

US ROCKIES WATTENBERG PLANNING



Project: WELD-NAD83-UTMFT13N
Site: 2N-65W-16 Cook 15-16HZ Pad
Well: Cook 36N-28HZ
Wellbore: Cook 36N-28HZ
Design: PDD Actual Surveys

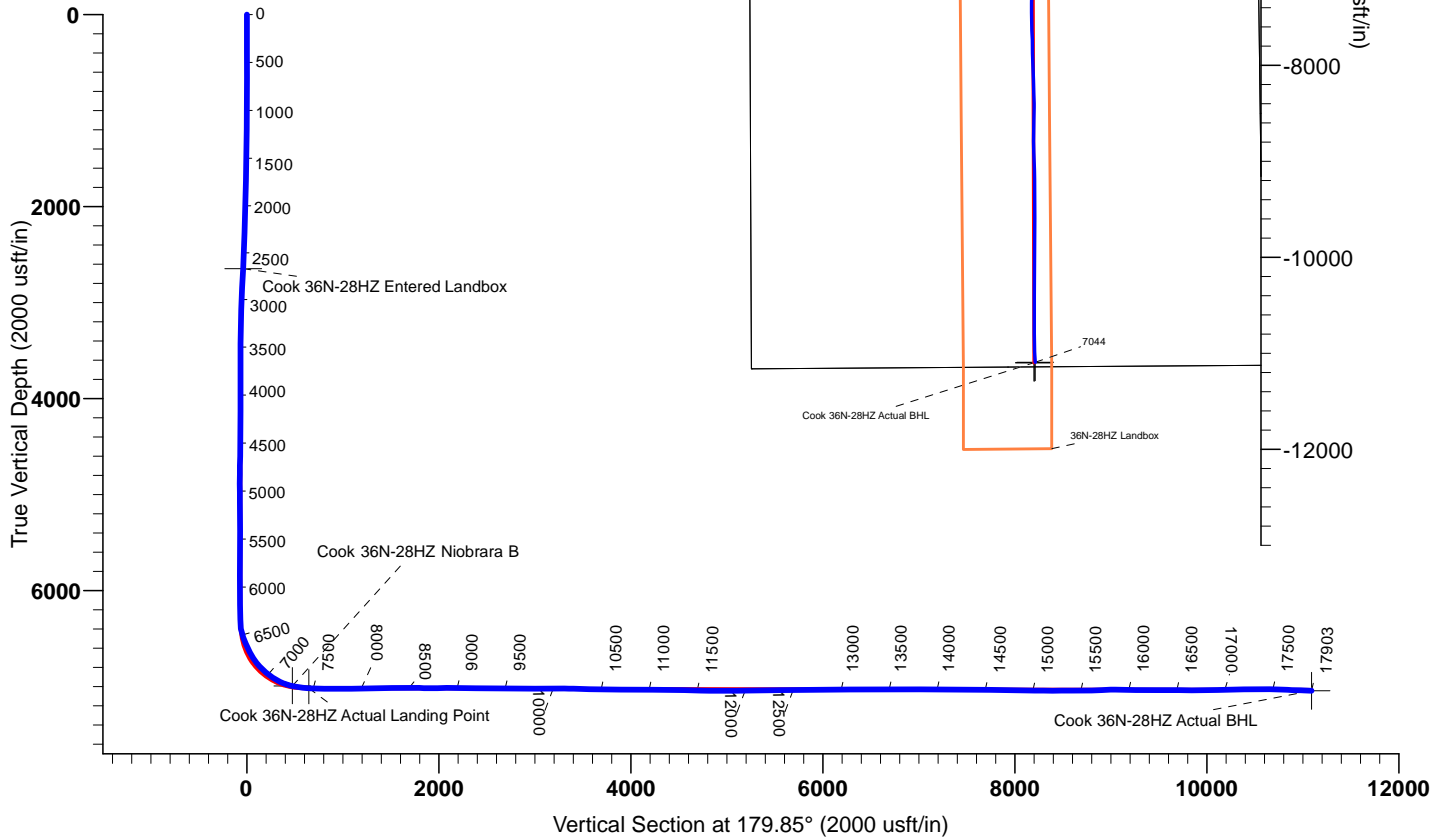
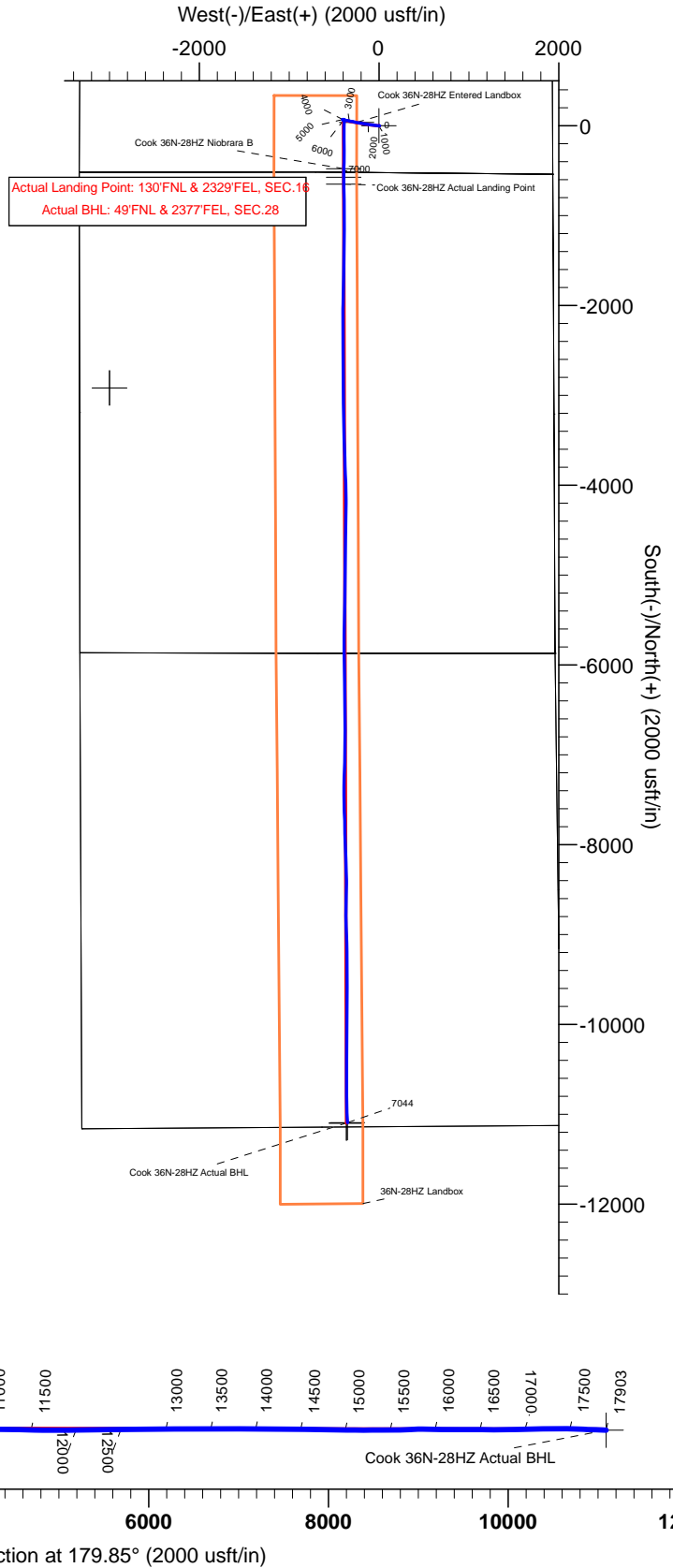
West(-)/East(+) (2000 usft/in)

