COLORADO	Well	THOMSEN 2N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN 2N-31HZ PWB
Facility	SEC.07-T2N-R65W		

WELLPATH DATA (191 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
4017.00†	24.000	172.890	3859.80	-817.08	-817.28	101.94	40°09'05.449"N	104°42'37.016"W	0.00	
4117.00†	24.000	172.890	3951.15	-857.44	-857.64	106.98	40°09'05.050"N	104°42'36.951"W	0.00	
4179.23†	24.000	172.890	4008.00	-882.55	-882.76	110.11	40°09'04.802"N	104°42'36.911"W	0.00	PARKMAN
4217.00†	24.000	172.890	4042.50	-897.79	-898.00	112.01	40°09'04.651"N	104°42'36.887"W	0.00	
4317.00†	24.000	172.890	4133.86	-938.14	-938.36	117.05	40°09'04.252"N	104°42'36.822"W	0.00	
4417.00†	24.000	172.890	4225.21	-978.49	-978.72	122.08	40°09'03.853"N	104°42'36.757"W	0.00	
4517.00†	24.000	172.890	4316.57	-1018.84	-1019.08	127.11	40°09'03.454"N	104°42'36.692"W	0.00	
4617.00†	24.000	172.890	4407.92	-1059.19	-1059.45	132.15	40°09'03.055"N	104°42'36.627"W	0.00	
4634.60†	24.000	172.890	4424.00	-1066.29	-1066.55	133.03	40°09'02.985"N	104°42'36.616"W	0.00	SUSSEX
4717.00†	24.000	172.890	4499.28	-1099.54	-1099.81	137.18	40°09'02.657"N	104°42'36.562"W	0.00	
4817.00†	24.000	172.890	4590.63	-1139.89	-1140.17	142.22	40°09'02.258"N	104°42'36.498"W	0.00	
4917.00†	24.000	172.890	4681.99	-1180.25	-1180.53	147.25	40°09'01.859"N	104°42'36.433"W	0.00	
5017.00†	24.000	172.890	4773.34	-1220.60	-1220.89	152.29	40°09'01.460"N	104°42'36.368"W	0.00	
5046.18	24.000	172.890	4800.00	-1232.37	-1232.67	153.76	40°09'01.344"N	104°42'36.349"W	0.00	BEGIN DROP
5117.00†	22.584	172.890	4865.04	-1260.15	-1260.45	157.22	40°09'01.069"N	104°42'36.304"W	2.00	
5217.00†	20.584	172.890	4958.03	-1296.64	-1296.95	161.77	40°09'00.708"N	104°42'36.246"W	2.00	
5317.00†	18.584	172.890	5052.24	-1329.90	-1330.21	165.92	40°09'00.380"N	104°42'36.192"W	2.00	
5417.00†	16.584	172.890	5147.56	-1359.86	-1360.19	169.66	40°09'00.084"N	104°42'36.144"W	2.00	
5517.00†	14.584	172.890	5243.88	-1386.51	-1386.85	172.99	40°08'59.820"N	104°42'36.101"W	2.00	
5617.00†	12.584	172.890	5341.08	-1409.81	-1410.15	175.89	40°08'59.590"N	104°42'36.064"W	2.00	
5717.00†	10.584	172.890	5439.04	-1429.73	-1430.08	178.38	40°08'59.393"N	104°42'36.032"W	2.00	
5817.00†	8.584	172.890	5537.64	-1446.25	-1446.59	180.44	40°08'59.230"N	104°42'36.005"W	2.00	
