



## 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 511-25
County & State	Garfield County, CO
SDI Job No.	OP.006666
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 8,085 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

9-Jan-18

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 511-25 - Slot PA 511-25 (B8)
<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 511-25	<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 22-25 Pad			
Site Position:		Northing:	1,615,186.77 usft	Latitude:	39.4968742
From:	Map	Easting:	2,308,728.18 usft	Longitude:	-107.9499045
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.55 °

Well		PA 511-25 - Slot PA 511-25 (B8), B8				
Well Position	+N/-S	0.00 usft	Northing:	1,615,198.75 usft	Latitude:	39.4969113
	+E/-W	0.00 usft	Easting:	2,308,785.52 usft	Longitude:	-107.9497026
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	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	12/17/2017	9.40	65.78	51,675

<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	325.77	

<b>Survey Program</b>	<b>Date</b>	1/9/2018			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
122.00	857.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
934.00	1,060.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,177.00	8,085.00	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	
<b>SHL (PA 511-25)</b>										
122.00	0.26	12.57	122.00	0.27	0.06	0.19	0.21	0.21	0.00	
<b>First SDI Gyro MWD Survey</b>										
213.00	0.79	322.47	213.00	0.97	-0.28	0.96	0.72	0.58	-55.05	
305.00	2.11	332.67	304.96	2.98	-1.44	3.27	1.46	1.43	11.09	
398.00	4.05	329.85	397.83	7.34	-3.88	8.25	2.09	2.09	-3.03	
489.00	6.95	325.63	488.40	14.66	-8.60	16.96	3.22	3.19	-4.64	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 511-25 - Slot PA 511-25 (B8)
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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 511-25	<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)
580.00	10.03	325.37	578.39	25.73	-16.21	30.39	3.38	3.38	-0.29
672.00	12.40	321.06	668.63	40.01	-26.98	48.25	2.73	2.58	-4.68
765.00	14.25	324.76	759.12	57.12	-39.86	69.65	2.19	1.99	3.98
857.00	15.40	326.95	848.06	76.61	-53.05	93.19	1.39	1.25	2.38
Last SDI Gyro MWD Survey									
934.00	16.55	327.38	922.08	94.42	-64.54	114.37	1.50	1.49	0.56
First SDI Surface MWD Survey									
1,028.00	17.41	325.70	1,011.99	117.31	-79.68	141.82	1.05	0.91	-1.79
1,060.00	17.67	324.64	1,042.50	125.23	-85.19	151.46	1.29	0.81	-3.31
Last SDI Surface MWD Survey									
1,177.00	18.41	322.47	1,153.75	154.36	-106.72	187.66	0.85	0.63	-1.85
First SDI Production MWD Survey									
1,271.00	17.36	325.99	1,243.21	177.76	-123.61	216.50	1.60	-1.12	3.74
1,366.00	16.63	324.46	1,334.06	200.57	-139.44	244.27	0.90	-0.77	-1.61
1,460.00	16.28	328.50	1,424.21	222.75	-154.14	270.88	1.27	-0.37	4.30
1,555.00	16.31	328.66	1,515.39	245.50	-168.04	297.50	0.06	0.03	0.17
1,649.00	14.45	327.06	1,606.02	266.62	-181.28	322.41	2.03	-1.98	-1.70
1,744.00	14.01	326.03	1,698.11	286.10	-194.15	345.76	0.53	-0.46	-1.08
1,838.00	13.47	329.95	1,789.42	305.01	-205.99	368.06	1.14	-0.57	4.17
1,932.00	14.58	331.14	1,880.62	324.85	-217.19	390.75	1.22	1.18	1.27
2,027.00	13.86	332.78	1,972.71	345.44	-228.16	413.95	0.87	-0.76	1.73
2,121.00	13.40	333.16	2,064.06	365.17	-238.23	435.93	0.50	-0.49	0.40
2,216.00	14.25	331.72	2,156.31	385.29	-248.74	458.48	0.97	0.89	-1.52
2,310.00	13.86	331.68	2,247.49	405.39	-259.56	481.18	0.42	-0.41	-0.04
2,405.00	13.25	332.44	2,339.84	425.06	-270.00	503.31	0.67	-0.64	0.80
2,500.00	14.42	328.97	2,432.09	444.85	-281.13	525.94	1.51	1.23	-3.65
2,594.00	13.98	327.61	2,523.22	464.47	-293.25	548.97	0.59	-0.47	-1.45
2,689.00	13.40	328.50	2,615.52	483.54	-305.15	571.44	0.65	-0.61	0.94
2,782.00	14.32	326.47	2,705.81	502.32	-317.13	593.70	1.12	0.99	-2.18
2,876.00	13.98	326.23	2,796.96	521.45	-329.87	616.68	0.37	-0.36	-0.26
2,971.00	13.30	326.16	2,889.28	540.06	-342.33	639.08	0.72	-0.72	-0.07
3,065.00	13.87	326.54	2,980.65	558.45	-354.56	661.16	0.61	0.61	0.40
3,160.00	13.32	325.00	3,072.99	576.91	-367.12	683.49	0.69	-0.58	-1.62
3,255.00	13.05	324.47	3,165.48	594.60	-379.63	705.16	0.31	-0.28	-0.56
3,350.00	13.70	324.65	3,257.90	612.51	-392.37	727.13	0.69	0.68	0.19
3,444.00	15.18	326.30	3,348.93	631.83	-405.64	750.56	1.63	1.57	1.76
3,539.00	14.34	325.80	3,440.80	651.90	-419.15	774.77	0.89	-0.88	-0.53
3,633.00	13.42	326.71	3,532.05	670.65	-431.68	797.31	1.01	-0.98	0.97
3,728.00	14.14	327.76	3,624.32	689.68	-443.92	819.93	0.80	0.76	1.11
3,822.00	13.85	327.36	3,715.53	708.87	-456.12	842.66	0.33	-0.31	-0.43
3,916.00	15.48	327.77	3,806.46	728.95	-468.88	866.44	1.74	1.73	0.44
4,011.00	15.21	327.90	3,898.07	750.23	-482.26	891.56	0.29	-0.28	0.14
4,121.00	14.90	328.04	4,004.30	774.46	-497.41	920.12	0.28	-0.28	0.13
4,200.00	14.25	328.17	4,080.76	791.34	-507.92	939.98	0.82	-0.82	0.16

