



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 442-26
County & State	Garfield County, CO
SDI Job No.	OP.005434
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 194 feet to a measured depth of 8,287 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

4-Dec-17

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 442-26 - Slot PA 442-26 (B1)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5224' & RKB 24' @ 5248.00usft
Site:	PA 22-25 Pad	MD Reference:	GL 5224' & RKB 24' @ 5248.00usft
Well:	PA 442-26	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		PA 22-25 Pad			
Site Position:		Northing:	1,615,186.77 usft	Latitude:	39.4968742
From:	Map	Easting:	2,308,728.18 usft	Longitude:	-107.9499045
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.55 °

Well	PA 442-26 - Slot PA 442-26 (B1), B1					
Well Position	+N/-S	0.00 usft	Northing:	1,615,200.04 usft	Latitude:	39.4969110
	+E/-W	0.00 usft	Easting:	2,308,733.03 usft	Longitude:	-107.9498886
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,224.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	10/28/2017	9.40	65.82	51,693

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	274.27	

Survey Program	Date	12/4/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
194.00	1,074.00	Survey #1 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,176.00	8,287.00	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	
0.05	0.00	255.78	0.05	0.00	0.00	0.00	0.00	0.00	0.00	
SHL (PA 442-26)										
194.00	1.04	255.78	193.99	-0.43	-1.71	1.67	0.54	0.54	0.00	
First SDI Surface MWD Survey										
287.00	2.96	281.52	286.93	-0.16	-4.88	4.85	2.23	2.06	27.68	
378.00	5.72	282.13	377.66	1.26	-11.62	11.68	3.03	3.03	0.67	
472.00	9.13	272.87	470.86	2.62	-23.65	23.78	3.83	3.63	-9.85	
563.00	12.34	270.79	560.26	3.12	-40.59	40.70	3.55	3.53	-2.29	

