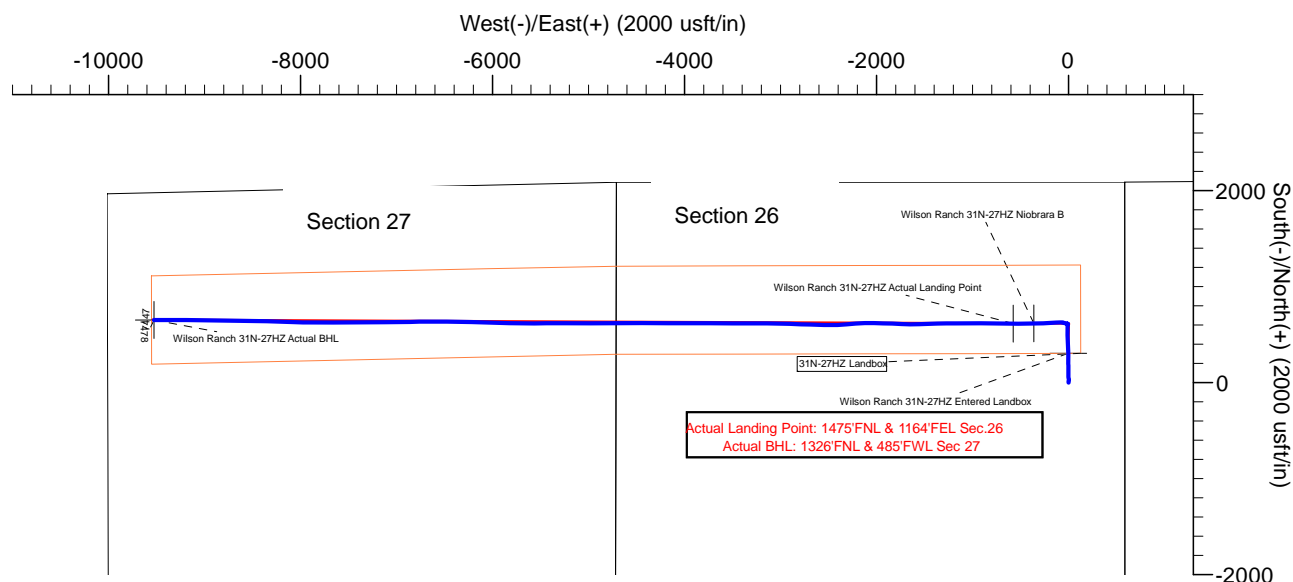


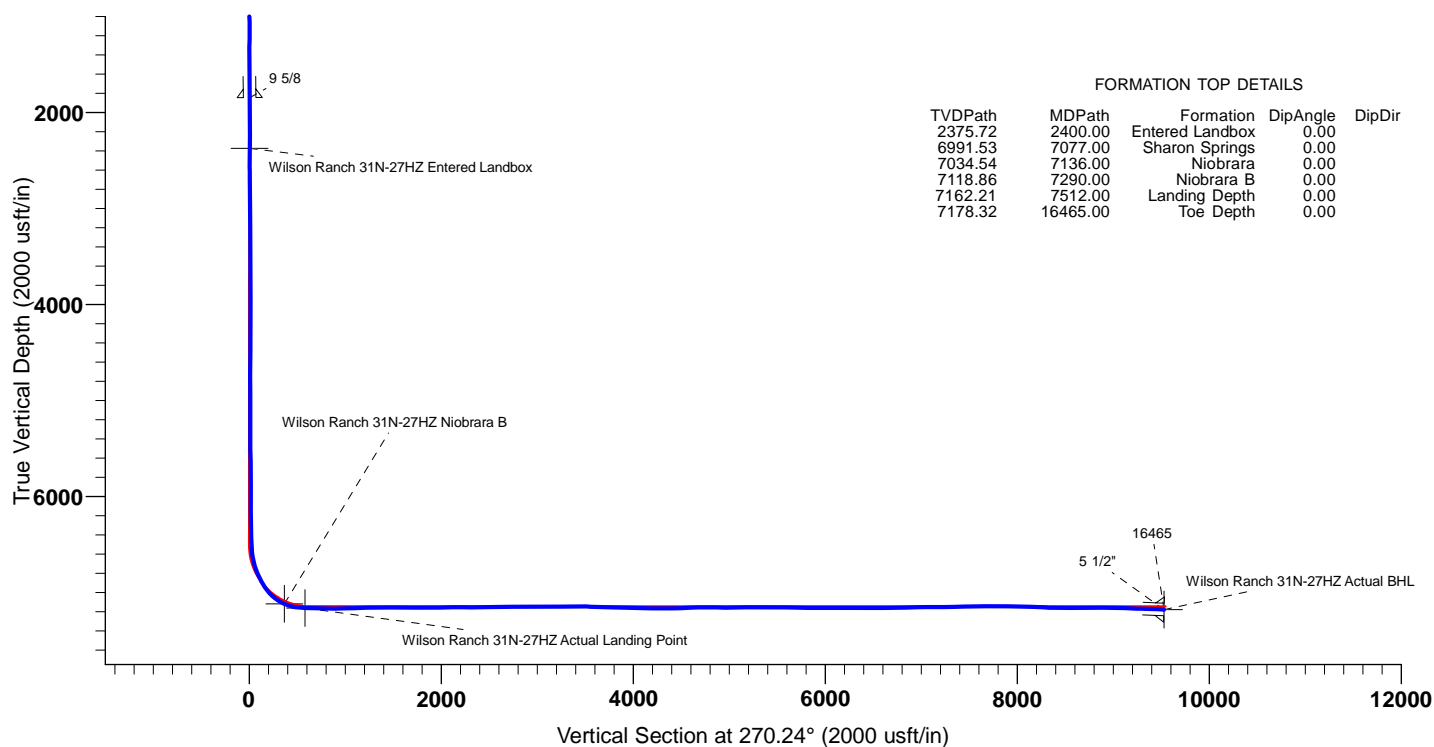
US ROCKIES WATTENBERG PLANNING

Project: WELD-NAD83-UTMFT13N
Site: 4N-68W-26 Wilson Ranch 8-26HZ
Well: Wilson Ranch 31N-27HZ
Wellbore: Wilson Ranch 31N-27HZ
Design: Actual Surveys



CASING DETAILS

TVD	MD	Name	Size
1847.04	1862.40	9 5/8	9-5/8
7178.32	16465.00	5 1/2"	5-1/2



FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
2375.72	2400.00	Entered Landbox	0.00	
6991.53	7077.00	Sharon Springs	0.00	
7034.54	7136.00	Niobrara	0.00	
7118.86	7290.00	Niobrara B	0.00	
7162.21	7512.00	Landing Depth	0.00	
7178.32	16465.00	Toe Depth	0.00	

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Wilson Ranch 31N-27HZ Entered Landbox	2375.72	305.54	-2.01	14631249.84	1650782.95	40.287009	-104.962828	Point
Wilson Ranch 31N-27HZ Niobrara B	7118.86	616.10	-361.74	14631560.24	1650423.09	40.287862	-104.964118	Point
Wilson Ranch 31N-27HZ Actual Landing Point	7162.21	614.14	-577.79	14631558.19	1650207.04	40.287856	-104.964893	Point
Wilson Ranch 31N-27HZ Actual BHL	7178.32	652.31	-9526.75	14631592.60	1641258.06	40.287956	-104.996983	Point



US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

4N-68W-26 Wilson Ranch 8-26HZ

Wilson Ranch 31N-27HZ

Wilson Ranch 31N-27HZ

Design: Actual Surveys

Standard Survey Report

11 January, 2016

PDD

Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Wilson Ranch 31N-27HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4992' + 20' KB @ 5012.00usft (P462)
Site:	4N-68W-26 Wilson Ranch 8-26HZ	MD Reference:	4992' + 20' KB @ 5012.00usft (P462)
Well:	Wilson Ranch 31N-27HZ	North Reference:	True
Wellbore:	Wilson Ranch 31N-27HZ	Survey Calculation Method:	Minimum Curvature
Design:	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	4N-68W-26 Wilson Ranch 8-26HZ, centered on 3N-25HZ				
Site Position:		Northing:	14,630,963.58 usft	Latitude:	40.286223
From:	Lat/Long	Easting:	1,650,762.21 usft	Longitude:	-104.962903
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.02 °

