



#### Well Details: PA 522-24

TVD Reference: GL 5371' & RKB 24' @ 5395.00usft (H&P 318) Ground Level: 5371.00  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.00 0.00 1618399.3900 2310455.5300 39.5058187 -107.9440919 PA 522-24 (B7)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 522-24 - Slot PA 522-24 (B7), True North  
 Vertical (TVD) Reference: GL 5371' & RKB 24' @ 5395.00usft (H&P 318)  
 Section (VS) Reference: Slot - PA 522-24 (B7) (0.00N, 0.00E)  
 Measured Depth Reference: GL 5371' & RKB 24' @ 5395.00usft (H&P 318)  
 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

15:36, October 08 2019  
 Created By: Mel Mireles Jr.





## Directional Survey Certification

2948 I-70 Business Loop  
Grand Junction, CO 81504  
(970)-245-9447 Fax (970)-245-9454

<b>Operator</b>	TEP Rocky Mountain, LLC.
<b>Well Name &amp; No.</b>	PA 522-24
<b>County &amp; State</b>	Garfield County, CO
<b>SDI Job No.</b>	OP.021054
<b>Rig</b>	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 122 feet to a measured depth of 8,998 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-Sep-19

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 522-24 - Slot PA 522-24 (B7)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Site:</b>	PA 34-24 Pad	<b>MD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Well:</b>	PA 522-24	<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	PA 34-24 Pad				
Site Position:		Northing:	1,618,371.2000 usft	Latitude:	39.5057421
From:	Map	Easting:	2,310,465.7000 usft	Longitude:	-107.9440532
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.54 °

Well	PA 522-24 - Slot PA 522-24 (B7)					
Well Position	+N/-S	0.00 usft	Northing:	1,618,399.3900 usft	Latitude:	39.5058188
	+E/-W	0.00 usft	Easting:	2,310,455.5300 usft	Longitude:	-107.9440919
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,371.00 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	9/14/2019	9.25	65.72	51,477

<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	309.23	

<b>Survey Program</b>	<b>Date</b>	10/8/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
122.00	488.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
560.00	1,070.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,168.00	8,998.00	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	
122.00	1.32	329.50	121.99	1.21	-0.71	1.32	1.08	1.08	0.00	
<b>First SDI Gyro MWD Survey</b>										
214.00	4.93	325.28	213.84	5.37	-3.50	6.11	3.93	3.92	-4.59	
306.00	8.62	315.26	305.18	13.52	-10.61	16.77	4.20	4.01	-10.89	
397.00	12.49	308.50	394.63	24.50	-23.12	33.40	4.46	4.25	-7.43	
488.00	16.19	306.83	482.78	38.23	-40.98	55.92	4.09	4.07	-1.84	
<b>Last SDI Gyro MWD Survey</b>										



