



## 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 42-26
County & State	Garfield County, CO
SDI Job No.	OP.006402
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           122           feet to a measured depth of   8,466   feet is true and correct as determined from all available records.

Signature

                    18-Dec-17                    

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 42-26 - Slot PA 42-26 (B4)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5224' & RKB 24' @ 5248.00usft
<b>Site:</b>	PA 22-25 Pad	<b>MD Reference:</b>	GL 5224' & RKB 24' @ 5248.00usft
<b>Well:</b>	PA 42-26	<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		

<b>Site</b>	PA 22-25 Pad				
<b>Site Position:</b>		<b>Northing:</b>	1,615,186.77 usft	<b>Latitude:</b>	39.4968742
<b>From:</b>	Map	<b>Easting:</b>	2,308,728.18 usft	<b>Longitude:</b>	-107.9499045
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13.20 in	<b>Grid Convergence:</b>	-1.55 °

<b>Well</b>	PA 42-26 - Slot PA 42-26 (B4), B4					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	1,615,199.49 usft	<b>Latitude:</b>	39.4969111
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	2,308,755.53 usft	<b>Longitude:</b>	-107.9498089
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	0.00 usft	<b>Ground Level:</b>	5,224.00 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	12/4/2017	9.38	65.82	51,681

<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	333.04	

<b>Survey Program</b>	<b>Date</b>	12/18/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
122.00	765.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
843.00	1,080.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,178.00	8,466.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