Well	Wilson Ranch 31N-27HZ					
Well Position	+N/-S	0.00 usft	Northing:	14,630,944.29 usft	Latitude:	40.286170
	+E/-W	0.00 usft	Easting:	1,650,785.08 usft	Longitude:	-104.962821
Position Uncertainty		3.28 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,992.00 usft

Wellbore	Wilson Ranch 31N-27HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/20/2015	8.36	66.77	52,583

Design	Actual Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	270.24	

Survey Program	Date	1/11/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
129.00	1,813.00	SDI MWD Surveys (Wilson Ranch 31N-27	APC_ISCWSA REV 2 MWD	Fixed:v2:standard declination	
1,958.00	16,396.00	PDD MWD+IFR+MSA Surveys (Wilson Ra	APC_ISCWSA REV 2 MWD+	Fixed:v2:Rockies, crustal dec + 3-axis correction	

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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
129.00	0.59	76.34	129.00	0.16	0.65	-0.64	0.46	0.46	0.00	
219.00	1.02	20.06	218.99	1.02	1.37	-1.37	0.94	0.48	-62.53	
341.00	2.73	359.94	340.92	4.94	1.74	-1.72	1.48	1.40	-16.49	
431.00	2.96	0.00	430.81	9.41	1.74	-1.70	0.26	0.26	0.07	
521.00	3.84	4.40	520.65	14.74	1.97	-1.91	1.02	0.98	4.89	
611.00	3.93	3.32	610.44	20.82	2.38	-2.29	0.13	0.10	-1.20	
701.00	5.19	2.29	700.16	27.97	2.72	-2.60	1.40	1.40	-1.14	
791.00	5.91	354.70	789.74	36.65	2.45	-2.30	1.14	0.80	-8.43	
883.00	7.69	351.59	881.09	47.46	1.12	-0.92	1.98	1.93	-3.38	