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2646.69	2668.00	Entered Landbox
6886.12	7020.00	Sharon Springs
6943.65	7128.00	Niobrara
6995.06	7282.00	Niobrara B
7017.52	7455.00	Landing Depth
7044.02	17903.00	Toe Depth

CASING DETAILS

TVD	MD	Name	Size
7043.59	17892.00	5 1/2"	5-1/2
1883.84	1890.60	9 5/8	9-5/8



TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Cook 36N-28HZ Entered Landbox	2646.69	36.18	-248.40	14575331.61	1733385.09	40.132961	-104.667385	Point
Cook 36N-28HZ Niobrara B	6995.06	-476.63	-393.57	14574818.25	1733241.84	40.131572	-104.667904	Point
Cook 36N-28HZ Actual Landing Point	7017.52	-648.16	-392.73	14574646.93	1733243.32	40.131102	-104.667901	Point
Cook 36N-28HZ Actual BHL	7044.02	-11092.71	-351.68	14564202.61	1733323.56	40.102420	-104.667753	Point



US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

2N-65W-16 Cook 15-16HZ Pad

Cook 36N-28HZ

Cook 36N-28HZ

Design: PDD Actual Surveys

Standard Survey Report

03 December, 2015

PDD
Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Cook 36N-28HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4884'GL + 25'KB @ 4909.00usft (H&P 307)
Site:	2N-65W-16 Cook 15-16HZ Pad	MD Reference:	4884'GL + 25'KB @ 4909.00usft (H&P 307)
Well:	Cook 36N-28HZ	North Reference:	True
Wellbore:	Cook 36N-28HZ	Survey Calculation Method:	Minimum Curvature
Design:	PDD Actual Surveys	Database:	EDM 5000.1 Single User Db

