

WELL DETAILS: Hergenreder 7N-4HZ

GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)

Northing	Easting	Latitude	Longitude
14595353.14	1636592.21	40.1884390	-105.0136940

PROJECT DETAILS: US Rockies Wattenberg Planning UTM83

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Annotation
125.00	125.00	0.53	247.33	-0.22	-0.53	First Total MWD Survey
2218.52	2306.00	21.71	80.87	90.49	534.23	Last Total MWD Survey
2305.80	2400.00	21.87	79.70	96.38	568.62	First SDI MWD Survey
6328.71	6650.00	8.53	181.31	284.67	1785.30	Curve KOP
6367.95	6690.00	13.65	179.86	276.98	1785.24	First SDI MWD Curve Survey
6885.22	7332.06	64.25	187.92	-77.59	1777.66	Enter Land Box : 7332.06' MD & 6885.22' TVD
6950.45	7576.00	84.19	178.39	-311.02	1764.57	Landing Point : 696' FNL 2519' FEL Sec 33
6950.74	7579.00	84.48	178.25	-314.00	1764.65	Last SDI MWD Curve Survey
6958.63	7668.00	85.35	178.73	-402.62	1766.99	First SDI MWD Lateral Survey
7019.43	8648.55	86.24	179.18	-1381.13	1776.26	Exit 460' Circle : 8648.55' MD & 7019.43' TVD 1767' FNL 2507' FEL
7193.59	13093.90	89.53	180.29	-5820.87	1846.12	Enter 460' Circle : 13093.90' MD & 7193.59' TVD 903' FNL 2428' FEL
7193.49	14146.00	93.25	178.69	-6872.69	1849.03	Last SDI MWD Survey
7190.31	14202.00	93.25	178.69	-6928.59	1850.31	Projection to TD : 2013' FNL 2423' FEL Sec 4

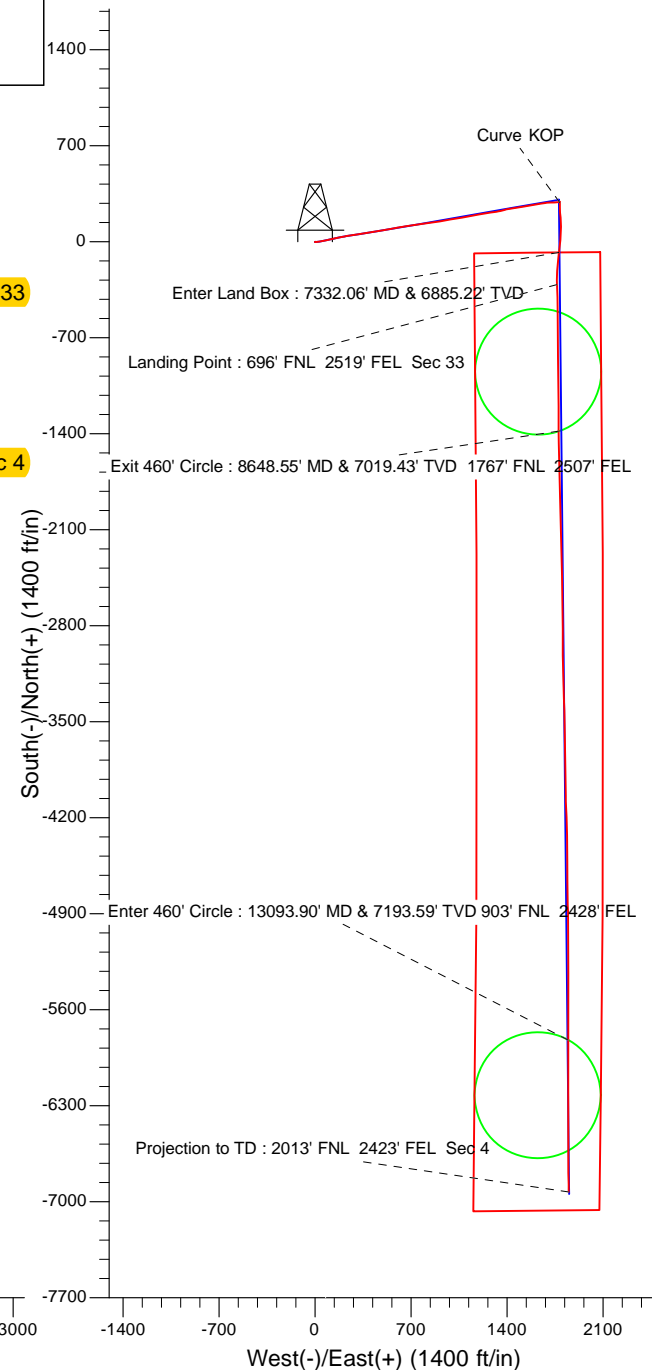
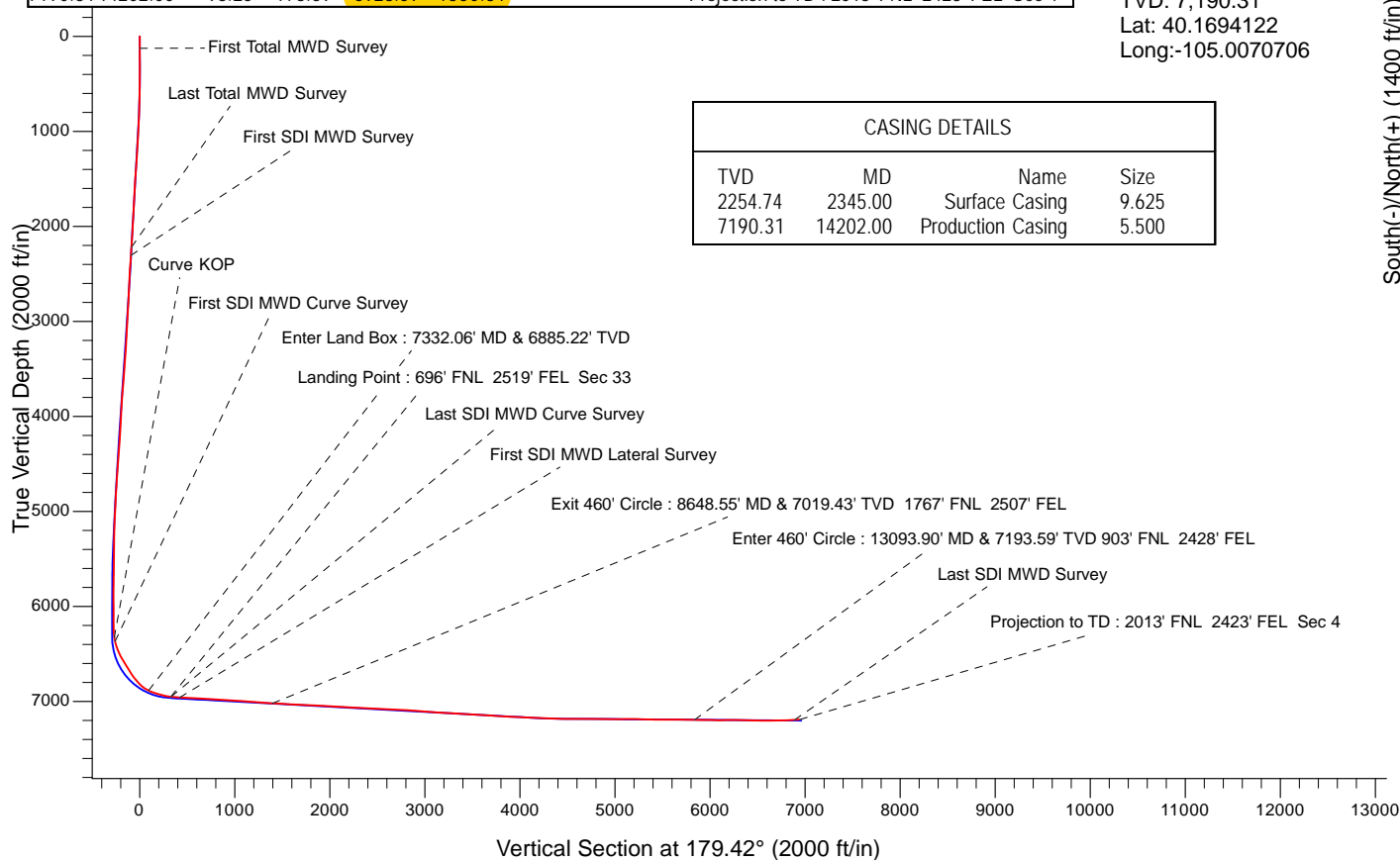
Surface Location:
 364' FNL 1020' FWL
 Sec 33 T3N R68W

