



## 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 512-26
County & State	Garfield County, CO
SDI Job No.	OP.011884
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 152 feet to a measured depth of 8,558 feet is true and correct as determined from all available records.

  
Signature

09-Aug-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 512-26 - Slot PA 512-26 (B16)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
<b>Site:</b>	PA 23-26 Pad	<b>MD Reference:</b>	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
<b>Well:</b>	PA 512-26	<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		

Site		PA 23-26 Pad			
Site Position:		Northing:	1,614,399.90 usft	Latitude:	39.4943598
From:	Map	Easting:	2,303,951.10 usft	Longitude:	-107.9667508
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.56 °

Well		PA 512-26 - Slot PA 512-26 (B16)				
Well Position	+N/-S	0.00 usft	Northing:	1,614,388.70 usft	Latitude:	39.4943229
	+E/-W	0.00 usft	Easting:	2,303,868.10 usft	Longitude:	-107.9670437
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,637.00 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	7/25/2018	9.37	65.75	51,605

<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	267.42	

<b>Survey Program</b>	<b>Date</b>	8/9/2018			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
152.00	305.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
377.00	1,069.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,172.00	8,558.00	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	
152.00	0.97	282.39	151.99	0.28	-1.26	1.24	0.64	0.64	0.00	
<b>First SDI Gyro MWD Survey</b>										
212.00	2.20	268.33	211.97	0.35	-2.90	2.89	2.13	2.05	-23.43	
305.00	3.96	265.52	304.83	0.05	-7.89	7.88	1.90	1.89	-3.02	
<b>Last SDI Gyro MWD Survey</b>										
377.00	5.63	261.88	376.58	-0.64	-13.87	13.88	2.36	2.32	-5.06	
<b>First SDI Surface MWD Survey</b>										

