



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.	TR 13-24-597
County & State	Garfield County, CO
SDI Job No.	OP.001437 & OP.002781
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 143 feet to a measured depth of 10,390 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

24-Jul-17

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well TR 13-24-597 - Slot A10 (TR 13-24-597)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8545.2' & RKB 24' @ 8569.20usft (H&P 318)
Site:	TR 32-23-597 Pad	MD Reference:	GL 8545.2' & RKB 24' @ 8569.20usft (H&P 318)
Well:	TR 13-24-597	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		TR 32-23-597 Pad			
Site Position:		Northing:	1,654,899.00 usft	Latitude:	39.5994964
From:	Map	Easting:	2,227,644.00 usft	Longitude:	-108.2413519
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.73 °

Well	TR 13-24-597 - Slot A10 (TR 13-24-597)					
Well Position	+N/-S	0.00 usft	Northing:	1,654,887.20 usft	Latitude:	39.5994632
	+E/-W	0.00 usft	Easting:	2,227,634.80 usft	Longitude:	-108.2413833
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,545.20 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/20/2017	9.77	65.93	51,609

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	100.99	

Survey Program	Date	7/24/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
143.00	531.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
601.00	2,941.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
3,064.00	10,390.00	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	
143.00	0.62	97.38	143.00	-0.10	0.77	0.77	0.43	0.43	0.00	
First SDI Gyro MWD Survey										
173.00	1.76	108.63	172.99	-0.27	1.36	1.39	3.86	3.80	37.50	
262.00	4.31	110.74	261.86	-1.89	5.79	6.04	2.87	2.87	2.37	
352.00	6.42	100.55	351.46	-4.01	13.90	14.41	2.56	2.34	-11.32	
442.00	8.62	100.46	440.68	-6.15	25.48	26.19	2.44	2.44	-0.10	
531.00	11.09	99.14	528.36	-8.72	40.49	41.41	2.79	2.78	-1.48	

