

WELL DETAILS: Land Fed 13N-32HZ

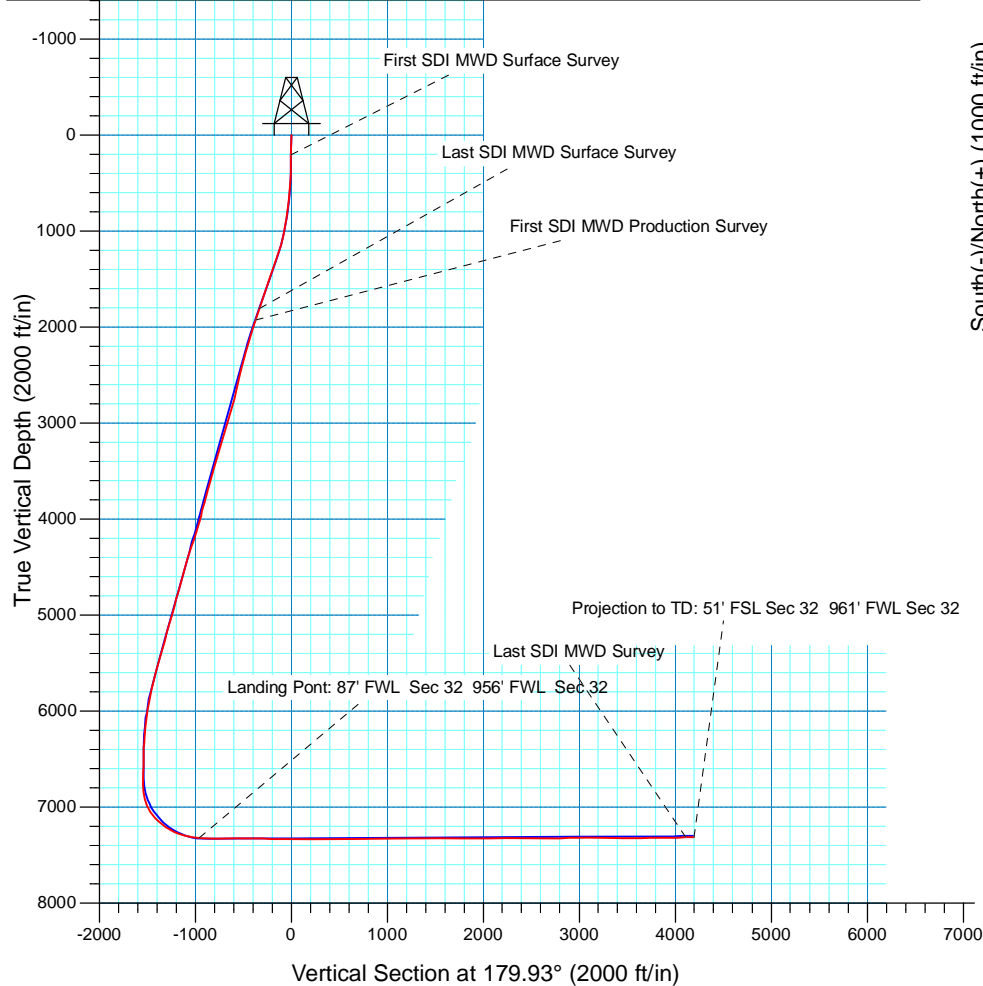
GL 4899' & KB 20' @ 4919.00ft (Precision 461) 4899.00
 Northing 14562852.97 Easting 1694802.24 Latitude 40.0990270 Longitude -104.8055200

Design: OH (Land Fed 13N-32HZ/OH)

Created By: Seth Burstad Date: 6-23-2016

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Annotation
213.00	213.00	0.44	328.33	0.70	-0.43	First SDI MWD Surface Survey
1808.53	1858.00	19.33	344.34	330.69	-86.52	Last SDI MWD Surface Survey
1930.73	1987.00	18.04	341.92	370.24	-98.48	First SDI MWD Production Survey
7325.89	7898.00	87.71	181.63	952.67	-453.47	Landing Point: 87' FWL Sec 32 956' FWL Sec 32
7319.76	12966.00	90.47	179.34	-4114.04	-441.76	Last SDI MWD Survey
7319.07	13050.00	90.47	179.34	-4198.03	-440.79	Projection to TD: 51' FSL Sec 32 961' FWL Sec 32



