



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 314-17
County & State	Garfield County, CO
SDI Job No.	OP.009868
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 10,738 feet is true and correct as determined from all available records.


Signature

07-May-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 314-17 - Slot RU 314-17 (A12)
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 314-17	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 314-17 - Slot RU 314-17 (A12)					
Well Position	+N/-S	0.00 usft	Northing:	1,594,587.30 usft	Latitude:	39.4433897
	+E/-W	0.00 usft	Easting:	2,351,269.90 usft	Longitude:	-107.7973550
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	4/30/2018	9.18	65.57	51,566

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	247.42	

Survey Program	Date	5/7/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
124.00	1,092.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
1,180.00	10,738.00	Survey #2 - 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	
124.00	1.14	259.37	123.99	-0.23	-1.21	1.21	0.92	0.92	0.00	
First SDI Gyro MWD Survey										
217.00	3.61	251.63	216.90	-1.32	-4.90	5.03	2.67	2.66	-8.32	
309.00	6.25	244.69	308.56	-4.38	-12.18	12.92	2.94	2.87	-7.54	
400.00	9.06	247.15	398.74	-9.28	-23.26	25.04	3.11	3.09	2.70	
492.00	12.05	250.22	489.17	-15.34	-38.98	41.88	3.31	3.25	3.34	
585.00	14.78	247.06	579.63	-23.25	-59.04	63.44	3.04	2.94	-3.40	
676.00	17.68	241.44	667.00	-34.38	-81.87	88.80	3.62	3.19	-6.18	
771.00	19.35	238.45	757.08	-49.52	-107.96	118.70	2.02	1.76	-3.15	