5917.00†	6.584	172.890	5636.76	-1459.34	-1459.69	182.07	40°08'59.100"N	104°42'35.984"W	2.00	
6017.00†	4.584	172.890	5736.28	-1468.99	-1469.34	183.28	40°08'59.005"N	104°42'35.969"W	2.00	
6117.00†	2.584	172.890	5836.08	-1475.19	-1475.55	184.05	40°08'58.944"N	104°42'35.959"W	2.00	
6217.00†	0.584	172.890	5936.03	-1477.94	-1478.29	184.39	40°08'58.916"N	104°42'35.954"W	2.00	
6246.18	0.000	0.109	5965.21	-1478.08	-1478.44	184.41	40°08'58.915"N	104°42'35.954"W	2.00	END DROP
6317.00†	0.000	0.109	6036.03	-1478.08	-1478.44	184.41	40°08'58.915"N	104°42'35.954"W	0.00	
6417.00†	0.000	0.109	6136.03	-1478.08	-1478.44	184.41	40°08'58.915"N	104°42'35.954"W	0.00	
6517.00†	0.000	0.109	6236.03	-1478.08	-1478.44	184.41	40°08'58.915"N	104°42'35.954"W	0.00	
6617.00†	0.000	0.109	6336.03	-1478.08	-1478.44	184.41	40°08'58.915"N	104°42'35.954"W	0.00	
6717.00†	0.000	0.109	6436.03	-1478.08	-1478.44	184.41	40°08'58.915"N	104°42'35.954"W	0.00	
6817.00†	0.000	0.109	6536.03	-1478.08	-1478.44	184.41	40°08'58.915"N	104°42'35.954"W	0.00	
6838.01	0.000	0.109	6557.04	-1478.08	-1478.44	184.41	40°08'58.915"N	104°42'35.954"W	0.00	KOP, BUILD @ 10°/100'
6917.00†	7.899	0.109	6635.78	-1472.65	-1473.00	184.42	40°08'58.969"N	104°42'35.954"W	10.00	
7017.00†	17.899	0.109	6733.14	-1450.35	-1450.71	184.46	40°08'59.189"N	104°42'35.954"W	10.00	
7117.00†	27.899	0.109	6825.14	-1411.49	-1411.85	184.54	40°08'59.573"N	104°42'35.953"W	10.00	
7217.00†	37.899	0.109	6908.99	-1357.24	-1357.60	184.64	40°09'00.109"N	104°42'35.951"W	10.00	
7317.00†	47.899	0.109	6982.16	-1289.26	-1289.61	184.77	40°09'00.781"N	104°42'35.950"W	10.00	
7353.90†	51.589	0.109	7006.00	-1261.10	-1261.46	184.82	40°09'01.059"N	104°42'35.949"W	10.00	SHARON SPRINGS
7417.00†	57.899	0.109	7042.40	-1209.60	-1209.96	184.92	40°09'01.568"N	104°42'35.948"W	10.00	
7466.80†	62.878	0.109	7067.00	-1166.33	-1166.68	185.01	40°09'01.996"N	104°42'35.947"W	10.00	NIOBRARA
7517.00†	67.899	0.109	7087.90	-1120.70	-1121.05	185.09	40°09'02.447"N	104°42'35.945"W	10.00	
7617.00†	77.899	0.109	7117.27	-1025.24	-1025.59	185.27	40°09'03.390"N	104°42'35.943"W	10.00	
7620.53†	78.252	0.109	7118.00	-1021.79	-1022.14	185.28	40°09'03.424"N	104°42'35.943"W	10.00	NIOBRARA B