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<b>Well:</b>	PA 511-25	<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

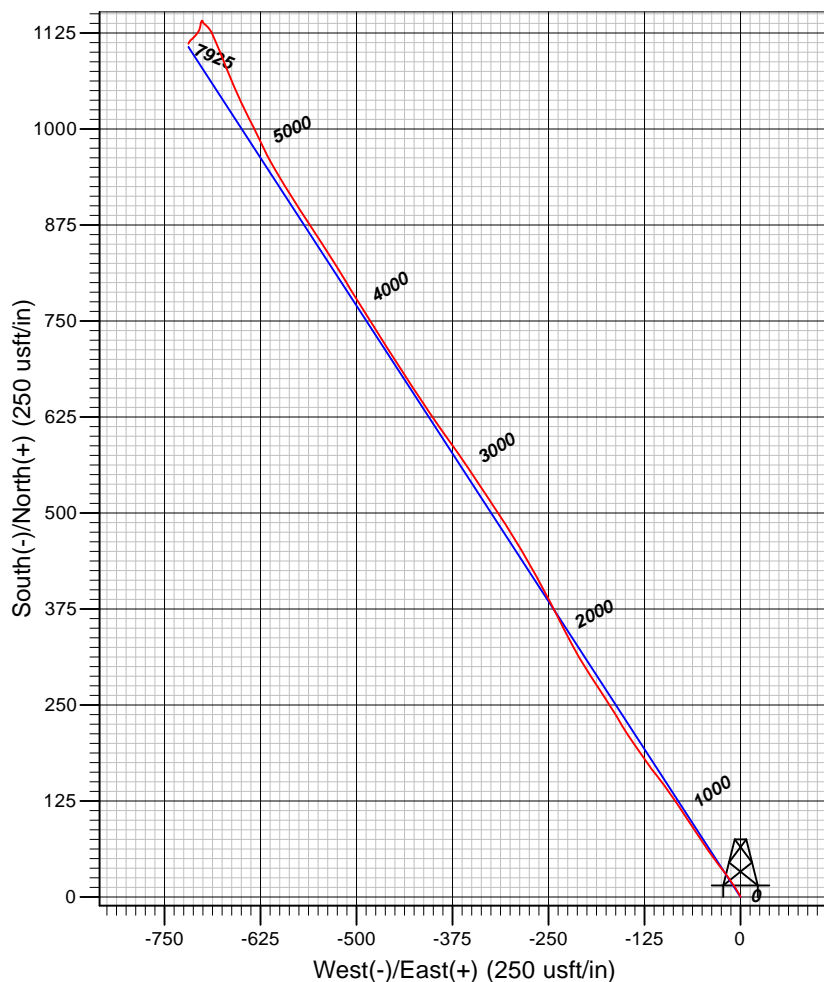
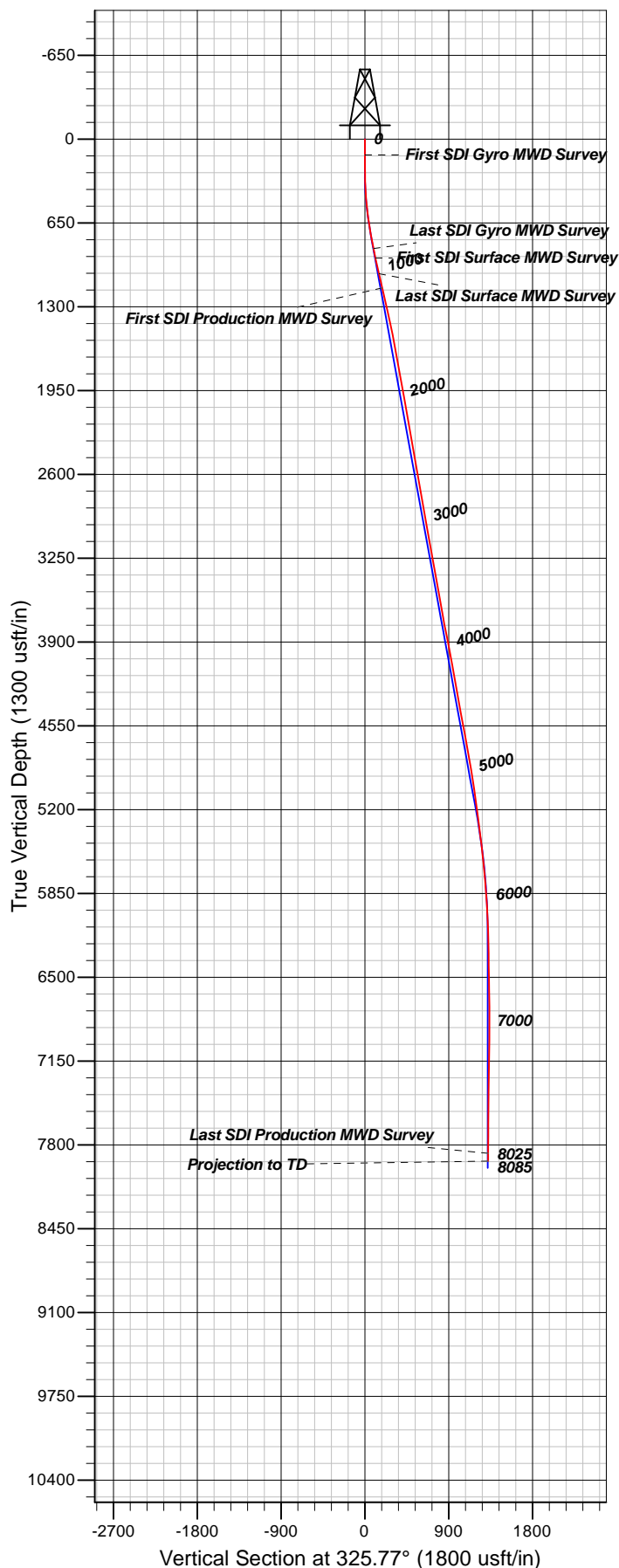
Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,310.00	13.07	328.79	4,187.64	813.48	-521.50	965.93	1.08	-1.07	0.56	
4,389.00	12.99	327.66	4,264.61	828.62	-530.88	983.72	0.34	-0.10	-1.43	
4,498.00	15.35	327.64	4,370.28	851.16	-545.16	1,010.39	2.17	2.17	-0.02	
4,578.00	14.82	327.21	4,447.53	868.70	-556.37	1,031.20	0.68	-0.66	-0.54	
4,583.98	14.81	327.17	4,453.31	869.99	-557.20	1,032.73	0.26	-0.19	-0.67	
PA 511-25 MVRD										
4,672.00	14.64	326.57	4,538.44	888.72	-569.42	1,055.10	0.26	-0.19	-0.68	
4,768.00	13.87	326.02	4,631.48	908.39	-582.54	1,078.73	0.81	-0.80	-0.57	
4,862.00	13.53	329.54	4,722.81	927.21	-594.41	1,100.97	0.96	-0.36	3.74	
4,957.00	13.95	329.65	4,815.09	946.67	-605.83	1,123.49	0.44	0.44	0.12	
5,052.00	12.50	332.42	4,907.57	965.67	-616.38	1,145.12	1.67	-1.53	2.92	
5,147.00	12.58	335.00	5,000.30	984.16	-625.51	1,165.55	0.60	0.08	2.72	
5,242.00	10.64	333.43	5,093.36	1,001.38	-633.80	1,184.45	2.07	-2.04	-1.65	
5,336.00	10.96	333.65	5,185.69	1,017.15	-641.65	1,201.91	0.34	0.34	0.23	
5,431.00	9.41	333.98	5,279.19	1,032.22	-649.07	1,218.54	1.63	-1.63	0.35	
5,526.00	10.63	336.50	5,372.74	1,047.24	-655.97	1,234.84	1.36	1.28	2.65	
5,621.00	9.61	336.99	5,466.26	1,062.57	-662.56	1,251.22	1.08	-1.07	0.52	
5,716.00	8.88	339.13	5,560.03	1,076.72	-668.27	1,266.14	0.85	-0.77	2.25	
5,810.00	7.73	337.04	5,653.04	1,089.32	-673.33	1,279.40	1.26	-1.22	-2.22	
5,905.00	7.20	338.43	5,747.23	1,100.74	-678.01	1,291.47	0.59	-0.56	1.46	
