

US ROCKIES WATTENBERG PLANNING

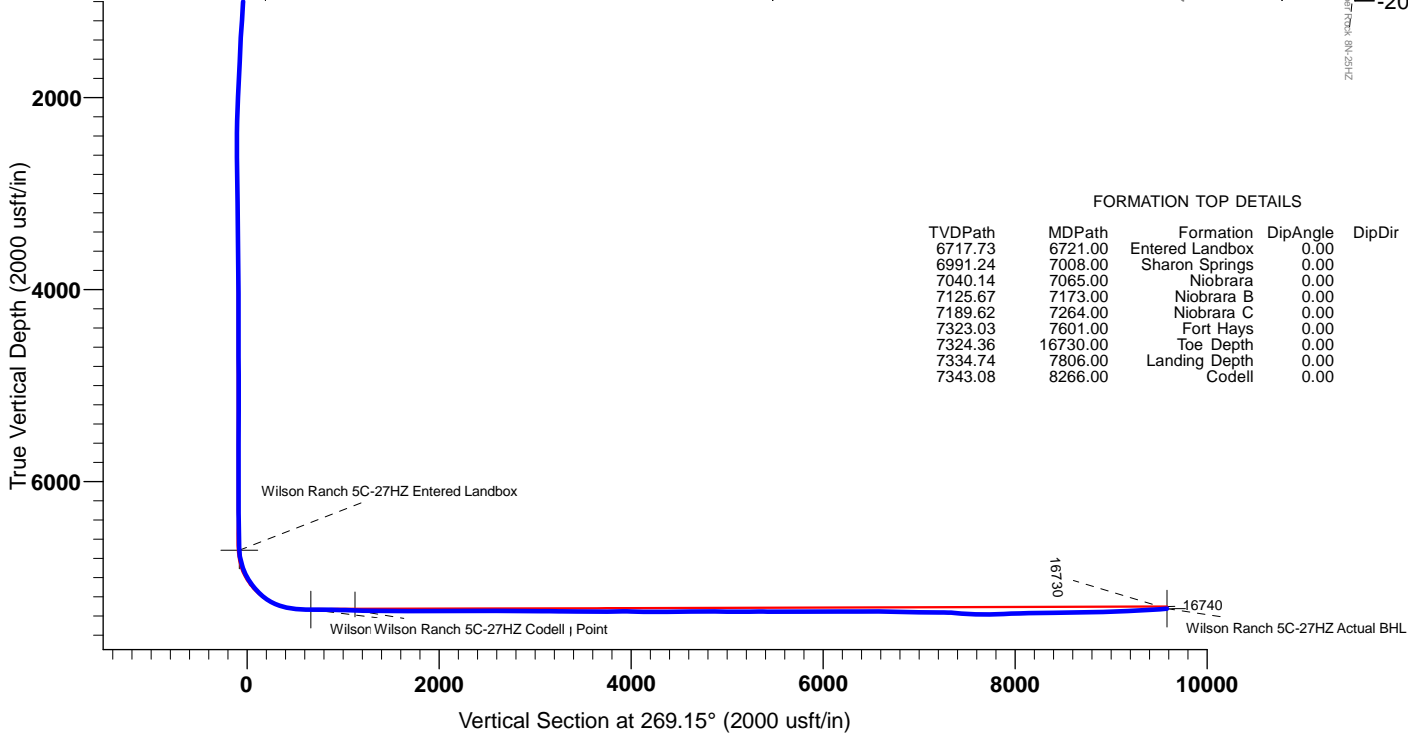
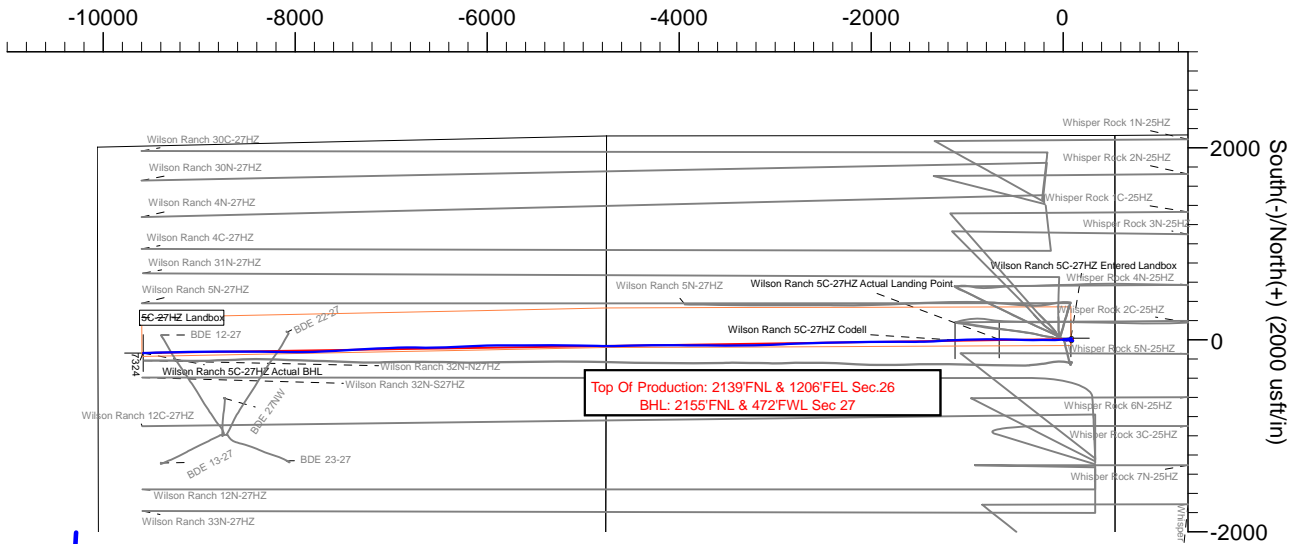