<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	0.00
0.01	0.00	247.94	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>SHL (PA 42-26)</b>										
122.00	0.26	247.94	122.00	-0.10	-0.26	0.02	0.21	0.21	0.00	0.00
<b>First SDI Gyro MWD Survey</b>										
214.00	0.88	288.37	213.99	0.04	-1.12	0.54	0.76	0.67	43.95	
306.00	1.50	282.22	305.97	0.52	-2.97	1.81	0.69	0.67	-6.68	
398.00	1.41	307.18	397.95	1.46	-5.05	3.59	0.69	-0.10	27.13	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 42-26 - Slot PA 42-26 (B4)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5224' & RKB 24' @ 5248.00usft
<b>Site:</b>	PA 22-25 Pad	<b>MD Reference:</b>	GL 5224' & RKB 24' @ 5248.00usft
<b>Well:</b>	PA 42-26	<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)	
489.00	1.32	349.37	488.92	3.16	-6.13	5.60	1.08	-0.10	46.36	
580.00	2.11	9.93	579.88	5.84	-6.04	7.95	1.09	0.87	22.59	
672.00	2.73	1.93	671.80	9.70	-5.67	11.22	0.77	0.67	-8.70	
765.00	3.52	347.43	764.66	14.70	-6.22	15.92	1.20	0.85	-15.59	
<b>Last SDI Gyro MWD Survey</b>										
843.00	3.61	331.41	842.51	19.20	-7.91	20.70	1.28	0.12	-20.54	
<b>First SDI Surface MWD Survey</b>										
936.00	4.43	329.13	935.28	24.85	-11.16	27.21	0.90	0.88	-2.45	
1,030.00	5.48	327.44	1,028.93	31.75	-15.44	35.30	1.13	1.12	-1.80	
1,080.00	6.16	324.47	1,078.67	35.94	-18.28	40.33	1.49	1.36	-5.94	
<b>Last SDI Surface MWD Survey</b>										
1,178.00	7.17	316.62	1,176.01	44.67	-25.54	51.39	1.39	1.03	-8.01	
<b>First SDI Production MWD Survey</b>										
1,272.00	8.31	303.60	1,269.16	52.69	-35.22	62.93	2.22	1.21	-13.85	
1,367.00	10.06	296.29	1,362.94	60.17	-48.38	75.56	2.21	1.84	-7.69	
1,461.00	12.11	293.19	1,455.18	67.69	-64.81	89.71	2.27	2.18	-3.30	
1,556.00	15.26	288.62	1,547.48	75.60	-85.82	106.30	3.50	3.32	-4.81	
1,650.00	18.78	287.81	1,637.35	84.19	-111.96	125.79	3.75	3.74	-0.86	
1,744.00	20.81	292.48	1,725.79	95.20	-141.80	149.14	2.74	2.16	4.97	
1,839.00	23.28	290.42	1,813.84	108.20	-174.99	175.77	2.72	2.60	-2.17	
1,933.00	25.79	290.86	1,899.35	121.97	-211.51	204.60	2.68	2.67	0.47	
2,028.00	28.40	292.39	1,983.92	137.94	-251.72	237.06	2.84	2.75	1.61	
2,123.00	28.96	292.78	2,067.26	155.45	-293.82	271.75	0.62	0.59	0.41	
2,217.00	31.20	292.82	2,148.60	173.70	-337.25	307.71	2.38	2.38	0.04	
2,312.00	31.05	292.57	2,229.92	192.65	-382.55	345.13	0.21	-0.16	-0.26	
2,406.00	31.60	292.30	2,310.22	211.30	-427.72	382.23	0.60	0.59	-0.29	
2,501.00	32.86	290.25	2,390.58	229.67	-474.93	420.01	1.76	1.33	-2.16	
2,594.00	32.27	289.66	2,468.96	246.75	-521.98	456.56	0.72	-0.63	-0.63	
2,688.00	30.88	289.44	2,549.04	263.22	-568.36	492.27	1.48	-1.48	-0.23	
2,783.00	31.04	289.82	2,630.51	279.64	-614.39	527.77	0.27	0.17	0.40	
2,878.00	32.16	289.85	2,711.42	296.53	-661.22	564.05	1.18	1.18	0.03	
2,972.00	31.29	289.34	2,791.37	313.11	-707.78	599.94	0.97	-0.93	-0.54	
3,067.00	29.63	289.40	2,873.26	329.08	-753.22	634.77	1.75	-1.75	0.06	
3,162.00	30.10	289.75	2,955.64	344.93	-797.79	669.10	0.53	0.49	0.37	
3,256.00	31.09	292.10	3,036.56	362.03	-842.46	704.59	1.65	1.05	2.50	
3,351.00	30.30	292.80	3,118.25	380.55	-887.28	741.42	0.91	-0.83	0.74	
3,445.00	30.88	292.12	3,199.17	398.82	-931.49	777.74	0.72	0.62	-0.72	
3,540.00	30.62	293.26	3,280.81	417.55	-976.30	814.75	0.67	-0.27	1.20	
3,634.00	29.70	293.89	3,362.08	436.44	-1,019.59	851.21	1.04	-0.98	0.67	
3,729.00	31.04	293.16	3,444.05	455.60	-1,063.62	888.26	1.46	1.41	-0.77	
3,823.00	30.45	293.30	3,524.83	474.56	-1,107.78	925.17	0.63	-0.63	0.15	
3,918.00	29.28	293.27	3,607.22	493.26	-1,151.24	961.53	1.23	-1.23	-0.03	
4,012.00	28.95	290.87	3,689.34	510.44	-1,193.61	996.06	1.29	-0.35	-2.55	
4,107.00	31.33	290.18	3,771.49	527.16	-1,238.28	1,031.21	2.53	2.51	-0.73	

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<b>Site:</b>	PA 22-25 Pad	<b>MD Reference:</b>	GL 5224' & RKB 24' @ 5248.00usft
<b>Well:</b>	PA 42-26	<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