Landing Point:
 696' FNL 2519' FEL Sec 33
 MD: 7,576.00
 TVD: 6,950.45
 Lat: 40.1875848
 Long: -105.0073758

BHL:
 2013' FNL 2423' FEL Sec 4
 MD: 14,202.00
 TVD: 7,190.31
 Lat: 40.1694122
 Long: -105.0070706

CASING DETAILS

TVD	MD	Name	Size
2254.74	2345.00	Surface Casing	9.625
7190.31	14202.00	Production Casing	5.500





US ROCKIES REGION PLANNING

US Rockies Wattenberg Planning UTM83

3N-68W-33 Hergenreder 4-33H Pad

Hergenreder 7N-4HZ

OH

Design: OH

Survey Report - Geographic

05 February, 2018



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Hergenreder 7N-4HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)
Site:	3N-68W-33 Hergenreder 4-33H Pad	MD Reference:	GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)
Well:	Hergenreder 7N-4HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Project	US Rockies Wattenberg Planning UTM83		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 13N (108 W to 102 W)		

Site						3N-68W-33 Hergenreder 4-33H Pad, Site Center : Hergenreder 32N-4HZ											
Site Position:			Northing:			14,595,483.88 usft			Latitude:			40.1887980					
From:			Lat/Long			Easting:			1,636,558.44 usft			Longitude:			-105.0138150		
Position Uncertainty:			0.00 ft			Slot Radius:			13.200 in			Grid Convergence:			-0.01 °		

Well	Hergenreder 7N-4HZ, 364' FNL 1020' FWL Sec 33 T3N R68W					
Well Position	+N/-S	0.00 ft	Northing:	14,595,353.14 usft	Latitude:	40.1884390
	+E/-W	0.00 ft	Easting:	1,636,592.21 usft	Longitude:	-105.0136940
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	4,944.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2016	1/3/2018	8.44	66.65	52,191

