



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.	SR 514-12
County & State	Garfield County, CO
SDI Job No.	OP.007854
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 121 feet to a measured depth of 10,150 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

23-Feb-18

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SR 514-12 - Slot SR 514-12 (A10)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7478' & RKB 24' @ 7502.00usft (H&P 318)
Site:	SR 23-12 Pad	MD Reference:	GL 7478' & RKB 24' @ 7502.00usft (H&P 318)
Well:	SR 514-12	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		SR 23-12 Pad			
Site Position:		Northing:	1,597,713.40 usft	Latitude:	39.4511965
From:	Map	Easting:	2,340,229.70 usft	Longitude:	-107.8367194
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.47 °

Well		SR 514-12 - Slot SR 514-12 (A10)				
Well Position	+N/-S	0.00 usft	Northing:	1,597,650.50 usft	Latitude:	39.4510256
	+E/-W	0.00 usft	Easting:	2,340,254.10 usft	Longitude:	-107.8366273
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,478.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	2/4/2018	9.22	65.62	51,620

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	231.21	

Survey Program	Date	2/23/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
121.00	862.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
941.00	1,110.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,179.00	10,150.00	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	
121.00	0.79	247.76	121.00	-0.32	-0.77	0.80	0.65	0.65	0.00	
First SDI Gyro MWD Survey										
214.00	3.17	228.96	213.93	-2.25	-3.31	3.98	2.62	2.56	-20.22	
305.00	5.01	232.29	304.70	-6.33	-8.35	10.47	2.04	2.02	3.66	
398.00	6.95	235.20	397.19	-12.03	-16.18	20.15	2.11	2.09	3.13	
489.00	10.21	234.76	487.16	-19.82	-27.29	33.69	3.58	3.58	-0.48	
581.00	13.90	233.09	577.11	-31.17	-42.79	52.88	4.03	4.01	-1.82	
673.00	17.51	230.45	665.67	-46.62	-62.31	77.77	4.00	3.92	-2.87	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SR 514-12 - Slot SR 514-12 (A10)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7478' & RKB 24' @ 7502.00usft (H&P 318)
Site:	SR 23-12 Pad	MD Reference:	GL 7478' & RKB 24' @ 7502.00usft (H&P 318)
Well:	SR 514-12	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)
768.00	21.55	229.66	755.18	-67.03	-86.64	109.52	4.26	4.25	-0.83
862.00	23.84	230.27	841.90	-90.35	-114.41	145.77	2.45	2.44	0.65
Last SDI Gyro MWD Survey									
941.00	26.16	231.42	913.49	-111.41	-140.30	179.16	3.00	2.94	1.46
First SDI Surface MWD Survey									
1,036.00	28.44	230.22	997.91	-138.95	-174.06	222.72	2.47	2.40	-1.26
1,110.00	30.51	229.91	1,062.32	-162.33	-201.98	259.12	2.80	2.80	-0.42