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN 2N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN 2N-31HZ PWB
Facility	SEC.07-T2N-R65W		

WELLPATH DATA (191 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
7717.00†	87.899	0.109	7129.62	-926.13	-926.49	185.46	40°09'04.369"N	104°42'35.941"W	10.00	
7739.02	90.101	0.109	7130.00	-904.12	-904.47	185.51	40°09'04.587"N	104°42'35.940"W	10.00	LANDING POINT
7817.00†	90.101	0.109	7129.86	-826.14	-826.49	185.65	40°09'05.358"N	104°42'35.938"W	0.00	
7917.00†	90.101	0.109	7129.69	-726.14	-726.49	185.85	40°09'06.346"N	104°42'35.936"W	0.00	
8017.00†	90.101	0.109	7129.51	-626.14	-626.49	186.04	40°09'07.334"N	104°42'35.933"W	0.00	
8117.00†	90.101	0.109	7129.34	-526.14	-526.49	186.23	40°09'08.322"N	104°42'35.931"W	0.00	
8217.00†	90.101	0.109	7129.16	-426.14	-426.49	186.42	40°09'09.310"N	104°42'35.928"W	0.00	
8317.00†	90.101	0.109	7128.99	-326.14	-326.49	186.61	40°09'10.299"N	104°42'35.926"W	0.00	
8417.00†	90.101	0.109	7128.81	-226.14	-226.49	186.80	40°09'11.287"N	104°42'35.923"W	0.00	
8517.00†	90.101	0.109	7128.64	-126.14	-126.49	186.99	40°09'12.275"N	104°42'35.921"W	0.00	
8617.00†	90.101	0.109	7128.46	-26.14	-26.50	187.18	40°09'13.263"N	104°42'35.918"W	0.00	
8717.00†	90.101	0.109	7128.28	73.86	73.50	187.37	40°09'14.251"N	104°42'35.916"W	0.00	
8817.00†	90.101	0.109	7128.11	173.86	173.50	187.56	40°09'15.240"N	104°42'35.913"W	0.00	
8917.00†	90.101	0.109	7127.93	273.86	273.50	187.75	40°09'16.228"N	104°42'35.911"W	0.00	
9017.00†	90.101	0.109	7127.76	373.86	373.50	187.94	40°09'17.216"N	104°42'35.909"W	0.00	
9117.00†	90.101	0.109	7127.58	473.86	473.50	188.13	40°09'18.204"N	104°42'35.906"W	0.00	
9217.00†	90.101	0.109	7127.41	573.86	573.50	188.32	40°09'19.192"N	104°42'35.904"W	0.00	
9317.00†	90.101	0.109	7127.23	673.86	673.50	188.52	40°09'20.181"N	104°42'35.901"W	0.00	
9417.00†	90.101	0.109	7127.06	773.86	773.50	188.71	40°09'21.169"N	104°42'35.899"W	0.00	
9517.00†	90.101	0.109	7126.88	873.86	873.50	188.90	40°09'22.157"N	104°42'35.896"W	0.00	
9617.00†	90.101	0.109	7126.70	973.86	973.50	189.09	40°09'23.145"N	104°42'35.894"W	0.00	
9717.00†	90.101	0.109	7126.53	1073.86	1073.50	189.28	40°09'24.133"N	104°42'35.891"W	0.00	
9817.00†	90.101	0.109	7126.35	1173.86	1173.50	189.47	40°09'25.122"N	104°42'35.889"W	0.00	
9917.00†	90.101	0.109	7126.18	1273.86	1273.50	189.66	40°09'26.110"N	104°42'35.886"W	0.00	
10017.00†	90.101	0.109	7126.00	1373.86	1373.50	189.85	40°09'27.098"N	104°42'35.884"W	0.00	
10117.00†	90.101	0.109	7125.83	1473.86	1473.50	190.04	40°09'28.086"N	104°42'35.881"W	0.00	
10217.00†	90.101	0.109	7125.65	1573.86	1573.50	190.23	40°09'29.074"N	104°42'35.879"W	0.00	
10317.00†	90.101	0.109	7125.48	1673.86	1673.50	190.42	40°09'30.063"N	104°42'35.876"W	0.00	
10417.00†	90.101	0.109	7125.30	1773.86	1773.50	190.61	40°09'31.051"N	104°42'35.874"W	0.00	
10517.00†	90.101	0.109	7125.12	1873.86	1873.50	190.80	40°09'32.039"N	104°42'35.872"W	0.00	
10617.00†	90.101	0.109	7124.95	1973.86	1973.50	190.99	40°09'33.027"N	104°42'35.869"W	0.00	
10717.00†	90.101	0.109	7124.77	2073.86	2073.50	191.18	40°09'34.015"N	104°42'35.867"W	0.00	
10817.00†	90.101	0.109	7124.60	2173.86	2173.50	191.38	40°09'35.004"N	104°42'35.864"W	0.00	
10917.00†	90.101	0.109	7124.42	2273.86	2273.50	191.57	40°09'35.992"N	104°42'35.862"W	0.00	
11017.00†	90.101	0.109	7124.25	2373.86	2373.50	191.76	40°09'36.980"N	104°42'35.859"W	0.00	
11117.00†	90.101	0.109	7124.07	2473.86	2473.50	191.95	40°09'37.968"N	104°42'35.857"W	0.00	
11217.00†	90.101	0.109	7123.89	2573.86	2573.50	192.14	40°09'38.956"N	104°42'35.854"W	0.00	
11317.00†	90.101	0.109	7123.72	2673.86	2673.50	192.33	40°09'39.945"N	104°42'35.852"W	0.00	
11417.00†	90.101	0.109	7123.54	2773.86	2773.50	192.52	40°09'40.933"N	104°42'35.849"W	0.00	
11517.00†	90.101	0.109	7123.37	2873.86	2873.49	192.71	40°09'41.921"N	104°42'35.847"W	0.00	
11617.00†	90.101	0.109	7123.19	2973.86	2973.49	192.90	40°09'42.909"N	104°42'35.844"W	0.00	
11717.00†	90.101	0.109	7123.02	3073.86	3073.49	193.09	40°09'43.897"N	104°42'35.842"W	0.00	
11817.00†	90.101	0.109	7122.84	3173.86	3173.49	193.28	40°09'44.886"N	104°42'35.839"W	0.00	
11917.00†	90.101	0.109	7122.67	3273.86	3273.49	193.47	40°09'45.874"N	104°42'35.837"W	0.00	
12017.00†	90.101	0.109	7122.49	3373.86	3373.49	193.66	40°09'46.862"N	104°42'35.835"W	0.00	