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	179.42	

Survey Program	Date	2/5/2018			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
125.00	2,306.00	Survey #1 - Surface (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
2,400.00	14,202.00	Survey #2 - Production (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	14,595,353.14	1,636,592.21	40.1884390	-105.0136940
125.00	0.53	247.33	125.00	-0.22	-0.53	14,595,352.92	1,636,591.67	40.1884384	-105.0136959
First Total MWD Survey									
157.00	0.35	229.05	157.00	-0.34	-0.74	14,595,352.80	1,636,591.46	40.1884381	-105.0136966
188.00	0.53	220.44	188.00	-0.52	-0.91	14,595,352.62	1,636,591.30	40.1884376	-105.0136972
220.00	0.53	205.32	220.00	-0.76	-1.07	14,595,352.38	1,636,591.14	40.1884369	-105.0136978
251.00	0.48	154.52	250.99	-1.01	-1.07	14,595,352.13	1,636,591.13	40.1884363	-105.0136978
283.00	0.62	148.90	282.99	-1.28	-0.93	14,595,351.86	1,636,591.28	40.1884355	-105.0136973
314.00	1.05	107.85	313.99	-1.51	-0.57	14,595,351.63	1,636,591.64	40.1884349	-105.0136960
346.00	2.07	93.35	345.98	-1.63	0.29	14,595,351.51	1,636,592.49	40.1884345	-105.0136929
377.00	2.15	85.26	376.96	-1.62	1.43	14,595,351.52	1,636,593.63	40.1884346	-105.0136889

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Hergenreder 7N-4HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)
Site:	3N-68W-33 Hergenreder 4-33H Pad	MD Reference:	GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)
Well:	Hergenreder 7N-4HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
409.00	3.08	91.30	408.92	-1.59	2.88	14,595,351.55	1,636,595.09	40.1884347	-105.0136836
441.00	4.13	88.87	440.86	-1.58	4.89	14,595,351.56	1,636,597.10	40.1884347	-105.0136764
472.00	4.70	89.83	471.77	-1.56	7.28	14,595,351.58	1,636,599.49	40.1884348	-105.0136679
504.00	5.54	87.02	503.64	-1.47	10.13	14,595,351.67	1,636,602.34	40.1884350	-105.0136577
535.00	6.02	82.98	534.48	-1.20	13.24	14,595,351.94	1,636,605.45	40.1884357	-105.0136466
567.00	6.72	80.60	566.28	-0.69	16.75	14,595,352.45	1,636,608.96	40.1884371	-105.0136340
599.00	7.56	81.13	598.04	-0.06	20.68	14,595,353.08	1,636,612.89	40.1884389	-105.0136199
631.00	8.04	81.48	629.74	0.60	24.97	14,595,353.74	1,636,617.18	40.1884407	-105.0136045
663.00	8.75	80.34	661.40	1.34	29.59	14,595,354.48	1,636,621.80	40.1884427	-105.0135880
694.00	9.18	79.99	692.02	2.17	34.35	14,595,355.30	1,636,626.56	40.1884450	-105.0135710
726.00	9.54	80.60	723.59	3.04	39.48	14,595,356.18	1,636,631.69	40.1884474	-105.0135526
758.00	10.20	80.43	755.12	3.95	44.89	14,595,357.08	1,636,637.10	40.1884499	-105.0135332
790.00	10.72	78.76	786.59	5.00	50.60	14,595,358.13	1,636,642.81	40.1884528	-105.0135128
822.00	11.12	78.41	818.01	6.20	56.54	14,595,359.33	1,636,648.75	40.1884561	-105.0134915
853.00	11.47	79.11	848.41	7.38	62.50	14,595,360.51	1,636,654.71	40.1884593	-105.0134702
885.00	12.66	77.44	879.70	8.74	69.05	14,595,361.87	1,636,661.25	40.1884630	-105.0134467
917.00	13.40	78.23	910.87	10.26	76.10	14,595,363.39	1,636,668.31	40.1884672	-105.0134215
948.00	14.11	78.85	940.98	11.73	83.32	14,595,364.85	1,636,675.53	40.1884712	-105.0133956
980.00	14.50	77.70	971.99	13.33	91.06	14,595,366.46	1,636,683.27	40.1884756	-105.0133679
1,012.00	14.81	78.40	1,002.95	15.01	98.98	14,595,368.14	1,636,691.19	40.1884803	-105.0133395
1,044.00	14.94	77.79	1,033.88	16.71	107.02	14,595,369.83	1,636,699.23	40.1884849	-105.0133108
1,075.00	15.64	77.26	1,063.78	18.47	115.00	14,595,371.59	1,636,707.21	40.1884898	-105.0132822
1,107.00	16.74	78.23	1,094.51	20.36	123.72	14,595,373.48	1,636,715.93	40.1884949	-105.0132510
1,139.00	17.53	77.88	1,125.09	22.32	132.95	14,595,375.43	1,636,725.16	40.1885003	-105.0132179
1,170.00	17.62	77.09	1,154.64	24.34	142.08	14,595,377.46	1,636,734.30	40.1885059	-105.0131852
1,202.00	17.97	77.18	1,185.11	26.52	151.62	14,595,379.64	1,636,743.83	40.1885119	-105.0131511
1,266.00	18.63	78.67	1,245.88	30.72	171.27	14,595,383.83	1,636,763.48	40.1885234	-105.0130807
1,298.00	19.69	78.41	1,276.10	32.81	181.56	14,595,385.92	1,636,773.77	40.1885291	-105.0130439
1,329.00	21.14	79.81	1,305.16	34.85	192.18	14,595,387.96	1,636,784.39	40.1885347	-105.0130058
1,361.00	21.31	79.81	1,334.99	36.90	203.58	14,595,390.00	1,636,795.79	40.1885403	-105.0129650
1,393.00	21.09	80.25	1,364.82	38.90	214.98	14,595,392.01	1,636,807.19	40.1885458	-105.0129242
1,425.00	21.27	78.85	1,394.66	41.00	226.35	14,595,394.10	1,636,818.56	40.1885516	-105.0128835
1,456.00	21.62	78.58	1,423.51	43.21	237.46	14,595,396.32	1,636,829.68	40.1885577	-105.0128437
1,488.00	21.84	78.67	1,453.24	45.55	249.08	14,595,398.65	1,636,841.29	40.1885641	-105.0128021
1,519.00	21.45	81.75	1,482.05	47.50	260.34	14,595,400.60	1,636,852.56	40.1885695	-105.0127618
1,551.00	21.49	82.27	1,511.83	49.13	271.94	14,595,402.22	1,636,864.15	40.1885739	-105.0127203
1,583.00	21.62	83.06	1,541.59	50.63	283.60	14,595,403.72	1,636,875.81	40.1885781	-105.0126785
1,615.00	21.09	82.71	1,571.40	52.07	295.16	14,595,405.16	1,636,887.38	40.1885820	-105.0126371
1,646.00	21.27	82.71	1,600.30	53.49	306.27	14,595,406.58	1,636,898.49	40.1885859	-105.0125973
1,678.00	21.75	83.15	1,630.07	54.93	317.92	14,595,408.02	1,636,910.13	40.1885899	-105.0125556
1,710.00	22.28	82.63	1,659.74	56.42	329.82	14,595,409.51	1,636,922.03	40.1885940	-105.0125130
1,742.00	20.96	81.04	1,689.49	58.09	341.49	14,595,411.18	1,636,933.71	40.1885985	-105.0124712
1,773.00	20.87	79.55	1,718.45	59.95	352.40	14,595,413.04	1,636,944.61	40.1886037	-105.0124322
1,805.00	20.74	79.99	1,748.36	61.97	363.58	14,595,415.06	1,636,955.80	40.1886092	-105.0123921
1,837.00	20.26	79.37	1,778.33	63.98	374.61	14,595,417.06	1,636,966.82	40.1886147	-105.0123526
1,869.00	20.30	78.85	1,808.35	66.08	385.50	14,595,419.16	1,636,977.72	40.1886205	-105.0123136
1,932.00	20.04	81.13	1,867.49	69.85	406.89	14,595,422.93	1,636,999.10	40.1886308	-105.0122371
1,964.00	20.04	81.92	1,897.55	71.47	417.73	14,595,424.54	1,637,009.95	40.1886353	-105.0121982
1,995.00	20.26	80.78	1,926.65	73.08	428.29	14,595,426.15	1,637,020.51	40.1886397	-105.0121604
2,027.00	19.91	80.25	1,956.71	74.89	439.13	14,595,427.96	1,637,031.35	40.1886447	-105.0121216
2,059.00	19.82	80.69	1,986.80	76.69	449.85	14,595,429.76	1,637,042.07	40.1886496	-105.0120832
2,091.00	19.56	80.25	2,016.93	78.47	460.48	14,595,431.54	1,637,052.70	40.1886545	-105.0120451
2,122.00	19.60	80.78	2,046.14	80.18	470.73	14,595,433.25	1,637,062.95	40.1886592	-105.0120085
2,154.00	19.78	80.60	2,076.27	81.93	481.37	14,595,434.99	1,637,073.59	40.1886640	-105.0119704
2,185.00	20.04	80.78	2,105.42	83.64	491.79	14,595,436.70	1,637,084.01	40.1886687	-105.0119331

