



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 321-26
County & State	Garfield County, CO
SDI Job No.	OP.009982
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 123 feet to a measured depth of 9,228 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

05-Jun-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 321-26 - Slot PA 321-26 (A4)
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 321-26	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 321-26 - Slot PA 321-26 (A4), A4					
Well Position	+N/-S	0.00 usft	Northing:	1,614,400.00 usft	Latitude:	39.4943606
	+E/-W	0.00 usft	Easting:	2,303,958.60 usft	Longitude:	-107.9667242
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	5/5/2018	9.38	65.77	51,631

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	353.94	

Survey Program	Date	6/5/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
123.00	491.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
562.00	1,067.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,174.00	9,228.00	Survey #3 - 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	
123.00	0.88	10.81	123.00	0.93	0.18	0.90	0.72	0.72	0.00	
First SDI Gyro MWD Survey										
215.00	2.73	3.69	214.95	3.81	0.45	3.74	2.02	2.01	-7.74	
307.00	4.31	359.03	306.77	9.45	0.53	9.34	1.74	1.72	-5.07	
400.00	6.95	355.34	399.31	18.56	0.02	18.45	2.86	2.84	-3.97	
491.00	9.94	354.55	489.32	31.86	-1.18	31.81	3.29	3.29	-0.87	
Last SDI Gyro MWD Survey										

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Site:	PA 23-26 Pad	MD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Well:	PA 321-26	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)	
562.00	12.51	355.09	558.95	45.63	-2.42	45.63	3.62	3.62	0.76	
First SDI Surface MWD Survey										
653.00	15.62	355.24	647.21	67.66	-4.28	67.74	3.42	3.42	0.16	
744.00	18.65	353.96	734.16	94.35	-6.83	94.54	3.36	3.33	-1.41	
836.00	21.32	351.62	820.62	125.53	-10.81	125.97	3.03	2.90	-2.54	
930.00	23.59	352.51	907.48	161.09	-15.75	161.85	2.44	2.41	0.95	
1,024.00	26.64	352.42	992.59	200.63	-20.99	201.73	3.24	3.24	-0.10	
1,067.00	27.17	353.65	1,030.93	219.95	-23.35	221.18	1.79	1.23	2.86	
Last SDI Surface MWD Survey										
1,174.00	29.06	353.85	1,125.30	270.07	-28.83	271.60	1.77	1.77	0.19	
First SDI Production MWD Survey										
1,268.00	30.86	353.78	1,206.74	316.74	-33.89	318.54	1.92	1.91	-0.07	
1,363.00	32.13	355.18	1,287.74	366.13	-38.65	368.17	1.54	1.34	1.47	
1,457.00	32.69	356.85	1,367.10	416.39	-42.15	418.51	1.12	0.60	1.78	
1,551.00	34.62	355.95	1,445.35	468.38	-45.43	470.56	2.12	2.05	-0.96	
1,646.00	32.70	353.21	1,524.42	520.78	-50.37	523.19	2.58	-2.02	-2.88	
1,740.00	33.83	353.30	1,603.01	571.99	-56.42	574.75	1.20	1.20	0.10	
1,835.00	34.33	354.35	1,681.70	624.91	-62.15	627.98	0.81	0.53	1.11	
1,929.00	33.35	353.45	1,759.77	676.96	-67.70	680.32	1.17	-1.04	-0.96	
2,023.00	34.40	356.15	1,837.82	729.13	-72.44	732.70	1.95	1.12	2.87	
2,118.00	33.64	355.68	1,916.56	782.14	-76.22	785.82	0.85	-0.80	-0.49	
2,212.00	34.54	358.30	1,994.41	834.74	-78.97	838.42	1.83	0.96	2.79	
2,306.00	33.40	357.39	2,072.37	887.23	-80.94	890.82	1.33	-1.21	-0.97	
2,400.00	34.18	358.86	2,150.49	939.48	-82.64	942.95	1.20	0.83	1.56	
2,494.00	32.78	358.39	2,228.89	991.31	-83.88	994.63	1.51	-1.49	-0.50	
2,589.00	33.41	358.86	2,308.48	1,043.17	-85.13	1,046.33	0.72	0.66	0.49	
2,683.00	34.06	358.84	2,386.65	1,095.36	-86.17	1,098.34	0.69	0.69	-0.02	
2,777.00	32.46	357.57	2,465.25	1,146.89	-87.78	1,149.75	1.86	-1.70	-1.35	
2,871.00	33.90	355.18	2,543.93	1,198.22	-91.05	1,201.13	2.07	1.53	-2.54	
2,965.00	33.23	354.61	2,622.25	1,249.98	-95.67	1,253.10	0.79	-0.71	-0.61	
3,059.00	34.16	355.00	2,700.46	1,301.91	-100.39	1,305.24	1.02	0.99	0.41	
3,153.00	33.11	353.51	2,778.72	1,353.72	-105.59	1,357.30	1.42	-1.12	-1.59	
3,248.00	34.28	353.63	2,857.76	1,406.09	-111.50	1,410.00	1.23	1.23	0.13	
3,342.00	32.55	354.46	2,936.22	1,457.57	-116.87	1,461.76	1.90	-1.84	0.88	
3,437.00	32.70	355.26	3,016.23	1,508.58	-121.46	1,512.97	0.48	0.16	0.84	
3,530.00	33.03	355.15	3,094.35	1,558.87	-125.68	1,563.43	0.36	0.35	-0.12	
3,625.00	33.77	353.91	3,173.66	1,610.93	-130.67	1,615.72	1.06	0.78	-1.31	
3,718.00	31.90	354.50	3,251.80	1,661.09	-135.77	1,666.14	2.04	-2.01	0.63	
3,813.00	32.55	352.80	3,332.17	1,711.43	-141.38	1,716.80	1.17	0.68	-1.79	
3,907.00	30.62	353.44	3,412.24	1,760.31	-147.28	1,766.02	2.08	-2.05	0.68	
4,001.00	32.38	352.98	3,492.38	1,809.08	-153.09	1,815.13	1.89	1.87	-0.49	
4,095.00	33.54	352.47	3,571.25	1,859.80	-159.57	1,866.26	1.27	1.23	-0.54	
4,190.00	32.34	352.23	3,650.98	1,911.00	-166.45	1,917.89	1.27	-1.26	-0.25	
4,284.00	33.52	350.86	3,729.88	1,961.54	-173.97	1,968.95	1.48	1.26	-1.46	

