



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 421-26
County & State	Garfield County, CO
SDI Job No.	OP.011632
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 92 feet to a measured depth of 8,990 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

25-Jul-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 421-26 - Slot PA 421-26 (A13)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Site:	PA 23-26 Pad	MD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Well:	PA 421-26	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		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 421-26 - Slot PA 421-26 (A13), A13					
Well Position	+N/-S	0.00 usft	Northing:	1,614,399.10 usft	Latitude:	39.4943531
	+E/-W	0.00 usft	Easting:	2,303,890.40 usft	Longitude:	-107.9669657
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,637.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/16/2018	9.37	65.75	51,608

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	344.28	

Survey Program	Date	7/25/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
92.00	1,087.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
1,172.00	8,990.00	Survey #2 - 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	
92.00	0.26	194.85	92.00	-0.20	-0.05	-0.18	0.28	0.28	0.00	
First SDI Gyro MWD Survey										
122.00	0.18	323.17	122.00	-0.23	-0.10	-0.19	1.33	-0.27	427.73	
212.00	3.43	350.95	211.94	2.54	-0.61	2.61	3.64	3.61	30.87	
305.00	5.01	350.33	304.69	9.29	-1.73	9.41	1.70	1.70	-0.67	
396.00	6.25	352.09	395.25	18.12	-3.08	18.27	1.38	1.36	1.93	
489.00	7.65	353.85	487.56	29.29	-4.44	29.39	1.52	1.51	1.89	
580.00	9.24	346.73	577.57	42.42	-6.76	42.67	2.09	1.75	-7.82	
672.00	10.56	343.65	668.20	57.70	-10.83	58.48	1.55	1.43	-3.35	