6,000.00	5.89	336.60	5,841.61	1,110.75	-682.13	1,302.07	1.40	-1.38	-1.93	
6,095.00	4.66	339.94	5,936.21	1,118.85	-685.39	1,310.60	1.33	-1.29	3.52	
6,190.00	4.04	326.75	6,030.94	1,125.27	-688.55	1,317.68	1.23	-0.65	-13.88	
6,284.00	2.66	327.40	6,124.77	1,129.88	-691.54	1,323.18	1.47	-1.47	0.69	
6,379.00	2.05	314.35	6,219.69	1,132.93	-693.94	1,327.04	0.85	-0.64	-13.74	
6,474.00	1.39	316.78	6,314.65	1,134.95	-695.95	1,329.85	0.70	-0.69	2.56	
6,569.00	1.06	294.68	6,409.63	1,136.16	-697.53	1,331.74	0.60	-0.35	-23.26	
6,663.00	0.97	324.20	6,503.62	1,137.17	-698.79	1,333.28	0.56	-0.10	31.40	
6,758.00	1.11	332.51	6,598.60	1,138.64	-699.69	1,335.00	0.22	0.15	8.75	
6,853.00	0.78	340.80	6,693.59	1,140.06	-700.32	1,336.53	0.38	-0.35	8.73	
6,948.00	0.35	315.15	6,788.58	1,140.88	-700.74	1,337.44	0.51	-0.45	-27.00	
7,043.00	0.34	243.70	6,883.58	1,140.96	-701.20	1,337.77	0.42	-0.01	-75.21	
7,137.00	0.70	209.69	6,977.58	1,140.34	-701.73	1,337.55	0.49	0.38	-36.18	
7,232.00	1.32	202.48	7,072.56	1,138.82	-702.44	1,336.70	0.66	0.65	-7.59	
7,326.00	1.77	187.52	7,166.53	1,136.38	-703.04	1,335.02	0.64	0.48	-15.91	
7,421.00	2.61	188.29	7,261.46	1,132.79	-703.55	1,332.33	0.88	0.88	0.81	
7,515.00	2.78	205.21	7,355.35	1,128.61	-704.83	1,329.60	0.86	0.18	18.00	
7,610.00	3.32	214.71	7,450.22	1,124.26	-707.37	1,327.44	0.78	0.57	10.00	
7,704.00	3.06	224.52	7,544.08	1,120.24	-710.68	1,325.97	0.64	-0.28	10.44	
7,799.00	2.06	233.04	7,638.98	1,117.40	-713.82	1,325.39	1.12	-1.05	8.97	
7,893.00	1.62	219.94	7,732.93	1,115.37	-716.03	1,324.95	0.64	-0.47	-13.94	
7,988.00	1.58	217.15	7,827.89	1,113.29	-717.68	1,324.16	0.09	-0.04	-2.94	
8,025.00	1.41	202.56	7,864.88	1,112.47	-718.16	1,323.75	1.12	-0.46	-39.43	
Last SDI Production MWD Survey										