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Well:	PA 321-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

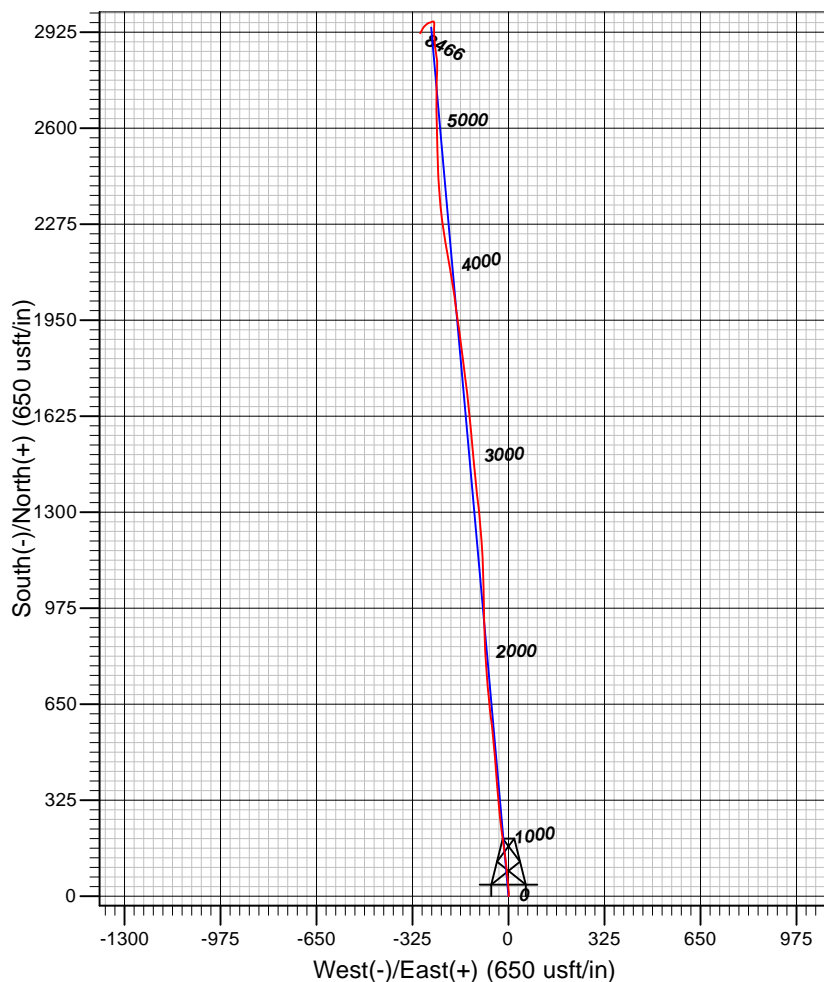
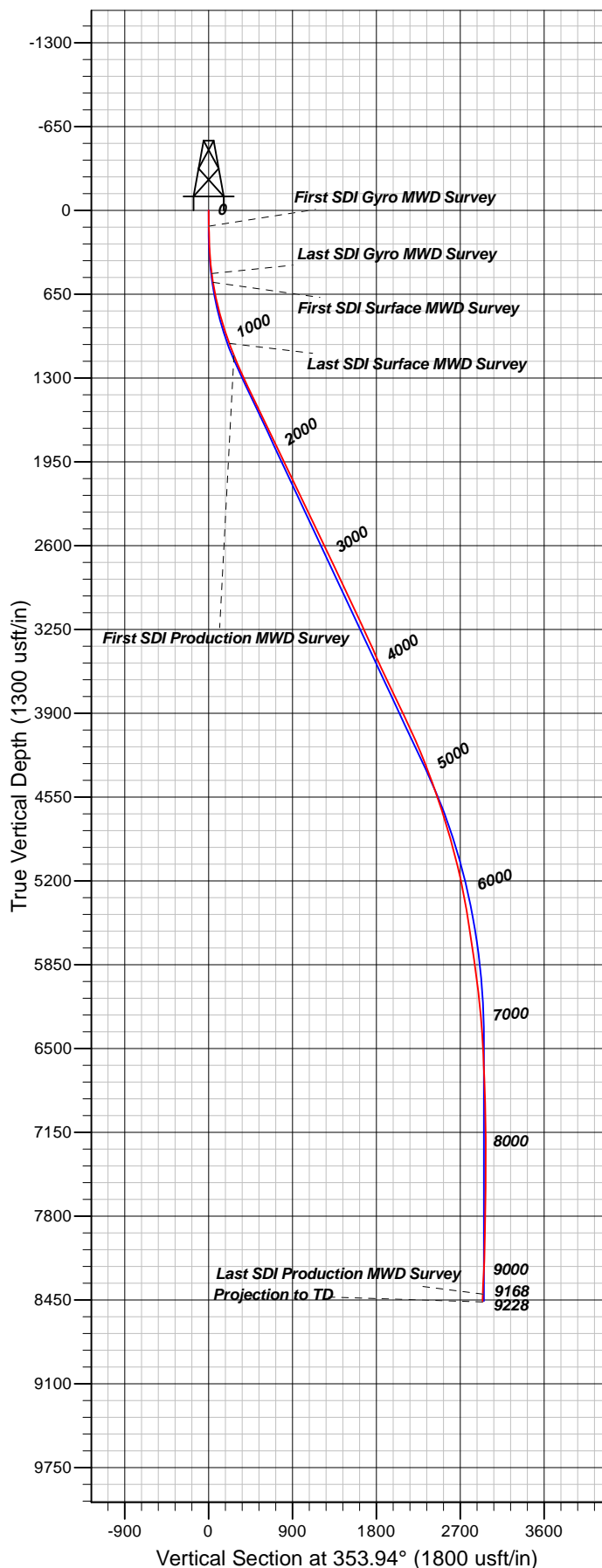
Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,379.00	34.25	352.95	3,808.74	2,013.97	-181.42	2,021.87	1.45	0.77	2.20	
4,473.00	33.87	351.11	3,886.62	2,066.10	-188.71	2,074.48	1.17	-0.40	-1.96	
4,567.00	32.96	350.61	3,965.08	2,117.21	-196.93	2,126.17	1.01	-0.97	-0.53	
4,662.00	32.34	349.45	4,045.07	2,167.69	-205.80	2,177.30	0.93	-0.65	-1.22	
4,756.00	31.29	350.39	4,124.95	2,216.48	-214.48	2,226.73	1.24	-1.12	1.00	
4,850.00	29.53	353.00	4,206.01	2,263.54	-221.38	2,274.26	2.34	-1.87	2.78	
4,960.00	28.75	352.51	4,302.09	2,316.68	-228.13	2,327.82	0.74	-0.71	-0.45	
5,040.00	27.40	355.57	4,372.68	2,354.11	-232.06	2,365.45	2.47	-1.69	3.83	
5,134.00	26.39	355.79	4,456.51	2,396.51	-235.27	2,407.96	1.08	-1.07	0.23	
5,229.00	24.91	356.03	4,542.15	2,437.53	-238.20	2,449.05	1.56	-1.56	0.25	
5,323.00	25.08	359.10	4,627.35	2,477.20	-239.89	2,488.68	1.39	0.18	3.27	
5,431.00	23.30	358.22	4,725.86	2,521.44	-240.91	2,532.78	1.68	-1.65	-0.81	