Landing Point: 87' FWL Sec 32 956' FWL Sec 32

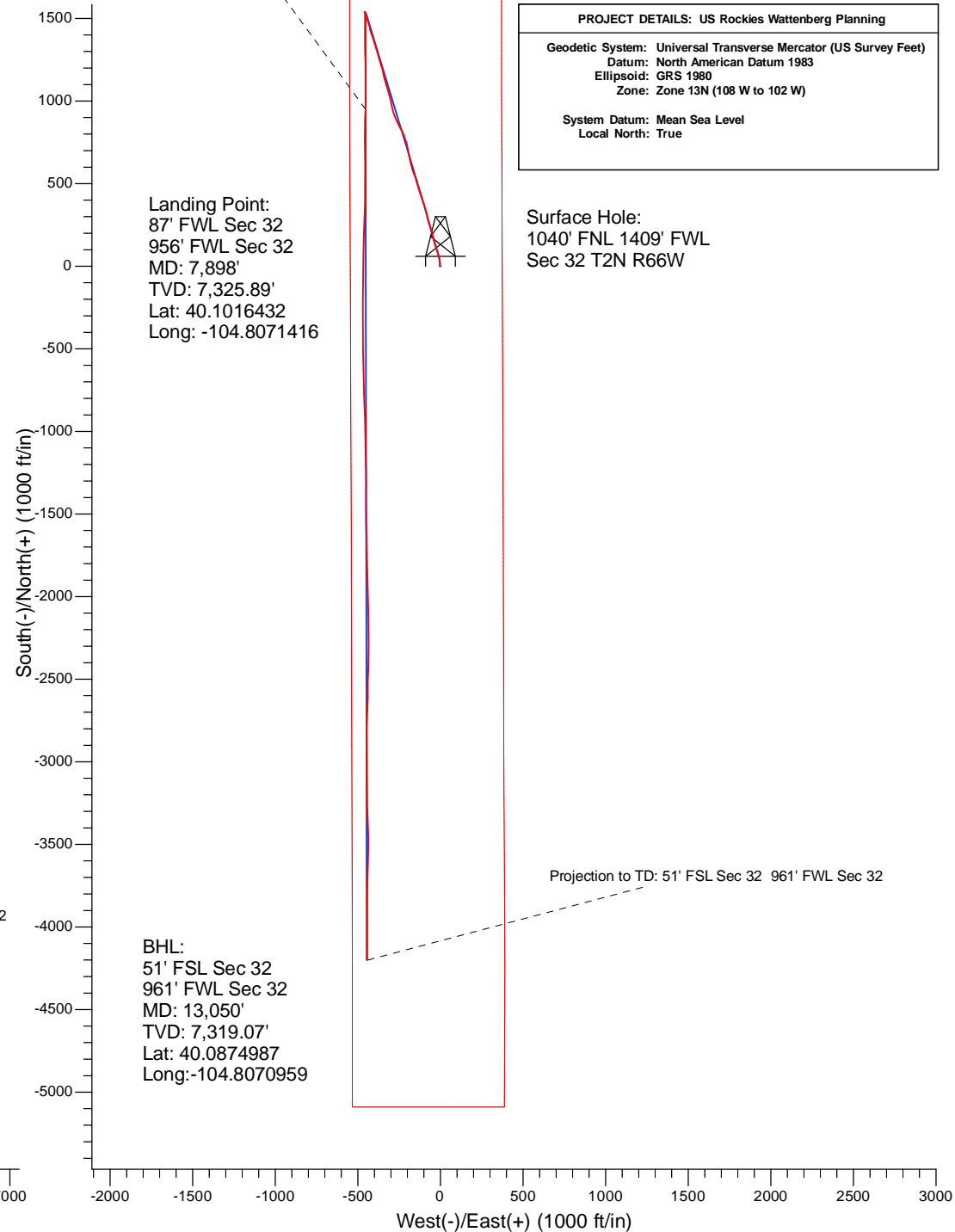
Landing Point:
 87' FWL Sec 32
 956' FWL Sec 32
 MD: 7,898'
 TVD: 7,325.89'
 Lat: 40.1016432
 Long: -104.8071416

