



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 431-26
County & State	Garfield County, CO
SDI Job No.	OP.011114
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 154 feet to a measured depth of 9,237 feet is true and correct as determined from all available records.

Signature

 05-Jul-18

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District



Scientific Drilling, Intl Survey Report

Company: TEP Rocky Mountain LLC	Local Co-ordinate Reference: Well PA 431-26 - Slot PA 431-26 (A8)
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 431-26	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 431-26 - Slot PA 431-26 (A8), A8						
Well Position	+N/-S	0.00 usft	Northing:	1,614,399.60 usft	Latitude:	39.4943573
	+E/-W	0.00 usft	Easting:	2,303,928.60 usft	Longitude:	-107.9668304
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	6/23/2018	9.37	65.75	51,615

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		21.06

Survey Program		Date 7/5/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
154.00	856.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5
931.00	1,095.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM
1,174.00	9,237.00	Survey #3 - Production MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM

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	
154.00	1.94	7.12	153.97	2.59	0.32	2.53	1.26	1.26	0.00	
First SDI Gyro MWD Survey										
215.00	2.64	352.00	214.92	5.00	0.26	4.76	1.51	1.15	-24.79	
306.00	3.34	340.66	305.80	9.58	-0.91	8.61	1.00	0.77	-12.46	
398.00	3.78	354.55	397.62	15.13	-2.09	13.37	1.05	0.48	15.10	
489.00	4.13	0.62	488.41	21.39	-2.34	19.12	0.60	0.38	6.67	
581.00	4.49	14.59	580.15	28.19	-1.40	25.80	1.20	0.39	15.18	
673.00	6.51	21.09	671.72	36.54	1.39	34.60	2.29	2.20	7.07	



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Site:	PA 23-26 Pad	MD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Well:	PA 431-26	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)	
765.00	10.21	28.65	762.73	48.57	7.18	47.90	4.19	4.02	8.22	
856.00	13.46	30.15	851.78	64.81	16.37	66.36	3.59	3.57	1.65	
Last SDI Gyro MWD Survey										
931.00	16.22	27.58	924.28	81.64	25.60	85.39	3.78	3.68	-3.43	
First SDI Surface MWD Survey										
1,025.00	18.90	25.87	1,013.89	106.98	38.32	113.61	2.90	2.85	-1.82	
1,095.00	20.40	29.23	1,079.81	127.83	49.23	136.98	2.68	2.14	4.80	
Last SDI Surface MWD Survey										
1,174.00	21.39	30.57	1,153.62	152.25	63.28	164.82	1.39	1.25	1.70	
First SDI Production MWD Survey										
1,269.00	23.00	29.93	1,241.57	183.25	81.35	200.25	1.71	1.69	-0.67	
1,363.00	25.82	28.97	1,327.16	217.08	100.43	238.68	3.03	3.00	-1.02	
1,457.00	27.82	26.97	1,411.05	254.55	120.30	280.78	2.33	2.13	-2.13	
1,551.00	30.16	25.99	1,493.27	295.33	140.60	326.13	2.54	2.49	-1.04	
1,646.00	31.74	26.93	1,574.74	339.06	162.37	374.76	1.74	1.66	0.99	
1,740.00	33.23	26.10	1,654.03	384.24	184.91	425.02	1.65	1.59	-0.88	
1,835.00	33.65	26.86	1,733.30	431.09	208.25	477.13	0.62	0.44	0.80	
1,929.00	32.92	26.26	1,811.88	477.24	231.32	528.48	0.85	-0.78	-0.64	
2,023.00	34.05	28.14	1,890.28	523.35	255.03	580.04	1.63	1.20	2.00	
2,118.00	33.34	27.34	1,969.32	569.99	279.57	632.38	0.88	-0.75	-0.84	
2,212.00	33.61	29.65	2,047.73	615.55	304.30	683.79	1.39	0.29	2.46	
2,306.00	33.23	29.21	2,126.19	660.64	329.74	735.01	0.48	-0.40	-0.47	
2,401.00	32.80	29.14	2,205.85	705.84	354.97	786.25	0.45	-0.45	-0.07	
2,495.00	32.86	28.20	2,284.84	750.55	379.42	836.76	0.55	0.06	-1.00	
2,590.00	32.37	28.04	2,364.86	795.71	403.56	887.58	0.52	-0.52	-0.17	
2,683.00	32.48	28.30	2,443.36	839.67	427.10	937.06	0.19	0.12	0.28	
2,778.00	31.94	28.28	2,523.74	884.26	451.10	987.30	0.57	-0.57	-0.02	
2,872.00	33.14	27.95	2,602.98	928.85	474.92	1,037.48	1.29	1.28	-0.35	
2,967.00	32.53	28.14	2,682.80	974.32	499.14	1,088.60	0.65	-0.64	0.20	
3,061.00	31.96	27.87	2,762.30	1,018.60	522.69	1,138.39	0.63	-0.61	-0.29	
3,156.00	32.32	29.40	2,842.75	1,062.95	546.91	1,188.48	0.94	0.38	1.61	
3,250.00	33.41	29.06	2,921.70	1,107.46	571.81	1,238.98	1.18	1.16	-0.36	
3,344.00	32.29	29.32	3,000.67	1,151.98	596.68	1,289.45	1.20	-1.19	0.28	
3,439.00	32.63	29.54	3,080.82	1,196.39	621.73	1,339.90	0.38	0.36	0.23	
3,533.00	32.91	29.57	3,159.86	1,240.64	646.83	1,390.22	0.30	0.30	0.03	
3,627.00	32.22	29.34	3,239.09	1,284.70	671.71	1,440.27	0.75	-0.73	-0.24	
3,722.00	31.01	28.46	3,319.99	1,328.29	695.78	1,489.60	1.36	-1.27	-0.93	
3,816.00	30.82	28.21	3,400.63	1,370.80	718.71	1,537.51	0.24	-0.20	-0.27	
3,911.00	31.86	26.38	3,481.77	1,414.71	741.35	1,586.62	1.48	1.09	-1.93	
4,005.00	30.52	25.48	3,562.18	1,458.48	762.64	1,635.12	1.51	-1.43	-0.96	
4,099.00	31.65	25.12	3,642.68	1,502.36	783.38	1,683.52	1.22	1.20	-0.38	
4,194.00	32.55	25.37	3,723.16	1,548.02	804.91	1,733.87	0.96	0.95	0.26	
4,288.00	31.94	25.46	3,802.66	1,593.32	826.44	1,783.88	0.65	-0.65	0.10	
4,382.00	31.32	23.94	3,882.70	1,638.10	847.04	1,833.07	1.07	-0.66	-1.62	