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Site:	PA 22-25 Pad	MD Reference:	GL 5224' & RKB 24' @ 5248.00usft
Well:	PA 442-26	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)
657.00	15.73	272.61	651.44	3.83	-63.36	63.47	3.64	3.61	1.94
748.00	19.07	275.24	738.26	5.75	-90.50	90.68	3.77	3.67	2.89
840.00	22.39	275.99	824.30	8.96	-122.90	123.23	3.62	3.61	0.82
934.00	24.96	274.18	910.38	12.27	-160.49	160.96	2.84	2.73	-1.93
1,029.00	26.75	274.26	995.87	15.32	-201.81	202.39	1.88	1.88	0.08
1,074.00	27.61	272.98	1,035.90	16.62	-222.32	222.94	2.31	1.91	-2.84
Last SDI Surface MWD Survey									
1,178.00	28.73	271.40	1,127.58	18.48	-271.38	272.00	1.29	1.08	-1.52
First SDI Production MWD Survey									
1,272.00	28.66	271.28	1,210.03	19.53	-316.50	317.08	0.10	-0.07	-0.13
1,367.00	27.97	271.30	1,293.67	20.55	-361.55	362.07	0.73	-0.73	0.02
1,462.00	28.94	276.12	1,377.20	23.51	-406.68	407.30	2.62	1.02	5.07
1,556.00	29.35	276.23	1,459.30	28.43	-452.20	453.06	0.44	0.44	0.12
1,651.00	27.66	276.14	1,542.78	33.32	-497.27	498.37	1.78	-1.78	-0.09
1,746.00	27.26	275.79	1,627.07	37.87	-540.84	542.16	0.45	-0.42	-0.37
1,840.00	24.98	278.19	1,711.47	42.87	-581.91	583.48	2.67	-2.43	2.55
1,935.00	24.17	277.72	1,797.87	48.34	-621.03	622.91	0.88	-0.85	-0.49
2,029.00	23.30	277.61	1,883.91	53.39	-658.53	660.68	0.93	-0.93	-0.12
2,124.00	22.60	275.57	1,971.40	57.65	-695.32	697.69	1.12	-0.74	-2.15
2,218.00	23.59	276.88	2,057.86	61.65	-731.98	734.53	1.19	1.05	1.39
2,313.00	23.36	276.42	2,145.00	66.04	-769.56	772.34	0.31	-0.24	-0.48
2,407.00	24.79	275.75	2,230.82	70.09	-807.69	810.67	1.55	1.52	-0.71
2,502.00	24.58	275.03	2,317.14	73.82	-847.19	850.34	0.39	-0.22	-0.76
2,596.00	24.55	276.01	2,402.63	77.58	-886.09	889.40	0.43	-0.03	1.04
2,691.00	24.02	275.12	2,489.22	81.37	-924.97	928.46	0.68	-0.56	-0.94
2,785.00	23.74	274.80	2,575.18	84.66	-962.88	966.51	0.33	-0.30	-0.34
2,880.00	23.09	274.40	2,662.35	87.69	-1,000.51	1,004.27	0.70	-0.68	-0.42
2,974.00	23.84	275.11	2,748.58	90.80	-1,037.81	1,041.69	0.85	0.80	0.76
3,069.00	23.10	275.18	2,835.72	94.19	-1,075.49	1,079.52	0.78	-0.78	0.07
3,163.00	23.89	276.12	2,921.93	97.89	-1,112.79	1,116.99	0.93	0.84	1.00
3,257.00	23.32	276.86	3,008.06	102.14	-1,150.18	1,154.60	0.68	-0.61	0.79
3,352.00	24.18	274.20	3,095.02	105.81	-1,188.26	1,192.84	1.45	0.91	-2.80
3,447.00	23.27	273.25	3,181.99	108.30	-1,226.40	1,231.06	1.04	-0.96	-1.00
3,542.00	24.50	275.92	3,268.85	111.39	-1,264.73	1,269.51	1.72	1.29	2.81
3,636.00	24.32	276.34	3,354.45	115.54	-1,303.35	1,308.34	0.27	-0.19	0.45
3,731.00	23.59	276.38	3,441.27	119.81	-1,341.69	1,346.89	0.77	-0.77	0.04
3,826.00	24.24	274.82	3,528.11	123.56	-1,380.01	1,385.38	0.95	0.68	-1.64
3,920.00	23.40	273.97	3,614.10	126.48	-1,417.86	1,423.35	0.97	-0.89	-0.90
4,015.00	22.78	273.61	3,701.49	128.94	-1,455.04	1,460.60	0.67	-0.65	-0.38
4,109.00	24.19	273.64	3,787.70	131.31	-1,492.42	1,498.06	1.50	1.50	0.03
4,204.00	23.35	275.13	3,874.65	134.23	-1,530.60	1,536.35	1.09	-0.88	1.57
4,299.00	23.78	272.90	3,961.73	136.88	-1,568.48	1,574.32	1.04	0.45	-2.35
4,393.00	23.26	272.90	4,047.92	138.78	-1,605.94	1,611.82	0.55	-0.55	0.00
4,488.00	22.52	273.05	4,135.43	140.70	-1,642.85	1,648.76	0.78	-0.78	0.16