<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 522-24 - Slot PA 522-24 (B7)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Site:</b>	PA 34-24 Pad	<b>MD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Well:</b>	PA 522-24	<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)	
560.00	18.61	306.11	551.48	51.02	-58.30	77.43	3.37	3.36	-1.00	
First SDI Surface MWD Survey										
652.00	22.51	305.46	637.60	69.90	-84.51	109.67	4.25	4.24	-0.71	
744.00	25.00	309.33	721.81	92.44	-113.90	146.69	3.19	2.71	4.21	
838.00	28.05	310.54	805.90	119.40	-146.07	188.66	3.30	3.24	1.29	
932.00	31.48	311.77	887.49	150.13	-181.18	235.29	3.71	3.65	1.31	
1,026.00	34.75	311.18	966.21	184.12	-219.66	286.60	3.50	3.48	-0.63	
1,070.00	35.64	311.07	1,002.17	200.80	-238.76	311.94	2.03	2.02	-0.25	
Last SDI Surface MWD Survey										
1,168.00	35.97	311.57	1,081.65	238.66	-281.82	369.24	0.45	0.34	0.51	
First SDI Production MWD Survey										
1,262.00	36.99	310.56	1,157.23	275.37	-323.96	425.09	1.26	1.09	-1.07	
1,356.00	37.78	309.52	1,231.92	312.08	-367.66	482.16	1.08	0.84	-1.11	
1,450.00	38.12	308.49	1,306.04	348.46	-412.58	539.96	0.76	0.36	-1.10	
1,545.00	37.91	307.32	1,380.89	384.40	-458.74	598.45	0.79	-0.22	-1.23	
1,639.00	37.85	306.26	1,455.08	418.97	-504.96	656.12	0.70	-0.06	-1.13	
1,733.00	37.51	305.04	1,529.48	452.46	-551.64	713.46	0.87	-0.36	-1.30	
1,828.00	37.73	307.95	1,604.73	486.94	-598.25	771.37	1.88	0.23	3.06	
1,922.00	37.89	307.08	1,679.00	522.03	-643.96	828.97	0.59	0.17	-0.93	
2,017.00	37.31	305.60	1,754.27	556.38	-690.64	886.86	1.13	-0.61	-1.56	
2,111.00	35.79	307.64	1,829.78	589.75	-735.58	942.77	2.07	-1.62	2.17	
2,206.00	35.40	311.09	1,907.04	624.81	-778.32	998.04	2.15	-0.41	3.63	
2,300.00	35.60	310.92	1,983.57	660.62	-819.51	1,052.60	0.24	0.21	-0.18	
2,394.00	34.75	310.45	2,060.40	695.92	-860.57	1,106.74	0.95	-0.90	-0.50	
2,489.00	35.82	312.77	2,137.95	732.37	-901.58	1,161.55	1.80	1.13	2.44	
2,584.00	35.00	312.21	2,215.38	769.55	-942.17	1,216.51	0.93	-0.86	-0.59	
2,678.00	33.37	311.29	2,293.13	804.72	-981.57	1,269.27	1.82	-1.73	-0.98	
2,772.00	34.70	311.24	2,371.03	839.42	-1,021.11	1,321.85	1.42	1.41	-0.05	
2,866.00	34.19	311.62	2,448.55	874.60	-1,060.98	1,374.98	0.59	-0.54	0.40	
2,960.00	37.13	311.53	2,524.91	910.96	-1,101.97	1,429.72	3.13	3.13	-0.10	
3,055.00	36.84	311.59	2,600.80	948.88	-1,144.73	1,486.83	0.31	-0.31	0.06	
3,149.00	36.05	312.04	2,676.42	986.11	-1,186.35	1,542.61	0.89	-0.84	0.48	
3,244.00	35.01	311.18	2,753.73	1,022.77	-1,227.62	1,597.77	1.21	-1.09	-0.91	
3,339.00	33.93	311.20	2,832.05	1,058.18	-1,268.08	1,651.50	1.14	-1.14	0.02	
3,433.00	35.02	311.90	2,909.54	1,093.47	-1,307.90	1,704.67	1.23	1.16	0.74	
3,528.00	33.54	311.54	2,988.03	1,129.08	-1,347.84	1,758.12	1.57	-1.56	-0.38	
3,622.00	35.25	311.69	3,065.59	1,164.35	-1,387.53	1,811.17	1.82	1.82	0.16	
3,717.00	34.36	311.15	3,143.60	1,200.22	-1,428.19	1,865.36	0.99	-0.94	-0.57	
3,811.00	36.23	311.42	3,220.32	1,236.06	-1,469.00	1,919.63	2.00	1.99	0.29	
3,906.00	34.19	311.43	3,297.93	1,272.30	-1,510.07	1,974.36	2.15	-2.15	0.01	
4,000.00	35.58	309.22	3,375.04	1,307.07	-1,551.06	2,028.11	2.00	1.48	-2.35	
4,094.00	33.97	309.83	3,452.25	1,341.18	-1,592.42	2,081.72	1.75	-1.71	0.65	
4,189.00	34.73	307.11	3,530.69	1,374.51	-1,634.38	2,135.30	1.80	0.80	-2.86	
4,284.00	35.22	308.27	3,608.53	1,407.81	-1,677.47	2,189.74	0.87	0.52	1.22	