Project	WELD-NAD83-UTMFT13N		
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	2N-65W-16 Cook 15-16HZ Pad, centered on 2N				
Site Position:		Northing:	14,575,319.30 usft	Latitude:	40.132945
From:	Lat/Long	Easting:	1,733,613.79 usft	Longitude:	-104.666567
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.21 °

Well	Cook 36N-28HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,575,296.55 usft	Latitude:	40.132882
	+E/-W	0.00 usft	Easting:	1,733,633.62 usft	Longitude:	-104.666496
Position Uncertainty		3.28 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,884.00 usft

Wellbore	Cook 36N-28HZ				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010	2/23/2015	(°)	(°)	(nT)
			8.29	66.72	52,612

Design	PDD Actual Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.00	0.00	0.00	179.85	

Survey Program	Date	12/3/2015			
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
104.00	1,839.00	SDI MWD Surveys (Cook 36N-28HZ)	APC_ISCWSA REV 2 MWD	Fixed:v2:standard declination	
1,994.00	17,903.00	PDD MWD+IFR+MSA Surveys (Cook 36N)	APC_ISCWSA REV 2 MWD+	Fixed:v2:Rockies, crustal dec + 3-axis correction	

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate	
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	0.57	118.60	104.00	-0.25	0.45	0.25	0.55	0.55	0.00	
194.00	0.66	109.38	193.99	-0.63	1.34	0.64	0.15	0.10	-10.24	
283.00	0.48	122.29	282.99	-1.00	2.13	1.01	0.25	-0.20	14.51	
390.00	0.45	115.04	389.99	-1.42	2.89	1.43	0.06	-0.03	-6.78	
480.00	0.18	259.07	479.98	-1.60	3.08	1.60	0.67	-0.30	160.03	
570.00	0.56	302.89	569.98	-1.38	2.57	1.39	0.50	0.42	48.69	
660.00	0.40	306.12	659.98	-0.96	1.94	0.97	0.18	-0.18	3.59	
750.00	0.61	257.16	749.98	-0.88	1.22	0.89	0.51	0.23	-54.40	
840.00	0.34	242.91	839.97	-1.11	0.52	1.11	0.33	-0.30	-15.83	