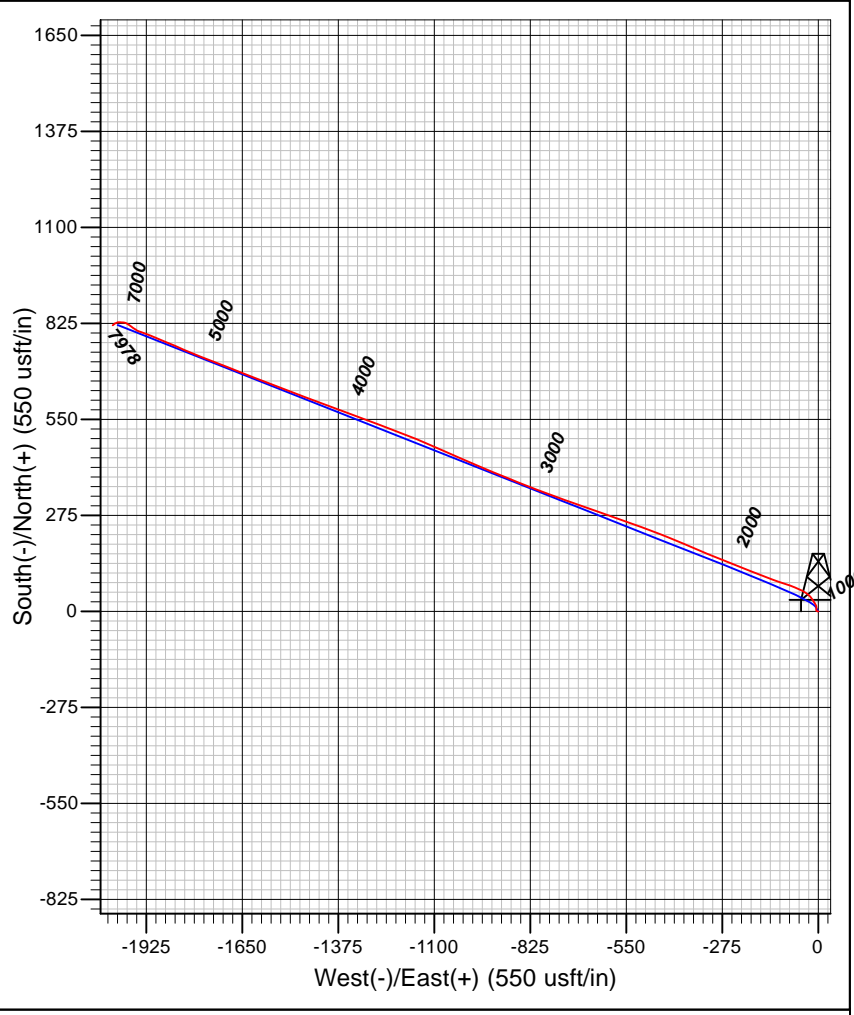
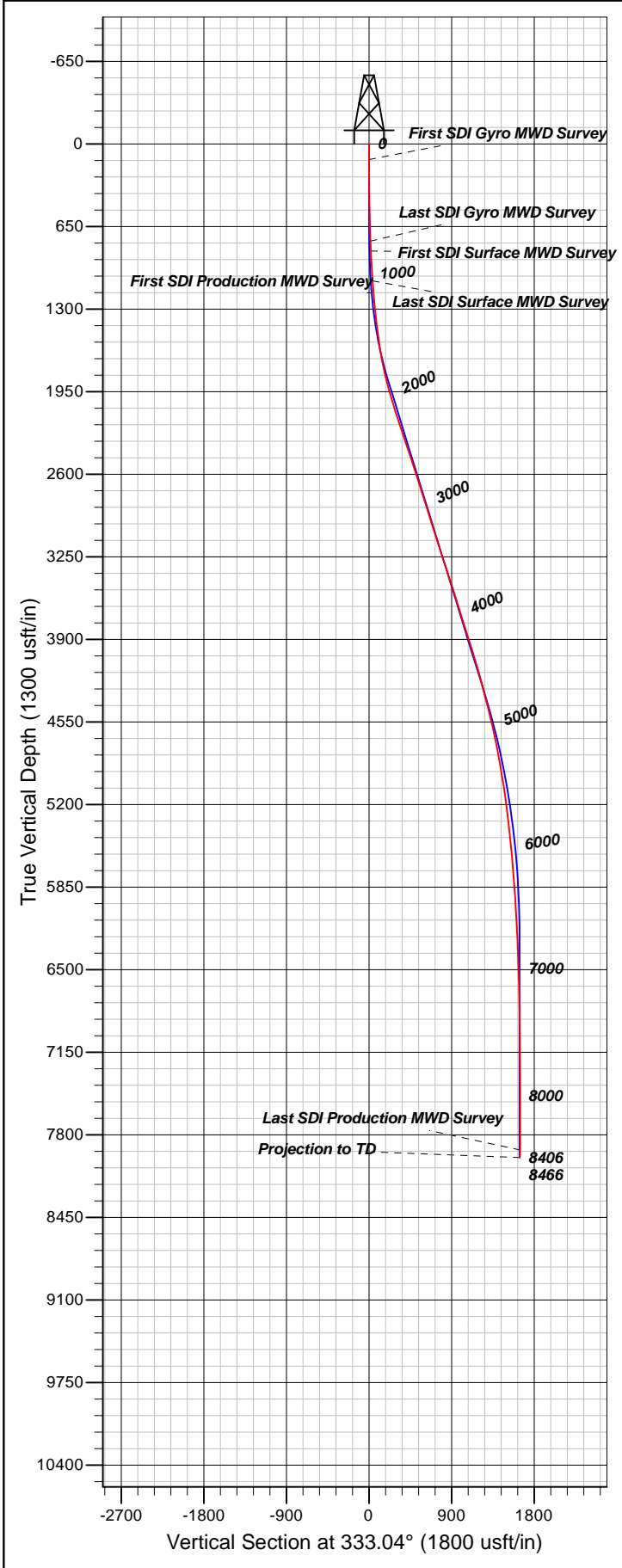
Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,201.00	30.85	290.52	3,851.99	544.03	-1,283.79	1,066.89	0.54	-0.51	0.36	
4,295.00	29.95	290.53	3,933.07	560.71	-1,328.34	1,101.95	0.96	-0.96	0.01	
4,390.00	29.07	291.04	4,015.74	577.32	-1,372.09	1,136.58	0.96	-0.93	0.54	
4,485.00	29.52	290.82	4,098.59	593.92	-1,415.51	1,171.06	0.49	0.47	-0.23	
4,580.00	28.42	289.99	4,181.70	609.97	-1,458.63	1,204.91	1.23	-1.16	-0.87	
4,675.00	25.64	289.65	4,266.32	624.61	-1,499.24	1,236.37	2.93	-2.93	-0.36	
4,769.00	25.97	291.44	4,350.95	638.97	-1,537.55	1,266.54	0.90	0.35	1.90	
4,864.00	24.45	291.77	4,436.90	653.87	-1,575.17	1,296.87	1.61	-1.60	0.35	
4,959.00	23.74	290.89	4,523.62	667.98	-1,611.30	1,325.82	0.84	-0.75	-0.93	
4,993.96	23.52	291.00	4,555.65	672.99	-1,624.38	1,336.22	0.64	-0.63	0.30	
<b>PA 42-26 MVRD</b>										
5,054.00	23.14	291.18	4,610.78	681.54	-1,646.57	1,353.90	0.64	-0.63	0.31	
5,148.00	20.67	291.87	4,697.98	694.40	-1,679.19	1,380.15	2.64	-2.63	0.73	
5,243.00	18.48	290.31	4,787.49	705.87	-1,708.88	1,403.83	2.37	-2.31	-1.64	
5,338.00	18.06	292.32	4,877.70	716.69	-1,736.62	1,426.05	0.80	-0.44	2.12	
5,433.00	18.03	291.57	4,968.03	727.69	-1,763.91	1,448.23	0.25	-0.03	-0.79	
5,528.00	15.32	291.77	5,059.02	737.75	-1,789.25	1,468.68	2.85	-2.85	0.21	
5,622.00	13.58	292.17	5,150.05	746.52	-1,811.00	1,486.36	1.85	-1.85	0.43	
5,717.00	12.66	295.40	5,242.57	755.19	-1,830.73	1,503.04	1.24	-0.97	3.40	
5,812.00	11.11	292.06	5,335.53	763.10	-1,848.62	1,518.19	1.78	-1.63	-3.52	
5,907.00	11.26	292.21	5,428.73	770.04	-1,865.69	1,532.12	0.16	0.16	0.16	