Project: WELD-NAD83-UTMFT13N
 Site: 4N-68W-26 Wilson Ranch 8-26HZ
 Well: Wilson Ranch 5C-27HZ
 Wellbore: Wilson Ranch 5C-27HZ
 Design: Actual Surveys

CASING DETAILS

TVD	MD	Name	Size
1847.63	1850.10	9 5/8"	9-5/8
7325.42	16717.00	5 1/2"	5-1/2

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



FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
6717.73	6721.00	Entered Landbox	0.00	
6991.24	7008.00	Sharon Springs	0.00	
7040.14	7065.00	Niobrara	0.00	
7125.67	7173.00	Niobrara B	0.00	
7189.62	7264.00	Niobrara C	0.00	
7323.03	7601.00	Fort Hays	0.00	
7324.36	16730.00	Toe Depth	0.00	
7334.74	7806.00	Landing Depth	0.00	
7343.08	8266.00	Codell	0.00	

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Wilson Ranch 5C-27HZ Entered Landbox	6717.73	16.86	80.79	14630922.24	1650911.63	40.286109	-104.962367	Point
Wilson Ranch 5C-27HZ Actual BHL	7324.36	-137.05	-9582.96	14630764.26	1641247.93	40.285682	-104.997019	Point
Wilson Ranch 5C-27HZ Actual Landing Point	7334.74	4.98	-665.16	14630910.05	1650165.68	40.286077	-104.965042	Point
Wilson Ranch 5C-27HZ Codell	7343.08	-2.99	-1124.86	14630901.89	1649705.98	40.286055	-104.966690	Point



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WELD-NAD83-UTMFT13N

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

Wilson Ranch 5C-27HZ

Wilson Ranch 5C-27HZ

Design: Actual Surveys

Standard Survey Report

14 December, 2015

PDD Survey Report

Company: US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference: Well Wilson Ranch 5C-27HZ
Project: WELD-NAD83-UTMFT13N	TVD Reference: 4992' GL+ 20*KB @ 5012.00usft (P462)
Site: 4N-68W-26 Wilson Ranch 8-26HZ	MD Reference: 4992' GL+ 20*KB @ 5012.00usft (P462)
Well: Wilson Ranch 5C-27HZ	North Reference: True
Wellbore: Wilson Ranch 5C-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 5C-27HZ			
Well Position	+N/-S 0.00 usft	Northing: 14,630,905.34 usft	Latitude: 40.286063
	+E/-W 0.00 usft	Easting: 1,650,830.84 usft	Longitude: -104.962657
Position Uncertainty	3.28 usft	Wellhead Elevation: 0.00 usft	Ground Level: 4,992.00 usft