5,607.00	20.79	359.14	4,888.98	2,587.47	-242.46	2,598.61	1.44	-1.43	0.52	
5,701.00	20.08	358.91	4,977.06	2,620.28	-243.02	2,631.30	0.76	-0.76	-0.24	
5,795.00	19.22	359.44	5,065.59	2,651.89	-243.47	2,662.78	0.93	-0.91	0.56	
5,889.00	17.31	358.63	5,154.85	2,681.35	-243.96	2,692.12	2.05	-2.03	-0.86	
5,983.00	15.38	359.39	5,245.05	2,707.79	-244.43	2,718.47	2.07	-2.05	0.81	
6,077.00	14.17	1.39	5,335.94	2,731.76	-244.28	2,742.29	1.40	-1.29	2.13	
6,172.00	13.72	2.41	5,428.14	2,754.64	-243.53	2,764.96	0.54	-0.47	1.07	
6,266.00	12.31	3.56	5,519.72	2,775.78	-242.43	2,785.86	1.53	-1.50	1.22	
6,361.00	12.28	0.85	5,612.54	2,795.99	-241.66	2,805.88	0.61	-0.03	-2.85	
6,455.00	11.48	359.38	5,704.53	2,815.34	-241.61	2,825.12	0.91	-0.85	-1.56	
6,550.00	11.93	351.56	5,797.56	2,834.51	-243.15	2,844.34	1.73	0.47	-8.23	
6,644.00	10.78	352.10	5,889.72	2,852.83	-245.79	2,862.83	1.23	-1.22	0.57	
6,739.00	9.51	353.54	5,983.23	2,869.42	-247.89	2,879.56	1.36	-1.34	1.52	
6,833.00	8.91	354.65	6,076.02	2,884.39	-249.44	2,894.60	0.67	-0.64	1.18	
6,927.00	8.08	354.76	6,168.99	2,898.21	-250.73	2,908.49	0.88	-0.88	0.12	