6,002.00	10.89	293.59	5,521.96	777.14	-1,882.50	1,546.06	0.48	-0.39	1.45	
6,097.00	10.07	294.19	5,615.37	784.13	-1,898.30	1,559.46	0.87	-0.86	0.63	
6,191.00	8.71	290.64	5,708.11	790.01	-1,912.46	1,571.12	1.57	-1.45	-3.78	
6,286.00	7.87	289.80	5,802.12	794.75	-1,925.31	1,581.17	0.89	-0.88	-0.88	
6,381.00	6.95	290.05	5,896.32	798.92	-1,936.83	1,590.11	0.97	-0.97	0.26	
6,475.00	5.98	288.43	5,989.72	802.42	-1,946.82	1,597.75	1.05	-1.03	-1.72	
6,570.00	5.80	306.10	6,084.23	806.81	-1,955.39	1,605.56	1.91	-0.19	18.60	
6,665.00	4.94	306.98	6,178.81	812.10	-1,962.54	1,613.51	0.91	-0.91	0.93	
6,760.00	3.97	305.86	6,273.52	816.49	-1,968.47	1,620.11	1.03	-1.02	-1.18	
6,855.00	3.19	304.70	6,368.34	819.92	-1,973.31	1,625.36	0.82	-0.82	-1.22	
6,949.00	2.64	301.70	6,462.22	822.55	-1,977.30	1,629.51	0.61	-0.59	-3.19	
7,044.00	2.37	295.90	6,557.12	824.55	-1,980.93	1,632.95	0.39	-0.28	-6.11	
7,138.00	2.29	294.41	6,651.05	826.18	-1,984.39	1,635.96	0.11	-0.09	-1.59	
7,233.00	2.37	283.42	6,745.97	827.42	-1,988.03	1,638.72	0.48	0.08	-11.57	
7,327.00	2.43	263.77	6,839.89	827.65	-1,991.90	1,640.68	0.87	0.06	-20.90	
7,422.00	1.95	281.47	6,934.82	827.76	-1,995.49	1,642.40	0.87	-0.51	18.63	
7,516.00	2.29	278.33	7,028.75	828.35	-1,998.91	1,644.48	0.38	0.36	-3.34	
7,611.00	2.55	270.24	7,123.67	828.63	-2,002.90	1,646.54	0.45	0.27	-8.52	
7,706.00	1.84	254.73	7,218.60	828.24	-2,006.49	1,647.82	0.97	-0.75	-16.33	
7,800.00	1.09	240.54	7,312.57	827.40	-2,008.72	1,648.08	0.88	-0.80	-15.10	
7,895.00	0.85	227.05	7,407.56	826.48	-2,010.02	1,647.85	0.35	-0.25	-14.20	
7,989.00	0.62	284.21	7,501.55	826.13	-2,011.03	1,647.99	0.78	-0.24	60.81	
8,084.00	1.34	253.20	7,596.54	825.93	-2,012.59	1,648.53	0.92	0.76	-32.64	