PROJECT DETAILS: US Rockies Wattenberg Planning

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

System Datum: Mean Sea Level
 Local North: True

Surface Hole:
 1040' FNL 1409' FWL
 Sec 32 T2N R66W





US ROCKIES REGION PLANNING

US Rockies Wattenberg Planning

Land 18-32HZ Pad 2N-66W-32

Land Fed 13N-32HZ

OH

Design: OH

Standard Survey Report

23 June, 2016



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Land Fed 13N-32HZ
Project:	US Rockies Wattenberg Planning	TVD Reference:	GL 4899' & KB 20' @ 4919.00ft (Precision 461)
Site:	Land 18-32HZ Pad 2N-66W-32	MD Reference:	GL 4899' & KB 20' @ 4919.00ft (Precision 461)
Well:	Land Fed 13N-32HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Project	US Rockies Wattenberg Planning		
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		Land 18-32HZ Pad 2N-66W-32, Site Center: Land Fed 30C-29HZ			
Site Position:		Northing:	14,562,853.50 usft	Latitude:	40.0990290
From:	Lat/Long	Easting:	1,694,712.19 usft	Longitude:	-104.8058420
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.13 °

Well	Land Fed 13N-32HZ, 1040' FNL 1409' FWL Sec 32 T2N R66W					
Well Position	+N/-S	0.00 ft	Northing:	14,562,852.96 usft	Latitude:	40.0990270
	+E/-W	0.00 ft	Easting:	1,694,802.23 usft	Longitude:	-104.8055200
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	4,899.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	User Defined	5/16/2016	8.34	66.69	52,581
	User Defined	6/19/2016	8.37	66.71	52,605

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		179.93

Survey Program	Date	6/23/2016			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
213.00	1,858.00	Survey #1 - Surface (OH)	APC_ISCWSA REV 2 MWD+ Fixed.v2:crustal field declination		
1,987.00	13,050.00	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)	Vertical Section (ft)	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	
213.00	0.44	328.33	213.00	0.70	-0.43	-0.70	0.21	0.21	0.00	
First SDI MWD Surface Survey										
307.00	1.08	351.80	306.99	1.88	-0.75	-1.88	0.74	0.68	24.97	
401.00	2.08	1.45	400.95	4.46	-0.83	-4.46	1.10	1.06	10.27	
495.00	3.25	2.37	494.85	8.83	-0.68	-8.83	1.25	1.24	0.98	
589.00	4.47	356.16	588.63	15.15	-0.81	-15.15	1.37	1.30	-6.61	
683.00	5.56	355.98	682.27	23.35	-1.37	-23.35	1.16	1.16	-0.19	