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Hergenreder 7N-4HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)
Site:	3N-68W-33 Hergenreder 4-33H Pad	MD Reference:	GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)
Well:	Hergenreder 7N-4HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
2,217.00	20.30	81.75	2,135.45	85.31	502.69	14,595,438.37	1,637,094.91	40.1886733	-105.0118940
2,249.00	20.92	80.69	2,165.41	87.03	513.83	14,595,440.09	1,637,106.05	40.1886780	-105.0118541
2,281.00	21.31	79.99	2,195.26	88.97	525.19	14,595,442.02	1,637,117.41	40.1886833	-105.0118135
2,306.00	21.71	80.87	2,218.52	90.49	534.23	14,595,443.55	1,637,126.45	40.1886875	-105.0117811
Last Total MWD Survey									
2,345.00	21.78	80.38	2,254.74	92.84	548.48	14,595,445.90	1,637,140.70	40.1886940	-105.0117301
Surface Casing									
2,400.00	21.87	79.70	2,305.80	96.38	568.62	14,595,449.43	1,637,160.84	40.1887037	-105.0116579
First SDI MWD Survey									
2,489.00	20.27	77.91	2,388.85	102.57	600.01	14,595,455.62	1,637,192.23	40.1887207	-105.0115456
2,578.00	22.33	80.49	2,471.77	108.59	631.76	14,595,461.64	1,637,223.98	40.1887372	-105.0114319
2,667.00	21.85	82.38	2,554.23	113.58	664.85	14,595,466.62	1,637,257.08	40.1887509	-105.0113134
2,756.00	20.44	80.42	2,637.24	118.37	696.59	14,595,471.40	1,637,288.82	40.1887641	-105.0111997
2,845.00	21.40	82.21	2,720.37	123.15	728.00	14,595,476.18	1,637,320.23	40.1887772	-105.0110872
2,934.00	21.50	82.22	2,803.21	127.56	760.25	14,595,480.59	1,637,352.48	40.1887893	-105.0109718
3,023.00	19.26	82.27	2,886.63	131.75	790.96	14,595,484.76	1,637,383.19	40.1888008	-105.0108618
3,111.00	18.32	81.08	2,969.94	135.84	819.00	14,595,488.86	1,637,411.23	40.1888120	-105.0107614
3,200.00	19.93	81.52	3,054.03	140.25	847.83	14,595,493.26	1,637,440.06	40.1888241	-105.0106582
3,289.00	21.24	82.72	3,137.34	144.53	878.82	14,595,497.53	1,637,471.05	40.1888359	-105.0105472
3,378.00	22.53	79.59	3,219.93	149.65	911.59	14,595,502.65	1,637,503.82	40.1888499	-105.0104299
3,467.00	26.59	80.34	3,300.86	156.08	948.01	14,595,509.07	1,637,540.24	40.1888676	-105.0102995
3,556.00	25.54	80.88	3,380.81	162.46	986.59	14,595,515.45	1,637,578.82	40.1888851	-105.0101613
3,644.00	23.44	80.85	3,460.89	168.25	1,022.60	14,595,521.23	1,637,614.84	40.1889010	-105.0100324
3,733.00	24.64	80.18	3,542.17	174.23	1,058.36	14,595,527.21	1,637,650.60	40.1889174	-105.0099043
3,822.00	25.51	80.69	3,622.78	180.50	1,095.56	14,595,533.47	1,637,687.79	40.1889346	-105.0097712
3,911.00	24.20	78.77	3,703.53	187.15	1,132.36	14,595,540.12	1,637,724.60	40.1889529	-105.0096394
4,001.00	21.97	77.74	3,786.32	194.32	1,166.91	14,595,547.28	1,637,759.15	40.1889726	-105.0095157
4,089.00	21.35	79.08	3,868.11	200.85	1,198.73	14,595,553.80	1,637,790.96	40.1889905	-105.0094017
4,178.00	21.52	82.63	3,950.96	206.01	1,230.83	14,595,558.96	1,637,823.06	40.1890047	-105.0092868
4,266.00	20.49	82.91	4,033.11	209.98	1,262.12	14,595,562.93	1,637,854.36	40.1890156	-105.0091748
4,355.00	19.82	81.83	4,116.66	214.05	1,292.51	14,595,566.99	1,637,884.75	40.1890267	-105.0090659
4,444.00	20.18	79.88	4,200.29	218.89	1,322.56	14,595,571.83	1,637,914.80	40.1890400	-105.0089583
4,533.00	20.28	76.69	4,283.80	225.14	1,352.68	14,595,578.07	1,637,944.92	40.1890572	-105.0088505
4,621.00	21.08	75.22	4,366.13	232.69	1,382.83	14,595,585.62	1,637,975.07	40.1890779	-105.0087425
4,710.00	23.06	78.57	4,448.61	240.23	1,415.39	14,595,593.15	1,638,007.63	40.1890986	-105.0086259
4,799.00	22.57	81.57	4,530.65	246.19	1,449.37	14,595,599.10	1,638,041.62	40.1891150	-105.0085043
4,888.00	22.66	81.02	4,612.81	251.37	1,483.20	14,595,604.28	1,638,075.45	40.1891292	-105.0083831
4,976.00	21.29	82.30	4,694.41	256.15	1,515.78	14,595,609.06	1,638,108.02	40.1891423	-105.0082665
5,065.00	21.20	79.54	4,777.36	261.24	1,547.62	14,595,614.14	1,638,139.86	40.1891563	-105.0081525
5,154.00	21.00	79.84	4,860.40	266.97	1,579.14	14,595,619.87	1,638,171.38	40.1891720	-105.0080396
5,243.00	20.10	81.26	4,943.73	272.11	1,609.95	14,595,625.00	1,638,202.20	40.1891861	-105.0079293
5,357.00	17.28	80.97	5,051.71	277.75	1,646.04	14,595,630.63	1,638,238.29	40.1892016	-105.0078000
5,446.00	17.41	80.12	5,136.66	282.11	1,672.21	14,595,634.99	1,638,264.46	40.1892136	-105.0077063
5,535.00	16.83	87.01	5,221.73	285.06	1,698.20	14,595,637.94	1,638,290.45	40.1892217	-105.0076133
5,624.00	13.03	87.92	5,307.71	286.10	1,721.10	14,595,638.97	1,638,313.35	40.1892245	-105.0075313
5,712.00	10.36	86.50	5,393.87	286.94	1,738.92	14,595,639.81	1,638,331.17	40.1892268	-105.0074675
5,801.00	8.77	86.05	5,481.63	287.90	1,753.67	14,595,640.77	1,638,345.92	40.1892295	-105.0074146
5,890.00	6.81	84.44	5,569.81	288.88	1,765.70	14,595,641.74	1,638,357.95	40.1892321	-105.0073716
5,979.00	4.79	82.38	5,658.35	289.88	1,774.63	14,595,642.75	1,638,366.88	40.1892349	-105.0073396
6,068.00	3.76	70.08	5,747.10	291.37	1,781.06	14,595,644.23	1,638,373.31	40.1892390	-105.0073166
6,156.00	1.59	83.95	5,835.00	292.48	1,784.99	14,595,645.34	1,638,377.24	40.1892420	-105.0073025
6,246.00	0.42	159.59	5,924.99	292.30	1,786.34	14,595,645.17	1,638,378.59	40.1892415	-105.0072977
6,334.00	0.41	114.19	6,012.99	291.87	1,786.74	14,595,644.73	1,638,378.99	40.1892404	-105.0072962
6,423.00	0.24	213.33	6,101.99	291.58	1,786.93	14,595,644.45	1,638,379.18	40.1892396	-105.0072956
6,512.00	0.62	245.91	6,190.98	291.23	1,786.39	14,595,644.10	1,638,378.64	40.1892386	-105.0072975