Wellbore Wilson Ranch 5C-27HZ					
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2010	11/20/2015	(°) 8.36	(°) 66.77	(nT) 52,583

Design 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	269.15

Survey Program		Date 12/14/2015	
From	To	Survey (Wellbore)	
(usft)	(usft)		
		Tool Name	
		Description	
98.00	1,801.00	SDI MWD Surveys (Wilson Ranch 5C-27H)	APC_ISCWSA REV 2 MWD Fixed:v2:standard declination
1,866.00	6,688.00	PDD MWD+IFR Surveys (Wilson Ranch 5)	APC_ISCWSA REV 2 MWD+ Fixed:v2:crustal field declination
6,783.00	16,658.00	PDD MWD+IFR+MSA Surveys 2 (Wilson R	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
98.00	0.69	116.07	98.00	-0.26	0.53	-0.53	0.70	0.70	0.00
189.00	0.60	108.35	188.99	-0.65	1.47	-1.46	0.14	-0.10	-8.48
280.00	1.23	99.36	279.98	-0.96	2.89	-2.88	0.71	0.69	-9.88
386.00	2.48	102.88	385.92	-1.66	6.25	-6.22	1.18	1.18	3.32
476.00	3.80	88.29	475.79	-2.00	11.13	-11.10	1.70	1.47	-16.21
566.00	4.57	87.79	565.55	-1.77	17.69	-17.66	0.86	0.86	-0.56
656.00	3.89	100.46	655.30	-2.19	24.28	-24.24	1.28	-0.76	14.08
746.00	3.26	105.19	745.13	-3.41	29.75	-29.70	0.77	-0.70	5.26

