

Well Details: PA 334-24

TVD Reference: GL 5733' & RKB 24' @ 5757.00usft
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1618770.30 2312576.00 39.5069930 -107.936614 PA 334-24 (A12)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 334-24 - Slot PA 334-24 (A12), True North
 Vertical (TVD) Reference: GL 5733' & RKB 24' @ 5757.00usft
 Section (VS) Reference: Slot - PA 334-24 (A12)(0.00N, 0.00E)
 Measured Depth Reference: GL 5733' & RKB 24' @ 5757.00usft
 Calculation Method: Minimum Curvature

PROJECT DETAILS: Garfield County, CO NAD83

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Central Zone

System Datum: Mean Sea Level

Plan: OH

11:53, September 24 2018
 Created By: Mel Mireles Jr.

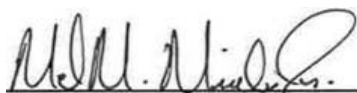


Directional Survey Certification

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 334-24
County & State	Garfield County, CO
SDI Job No.	OP. 012949
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 155 feet to a measured depth of 9,042 feet is true and correct as determined from all available records.


Signature

24-Sep-18
Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 334-24 - Slot PA 334-24 (A12)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5733' & RKB 24' @ 5757.00usft
Site:	RWF 13-19 Pad	MD Reference:	GL 5733' & RKB 24' @ 5757.00usft
Well:	PA 334-24	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		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 334-24 - Slot PA 334-24 (A12)					
Well Position	+N/-S	0.00 usft	Northing:	1,618,770.30 usft	Latitude:	39.5069931
	+E/-W	0.00 usft	Easting:	2,312,576.00 usft	Longitude:	-107.9366148
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,733.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	9/10/2018	9.35	65.75	51,575

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	263.72	

Survey Program	Date	9/13/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
155.00	494.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
566.00	1,075.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,167.00	9,042.00	Survey #3 - Production MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	

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	
155.00	1.32	266.31	154.99	-0.11	-1.78	1.78	0.85	0.85	0.00	
First SDI Gyro MWD Survey										
216.00	2.29	268.24	215.96	-0.20	-3.70	3.70	1.59	1.59	3.16	
310.00	4.57	260.77	309.78	-0.86	-9.28	9.31	2.47	2.43	-7.95	
402.00	7.65	263.94	401.25	-2.09	-18.98	19.10	3.37	3.35	3.45	
494.00	11.26	258.40	491.98	-4.54	-33.88	34.17	4.04	3.92	-6.02	
Last SDI Gyro MWD Survey										