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Site:	TR 32-23-597 Pad	MD Reference:	GL 8545.2' & RKB 24' @ 8569.20usft (H&P 318)
Well:	TR 13-24-597	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)
Last SDI Gyro MWD Survey									
601.00	12.93	99.78	596.83	-11.12	54.86	55.97	2.64	2.63	0.91
First SDI Surface MWD Survey									
690.00	15.03	101.20	683.19	-15.06	75.99	77.47	2.39	2.36	1.60
779.00	16.93	101.11	768.74	-19.80	100.03	101.97	2.14	2.13	-0.10
868.00	18.23	99.37	853.58	-24.56	126.48	128.85	1.58	1.46	-1.96
958.00	18.35	97.35	939.04	-28.66	154.42	157.06	0.72	0.13	-2.24
1,053.00	18.65	98.17	1,029.13	-32.74	184.29	187.15	0.42	0.32	0.86
1,147.00	18.81	94.90	1,118.15	-36.17	214.27	217.23	1.13	0.17	-3.48
1,242.00	19.21	98.99	1,207.98	-39.92	244.97	248.08	1.46	0.42	4.31
1,337.00	18.01	101.84	1,298.01	-45.37	274.78	278.39	1.58	-1.26	3.00
1,431.00	18.29	102.32	1,387.33	-51.50	303.41	307.66	0.34	0.30	0.51
1,526.00	19.34	98.01	1,477.26	-56.88	333.55	338.28	1.83	1.11	-4.54
1,621.00	18.47	98.97	1,567.13	-61.41	364.00	369.03	0.97	-0.92	1.01
1,716.00	17.78	105.52	1,657.43	-67.64	392.84	398.53	2.26	-0.73	6.89
1,811.00	18.94	107.39	1,747.59	-76.13	421.53	428.31	1.37	1.22	1.97
1,905.00	18.41	105.25	1,836.64	-84.60	450.41	458.28	0.92	-0.56	-2.28
2,000.00	17.55	101.13	1,927.01	-91.31	478.94	487.56	1.62	-0.91	-4.34
2,095.00	17.10	100.19	2,017.70	-96.54	506.74	515.85	0.56	-0.47	-0.99
2,189.00	16.45	101.11	2,107.70	-101.55	533.40	542.98	0.75	-0.69	0.98
2,284.00	16.67	101.77	2,198.76	-106.92	559.94	570.05	0.30	0.23	0.69
2,379.00	16.80	101.44	2,289.73	-112.43	586.73	597.41	0.17	0.14	-0.35
2,474.00	18.25	101.10	2,380.32	-118.01	614.79	626.01	1.53	1.53	-0.36
2,569.00	17.75	102.12	2,470.67	-123.92	643.54	655.36	0.62	-0.53	1.07
2,664.00	17.72	103.00	2,561.16	-130.21	671.79	684.29	0.28	-0.03	0.93
2,759.00	18.23	103.18	2,651.52	-136.85	700.34	713.59	0.54	0.54	0.19
2,854.00	18.56	104.11	2,741.67	-143.92	729.47	743.53	0.46	0.35	0.98
2,941.00	17.06	103.81	2,824.49	-150.35	755.30	770.11	1.73	-1.72	-0.34
Last SDI Surface MWD Survey									
3,064.00	16.69	105.47	2,942.20	-159.36	789.84	805.74	0.49	-0.30	1.35
First SDI Production MWD Survey									
3,159.00	18.64	102.35	3,032.72	-166.25	817.82	834.52	2.28	2.05	-3.28
3,253.00	17.11	100.56	3,122.18	-172.00	846.09	863.36	1.73	-1.63	-1.90
3,348.00	16.44	99.13	3,213.13	-176.69	873.10	890.78	0.83	-0.71	-1.51
3,442.00	15.48	95.71	3,303.51	-180.05	898.72	916.56	1.43	-1.02	-3.64
3,537.00	14.86	95.88	3,395.20	-182.56	923.45	941.32	0.65	-0.65	0.18
3,631.00	16.44	97.64	3,485.71	-185.56	948.63	966.61	1.75	1.68	1.87
3,726.00	17.57	97.76	3,576.56	-189.29	976.16	994.34	1.19	1.19	0.13
3,821.00	17.99	96.85	3,667.02	-192.97	1,004.93	1,023.29	0.53	0.44	-0.96
3,915.00	17.15	96.15	3,756.64	-196.19	1,033.13	1,051.58	0.92	-0.89	-0.74
4,010.00	18.29	95.97	3,847.13	-199.24	1,061.88	1,080.39	1.20	1.20	-0.19
4,104.00	16.18	95.09	3,936.90	-201.94	1,089.60	1,108.11	2.26	-2.24	-0.94
4,198.00	15.35	98.43	4,027.37	-204.92	1,114.95	1,133.57	1.31	-0.88	3.55
4,293.00	16.18	99.93	4,118.79	-209.05	1,140.43	1,159.37	0.97	0.87	1.58

