

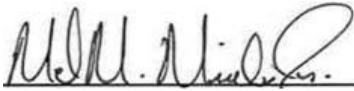


Directional Survey Certification

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 512-17
County & State	Garfield County, CO
SDI Job No.	OP.008913
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 123 feet to a measured depth of 10,804 feet is true and correct as determined from all available records.



Signature

28-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 512-17 - Slot RU 512-17 (A3)
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 512-17	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 512-17 - Slot RU 512-17 (A3)					
Well Position	+N/-S	0.00 usft	Northing:	1,594,640.30 usft	Latitude:	39.4435322
	+E/-W	0.00 usft	Easting:	2,351,228.20 usft	Longitude:	-107.7975074
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	3/19/2018	9.18	65.57	51,581

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	293.62	

Survey Program	Date	3/28/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
123.00	865.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
943.00	1,067.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,182.00	10,804.00	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
123.00	0.09	45.88	123.00	0.07	0.07	-0.04	0.07	0.07	0.00	0.00
First SDI Gyro MWD Survey										
215.00	2.02	289.07	214.98	0.65	-1.41	1.55	2.24	2.10	-126.97	
307.00	3.70	290.30	306.86	2.21	-5.73	6.13	1.83	1.83	1.34	
399.00	6.95	291.18	398.45	5.25	-13.70	14.66	3.53	3.53	0.96	
492.00	9.33	293.12	490.51	10.24	-25.89	27.82	2.58	2.56	2.09	
584.00	11.52	293.99	580.99	16.91	-41.14	44.47	2.39	2.38	0.95	
676.00	14.34	293.55	670.64	25.20	-59.98	65.05	3.07	3.07	-0.48	

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Well:	RU 512-17	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	17.51	292.76	761.99	35.43	-83.95	91.11	3.34	3.34	-0.83	
865.00	19.79	293.38	851.05	47.21	-111.60	121.17	2.43	2.43	0.66	
Last SDI Gyro MWD Survey										
943.00	21.63	293.78	924.00	58.25	-136.88	148.75	2.37	2.36	0.51	
First SDI Surface MWD Survey										
1,038.00	23.22	294.16	1,011.82	72.98	-169.99	184.99	1.68	1.67	0.40	
1,067.00	24.01	294.82	1,038.39	77.79	-180.56	196.60	2.87	2.72	2.28	
Last SDI Surface MWD Survey										
1,182.00	21.51	295.22	1,144.42	96.60	-220.88	241.08	2.18	-2.17	0.35	
First SDI Production MWD Survey										
1,276.00	21.04	295.04	1,232.02	111.09	-251.75	275.17	0.50	-0.50	-0.19	
1,371.00	20.23	294.30	1,320.92	125.06	-282.18	308.65	0.90	-0.85	-0.78	
1,465.00	19.41	293.75	1,409.35	138.04	-311.29	340.52	0.89	-0.87	-0.59	
1,560.00	21.64	292.71	1,498.32	151.17	-341.90	373.82	2.38	2.35	-1.09	
1,654.00	21.33	291.58	1,585.79	164.14	-373.78	408.24	0.55	-0.33	-1.20	
1,748.00	21.00	289.80	1,673.45	176.14	-405.53	442.13	0.77	-0.35	-1.89	
1,843.00	20.73	287.58	1,762.22	186.98	-437.57	475.83	0.88	-0.28	-2.34	
1,937.00	22.21	293.20	1,849.70	199.01	-469.77	510.15	2.69	1.57	5.98	
2,032.00	22.51	292.72	1,937.56	213.11	-503.04	546.28	0.37	0.32	-0.51	
2,126.00	22.24	291.26	2,024.48	226.51	-536.22	582.05	0.66	-0.29	-1.55	
2,221.00	21.81	290.87	2,112.55	239.31	-569.46	617.64	0.48	-0.45	-0.41	
2,315.00	22.95	296.23	2,199.48	253.63	-602.22	653.39	2.49	1.21	5.70	
2,410.00	23.39	296.23	2,286.81	270.15	-635.75	690.73	0.46	0.46	0.00	
2,504.00	22.89	295.94	2,373.25	286.40	-668.93	727.64	0.55	-0.53	-0.31	
2,598.00	22.71	296.28	2,459.91	302.43	-701.64	764.03	0.24	-0.19	0.36	
2,693.00	22.96	295.65	2,547.46	318.57	-734.79	800.87	0.37	0.26	-0.66	
2,787.00	22.53	295.15	2,634.15	334.16	-767.62	837.19	0.50	-0.46	-0.53	
2,881.00	21.03	294.74	2,721.44	348.87	-799.24	872.06	1.60	-1.60	-0.44	
2,975.00	20.35	294.78	2,809.37	362.78	-829.40	905.27	0.72	-0.72	0.04	
3,070.00	19.23	296.24	2,898.76	376.62	-858.43	937.41	1.29	-1.18	1.54	
3,164.00	19.86	295.23	2,987.35	390.27	-886.76	968.84	0.76	0.67	-1.07	
3,258.00	20.75	293.77	3,075.51	403.79	-916.44	1,001.45	1.09	0.95	-1.55	
3,352.00	19.43	292.54	3,163.78	416.50	-946.12	1,033.73	1.47	-1.40	-1.31	
3,447.00	19.26	292.89	3,253.42	428.65	-975.15	1,065.20	0.22	-0.18	0.37	
3,541.00	18.82	292.10	3,342.28	440.38	-1,003.48	1,095.86	0.54	-0.47	-0.84	
3,636.00	18.02	291.76	3,432.41	451.59	-1,031.32	1,125.86	0.85	-0.84	-0.36	
3,731.00	19.61	290.08	3,522.33	462.52	-1,059.95	1,156.46	1.77	1.67	-1.77	
3,825.00	19.37	290.84	3,610.95	473.48	-1,089.33	1,187.78	0.37	-0.26	0.81	
3,920.00	19.17	290.78	3,700.62	484.62	-1,118.64	1,219.09	0.21	-0.21	-0.06	
4,014.00	19.26	290.61	3,789.39	495.55	-1,147.58	1,249.99	0.11	0.10	-0.18	
4,109.00	19.43	289.99	3,879.02	506.47	-1,177.09	1,281.40	0.28	0.18	-0.65	
4,203.00	18.29	289.46	3,967.97	516.72	-1,205.69	1,311.72	1.23	-1.21	-0.56	
4,298.00	20.75	291.48	4,057.51	527.85	-1,235.41	1,343.41	2.68	2.59	2.13	
4,392.00	20.40	291.66	4,145.51	540.00	-1,266.13	1,376.42	0.38	-0.37	0.19	