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well PA 512-26 - Slot PA 512-26 (B16)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
<b>Site:</b>	PA 23-26 Pad	<b>MD Reference:</b>	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
<b>Well:</b>	PA 512-26	<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)
469.00	7.49	271.79	467.97	-1.09	-24.33	24.35	2.36	2.02	10.77
560.00	9.50	284.73	557.98	1.00	-37.52	37.44	3.04	2.21	14.22
652.00	12.22	288.69	648.32	6.05	-54.09	53.76	3.06	2.96	4.30
742.00	15.00	289.33	735.79	12.96	-74.11	73.45	3.09	3.09	0.71
834.00	17.66	290.97	824.07	21.90	-98.38	97.29	2.93	2.89	1.78
928.00	20.78	293.17	912.82	33.56	-127.03	125.39	3.41	3.32	2.34
1,023.00	22.69	291.41	1,001.06	46.88	-159.58	157.31	2.12	2.01	-1.85
1,069.00	23.21	289.30	1,043.42	53.12	-176.40	173.83	2.12	1.13	-4.59
Last SDI Surface MWD Survey									
1,172.00	24.06	286.00	1,137.79	65.62	-215.74	212.57	1.53	0.83	-3.20
First SDI Production MWD Survey									
1,267.00	23.64	289.63	1,224.68	77.35	-252.30	248.56	1.61	-0.44	3.82
1,361.00	23.38	287.48	1,310.88	89.29	-287.84	283.53	0.95	-0.28	-2.29
1,455.00	22.75	292.57	1,397.37	101.87	-322.41	317.51	2.22	-0.67	5.41
1,550.00	22.24	297.26	1,485.15	117.15	-355.36	349.74	1.96	-0.54	4.94
1,644.00	21.57	299.99	1,572.36	133.94	-386.14	379.73	1.30	-0.71	2.90
1,738.00	21.51	296.27	1,659.80	150.20	-416.56	409.39	1.45	-0.06	-3.96
1,833.00	19.39	298.30	1,748.81	165.39	-446.07	438.18	2.35	-2.23	2.14
1,927.00	19.24	296.76	1,837.52	179.76	-473.64	465.08	0.56	-0.16	-1.64
2,021.00	18.52	296.71	1,926.46	193.44	-500.80	491.60	0.77	-0.77	-0.05
2,116.00	17.50	295.11	2,016.81	206.29	-527.21	517.41	1.19	-1.07	-1.68
2,210.00	18.72	299.10	2,106.15	219.62	-553.19	542.76	1.85	1.30	4.24
2,304.00	17.55	299.08	2,195.48	233.85	-578.76	567.66	1.24	-1.24	-0.02
2,399.00	18.80	298.27	2,285.74	248.06	-604.76	593.00	1.34	1.32	-0.85
2,493.00	17.59	296.29	2,375.04	261.52	-630.84	618.44	1.45	-1.29	-2.11
2,587.00	18.84	297.81	2,464.33	274.90	-657.00	643.97	1.42	1.33	1.62
2,681.00	19.65	298.14	2,553.08	289.43	-684.36	670.66	0.87	0.86	0.35
2,776.00	18.63	296.38	2,642.82	303.71	-712.04	697.67	1.23	-1.07	-1.85
2,871.00	18.11	296.06	2,732.98	316.94	-738.90	723.90	0.56	-0.55	-0.34
2,965.00	17.14	294.87	2,822.57	329.18	-764.59	749.02	1.10	-1.03	-1.27
3,059.00	19.04	292.56	2,911.92	340.89	-791.32	775.19	2.16	2.02	-2.46
3,153.00	17.85	292.15	3,001.09	352.20	-818.82	802.16	1.27	-1.27	-0.44
3,248.00	19.32	295.45	3,091.14	364.45	-846.50	829.26	1.90	1.55	3.47
3,342.00	18.74	295.92	3,180.00	377.73	-874.12	856.26	0.64	-0.62	0.50
3,437.00	20.10	295.99	3,269.59	391.56	-902.52	884.01	1.43	1.43	0.07
3,531.00	18.76	295.16	3,358.24	405.06	-930.72	911.57	1.46	-1.43	-0.88
3,625.00	20.26	294.51	3,446.84	418.24	-959.21	939.44	1.61	1.60	-0.69
3,720.00	19.01	293.67	3,536.31	431.27	-988.35	967.96	1.35	-1.32	-0.88
3,814.00	20.88	295.23	3,624.67	444.56	-1,017.53	996.52	2.07	1.99	1.66
3,909.00	19.94	294.14	3,713.70	458.40	-1,047.63	1,025.96	1.07	-0.99	-1.15
4,003.00	18.81	294.36	3,802.38	471.21	-1,076.06	1,053.79	1.20	-1.20	0.23
4,098.00	17.55	294.40	3,892.64	483.45	-1,103.06	1,080.21	1.33	-1.33	0.04
4,192.00	18.58	298.58	3,982.00	496.46	-1,129.11	1,105.66	1.76	1.10	4.45
4,286.00	18.30	299.42	4,071.18	510.88	-1,155.12	1,130.99	0.41	-0.30	0.89

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<b>Well:</b>	PA 512-26	<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