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<b>Well:</b>	PA 511-25	<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)
8,085.00	1.41	202.56	7,924.86	1,111.10	-718.73	1,322.94	0.00	0.00	0.00
Projection to TD - PA 511-25 PBHL - PBHL (PA 511-25)									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
122.00	122.00	0.27	0.06	First SDI Gyro MWD Survey	
857.00	848.06	76.61	-53.05	Last SDI Gyro MWD Survey	
934.00	922.08	94.42	-64.54	First SDI Surface MWD Survey	
1,060.00	1,042.50	125.23	-85.19	Last SDI Surface MWD Survey	
1,177.00	1,153.75	154.36	-106.72	First SDI Production MWD Survey	
8,025.00	7,864.88	1,112.47	-718.16	Last SDI Production MWD Survey	
8,085.00	7,924.86	1,111.10	-718.73	Projection to TD	

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



#### Well Details: PA 511-25

TVD Reference: GL 5224' & RKB 24' @ 5248.00usft  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.00 0.00 1615198.76 2308785.52 39.4969113 -107.9497025PA 511-25 (B8)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 511-25 - Slot PA 511-25 (B8), True North  
 Vertical (TVD) Reference: GL 5224' & RKB 24' @ 5248.00usft  
 Section (VS) Reference: Slot - PA 511-25 (B8)(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

9:55, January 09 2018  
 Created By: Mel Mireles Jr.