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Hergenreder 7N-4HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)
Site:	3N-68W-33 Hergenreder 4-33H Pad	MD Reference:	GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)
Well:	Hergenreder 7N-4HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
6,601.00	2.31	191.79	6,279.95	289.28	1,785.58	14,595,642.14	1,638,377.83	40.1892332	-105.0073004	
6,650.00	8.53	181.31	6,328.71	284.67	1,785.30	14,595,637.54	1,638,377.55	40.1892206	-105.0073014	
Curve KOP										
6,690.00	13.65	179.86	6,367.95	276.98	1,785.24	14,595,629.85	1,638,377.49	40.1891995	-105.0073016	
First SDI MWD Curve Survey										
6,779.00	21.71	177.92	6,452.68	249.99	1,785.86	14,595,602.85	1,638,378.11	40.1891253	-105.0072994	
6,868.00	27.97	177.87	6,533.40	212.64	1,787.24	14,595,565.51	1,638,379.48	40.1890228	-105.0072945	
6,957.00	32.65	176.70	6,610.22	167.79	1,789.40	14,595,520.66	1,638,381.63	40.1888996	-105.0072867	
7,046.00	33.05	177.15	6,684.99	119.58	1,791.99	14,595,472.45	1,638,384.21	40.1887672	-105.0072775	
7,135.00	35.52	180.29	6,758.52	69.48	1,793.06	14,595,422.34	1,638,385.28	40.1886297	-105.0072737	
7,223.00	46.93	185.78	6,824.62	11.73	1,789.68	14,595,364.59	1,638,381.89	40.1884711	-105.0072858	
7,312.00	62.07	188.89	6,876.16	-59.89	1,780.28	14,595,292.98	1,638,372.47	40.1882744	-105.0073195	
7,332.06	64.25	187.92	6,885.22	-77.59	1,777.66	14,595,275.27	1,638,369.86	40.1882258	-105.0073288	
Enter Land Box : 7332.06' MD & 6885.22' TVD										
7,401.00	71.79	184.81	6,911.01	-141.08	1,770.63	14,595,211.79	1,638,362.81	40.1880514	-105.0073540	
7,490.00	76.02	182.51	6,935.68	-226.39	1,765.19	14,595,126.48	1,638,357.36	40.1878172	-105.0073735	
7,576.00	84.19	178.39	6,950.45	-311.02	1,764.57	14,595,041.85	1,638,356.72	40.1875848	-105.0073758	
Landing Point : 696' FNL 2519' FEL Sec 33										
7,579.00	84.48	178.25	6,950.74	-314.00	1,764.65	14,595,038.87	1,638,356.81	40.1875766	-105.0073755	
Last SDI MWD Curve Survey										
7,668.00	85.35	178.73	6,958.63	-402.62	1,766.99	14,594,950.25	1,638,359.13	40.1873332	-105.0073671	
First SDI MWD Lateral Survey										
7,757.00	87.55	179.29	6,964.14	-491.43	1,768.52	14,594,861.44	1,638,360.65	40.1870893	-105.0073617	
7,845.00	87.86	179.49	6,967.67	-579.36	1,769.46	14,594,773.51	1,638,361.57	40.1868479	-105.0073583	
7,934.00	87.62	179.08	6,971.18	-668.28	1,770.57	14,594,684.59	1,638,362.67	40.1866037	-105.0073544	
8,023.00	86.28	179.58	6,975.91	-757.14	1,771.61	14,594,595.72	1,638,363.70	40.1863597	-105.0073507	
8,111.00	85.57	179.52	6,982.17	-844.92	1,772.30	14,594,507.95	1,638,364.37	40.1861186	-105.0073482	
8,200.00	85.81	179.78	6,988.85	-933.67	1,772.84	14,594,419.20	1,638,364.90	40.1858749	-105.0073463	
8,289.00	86.24	179.57	6,995.02	-1,022.45	1,773.34	14,594,330.42	1,638,365.39	40.1856311	-105.0073445	
8,378.00	87.35	179.19	7,000.00	-1,111.30	1,774.30	14,594,241.56	1,638,366.34	40.1853871	-105.0073411	
8,466.00	85.14	179.81	7,005.76	-1,199.11	1,775.07	14,594,153.76	1,638,367.09	40.1851460	-105.0073384	
8,555.00	85.71	179.79	7,012.86	-1,287.82	1,775.38	14,594,065.05	1,638,367.39	40.1849024	-105.0073373	
8,644.00	86.21	179.16	7,019.13	-1,376.60	1,776.19	14,593,976.27	1,638,368.19	40.1846586	-105.0073344	
8,648.55	86.24	179.18	7,019.43	-1,381.13	1,776.26	14,593,971.73	1,638,368.25	40.1846461	-105.0073342	
Exit 460' Circle : 8648.55' MD & 7019.43' TVD 1767' FNL 2507' FEL										
8,733.00	86.72	179.59	7,024.62	-1,465.42	1,777.16	14,593,887.45	1,638,369.14	40.1844147	-105.0073310	