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<b>Well:</b>	PA 42-26	<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)	
8,178.00	1.38	237.45	7,690.51	825.00	-2,014.60	1,648.61	0.40	0.04		-16.76
8,273.00	1.55	223.13	7,785.48	823.45	-2,016.44	1,648.06	0.42	0.18		-15.07
8,367.00	1.93	231.74	7,879.44	821.54	-2,018.55	1,647.32	0.49	0.40		9.16
8,406.00	2.02	231.74	7,918.41	820.71	-2,019.61	1,647.05	0.23	0.23		0.00
<b>Last SDI Production MWD Survey</b>										
8,465.20	2.02	231.74	7,977.58	819.42	-2,021.24	1,646.64	0.00	0.00		0.00
<b>PBHL (PA 42-26) - PA 42-26 PBHL</b>										
8,466.00	2.02	231.74	7,978.37	819.40	-2,021.27	1,646.64	0.00	0.00		0.00
<b>Projection to TD</b>										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
122.00	122.00	-0.10	-0.26	First SDI Gyro MWD Survey	
765.00	764.66	14.70	-6.22	Last SDI Gyro MWD Survey	
843.00	842.51	19.20	-7.91	First SDI Surface MWD Survey	
1,080.00	1,078.67	35.94	-18.28	Last SDI Surface MWD Survey	
1,178.00	1,176.01	44.67	-25.54	First SDI Production MWD Survey	
8,406.00	7,918.41	820.71	-2,019.61	Last SDI Production MWD Survey	
8,466.00	7,978.37	819.40	-2,021.27	Projection to TD	

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



**Well Details: PA 42-26**

TVD Reference: GL 5224' & RKB 24' @ 5248.00usft						Ground Level: 5224.00	
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot	
0.00	0.00	1615199.49	2308755.53	39.4969111	-107.9498088	PA 42-26 (B4)	

**REFERENCE INFORMATION**

Co-ordinate (N/E) Reference: Well PA 42-26 - Slot PA 42-26 (B4), True North  
 Vertical (TVD) Reference: GL 5224' & RKB 24' @ 5248.00usft  
 Section (VS) Reference: Slot - PA 42-26 (B4)(0.00N, 0.00E)  
 Measured Depth Reference: GL 5224' & RKB 24' @ 5248.00usft  
 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

12:28, December 18 2017  
 Created By: Mel Mireles Jr.