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Site:	RU 23-17 Pad	MD Reference:	GL 8368.6' & RKB 24' @ 8392.60usft (H&P 318)
Well:	RU 314-17	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)
865.00	20.15	237.48	845.55	-66.37	-134.88	150.03	0.92	0.85	-1.03
959.00	21.29	236.87	933.47	-84.40	-162.82	182.75	1.23	1.21	-0.65
1,054.00	20.41	240.21	1,022.25	-102.06	-191.64	216.14	1.56	-0.93	3.52
1,092.00	20.67	242.40	1,057.83	-108.46	-203.34	229.40	2.13	0.68	5.76
Last SDI Gyro MWD Survey									
1,180.00	20.67	246.12	1,140.17	-121.94	-231.31	260.40	1.49	0.00	4.23
First SDI Production MWD Survey									
1,274.00	19.64	246.81	1,228.41	-134.88	-261.00	292.78	1.12	-1.10	0.73
1,369.00	18.85	247.01	1,318.10	-147.16	-289.80	324.09	0.83	-0.83	0.21
1,463.00	20.24	244.16	1,406.69	-160.18	-318.42	355.51	1.79	1.48	-3.03
1,558.00	19.52	243.24	1,496.03	-174.49	-347.38	387.75	0.83	-0.76	-0.97
1,652.00	20.19	245.34	1,584.44	-188.33	-376.14	419.62	1.04	0.71	2.23
1,747.00	18.91	244.15	1,673.96	-201.88	-404.90	451.38	1.41	-1.35	-1.25
1,841.00	19.08	249.91	1,762.85	-213.80	-433.04	481.93	2.00	0.18	6.13
1,936.00	18.53	249.05	1,852.78	-224.53	-461.72	512.54	0.65	-0.58	-0.91
2,030.00	17.54	246.85	1,942.16	-235.44	-488.69	541.63	1.28	-1.05	-2.34
2,125.00	18.03	252.11	2,032.63	-245.58	-515.85	570.60	1.77	0.52	5.54
2,219.00	19.43	252.64	2,121.65	-254.72	-544.61	600.67	1.50	1.49	0.56
2,313.00	18.91	251.93	2,210.43	-264.11	-574.02	631.43	0.61	-0.55	-0.76
2,408.00	17.95	251.72	2,300.56	-273.48	-602.55	661.37	1.01	-1.01	-0.22
2,502.00	18.64	251.23	2,389.81	-282.85	-630.53	690.80	0.75	0.73	-0.52
2,597.00	17.97	250.78	2,480.00	-292.56	-658.74	720.58	0.72	-0.71	-0.47
2,691.00	19.35	248.95	2,569.06	-302.93	-686.97	750.63	1.59	1.47	-1.95
2,786.00	18.67	250.16	2,658.88	-313.74	-715.96	781.55	0.83	-0.72	1.27
2,880.00	18.64	250.00	2,747.94	-323.99	-744.23	811.58	0.06	-0.03	-0.17
2,975.00	20.16	251.61	2,837.54	-334.35	-774.03	843.08	1.70	1.60	1.69
3,069.00	19.17	250.88	2,926.06	-344.51	-803.99	874.64	1.09	-1.05	-0.78
3,164.00	20.31	251.14	3,015.47	-354.95	-834.33	906.66	1.20	1.20	0.27
3,258.00	19.61	249.91	3,103.83	-365.64	-864.58	938.70	0.87	-0.74	-1.31
3,363.00	19.29	250.02	3,202.84	-377.62	-897.43	973.63	0.31	-0.30	0.10
3,447.00	18.73	250.09	3,282.25	-386.95	-923.15	1,000.96	0.67	-0.67	0.08
3,541.00	19.70	247.98	3,371.02	-398.03	-952.03	1,031.88	1.27	1.03	-2.24
3,636.00	19.39	248.02	3,460.54	-409.94	-981.49	1,063.66	0.33	-0.33	0.04
3,731.00	18.22	246.88	3,550.47	-421.67	-1,009.78	1,094.28	1.29	-1.23	-1.20
3,825.00	19.83	247.05	3,639.33	-433.66	-1,037.98	1,124.92	1.71	1.71	0.18
3,920.00	19.18	247.20	3,728.88	-445.99	-1,067.20	1,156.64	0.69	-0.68	0.16
4,014.00	18.73	247.10	3,817.78	-457.85	-1,095.34	1,187.18	0.48	-0.48	-0.11
4,109.00	18.11	249.56	3,907.92	-468.94	-1,123.23	1,217.18	1.05	-0.65	2.59
4,204.00	18.88	247.29	3,998.01	-480.03	-1,151.24	1,247.31	1.11	0.81	-2.39
4,298.00	18.39	248.09	4,087.08	-491.44	-1,179.03	1,277.35	0.59	-0.52	0.85
4,392.00	19.46	246.78	4,176.00	-503.14	-1,207.17	1,307.83	1.22	1.14	-1.39
4,487.00	18.68	246.19	4,265.79	-515.52	-1,235.64	1,338.86	0.85	-0.82	-0.62
4,582.00	17.26	247.09	4,356.15	-527.15	-1,262.54	1,368.17	1.52	-1.49	0.95