PDD
Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Wilson Ranch 5C-27HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4992' GL+ 20*KB @ 5012.00usft (P462)
Site:	4N-68W-26 Wilson Ranch 8-26HZ	MD Reference:	4992' GL+ 20*KB @ 5012.00usft (P462)
Well:	Wilson Ranch 5C-27HZ	North Reference:	True
Wellbore:	Wilson Ranch 5C-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)	
836.00	3.16	91.81	834.99	-4.16	34.70	-34.63	0.84	-0.11	-14.87	
926.00	2.39	88.19	924.88	-4.18	39.05	-38.99	0.88	-0.86	-4.02	
1,016.00	2.78	78.94	1,014.79	-3.70	43.07	-43.01	0.63	0.43	-10.28	
1,106.00	3.41	81.87	1,104.66	-2.91	47.86	-47.81	0.72	0.70	3.26	
1,196.00	3.87	92.07	1,194.48	-2.64	53.55	-53.50	0.88	0.51	11.33	
1,287.00	3.92	104.86	1,285.27	-3.55	59.62	-59.56	0.95	0.05	14.05	
1,377.00	3.04	98.42	1,375.10	-4.68	64.96	-64.88	1.07	-0.98	-7.16	
1,467.00	2.60	102.60	1,464.99	-5.48	69.31	-69.22	0.54	-0.49	4.64	
1,557.00	2.21	101.52	1,554.91	-6.27	73.00	-72.90	0.44	-0.43	-1.20	
1,647.00	2.67	101.72	1,644.83	-7.04	76.76	-76.64	0.51	0.51	0.22	
1,737.00	3.31	81.16	1,734.71	-7.07	81.38	-81.26	1.38	0.71	-22.84	
1,801.00	3.43	85.30	1,798.60	-6.63	85.11	-85.00	0.42	0.19	6.47	
1,866.00	2.70	90.86	1,863.51	-6.49	88.58	-88.47	1.21	-1.12	8.55	
2,057.00	1.89	90.46	2,054.35	-6.59	96.23	-96.12	0.42	-0.42	-0.21	
2,246.00	1.80	79.96	2,243.25	-6.09	102.27	-102.16	0.18	-0.05	-5.56	
2,436.00	0.79	176.96	2,433.22	-6.88	105.27	-105.16	1.08	-0.53	51.05	
2,626.00	0.31	257.04	2,623.21	-8.30	104.84	-104.71	0.42	-0.25	42.15	
2,812.00	0.51	222.93	2,809.21	-9.02	103.79	-103.64	0.17	0.11	-18.34	
3,002.00	0.70	254.75	2,999.20	-9.95	102.09	-101.93	0.20	0.10	16.75	
3,192.00	0.90	263.76	3,189.18	-10.42	99.49	-99.32	0.12	0.11	4.74	
3,382.00	1.30	275.85	3,379.14	-10.36	95.86	-95.70	0.24	0.21	6.36	
3,571.00	1.01	314.04	3,568.11	-8.98	92.53	-92.39	0.43	-0.15	20.21	
3,761.00	0.90	305.64	3,758.08	-6.95	90.12	-90.00	0.09	-0.06	-4.42	
3,952.00	1.21	11.83	3,949.06	-4.10	89.31	-89.24	0.62	0.16	34.65	
4,141.00	0.70	16.54	4,138.03	-1.04	90.05	-90.02	0.27	-0.27	2.49	
4,329.00	0.59	22.47	4,326.02	0.96	90.74	-90.75	0.07	-0.06	3.15	
4,516.00	0.90	307.14	4,513.00	2.73	89.94	-89.97	0.50	0.17	-40.28	
4,703.00	1.69	346.87	4,699.96	6.30	88.14	-88.23	0.62	0.42	21.25	
4,888.00	1.60	344.15	4,884.88	11.45	86.82	-86.98	0.06	-0.05	-1.47	
5,078.00	0.59	17.77	5,074.85	14.93	86.39	-86.61	0.61	-0.53	17.69	
5,265.00	0.59	93.45	5,261.84	15.79	87.65	-87.87	0.39	0.00	40.47	
5,454.00	0.31	94.94	5,450.83	15.68	89.13	-89.35	0.15	-0.15	0.79	
5,643.00	0.51	255.45	5,639.83	15.43	88.82	-89.04	0.43	0.11	84.93	
5,834.00	0.11	48.27	5,830.83	15.34	88.14	-88.36	0.32	-0.21	80.01	
6,024.00	0.31	349.07	6,020.83	15.96	88.18	-88.40	0.14	0.11	-31.16	
6,214.00	0.40	286.75	6,210.82	16.66	87.44	-87.68	0.20	0.05	-32.80	
6,309.00	0.31	284.94	6,305.82	16.82	86.88	-87.12	0.10	-0.09	-1.91	
6,404.00	0.31	310.04	6,400.82	17.05	86.43	-86.68	0.14	0.00	26.42	
6,499.00	0.59	279.93	6,495.82	17.30	85.75	-86.00	0.38	0.29	-31.69	
6,594.00	0.70	284.33	6,590.81	17.53	84.71	-84.96	0.13	0.12	4.63	
6,688.00	2.00	257.56	6,684.78	17.32	82.55	-82.80	1.50	1.38	-28.48	
6,783.00	8.69	252.67	6,779.32	14.82	74.07	-74.28	7.05	7.04	-5.15	
6,878.00	16.83	263.06	6,871.91	11.02	53.53	-53.69	8.87	8.57	10.94	