PDD
Survey Report

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Site:	2N-65W-16 Cook 15-16HZ Pad	MD Reference:	4884'GL + 25'KB @ 4909.00usft (H&P 307)
Well:	Cook 36N-28HZ	North Reference:	True
Wellbore:	Cook 36N-28HZ	Survey Calculation Method:	Minimum Curvature
Design:	PDD Actual Surveys	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
930.00	1.23	261.60	929.96	-1.37	-0.67	1.37	1.02	0.99	20.77	
1,021.00	2.23	261.10	1,020.92	-1.79	-3.39	1.78	1.10	1.10	-0.55	
1,111.00	3.39	272.75	1,110.81	-1.93	-7.78	1.91	1.43	1.29	12.94	
1,201.00	4.64	279.37	1,200.59	-1.21	-14.03	1.18	1.48	1.39	7.36	
1,291.00	5.94	281.63	1,290.20	0.32	-22.18	-0.38	1.46	1.44	2.51	
1,381.00	6.81	279.23	1,379.65	2.11	-32.01	-2.20	1.01	0.97	-2.67	
1,471.00	7.60	281.54	1,468.94	4.16	-43.11	-4.27	0.93	0.88	2.57	
1,561.00	7.85	278.97	1,558.12	6.31	-55.01	-6.45	0.47	0.28	-2.86	
1,651.00	8.68	278.67	1,647.18	8.29	-67.79	-8.47	0.92	0.92	-0.33	
1,741.00	8.99	276.39	1,736.12	10.10	-81.50	-10.31	0.52	0.34	-2.53	
1,839.00	9.32	275.39	1,832.87	11.70	-97.01	-11.95	0.37	0.34	-1.02	
1,994.00	7.11	274.84	1,986.27	13.68	-119.06	-14.00	1.43	-1.43	-0.35	
2,088.00	8.01	279.11	2,079.45	15.21	-131.33	-15.56	1.13	0.96	4.54	
2,183.00	8.98	286.04	2,173.41	18.31	-144.99	-18.69	1.48	1.02	7.29	
2,277.00	10.49	285.37	2,266.05	22.60	-160.29	-23.02	1.61	1.61	-0.71	
2,372.00	12.82	277.37	2,359.09	26.25	-179.09	-26.72	2.98	2.45	-8.42	
2,466.00	14.34	278.66	2,450.46	29.34	-200.94	-29.87	1.65	1.62	1.37	
2,560.00	13.26	278.02	2,541.75	32.60	-223.12	-33.18	1.16	-1.15	-0.68	
2,654.00	13.98	277.97	2,633.11	35.67	-245.04	-36.32	0.77	0.77	-0.05	
2,749.00	14.67	286.05	2,725.16	40.59	-267.97	-41.29	2.22	0.73	8.51	
2,843.00	13.40	281.25	2,816.36	46.01	-290.09	-46.77	1.83	-1.35	-5.11	
2,938.00	13.24	279.57	2,908.80	49.96	-311.62	-50.78	0.44	-0.17	-1.77	
3,032.00	11.42	282.70	3,000.63	53.80	-331.31	-54.67	2.06	-1.94	3.33	
3,127.00	9.08	278.22	3,094.11	56.94	-347.91	-57.85	2.60	-2.46	-4.72	
3,221.00	7.79	280.60	3,187.09	59.17	-361.51	-60.12	1.42	-1.37	2.53	
3,316.00	5.60	284.02	3,281.44	61.48	-372.34	-62.46	2.34	-2.31	3.60	
3,410.00	3.54	282.93	3,375.13	63.24	-379.62	-64.23	2.19	-2.19	-1.16	
3,505.00	3.00	278.62	3,469.98	64.27	-384.93	-65.28	0.62	-0.57	-4.54	
3,599.00	0.91	267.39	3,563.92	64.60	-388.11	-65.62	2.25	-2.22	-11.95	
3,693.00	0.69	297.20	3,657.91	64.83	-389.36	-65.85	0.49	-0.23	31.71	
3,788.00	0.84	297.56	3,752.90	65.41	-390.49	-66.44	0.16	0.16	0.38	
3,882.00	1.56	264.36	3,846.88	65.61	-392.37	-66.63	1.03	0.77	-35.32	
3,977.00	1.04	260.50	3,941.86	65.34	-394.51	-66.37	0.55	-0.55	-4.06	
4,071.00	1.21	247.85	4,035.84	64.82	-396.27	-65.86	0.32	0.18	-13.46	
4,166.00	0.87	247.39	4,130.82	64.17	-397.86	-65.21	0.36	-0.36	-0.48	
4,260.00	0.80	265.29	4,224.81	63.84	-399.18	-64.88	0.29	-0.07	19.04	
4,355.00	0.82	310.44	4,319.80	64.22	-400.35	-65.27	0.65	0.02	47.53	
4,449.00	1.03	304.54	4,413.79	65.14	-401.56	-66.19	0.25	0.22	-6.28	
4,544.00	1.37	290.51	4,508.77	66.02	-403.33	-67.08	0.47	0.36	-14.77	
4,638.00	1.64	308.33	4,602.74	67.25	-405.44	-68.31	0.57	0.29	18.96	
4,733.00	1.21	358.85	4,697.71	69.10	-406.52	-70.16	1.34	-0.45	53.18	
4,827.00	1.99	64.89	4,791.68	70.78	-405.07	-71.84	1.98	0.83	70.26	
4,922.00	2.18	99.30	4,886.62	71.19	-401.79	-72.24	1.31	0.20	36.22	