8,822.00	87.28	178.46	7,029.28	-1,554.28	1,778.68	14,593,798.59	1,638,370.64	40.1841706	-105.0073256	
8,911.00	87.79	178.56	7,033.10	-1,643.17	1,780.99	14,593,709.70	1,638,372.94	40.1839265	-105.0073173	
8,999.00	87.05	178.33	7,037.07	-1,731.05	1,783.37	14,593,621.82	1,638,375.31	40.1836852	-105.0073088	
9,088.00	87.18	178.35	7,041.55	-1,819.90	1,785.95	14,593,532.97	1,638,377.87	40.1834412	-105.0072996	
9,177.00	87.18	178.43	7,045.92	-1,908.76	1,788.45	14,593,444.11	1,638,380.36	40.1831972	-105.0072907	
9,266.00	86.18	178.79	7,051.08	-1,997.58	1,790.60	14,593,355.29	1,638,382.50	40.1829533	-105.0072830	
9,355.00	87.35	178.19	7,056.10	-2,086.40	1,792.94	14,593,266.46	1,638,384.83	40.1827094	-105.0072746	
9,444.00	86.32	179.18	7,061.01	-2,175.24	1,794.98	14,593,177.62	1,638,386.85	40.1824654	-105.0072674	
9,532.00	86.19	179.79	7,066.76	-2,263.05	1,795.77	14,593,089.82	1,638,387.63	40.1822243	-105.0072646	
9,621.00	86.85	178.95	7,072.16	-2,351.88	1,796.75	14,593,000.99	1,638,388.59	40.1819804	-105.0072611	
9,711.00	87.99	178.25	7,076.22	-2,441.76	1,798.95	14,592,911.11	1,638,390.77	40.1817335	-105.0072532	
9,799.00	87.45	178.57	7,079.72	-2,529.66	1,801.39	14,592,823.21	1,638,393.20	40.1814922	-105.0072445	
9,888.00	87.62	177.79	7,083.54	-2,618.53	1,804.21	14,592,734.34	1,638,396.01	40.1812481	-105.0072344	
9,977.00	87.49	179.10	7,087.34	-2,707.41	1,806.62	14,592,645.45	1,638,398.41	40.1810040	-105.0072258	
10,065.00	86.24	179.52	7,092.15	-2,795.27	1,807.68	14,592,557.59	1,638,399.45	40.1807628	-105.0072221	
10,154.00	85.04	180.76	7,098.92	-2,884.01	1,807.47	14,592,468.86	1,638,399.23	40.1805191	-105.0072229	
10,243.00	86.08	180.35	7,105.81	-2,972.74	1,806.61	14,592,380.13	1,638,398.35	40.1802754	-105.0072260	
10,332.00	85.94	179.00	7,112.00	-3,061.52	1,807.11	14,592,291.35	1,638,398.84	40.1800316	-105.0072242	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Hergenreder 7N-4HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)
Site:	3N-68W-33 Hergenreder 4-33H Pad	MD Reference:	GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)
Well:	Hergenreder 7N-4HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,421.00	86.95	178.41	7,117.52	-3,150.32	1,809.12	14,592,202.54	1,638,400.84	40.1797877	-105.0072170
10,510.00	86.07	178.35	7,122.94	-3,239.12	1,811.63	14,592,113.74	1,638,403.33	40.1795439	-105.0072080
10,599.00	86.52	177.93	7,128.69	-3,327.89	1,814.51	14,592,024.98	1,638,406.20	40.1793001	-105.0071977
10,687.00	87.45	177.73	7,133.32	-3,415.70	1,817.84	14,591,937.16	1,638,409.52	40.1790590	-105.0071859
10,776.00	87.22	179.27	7,137.46	-3,504.57	1,820.17	14,591,848.29	1,638,411.83	40.1788149	-105.0071775
10,865.00	85.87	179.44	7,142.82	-3,593.40	1,821.17	14,591,759.46	1,638,412.82	40.1785710	-105.0071740
10,954.00	85.97	179.21	7,149.15	-3,682.17	1,822.21	14,591,670.69	1,638,413.85	40.1783272	-105.0071703
11,043.00	86.38	179.06	7,155.09	-3,770.96	1,823.55	14,591,581.90	1,638,415.18	40.1780834	-105.0071655
11,132.00	86.82	178.76	7,160.37	-3,859.79	1,825.24	14,591,493.08	1,638,416.85	40.1778395	-105.0071595
11,221.00	87.56	178.69	7,164.73	-3,948.66	1,827.22	14,591,404.20	1,638,418.82	40.1775954	-105.0071524
11,310.00	88.66	179.46	7,167.67	-4,037.60	1,828.66	14,591,315.27	1,638,420.24	40.1773512	-105.0071473
11,399.00	86.98	178.45	7,171.05	-4,126.52	1,830.28	14,591,226.35	1,638,421.85	40.1771070	-105.0071415
11,488.00	87.32	178.00	7,175.48	-4,215.36	1,833.03	14,591,137.50	1,638,424.59	40.1768630	-105.0071317