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN 2N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN 2N-31HZ PWB
Facility	SEC.07-T2N-R65W		

WELLPATH DATA (191 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
12117.00†	90.101	0.109	7122.31	3473.86	3473.49	193.85	40°09'47.850"N	104°42'35.832"W	0.00	
12217.00†	90.101	0.109	7122.14	3573.86	3573.49	194.05	40°09'48.838"N	104°42'35.830"W	0.00	
12317.00†	90.101	0.109	7121.96	3673.86	3673.49	194.24	40°09'49.827"N	104°42'35.827"W	0.00	
12417.00†	90.101	0.109	7121.79	3773.86	3773.49	194.43	40°09'50.815"N	104°42'35.825"W	0.00	
12517.00†	90.101	0.109	7121.61	3873.85	3873.49	194.62	40°09'51.803"N	104°42'35.822"W	0.00	
12617.00†	90.101	0.109	7121.44	3973.85	3973.49	194.81	40°09'52.791"N	104°42'35.820"W	0.00	
12717.00†	90.101	0.109	7121.26	4073.85	4073.49	195.00	40°09'53.779"N	104°42'35.817"W	0.00	
12817.00†	90.101	0.109	7121.09	4173.85	4173.49	195.19	40°09'54.768"N	104°42'35.815"W	0.00	
12917.00†	90.101	0.109	7120.91	4273.85	4273.49	195.38	40°09'55.756"N	104°42'35.812"W	0.00	
13017.00†	90.101	0.109	7120.73	4373.85	4373.49	195.57	40°09'56.744"N	104°42'35.810"W	0.00	
13117.00†	90.101	0.109	7120.56	4473.85	4473.49	195.76	40°09'57.732"N	104°42'35.807"W	0.00	
13217.00†	90.101	0.109	7120.38	4573.85	4573.49	195.95	40°09'58.720"N	104°42'35.805"W	0.00	
13317.00†	90.101	0.109	7120.21	4673.85	4673.49	196.14	40°09'59.709"N	104°42'35.802"W	0.00	
13417.00†	90.101	0.109	7120.03	4773.85	4773.49	196.33	40°10'00.697"N	104°42'35.800"W	0.00	
13517.00†	90.101	0.109	7119.86	4873.85	4873.49	196.52	40°10'01.685"N	104°42'35.798"W	0.00	
13617.00†	90.101	0.109	7119.68	4973.85	4973.49	196.72	40°10'02.673"N	104°42'35.795"W	0.00	
13717.00†	90.101	0.109	7119.51	5073.85	5073.49	196.91	40°10'03.661"N	104°42'35.793"W	0.00	
13817.00†	90.101	0.109	7119.33	5173.85	5173.49	197.10	40°10'04.650"N	104°42'35.790"W	0.00	
13917.00†	90.101	0.109	7119.15	5273.85	5273.49	197.29	40°10'05.638"N	104°42'35.788"W	0.00	
14017.00†	90.101	0.109	7118.98	5373.85	5373.49	197.48	40°10'06.626"N	104°42'35.785"W	0.00	
14117.00†	90.101	0.109	7118.80	5473.85	5473.49	197.67	40°10'07.614"N	104°42'35.783"W	0.00	
14217.00†	90.101	0.109	7118.63	5573.85	5573.49	197.86	40°10'08.602"N	104°42'35.780"W	0.00	
14317.00†	90.101	0.109	7118.45	5673.85	5673.49	198.05	40°10'09.591"N	104°42'35.778"W	0.00	
14417.00†	90.101	0.109	7118.28	5773.85	5773.49	198.24	40°10'10.579"N	104°42'35.775"W	0.00	
14517.00†	90.101	0.109	7118.10	5873.85	5873.48	198.43	40°10'11.567"N	104°42'35.773"W	0.00	
14574.34†	90.101	0.109	7118.00	5931.19	5930.82	198.54	40°10'12.134"N	104°42'35.771"W	0.00	NIOBRARA B
14617.00†	90.101	0.109	7117.93	5973.85	5973.48	198.62	40°10'12.555"N	104°42'35.770"W	0.00	
14717.00†	90.101	0.109	7117.75	6073.85	6073.48	198.81	40°10'13.543"N	104°42'35.768"W	0.00	
14817.00†	90.101	0.109	7117.57	6173.85	6173.48	199.00	40°10'14.532"N	104°42'35.765"W	0.00	
14917.00†	90.101	0.109	7117.40	6273.85	6273.48	199.19	40°10'15.520"N	104°42'35.763"W	0.00	
15017.00†	90.101	0.109	7117.22	6373.85	6373.48	199.39	40°10'16.508"N	104°42'35.761"W	0.00	
15117.00†	90.101	0.109	7117.05	6473.85	6473.48	199.58	40°10'17.496"N	104°42'35.758"W	0.00	
15217.00†	90.101	0.109	7116.87	6573.85	6573.48	199.77	40°10'18.484"N	104°42'35.756"W	0.00	
15317.00†	90.101	0.109	7116.70	6673.85	6673.48	199.96	40°10'19.473"N	104°42'35.753"W	0.00	
15417.00†	90.101	0.109	7116.52	6773.85	6773.48	200.15	40°10'20.461"N	104°42'35.751"W	0.00	
15517.00†	90.101	0.109	7116.34	6873.85	6873.48	200.34	40°10'21.449"N	104°42'35.748"W	0.00	
15617.00†	90.101	0.109	7116.17	6973.85	6973.48	200.53	40°10'22.437"N	104°42'35.746"W	0.00	
15717.00†	90.101	0.109	7115.99	7073.85	7073.48	200.72	40°10'23.425"N	104°42'35.743"W	0.00	
15817.00†	90.101	0.109	7115.82	7173.85	7173.48	200.91	40°10'24.414"N	104°42'35.741"W	0.00	
15917.00†	90.101	0.109	7115.64	7273.85	7273.48	201.10	40°10'25.402"N	104°42'35.738"W	0.00	
16017.00†	90.101	0.109	7115.47	7373.85	7373.48	201.29	40°10'26.390"N	104°42'35.736"W	0.00	
16117.00†	90.101	0.109	7115.29	7473.85	7473.48	201.48	40°10'27.378"N	104°42'35.733"W	0.00	
16217.00†	90.101	0.109	7115.12	7573.85	7573.48	201.67	40°10'28.366"N	104°42'35.731"W	0.00	
16317.00†	90.101	0.109	7114.94	7673.85	7673.48	201.86	40°10'29.355"N	104°42'35.728"W	0.00	
16417.00†	90.101	0.109	7114.76	7773.85	7773.48	202.06	40°10'30.343"N	104°42'35.726"W	0.00	