<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 522-24 - Slot PA 522-24 (B7)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Site:</b>	PA 34-24 Pad	<b>MD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Well:</b>	PA 522-24	<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)
4,378.00	34.08	309.24	3,685.86	1,441.26	-1,719.15	2,243.18	1.35	-1.21	1.03
4,473.00	32.45	309.52	3,765.29	1,474.31	-1,759.43	2,295.29	1.72	-1.72	0.29
4,567.00	30.42	309.38	3,845.49	1,505.46	-1,797.28	2,344.31	2.16	-2.16	-0.15
4,662.00	32.00	309.26	3,926.74	1,536.65	-1,835.36	2,393.53	1.66	1.66	-0.13
4,756.00	30.02	310.27	4,007.30	1,567.62	-1,872.59	2,441.95	2.18	-2.11	1.07
4,851.00	29.31	310.70	4,089.85	1,598.14	-1,908.36	2,488.96	0.78	-0.75	0.45
4,946.00	28.82	309.61	4,172.88	1,627.91	-1,943.62	2,535.10	0.76	-0.52	-1.15
5,040.00	26.62	309.58	4,256.09	1,655.77	-1,977.32	2,578.82	2.34	-2.34	-0.03
5,134.00	25.88	310.40	4,340.40	1,682.49	-2,009.17	2,620.39	0.88	-0.79	0.87
5,229.00	23.67	311.34	4,426.65	1,708.52	-2,039.28	2,660.18	2.36	-2.33	0.99
5,323.00	21.28	311.42	4,513.50	1,732.28	-2,066.24	2,696.09	2.54	-2.54	0.09
5,418.00	20.82	309.57	4,602.16	1,754.44	-2,092.18	2,730.20	0.85	-0.48	-1.95
5,512.00	20.63	309.24	4,690.08	1,775.55	-2,117.89	2,763.47	0.24	-0.20	-0.35
5,607.00	19.70	309.38	4,779.26	1,796.30	-2,143.23	2,796.21	0.98	-0.98	0.15
5,701.00	17.76	308.26	4,868.27	1,815.23	-2,166.73	2,826.39	2.10	-2.06	-1.19
5,796.00	15.79	307.53	4,959.23	1,832.08	-2,188.36	2,853.80	2.09	-2.07	-0.77
5,890.00	14.33	310.37	5,050.00	1,847.40	-2,207.37	2,878.22	1.74	-1.55	3.02
5,984.00	13.55	310.61	5,141.23	1,862.11	-2,224.59	2,900.86	0.83	-0.83	0.26
6,079.00	11.61	310.67	5,233.94	1,875.58	-2,240.29	2,921.54	2.04	-2.04	0.06
6,173.00	10.46	307.97	5,326.20	1,887.00	-2,254.19	2,939.53	1.34	-1.22	-2.87
6,268.00	8.97	307.38	5,419.84	1,896.80	-2,266.88	2,955.55	1.57	-1.57	-0.62
6,362.00	8.58	310.20	5,512.74	1,905.77	-2,278.06	2,969.89	0.62	-0.41	3.00
6,457.00	8.42	309.54	5,606.70	1,914.78	-2,288.83	2,983.93	0.20	-0.17	-0.69
6,526.15	8.24	309.37	5,675.12	1,921.14	-2,296.56	2,993.95	0.27	-0.27	-0.24
PA 522-24 BTV									
6,551.00	8.17	309.31	5,699.71	1,923.39	-2,299.31	2,997.49	0.27	-0.27	-0.25
6,646.00	6.95	308.63	5,793.89	1,931.25	-2,309.02	3,009.99	1.29	-1.28	-0.72
6,740.00	6.26	309.47	5,887.26	1,938.06	-2,317.42	3,020.80	0.74	-0.73	0.89
6,834.00	4.69	298.11	5,980.83	1,943.13	-2,324.77	3,029.70	2.02	-1.67	-12.09
6,929.00	4.27	287.58	6,075.54	1,946.03	-2,331.56	3,036.80	0.97	-0.44	-11.08
7,023.00	3.29	296.06	6,169.34	1,948.27	-2,337.32	3,042.68	1.20	-1.04	9.02
7,118.00	2.39	301.06	6,264.22	1,950.49	-2,341.47	3,047.29	0.98	-0.95	5.26
7,212.00	0.74	252.88	6,358.19	1,951.32	-2,343.73	3,049.57	2.10	-1.76	-51.26
7,307.00	1.43	243.84	6,453.17	1,950.62	-2,345.38	3,050.40	0.75	0.73	-9.52
7,401.00	0.28	284.13	6,547.16	1,950.16	-2,346.65	3,051.10	1.31	-1.22	42.86
7,496.00	0.51	242.69	6,642.15	1,950.02	-2,347.25	3,051.48	0.37	0.24	-43.62
7,590.00	0.56	228.09	6,736.15	1,949.52	-2,347.97	3,051.71	0.15	0.05	-15.53
7,685.00	0.86	187.38	6,831.14	1,948.51	-2,348.40	3,051.41	0.60	0.32	-42.85
7,779.00	1.10	186.67	6,925.13	1,946.91	-2,348.60	3,050.55	0.26	0.26	-0.76
7,874.00	1.36	173.84	7,020.11	1,944.88	-2,348.59	3,049.26	0.40	0.27	-13.51
7,968.00	1.61	185.78	7,114.08	1,942.46	-2,348.60	3,047.74	0.42	0.27	12.70
8,063.00	1.67	178.44	7,209.04	1,939.75	-2,348.70	3,046.10	0.23	0.06	-7.73
8,157.00	1.74	176.03	7,303.00	1,936.96	-2,348.56	3,044.22	0.11	0.07	-2.56
8,252.00	1.85	166.49	7,397.95	1,934.03	-2,348.10	3,042.02	0.33	0.12	-10.04