PDD
Survey Report

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Well:	Wilson Ranch 5C-27HZ	North Reference:	True
Wellbore:	Wilson Ranch 5C-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)	
6,972.00	26.10	262.95	6,959.29	6.82	19.43	-19.53	9.86	9.86	-0.12	
7,067.00	33.17	262.50	7,041.81	0.86	-27.13	27.12	7.45	7.44	-0.47	
7,162.00	41.25	270.10	7,117.45	-2.48	-84.34	84.37	9.77	8.51	8.00	
7,257.00	48.08	271.46	7,184.98	-1.53	-151.08	151.08	7.26	7.19	1.43	
7,352.00	58.69	268.85	7,241.56	-1.44	-227.21	227.21	11.38	11.17	-2.75	
7,448.00	68.74	270.26	7,284.02	-2.06	-313.17	313.16	10.55	10.47	1.47	
7,543.00	76.96	271.40	7,312.01	-0.73	-403.85	403.82	8.73	8.65	1.20	
7,639.00	83.87	272.26	7,327.99	2.30	-498.41	498.32	7.25	7.20	0.90	
7,734.00	89.13	270.48	7,333.79	4.56	-593.17	593.03	5.84	5.54	-1.87	
7,828.00	89.42	270.10	7,334.98	5.04	-687.16	687.01	0.51	0.31	-0.40	
7,923.00	90.11	271.24	7,335.37	6.15	-782.15	781.97	1.40	0.73	1.20	
8,019.00	88.54	268.86	7,336.50	6.23	-878.13	877.94	2.97	-1.64	-2.48	
8,114.00	89.19	267.72	7,338.38	3.40	-973.07	972.91	1.38	0.68	-1.20	
8,209.00	87.82	267.64	7,340.86	-0.45	-1,067.96	1,067.84	1.44	-1.44	-0.08	
8,303.00	87.65	267.00	7,344.57	-4.84	-1,161.78	1,161.72	0.70	-0.18	-0.68	
8,397.00	88.75	266.17	7,347.53	-10.44	-1,255.56	1,255.58	1.47	1.17	-0.88	
8,491.00	89.28	267.99	7,349.14	-15.22	-1,349.42	1,349.50	2.02	0.56	1.94	
8,586.00	90.72	267.93	7,349.14	-18.61	-1,444.36	1,444.48	1.52	1.52	-0.06	
8,682.00	90.19	269.56	7,348.38	-20.71	-1,540.33	1,540.47	1.79	-0.55	1.70	
8,776.00	88.85	270.36	7,349.17	-20.77	-1,634.32	1,634.45	1.66	-1.43	0.85	
8,871.00	90.00	270.00	7,350.12	-20.47	-1,729.32	1,729.43	1.27	1.21	-0.38	
8,966.00	89.69	269.39	7,350.38	-20.98	-1,824.32	1,824.43	0.72	-0.33	-0.64	
9,061.00	91.11	269.57	7,349.71	-21.84	-1,919.31	1,919.42	1.51	1.49	0.19	
9,157.00	90.56	270.27	7,348.31	-21.98	-2,015.30	2,015.40	0.93	-0.57	0.73	
9,252.00	89.89	269.44	7,347.94	-22.22	-2,110.29	2,110.39	1.12	-0.71	-0.87	
9,347.00	91.31	269.36	7,346.95	-23.21	-2,205.28	2,205.38	1.50	1.49	-0.08	
9,442.00	89.46	268.52	7,346.31	-24.97	-2,300.26	2,300.37	2.14	-1.95	-0.88	
9,538.00	89.17	267.32	7,347.46	-28.45	-2,396.18	2,396.34	1.29	-0.30	-1.25	
9,632.00	89.57	268.93	7,348.49	-31.53	-2,490.13	2,490.32	1.76	0.43	1.71	
9,727.00	90.63	268.45	7,348.32	-33.70	-2,585.10	2,585.31	1.22	1.12	-0.51	
9,822.00	88.41	268.55	7,349.12	-36.19	-2,680.06	2,680.30	2.34	-2.34	0.11	
9,917.00	89.17	267.95	7,351.13	-39.09	-2,774.99	2,775.26	1.02	0.80	-0.63	
10,012.00	90.52	267.65	7,351.38	-42.73	-2,869.92	2,870.24	1.46	1.42	-0.32	
10,107.00	90.88	266.29	7,350.22	-47.76	-2,964.78	2,965.16	1.48	0.38	-1.43	
10,201.00	89.28	268.00	7,350.09	-52.44	-3,058.65	3,059.09	2.49	-1.70	1.82	
10,295.00	89.26	269.26	7,351.29	-54.68	-3,152.62	3,153.08	1.34	-0.02	1.34	
10,389.00	88.71	267.77	7,352.95	-57.12	-3,246.57	3,247.06	1.69	-0.59	-1.59	
10,484.00	89.82	269.78	7,354.17	-59.15	-3,341.53	3,342.04	2.42	1.17	2.12	
10,579.00	90.00	271.35	7,354.32	-58.21	-3,436.52	3,437.01	1.66	0.19	1.65	
10,674.00	88.69	269.07	7,355.41	-57.86	-3,531.51	3,531.98	2.77	-1.38	-2.40	
10,767.00	89.20	270.71	7,357.12	-58.04	-3,624.49	3,624.95	1.85	0.55	1.76	
10,863.00	90.81	270.45	7,357.11	-57.07	-3,720.48	3,720.92	1.70	1.68	-0.27	
10,958.00	91.68	269.88	7,355.05	-56.80	-3,815.46	3,815.88	1.09	0.92	-0.60	