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Well:	RU 512-17	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

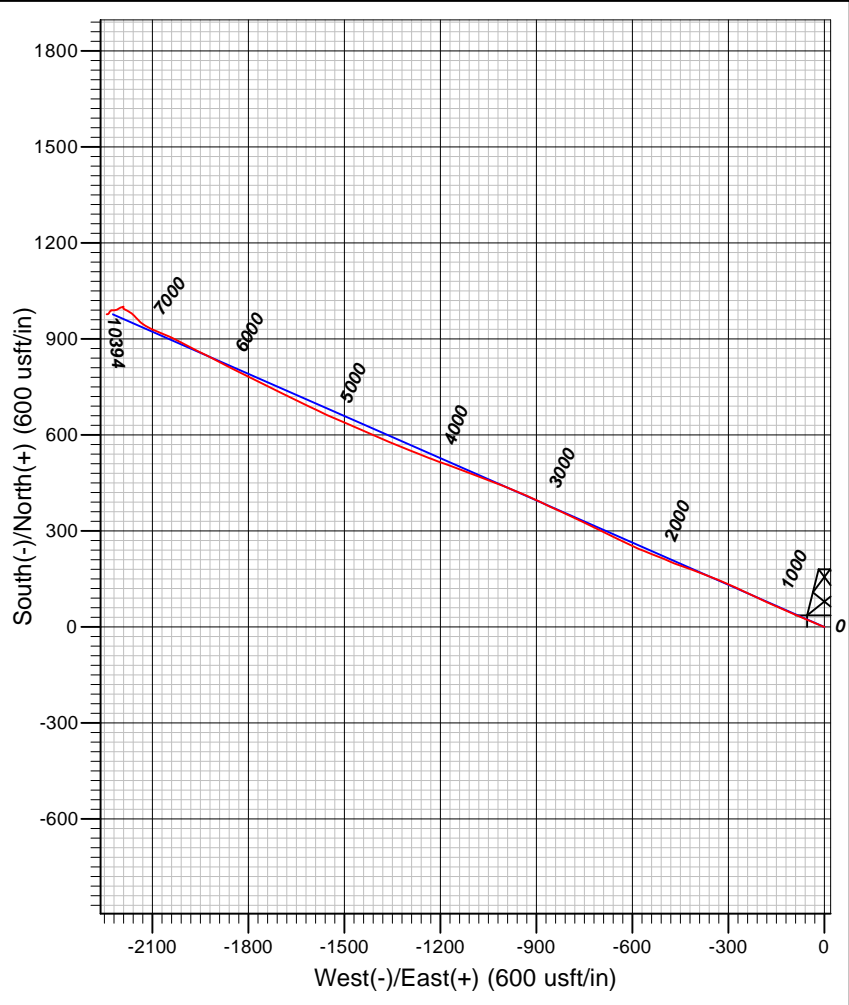
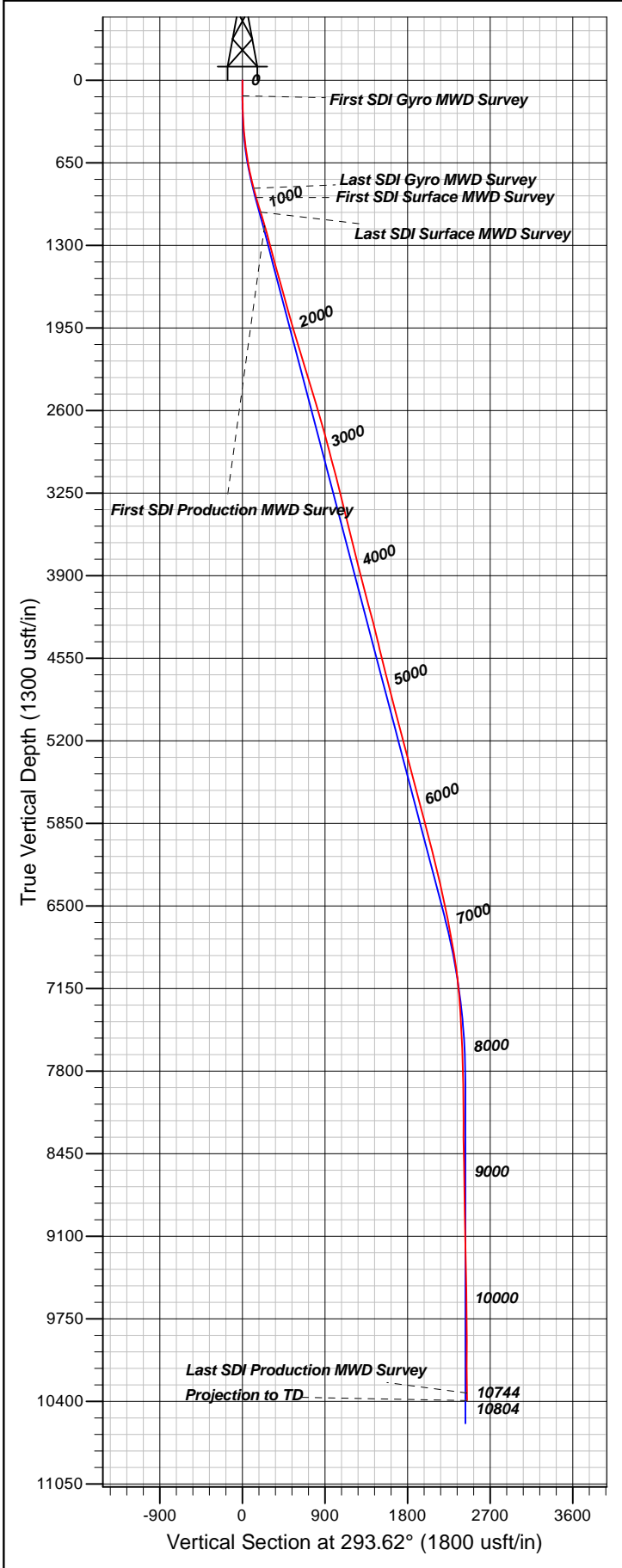
Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,486.00	20.66	292.10	4,233.54	552.28	-1,296.72	1,409.37	0.32	0.28	0.47	
4,581.00	19.52	291.92	4,322.76	564.52	-1,326.98	1,441.99	1.20	-1.20	-0.19	
4,675.00	17.67	292.72	4,411.85	575.89	-1,354.71	1,471.95	1.99	-1.97	0.85	
4,770.00	19.72	292.58	4,501.83	587.61	-1,382.81	1,502.40	2.16	2.16	-0.15	
4,864.00	19.26	293.68	4,590.45	599.93	-1,411.65	1,533.76	0.63	-0.49	1.17	
4,959.00	18.00	294.59	4,680.47	612.33	-1,439.35	1,564.10	1.36	-1.33	0.96	
5,053.00	18.99	294.39	4,769.61	624.69	-1,466.48	1,593.92	1.06	1.05	-0.21	
5,148.00	20.20	292.10	4,859.11	637.24	-1,495.76	1,625.77	1.51	1.27	-2.41	
5,242.00	19.88	292.55	4,947.42	649.48	-1,525.56	1,657.97	0.38	-0.34	0.48	
5,337.00	20.66	295.09	5,036.53	662.78	-1,555.65	1,690.88	1.24	0.82	2.67	
5,431.00	19.96	295.70	5,124.69	676.77	-1,585.13	1,723.49	0.78	-0.74	0.65	
5,526.00	19.08	295.53	5,214.23	690.49	-1,613.75	1,755.21	0.93	-0.93	-0.18	