PDD

Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Wilson Ranch 31N-27HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4992' + 20' KB @ 5012.00usft (P462)
Site:	4N-68W-26 Wilson Ranch 8-26HZ	MD Reference:	4992' + 20' KB @ 5012.00usft (P462)
Well:	Wilson Ranch 31N-27HZ	North Reference:	True
Wellbore:	Wilson Ranch 31N-27HZ	Survey Calculation Method:	Minimum Curvature
Design:	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)
971.00	8.21	352.35	968.24	59.51	-0.58	0.83	0.60	0.59	0.86
1,061.00	8.49	357.64	1,057.29	72.52	-1.71	2.01	0.91	0.31	5.88
1,151.00	9.80	0.23	1,146.14	86.82	-1.95	2.32	1.53	1.46	2.88
1,241.00	9.78	0.60	1,234.83	102.12	-1.84	2.27	0.07	-0.02	0.41
1,332.00	9.15	3.31	1,324.59	117.07	-1.34	1.83	0.85	-0.69	2.98
1,422.00	9.43	2.16	1,413.41	131.58	-0.65	1.20	0.37	0.31	-1.28
1,512.00	10.23	359.72	1,502.09	146.94	-0.41	1.03	1.00	0.89	-2.71
1,602.00	10.17	357.80	1,590.67	162.87	-0.76	1.44	0.38	-0.07	-2.13
1,692.00	9.87	353.90	1,679.30	178.48	-1.88	2.63	0.82	-0.33	-4.33
1,782.00	10.35	354.79	1,767.90	194.20	-3.44	4.25	0.56	0.53	0.99
1,813.00	10.20	357.41	1,798.40	199.72	-3.81	4.65	1.58	-0.48	8.45
1,958.00	9.31	356.39	1,941.30	224.25	-5.13	6.07	0.63	-0.61	-0.70
2,147.00	10.80	2.97	2,127.40	257.20	-5.18	6.25	0.99	0.79	3.48
2,337.00	11.20	4.66	2,313.91	293.36	-2.76	3.98	0.27	0.21	0.89
2,526.00	11.08	357.59	2,499.36	329.81	-2.03	3.41	0.73	-0.06	-3.74
2,716.00	9.02	357.58	2,686.43	362.93	-3.42	4.94	1.08	-1.08	-0.01
2,904.00	8.53	354.80	2,872.23	391.54	-5.31	6.95	0.34	-0.26	-1.48
3,092.00	8.23	356.13	3,058.23	418.85	-7.48	9.24	0.19	-0.16	0.71
3,283.00	7.84	357.66	3,247.35	445.51	-8.94	10.80	0.23	-0.20	0.80
3,473.00	8.36	1.86	3,435.46	472.26	-9.02	11.00	0.41	0.27	2.21
3,662.00	8.77	0.05	3,622.35	500.40	-8.56	10.65	0.26	0.22	-0.96
3,851.00	9.12	354.54	3,809.05	529.72	-9.97	12.19	0.49	0.19	-2.92
4,042.00	7.30	356.85	3,998.09	556.91	-12.08	14.41	0.97	-0.95	1.21
4,232.00	5.95	10.58	4,186.83	578.64	-10.93	13.36	1.09	-0.71	7.23
4,419.00	3.54	357.62	4,373.18	593.94	-9.39	11.88	1.40	-1.29	-6.93
4,607.00	2.22	36.41	4,560.95	602.67	-7.47	10.00	1.21	-0.70	20.63
4,796.00	0.96	315.58	4,749.89	606.75	-6.41	8.95	1.20	-0.67	-42.77
4,981.00	0.88	329.20	4,934.87	609.08	-8.22	10.77	0.13	-0.04	7.36
5,168.00	0.95	22.23	5,121.85	611.75	-8.37	10.93	0.44	0.04	28.36
5,358.00	0.16	319.35	5,311.84	613.40	-7.95	10.52	0.47	-0.42	-33.09
5,545.00	0.45	313.70	5,498.84	614.11	-8.65	11.22	0.16	0.16	-3.02
5,734.00	0.38	250.38	5,687.83	614.41	-9.77	12.35	0.23	-0.04	-33.50
5,924.00	0.73	263.47	5,877.82	614.06	-11.57	14.14	0.19	0.18	6.89
6,115.00	0.82	286.59	6,068.81	614.31	-14.09	16.66	0.17	0.05	12.10
6,305.00	0.73	274.19	6,258.79	614.79	-16.60	19.17	0.10	-0.05	-6.53
6,494.00	0.72	329.20	6,447.77	615.90	-18.41	20.99	0.35	-0.01	29.11
6,589.00	4.53	280.91	6,542.66	617.12	-22.40	24.98	4.30	4.01	-50.83
6,684.00	10.09	280.20	6,636.85	619.31	-34.28	36.88	5.85	5.85	-0.75
6,779.00	17.42	285.79	6,729.07	624.66	-56.19	58.80	7.83	7.72	5.88
6,874.00	24.69	266.61	6,817.77	627.36	-89.76	92.39	10.45	7.65	-20.19
6,969.00	29.55	265.83	6,902.30	624.48	-132.96	135.57	5.13	5.12	-0.82
7,064.00	37.68	269.27	6,981.36	622.41	-185.45	188.05	8.79	8.56	3.62
7,157.00	49.66	268.58	7,048.50	621.16	-249.53	252.13	12.89	12.88	-0.74