PDD
Survey Report

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Well:	Cook 36N-28HZ	North Reference:	True
Wellbore:	Cook 36N-28HZ	Survey Calculation Method:	Minimum Curvature
Design:	PDD Actual Surveys	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,016.00	1.05	136.64	4,980.59	70.27	-399.43	-71.32	1.58	-1.20	39.72	
5,111.00	1.01	121.19	5,075.57	69.21	-398.12	-70.25	0.29	-0.04	-16.26	
5,205.00	1.33	111.63	5,169.55	68.38	-396.40	-69.41	0.40	0.34	-10.17	
5,300.00	0.55	77.20	5,264.54	68.07	-394.93	-69.10	0.98	-0.82	-36.24	
5,394.00	0.39	54.41	5,358.54	68.36	-394.23	-69.39	0.26	-0.17	-24.24	
5,489.00	0.65	59.61	5,453.53	68.82	-393.50	-69.85	0.28	0.27	5.47	
5,583.00	0.94	51.85	5,547.52	69.56	-392.43	-70.59	0.33	0.31	-8.26	
5,677.00	1.43	34.49	5,641.50	71.01	-391.16	-72.03	0.64	0.52	-18.47	
5,772.00	0.80	91.16	5,736.49	71.97	-389.83	-72.99	1.26	-0.66	59.65	
5,866.00	1.17	149.75	5,830.47	71.13	-388.69	-72.15	1.08	0.39	62.33	
5,961.00	1.26	215.77	5,925.46	69.44	-388.81	-70.46	1.40	0.09	69.49	
6,055.00	0.79	185.67	6,019.44	67.96	-389.48	-68.98	0.74	-0.50	-32.02	
6,150.00	0.34	190.74	6,114.44	67.03	-389.60	-68.05	0.48	-0.47	5.34	
6,244.00	0.49	123.75	6,208.44	66.53	-389.31	-67.55	0.51	0.16	-71.27	
6,339.00	0.59	67.94	6,303.43	66.49	-388.52	-67.51	0.54	0.11	-58.75	
6,433.00	9.40	173.42	6,397.02	59.03	-387.19	-60.04	10.19	9.37	112.21	
6,528.00	18.63	183.23	6,489.10	36.12	-387.16	-37.13	10.00	9.72	10.33	
6,622.00	26.10	185.63	6,575.97	0.50	-390.04	-1.52	8.00	7.95	2.55	
6,717.00	28.09	183.66	6,660.54	-42.62	-393.51	41.59	2.30	2.09	-2.07	
6,811.00	36.81	174.36	6,739.84	-92.86	-392.16	91.83	10.66	9.28	-9.89	
6,905.00	44.99	178.32	6,810.84	-154.21	-388.41	153.19	9.13	8.70	4.21	
7,000.00	51.70	179.16	6,873.94	-225.13	-386.87	224.12	7.09	7.06	0.88	
7,094.00	59.27	181.57	6,927.17	-302.52	-387.44	301.50	8.32	8.05	2.56	
7,189.00	68.98	182.86	6,968.58	-387.83	-390.78	386.80	10.29	10.22	1.36	
7,283.00	78.01	180.76	6,995.26	-477.81	-393.59	476.78	9.84	9.61	-2.23	
7,378.00	82.92	179.47	7,011.00	-571.47	-393.77	570.43	5.34	5.17	-1.36	
7,472.00	88.34	178.88	7,018.16	-665.15	-392.42	664.12	5.80	5.77	-0.63	
7,567.00	88.03	178.10	7,021.17	-760.07	-389.91	759.04	0.88	-0.33	-0.82	
7,661.00	89.27	179.00	7,023.38	-854.01	-387.54	852.99	1.63	1.32	0.96	
7,756.00	88.66	179.07	7,025.10	-948.98	-385.94	947.96	0.65	-0.64	0.07	
7,850.00	91.07	181.28	7,025.32	-1,042.96	-386.22	1,041.95	3.48	2.56	2.35	
7,945.00	91.05	181.22	7,023.56	-1,137.93	-388.29	1,136.90	0.07	-0.02	-0.06	
8,039.00	90.88	180.35	7,021.98	-1,231.90	-389.58	1,230.88	0.94	-0.18	-0.93	
8,134.00	91.40	180.32	7,020.09	-1,326.88	-390.14	1,325.86	0.55	0.55	-0.03	
8,228.00	91.46	179.70	7,017.74	-1,420.85	-390.15	1,419.83	0.66	0.06	-0.66	
8,323.00	90.71	180.44	7,015.94	-1,515.83	-390.27	1,514.81	1.11	-0.79	0.78	
8,417.00	89.77	180.85	7,015.55	-1,609.83	-391.33	1,608.80	1.09	-1.00	0.44	
8,511.00	90.63	180.93	7,015.22	-1,703.81	-392.79	1,702.78	0.92	0.91	0.09	
8,606.00	88.86	181.33	7,015.64	-1,798.79	-394.66	1,797.75	1.91	-1.86	0.42	
8,700.00	89.89	181.46	7,016.67	-1,892.75	-396.95	1,891.71	1.10	1.10	0.14	
8,795.00	90.82	181.82	7,016.08	-1,987.71	-399.67	1,986.66	1.05	0.98	0.38	
8,889.00	89.65	180.33	7,015.70	-2,081.69	-401.43	2,080.63	2.02	-1.24	-1.59	
8,984.00	88.75	179.13	7,017.02	-2,176.68	-400.98	2,175.62	1.58	-0.95	-1.26	

PDD
Survey Report

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Well:	Cook 36N-28HZ	North Reference:	True
Wellbore:	Cook 36N-28HZ	Survey Calculation Method:	Minimum Curvature
Design:	PDD Actual Surveys	Database:	EDM 5000.1 Single User Db