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Site:	RWF 13-19 Pad	MD Reference:	GL 5733' & RKB 24' @ 5757.00usft
Well:	PA 334-24	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)	
566.00	14.49	255.26	562.17	-8.25	-49.48	50.08	4.59	4.49	-4.36	
First SDI Surface MWD Survey										
658.00	18.21	254.34	650.43	-15.06	-74.46	75.66	4.05	4.04	-1.00	
750.00	20.68	254.50	737.18	-23.28	-103.96	105.88	2.69	2.68	0.17	
841.00	23.29	257.06	821.55	-31.61	-136.98	139.62	3.05	2.87	2.81	
936.00	25.43	257.70	908.09	-40.16	-175.22	178.56	2.27	2.25	0.67	
1,030.00	27.52	257.82	992.23	-49.04	-216.17	220.24	2.22	2.22	0.13	
1,075.00	28.40	258.17	1,031.98	-53.43	-236.81	241.23	1.99	1.96	0.78	
Last SDI Surface MWD Survey										
1,175.00	30.75	257.47	1,118.94	-63.85	-285.05	290.32	2.38	2.35	-0.70	
First SDI Production MWD Survey										
1,269.00	31.18	257.17	1,199.54	-74.47	-332.23	338.39	0.49	0.46	-0.32	
1,363.00	31.51	256.99	1,279.82	-85.40	-379.89	386.96	0.36	0.35	-0.19	
1,457.00	31.58	255.71	1,359.93	-97.01	-427.68	435.73	0.72	0.07	-1.36	
1,552.00	32.60	257.86	1,440.42	-108.53	-476.81	485.82	1.61	1.07	2.26	
1,646.00	32.91	257.31	1,519.48	-119.47	-526.47	536.39	0.46	0.33	-0.59	
1,740.00	32.96	256.03	1,598.37	-131.25	-576.20	587.11	0.74	0.05	-1.36	
1,835.00	33.39	259.52	1,677.89	-142.24	-626.99	638.79	2.06	0.45	3.67	
1,929.00	33.50	258.06	1,756.33	-152.32	-677.80	690.40	0.86	0.12	-1.55	
2,023.00	32.70	256.35	1,835.07	-163.68	-727.86	741.40	1.31	-0.85	-1.82	
2,118.00	32.96	254.52	1,914.90	-176.63	-777.70	792.36	1.08	0.27	-1.93	
2,212.00	34.01	258.18	1,993.31	-188.84	-828.08	843.78	2.42	1.12	3.89	
2,306.00	33.61	256.88	2,071.41	-200.13	-879.15	895.78	0.88	-0.43	-1.38	
2,401.00	33.33	258.17	2,150.66	-211.45	-930.31	947.86	0.80	-0.29	1.36	
2,495.00	32.90	257.56	2,229.39	-222.24	-980.51	998.95	0.58	-0.46	-0.65	
2,589.00	32.74	259.68	2,308.39	-232.30	-1,030.45	1,049.69	1.23	-0.17	2.26	
2,684.00	31.68	258.51	2,388.77	-241.87	-1,080.17	1,100.16	1.29	-1.12	-1.23	
2,778.00	30.97	258.85	2,469.07	-251.46	-1,128.09	1,148.84	0.78	-0.76	0.36	
2,873.00	29.77	259.01	2,551.03	-260.69	-1,175.23	1,196.70	1.27	-1.26	0.17	
2,967.00	30.03	258.69	2,632.52	-269.75	-1,221.20	1,243.39	0.32	0.28	-0.34	
3,061.00	31.06	259.42	2,713.47	-278.81	-1,268.10	1,291.00	1.16	1.10	0.78	
3,155.00	32.54	261.11	2,793.36	-287.17	-1,316.92	1,340.44	1.84	1.57	1.80	
3,249.00	31.96	260.86	2,872.86	-295.03	-1,366.46	1,390.54	0.63	-0.62	-0.27	
3,344.00	31.45	260.83	2,953.68	-302.98	-1,415.75	1,440.41	0.54	-0.54	-0.03	
3,438.00	31.71	260.44	3,033.76	-310.99	-1,464.32	1,489.56	0.35	0.28	-0.41	
3,532.00	30.43	259.66	3,114.28	-319.36	-1,512.10	1,537.97	1.43	-1.36	-0.83	
3,626.00	30.88	260.07	3,195.14	-327.79	-1,559.28	1,585.79	0.53	0.48	0.44	
3,721.00	29.48	259.85	3,277.26	-336.12	-1,606.31	1,633.45	1.48	-1.47	-0.23	
3,815.00	30.90	260.30	3,358.51	-344.26	-1,652.87	1,680.62	1.53	1.51	0.48	
3,909.00	29.06	259.62	3,439.93	-352.44	-1,699.12	1,727.49	1.99	-1.96	-0.72	
4,004.00	28.39	259.66	3,523.24	-360.65	-1,744.03	1,773.03	0.71	-0.71	0.04	
4,098.00	27.19	259.50	3,606.39	-368.58	-1,787.14	1,816.74	1.28	-1.28	-0.17	
4,192.00	26.06	259.54	3,690.42	-376.24	-1,828.56	1,858.75	1.20	-1.20	0.04	
4,287.00	24.55	259.30	3,776.31	-383.69	-1,868.47	1,899.25	1.59	-1.59	-0.25	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 334-24 - Slot PA 334-24 (A12)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5733' & RKB 24' @ 5757.00usft
