



Directional Survey Certification

2948 I-70 Business Loop
Grand Junction, CO 81504
(970)-245-9447 Fax (970)-245-9454

Operator	TEP Rocky Mountain, LLC.
Well Name & No.	RU 323-17
County & State	Garfield County, CO
SDI Job No.	OP.008829
Rig	H&P 318

I, Mel Mireles Jr. , having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 124 feet to a measured depth of 10,403 feet is true and correct as determined from all available records.

Signature

 23-Mar-18

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 323-17 - Slot RU 323-17 (B3)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
Site:	RU 23-17 Pad	MD Reference:	GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
Well:	RU 323-17	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Project	Garfield County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	RU 23-17 Pad				
Site Position:		Northing:	1,594,634.40 usft	Latitude:	39.4435163
From:	Map	Easting:	2,351,232.80 usft	Longitude:	-107.7974906
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.45 °

Well	RU 323-17 - Slot RU 323-17 (B3)					
Well Position	+N/-S	0.00 usft	Northing:	1,594,646.50 usft	Latitude:	39.4435498
	+E/-W	0.00 usft	Easting:	2,351,236.00 usft	Longitude:	-107.7974803
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,368.60 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	3/15/2018	9.18	65.57	51,582

Design	OH				
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	307.63	

Survey Program	Date	3/23/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
124.00	771.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
849.00	1,038.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,182.00	10,403.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

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	0.00
124.00	0.35	350.16	124.00	0.37	-0.06	0.28	0.28	0.28	0.28	0.00
First SDI Gyro MWD Survey										
215.00	0.53	342.69	215.00	1.05	-0.24	0.83	0.21	0.20	0.20	-8.21
307.00	2.46	288.46	306.96	2.08	-2.24	3.04	2.38	2.10	2.10	-58.95
399.00	3.43	285.47	398.84	3.44	-6.76	7.46	1.07	1.05	1.05	-3.25
492.00	4.93	305.86	491.60	6.52	-12.68	14.03	2.25	1.61	1.61	21.92
584.00	6.42	307.44	583.14	11.97	-19.97	23.12	1.63	1.62	1.62	1.72
676.00	4.84	309.81	674.70	17.58	-27.04	32.15	1.74	-1.72	-1.72	2.58