Survey										
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9,078.00	89.86	179.22	7,018.16	-2,270.66	-399.63	2,269.61	1.18	1.18	0.10	
9,173.00	90.17	179.59	7,018.14	-2,365.65	-398.64	2,364.60	0.51	0.33	0.39	
9,267.00	91.06	180.14	7,017.13	-2,459.65	-398.42	2,458.60	1.11	0.95	0.59	
9,362.00	89.02	180.45	7,017.06	-2,554.64	-398.91	2,553.59	2.17	-2.15	0.33	
9,456.00	89.36	180.44	7,018.39	-2,648.63	-399.64	2,647.57	0.36	0.36	-0.01	
9,551.00	88.71	179.33	7,019.99	-2,743.61	-399.45	2,742.56	1.35	-0.68	-1.17	
9,645.00	88.63	178.76	7,022.17	-2,837.57	-397.89	2,836.52	0.61	-0.09	-0.61	
9,740.00	89.54	179.56	7,023.69	-2,932.55	-396.49	2,931.50	1.28	0.96	0.84	
9,834.00	89.92	179.30	7,024.13	-3,026.54	-395.56	3,025.50	0.49	0.40	-0.28	
9,929.00	90.39	179.06	7,023.88	-3,121.53	-394.20	3,120.49	0.56	0.49	-0.25	
10,023.00	91.33	179.14	7,022.46	-3,215.51	-392.72	3,214.47	1.00	1.00	0.09	
10,118.00	89.34	179.40	7,021.91	-3,310.50	-391.51	3,309.46	2.11	-2.09	0.27	
10,212.00	88.19	178.66	7,023.93	-3,404.46	-389.92	3,403.43	1.45	-1.22	-0.79	
10,307.00	88.74	178.37	7,026.48	-3,499.39	-387.46	3,498.37	0.65	0.58	-0.31	
10,401.00	88.82	178.01	7,028.48	-3,593.32	-384.49	3,592.30	0.39	0.09	-0.38	
10,496.00	89.00	178.20	7,030.29	-3,688.25	-381.35	3,687.24	0.28	0.19	0.20	
10,590.00	89.19	177.84	7,031.77	-3,782.19	-378.10	3,781.18	0.43	0.20	-0.38	
10,685.00	89.90	178.42	7,032.53	-3,877.13	-375.00	3,876.14	0.97	0.75	0.61	
10,779.00	89.91	177.86	7,032.68	-3,971.08	-371.95	3,970.09	0.60	0.01	-0.60	
10,874.00	90.05	178.42	7,032.72	-4,066.03	-368.87	4,065.05	0.61	0.15	0.59	
10,968.00	89.94	179.56	7,032.72	-4,160.02	-367.21	4,159.04	1.22	-0.12	1.21	
11,063.00	89.47	180.70	7,033.21	-4,255.01	-367.43	4,254.04	1.30	-0.49	1.20	
11,157.00	88.77	180.77	7,034.66	-4,348.99	-368.63	4,348.01	0.75	-0.74	0.07	
11,251.00	88.86	181.05	7,036.60	-4,442.96	-370.13	4,441.98	0.31	0.10	0.30	
11,346.00	88.85	181.03	7,038.50	-4,537.93	-371.85	4,536.94	0.02	-0.01	-0.02	
11,440.00	88.40	180.83	7,040.76	-4,631.89	-373.38	4,630.89	0.52	-0.48	-0.21	
11,535.00	88.57	181.09	7,043.27	-4,726.84	-374.97	4,725.84	0.33	0.18	0.27	
11,629.00	88.97	180.51	7,045.28	-4,820.81	-376.28	4,819.81	0.75	0.43	-0.62	
11,723.00	90.36	180.17	7,045.83	-4,914.80	-376.84	4,913.80	1.52	1.48	-0.36	
11,818.00	90.42	180.86	7,045.19	-5,009.80	-377.69	5,008.79	0.73	0.06	0.73	
11,912.00	90.93	180.77	7,044.08	-5,103.78	-379.03	5,102.77	0.55	0.54	-0.10	
12,007.00	91.04	180.36	7,042.45	-5,198.76	-379.96	5,197.75	0.45	0.12	-0.43	
12,101.00	90.51	180.68	7,041.18	-5,292.75	-380.82	5,291.73	0.66	-0.56	0.34	
12,196.00	91.07	180.85	7,039.87	-5,387.73	-382.09	5,386.71	0.62	0.59	0.18	
12,290.00	89.90	181.09	7,039.07	-5,481.71	-383.68	5,480.69	1.27	-1.24	0.26	
12,385.00	90.70	181.06	7,038.57	-5,576.69	-385.46	5,575.66	0.84	0.84	-0.03	
12,479.00	91.22	180.88	7,037.00	-5,670.67	-387.05	5,669.63	0.59	0.55	-0.19	
12,574.00	90.50	179.92	7,035.57	-5,765.65	-387.71	5,764.62	1.26	-0.76	-1.01	
12,652.00	90.62	180.02	7,034.81	-5,843.65	-387.67	5,842.61	0.20	0.15	0.13	
12,747.00	91.63	179.63	7,032.94	-5,938.63	-387.38	5,937.59	1.14	1.06	-0.41	
12,841.00	88.89	178.93	7,032.52	-6,032.61	-386.20	6,031.58	3.01	-2.91	-0.74	
12,936.00	89.43	178.58	7,033.91	-6,127.58	-384.14	6,126.55	0.68	0.57	-0.37	
13,030.00	90.16	178.61	7,034.25	-6,221.55	-381.83	6,220.52	0.78	0.78	0.03	
13,125.00	90.84	178.39	7,033.42	-6,316.51	-379.35	6,315.49	0.75	0.72	-0.23	