PDD
Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Wilson Ranch 5C-27HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4992' GL+ 20'KB @ 5012.00usft (P462)
Site:	4N-68W-26 Wilson Ranch 8-26HZ	MD Reference:	4992' GL+ 20'KB @ 5012.00usft (P462)
Well:	Wilson Ranch 5C-27HZ	North Reference:	True
Wellbore:	Wilson Ranch 5C-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)	
11,053.00	90.29	270.38	7,353.42	-56.58	-3,910.44	3,910.85	1.55	-1.46	0.53	
11,148.00	88.92	270.72	7,354.07	-55.67	-4,005.43	4,005.81	1.49	-1.44	0.36	
11,240.00	88.69	270.05	7,355.99	-55.05	-4,097.41	4,097.77	0.77	-0.25	-0.73	
11,333.00	89.52	270.06	7,357.44	-54.96	-4,190.39	4,190.75	0.89	0.89	0.01	
11,427.00	89.12	269.16	7,358.56	-55.60	-4,284.38	4,284.74	1.05	-0.43	-0.96	
11,521.00	90.11	268.59	7,359.19	-57.45	-4,378.36	4,378.73	1.22	1.05	-0.61	
11,616.00	91.55	268.44	7,357.81	-59.91	-4,473.32	4,473.72	1.52	1.52	-0.16	
11,710.00	90.25	268.68	7,356.34	-62.27	-4,567.28	4,567.70	1.41	-1.38	0.26	
11,805.00	90.78	269.50	7,355.48	-63.78	-4,662.26	4,662.69	1.03	0.56	0.86	
11,901.00	91.08	270.11	7,353.92	-64.11	-4,758.24	4,758.67	0.71	0.31	0.64	
11,995.00	89.11	271.48	7,353.77	-62.80	-4,852.23	4,852.63	2.55	-2.10	1.46	
12,091.00	88.38	270.94	7,355.87	-60.78	-4,948.18	4,948.54	0.95	-0.76	-0.56	
12,186.00	90.02	270.94	7,357.20	-59.22	-5,043.16	5,043.48	1.73	1.73	0.00	
12,281.00	89.80	270.56	7,357.35	-57.97	-5,138.15	5,138.44	0.46	-0.23	-0.40	
12,376.00	91.12	270.13	7,356.58	-57.40	-5,233.14	5,233.42	1.46	1.39	-0.45	
12,471.00	90.04	270.85	7,355.62	-56.59	-5,328.13	5,328.39	1.37	-1.14	0.76	
12,566.00	88.94	270.17	7,356.47	-55.74	-5,423.12	5,423.35	1.36	-1.16	-0.72	
12,661.00	90.55	269.82	7,356.89	-55.75	-5,518.12	5,518.34	1.73	1.69	-0.37	
12,756.00	89.03	269.77	7,357.24	-56.09	-5,613.11	5,613.33	1.60	-1.60	-0.05	
12,851.00	90.09	269.63	7,357.97	-56.59	-5,708.11	5,708.32	1.13	1.12	-0.15	
12,946.00	91.89	269.89	7,356.33	-56.99	-5,803.09	5,803.30	1.91	1.89	0.27	
13,040.00	90.40	269.68	7,354.45	-57.34	-5,897.07	5,897.27	1.60	-1.59	-0.22	
13,135.00	89.58	268.02	7,354.46	-59.25	-5,992.04	5,992.26	1.95	-0.86	-1.75	
13,230.00	90.32	268.22	7,354.55	-62.36	-6,086.99	6,087.25	0.81	0.78	0.21	
13,325.00	89.61	267.44	7,354.61	-65.96	-6,181.92	6,182.22	1.11	-0.75	-0.82	
13,420.00	90.74	266.52	7,354.32	-70.97	-6,276.79	6,277.15	1.53	1.19	-0.97	
13,514.00	89.49	268.63	7,354.13	-74.94	-6,370.70	6,371.11	2.61	-1.33	2.24	
13,608.00	89.98	267.25	7,354.56	-78.32	-6,464.63	6,465.08	1.56	0.52	-1.47	
13,701.00	90.32	270.12	7,354.32	-80.46	-6,557.60	6,558.07	3.11	0.37	3.09	
13,796.00	88.49	270.30	7,355.30	-80.11	-6,652.59	6,653.04	1.94	-1.93	0.19	
13,890.00	88.98	270.42	7,357.38	-79.52	-6,746.56	6,747.00	0.54	0.52	0.13	
13,983.00	88.34	269.34	7,359.55	-79.71	-6,839.54	6,839.96	1.35	-0.69	-1.16	
14,075.00	88.57	268.56	7,362.04	-81.40	-6,931.49	6,931.93	0.88	0.25	-0.85	
14,168.00	89.26	267.81	7,363.80	-84.34	-7,024.42	7,024.90	1.10	0.74	-0.81	
14,261.00	90.63	267.41	7,363.89	-88.22	-7,117.34	7,117.86	1.53	1.47	-0.43	
14,353.00	89.09	267.29	7,364.11	-92.47	-7,209.24	7,209.81	1.68	-1.67	-0.13	
14,447.00	88.05	266.12	7,366.46	-97.87	-7,303.05	7,303.70	1.67	-1.11	-1.24	
14,541.00	85.58	267.08	7,371.68	-103.44	-7,396.73	7,397.45	2.82	-2.63	1.02	
14,633.00	85.67	266.55	7,378.70	-108.54	-7,488.32	7,489.11	0.58	0.10	-0.58	
14,726.00	87.60	266.24	7,384.16	-114.38	-7,580.97	7,581.83	2.10	2.08	-0.33	
14,820.00	90.45	267.96	7,385.75	-119.13	-7,674.82	7,675.75	3.54	3.03	1.83	
14,912.00	91.37	268.29	7,384.29	-122.14	-7,766.76	7,767.72	1.06	1.00	0.36	
15,007.00	92.60	268.09	7,381.00	-125.14	-7,861.66	7,862.65	1.31	1.29	-0.21	
15,102.00	91.15	269.78	7,377.89	-126.90	-7,956.58	7,957.59	2.34	-1.53	1.78	