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Well:	Land Fed 13N-32HZ	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)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
777.00	7.53	354.71	775.66	34.02	-2.26	-34.02	2.10	2.10	-1.35
871.00	9.27	345.80	868.65	47.50	-4.69	-47.50	2.31	1.85	-9.48
965.00	10.85	343.81	961.20	63.33	-9.01	-63.34	1.72	1.68	-2.12
1,059.00	13.03	340.85	1,053.16	81.84	-14.96	-81.86	2.41	2.32	-3.15
1,153.00	15.79	342.40	1,144.20	104.05	-22.30	-104.07	2.96	2.94	1.65
1,247.00	18.46	345.12	1,234.02	130.63	-29.99	-130.66	2.96	2.84	2.89
1,341.00	19.43	343.65	1,322.93	160.01	-38.21	-160.06	1.15	1.03	-1.56
1,434.00	20.03	344.82	1,410.47	190.23	-46.74	-190.28	0.77	0.65	1.26
1,528.00	20.19	344.60	1,498.74	221.40	-55.26	-221.47	0.19	0.17	-0.23
1,624.00	20.76	343.87	1,588.67	253.72	-64.39	-253.80	0.65	0.59	-0.76
1,719.00	20.29	343.82	1,677.64	285.71	-73.66	-285.80	0.50	-0.49	-0.05
1,814.00	19.35	344.10	1,767.01	316.67	-82.56	-316.77	0.99	-0.99	0.29
1,858.00	19.33	344.34	1,808.53	330.69	-86.52	-330.80	0.19	-0.05	0.55
Last SDI MWD Surface Survey									
1,987.00	18.04	341.92	1,930.73	370.24	-98.48	-370.36	1.17	-1.00	-1.88
First SDI MWD Production Survey									
2,082.00	17.57	340.47	2,021.18	397.74	-107.84	-397.87	0.68	-0.49	-1.53
2,176.00	18.08	341.78	2,110.67	424.96	-117.14	-425.11	0.69	0.54	1.39
2,271.00	17.50	343.45	2,201.13	452.66	-125.82	-452.81	0.81	-0.61	1.76
2,366.00	15.18	342.91	2,292.28	478.24	-133.55	-478.40	2.45	-2.44	-0.57
2,462.00	14.97	342.64	2,384.98	502.09	-140.94	-502.26	0.23	-0.22	-0.28
2,557.00	15.65	346.30	2,476.61	526.25	-147.64	-526.43	1.24	0.72	3.85
2,652.00	13.70	340.49	2,568.51	549.31	-154.43	-549.50	2.57	-2.05	-6.12
2,746.00	13.21	337.97	2,659.93	569.76	-162.18	-569.95	0.81	-0.52	-2.68
2,840.00	14.18	343.41	2,751.26	590.75	-169.49	-590.95	1.71	1.03	5.79
2,934.00	15.52	346.76	2,842.12	614.03	-175.66	-614.24	1.69	1.43	3.56
3,029.00	17.99	347.36	2,933.08	640.72	-181.78	-640.94	2.61	2.60	0.63
3,123.00	17.32	347.42	3,022.65	668.54	-188.01	-668.77	0.71	-0.71	0.06
3,218.00	17.35	348.05	3,113.34	696.20	-194.02	-696.43	0.20	0.03	0.66
3,312.00	18.18	346.44	3,202.86	724.16	-200.36	-724.41	1.03	0.88	-1.71
3,408.00	16.51	343.70	3,294.49	751.82	-207.70	-752.07	1.94	-1.74	-2.85
3,501.00	16.45	344.44	3,383.67	777.19	-214.94	-777.45	0.23	-0.06	0.80
3,596.00	17.35	337.05	3,474.58	803.19	-224.07	-803.47	2.45	0.95	-7.78
3,689.00	16.62	331.65	3,563.53	827.67	-235.80	-827.96	1.87	-0.78	-5.81
3,783.00	17.37	332.76	3,653.42	851.97	-248.60	-852.28	0.87	0.80	1.18
3,878.00	18.39	335.04	3,743.83	878.17	-261.42	-878.49	1.30	1.07	2.40
3,973.00	15.86	337.74	3,834.61	903.77	-272.66	-904.11	2.79	-2.66	2.84
4,067.00	14.85	341.97	3,925.26	927.12	-281.26	-927.46	1.60	-1.07	4.50
4,161.00	16.13	343.98	4,015.84	951.12	-288.59	-951.47	1.48	1.36	2.14
4,255.00	17.14	348.00	4,105.91	977.22	-295.07	-977.58	1.63	1.07	4.28
4,350.00	19.76	348.98	4,196.02	1,006.68	-301.05	-1,007.05	2.78	2.76	1.03
4,445.00	20.03	344.97	4,285.36	1,038.16	-308.34	-1,038.54	1.46	0.28	-4.22
4,539.00	17.74	343.53	4,374.29	1,067.44	-316.58	-1,067.83	2.49	-2.44	-1.53
4,634.00	15.33	342.66	4,465.36	1,093.32	-324.43	-1,093.71	2.55	-2.54	-0.92

