





## 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.	PA 32-24
County & State	Garfield County, CO
SDI Job No.	OP.013147
Rig	H&P 271

I, Mel Mireles Jr., having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 58 feet to a measured depth of 9,278 feet is true and correct as determined from all available records.

A handwritten signature in black ink, appearing to read 'Mel Mireles Jr.', written over a horizontal line.

Signature

03-Oct-18

Date

### Mel Mireles Jr.

Grand Junction Assistant Well Planner  
Scientific Drilling - Colorado District

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 32-24 - Slot PA 32-24 (B6)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5733' & RKB 24' @ 5757.00usft
<b>Site:</b>	RWF 13-19 Pad	<b>MD Reference:</b>	GL 5733' & RKB 24' @ 5757.00usft
<b>Well:</b>	PA 32-24	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

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

Site		RWF 13-19 Pad			
Site Position:		Northing:	1,618,792.50 usft	Latitude:	39.5070510
From:	Map	Easting:	2,312,535.60 usft	Longitude:	-107.9367600
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.54 °

Well		PA 32-24 - Slot PA 32-24 (B6)				
Well Position	+N/-S	0.00 usft	Northing:	1,618,792.50 usft	Latitude:	39.5070510
	+E/-W	0.00 usft	Easting:	2,312,535.60 usft	Longitude:	-107.9367600
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,733.00 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	9/19/2018	9.35	65.75	51,572