<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 522-24 - Slot PA 522-24 (B7)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Site:</b>	PA 34-24 Pad	<b>MD Reference:</b>	GL 5371' & RKB 24' @ 5395.00usft (H&P 318)
<b>Well:</b>	PA 522-24	<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)
8,346.00	2.00	165.60	7,491.90	1,930.96	-2,347.34	3,039.49	0.16	0.16	-0.95
8,440.00	2.44	148.05	7,585.83	1,927.67	-2,345.87	3,036.27	0.86	0.47	-18.67
8,535.00	2.64	150.31	7,680.73	1,924.06	-2,343.72	3,032.32	0.24	0.21	2.38
8,630.00	2.81	140.09	7,775.63	1,920.37	-2,341.14	3,027.99	0.54	0.18	-10.76
8,724.00	4.02	131.66	7,869.46	1,916.41	-2,337.20	3,022.43	1.39	1.29	-8.97
8,819.00	4.49	120.69	7,964.20	1,912.30	-2,331.51	3,015.43	0.99	0.49	-11.55
8,913.00	4.75	110.61	8,057.89	1,909.05	-2,324.71	3,008.10	0.91	0.28	-10.72
8,939.00	4.75	110.15	8,083.80	1,908.30	-2,322.69	3,006.06	0.15	0.00	-1.77
<b>Last SDI Production MWD Survey</b>									
8,998.00	4.75	110.15	8,142.60	1,906.62	-2,318.10	3,001.45	0.00	0.00	0.00
<b>Projection to TD - PA 522-24 PBHL</b>									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
122.00	121.99	1.21	-0.71	First SDI Gyro MWD Survey
488.00	482.78	38.23	-40.98	Last SDI Gyro MWD Survey
560.00	551.48	51.02	-58.30	First SDI Surface MWD Survey
1,070.00	1,002.17	200.80	-238.76	Last SDI Surface MWD Survey
1,168.00	1,081.65	238.66	-281.82	First SDI Production MWD Survey
8,939.00	8,083.80	1,908.30	-2,322.69	Last SDI Production MWD Survey
8,998.00	8,142.60	1,906.62	-2,318.10	Projection to TD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_