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Well:	Land Fed 13N-32HZ	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)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,728.00	15.31	344.74	4,556.02	1,117.15	-331.40	-1,117.55	0.58	-0.02	2.21	
4,823.00	16.10	345.79	4,647.47	1,142.02	-337.93	-1,142.43	0.88	0.83	1.11	
4,917.00	16.38	345.83	4,737.72	1,167.50	-344.37	-1,167.92	0.30	0.30	0.04	
5,010.00	16.52	346.01	4,826.91	1,193.05	-350.78	-1,193.48	0.16	0.15	0.19	
5,104.00	16.54	345.47	4,917.03	1,218.97	-357.37	-1,219.40	0.16	0.02	-0.57	
5,199.00	15.83	342.58	5,008.26	1,244.42	-364.64	-1,244.87	1.13	-0.75	-3.04	
5,292.00	15.71	342.19	5,097.76	1,268.51	-372.29	-1,268.97	0.17	-0.13	-0.42	
5,387.00	16.62	342.67	5,189.00	1,293.73	-380.27	-1,294.19	0.97	0.96	0.51	
5,481.00	16.65	342.84	5,279.07	1,319.43	-388.25	-1,319.90	0.06	0.03	0.18	
5,574.00	16.70	343.35	5,368.16	1,344.96	-396.01	-1,345.44	0.17	0.05	0.55	
5,669.00	15.81	343.24	5,459.36	1,370.43	-403.65	-1,370.92	0.94	-0.94	-0.12	
5,764.00	15.86	342.25	5,550.76	1,395.18	-411.34	-1,395.69	0.29	0.05	-1.04	
5,859.00	16.68	343.62	5,641.95	1,420.63	-419.14	-1,421.14	0.95	0.86	1.44	
5,953.00	13.83	340.83	5,732.63	1,444.19	-426.64	-1,444.71	3.13	-3.03	-2.97	
6,048.00	11.92	342.23	5,825.24	1,464.26	-433.36	-1,464.79	2.04	-2.01	1.47	
6,142.00	10.67	345.53	5,917.42	1,481.93	-438.50	-1,482.46	1.50	-1.33	3.51	
6,237.00	9.38	343.74	6,010.96	1,497.88	-442.86	-1,498.42	1.40	-1.36	-1.88	
6,329.00	6.60	344.06	6,102.06	1,510.16	-446.42	-1,510.71	3.02	-3.02	0.35	
6,423.00	5.39	342.50	6,195.55	1,519.57	-449.23	-1,520.11	1.30	-1.29	-1.66	
6,516.00	4.00	341.66	6,288.23	1,526.81	-451.56	-1,527.36	1.50	-1.49	-0.90	
6,609.00	2.23	335.77	6,381.09	1,531.54	-453.32	-1,532.09	1.93	-1.90	-6.33	
6,702.00	2.09	344.34	6,474.03	1,534.82	-454.52	-1,535.38	0.38	-0.15	9.22	
6,797.00	2.26	338.10	6,568.96	1,538.23	-455.69	-1,538.79	0.31	0.18	-6.57	
6,890.00	2.22	330.48	6,661.89	1,541.50	-457.26	-1,542.06	0.32	-0.04	-8.19	
6,984.00	2.19	177.18	6,755.86	1,541.29	-458.07	-1,541.85	4.56	-0.03	-163.09	
7,045.00	2.48	143.90	6,816.81	1,539.06	-457.24	-1,539.62	2.24	0.48	-54.56	
7,139.00	14.13	185.15	6,909.71	1,525.94	-457.07	-1,526.49	13.16	12.39	43.88	
7,235.00	23.86	179.35	7,000.38	1,494.77	-457.90	-1,495.33	10.31	10.14	-6.04	
7,330.00	36.20	178.45	7,082.47	1,447.33	-456.92	-1,447.89	13.00	12.99	-0.95	
7,425.00	47.87	179.69	7,152.91	1,383.84	-455.97	-1,384.40	12.31	12.28	1.31	
7,519.00	57.63	179.31	7,209.74	1,309.11	-455.30	-1,309.67	10.39	10.38	-0.40	
7,614.00	65.06	177.89	7,255.26	1,225.83	-453.23	-1,226.39	7.93	7.82	-1.49	
7,709.00	71.52	179.58	7,290.39	1,137.65	-451.31	-1,138.20	7.00	6.80	1.78	
7,804.00	78.70	180.71	7,314.78	1,045.90	-451.56	-1,046.45	7.64	7.56	1.19	
7,898.00	87.71	181.63	7,325.89	952.67	-453.47	-953.23	9.63	9.59	0.98	
Landing Pont: 87' FWL Sec 32 956' FWL Sec 32										
7,992.00	88.79	181.66	7,328.76	858.76	-456.16	-859.31	1.15	1.15	0.03	
8,085.00	88.89	179.38	7,330.65	765.79	-457.01	-766.34	2.45	0.11	-2.45	
8,179.00	89.87	179.55	7,331.66	671.80	-456.13	-672.35	1.06	1.04	0.18	
8,273.00	89.16	180.01	7,332.46	577.80	-455.77	-578.36	0.90	-0.76	0.49	
8,367.00	90.47	180.37	7,332.76	483.81	-456.08	-484.36	1.45	1.39	0.38	
8,462.00	90.20	181.44	7,332.21	388.82	-457.58	-389.38	1.16	-0.28	1.13	
8,556.00	88.49	180.54	7,333.28	294.85	-459.21	-295.41	2.06	-1.82	-0.96	