11,577.00	88.15	177.61	7,179.00	-4,304.23	1,836.44	14,591,048.64	1,638,427.98	40.1766190	-105.0071195
11,666.00	88.56	180.02	7,181.55	-4,393.16	1,838.28	14,590,959.70	1,638,429.80	40.1763748	-105.0071129
11,755.00	89.26	179.88	7,183.24	-4,482.15	1,838.35	14,590,870.72	1,638,429.87	40.1761304	-105.0071127
11,844.00	90.10	179.41	7,183.74	-4,571.14	1,838.91	14,590,781.72	1,638,430.41	40.1758860	-105.0071107
11,933.00	89.03	179.33	7,184.42	-4,660.13	1,839.88	14,590,692.73	1,638,431.37	40.1756416	-105.0071073
12,021.00	89.40	179.07	7,185.62	-4,748.12	1,841.11	14,590,604.75	1,638,432.59	40.1754000	-105.0071029
12,110.00	90.37	178.27	7,185.80	-4,837.09	1,843.18	14,590,515.77	1,638,434.64	40.1751557	-105.0070955
12,199.00	89.30	179.79	7,186.06	-4,926.07	1,844.69	14,590,426.79	1,638,436.13	40.1749113	-105.0070901
12,288.00	89.73	179.83	7,186.81	-5,015.07	1,844.98	14,590,337.80	1,638,436.41	40.1746669	-105.0070891
12,377.00	90.80	179.37	7,186.40	-5,104.07	1,845.60	14,590,248.80	1,638,437.02	40.1744226	-105.0070869
12,466.00	89.13	179.97	7,186.45	-5,193.06	1,846.11	14,590,159.81	1,638,437.52	40.1741782	-105.0070851
12,554.00	88.79	180.02	7,188.05	-5,281.05	1,846.12	14,590,071.82	1,638,437.51	40.1739366	-105.0070851
12,643.00	88.25	179.60	7,190.35	-5,370.02	1,846.42	14,589,982.85	1,638,437.79	40.1736922	-105.0070841
12,732.00	89.53	180.11	7,192.07	-5,459.00	1,846.64	14,589,893.87	1,638,438.01	40.1734479	-105.0070833
12,820.00	89.63	179.56	7,192.72	-5,546.99	1,846.90	14,589,805.87	1,638,438.24	40.1732062	-105.0070824
12,909.00	90.90	179.97	7,192.31	-5,635.99	1,847.26	14,589,716.88	1,638,438.60	40.1729618	-105.0070811
12,998.00	88.96	180.57	7,192.42	-5,724.98	1,846.84	14,589,627.88	1,638,438.16	40.1727175	-105.0070826
13,087.00	89.60	180.31	7,193.53	-5,813.97	1,846.16	14,589,538.89	1,638,437.47	40.1724731	-105.0070851
13,093.90	89.53	180.29	7,193.59	-5,820.87	1,846.12	14,589,531.99	1,638,437.43	40.1724541	-105.0070852
Enter 460' Circle : 13093.90' MD & 7193.59' TVD 903' FNL 2428' FEL									
13,176.00	88.76	180.08	7,194.81	-5,902.96	1,845.86	14,589,449.90	1,638,437.15	40.1722287	-105.0070862
13,265.00	89.36	180.08	7,196.27	-5,991.95	1,845.73	14,589,360.92	1,638,437.01	40.1719843	-105.0070867
13,354.00	89.93	179.40	7,196.82	-6,080.95	1,846.14	14,589,271.92	1,638,437.40	40.1717399	-105.0070853
13,443.00	91.01	179.24	7,196.09	-6,169.94	1,847.19	14,589,182.93	1,638,438.44	40.1714956	-105.0070815
13,532.00	89.23	180.53	7,195.90	-6,258.93	1,847.37	14,589,093.94	1,638,438.61	40.1712512	-105.0070809
13,620.00	89.53	180.38	7,196.85	-6,346.92	1,846.67	14,589,005.95	1,638,437.90	40.1710095	-105.0070834
13,709.00	88.16	180.14	7,198.65	-6,435.90	1,846.27	14,588,916.97	1,638,437.48	40.1707652	-105.0070849
13,797.00	88.86	180.08	7,200.94	-6,523.87	1,846.10	14,588,829.00	1,638,437.30	40.1705236	-105.0070855
13,886.00	90.34	179.86	7,201.56	-6,612.87	1,846.14	14,588,740.00	1,638,437.33	40.1702792	-105.0070854
13,975.00	91.31	179.68	7,200.28	-6,701.86	1,846.50	14,588,651.01	1,638,437.67	40.1700349	-105.0070841
14,064.00	92.31	179.10	7,197.47	-6,790.80	1,847.45	14,588,562.06	1,638,438.61	40.1697906	-105.0070807
14,146.00	93.25	178.69	7,193.49	-6,872.69	1,849.03	14,588,480.18	1,638,440.17	40.1695657	-105.0070751
Last SDI MWD Survey									
14,202.00	93.25	178.69	7,190.31	-6,928.59	1,850.31	14,588,424.28	1,638,441.44	40.1694122	-105.0070706
Projection to TD : 2013' FNL 2423' FEL Sec 4 - Production Casing									