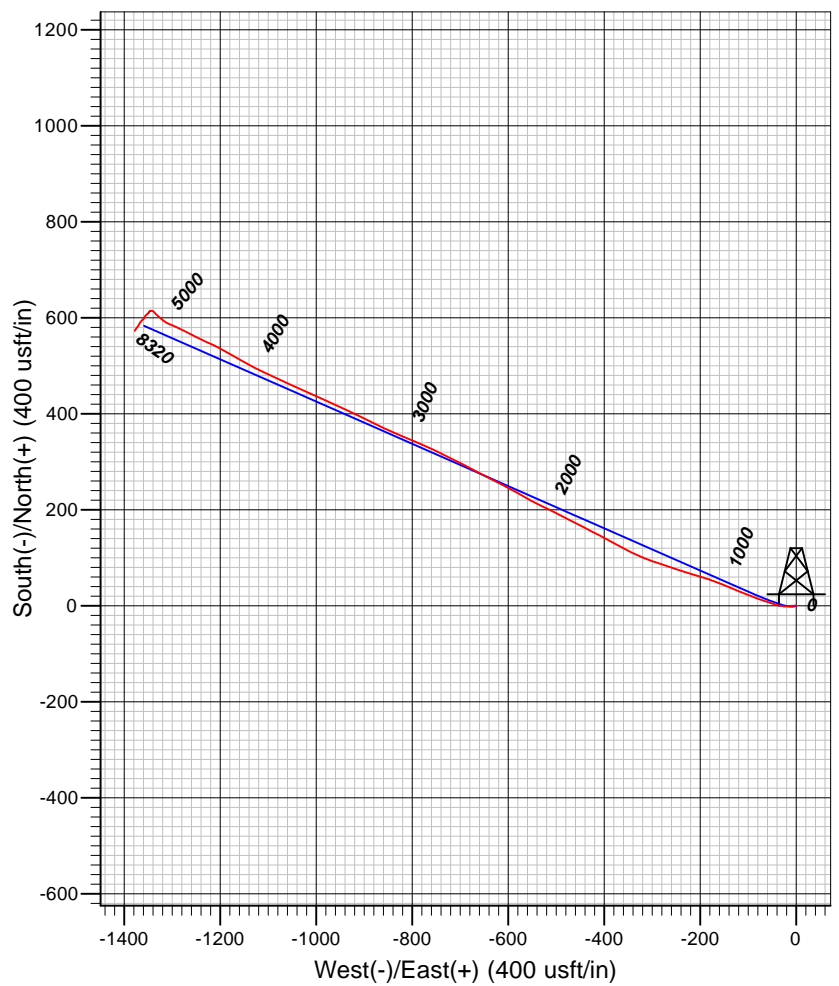
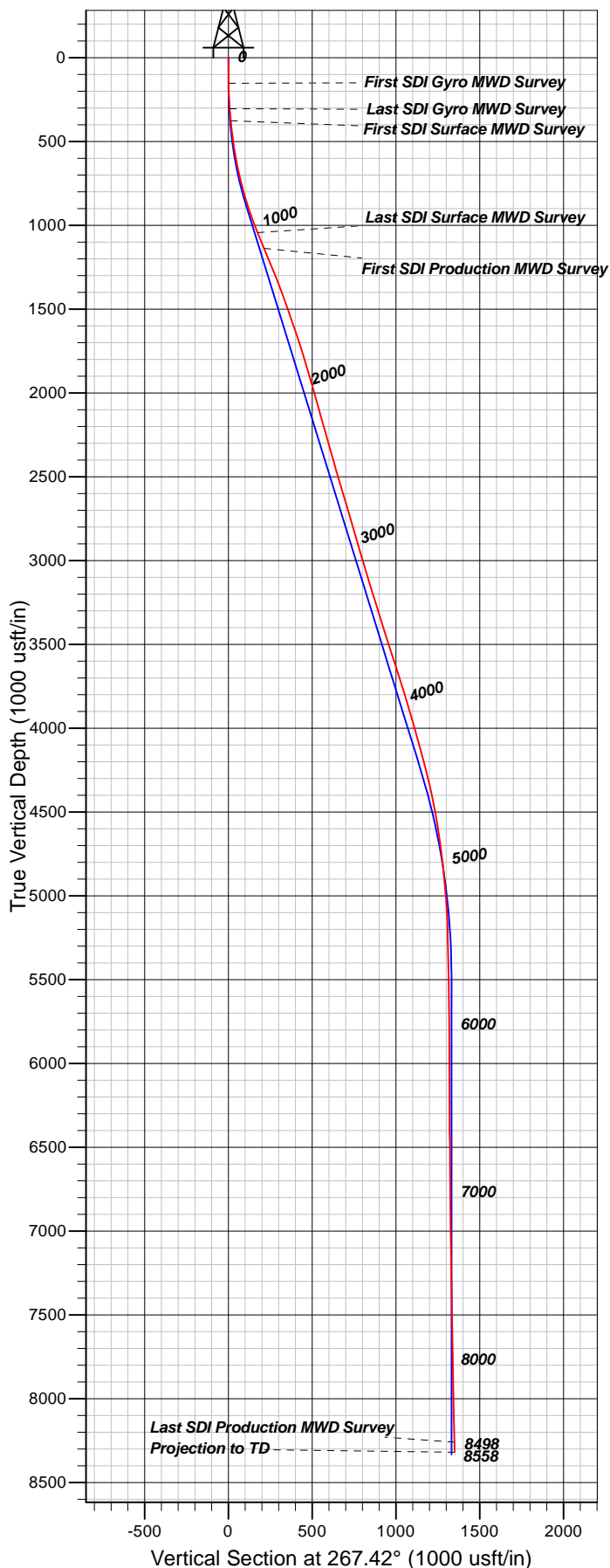
Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,381.00	17.96	298.80	4,161.46	525.26	-1,180.95	1,156.14	0.41	-0.36	-0.65	
4,475.00	15.75	298.06	4,251.42	538.25	-1,204.91	1,179.49	2.36	-2.35	-0.79	
4,570.00	14.36	294.77	4,343.16	549.25	-1,226.98	1,201.05	1.72	-1.46	-3.46	
4,664.00	13.67	295.50	4,434.36	558.91	-1,247.59	1,221.21	0.76	-0.73	0.78	
4,759.00	11.76	297.91	4,527.02	568.28	-1,266.28	1,239.46	2.09	-2.01	2.54	
4,853.00	9.27	295.79	4,619.44	576.06	-1,281.57	1,254.38	2.68	-2.65	-2.26	
4,947.00	8.13	294.02	4,712.36	582.06	-1,294.46	1,266.98	1.25	-1.21	-1.88	
5,042.00	7.65	291.32	4,806.46	587.09	-1,306.48	1,278.77	0.64	-0.51	-2.84	
5,136.00	7.05	308.45	4,899.70	592.95	-1,316.83	1,288.84	2.41	-0.64	18.22	
5,230.00	6.52	309.55	4,993.04	599.94	-1,325.46	1,297.15	0.58	-0.56	1.17	
5,325.00	4.53	312.42	5,087.59	605.90	-1,332.39	1,303.81	2.11	-2.09	3.02	
5,419.00	2.28	325.62	5,181.42	609.95	-1,336.19	1,307.42	2.52	-2.39	14.04	
5,513.00	1.70	317.31	5,275.36	612.52	-1,338.19	1,309.30	0.69	-0.62	-8.84	
5,608.00	1.23	292.31	5,370.33	613.94	-1,340.09	1,311.14	0.82	-0.49	-26.32	
5,702.00	1.35	270.63	5,464.31	614.34	-1,342.13	1,313.16	0.53	0.13	-23.06	
5,797.00	1.63	266.21	5,559.28	614.26	-1,344.60	1,315.63	0.32	0.29	-4.65	
5,891.00	0.26	343.71	5,653.26	614.38	-1,345.99	1,317.01	1.70	-1.46	82.45	
5,985.00	0.14	358.09	5,747.26	614.70	-1,346.05	1,317.06	0.14	-0.13	15.30	
6,079.00	0.38	246.43	5,841.26	614.69	-1,346.34	1,317.35	0.48	0.26	-118.79	
6,174.00	0.34	200.44	5,936.26	614.30	-1,346.73	1,317.76	0.30	-0.04	-48.41	