5,620.00	21.28	296.49	5,302.45	704.73	-1,642.88	1,787.61	2.37	2.34	1.02	
5,715.00	20.56	295.62	5,391.19	719.63	-1,673.36	1,821.50	0.83	-0.76	-0.92	
5,809.00	20.14	295.53	5,479.32	733.74	-1,702.84	1,854.17	0.45	-0.45	-0.10	
5,904.00	20.38	296.78	5,568.45	748.24	-1,732.37	1,887.03	0.52	0.25	1.32	
5,998.00	19.82	295.45	5,656.72	762.46	-1,761.37	1,919.30	0.77	-0.60	-1.41	
6,093.00	19.65	296.99	5,746.14	776.63	-1,790.15	1,951.35	0.58	-0.18	1.62	
6,187.00	19.70	296.41	5,834.65	790.85	-1,818.42	1,982.95	0.21	0.05	-0.62	
6,282.00	19.70	297.02	5,924.09	805.25	-1,847.02	2,014.92	0.22	0.00	0.64	
6,376.00	19.17	299.07	6,012.74	819.95	-1,874.63	2,046.10	0.92	-0.56	2.18	
6,471.00	19.66	296.60	6,102.34	834.68	-1,902.55	2,077.59	1.01	0.52	-2.60	
6,566.00	19.15	296.05	6,191.94	848.68	-1,930.84	2,109.12	0.57	-0.54	-0.58	
6,660.00	18.07	296.82	6,281.02	862.03	-1,957.70	2,139.08	1.18	-1.15	0.82	
6,755.00	17.08	296.88	6,371.59	874.99	-1,983.29	2,167.72	1.04	-1.04	0.06	
6,849.00	16.56	297.81	6,461.57	887.48	-2,007.46	2,194.86	0.62	-0.55	0.99	
6,944.00	15.74	295.84	6,552.82	899.41	-2,031.03	2,221.24	1.04	-0.86	-2.07	