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Site:	PA 23-26 Pad	MD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Well:	PA 421-26	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)
762.00	11.96	340.84	756.47	74.42	-16.21	76.03	1.67	1.56	-3.12
854.00	13.99	340.66	846.12	93.92	-23.03	96.65	2.21	2.21	-0.20
948.00	15.13	345.32	937.10	116.51	-29.90	120.26	1.74	1.21	4.96
1,042.00	17.33	344.79	1,027.35	141.89	-36.68	146.52	2.35	2.34	-0.56
1,087.00	18.65	343.92	1,070.15	155.27	-40.43	160.42	2.99	2.93	-1.93
Last SDI Gyro MWD Survey									
1,172.00	19.89	344.21	1,150.38	182.25	-48.13	188.47	1.46	1.46	0.34
First SDI Production MWD Survey									
1,266.00	21.65	342.20	1,238.27	214.15	-57.78	221.79	2.02	1.87	-2.14
1,361.00	22.84	342.54	1,326.20	248.42	-68.67	257.74	1.26	1.25	0.36
1,455.00	24.46	342.34	1,412.30	284.37	-80.05	295.42	1.73	1.72	-0.21
1,550.00	26.31	344.56	1,498.13	323.41	-91.63	336.14	2.19	1.95	2.34
1,644.00	27.11	346.62	1,582.10	364.33	-102.13	378.37	1.30	0.85	2.19
1,738.00	28.49	347.74	1,665.25	407.07	-111.85	422.15	1.57	1.47	1.19
1,832.00	31.39	351.26	1,746.70	453.19	-120.33	468.84	3.61	3.09	3.74
1,927.00	30.78	349.63	1,828.06	501.56	-128.46	517.60	1.09	-0.64	-1.72
2,021.00	31.33	351.45	1,908.59	549.39	-136.43	565.80	1.16	0.59	1.94
2,115.00	30.65	351.34	1,989.17	597.24	-143.67	613.83	0.73	-0.72	-0.12
2,210.00	30.07	350.65	2,071.14	644.66	-151.18	661.51	0.71	-0.61	-0.73
2,304.00	30.88	352.57	2,152.16	691.82	-158.13	708.79	1.35	0.86	2.04
2,399.00	29.67	352.68	2,234.20	739.32	-164.27	756.17	1.28	-1.27	0.12
2,493.00	29.96	354.87	2,315.76	785.77	-169.34	802.26	1.20	0.31	2.33
2,588.00	30.80	355.19	2,397.71	833.64	-173.50	849.46	0.90	0.88	0.34
2,682.00	29.95	354.74	2,478.81	880.99	-177.67	896.17	0.94	-0.90	-0.48
2,776.00	31.09	356.15	2,559.79	928.57	-181.45	943.00	1.43	1.21	1.50
2,871.00	31.56	358.17	2,640.94	977.89	-183.89	991.13	1.21	0.49	2.13
2,965.00	30.65	358.03	2,721.43	1,026.43	-185.50	1,038.29	0.97	-0.97	-0.15
3,060.00	29.86	357.96	2,803.48	1,074.26	-187.17	1,084.79	0.83	-0.83	-0.07
3,154.00	31.81	0.19	2,884.20	1,122.43	-187.92	1,131.36	2.40	2.07	2.37
3,249.00	30.15	0.17	2,965.64	1,171.33	-187.77	1,178.38	1.75	-1.75	-0.02
3,343.00	30.30	1.35	3,046.86	1,218.64	-187.14	1,223.76	0.65	0.16	1.26
3,437.00	29.80	1.15	3,128.23	1,265.70	-186.11	1,268.78	0.54	-0.53	-0.21
3,532.00	30.62	359.88	3,210.33	1,313.49	-185.69	1,314.67	1.09	0.86	-1.34
3,626.00	30.83	358.60	3,291.13	1,361.51	-186.33	1,361.07	0.73	0.22	-1.36
3,721.00	29.27	358.51	3,373.36	1,409.07	-187.53	1,407.17	1.64	-1.64	-0.09
3,815.00	30.09	0.19	3,455.03	1,455.61	-188.05	1,452.10	1.24	0.87	1.79
3,910.00	31.23	0.05	3,536.75	1,504.05	-187.95	1,498.71	1.20	1.20	-0.15
4,004.00	32.00	0.69	3,616.80	1,553.32	-187.63	1,546.05	0.89	0.82	0.68
4,098.00	31.57	359.96	3,696.70	1,602.83	-187.34	1,593.63	0.61	-0.46	-0.78
4,192.00	30.68	359.99	3,777.17	1,651.42	-187.36	1,640.41	0.95	-0.95	0.03
4,287.00	32.07	359.97	3,858.27	1,700.88	-187.38	1,688.02	1.46	1.46	-0.02
4,381.00	31.11	359.57	3,938.34	1,750.12	-187.58	1,735.47	1.05	-1.02	-0.43
4,476.00	29.84	358.97	4,020.22	1,798.30	-188.19	1,782.01	1.37	-1.34	-0.63

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Site:	PA 23-26 Pad	MD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Well:	PA 421-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