PDD Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Wilson Ranch 31N-27HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4992' + 20' KB @ 5012.00usft (P462)
Site:	4N-68W-26 Wilson Ranch 8-26HZ	MD Reference:	4992' + 20' KB @ 5012.00usft (P462)
Well:	Wilson Ranch 31N-27HZ	North Reference:	True
Wellbore:	Wilson Ranch 31N-27HZ	Survey Calculation Method:	Minimum Curvature
Design:	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)	
7,252.00	61.55	266.78	7,102.08	617.91	-327.71	330.30	12.61	12.52	-1.89	
7,348.00	72.78	267.63	7,139.27	613.63	-415.94	418.51	11.73	11.70	0.89	
7,443.00	85.08	271.15	7,157.48	612.70	-508.97	511.54	13.45	12.95	3.71	
7,538.00	87.81	271.29	7,163.37	614.71	-603.76	606.33	2.88	2.87	0.15	
7,634.00	88.89	270.76	7,166.14	616.43	-699.70	702.28	1.25	1.13	-0.55	
7,729.00	89.17	270.14	7,167.75	617.18	-794.69	797.26	0.72	0.29	-0.65	
7,824.00	90.05	270.36	7,168.39	617.59	-889.68	892.26	0.95	0.93	0.23	
7,919.00	90.81	269.62	7,167.68	617.58	-984.68	987.26	1.12	0.80	-0.78	
8,014.00	91.90	270.20	7,165.43	617.43	-1,079.65	1,082.23	1.30	1.15	0.61	
8,109.00	91.13	270.09	7,162.92	617.67	-1,174.62	1,177.19	0.82	-0.81	-0.12	
8,204.00	92.45	269.61	7,159.95	617.42	-1,269.57	1,272.14	1.48	1.39	-0.51	
8,300.00	89.97	268.61	7,157.93	615.93	-1,365.52	1,368.09	2.79	-2.58	-1.04	
8,395.00	90.57	266.97	7,157.48	612.26	-1,460.45	1,463.00	1.84	0.63	-1.73	
8,489.00	88.83	267.84	7,157.97	608.01	-1,554.35	1,556.88	2.07	-1.85	0.93	
8,583.00	88.96	271.54	7,159.78	607.50	-1,648.31	1,650.84	3.94	0.14	3.94	
8,677.00	89.75	272.12	7,160.84	610.50	-1,742.26	1,744.80	1.04	0.84	0.62	
8,772.00	91.06	272.16	7,160.17	614.05	-1,837.19	1,839.74	1.38	1.38	0.04	
8,868.00	92.02	272.13	7,157.59	617.64	-1,933.08	1,935.65	1.00	1.00	-0.03	
8,962.00	90.49	271.40	7,155.53	620.53	-2,027.01	2,029.59	1.80	-1.63	-0.78	
9,056.00	89.77	268.82	7,155.32	620.71	-2,121.00	2,123.59	2.85	-0.77	-2.74	
9,152.00	89.79	265.36	7,155.69	615.84	-2,216.86	2,219.43	3.60	0.02	-3.60	
9,247.00	89.26	263.90	7,156.48	606.95	-2,311.44	2,313.96	1.63	-0.56	-1.54	
9,343.00	91.46	269.32	7,155.87	601.28	-2,407.23	2,409.73	6.09	2.29	5.65	
9,438.00	90.81	270.60	7,153.99	601.21	-2,502.21	2,504.71	1.51	-0.68	1.35	
9,532.00	90.07	271.74	7,153.27	603.13	-2,596.18	2,598.69	1.45	-0.79	1.21	
9,628.00	91.62	271.26	7,151.85	605.64	-2,692.14	2,694.65	1.69	1.61	-0.50	
9,723.00	89.91	271.18	7,150.58	607.67	-2,787.10	2,789.63	1.80	-1.80	-0.08	
9,818.00	91.52	272.57	7,149.40	610.77	-2,882.04	2,884.57	2.24	1.69	1.46	
9,913.00	90.39	271.72	7,147.82	614.33	-2,976.96	2,979.51	1.49	-1.19	-0.89	
10,008.00	89.43	270.42	7,147.96	616.10	-3,071.94	3,074.49	1.70	-1.01	-1.37	
10,103.00	89.47	270.67	7,148.88	617.01	-3,166.93	3,169.49	0.27	0.04	0.26	
10,198.00	90.06	270.34	7,149.27	617.84	-3,261.92	3,264.48	0.71	0.62	-0.35	
10,293.00	91.04	269.31	7,148.35	617.55	-3,356.92	3,359.48	1.50	1.03	-1.08	
10,387.00	90.33	269.89	7,147.23	616.90	-3,450.91	3,453.46	0.98	-0.76	0.62	
10,481.00	88.46	270.89	7,148.22	617.54	-3,544.89	3,547.45	2.26	-1.99	1.06	
10,574.00	87.51	270.02	7,151.49	618.27	-3,637.83	3,640.39	1.38	-1.02	-0.94	
10,669.00	87.44	270.05	7,155.68	618.33	-3,732.74	3,735.30	0.08	-0.07	0.03	
10,764.00	89.31	269.96	7,158.37	618.34	-3,827.70	3,830.25	1.97	1.97	-0.09	
10,859.00	89.05	270.15	7,159.73	618.43	-3,922.69	3,925.24	0.34	-0.27	0.20	
10,953.00	88.75	270.16	7,161.54	618.69	-4,016.67	4,019.23	0.32	-0.32	0.01	
11,048.00	87.89	269.39	7,164.32	618.31	-4,111.63	4,114.18	1.21	-0.91	-0.81	
11,144.00	89.69	271.21	7,166.35	618.82	-4,207.60	4,210.15	2.67	1.88	1.90	
11,239.00	88.81	270.41	7,167.59	620.16	-4,302.58	4,305.14	1.25	-0.93	-0.84	