7,038.00	14.96	293.75	6,643.47	909.85	-2,053.61	2,246.11	1.02	-0.83	-2.22	
7,132.00	13.81	293.42	6,734.52	919.20	-2,075.01	2,269.47	1.23	-1.22	-0.35	
7,227.00	13.98	293.07	6,826.74	928.20	-2,095.97	2,292.28	0.20	0.18	-0.37	
7,322.00	12.05	297.55	6,919.29	937.29	-2,115.32	2,313.65	2.29	-2.03	4.72	
7,416.00	10.82	307.83	7,011.44	947.24	-2,130.99	2,332.00	2.53	-1.31	10.94	
7,510.00	8.44	314.60	7,104.11	957.49	-2,142.88	2,346.99	2.80	-2.53	7.20	
7,605.00	8.09	317.85	7,198.12	967.35	-2,152.33	2,359.60	0.61	-0.37	3.42	
7,699.00	5.89	314.86	7,291.42	975.65	-2,160.19	2,370.13	2.37	-2.34	-3.18	
7,793.00	3.80	304.54	7,385.08	980.82	-2,166.17	2,377.68	2.40	-2.22	-10.98	
7,887.00	3.61	297.81	7,478.88	983.97	-2,171.35	2,383.69	0.50	-0.20	-7.16	
7,982.00	3.87	299.92	7,573.68	986.96	-2,176.78	2,389.86	0.31	0.27	2.22	
8,076.00	3.25	298.78	7,667.50	989.83	-2,181.86	2,395.67	0.66	-0.66	-1.21	
8,171.00	2.90	295.31	7,762.36	992.15	-2,186.40	2,400.75	0.42	-0.37	-3.65	
8,266.00	1.84	312.30	7,857.28	994.21	-2,189.70	2,404.60	1.33	-1.12	17.88	
8,360.00	1.67	354.94	7,951.24	996.59	-2,190.93	2,406.69	1.37	-0.18	45.36	
8,455.00	1.49	356.17	8,046.20	999.20	-2,191.14	2,407.92	0.19	-0.19	1.29	