Last SDI Surface MWD Survey									
1,179.00	31.22	230.62	1,121.55	-184.95	-229.20	294.52	1.16	1.03	1.03
First SDI Production MWD Survey									
1,274.00	30.82	230.78	1,202.97	-215.96	-267.09	343.47	0.43	-0.42	0.17
1,369.00	30.28	230.41	1,284.78	-246.61	-304.40	391.76	0.60	-0.57	-0.39
1,463.00	32.01	230.62	1,365.23	-277.52	-341.92	440.37	1.84	1.84	0.22
1,558.00	32.13	229.52	1,445.73	-309.90	-380.60	490.80	0.63	0.13	-1.16
1,653.00	32.20	228.16	1,526.15	-343.18	-418.67	541.32	0.77	0.07	-1.43
1,747.00	31.66	230.30	1,605.93	-375.65	-456.31	591.00	1.33	-0.57	2.28
1,842.00	31.51	234.32	1,686.87	-406.06	-495.66	640.72	2.22	-0.16	4.23
1,936.00	31.48	233.49	1,767.02	-434.99	-535.34	689.78	0.46	-0.03	-0.88
2,030.00	31.14	232.95	1,847.33	-464.23	-574.47	738.60	0.47	-0.36	-0.57
2,124.00	29.93	232.74	1,928.29	-493.08	-612.53	786.33	1.29	-1.29	-0.22
2,219.00	29.09	233.41	2,010.97	-521.19	-649.94	833.10	0.95	-0.88	0.71
2,313.00	30.63	234.53	2,092.49	-548.71	-687.79	879.85	1.74	1.64	1.19
2,408.00	30.24	234.38	2,174.40	-576.68	-726.95	927.89	0.42	-0.41	-0.16
2,503.00	29.24	234.83	2,256.88	-603.98	-765.36	974.93	1.08	-1.05	0.47
2,597.00	31.11	234.48	2,338.14	-631.32	-803.90	1,022.10	2.00	1.99	-0.37
2,691.00	29.39	234.82	2,419.34	-658.72	-842.52	1,069.36	1.84	-1.83	0.36
2,786.00	31.23	233.93	2,501.35	-686.65	-881.48	1,117.23	1.99	1.94	-0.94
2,880.00	30.87	234.46	2,581.88	-715.02	-920.80	1,165.65	0.48	-0.38	0.56
2,974.00	29.74	233.64	2,663.04	-742.86	-959.20	1,213.02	1.28	-1.20	-0.87
3,069.00	31.28	232.30	2,744.88	-771.91	-997.69	1,261.23	1.77	1.62	-1.41
3,163.00	30.59	231.19	2,825.51	-801.82	-1,035.64	1,309.54	0.95	-0.73	-1.18
3,258.00	29.26	231.69	2,907.84	-831.37	-1,072.69	1,356.93	1.42	-1.40	0.53
3,352.00	30.86	230.53	2,989.20	-860.94	-1,109.33	1,404.02	1.81	1.70	-1.23
3,447.00	29.76	229.14	3,071.21	-891.85	-1,145.97	1,451.94	1.37	-1.16	-1.46
3,541.00	32.03	230.15	3,151.87	-923.09	-1,182.76	1,500.19	2.48	2.41	1.07
3,636.00	31.07	231.01	3,232.83	-954.66	-1,221.16	1,549.89	1.12	-1.01	0.91
3,730.00	29.99	231.54	3,313.79	-984.53	-1,258.41	1,597.64	1.18	-1.15	0.56
3,825.00	32.32	232.23	3,395.09	-1,014.86	-1,297.08	1,646.78	2.48	2.45	0.73
3,919.00	30.60	231.54	3,475.26	-1,045.13	-1,335.68	1,695.83	1.87	-1.83	-0.73
4,014.00	28.54	232.38	3,557.89	-1,074.03	-1,372.59	1,742.71	2.21	-2.17	0.88
4,109.00	30.42	230.92	3,640.58	-1,103.04	-1,409.24	1,789.45	2.12	1.98	-1.54
4,204.00	29.06	229.89	3,723.07	-1,133.07	-1,445.56	1,836.57	1.53	-1.43	-1.08
4,299.00	27.23	230.47	3,806.83	-1,161.77	-1,479.97	1,881.37	1.95	-1.93	0.61
4,394.00	29.19	230.27	3,890.55	-1,190.42	-1,514.55	1,926.27	2.07	2.06	-0.21