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Well:	RU 314-17	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)	
4,676.00	19.08	245.46	4,445.46	-538.96	-1,289.36	1,397.47	2.01	1.94	-1.73	
4,771.00	17.97	245.14	4,535.54	-551.57	-1,316.78	1,427.63	1.17	-1.17	-0.34	
4,865.00	19.22	247.95	4,624.63	-563.48	-1,344.28	1,457.60	1.64	1.33	2.99	
4,960.00	18.37	248.83	4,714.56	-574.76	-1,372.74	1,488.20	0.94	-0.89	0.93	
5,054.00	17.35	249.71	4,804.03	-584.97	-1,399.70	1,517.01	1.12	-1.09	0.94	
5,149.00	18.27	246.39	4,894.48	-595.84	-1,426.63	1,546.06	1.44	0.97	-3.49	
5,243.00	17.11	247.37	4,984.03	-607.06	-1,452.89	1,574.62	1.27	-1.23	1.04	
5,337.00	17.99	255.63	5,073.67	-615.99	-1,479.72	1,602.82	2.81	0.94	8.79	
5,432.00	19.63	253.85	5,163.60	-624.07	-1,509.26	1,633.20	1.83	1.73	-1.87	
5,526.00	18.83	254.03	5,252.35	-632.63	-1,539.01	1,663.95	0.85	-0.85	0.19	
5,621.00	20.46	250.84	5,341.82	-642.30	-1,569.44	1,695.76	2.05	1.72	-3.36	
5,715.00	19.45	251.59	5,430.18	-652.64	-1,599.81	1,727.77	1.11	-1.07	0.80	
5,810.00	18.38	252.77	5,520.05	-662.07	-1,629.12	1,758.46	1.20	-1.13	1.24	
5,904.00	20.05	249.03	5,608.81	-672.23	-1,658.33	1,789.32	2.21	1.78	-3.98	
5,998.00	19.26	247.80	5,697.33	-683.85	-1,687.73	1,820.94	0.95	-0.84	-1.31	
6,092.00	18.65	249.15	5,786.23	-695.06	-1,716.13	1,851.46	0.80	-0.65	1.43	
6,187.00	19.96	249.91	5,875.89	-706.04	-1,745.55	1,882.85	1.40	1.38	0.80	
6,281.00	19.03	250.29	5,964.50	-716.72	-1,775.05	1,914.18	1.00	-0.99	0.40	
6,380.00	19.52	247.19	6,057.95	-728.57	-1,805.49	1,946.84	1.15	0.49	-3.13	
6,475.00	18.57	246.94	6,147.75	-740.65	-1,834.04	1,977.84	1.00	-1.00	-0.26	
6,570.00	18.43	249.54	6,237.84	-751.83	-1,862.03	2,007.97	0.88	-0.15	2.74	
6,664.00	19.12	240.74	6,326.86	-764.55	-1,889.39	2,038.12	3.10	0.73	-9.36	
6,759.00	18.73	240.07	6,416.73	-779.76	-1,916.18	2,068.70	0.47	-0.41	-0.71	
6,854.00	18.07	239.32	6,506.87	-794.89	-1,942.07	2,098.41	0.74	-0.69	-0.79	
6,948.00	17.12	239.33	6,596.47	-809.39	-1,966.51	2,126.55	1.01	-1.01	0.01	
7,043.00	16.88	238.66	6,687.32	-823.69	-1,990.31	2,154.02	0.33	-0.25	-0.71	
7,138.00	16.80	240.33	6,778.25	-837.66	-2,014.02	2,181.28	0.52	-0.08	1.76	
7,232.00	15.48	239.72	6,868.54	-850.71	-2,036.66	2,207.19	1.42	-1.40	-0.65	
7,327.00	14.60	240.07	6,960.28	-863.08	-2,057.99	2,231.63	0.93	-0.93	0.37	
7,422.00	12.69	242.17	7,052.60	-873.93	-2,077.59	2,253.90	2.08	-2.01	2.21	
7,516.00	10.82	243.58	7,144.62	-882.67	-2,094.63	2,272.98	2.01	-1.99	1.50	
7,611.00	9.58	243.58	7,238.12	-890.16	-2,109.69	2,289.77	1.31	-1.31	0.00	
7,706.00	8.62	242.27	7,331.92	-896.99	-2,123.07	2,304.75	1.03	-1.01	-1.38	
7,800.00	6.16	247.28	7,425.14	-902.22	-2,133.96	2,316.81	2.70	-2.62	5.33	
7,895.00	5.28	244.90	7,519.66	-906.04	-2,142.62	2,326.27	0.96	-0.93	-2.51	
7,989.00	4.23	252.85	7,613.34	-908.90	-2,149.85	2,334.04	1.32	-1.12	8.46	
8,084.00	3.08	260.20	7,708.14	-910.36	-2,155.71	2,340.02	1.30	-1.21	7.74	
8,179.00	2.29	253.60	7,803.04	-911.33	-2,160.05	2,344.40	0.89	-0.83	-6.95	
8,273.00	0.97	230.58	7,897.00	-912.37	-2,162.47	2,347.03	1.54	-1.40	-24.49	
8,368.00	0.70	241.12	7,991.99	-913.16	-2,163.60	2,348.37	0.33	-0.28	11.09	
8,463.00	1.41	231.10	8,086.97	-914.17	-2,165.01	2,350.07	0.77	0.75	-10.55	
8,557.00	0.70	283.49	8,180.96	-914.77	-2,166.47	2,351.64	1.20	-0.76	55.73	
8,652.00	0.44	319.26	8,275.95	-914.35	-2,167.27	2,352.23	0.45	-0.27	37.65	
8,747.00	0.26	287.79	8,370.95	-914.01	-2,167.72	2,352.51	0.27	-0.19	-33.13	