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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)
4,583.00	22.38	274.07	4,223.23	142.95	-1,679.05	1,685.04	0.44	-0.15	1.07
4,677.00	20.71	274.50	4,310.66	145.52	-1,713.47	1,719.55	1.78	-1.78	0.46
4,772.00	18.69	276.21	4,400.10	148.49	-1,745.36	1,751.57	2.21	-2.13	1.80
4,803.08	18.13	276.67	4,429.58	149.59	-1,755.11	1,761.37	1.87	-1.81	1.47
PA 442-26 MVRD									
4,867.00	16.97	277.70	4,490.53	151.99	-1,774.23	1,780.62	1.87	-1.81	1.62
4,961.00	16.27	277.82	4,580.61	155.62	-1,800.87	1,807.46	0.75	-0.74	0.13
5,056.00	14.39	277.87	4,672.22	159.05	-1,825.75	1,832.53	1.98	-1.98	0.05
5,151.00	11.54	275.90	4,764.79	161.64	-1,846.90	1,853.81	3.04	-3.00	-2.07
5,245.00	10.25	276.56	4,857.09	163.56	-1,864.56	1,871.57	1.38	-1.37	0.70
5,340.00	9.27	277.30	4,950.72	165.50	-1,880.55	1,887.65	1.04	-1.03	0.78
5,434.00	8.40	277.46	5,043.60	167.36	-1,894.87	1,902.07	0.93	-0.93	0.17
5,529.00	7.72	279.00	5,137.66	169.26	-1,908.05	1,915.36	0.75	-0.72	1.62
5,624.00	7.27	277.41	5,231.85	171.03	-1,920.31	1,927.72	0.52	-0.47	-1.67
5,718.00	6.45	275.53	5,325.18	172.30	-1,931.46	1,938.93	0.90	-0.87	-2.00
5,813.00	6.09	273.42	5,419.61	173.12	-1,941.81	1,949.31	0.45	-0.38	-2.22
5,908.00	5.00	284.57	5,514.17	174.46	-1,950.84	1,958.42	1.61	-1.15	11.74
6,002.00	3.26	279.07	5,607.92	175.91	-1,957.45	1,965.12	1.90	-1.85	-5.85
6,097.00	2.83	274.13	5,702.78	176.51	-1,962.46	1,970.15	0.53	-0.45	-5.20
6,191.00	2.70	278.14	5,796.68	176.99	-1,966.96	1,974.68	0.25	-0.14	4.27
6,286.00	2.08	276.09	5,891.59	177.49	-1,970.89	1,978.64	0.66	-0.65	-2.16
6,380.00	2.14	269.08	5,985.53	177.64	-1,974.34	1,982.09	0.28	0.06	-7.46
6,475.00	1.08	333.46	6,080.50	178.41	-1,976.52	1,984.32	2.04	-1.12	67.77
6,569.00	0.88	319.94	6,174.48	179.76	-1,977.38	1,985.27	0.32	-0.21	-14.38
6,664.00	0.60	320.91	6,269.47	180.70	-1,978.16	1,986.12	0.30	-0.29	1.02
6,759.00	0.37	291.27	6,364.47	181.20	-1,978.76	1,986.76	0.35	-0.24	-31.20
6,853.00	0.27	211.28	6,458.47	181.12	-1,979.16	1,987.15	0.45	-0.11	-85.10
6,947.00	0.41	162.77	6,552.47	180.61	-1,979.17	1,987.13	0.33	0.15	-51.61
7,042.00	0.81	184.35	6,647.46	179.62	-1,979.12	1,987.00	0.48	0.42	22.72
7,136.00	1.36	190.61	6,741.45	177.86	-1,979.38	1,987.13	0.60	0.59	6.66
7,231.00	1.63	195.01	6,836.41	175.44	-1,979.94	1,987.50	0.31	0.28	4.63
7,325.00	0.27	55.30	6,930.40	174.28	-1,980.10	1,987.58	1.96	-1.45	-148.63
7,420.00	1.20	84.77	7,025.39	174.50	-1,978.92	1,986.43	1.03	0.98	31.02
7,514.00	1.69	87.42	7,119.36	174.65	-1,976.56	1,984.08	0.53	0.52	2.82
7,609.00	1.58	95.45	7,214.32	174.59	-1,973.86	1,981.38	0.27	-0.12	8.45
7,703.00	2.19	105.33	7,308.27	173.99	-1,970.83	1,978.32	0.73	0.65	10.51
7,798.00	2.20	110.94	7,403.20	172.86	-1,967.38	1,974.79	0.23	0.01	5.91
7,892.00	1.91	139.01	7,497.15	171.03	-1,964.67	1,971.95	1.10	-0.31	29.86
7,987.00	1.65	156.08	7,592.10	168.59	-1,963.08	1,970.18	0.62	-0.27	17.97
8,080.00	1.73	159.05	7,685.06	166.05	-1,962.03	1,968.95	0.13	0.09	3.19
8,174.00	2.20	165.23	7,779.01	162.98	-1,961.06	1,967.76	0.55	0.50	6.57
8,227.00	2.04	165.70	7,831.97	161.08	-1,960.57	1,967.12	0.30	-0.30	0.89
Last SDI Production MWD Survey									

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Site:	PA 22-25 Pad	MD Reference:	GL 5224' & RKB 24' @ 5248.00usft
Well:	PA 442-26	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)
8,287.00	2.04	165.70	7,891.93	159.01	-1,960.04	1,966.44	0.00	0.00	0.00
Projection to TD - PBHL (PA 442-26) - PA 442-26 PBHL									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
194.00	193.99	-0.43	-1.71	First SDI Surface MWD Survey	
1,074.00	1,035.90	16.62	-222.32	Last SDI Surface MWD Survey	
1,178.00	1,127.58	18.48	-271.38	First SDI Production MWD Survey	
8,227.00	7,831.97	161.08	-1,960.57	Last SDI Production MWD Survey	
8,287.00	7,891.93	159.01	-1,960.04	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____