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Site:	SR 23-12 Pad	MD Reference:	GL 7478' & RKB 24' @ 7502.00usft (H&P 318)
Well:	SR 514-12	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)
4,489.00	28.05	230.56	3,973.94	-1,219.41	-1,549.62	1,971.77	1.21	-1.20	0.31
4,584.00	26.86	231.06	4,058.24	-1,247.09	-1,583.57	2,015.57	1.28	-1.25	0.53
4,678.00	25.70	230.74	4,142.52	-1,273.34	-1,615.87	2,057.19	1.24	-1.23	-0.34
4,772.00	24.01	230.88	4,227.81	-1,298.31	-1,646.49	2,096.70	1.80	-1.80	0.15
4,867.00	22.60	231.06	4,315.06	-1,321.97	-1,675.68	2,134.28	1.49	-1.48	0.19
4,961.00	20.93	231.67	4,402.35	-1,343.74	-1,702.90	2,169.13	1.79	-1.78	0.65
5,055.00	19.62	231.67	4,490.53	-1,363.94	-1,728.45	2,201.70	1.39	-1.39	0.00
5,149.00	18.08	231.95	4,579.48	-1,382.72	-1,752.32	2,232.07	1.64	-1.64	0.30
5,244.00	16.83	232.82	4,670.11	-1,400.12	-1,774.89	2,260.56	1.34	-1.32	0.92
5,338.00	15.93	231.81	4,760.29	-1,416.32	-1,795.87	2,287.06	1.00	-0.96	-1.07
5,433.00	15.19	231.75	4,851.81	-1,432.08	-1,815.89	2,312.55	0.78	-0.78	-0.06
5,527.00	14.52	233.43	4,942.67	-1,446.73	-1,835.03	2,336.64	0.85	-0.71	1.79
5,622.00	13.10	226.84	5,034.92	-1,461.19	-1,852.44	2,359.27	2.23	-1.49	-6.94
5,716.00	12.53	225.59	5,126.58	-1,475.61	-1,867.50	2,380.04	0.67	-0.61	-1.33
5,810.00	10.46	222.09	5,218.69	-1,489.08	-1,880.50	2,398.62	2.32	-2.20	-3.72
5,905.00	10.03	223.20	5,312.18	-1,501.51	-1,891.95	2,415.32	0.50	-0.45	1.17
5,999.00	8.54	217.61	5,404.94	-1,513.01	-1,901.81	2,430.21	1.85	-1.59	-5.95
6,094.00	7.39	214.09	5,499.03	-1,523.66	-1,909.54	2,442.91	1.31	-1.21	-3.71
6,188.00	5.54	198.10	5,592.43	-1,532.98	-1,914.34	2,452.49	2.73	-1.97	-17.01
6,283.00	5.10	200.12	5,687.02	-1,541.30	-1,917.22	2,459.95	0.50	-0.46	2.13
6,377.00	4.66	198.80	5,780.68	-1,548.84	-1,919.89	2,466.75	0.48	-0.47	-1.40
6,472.00	4.13	194.76	5,875.40	-1,555.80	-1,922.00	2,472.76	0.65	-0.56	-4.25
6,517.81	3.88	197.61	5,921.10	-1,558.87	-1,922.89	2,475.37	0.70	-0.55	6.23
SR 514-12 BTV									
6,567.00	3.62	201.11	5,970.19	-1,561.91	-1,923.95	2,478.10	0.70	-0.52	7.11
6,661.00	3.63	196.19	6,064.00	-1,567.53	-1,925.85	2,483.11	0.33	0.01	-5.23
6,756.00	3.01	202.19	6,158.84	-1,572.73	-1,927.63	2,487.75	0.75	-0.65	6.32
6,851.00	2.37	193.61	6,253.73	-1,576.95	-1,929.04	2,491.49	0.79	-0.67	-9.03
6,946.00	2.27	194.79	6,348.66	-1,580.68	-1,929.98	2,494.56	0.12	-0.11	1.24
7,040.00	2.20	197.57	6,442.58	-1,584.20	-1,931.00	2,497.56	0.14	-0.07	2.96
7,135.00	1.50	200.99	6,537.53	-1,587.10	-1,931.99	2,500.15	0.75	-0.74	3.60
7,230.00	0.80	289.49	6,632.52	-1,588.04	-1,933.06	2,501.57	1.77	-0.74	93.16
7,324.00	1.07	300.40	6,726.51	-1,587.37	-1,934.44	2,502.23	0.34	0.29	11.61
7,419.00	1.21	320.45	6,821.49	-1,586.15	-1,935.84	2,502.56	0.44	0.15	21.11
7,514.00	0.97	326.17	6,916.47	-1,584.71	-1,936.93	2,502.50	0.28	-0.25	6.02
7,609.00	1.06	315.08	7,011.46	-1,583.42	-1,938.00	2,502.53	0.23	0.09	-11.67
7,703.00	1.14	326.68	7,105.44	-1,582.02	-1,939.13	2,502.53	0.25	0.09	12.34
7,798.00	1.06	353.93	7,200.42	-1,580.36	-1,939.74	2,501.97	0.55	-0.08	28.68
7,893.00	1.06	358.06	7,295.41	-1,578.61	-1,939.86	2,500.96	0.08	0.00	4.35
7,987.00	1.44	357.52	7,389.38	-1,576.56	-1,939.94	2,499.74	0.40	0.40	-0.57
8,082.00	1.27	349.15	7,484.36	-1,574.33	-1,940.19	2,498.54	0.27	-0.18	-8.81
8,177.00	1.58	339.69	7,579.33	-1,572.07	-1,940.84	2,497.64	0.41	0.33	-9.96
8,271.00	1.83	345.12	7,673.29	-1,569.40	-1,941.68	2,496.62	0.32	0.27	5.78