7,022.00	6.68	354.97	6,263.20	2,910.37	-251.82	2,920.69	1.47	-1.47	0.22	
7,116.00	5.45	357.08	6,356.67	2,920.27	-252.53	2,930.61	1.33	-1.31	2.24	
7,210.00	4.52	1.80	6,450.31	2,928.43	-252.64	2,938.74	1.08	-0.99	5.02	
7,305.00	4.01	2.37	6,545.05	2,935.49	-252.38	2,945.73	0.54	-0.54	0.60	
7,399.00	3.44	11.19	6,638.85	2,941.54	-251.70	2,951.68	0.86	-0.61	9.38	
7,494.00	3.16	353.11	6,733.70	2,946.94	-251.46	2,957.02	1.13	-0.29	-19.03	
7,588.00	2.99	357.87	6,827.56	2,951.96	-251.86	2,962.06	0.33	-0.18	5.06	
7,682.00	2.10	354.16	6,921.47	2,956.13	-252.13	2,966.22	0.96	-0.95	-3.95	
7,776.00	1.41	350.05	7,015.42	2,958.98	-252.50	2,969.10	0.75	-0.73	-4.37	
7,870.00	1.08	311.62	7,109.40	2,960.71	-253.37	2,970.91	0.93	-0.35	-40.88	
7,965.00	0.97	289.91	7,204.39	2,961.57	-254.79	2,971.92	0.42	-0.12	-22.85	
8,059.00	0.88	245.72	7,298.38	2,961.55	-256.20	2,972.05	0.75	-0.10	-47.01	
8,153.00	1.76	249.41	7,392.35	2,960.74	-258.21	2,971.46	0.94	0.94	3.93	
8,248.00	2.02	252.05	7,487.30	2,959.71	-261.16	2,970.75	0.29	0.27	2.78	
8,342.00	2.35	245.84	7,581.23	2,958.41	-264.50	2,969.81	0.43	0.35	-6.61	
8,437.00	2.54	251.39	7,676.14	2,956.95	-268.27	2,968.74	0.32	0.20	5.84	