PDD
Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Wilson Ranch 5C-27HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4992' GL+ 20'KB @ 5012.00usft (P462)
Site:	4N-68W-26 Wilson Ranch 8-26HZ	MD Reference:	4992' GL+ 20'KB @ 5012.00usft (P462)
Well:	Wilson Ranch 5C-27HZ	North Reference:	True
Wellbore:	Wilson Ranch 5C-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)	
15,195.00	92.04	269.70	7,375.31	-127.32	-8,049.54	8,050.55	0.96	0.96	-0.09	
15,288.00	92.14	270.44	7,371.91	-127.21	-8,142.48	8,143.47	0.80	0.11	0.80	
15,381.00	90.92	270.93	7,369.43	-126.10	-8,235.44	8,236.40	1.41	-1.31	0.53	
15,474.00	88.88	270.54	7,369.59	-124.91	-8,328.43	8,329.36	2.23	-2.19	-0.42	
15,567.00	91.00	270.93	7,369.69	-123.71	-8,421.41	8,422.32	2.32	2.28	0.42	
15,660.00	93.00	271.31	7,366.45	-121.90	-8,514.33	8,515.21	2.19	2.15	0.41	
15,754.00	91.09	270.37	7,363.09	-120.52	-8,608.26	8,609.10	2.26	-2.03	-1.00	
15,848.00	88.69	269.13	7,363.27	-120.93	-8,702.25	8,703.09	2.87	-2.55	-1.32	
15,942.00	90.49	268.97	7,363.94	-122.49	-8,796.23	8,797.08	1.92	1.91	-0.17	
16,035.00	92.17	269.51	7,361.79	-123.72	-8,889.19	8,890.05	1.90	1.81	0.58	
16,130.00	93.64	269.09	7,356.97	-124.88	-8,984.06	8,984.93	1.61	1.55	-0.44	
16,225.00	91.49	269.41	7,352.72	-126.12	-9,078.95	9,079.82	2.29	-2.26	0.34	
16,320.00	93.18	269.25	7,348.85	-127.23	-9,173.86	9,174.74	1.79	1.78	-0.17	
16,413.00	92.35	269.28	7,344.36	-128.42	-9,266.75	9,267.63	0.89	-0.89	0.03	
16,508.00	93.40	268.65	7,339.60	-130.14	-9,361.61	9,362.51	1.29	1.11	-0.66	
16,600.00	93.29	268.31	7,334.23	-132.57	-9,453.42	9,454.35	0.39	-0.12	-0.37	
16,658.00	94.66	267.94	7,330.21	-134.47	-9,511.25	9,512.20	2.45	2.36	-0.64	
16,730.00	94.66	267.94	7,324.36	-137.05	-9,582.96	9,583.94	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	
Wilson Ranch 5C-27HZ - hit/miss target - Shape	0.00	0.00	6,717.73	16.86	80.79	14,630,922.23	1,650,911.62	40.286109	-104.962368	
- actual wellpath misses target center by 0.01usft at 6720.99usft MD (6717.72 TVD, 16.86 N, 80.79 E)										
- Point										
Wilson Ranch 5C-27HZ - actual wellpath hits target center - Point	0.00	0.00	7,324.36	-137.05	-9,582.96	14,630,764.26	1,641,247.93	40.285682	-104.997020	
Wilson Ranch 5C-27HZ - actual wellpath hits target center - Point	0.00	0.00	7,334.74	4.98	-665.16	14,630,910.04	1,650,165.68	40.286077	-104.965042	
Wilson Ranch 5C-27HZ - actual wellpath hits target center - Point	0.00	0.00	7,343.08	-2.99	-1,124.86	14,630,901.88	1,649,705.98	40.286055	-104.966691	