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 323-17 - Slot RU 323-17 (B3)
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Site:	RU 23-17 Pad	MD Reference:	GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
Well:	RU 323-17	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)	
771.00	3.17	312.63	769.46	21.92	-32.05	38.77	1.77	-1.76	2.97	
Last SDI Gyro MWD Survey										
849.00	3.14	314.13	847.34	24.87	-35.17	43.04	0.11	-0.04	1.92	
First SDI Surface MWD Survey										
943.00	3.30	318.84	941.19	28.70	-38.80	48.25	0.33	0.17	5.01	
1,038.00	5.01	313.55	1,035.94	33.62	-43.60	55.06	1.84	1.80	-5.57	
Last SDI Surface MWD Survey										
1,182.00	5.95	318.11	1,179.28	43.51	-53.14	68.65	0.72	0.65	3.17	
First SDI Production MWD Survey										
1,276.00	5.48	319.30	1,272.81	50.54	-59.32	77.84	0.52	-0.50	1.27	
1,371.00	5.29	305.78	1,367.40	56.54	-65.84	86.66	1.35	-0.20	-14.23	
1,465.00	5.26	303.21	1,461.00	61.43	-72.96	95.29	0.25	-0.03	-2.73	
1,560.00	4.73	300.62	1,555.64	65.81	-79.97	103.51	0.61	-0.56	-2.73	
1,654.00	4.92	297.72	1,649.31	69.66	-86.87	111.33	0.33	0.20	-3.09	
1,748.00	4.97	310.79	1,742.96	74.19	-93.53	119.37	1.20	0.05	13.90	
1,843.00	5.19	310.64	1,837.59	79.68	-99.90	127.77	0.23	0.23	-0.16	
1,937.00	4.91	310.30	1,931.22	85.05	-106.20	136.03	0.30	-0.30	-0.36	
2,032.00	4.68	309.31	2,025.89	90.14	-112.29	143.97	0.26	-0.24	-1.04	
2,126.00	4.83	311.81	2,119.57	95.20	-118.21	151.75	0.27	0.16	2.66	
2,221.00	4.48	304.76	2,214.25	99.99	-124.24	159.44	0.71	-0.37	-7.42	
2,315.00	4.40	309.50	2,307.97	104.37	-130.04	166.71	0.40	-0.09	5.04	
2,410.00	4.57	311.48	2,402.68	109.20	-135.69	174.13	0.24	0.18	2.08	
2,504.00	4.33	310.99	2,496.40	114.01	-141.17	181.41	0.26	-0.26	-0.52	
2,598.00	4.22	311.35	2,590.14	118.62	-146.45	188.40	0.12	-0.12	0.38	
2,693.00	3.96	315.92	2,684.89	123.28	-151.35	195.14	0.44	-0.27	4.81	
2,787.00	3.87	316.97	2,778.67	127.93	-155.77	201.48	0.12	-0.10	1.12	
2,881.00	3.78	312.40	2,872.47	132.34	-160.23	207.70	0.34	-0.10	-4.86	
2,975.00	3.55	309.15	2,966.27	136.27	-164.77	213.69	0.33	-0.24	-3.46	
3,070.00	3.37	316.35	3,061.10	140.15	-168.98	219.40	0.49	-0.19	7.58	
3,164.00	2.90	309.59	3,154.96	143.66	-172.72	224.50	0.64	-0.50	-7.19	
3,258.00	4.97	305.27	3,248.73	147.53	-177.88	230.95	2.22	2.20	-4.60	
3,352.00	4.92	310.56	3,342.38	152.50	-184.26	239.04	0.49	-0.05	5.63	
3,447.00	4.49	310.22	3,437.06	157.55	-190.20	246.83	0.45	-0.45	-0.36	
3,542.00	4.31	304.67	3,531.78	161.98	-195.97	254.11	0.49	-0.19	-5.84	
3,636.00	4.04	303.35	3,625.53	165.81	-201.64	260.93	0.30	-0.29	-1.40	
3,731.00	4.31	304.23	3,720.28	169.66	-207.39	267.84	0.29	0.28	0.93	
3,825.00	4.33	306.67	3,814.02	173.77	-213.16	274.91	0.20	0.02	2.60	
3,920.00	3.78	303.97	3,908.78	177.66	-218.63	281.62	0.61	-0.58	-2.84	
4,014.00	4.04	309.15	4,002.56	181.48	-223.77	288.02	0.47	0.28	5.51	
4,109.00	4.22	306.34	4,097.31	185.66	-229.18	294.86	0.29	0.19	-2.96	
4,203.00	3.73	315.63	4,191.09	189.90	-234.10	301.35	0.86	-0.52	9.88	
4,297.00	3.61	311.60	4,284.89	194.05	-238.46	307.33	0.30	-0.13	-4.29	
4,392.00	3.25	314.95	4,379.72	197.94	-242.60	312.98	0.43	-0.38	3.53	
4,486.00	2.59	318.20	4,473.60	201.40	-245.90	317.71	0.72	-0.70	3.46	

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Site:	RU 23-17 Pad	MD Reference:	GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
Well:	RU 323-17	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