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN 2N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN 2N-31HZ PWB
Facility	SEC.07-T2N-R65W		

WELLPATH DATA (191 stations) † = interpolated/extrapolated station										
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Latitude	Longitude	DLS [°/100ft]	Comments
16517.00†	90.101	0.109	7114.59	7873.85	7873.48	202.25	40°10'31.331"N	104°42'35.724"W	0.00	
16617.00†	90.101	0.109	7114.41	7973.85	7973.48	202.44	40°10'32.319"N	104°42'35.721"W	0.00	
16717.00†	90.101	0.109	7114.24	8073.85	8073.48	202.63	40°10'33.307"N	104°42'35.719"W	0.00	
16817.00†	90.101	0.109	7114.06	8173.85	8173.48	202.82	40°10'34.296"N	104°42'35.716"W	0.00	
16917.00†	90.101	0.109	7113.89	8273.85	8273.48	203.01	40°10'35.284"N	104°42'35.714"W	0.00	
17017.00†	90.101	0.109	7113.71	8373.85	8373.48	203.20	40°10'36.272"N	104°42'35.711"W	0.00	
17117.00†	90.101	0.109	7113.54	8473.85	8473.48	203.39	40°10'37.260"N	104°42'35.709"W	0.00	
17217.00†	90.101	0.109	7113.36	8573.85	8573.48	203.58	40°10'38.248"N	104°42'35.706"W	0.00	
17317.00†	90.101	0.109	7113.18	8673.85	8673.48	203.77	40°10'39.237"N	104°42'35.704"W	0.00	
17417.00†	90.101	0.109	7113.01	8773.85	8773.48	203.96	40°10'40.225"N	104°42'35.701"W	0.00	
17422.02	90.101	0.109	7113.00 ¹	8778.86	8778.49	203.97	40°10'40.274"N	104°42'35.701"W	0.00	TOTAL DEPTH