PDD

Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Wilson Ranch 31N-27HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4992' + 20' KB @ 5012.00usft (P462)
Site:	4N-68W-26 Wilson Ranch 8-26HZ	MD Reference:	4992' + 20' KB @ 5012.00usft (P462)
Well:	Wilson Ranch 31N-27HZ	North Reference:	True
Wellbore:	Wilson Ranch 31N-27HZ	Survey Calculation Method:	Minimum Curvature
Design:	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)	
11,333.00	91.41	270.39	7,167.41	620.82	-4,396.57	4,399.13	2.77	2.77	-0.02	
11,426.00	92.39	270.41	7,164.33	621.46	-4,489.51	4,492.08	1.05	1.05	0.02	
11,519.00	93.01	268.80	7,159.95	620.82	-4,582.40	4,584.96	1.85	0.67	-1.73	
11,613.00	90.72	268.19	7,156.89	618.36	-4,676.31	4,678.86	2.52	-2.44	-0.65	
11,707.00	90.12	270.75	7,156.20	617.49	-4,770.30	4,772.84	2.80	-0.64	2.72	
11,801.00	89.21	270.42	7,156.75	618.45	-4,864.29	4,866.84	1.03	-0.97	-0.35	
11,896.00	89.09	270.28	7,158.16	619.03	-4,959.28	4,961.83	0.19	-0.13	-0.15	
11,991.00	90.84	270.46	7,158.22	619.64	-5,054.27	5,056.82	1.85	1.84	0.19	
12,086.00	91.69	269.33	7,156.12	619.47	-5,149.25	5,151.80	1.49	0.89	-1.19	
12,181.00	90.09	269.79	7,154.64	618.74	-5,244.23	5,246.78	1.75	-1.68	0.48	
12,276.00	89.99	269.94	7,154.58	618.51	-5,339.23	5,341.77	0.19	-0.11	0.16	
12,371.00	89.55	270.04	7,154.96	618.50	-5,434.23	5,436.77	0.47	-0.46	0.11	
12,467.00	89.24	269.75	7,155.97	618.32	-5,530.22	5,532.76	0.44	-0.32	-0.30	
12,561.00	88.47	269.05	7,157.85	617.34	-5,624.20	5,626.73	1.11	-0.82	-0.74	
12,657.00	89.89	271.28	7,159.22	617.61	-5,720.18	5,722.72	2.75	1.48	2.32	
12,752.00	89.06	271.27	7,160.09	619.73	-5,815.15	5,817.70	0.87	-0.87	-0.01	
12,846.00	89.18	271.40	7,161.54	621.92	-5,909.11	5,911.67	0.19	0.13	0.14	
12,942.00	90.60	272.12	7,161.72	624.87	-6,005.07	6,007.63	1.66	1.48	0.75	
13,037.00	90.66	271.82	7,160.68	628.13	-6,100.00	6,102.58	0.32	0.06	-0.32	