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Site:	TR 32-23-597 Pad	MD Reference:	GL 8545.2' & RKB 24' @ 8569.20usft (H&P 318)
Well:	TR 13-24-597	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)
4,387.00	17.32	96.06	4,208.81	-212.78	1,167.24	1,186.40	1.70	1.21	-4.12
4,482.00	18.78	95.93	4,299.13	-215.86	1,196.52	1,215.72	1.54	1.54	-0.14
4,576.00	19.49	95.57	4,387.93	-218.94	1,227.17	1,246.41	0.77	0.76	-0.38
4,671.00	18.10	94.85	4,477.87	-221.73	1,257.65	1,276.86	1.48	-1.46	-0.76
4,765.00	18.82	97.38	4,567.03	-224.91	1,287.24	1,306.51	1.15	0.77	2.69
4,860.00	17.67	96.15	4,657.25	-228.42	1,316.77	1,336.17	1.28	-1.21	-1.29
4,954.00	17.41	100.72	4,746.89	-232.57	1,344.78	1,364.45	1.49	-0.28	4.86
5,048.00	15.59	100.02	4,837.01	-237.38	1,371.03	1,391.14	1.95	-1.94	-0.74
5,143.00	16.27	101.16	4,928.36	-242.18	1,396.66	1,417.22	0.79	0.72	1.20
5,237.00	14.33	101.33	5,019.03	-247.01	1,420.99	1,442.02	2.06	-2.06	0.18
5,331.00	13.28	98.61	5,110.31	-250.92	1,443.07	1,464.44	1.31	-1.12	-2.89
5,425.00	10.82	95.53	5,202.23	-253.38	1,462.53	1,484.01	2.70	-2.62	-3.28
5,520.00	11.26	96.50	5,295.48	-255.29	1,480.62	1,502.14	0.50	0.46	1.02
5,614.00	10.64	97.64	5,387.76	-257.48	1,498.34	1,519.95	0.70	-0.66	1.21
5,709.00	8.53	94.92	5,481.43	-259.26	1,514.05	1,535.71	2.27	-2.22	-2.86
5,803.00	8.62	100.63	5,574.38	-261.15	1,527.92	1,549.69	0.91	0.10	6.07
5,898.00	7.39	100.28	5,668.46	-263.56	1,540.93	1,562.92	1.30	-1.29	-0.37
5,992.00	6.42	103.88	5,761.77	-265.90	1,551.98	1,574.21	1.13	-1.03	3.83
6,087.00	6.33	101.77	5,856.19	-268.24	1,562.27	1,584.75	0.26	-0.09	-2.22
6,181.00	5.89	103.79	5,949.65	-270.44	1,572.02	1,594.75	0.52	-0.47	2.15
6,276.00	5.10	107.84	6,044.22	-272.90	1,580.78	1,603.81	0.93	-0.83	4.26
6,370.00	5.01	110.65	6,137.85	-275.63	1,588.60	1,612.01	0.28	-0.10	2.99
6,465.00	4.57	105.55	6,232.52	-278.11	1,596.12	1,619.87	0.64	-0.46	-5.37
6,560.00	4.40	104.85	6,327.23	-280.05	1,603.29	1,627.28	0.19	-0.18	-0.74
6,655.00	1.89	77.71	6,422.08	-280.65	1,608.35	1,632.35	3.00	-2.64	-28.57
6,750.00	1.67	65.56	6,517.04	-279.75	1,611.14	1,634.92	0.46	-0.23	-12.79
6,784.37	1.51	63.98	6,551.39	-279.34	1,612.00	1,635.69	0.48	-0.47	-4.59
TR 13-24-597 MVRD									
6,845.00	1.23	60.20	6,612.01	-278.67	1,613.28	1,636.82	0.48	-0.46	-6.24
6,940.00	1.14	61.43	6,706.99	-277.71	1,615.00	1,638.32	0.10	-0.09	1.29
7,034.00	1.23	44.03	6,800.97	-276.54	1,616.52	1,639.59	0.39	0.10	-18.51
7,129.00	0.70	25.83	6,895.95	-275.28	1,617.48	1,640.30	0.64	-0.56	-19.16
7,223.00	0.26	343.56	6,989.95	-274.56	1,617.67	1,640.35	0.57	-0.47	-44.97
7,318.00	0.44	271.22	7,084.95	-274.35	1,617.24	1,639.89	0.46	0.19	-76.15
7,412.00	0.70	280.19	7,178.94	-274.24	1,616.32	1,638.96	0.29	0.28	9.54
7,507.00	0.94	57.45	7,273.94	-273.72	1,616.40	1,638.94	1.61	0.25	144.48
7,601.00	0.79	39.72	7,367.93	-272.80	1,617.47	1,639.81	0.32	-0.16	-18.86
7,696.00	0.38	17.89	7,462.92	-272.00	1,617.98	1,640.16	0.48	-0.43	-22.98
7,790.00	0.44	17.49	7,556.92	-271.36	1,618.19	1,640.24	0.06	0.06	-0.43
7,885.00	0.53	326.86	7,651.92	-270.64	1,618.06	1,639.98	0.44	0.09	-53.29
7,979.00	0.70	325.80	7,745.91	-269.80	1,617.50	1,639.27	0.18	0.18	-1.13
8,074.00	0.79	335.47	7,840.90	-268.73	1,616.90	1,638.48	0.16	0.09	10.18
8,168.00	0.53	290.12	7,934.90	-267.99	1,616.22	1,637.67	0.60	-0.28	-48.24
8,263.00	1.32	271.14	8,029.88	-267.81	1,614.71	1,636.16	0.88	0.83	-19.98