<b>Design</b>	OH				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	305.00	

<b>Survey Program</b>	<b>Date</b>	10/3/2018			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
58.00	586.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
658.00	1,030.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,175.00	9,278.00	Survey #3 - Production MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
58.00	0.09	256.29	58.00	-0.01	-0.04	0.03	0.16	0.16	0.00	
<b>First SDI Gyro MWD Survey</b>										
126.00	0.88	317.46	126.00	0.36	-0.45	0.58	1.24	1.16	89.96	
216.00	3.52	301.11	215.92	2.30	-3.28	4.01	2.99	2.93	-18.17	
310.00	7.13	301.99	309.50	6.88	-10.70	12.71	3.84	3.84	0.94	
402.00	10.82	304.98	400.36	14.86	-22.63	27.06	4.04	4.01	3.25	
494.00	14.52	308.41	490.11	26.98	-38.74	47.21	4.10	4.02	3.73	
586.00	18.12	311.92	578.39	43.71	-58.43	72.94	4.06	3.91	3.82	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 32-24 - Slot PA 32-24 (B6)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5733' & RKB 24' @ 5757.00usft
<b>Site:</b>	RWF 13-19 Pad	<b>MD Reference:</b>	GL 5733' & RKB 24' @ 5757.00usft
<b>Well:</b>	PA 32-24	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
<b>Last SDI Gyro MWD Survey</b>									
658.00	21.27	311.63	646.17	59.87	-76.53	97.03	4.38	4.38	-0.40
<b>First SDI Surface MWD Survey</b>									
750.00	24.54	309.58	730.90	83.13	-103.74	132.66	3.66	3.55	-2.23
841.00	27.70	307.87	812.60	108.16	-135.00	172.63	3.57	3.47	-1.88
935.00	30.20	307.29	894.85	135.90	-171.07	218.08	2.68	2.66	-0.62
1,030.00	31.74	307.13	976.30	165.47	-210.00	266.93	1.62	1.62	-0.17
<b>Last SDI Surface MWD Survey</b>									
1,175.00	33.59	305.64	1,098.36	211.86	-273.01	345.16	1.39	1.28	-1.03
<b>First SDI Production MWD Survey</b>									
1,269.00	34.55	305.12	1,176.23	242.35	-315.95	397.82	1.07	1.02	-0.55
1,363.00	35.00	308.18	1,253.45	274.35	-358.94	451.39	1.92	0.48	3.26
1,458.00	35.81	307.87	1,330.88	308.25	-402.30	506.35	0.87	0.85	-0.33
1,552.00	34.90	309.82	1,407.54	342.36	-444.66	560.62	1.54	-0.97	2.07
1,646.00	35.08	309.35	1,484.55	376.70	-486.21	614.35	0.34	0.19	-0.50
1,741.00	35.03	307.91	1,562.32	410.77	-528.83	668.80	0.87	-0.05	-1.52
1,835.00	33.87	309.20	1,639.84	443.90	-570.41	721.87	1.46	-1.23	1.37
1,929.00	33.94	308.86	1,717.85	476.92	-611.15	774.17	0.22	0.07	-0.36
2,024.00	32.68	309.66	1,797.24	509.93	-651.54	826.20	1.40	-1.33	0.84
2,118.00	32.70	308.87	1,876.36	542.06	-690.85	876.82	0.45	0.02	-0.84
2,212.00	33.42	308.17	1,955.14	573.99	-730.97	928.01	0.87	0.77	-0.74
2,307.00	32.80	309.53	2,034.71	606.54	-771.39	979.78	1.02	-0.65	1.43
2,401.00	32.56	309.45	2,113.83	638.82	-810.56	1,030.38	0.26	-0.26	-0.09
2,495.00	32.17	309.46	2,193.23	670.79	-849.41	1,080.55	0.41	-0.41	0.01
2,590.00	32.55	309.38	2,273.48	703.08	-888.69	1,131.24	0.40	0.40	-0.08
2,684.00	32.11	308.92	2,352.90	734.82	-927.67	1,181.38	0.54	-0.47	-0.49
2,778.00	31.68	308.31	2,432.71	765.82	-966.48	1,230.95	0.57	-0.46	-0.65
2,873.00	31.99	308.22	2,513.42	796.85	-1,005.82	1,280.97	0.33	0.33	-0.09
2,967.00	31.79	307.77	2,593.23	827.42	-1,044.96	1,330.57	0.33	-0.21	-0.48
3,062.00	30.99	307.44	2,674.33	857.62	-1,084.16	1,380.00	0.86	-0.84	-0.35
3,156.00	31.77	309.04	2,754.58	887.91	-1,122.59	1,428.86	1.21	0.83	1.70
3,250.00	31.89	309.01	2,834.44	919.13	-1,161.11	1,478.31	0.13	0.13	-0.03
3,344.00	30.77	309.10	2,914.74	949.92	-1,199.06	1,527.07	1.19	-1.19	0.10
3,439.00	31.52	311.09	2,996.04	981.57	-1,236.64	1,576.00	1.34	0.79	2.09
3,533.00	30.29	311.64	3,076.70	1,013.48	-1,272.87	1,623.98	1.34	-1.31	0.59
3,627.00	31.55	310.88	3,157.34	1,045.32	-1,309.18	1,671.99	1.40	1.34	-0.81
3,721.00	30.25	311.41	3,237.99	1,077.08	-1,345.54	1,719.99	1.41	-1.38	0.56
3,816.00	31.15	309.82	3,319.68	1,108.64	-1,382.36	1,768.25	1.28	0.95	-1.67
3,910.00	32.80	309.44	3,399.42	1,140.39	-1,420.70	1,817.87	1.77	1.76	-0.40
4,004.00	31.48	309.68	3,479.01	1,172.24	-1,459.25	1,867.71	1.41	-1.40	0.26
4,099.00	30.69	309.59	3,560.37	1,203.52	-1,497.02	1,916.60	0.83	-0.83	-0.09
4,193.00	33.60	308.33	3,639.95	1,234.95	-1,535.92	1,966.49	3.18	3.10	-1.34
4,287.00	32.73	308.42	3,718.64	1,266.87	-1,576.24	2,017.82	0.93	-0.93	0.10
4,382.00	31.47	308.38	3,799.11	1,298.23	-1,615.80	2,068.22	1.33	-1.33	-0.04