6,268.00	0.75	218.02	6,030.26	613.55	-1,347.21	1,318.26	0.47	0.44	18.70	
6,363.00	1.71	209.91	6,125.23	611.83	-1,348.30	1,319.43	1.02	1.01	-8.54	
6,457.00	0.40	11.82	6,219.22	610.94	-1,348.93	1,320.10	2.23	-1.39	172.24	
6,552.00	0.28	228.93	6,314.22	611.11	-1,349.04	1,320.20	0.68	-0.13	-150.41	
6,646.00	0.91	232.57	6,408.22	610.50	-1,349.80	1,320.99	0.67	0.67	3.87	
6,741.00	1.15	223.02	6,503.20	609.35	-1,351.05	1,322.29	0.31	0.25	-10.05	
6,835.00	0.38	168.41	6,597.19	608.35	-1,351.63	1,322.92	1.04	-0.82	-58.10	
6,929.00	0.69	225.81	6,691.19	607.65	-1,351.98	1,323.29	0.62	0.33	61.06	
7,023.00	0.49	251.22	6,785.18	607.13	-1,352.76	1,324.10	0.35	-0.21	27.03	
7,118.00	0.91	241.25	6,880.18	606.64	-1,353.81	1,325.17	0.46	0.44	-10.49	
7,212.00	1.10	211.44	6,974.16	605.51	-1,354.93	1,326.34	0.58	0.20	-31.71	
7,307.00	1.32	213.28	7,069.14	603.82	-1,356.01	1,327.50	0.24	0.23	1.94	
7,401.00	1.55	211.51	7,163.11	601.83	-1,357.27	1,328.84	0.25	0.24	-1.88	
7,495.00	1.55	216.81	7,257.08	599.72	-1,358.69	1,330.36	0.15	0.00	5.64	
7,589.00	1.42	213.91	7,351.05	597.74	-1,360.11	1,331.86	0.16	-0.14	-3.09	
7,684.00	1.65	224.40	7,446.01	595.79	-1,361.72	1,333.56	0.38	0.24	11.04	
7,778.00	1.34	231.28	7,539.98	594.13	-1,363.52	1,335.44	0.38	-0.33	7.32	
7,873.00	1.28	228.59	7,634.96	592.73	-1,365.19	1,337.16	0.09	-0.06	-2.83	
7,966.00	1.23	209.23	7,727.93	591.18	-1,366.45	1,338.50	0.46	-0.05	-20.82	
8,061.00	1.63	210.24	7,822.90	589.12	-1,367.63	1,339.77	0.42	0.42	1.06	
8,155.00	1.75	211.56	7,916.86	586.74	-1,369.06	1,341.30	0.13	0.13	1.40	
8,249.00	2.07	214.50	8,010.81	584.12	-1,370.77	1,343.13	0.36	0.34	3.13	
8,343.00	2.46	215.65	8,104.74	581.08	-1,372.91	1,345.40	0.42	0.41	1.22	