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,850.10	1,847.63	9 5/8"	9-5/8	13-1/2	
16,717.00	7,325.42	5 1/2"	5-1/2	8-1/2	

PDD
Survey Report

Company:	US ROCKIES WATTENBERG PLANNING	Local Co-ordinate Reference:	Well Wilson Ranch 5C-27HZ
Project:	WELD-NAD83-UTMFT13N	TVD Reference:	4992' GL+ 20'KB @ 5012.00usft (P462)
Site:	4N-68W-26 Wilson Ranch 8-26HZ	MD Reference:	4992' GL+ 20'KB @ 5012.00usft (P462)
Well:	Wilson Ranch 5C-27HZ	North Reference:	True
Wellbore:	Wilson Ranch 5C-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 (°)
6,721.00	6,717.73	Entered Landbox		0.00	
7,008.00	6,991.24	Sharon Springs		0.00	
7,065.00	7,040.14	Niobrara		0.00	
7,173.00	7,125.67	Niobrara B		0.00	
7,264.00	7,189.62	Niobrara C		0.00	
7,601.00	7,323.03	Fort Hays		0.00	
16,730.00	7,324.36	Toe Depth		0.00	
7,806.00	7,334.74	Landing Depth		0.00	
8,266.00	7,343.08	Codell		0.00	

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
16,730.00	7,324.36	-137.05	-9,582.96	Projection to Bit

Checked By: _____ Approved By: _____ Date: _____