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Design:	OH	Database:	Denver Sales Office

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8,649.00	88.92	180.75	7,335.39	201.88	-460.25	-202.44	0.51	0.46	0.23	
8,743.00	89.70	182.01	7,336.52	107.91	-462.52	-108.48	1.58	0.83	1.34	
8,837.00	88.59	180.62	7,337.92	13.95	-464.67	-14.52	1.89	-1.18	-1.48	
8,932.00	89.43	181.32	7,339.56	-81.02	-466.28	80.45	1.15	0.88	0.74	
9,027.00	91.21	181.49	7,339.03	-175.99	-468.61	175.41	1.88	1.87	0.18	
9,121.00	91.11	179.55	7,337.13	-269.96	-469.46	269.38	2.07	-0.11	-2.06	
9,215.00	89.66	180.35	7,336.50	-363.95	-469.38	363.38	1.76	-1.54	0.85	
9,310.00	89.60	178.42	7,337.11	-458.94	-468.36	458.37	2.03	-0.06	-2.03	
9,403.00	89.76	178.73	7,337.63	-551.91	-466.05	551.34	0.38	0.17	0.33	
9,498.00	90.50	178.82	7,337.41	-646.89	-464.02	646.32	0.78	0.78	0.09	
9,592.00	90.71	178.24	7,336.42	-740.85	-461.61	740.29	0.66	0.22	-0.62	
9,685.00	91.78	178.34	7,334.40	-833.79	-458.83	833.23	1.16	1.15	0.11	
9,779.00	90.50	178.46	7,332.53	-927.73	-456.21	927.17	1.37	-1.36	0.13	
9,873.00	91.35	178.41	7,331.01	-1,021.68	-453.64	1,021.13	0.91	0.90	-0.05	
9,967.00	90.97	179.21	7,329.11	-1,115.64	-451.69	1,115.09	0.94	-0.40	0.85	
10,060.00	89.70	179.44	7,328.57	-1,208.63	-450.59	1,208.08	1.39	-1.37	0.25	
10,154.00	90.67	179.78	7,328.26	-1,302.63	-449.95	1,302.08	1.09	1.03	0.36	
10,248.00	90.03	180.12	7,327.69	-1,396.62	-449.87	1,396.07	0.77	-0.68	0.36	
10,342.00	91.01	179.65	7,326.83	-1,490.62	-449.68	1,490.07	1.16	1.04	-0.50	
10,436.00	88.93	179.72	7,326.88	-1,584.61	-449.17	1,584.06	2.21	-2.21	0.07	
10,530.00	89.43	178.83	7,328.23	-1,678.59	-447.98	1,678.05	1.09	0.53	-0.95	
10,625.00	91.08	178.53	7,327.81	-1,773.56	-445.79	1,773.02	1.77	1.74	-0.32	
10,719.00	90.00	178.44	7,326.92	-1,867.53	-443.30	1,866.98	1.15	-1.15	-0.10	
10,813.00	89.93	178.62	7,326.98	-1,961.49	-440.89	1,960.95	0.21	-0.07	0.19	
10,906.00	90.17	177.59	7,326.90	-2,054.44	-437.82	2,053.91	1.14	0.26	-1.11	
11,000.00	91.18	178.70	7,325.79	-2,148.38	-434.78	2,147.85	1.60	1.07	1.18	
11,093.00	90.60	180.60	7,324.34	-2,241.37	-434.21	2,240.83	2.14	-0.62	2.04	
11,186.00	89.50	180.82	7,324.26	-2,334.36	-435.36	2,333.82	1.21	-1.18	0.24	
11,279.00	89.33	180.92	7,325.21	-2,427.34	-436.77	2,426.81	0.21	-0.18	0.11	
11,371.00	89.19	180.72	7,326.40	-2,519.32	-438.09	2,518.79	0.27	-0.15	-0.22	