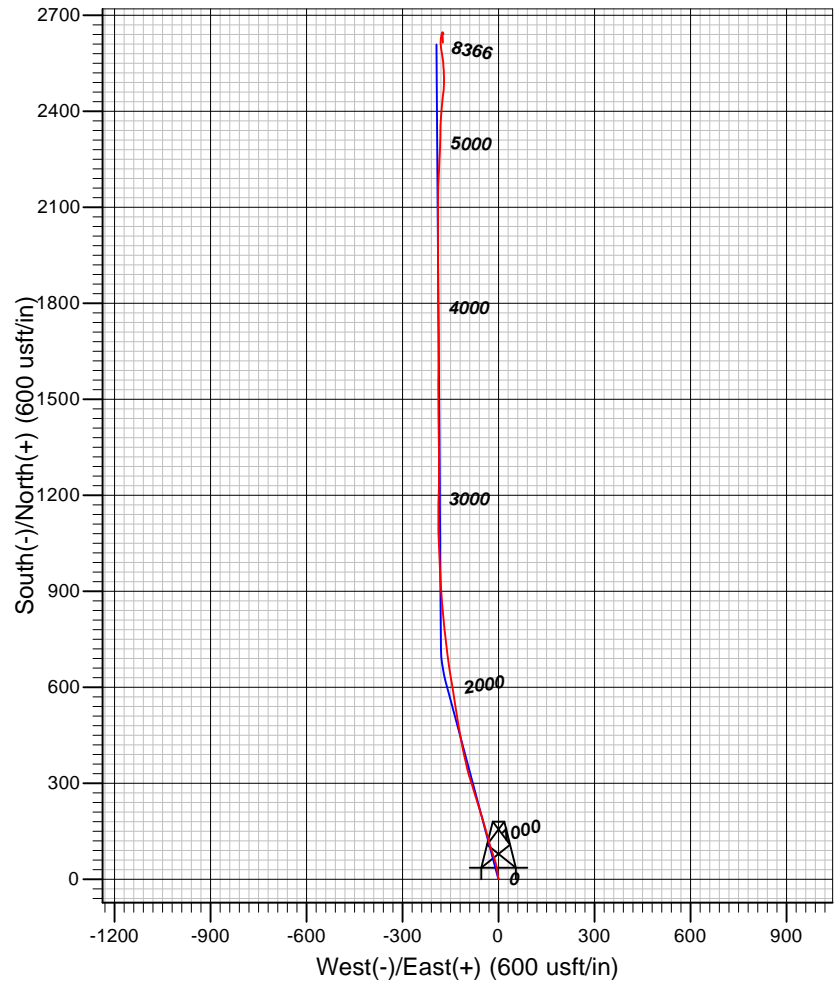
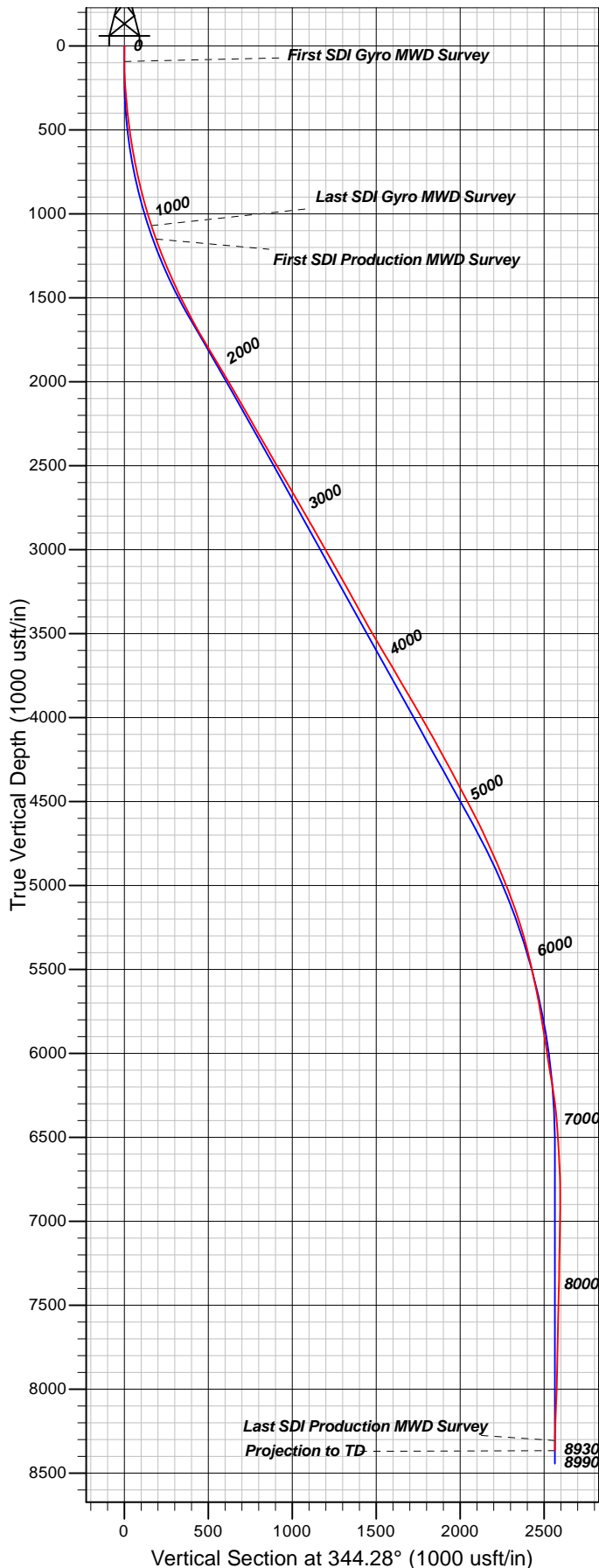
Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,570.00	30.47	359.63	4,101.50	1,845.51	-188.76	1,827.62	0.76	0.67	0.70
4,664.00	30.10	359.86	4,182.67	1,892.92	-188.97	1,873.30	0.41	-0.39	0.24
4,758.00	28.68	0.11	4,264.57	1,939.05	-188.99	1,917.71	1.52	-1.51	0.27
4,863.00	29.46	359.26	4,356.34	1,990.06	-189.27	1,966.89	0.84	0.74	-0.81
4,947.00	28.41	0.01	4,429.85	2,030.70	-189.53	2,006.08	1.32	-1.25	0.89
5,042.00	29.24	0.71	4,513.08	2,076.50	-189.24	2,050.09	0.94	0.87	0.74
5,136.00	27.80	0.31	4,595.67	2,121.38	-188.84	2,093.18	1.55	-1.53	-0.43
5,230.00	26.16	1.53	4,679.44	2,164.02	-188.17	2,134.04	1.84	-1.74	1.30
5,356.00	25.32	2.60	4,792.94	2,218.70	-186.20	2,186.15	0.76	-0.67	0.85
5,419.00	24.50	2.76	4,850.08	2,245.20	-184.96	2,211.32	1.31	-1.30	0.25
5,513.00	23.81	2.68	4,935.85	2,283.63	-183.14	2,247.81	0.73	-0.73	-0.09
5,608.00	22.61	0.78	5,023.16	2,321.04	-181.99	2,283.52	1.49	-1.26	-2.00
5,703.00	20.34	2.57	5,111.56	2,355.80	-181.00	2,316.71	2.49	-2.39	1.88
5,797.00	19.20	3.16	5,200.02	2,387.56	-179.42	2,346.85	1.23	-1.21	0.63
5,891.00	16.92	5.31	5,289.38	2,416.61	-177.30	2,374.24	2.53	-2.43	2.29
5,986.00	15.45	6.64	5,380.61	2,442.95	-174.56	2,398.85	1.60	-1.55	1.40
6,080.00	13.56	7.05	5,471.61	2,466.32	-171.76	2,420.59	2.01	-2.01	0.44
6,174.00	12.74	0.50	5,563.15	2,487.63	-170.31	2,440.71	1.81	-0.87	-6.97
6,268.00	11.63	358.33	5,655.03	2,507.46	-170.50	2,459.85	1.28	-1.18	-2.31
6,363.00	9.91	356.56	5,748.36	2,525.20	-171.27	2,477.13	1.84	-1.81	-1.86
6,457.00	9.84	355.84	5,840.96	2,541.28	-172.34	2,492.90	0.15	-0.07	-0.77