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8,549.00	0.64	29.72	8,140.19	1,000.87	-2,190.96	2,408.43	1.09	-0.90	35.69	
8,644.00	0.44	124.14	8,235.18	1,001.13	-2,190.39	2,408.01	0.85	-0.21	99.39	
8,739.00	1.58	255.89	8,330.17	1,000.60	-2,191.36	2,408.69	2.00	1.20	138.68	
8,833.00	1.88	256.03	8,424.13	999.92	-2,194.12	2,410.94	0.32	0.32	0.15	
8,928.00	1.76	248.77	8,519.08	999.01	-2,196.99	2,413.21	0.27	-0.13	-7.64	
9,023.00	2.02	244.46	8,614.03	997.76	-2,199.86	2,415.34	0.31	0.27	-4.54	
9,118.00	1.67	239.37	8,708.98	996.33	-2,202.56	2,417.24	0.41	-0.37	-5.36	
9,212.00	1.85	234.62	8,802.94	994.76	-2,204.98	2,418.82	0.25	0.19	-5.05	
9,307.00	2.11	247.80	8,897.88	993.21	-2,207.85	2,420.83	0.55	0.27	13.87	
9,402.00	2.46	242.62	8,992.81	991.61	-2,211.28	2,423.33	0.43	0.37	-5.45	
9,496.00	2.11	259.76	9,086.73	990.38	-2,214.77	2,426.04	0.81	-0.37	18.23	
9,591.00	2.21	265.21	9,181.66	989.91	-2,218.32	2,429.10	0.24	0.11	5.74	
9,686.00	2.29	270.04	9,276.59	989.76	-2,222.04	2,432.45	0.22	0.08	5.08	
9,781.00	2.55	268.55	9,371.51	989.71	-2,226.05	2,436.10	0.28	0.27	-1.57	
9,875.00	1.06	250.35	9,465.46	989.36	-2,228.96	2,438.63	1.68	-1.59	-19.36	
9,970.00	0.62	216.25	9,560.45	988.65	-2,230.09	2,439.38	0.68	-0.46	-35.89	
10,064.00	0.88	222.40	9,654.44	987.71	-2,230.88	2,439.73	0.29	0.28	6.54	
10,159.00	1.23	224.60	9,749.42	986.44	-2,232.09	2,440.33	0.37	0.37	2.32	
10,254.00	1.49	213.97	9,844.40	984.69	-2,233.49	2,440.91	0.38	0.27	-11.19	
10,348.00	1.85	205.97	9,938.36	982.32	-2,234.84	2,441.20	0.46	0.38	-8.51	
10,443.00	1.44	213.94	10,033.32	979.95	-2,236.18	2,441.47	0.49	-0.43	8.39	
10,538.00	1.49	238.22	10,128.29	978.31	-2,237.89	2,442.39	0.65	0.05	25.56	
10,632.00	1.32	250.97	10,222.26	977.31	-2,239.96	2,443.88	0.38	-0.18	13.56	
10,727.00	1.32	266.26	10,317.23	976.88	-2,242.08	2,445.65	0.37	0.00	16.09	
10,744.00	0.97	264.24	10,334.23	976.85	-2,242.42	2,445.95	2.07	-2.06	-11.88	
Last SDI Production MWD Survey										
10,804.00	0.97	264.24	10,394.22	976.75	-2,243.43	2,446.84	0.00	0.00	0.00	
Projection to TD - PBHL(RU_512-17)										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
123.00	123.00	0.07	0.07	First SDI Gyro MWD Survey	
865.00	851.05	47.21	-111.60	Last SDI Gyro MWD Survey	
943.00	924.00	58.25	-136.88	First SDI Surface MWD Survey	
1,067.00	1,038.39	77.79	-180.56	Last SDI Surface MWD Survey	
1,182.00	1,144.42	96.60	-220.88	First SDI Production MWD Survey	
10,744.00	10,334.23	976.85	-2,242.42	Last SDI Production MWD Survey	
10,804.00	10,394.22	976.75	-2,243.43	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____



Well Details: RU 512-17

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	1594640.30	2351228.20	39.4435322	-107.7975073

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well RU 512-17 - Slot RU 512-17 (A3), True North
 Vertical (TVD) Reference: GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
 Section (VS) Reference: Slot - RU 512-17 (A3)(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

12:21, March 28 2018
Created By: Mel Mireles Jr.