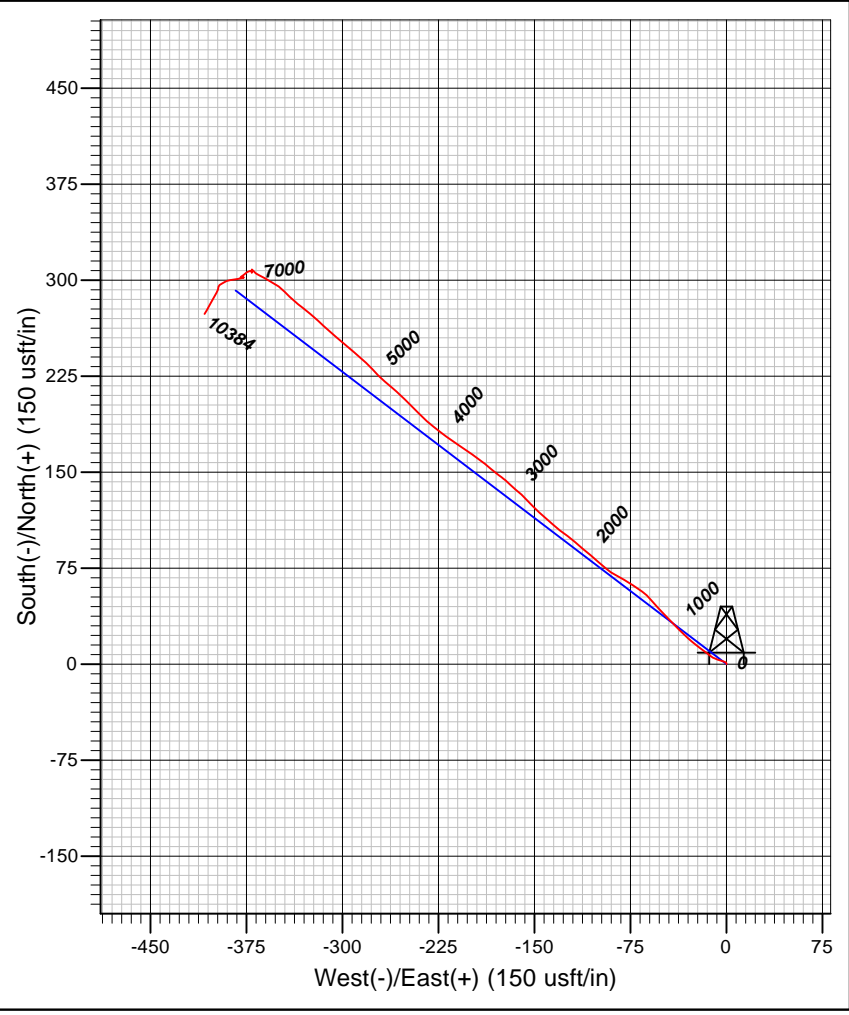
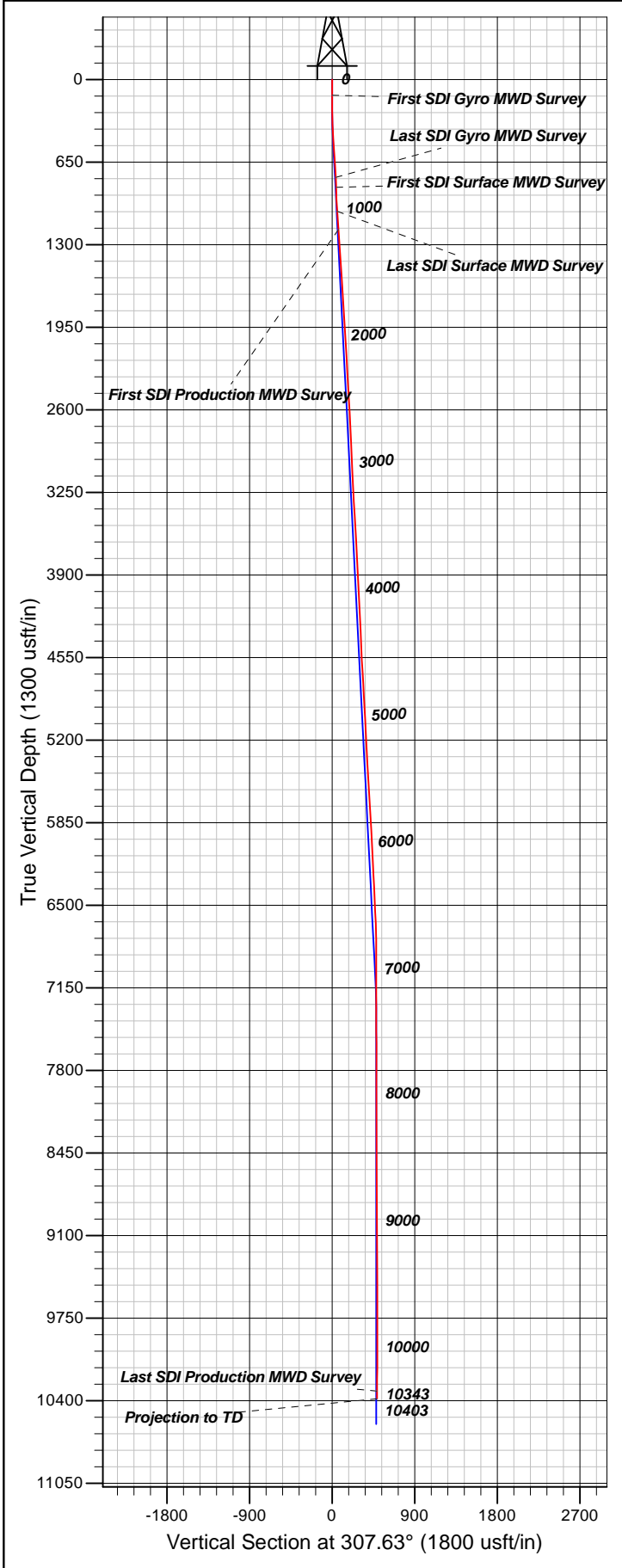
Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,581.00	4.68	313.72	4,568.41	205.68	-250.13	323.68	2.22	2.20	-4.72	
4,675.00	4.59	313.08	4,662.10	210.90	-255.65	331.24	0.11	-0.10	-0.68	
4,770.00	4.60	309.83	4,756.79	215.94	-261.35	338.83	0.27	0.01	-3.42	
4,864.00	4.50	311.62	4,850.50	220.80	-267.00	346.27	0.18	-0.11	1.90	
4,959.00	4.12	315.31	4,945.23	225.70	-272.19	353.37	0.49	-0.40	3.88	
5,053.00	3.98	316.50	5,038.99	230.47	-276.81	359.94	0.17	-0.15	1.27	
5,148.00	4.20	314.33	5,133.75	235.29	-281.57	366.65	0.28	0.23	-2.28	
5,242.00	4.08	311.29	5,227.51	239.90	-286.54	373.41	0.27	-0.13	-3.23	
5,337.00	4.43	310.06	5,322.24	244.50	-291.89	380.45	0.38	0.37	-1.29	
5,431.00	4.26	308.45	5,415.97	249.00	-297.40	387.57	0.22	-0.18	-1.71	
5,526.00	4.38	312.39	5,510.70	253.64	-302.85	394.71	0.34	0.13	4.15	
5,620.00	4.45	310.69	5,604.43	258.44	-308.26	401.93	0.16	0.07	-1.81	
5,715.00	4.34	313.50	5,699.15	263.32	-313.66	409.18	0.25	-0.12	2.96	
5,809.00	4.68	311.12	5,792.85	268.29	-319.13	416.55	0.41	0.36	-2.53	
5,904.00	5.10	310.67	5,887.51	273.59	-325.25	424.63	0.44	0.44	-0.47	
5,998.00	5.10	307.92	5,981.14	278.88	-331.72	432.98	0.26	0.00	-2.93	
6,093.00	3.39	309.85	6,075.87	283.27	-337.21	440.01	1.81	-1.80	2.03	
6,187.00	3.24	313.49	6,169.72	286.88	-341.27	445.43	0.27	-0.16	3.87	
6,282.00	3.71	317.67	6,264.54	291.00	-345.29	451.13	0.56	0.49	4.40	
6,376.00	3.75	303.90	6,358.34	294.97	-349.88	457.19	0.95	0.04	-14.65	
6,566.00	3.72	297.77	6,547.94	301.30	-360.50	469.47	0.21	-0.02	-3.23	