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Hergenreder 7N-4HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)
Site:	3N-68W-33 Hergenreder 4-33H Pad	MD Reference:	GL 4944' & KB 17' @ 4961.00ft (Xtreme 24)
Well:	Hergenreder 7N-4HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
2,345.00	2,254.74	Surface Casing	9.625	12.250
14,202.00	7,190.31	Production Casing	5.500	8.500

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
125.00	125.00	-0.22	-0.53	First Total MWD Survey
2,306.00	2,218.52	90.49	534.23	Last Total MWD Survey
2,400.00	2,305.80	96.38	568.62	First SDI MWD Survey
6,650.00	6,328.71	284.67	1,785.30	Curve KOP
6,690.00	6,367.95	276.98	1,785.24	First SDI MWD Curve Survey
7,332.06	6,885.22	-77.59	1,777.66	Enter Land Box : 7332.06' MD & 6885.22' TVD
7,576.00	6,950.45	-311.02	1,764.57	Landing Point : 696' FNL 2519' FEL Sec 33
7,579.00	6,950.74	-314.00	1,764.65	Last SDI MWD Curve Survey
7,668.00	6,958.63	-402.62	1,766.99	First SDI MWD Lateral Survey
8,648.55	7,019.43	-1,381.13	1,776.26	Exit 460' Circle : 8648.55' MD & 7019.43' TVD 1767' FNL 2507' FEL
13,093.90	7,193.59	-5,820.87	1,846.12	Enter 460' Circle : 13093.90' MD & 7193.59' TVD 903' FNL 2428' FEL
14,146.00	7,193.49	-6,872.69	1,849.03	Last SDI MWD Survey
14,202.00	7,190.31	-6,928.59	1,850.31	Projection to TD : 2013' FNL 2423' FEL Sec 4

Checked By: _____	Approved By: _____	Date: _____
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