HOLE & CASING SECTIONS -									
Ref Wellbore: THOMSEN 2N-31HZ PWB					Ref Wellpath: THOMSEN 2N-31HZ (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	17.00	1301.00	1284.00	17.00	1301.00	0.00	0.00	0.00	0.00
9.625in Casing Surface	17.00	1301.00	1284.00	17.00	1301.00	0.00	0.00	0.00	0.00
8.75in Open Hole	1301.00	7739.02	6438.02	1301.00	7130.00	0.00	0.00	-904.47	185.51
7in Casing Intermediate	17.00	7739.02	7722.02	17.00	7130.00	0.00	0.00	-904.47	185.51
6.125in Open Hole	7739.02	17422.02	9683.00	7130.00	NA	-904.47	185.51	NA	NA
4.5in Casing Production	17.00	17422.02	17405.02	17.00	NA	0.00	0.00	NA	NA

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN 2N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN 2N-31HZ PWB
Facility	SEC.07-T2N-R65W		

TARGETS									
Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
SEC.06-T2N-R65W SECTION LINES		1.00	-49.47	-691.30	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W	polygon
SEC.31-T3N-R65W SECTION LINES		1.00	-49.47	-691.30	3219947.79	1299783.36	40°09'13.036"N	104°42'47.232"W	polygon
SEC.07-T2N-R65W SECTION LINES		36.00	1960.78	2788.68	3223409.59	1301824.42	40°09'32.900"N	104°42'02.412"W	polygon
1) THOMSEN 2N-31HZ BHL ON PLAT REV-1 (1150'FSL & 1650'FWL, SEC.31)	17422.02	7113.00	8778.49	203.97	3220764.41	1308618.56	40°10'40.274"N	104°42'35.701"W	point
THOMSEN 2N-31HZ LANDBOX		7113.00	0.00	0.00	3220638.60	1299838.98	40°09'13.525"N	104°42'38.329"W	polygon

SURVEY PROGRAM - Ref Wellbore: THOMSEN 2N-31HZ PWB					Ref Wellpath: THOMSEN 2N-31HZ (PERMIT REV-1) PWP	
Start MD [ft]	End MD [ft]	Positional Uncertainty Model		Log Name/Comment		Wellbore
17.00	17422.02	NaviTrak (MAGCORR,IFR)				THOMSEN 2N-31HZ PWB

REFERENCE WELLPATH IDENTIFICATION			
Operator	KERR-MCGEE OIL & GAS ONSHORE LP	Slot	SLOT#16 THOMSEN 2N-31HZ (2370'FNL & 1461'FWL, SEC.07)
Area	COLORADO	Well	THOMSEN 2N-31HZ
Field	WELD COUNTY (KERR MCGEE)	Wellbore	THOMSEN 2N-31HZ PWB
Facility	SEC.07-T2N-R65W		

WELLPATH COMMENTS				
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
950.00	0.000	172.890	950.00	BASE FOX HILLS
1301.00	0.000	172.890	1301.00	SURFACE CSG SETTING DEPTH
4179.23	24.000	172.890	4008.00	PARKMAN
4634.60	24.000	172.890	4424.00	SUSSEX
7353.90	51.589	0.109	7006.00	SHARON SPRINGS
7466.80	62.878	0.109	7067.00	NIOBRARA
7620.53	78.252	0.109	7118.00	NIOBRARA B
14574.34	90.101	0.109	7118.00	NIOBRARA B

DESIGN COMMENTS				
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Comment
17.00	0.000	172.890	17.00	TIE ON
1401.00	0.000	172.890	1401.00	BEGIN NUDGE
2601.00	24.000	172.890	2566.21	END NUDGE
5046.18	24.000	172.890	4800.00	BEGIN DROP
6246.18	0.000	0.109	5965.21	END DROP
6838.01	0.000	0.109	6557.04	KOP, BUILD @ 10°/100'
7739.02	90.101	0.109	7130.00	LANDING POINT
17422.02	90.101	0.109	7113.00	TOTAL DEPTH