6,660.00	3.40	298.56	6,641.76	304.06	-365.64	475.22	0.34	-0.34	0.84	
6,755.00	2.29	318.91	6,736.64	306.83	-369.36	479.87	1.56	-1.17	21.42	
6,849.00	0.34	287.57	6,830.61	308.33	-370.86	481.97	2.14	-2.07	-33.34	
6,944.00	0.44	141.81	6,925.61	308.13	-370.91	481.88	0.79	0.11	-153.43	
7,038.00	0.56	178.91	7,019.61	307.39	-370.68	481.24	0.36	0.13	39.47	
7,133.00	0.84	188.78	7,114.60	306.24	-370.77	480.62	0.32	0.29	10.39	
7,227.00	0.11	355.43	7,208.60	305.65	-370.89	480.35	1.01	-0.78	177.29	
7,322.00	0.09	352.22	7,303.60	305.81	-370.90	480.46	0.02	-0.02	-3.38	
7,416.00	0.64	340.78	7,397.60	306.38	-371.09	480.95	0.59	0.59	-12.17	
7,510.00	0.31	325.13	7,491.59	307.08	-371.40	481.63	0.37	-0.35	-16.65	
7,605.00	0.69	259.60	7,586.59	307.19	-372.11	482.26	0.66	0.40	-68.98	
7,699.00	0.76	241.94	7,680.58	306.80	-373.22	482.90	0.25	0.07	-18.79	
7,793.00	0.73	251.19	7,774.58	306.31	-374.34	483.48	0.13	-0.03	9.84	
7,887.00	0.62	221.44	7,868.57	305.73	-375.24	483.85	0.39	-0.12	-31.65	
7,982.00	0.97	236.90	7,963.56	304.91	-376.25	484.15	0.43	0.37	16.27	
8,076.00	1.06	231.98	8,057.55	303.94	-377.61	484.63	0.13	0.10	-5.23	
8,171.00	1.33	230.02	8,152.52	302.69	-379.14	485.08	0.29	0.28	-2.06	
8,266.00	0.44	97.16	8,247.52	301.94	-379.63	485.00	1.75	-0.94	-139.85	
8,361.00	0.53	99.80	8,342.51	301.82	-378.83	484.30	0.10	0.09	2.78	
8,455.00	0.48	82.29	8,436.51	301.80	-378.01	483.64	0.17	-0.05	-18.63	
8,550.00	0.42	61.01	8,531.51	302.02	-377.31	483.22	0.19	-0.06	-22.40	
8,644.00	0.14	214.41	8,625.51	302.09	-377.08	483.08	0.58	-0.30	163.19	