Site:	RWF 13-19 Pad	MD Reference:	GL 5733' & RKB 24' @ 5757.00usft
Well:	PA 334-24	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)	
4,381.00	23.39	259.42	3,862.20	-390.75	-1,906.00	1,937.32	1.24	-1.23	0.13	
4,475.00	21.64	259.26	3,949.03	-397.40	-1,941.38	1,973.21	1.86	-1.86	-0.17	
4,569.00	21.07	259.45	4,036.58	-403.73	-1,975.02	2,007.34	0.61	-0.61	0.20	
4,664.00	19.91	258.74	4,125.56	-410.01	-2,007.67	2,040.49	1.25	-1.22	-0.75	
4,758.00	19.26	260.17	4,214.13	-415.78	-2,038.65	2,071.91	0.86	-0.69	1.52	
4,871.00	18.20	259.14	4,321.14	-422.29	-2,074.34	2,108.10	0.98	-0.94	-0.91	
4,945.00	17.84	257.10	4,391.51	-427.00	-2,096.74	2,130.88	0.98	-0.49	-2.76	
5,059.00	16.53	256.32	4,500.42	-434.73	-2,129.52	2,164.31	1.17	-1.15	-0.68	
5,134.00	15.73	255.83	4,572.47	-439.74	-2,149.74	2,184.96	1.08	-1.07	-0.65	
5,229.00	15.25	257.28	4,664.02	-445.65	-2,174.42	2,210.13	0.65	-0.51	1.53	
5,323.00	14.52	255.44	4,754.86	-451.33	-2,197.88	2,234.08	0.93	-0.78	-1.96	
5,417.00	12.51	256.97	4,846.25	-456.59	-2,219.21	2,255.85	2.17	-2.14	1.63	
5,512.00	10.89	255.90	4,939.28	-461.10	-2,237.94	2,274.96	1.72	-1.71	-1.13	
5,606.00	10.68	256.23	5,031.62	-465.33	-2,255.01	2,292.39	0.23	-0.22	0.35	
5,701.00	10.46	256.85	5,125.00	-469.39	-2,271.96	2,309.68	0.26	-0.23	0.65	
5,795.00	8.60	257.43	5,217.70	-472.86	-2,287.13	2,325.14	1.98	-1.98	0.62	
5,889.00	7.91	257.47	5,310.73	-475.79	-2,300.30	2,338.56	0.73	-0.73	0.04	
5,983.00	5.73	258.29	5,404.06	-478.15	-2,311.21	2,349.66	2.32	-2.32	0.87	
6,078.00	4.19	268.36	5,498.70	-479.21	-2,319.32	2,357.84	1.86	-1.62	10.60	
6,172.00	3.70	262.43	5,592.48	-479.71	-2,325.76	2,364.30	0.68	-0.52	-6.31	
6,256.16	3.10	260.97	5,676.49	-480.43	-2,330.70	2,369.29	0.72	-0.71	-1.74	
PA 334-24 KMV										
6,266.00	3.03	260.76	5,686.32	-480.51	-2,331.22	2,369.81	0.72	-0.71	-2.12	
6,361.00	2.80	254.07	5,781.19	-481.55	-2,335.93	2,374.61	0.43	-0.24	-7.04	
6,455.00	2.67	247.14	5,875.09	-483.03	-2,340.16	2,378.97	0.38	-0.14	-7.37	
6,550.00	1.11	268.51	5,970.03	-483.91	-2,343.12	2,382.01	1.77	-1.64	22.49	
6,644.00	0.83	259.67	6,064.02	-484.06	-2,344.70	2,383.59	0.34	-0.30	-9.40	
6,738.00	0.49	232.85	6,158.01	-484.42	-2,345.69	2,384.62	0.48	-0.36	-28.53	
6,832.00	1.09	217.94	6,252.00	-485.37	-2,346.56	2,385.58	0.67	0.64	-15.86	
6,927.00	0.18	39.63	6,347.00	-485.97	-2,347.02	2,386.11	1.34	-0.96	-187.69	
7,021.00	0.82	73.87	6,440.99	-485.67	-2,346.28	2,385.34	0.72	0.68	36.43	
7,115.00	0.84	98.57	6,534.99	-485.58	-2,344.95	2,384.01	0.38	0.02	26.28	
7,210.00	0.94	115.68	6,629.97	-486.03	-2,343.56	2,382.68	0.30	0.11	18.01	
7,305.00	0.60	81.55	6,724.97	-486.29	-2,342.36	2,381.52	0.59	-0.36	-35.93	
7,399.00	0.44	39.86	6,818.96	-485.94	-2,341.65	2,380.77	0.42	-0.17	-44.35	
7,494.00	0.35	73.07	6,913.96	-485.58	-2,341.13	2,380.22	0.25	-0.09	34.96	
7,588.00	0.87	128.72	7,007.96	-485.94	-2,340.30	2,379.43	0.78	0.55	59.20	
7,682.00	1.06	130.38	7,101.94	-486.95	-2,339.08	2,378.33	0.20	0.20	1.77	
7,777.00	1.49	158.94	7,196.92	-488.67	-2,337.97	2,377.41	0.79	0.45	30.06	
7,871.00	1.06	173.53	7,290.90	-490.68	-2,337.43	2,377.10	0.57	-0.46	15.52	
7,966.00	1.61	177.51	7,385.87	-492.88	-2,337.28	2,377.18	0.59	0.58	4.19	
8,060.00	1.06	181.79	7,479.84	-495.07	-2,337.25	2,377.39	0.59	-0.59	4.55	
8,155.00	1.67	214.31	7,574.82	-497.09	-2,338.05	2,378.42	1.01	0.64	34.23	
8,249.00	2.08	185.72	7,668.77	-499.92	-2,339.00	2,379.66	1.07	0.44	-30.41	