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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)
8,841.00	0.70	316.97	8,464.95	-913.53	-2,168.31	2,352.87	0.52	0.47	31.04
8,936.00	0.88	322.77	8,559.94	-912.52	-2,169.15	2,353.26	0.21	0.19	6.11
9,031.00	0.97	341.58	8,654.93	-911.18	-2,169.84	2,353.38	0.33	0.09	19.80
9,126.00	1.06	322.86	8,749.91	-909.71	-2,170.63	2,353.54	0.36	0.09	-19.71
9,220.00	1.48	332.09	8,843.89	-907.95	-2,171.72	2,353.88	0.50	0.45	9.82
9,315.00	0.62	285.33	8,938.87	-906.73	-2,172.79	2,354.40	1.21	-0.91	-49.22
9,409.00	0.70	292.01	9,032.87	-906.38	-2,173.82	2,355.21	0.12	0.09	7.11
9,504.00	0.88	320.93	9,127.86	-905.60	-2,174.81	2,355.83	0.45	0.19	30.44
9,598.00	1.14	346.86	9,221.85	-904.12	-2,175.48	2,355.88	0.55	0.28	27.59
9,692.00	1.41	337.54	9,315.82	-902.15	-2,176.14	2,355.72	0.36	0.29	-9.91
9,787.00	1.14	340.62	9,410.80	-900.17	-2,176.90	2,355.67	0.29	-0.28	3.24
9,881.00	1.41	322.42	9,504.78	-898.37	-2,177.91	2,355.91	0.51	0.29	-19.36
9,975.00	1.32	317.41	9,598.75	-896.66	-2,179.35	2,356.58	0.16	-0.10	-5.33
10,070.00	1.32	292.36	9,693.72	-895.44	-2,181.10	2,357.73	0.60	0.00	-26.37
10,164.00	1.76	295.79	9,787.69	-894.40	-2,183.40	2,359.46	0.48	0.47	3.65
10,258.00	2.20	295.70	9,881.63	-892.99	-2,186.33	2,361.62	0.47	0.47	-0.10
10,353.00	1.85	308.80	9,976.57	-891.24	-2,189.17	2,363.57	0.61	-0.37	13.79
10,447.00	0.97	319.17	10,070.55	-889.68	-2,190.87	2,364.54	0.97	-0.94	11.03
10,541.00	0.53	328.53	10,164.54	-888.71	-2,191.62	2,364.86	0.48	-0.47	9.96
10,636.00	0.79	343.87	10,259.53	-887.71	-2,192.03	2,364.85	0.33	0.27	16.15
10,679.00	1.14	351.51	10,302.52	-887.00	-2,192.17	2,364.71	0.87	0.81	17.77
Last SDI Production MWD Survey									
10,738.00	1.14	351.51	10,361.51	-885.84	-2,192.35	2,364.43	0.00	0.00	0.00
Projection to TD - PBHL(RU_314-17)									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
124.00	123.99	-0.23	-1.21	First SDI Gyro MWD Survey
1,092.00	1,057.83	-108.46	-203.34	Last SDI Gyro MWD Survey
1,180.00	1,140.17	-121.94	-231.31	First SDI Production MWD Survey
10,679.00	10,302.52	-887.00	-2,192.17	Last SDI Production MWD Survey
10,738.00	10,361.51	-885.84	-2,192.35	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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