6,552.00	8.54	355.01	5,934.74	2,556.40	-173.54	2,507.79	1.38	-1.37	-0.87
6,646.00	8.73	352.11	6,027.68	2,570.42	-175.13	2,521.71	0.51	0.20	-3.09
6,740.00	9.85	348.89	6,120.44	2,585.38	-177.66	2,536.79	1.31	1.19	-3.43
6,835.00	9.15	353.55	6,214.14	2,600.86	-180.07	2,552.35	1.09	-0.74	4.91
6,929.00	7.36	359.30	6,307.16	2,614.31	-180.98	2,565.54	2.09	-1.90	6.12
7,023.00	4.93	8.90	6,400.62	2,624.32	-180.43	2,575.03	2.80	-2.59	10.21
7,117.00	4.13	7.41	6,494.33	2,631.67	-179.37	2,581.81	0.86	-0.85	-1.59
7,212.00	3.45	8.87	6,589.12	2,637.88	-178.49	2,587.56	0.72	-0.72	1.54
7,306.00	3.00	15.51	6,682.97	2,643.05	-177.39	2,592.23	0.62	-0.48	7.06
7,400.00	1.73	33.86	6,776.89	2,646.60	-175.95	2,595.26	1.56	-1.35	19.52
7,494.00	0.64	134.03	6,870.87	2,647.41	-174.78	2,595.72	2.07	-1.16	106.56
7,589.00	0.54	130.31	6,965.87	2,646.75	-174.06	2,594.89	0.11	-0.11	-3.92
7,684.00	1.31	150.80	7,060.85	2,645.52	-173.18	2,593.47	0.87	0.81	21.57
7,778.00	1.14	172.00	7,154.83	2,643.65	-172.53	2,591.49	0.51	-0.18	22.55
7,873.00	1.02	188.90	7,249.82	2,641.88	-172.53	2,589.79	0.36	-0.13	17.79
7,967.00	1.37	213.26	7,343.80	2,640.11	-173.27	2,588.29	0.65	0.37	25.91
8,061.00	1.71	204.54	7,437.76	2,637.90	-174.47	2,586.48	0.44	0.36	-9.28
8,155.00	1.34	177.16	7,531.73	2,635.52	-175.00	2,584.34	0.86	-0.39	-29.13
8,249.00	1.04	184.65	7,625.71	2,633.58	-175.02	2,582.47	0.36	-0.32	7.97
8,344.00	1.04	162.90	7,720.70	2,631.89	-174.83	2,580.80	0.41	0.00	-22.89
8,439.00	1.21	174.23	7,815.68	2,630.07	-174.48	2,578.95	0.29	0.18	11.93
8,533.00	1.54	179.45	7,909.65	2,627.82	-174.37	2,576.75	0.38	0.35	5.55
8,628.00	1.58	188.34	8,004.61	2,625.25	-174.54	2,574.33	0.26	0.04	9.36