13,132.00	89.91	271.00	7,160.21	630.47	-6,194.97	6,197.56	1.17	-0.79	-0.86	
13,226.00	89.91	270.91	7,160.35	632.04	-6,288.96	6,291.55	0.10	0.00	-0.10	
13,320.00	88.90	270.68	7,161.33	633.34	-6,382.94	6,385.54	1.10	-1.07	-0.24	
13,415.00	90.05	270.43	7,162.20	634.26	-6,477.93	6,480.53	1.24	1.21	-0.26	
13,511.00	90.16	269.84	7,162.02	634.49	-6,573.93	6,576.53	0.63	0.11	-0.61	
13,605.00	90.58	270.56	7,161.42	634.81	-6,667.93	6,670.53	0.89	0.45	0.77	
13,699.00	91.18	269.52	7,159.97	634.88	-6,761.92	6,764.52	1.28	0.64	-1.11	
13,792.00	91.67	268.74	7,157.66	633.47	-6,854.88	6,857.47	0.99	0.53	-0.84	
13,887.00	91.25	269.66	7,155.24	632.14	-6,949.83	6,952.42	1.06	-0.44	0.97	
13,981.00	90.74	269.87	7,153.61	631.76	-7,043.82	7,046.40	0.59	-0.54	0.22	
14,076.00	90.01	268.95	7,152.99	630.78	-7,138.81	7,141.39	1.24	-0.77	-0.97	
14,168.00	90.48	268.39	7,152.59	628.64	-7,230.78	7,233.35	0.79	0.51	-0.61	
14,261.00	91.66	268.65	7,150.86	626.24	-7,323.74	7,326.29	1.30	1.27	0.28	
14,353.00	91.17	270.51	7,148.58	625.57	-7,415.70	7,418.26	2.09	-0.53	2.02	
14,446.00	91.82	270.20	7,146.16	626.14	-7,508.67	7,511.22	0.77	0.70	-0.33	
14,540.00	89.46	270.64	7,145.11	626.83	-7,602.65	7,605.21	2.55	-2.51	0.47	
14,633.00	89.67	269.77	7,145.81	627.17	-7,695.65	7,698.21	0.96	0.23	-0.94	
14,726.00	90.45	269.39	7,145.72	626.48	-7,788.64	7,791.20	0.93	0.84	-0.41	
14,820.00	89.81	270.22	7,145.50	626.16	-7,882.64	7,885.20	1.11	-0.68	0.88	
14,913.00	88.58	271.71	7,146.81	627.73	-7,975.61	7,978.17	2.08	-1.32	1.60	
15,007.00	88.65	272.34	7,149.08	631.05	-8,069.53	8,072.10	0.67	0.07	0.67	
15,102.00	87.97	271.68	7,151.88	634.38	-8,164.43	8,167.01	1.00	-0.72	-0.69	
15,196.00	87.19	271.10	7,155.85	636.66	-8,258.31	8,260.91	1.03	-0.83	-0.62	
15,288.00	89.44	271.02	7,158.56	638.36	-8,350.25	8,352.85	2.45	2.45	-0.09	
15,382.00	89.73	271.88	7,159.24	640.74	-8,444.22	8,446.83	0.97	0.31	0.91	