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Design:	OH	Database:	Grand Junction District

Survey									
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8,357.00	0.55	31.85	8,123.88	-267.41	1,613.87	1,635.25	1.78	-0.82	128.41
8,452.00	0.44	321.59	8,218.87	-266.74	1,613.88	1,635.14	0.61	-0.12	-73.96
8,546.00	0.53	267.36	8,312.87	-266.47	1,613.23	1,634.44	0.48	0.10	-57.69
8,641.00	0.88	287.75	8,407.86	-266.27	1,612.09	1,633.29	0.45	0.37	21.46
8,735.00	0.26	101.07	8,501.86	-266.09	1,611.61	1,632.79	1.21	-0.66	184.38
8,829.00	0.62	216.73	8,595.86	-266.54	1,611.52	1,632.78	0.82	0.38	123.04
8,924.00	1.32	210.93	8,690.85	-267.89	1,610.65	1,632.18	0.74	0.74	-6.11
9,018.00	1.32	227.28	8,784.82	-269.56	1,609.30	1,631.17	0.40	0.00	17.39
9,113.00	1.85	236.86	8,879.78	-271.14	1,607.21	1,629.42	0.62	0.56	10.08
9,207.00	1.93	234.66	8,973.73	-272.88	1,604.65	1,627.24	0.11	0.09	-2.34
9,302.00	2.55	241.08	9,068.66	-274.83	1,601.49	1,624.52	0.70	0.65	6.76
9,397.00	2.64	234.49	9,163.56	-277.12	1,597.86	1,621.39	0.33	0.09	-6.94
9,491.00	1.93	260.38	9,257.49	-278.64	1,594.54	1,618.42	1.31	-0.76	27.54
9,586.00	2.99	253.03	9,352.40	-279.63	1,590.59	1,614.73	1.16	1.12	-7.74
9,680.00	3.61	250.04	9,446.24	-281.36	1,585.47	1,610.03	0.68	0.66	-3.18
9,775.00	4.22	249.08	9,541.02	-283.63	1,579.39	1,604.49	0.65	0.64	-1.01
9,869.00	3.61	243.89	9,634.80	-286.17	1,573.50	1,599.20	0.75	-0.65	-5.52
9,964.00	3.52	262.52	9,729.62	-287.86	1,567.92	1,594.05	1.22	-0.09	19.61
10,058.00	4.04	272.19	9,823.42	-288.11	1,561.75	1,588.04	0.87	0.55	10.29
10,153.00	3.52	278.87	9,918.21	-287.53	1,555.53	1,581.82	0.72	-0.55	7.03
10,247.00	3.44	274.05	10,012.04	-286.89	1,549.86	1,576.13	0.32	-0.09	-5.13
10,330.00	3.96	267.01	10,094.87	-286.86	1,544.52	1,570.88	0.83	0.63	-8.48
Last SDI Production MWD Survey									
10,390.00	3.96	267.01	10,154.72	-287.08	1,540.38	1,566.86	0.00	0.00	0.00
Projection to TD - TR 13-24-597 PBHL									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
143.00	143.00	-0.10	0.77	First SDI Gyro MWD Survey
531.00	528.36	-8.72	40.49	Last SDI Gyro MWD Survey
601.00	596.83	-11.12	54.86	First SDI Surface MWD Survey
2,941.00	2,824.49	-150.35	755.30	Last SDI Surface MWD Survey
3,064.00	2,942.20	-159.36	789.84	First SDI Production MWD Survey
10,330.00	10,094.87	-286.86	1,544.52	Last SDI Production MWD Survey
10,390.00	10,154.72	-287.08	1,540.38	Projection to TD

Checked By: _____ Approved By: _____ Date: _____