PDD
Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Cook 36N-28HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4884'GL + 25'KB @ 4909.00usft (H&P 307)
Site:	2N-65W-16 Cook 15-16HZ Pad	MD Reference:	4884'GL + 25'KB @ 4909.00usft (H&P 307)
Well:	Cook 36N-28HZ	North Reference:	True
Wellbore:	Cook 36N-28HZ	Survey Calculation Method:	Minimum Curvature
Design:	PDD Actual Surveys	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,219.00	91.47	178.73	7,031.52	-6,410.46	-376.98	6,409.45	0.76	0.67	0.36
13,314.00	90.54	180.21	7,029.86	-6,505.44	-376.11	6,504.43	1.84	-0.98	1.56
13,408.00	89.32	180.63	7,029.97	-6,599.43	-376.79	6,598.42	1.37	-1.30	0.45
13,503.00	89.83	179.55	7,030.68	-6,694.43	-376.94	6,693.42	1.26	0.54	-1.14
13,597.00	89.92	180.71	7,030.88	-6,788.43	-377.16	6,787.42	1.24	0.10	1.23
13,692.00	90.60	181.02	7,030.45	-6,883.41	-378.59	6,882.40	0.79	0.72	0.33
13,786.00	91.00	181.05	7,029.14	-6,977.39	-380.29	6,976.37	0.43	0.43	0.03
13,880.00	89.49	180.93	7,028.74	-7,071.37	-381.91	7,070.35	1.61	-1.61	-0.13
13,975.00	90.23	181.33	7,028.97	-7,166.35	-383.79	7,165.32	0.89	0.78	0.42
14,069.00	89.31	181.68	7,029.35	-7,260.32	-386.25	7,259.28	1.05	-0.98	0.37
14,164.00	89.80	181.35	7,030.08	-7,355.28	-388.77	7,354.24	0.62	0.52	-0.35
14,258.00	88.83	179.03	7,031.21	-7,449.27	-389.08	7,448.22	2.67	-1.03	-2.47
14,353.00	88.72	178.20	7,033.24	-7,544.22	-386.78	7,543.18	0.88	-0.12	-0.87
14,447.00	88.57	178.56	7,035.46	-7,638.15	-384.13	7,637.12	0.41	-0.16	0.38
14,542.00	89.08	178.48	7,037.41	-7,733.10	-381.67	7,732.07	0.54	0.54	-0.08
14,636.00	89.65	178.44	7,038.45	-7,827.06	-379.15	7,826.04	0.61	0.61	-0.04
14,731.00	89.00	178.54	7,039.57	-7,922.02	-376.64	7,921.01	0.69	-0.68	0.11
14,826.00	89.74	178.37	7,040.61	-8,016.98	-374.08	8,015.97	0.80	0.78	-0.18
14,920.00	89.34	178.06	7,041.37	-8,110.93	-371.15	8,109.93	0.54	-0.43	-0.33
15,015.00	89.48	177.53	7,042.35	-8,205.85	-367.50	8,204.86	0.58	0.15	-0.56
15,109.00	89.05	178.61	7,043.55	-8,299.79	-364.33	8,298.81	1.24	-0.46	1.15
15,204.00	90.34	179.65	7,044.06	-8,394.78	-362.89	8,393.80	1.74	1.36	1.09
15,298.00	90.71	180.85	7,043.20	-8,488.77	-363.30	8,487.79	1.34	0.39	1.28
15,393.00	90.51	181.36	7,042.19	-8,583.75	-365.13	8,582.76	0.58	-0.21	0.54
15,487.00	89.69	180.76	7,042.02	-8,677.73	-366.87	8,676.74	1.08	-0.87	-0.64
15,527.00	89.99	180.25	7,042.13	-8,717.73	-367.23	8,716.74	1.48	0.75	-1.28
15,621.00	92.24	179.00	7,040.31	-8,811.70	-366.61	8,810.71	2.74	2.39	-1.33
15,716.00	92.58	179.10	7,036.31	-8,906.60	-365.04	8,905.62	0.37	0.36	0.11
15,810.00	90.44	178.25	7,033.83	-9,000.54	-362.86	8,999.56	2.45	-2.28	-0.90
15,905.00	88.99	178.04	7,034.31	-9,095.48	-359.79	9,094.51	1.54	-1.53	-0.22
15,999.00	89.61	178.69	7,035.45	-9,189.44	-357.11	9,188.47	0.96	0.66	0.69
16,093.00	89.18	179.15	7,036.45	-9,283.42	-355.34	9,282.45	0.67	-0.46	0.49
16,188.00	90.48	180.43	7,036.73	-9,378.41	-354.99	9,377.45	1.92	1.37	1.35
16,282.00	90.29	180.14	7,036.10	-9,472.41	-355.45	9,471.44	0.37	-0.20	-0.31
16,377.00	89.77	180.30	7,036.05	-9,567.41	-355.82	9,566.44	0.57	-0.55	0.17
16,471.00	88.94	180.41	7,037.11	-9,661.40	-356.40	9,660.43	0.89	-0.88	0.12
16,565.00	90.06	180.02	7,037.93	-9,755.39	-356.75	9,754.42	1.26	1.19	-0.41
16,660.00	90.12	179.90	7,037.78	-9,850.39	-356.69	9,849.42	0.14	0.06	-0.13
16,755.00	89.74	179.74	7,037.89	-9,945.39	-356.39	9,944.42	0.43	-0.40	-0.17
16,849.00	90.54	180.25	7,037.66	-10,039.39	-356.38	10,038.42	1.01	0.85	0.54
16,943.00	91.00	180.79	7,036.40	-10,133.38	-357.23	10,132.41	0.75	0.49	0.57
17,038.00	90.73	180.77	7,034.97	-10,228.36	-358.53	10,227.38	0.28	-0.28	-0.02
17,132.00	91.52	180.88	7,033.12	-10,322.33	-359.88	10,321.35	0.85	0.84	0.12