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)	
8,739.00	0.69	255.62	8,720.50	301.85	-377.70	483.42	0.62	0.58	43.38	
8,833.00	1.32	252.94	8,814.49	301.39	-379.28	484.40	0.67	0.67	-2.85	
8,928.00	2.11	263.27	8,909.45	300.87	-382.06	486.28	0.89	0.83	10.87	
9,023.00	0.70	266.35	9,004.41	300.63	-384.38	487.97	1.49	-1.48	3.24	
9,118.00	0.59	250.75	9,099.41	300.43	-385.42	488.67	0.22	-0.12	-16.42	
9,212.00	0.88	252.80	9,193.40	300.05	-386.57	489.35	0.31	0.31	2.18	
9,307.00	1.41	267.58	9,288.38	299.79	-388.43	490.67	0.63	0.56	15.56	
9,402.00	1.25	246.47	9,383.36	299.33	-390.55	492.06	0.54	-0.17	-22.22	
9,496.00	1.29	232.05	9,477.33	298.27	-392.32	492.82	0.34	0.04	-15.34	
9,591.00	1.31	249.65	9,572.31	297.23	-394.18	493.66	0.42	0.02	18.53	
9,686.00	1.23	229.17	9,667.29	296.19	-395.97	494.44	0.48	-0.08	-21.56	
9,781.00	0.79	196.83	9,762.27	294.89	-396.94	494.41	0.74	-0.46	-34.04	
9,875.00	1.11	181.37	9,856.26	293.36	-397.14	493.64	0.43	0.34	-16.45	
9,970.00	0.70	210.89	9,951.25	291.94	-397.46	493.03	0.64	-0.43	31.07	
10,064.00	1.76	205.88	10,045.23	290.15	-398.39	492.67	1.13	1.13	-5.33	
10,159.00	3.84	210.36	10,140.11	286.10	-400.63	491.97	2.20	2.19	4.72	
10,254.00	3.43	207.99	10,234.92	280.84	-403.58	491.09	0.46	-0.43	-2.49	
10,343.00	3.17	211.42	10,323.77	276.39	-406.11	490.38	0.37	-0.29	3.85	
Last SDI Production MWD Survey										
10,403.00	3.17	211.42	10,383.68	273.56	-407.84	490.02	0.00	0.00	0.00	
Projection to TD - PBHL(RU_323-17)										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
124.00	124.00	0.37	-0.06	First SDI Gyro MWD Survey	
771.00	769.46	21.92	-32.05	Last SDI Gyro MWD Survey	
849.00	847.34	24.87	-35.17	First SDI Surface MWD Survey	
1,038.00	1,035.94	33.62	-43.60	Last SDI Surface MWD Survey	
1,182.00	1,179.28	43.51	-53.14	First SDI Production MWD Survey	
10,343.00	10,323.77	276.39	-406.11	Last SDI Production MWD Survey	
10,403.00	10,383.68	273.56	-407.84	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____



Well Details: RU 323-17					
TVD Reference: GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318) Level: 8368.60					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1594646.50	2351236.00	39.4435497	-107.7974803
Slot RU 323-17 (B3)					
REFERENCE INFORMATION					
Co-ordinate (N/E) Reference: Well RU 323-17 - Slot RU 323-17 (B3), True North					
Vertical (TVD) Reference: GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)					
Section (VS) Reference: Slot - RU 323-17 (B3)(0.00N, 0.00E)					
Measured Depth Reference: GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)					
Calculation Method: Minimum Curvature					
PROJECT DETAILS: Garfield County, CO NAD83					
Geodetic System: US State Plane 1983					
Datum: North American Datum 1983					
Ellipsoid: GRS 1980					
Zone: Colorado Central Zone					
System Datum: Mean Sea Level					
Plan: OH					
10:30, March 23 2018 Created By: Mel Mireles Jr.					