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Site:	PA 23-26 Pad	MD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Well:	PA 421-26	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)	
8,722.00	2.55	168.71	8,098.55	2,621.92	-174.32	2,571.06	1.26	1.03	-20.88	
8,816.00	1.86	176.71	8,192.48	2,618.34	-173.83	2,567.48	0.80	-0.73	8.51	
8,910.00	1.06	188.22	8,286.45	2,615.96	-173.86	2,565.20	0.90	-0.85	12.24	
8,930.00	0.97	189.01	8,306.45	2,615.61	-173.92	2,564.88	0.46	-0.45	3.95	
Last SDI Production MWD Survey										
8,990.00	0.97	189.01	8,366.44	2,614.61	-174.07	2,563.95	0.00	0.00	0.00	
Projection to TD - PBHL(PA 421-26)										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
92.00	92.00	-0.20	-0.05	First SDI Gyro MWD Survey	
1,087.00	1,070.15	155.27	-40.43	Last SDI Gyro MWD Survey	
1,172.00	1,150.38	182.25	-48.13	First SDI Production MWD Survey	
8,930.00	8,306.45	2,615.61	-173.92	Last SDI Production MWD Survey	
8,990.00	8,366.44	2,614.61	-174.07	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____



Well Details: PA 421-26

TVD Reference: GL 5637' & RKB 24' @ 5661.00usft (H&P 271) and Level: 5637.00					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1614399.10	2303890.40	39.4943530	-107.9669650

PA 421-26 (A13)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 421-26 - Slot PA 421-26 (A13), True North
 Vertical (TVD) Reference: GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
 Section (VS) Reference: Slot - PA 421-26 (A13)(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

16:12, July 25 2018
 Created By: Mel Mireles Jr.