PDD
Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Cook 36N-28HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4884'GL + 25'KB @ 4909.00usft (H&P 307)
Site:	2N-65W-16 Cook 15-16HZ Pad	MD Reference:	4884'GL + 25'KB @ 4909.00usft (H&P 307)
Well:	Cook 36N-28HZ	North Reference:	True
Wellbore:	Cook 36N-28HZ	Survey Calculation Method:	Minimum Curvature
Design:	PDD Actual Surveys	Database:	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
17,227.00	92.51	180.44	7,029.78	-10,417.26	-360.97	10,416.28	1.14	1.04	-0.46	
17,321.00	90.69	180.76	7,027.16	-10,511.22	-361.96	10,510.23	1.97	-1.94	0.34	
17,416.00	89.72	180.36	7,026.82	-10,606.21	-362.89	10,605.22	1.10	-1.02	-0.42	
17,510.00	87.68	179.51	7,028.95	-10,700.18	-362.78	10,699.19	2.35	-2.17	-0.90	
17,604.00	87.09	178.51	7,033.24	-10,794.07	-361.16	10,793.08	1.23	-0.63	-1.06	
17,699.00	88.63	178.66	7,036.78	-10,888.97	-358.81	10,887.99	1.63	1.62	0.16	
17,793.00	87.81	177.97	7,039.70	-10,982.88	-356.05	10,981.91	1.14	-0.87	-0.73	
17,825.00	87.74	177.68	7,040.95	-11,014.83	-354.84	11,013.87	0.93	-0.22	-0.91	
17,903.00	87.74	177.68	7,044.02	-11,092.71	-351.68	11,091.75	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Cook 36N-28HZ Enterec - hit/miss target - Shape - actual wellpath hits target center - Point	0.00	0.00	2,646.69	36.18	-248.40	14,575,331.80	1,733,385.09	40.132981	-104.667385	
Cook 36N-28HZ Niobarar - actual wellpath hits target center - Point	0.00	0.00	6,995.06	-476.83	-393.57	14,574,818.25	1,733,241.84	40.131573	-104.667904	
Cook 36N-28HZ Actual I - actual wellpath misses target center by 0.01usft at 7455.01usft MD (7017.52 TVD, -648.17 N, -392.73 E) - Point	0.00	0.00	7,017.52	-648.16	-392.73	14,574,646.92	1,733,243.32	40.131102	-104.667901	
Cook 36N-28HZ Actual E - actual wellpath hits target center - Point	0.00	0.00	7,044.02	-11,092.71	-351.68	14,564,202.60	1,733,323.56	40.102420	-104.667754	

Casing Points						
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")		
1,890.60	1,883.84	9 5/8	9-5/8	13-1/2		
17,892.00	7,043.59	5 1/2"	5-1/2	8-1/2		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,668.00	2,646.69	Entered Landbox		0.00		
7,020.00	6,886.12	Sharon Springs		0.00		
7,128.00	6,943.65	Niobrara		0.00		
7,282.00	6,995.06	Niobrara B		0.00		
7,455.00	7,017.52	Landing Depth		0.00		
17,903.00	7,044.02	Toe Depth		0.00		

PDD
Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Cook 36N-28HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4884'GL + 25'KB @ 4909.00usft (H&P 307)
Site:	2N-65W-16 Cook 15-16HZ Pad	MD Reference:	4884'GL + 25'KB @ 4909.00usft (H&P 307)
Well:	Cook 36N-28HZ	North Reference:	True
Wellbore:	Cook 36N-28HZ	Survey Calculation Method:	Minimum Curvature
Design:	PDD Actual Surveys	Database:	EDM 5000.1 Single User Db

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
17,903.00	7,044.02	-11,092.71	-351.68	Projection to Bit

Checked By: _____ Approved By: _____ Date: _____