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Well:	SR 514-12	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)
8,366.00	0.53	335.56	7,768.26	-1,567.54	-1,942.25	2,495.89	1.38	-1.37	-10.06
8,461.00	0.26	323.96	7,863.26	-1,566.96	-1,942.56	2,495.77	0.29	-0.28	-12.21
8,555.00	1.06	357.88	7,957.26	-1,565.92	-1,942.72	2,495.24	0.91	0.85	36.09
8,650.00	1.14	341.71	8,052.24	-1,564.15	-1,943.05	2,494.39	0.34	0.08	-17.02
8,744.00	1.23	343.64	8,146.22	-1,562.29	-1,943.62	2,493.68	0.10	0.10	2.05
8,839.00	0.88	315.69	8,241.20	-1,560.79	-1,944.42	2,493.36	0.64	-0.37	-29.42
8,934.00	1.13	333.76	8,336.19	-1,559.43	-1,945.34	2,493.22	0.42	0.26	19.02
9,028.00	1.02	313.49	8,430.17	-1,558.02	-1,946.36	2,493.14	0.42	-0.12	-21.56
9,123.00	1.23	315.21	8,525.15	-1,556.71	-1,947.69	2,493.36	0.22	0.22	1.81
9,218.00	1.26	310.28	8,620.13	-1,555.32	-1,949.21	2,493.66	0.12	0.03	-5.19
9,312.00	0.26	168.83	8,714.12	-1,554.86	-1,949.95	2,493.95	1.57	-1.06	-150.48
9,407.00	0.79	233.34	8,809.12	-1,555.46	-1,950.44	2,494.71	0.76	0.56	67.91
9,502.00	1.50	252.16	8,904.10	-1,556.23	-1,952.15	2,496.53	0.84	0.75	19.81
9,596.00	2.20	249.25	8,998.05	-1,557.25	-1,955.01	2,499.39	0.75	0.74	-3.10
9,691.00	2.73	240.11	9,092.96	-1,559.02	-1,958.67	2,503.36	0.69	0.56	-9.62
9,785.00	2.29	244.50	9,186.87	-1,560.94	-1,962.31	2,507.40	0.51	-0.47	4.67
9,880.00	2.40	234.46	9,281.79	-1,562.92	-1,965.64	2,511.23	0.45	0.12	-10.57
9,975.00	2.29	207.41	9,376.72	-1,565.76	-1,968.13	2,514.95	1.16	-0.12	-28.47
10,070.00	1.76	214.18	9,471.66	-1,568.65	-1,969.83	2,518.09	0.61	-0.56	7.13
10,089.00	2.02	218.49	9,490.65	-1,569.15	-1,970.20	2,518.69	1.56	1.37	22.68
Last SDI Production MWD Survey									
10,150.00	2.02	218.49	9,551.61	-1,570.84	-1,971.54	2,520.79	0.00	0.00	0.00
Projection to TD - SR 514-12 PBHL									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
121.00	121.00	-0.32	-0.77	First SDI Gyro MWD Survey
862.00	841.90	-90.35	-114.41	Last SDI Gyro MWD Survey
941.00	913.49	-111.41	-140.30	First SDI Surface MWD Survey
1,110.00	1,062.32	-162.33	-201.98	Last SDI Surface MWD Survey
1,179.00	1,121.55	-184.95	-229.20	First SDI Production MWD Survey
10,089.00	9,490.65	-1,569.15	-1,970.20	Last SDI Production MWD Survey
10,150.00	9,551.61	-1,570.84	-1,971.54	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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