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<b>Well:</b>	PA 32-24	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
4,476.00	30.44	308.83	3,879.72	1,328.40	-1,653.58	2,116.47	1.12	-1.10	0.48
4,570.00	29.39	308.76	3,961.20	1,357.77	-1,690.12	2,163.25	1.12	-1.12	-0.07
4,664.00	28.67	308.71	4,043.39	1,386.31	-1,725.70	2,208.76	0.77	-0.77	-0.05
4,759.00	27.59	309.28	4,127.16	1,414.49	-1,760.51	2,253.45	1.17	-1.14	0.60
4,853.00	26.10	310.69	4,211.03	1,441.75	-1,793.04	2,295.73	1.72	-1.59	1.50
4,947.00	26.95	307.22	4,295.14	1,468.12	-1,825.69	2,337.59	1.88	0.90	-3.69
5,041.00	28.14	307.30	4,378.48	1,494.44	-1,860.28	2,381.03	1.27	1.27	0.09
5,134.00	26.82	306.95	4,460.99	1,520.34	-1,894.50	2,423.91	1.43	-1.42	-0.38
5,323.00	28.59	308.45	4,628.32	1,574.10	-1,963.99	2,511.67	1.01	0.94	0.79
5,417.00	27.00	307.30	4,711.47	1,601.01	-1,998.58	2,555.45	1.79	-1.69	-1.22
5,512.00	24.63	304.60	4,796.99	1,625.33	-2,032.04	2,596.80	2.78	-2.49	-2.84
5,606.00	23.82	313.45	4,882.74	1,649.51	-2,061.95	2,635.17	3.95	-0.86	9.41
5,701.00	24.09	313.81	4,969.55	1,676.13	-2,089.87	2,673.31	0.32	0.28	0.38
5,795.00	23.30	316.36	5,055.63	1,702.86	-2,116.54	2,710.49	1.38	-0.84	2.71
5,889.00	21.19	316.62	5,142.63	1,728.67	-2,141.05	2,745.36	2.25	-2.24	0.28
5,984.00	19.28	316.87	5,231.76	1,752.60	-2,163.56	2,777.53	2.01	-2.01	0.26
6,078.00	16.36	317.59	5,321.24	1,773.70	-2,183.10	2,805.65	3.12	-3.11	0.77
6,172.00	15.33	309.48	5,411.68	1,791.38	-2,201.63	2,830.96	2.60	-1.10	-8.63
6,267.00	15.37	308.37	5,503.29	1,807.18	-2,221.19	2,856.05	0.31	0.04	-1.17
6,361.00	15.01	308.70	5,594.01	1,822.52	-2,240.46	2,880.63	0.39	-0.38	0.35
6,455.00	12.62	303.34	5,685.29	1,835.78	-2,258.54	2,903.04	2.88	-2.54	-5.70
6,525.94	10.95	301.72	5,754.73	1,843.58	-2,270.74	2,917.52	2.41	-2.36	-2.28
PA 32-24 KMV									
6,550.00	10.38	301.06	5,778.37	1,845.90	-2,274.54	2,921.96	2.41	-2.35	-2.76
6,644.00	7.83	303.26	5,871.18	1,853.78	-2,287.15	2,936.81	2.74	-2.71	2.34
6,739.00	5.28	308.97	5,965.55	1,860.08	-2,295.96	2,947.64	2.77	-2.68	6.01
6,833.00	2.99	317.32	6,059.30	1,864.60	-2,300.99	2,954.35	2.51	-2.44	8.88
6,927.00	1.06	311.61	6,153.24	1,866.98	-2,303.30	2,957.61	2.06	-2.05	-6.07
7,022.00	0.09	224.86	6,248.24	1,867.51	-2,304.01	2,958.50	1.11	-1.02	-91.32
7,116.00	0.55	108.33	6,342.23	1,867.32	-2,303.63	2,958.08	0.63	0.49	-123.97
7,210.00	0.88	139.69	6,436.23	1,866.63	-2,302.74	2,956.95	0.53	0.35	33.36
7,304.00	0.94	141.80	6,530.21	1,865.47	-2,301.80	2,955.51	0.07	0.06	2.24
7,399.00	1.14	144.62	6,625.20	1,864.09	-2,300.77	2,953.87	0.22	0.21	2.97
7,493.00	1.40	143.43	6,719.18	1,862.40	-2,299.54	2,951.90	0.28	0.28	-1.27
7,588.00	0.18	100.32	6,814.17	1,861.44	-2,298.70	2,950.67	1.34	-1.28	-45.38
7,682.00	0.61	78.13	6,908.16	1,861.52	-2,298.07	2,950.19	0.48	0.46	-23.61
7,777.00	0.79	102.96	7,003.16	1,861.48	-2,296.93	2,949.24	0.37	0.19	26.14
7,871.00	0.79	105.33	7,097.15	1,861.16	-2,295.68	2,948.03	0.03	0.00	2.52
7,966.00	0.78	97.27	7,192.14	1,860.91	-2,294.41	2,946.84	0.12	-0.01	-8.48
8,060.00	0.53	87.14	7,286.13	1,860.85	-2,293.34	2,945.93	0.29	-0.27	-10.78
8,155.00	0.77	5.43	7,381.13	1,861.50	-2,292.84	2,945.90	0.92	0.25	-86.01
8,249.00	0.79	4.78	7,475.12	1,862.78	-2,292.72	2,946.53	0.02	0.02	-0.69
8,344.00	0.62	21.87	7,570.11	1,863.91	-2,292.48	2,946.98	0.28	-0.18	17.99