11,465.00	89.76	181.44	7,327.26	-2,613.30	-439.86	2,612.76	0.98	0.61	0.77	
11,558.00	90.37	180.59	7,327.16	-2,706.29	-441.51	2,705.75	1.12	0.66	-0.91	
11,652.00	90.57	181.30	7,326.39	-2,800.27	-443.06	2,799.73	0.78	0.21	0.76	
11,745.00	91.01	180.37	7,325.10	-2,893.25	-444.41	2,892.71	1.11	0.47	-1.00	
11,839.00	90.50	179.44	7,323.87	-2,987.24	-444.26	2,986.70	1.13	-0.54	-0.99	
11,931.00	91.14	179.65	7,322.55	-3,079.23	-443.53	3,078.68	0.73	0.70	0.23	
12,026.00	89.56	178.99	7,321.97	-3,174.22	-442.40	3,173.67	1.80	-1.66	-0.69	
12,120.00	89.36	179.24	7,322.85	-3,268.20	-440.95	3,267.66	0.34	-0.21	0.27	
12,214.00	89.13	179.08	7,324.09	-3,362.18	-439.57	3,361.64	0.30	-0.24	-0.17	
12,306.00	89.53	178.79	7,325.17	-3,454.16	-437.86	3,453.62	0.54	0.43	-0.32	
12,399.00	90.77	180.49	7,324.93	-3,547.15	-437.28	3,546.62	2.26	1.33	1.83	
12,494.00	91.51	181.29	7,323.04	-3,642.12	-438.75	3,641.58	1.15	0.78	0.84	
12,589.00	90.03	182.10	7,321.76	-3,737.07	-441.56	3,736.53	1.78	-1.56	0.85	
12,684.00	90.03	179.20	7,321.71	-3,832.05	-442.64	3,831.51	3.05	0.00	-3.05	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Land Fed 13N-32HZ
Project:	US Rockies Wattenberg Planning	TVD Reference:	GL 4899' & KB 20' @ 4919.00ft (Precision 461)
Site:	Land 18-32HZ Pad 2N-66W-32	MD Reference:	GL 4899' & KB 20' @ 4919.00ft (Precision 461)
Well:	Land Fed 13N-32HZ	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)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,778.00	90.47	179.99	7,321.30	-3,926.05	-441.97	3,925.50	0.96	0.47	0.84
12,873.00	90.47	180.20	7,320.52	-4,021.04	-442.13	4,020.50	0.22	0.00	0.22
12,966.00	90.47	179.34	7,319.76	-4,114.04	-441.76	4,113.50	0.92	0.00	-0.92
Last SDI MWD Survey									
13,050.00	90.47	179.34	7,319.07	-4,198.03	-440.79	4,197.49	0.00	0.00	0.00
Projection to TD: 51' FSL Sec 32 961' FWL Sec 32									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
213.00	213.00	0.70	-0.43	First SDI MWD Surface Survey	
1,858.00	1,808.53	330.69	-86.52	Last SDI MWD Surface Survey	
1,987.00	1,930.73	370.24	-98.48	First SDI MWD Production Survey	
7,898.00	7,325.89	952.67	-453.47	Landing Pont: 87' FWL Sec 32 956' FWL Sec 32	
12,966.00	7,319.76	-4,114.04	-441.76	Last SDI MWD Survey	
13,050.00	7,319.07	-4,198.03	-440.79	Projection to TD: 51' FSL Sec 32 961' FWL Sec 32	

Checked By: _____ Approved By: _____ Date: _____