PDD

Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Wilson Ranch 31N-27HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4992' + 20' KB @ 5012.00usft (P462)
Site:	4N-68W-26 Wilson Ranch 8-26HZ	MD Reference:	4992' + 20' KB @ 5012.00usft (P462)
Well:	Wilson Ranch 31N-27HZ	North Reference:	True
Wellbore:	Wilson Ranch 31N-27HZ	Survey Calculation Method:	Minimum Curvature
Design:	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)
15,474.00	89.26	270.72	7,160.05	642.83	-8,536.19	8,538.81	1.36	-0.51	-1.26
15,568.00	89.68	270.74	7,160.92	644.02	-8,630.18	8,632.80	0.45	0.45	0.02
15,660.00	90.18	270.45	7,161.03	644.98	-8,722.17	8,724.80	0.63	0.54	-0.32
15,753.00	91.42	271.37	7,159.73	646.46	-8,815.15	8,817.78	1.66	1.33	0.99
15,847.00	89.14	270.80	7,159.27	648.24	-8,909.13	8,911.76	2.50	-2.43	-0.61
15,942.00	89.04	271.32	7,160.78	649.99	-9,004.10	9,006.74	0.56	-0.11	0.55
16,035.00	87.98	270.92	7,163.20	651.81	-9,097.05	9,099.70	1.22	-1.14	-0.43
16,130.00	87.54	270.10	7,166.91	652.66	-9,191.97	9,194.62	0.98	-0.46	-0.86
16,224.00	89.10	270.53	7,169.67	653.17	-9,285.92	9,288.58	1.72	1.66	0.46
16,319.00	87.91	269.98	7,172.15	653.59	-9,380.89	9,383.54	1.38	-1.25	-0.58
16,396.00	87.46	269.32	7,175.26	653.12	-9,457.82	9,460.48	1.04	-0.58	-0.86
16,465.00	87.46	269.32	7,178.32	652.31	-9,526.75	9,529.40	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
- hit/miss target									
- Shape									
Wilson Ranch 31N-27HZ	0.00	0.00	2,375.72	305.54	-2.01	14,631,249.83	1,650,782.94	40.287009	-104.962828
- actual wellpath hits target center									
- Point									
Wilson Ranch 31N-27HZ	0.00	0.00	7,118.86	616.10	-361.74	14,631,560.24	1,650,423.08	40.287862	-104.964118
- actual wellpath misses target center by 0.02usft at 7289.98usft MD (7118.86 TVD, 616.10 N, -361.73 E)									
- Point									
Wilson Ranch 31N-27HZ	0.00	0.00	7,162.21	614.14	-577.79	14,631,558.19	1,650,207.03	40.287857	-104.964893
- actual wellpath hits target center									
- Point									
Wilson Ranch 31N-27HZ	0.00	0.00	7,178.32	652.31	-9,526.75	14,631,592.60	1,641,258.06	40.287956	-104.996983
- actual wellpath hits target center									
- Point									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name		Casing Diameter (")	Hole Diameter (")
1,862.40	1,847.04	9 5/8		9-5/8	13-1/2
16,465.00	7,178.32	5 1/2"		5-1/2	8-1/2

PDD
Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Wilson Ranch 31N-27HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4992' + 20' KB @ 5012.00usft (P462)
Site:	4N-68W-26 Wilson Ranch 8-26HZ	MD Reference:	4992' + 20' KB @ 5012.00usft (P462)
Well:	Wilson Ranch 31N-27HZ	North Reference:	True
Wellbore:	Wilson Ranch 31N-27HZ	Survey Calculation Method:	Minimum Curvature
Design:	Actual Surveys	Database:	EDM 5000.1 Single User Db

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,400.00	2,375.72	Entered Landbox		0.00		
7,077.00	6,991.53	Sharon Springs		0.00		
7,136.00	7,034.54	Niobrara		0.00		
7,290.00	7,118.86	Niobrara B		0.00		
7,512.00	7,162.21	Landing Depth		0.00		
16,465.00	7,178.32	Toe Depth		0.00		

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
16,465.00	7,178.32	652.31	-9,526.75	Projection to Bit	

Checked By: _____	Approved By: _____	Date: _____
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