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<b>Well:</b>	PA 512-26	<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)
8,438.00	2.54	210.55	8,199.65	577.61	-1,375.16	1,347.81	0.25	0.08	-5.37
8,498.00	2.55	215.21	8,259.59	575.38	-1,376.61	1,349.35	0.35	0.02	7.77
Last SDI Production MWD Survey									
8,558.00	2.55	215.21	8,319.53	573.20	-1,378.15	1,350.99	0.00	0.00	0.00
Projection to TD - PBHL(PA 512-26)									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
152.00	151.99	0.28	-1.26	First SDI Gyro MWD Survey
305.00	304.83	0.05	-7.89	Last SDI Gyro MWD Survey
377.00	376.58	-0.64	-13.87	First SDI Surface MWD Survey
1,069.00	1,043.42	53.12	-176.40	Last SDI Surface MWD Survey
1,172.00	1,137.79	65.62	-215.74	First SDI Production MWD Survey
8,498.00	8,259.59	575.38	-1,376.61	Last SDI Production MWD Survey
8,558.00	8,319.53	573.20	-1,378.15	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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#### Well Details: PA 512-26

TVD Reference: GL 5637' & RKB 24' @ 5661.00usft (H&P 271) and Level: 5637.00  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.00 0.00 1614388.70 2303868.10 39.4943228 -107.9670438 PA 512-26 (B16)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 512-26 - Slot PA 512-26 (B16), True North  
 Vertical (TVD) Reference: GL 5637' & RKB 24' @ 5661.00usft (H&P 271)  
 Section (VS) Reference: Slot - PA 512-26 (B16)(0.00N, 0.00E)  
 Measured Depth Reference: GL 5637' & RKB 24' @ 5661.00usft (H&P 271)  
 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

12:15, August 09 2018  
 Created By: Mel Mireles Jr.