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Well:	PA 321-26	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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8,531.00	2.14	239.74	7,770.06	2,955.40	-271.76	2,967.57	0.66	-0.43	-12.39	
8,626.00	2.17	237.42	7,865.00	2,953.53	-274.81	2,966.04	0.10	0.03	-2.44	
8,720.00	2.94	233.34	7,958.90	2,951.14	-278.24	2,964.02	0.84	0.82	-4.34	
8,814.00	3.63	223.50	8,052.75	2,947.54	-282.22	2,960.86	0.95	0.73	-10.47	
8,908.00	4.74	220.17	8,146.50	2,942.41	-286.78	2,956.25	1.21	1.18	-3.54	
9,002.00	4.56	208.92	8,240.19	2,936.17	-291.09	2,950.50	0.99	-0.19	-11.97	
9,097.00	4.32	209.78	8,334.90	2,929.76	-294.69	2,944.50	0.26	-0.25	0.91	
9,168.00	4.04	204.94	8,405.72	2,925.17	-297.08	2,940.19	0.63	-0.39	-6.82	
Last SDI Production MWD Survey										
9,219.11	4.04	204.94	8,456.69	2,921.91	-298.60	2,937.10	0.00	0.00	0.00	
PBHL(PA 321-26)										
9,228.00	4.04	204.94	8,465.57	2,921.34	-298.86	2,936.57	0.00	0.00	0.00	
Projection to TD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
123.00	123.00	0.93	0.18	First SDI Gyro MWD Survey	
491.00	489.32	31.86	-1.18	Last SDI Gyro MWD Survey	
562.00	558.95	45.63	-2.42	First SDI Surface MWD Survey	
1,067.00	1,030.93	219.95	-23.35	Last SDI Surface MWD Survey	
1,174.00	1,125.30	270.07	-28.83	First SDI Production MWD Survey	
9,168.00	8,405.72	2,925.17	-297.08	Last SDI Production MWD Survey	
9,228.00	8,465.57	2,921.34	-298.86	Projection to TD	

Checked By: _____	Approved By: _____	Date: _____
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+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	1614400.00	2303958.60	39.4943606	-107.9667242	PA 321-26 (A4)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 321-26 - Slot PA 321-26 (A4), True North
 Vertical (TVD) Reference: GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
 Section (VS) Reference: Slot - PA 321-26 (A4)(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

17:31, June 05 2018
 Created By: Mel Mireles Jr.