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey									
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8,343.00	1.93	188.82	7,762.71	-503.18	-2,339.41	2,380.43	0.20	-0.16	3.30
8,438.00	2.63	189.75	7,857.64	-506.91	-2,340.02	2,381.45	0.74	0.74	0.98
8,532.00	2.69	203.52	7,951.54	-511.06	-2,341.27	2,383.14	0.68	0.06	14.65
8,626.00	2.32	192.01	8,045.45	-514.94	-2,342.54	2,384.83	0.66	-0.39	-12.24
8,721.00	1.98	194.04	8,140.38	-518.42	-2,343.34	2,386.01	0.37	-0.36	2.14
8,815.00	2.14	193.09	8,234.32	-521.70	-2,344.13	2,387.15	0.17	0.17	-1.01
8,909.00	0.87	147.61	8,328.29	-524.01	-2,344.15	2,387.42	1.76	-1.35	-48.38
8,982.00	1.41	168.61	8,401.27	-525.36	-2,343.67	2,387.10	0.92	0.74	28.77
Last SDI Production MWD Survey									
9,040.36	1.41	168.61	8,459.61	-526.77	-2,343.39	2,386.97	0.00	0.00	0.00
PA 334-24 PBHL									
9,042.00	1.41	168.61	8,461.25	-526.81	-2,343.38	2,386.97	0.00	0.00	0.00
Projection to TD									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
155.00	154.99	-0.11	-1.78	First SDI Gyro MWD Survey	
494.00	491.98	-4.54	-33.88	Last SDI Gyro MWD Survey	
566.00	562.17	-8.25	-49.48	First SDI Surface MWD Survey	
1,075.00	1,031.98	-53.43	-236.81	Last SDI Surface MWD Survey	
1,175.00	1,118.94	-63.85	-285.05	First SDI Production MWD Survey	
8,982.00	8,401.27	-525.36	-2,343.67	Last SDI Production MWD Survey	
9,042.00	8,461.25	-526.81	-2,343.38	Projection to TD	

Checked By: _____	Approved By: _____	Date: _____
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