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<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

Survey										
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8,438.00	0.72	301.55	7,664.11	1,864.69	-2,292.79	2,947.69	0.92	0.11	-85.45	
8,532.00	0.70	269.51	7,758.10	1,864.99	-2,293.87	2,948.74	0.42	-0.02	-34.09	
8,627.00	1.51	275.33	7,853.08	1,865.10	-2,295.70	2,950.30	0.86	0.85	6.13	
8,721.00	1.58	279.09	7,947.05	1,865.42	-2,298.21	2,952.54	0.13	0.07	4.00	
8,815.00	1.29	294.41	8,041.02	1,866.07	-2,300.45	2,954.75	0.51	-0.31	16.30	
8,910.00	0.95	320.93	8,136.00	1,867.12	-2,301.92	2,956.56	0.64	-0.36	27.92	
9,004.00	1.40	1.61	8,229.98	1,868.87	-2,302.38	2,957.94	0.98	0.48	43.28	
9,099.00	1.48	18.62	8,324.95	1,871.20	-2,301.96	2,958.92	0.46	0.08	17.91	
9,193.00	1.29	22.56	8,418.93	1,873.32	-2,301.16	2,959.49	0.23	-0.20	4.19	
9,218.00	1.06	30.18	8,443.92	1,873.78	-2,300.94	2,959.57	1.11	-0.92	30.48	
Last SDI Production MWD Survey										
9,278.00	1.06	30.18	8,503.91	1,874.74	-2,300.38	2,959.67	0.00	0.00	0.00	
Projection to TD - PA 32-24 PBHL										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
58.00	58.00	-0.01	-0.04	First SDI Gyro MWD Survey	
586.00	578.39	43.71	-58.43	Last SDI Gyro MWD Survey	
658.00	646.17	59.87	-76.53	First SDI Surface MWD Survey	
1,030.00	976.30	165.47	-210.00	Last SDI Surface MWD Survey	
1,175.00	1,098.36	211.86	-273.01	First SDI Production MWD Survey	
9,218.00	8,443.92	1,873.78	-2,300.94	Last SDI Production MWD Survey	
9,278.00	8,503.91	1,874.74	-2,300.38	Projection to TD	

Checked By: _____	Approved By: _____	Date: _____
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