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Site:	PA 23-26 Pad	MD Reference:	GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
Well:	PA 431-26	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)	
4,476.00	31.78	25.30	3,962.80	1,682.81	867.53	1,882.16	0.90	0.49	1.45	
4,571.00	32.83	25.54	4,043.10	1,728.67	889.33	1,932.78	1.11	1.11	0.25	
4,665.00	31.69	27.22	4,122.59	1,773.61	911.61	1,982.74	1.54	-1.21	1.79	
4,759.00	29.95	27.68	4,203.31	1,816.35	933.80	2,030.60	1.87	-1.85	0.49	
4,854.00	30.16	29.72	4,285.54	1,858.08	956.65	2,077.75	1.10	0.22	2.15	
4,948.00	29.77	28.78	4,366.98	1,899.04	979.59	2,124.22	0.65	-0.41	-1.00	
5,057.00	28.75	29.50	4,462.07	1,945.58	1,005.53	2,176.96	0.99	-0.94	0.66	
5,136.00	27.21	29.40	4,531.83	1,977.85	1,023.75	2,213.63	1.95	-1.95	-0.13	
5,246.00	26.56	28.97	4,629.94	2,021.28	1,048.01	2,262.87	0.62	-0.59	-0.39	
5,325.00	25.42	30.33	4,700.95	2,051.36	1,065.13	2,297.10	1.63	-1.44	1.72	
5,420.00	25.32	32.66	4,786.79	2,086.07	1,086.39	2,337.12	1.06	-0.11	2.45	
5,514.00	24.99	31.46	4,871.88	2,119.93	1,107.60	2,376.35	0.65	-0.35	-1.28	
5,608.00	23.73	31.16	4,957.51	2,153.05	1,127.75	2,414.50	1.35	-1.34	-0.32	
5,702.00	23.44	31.47	5,043.66	2,185.18	1,147.29	2,451.51	0.34	-0.31	0.33	
5,797.00	21.71	30.51	5,131.37	2,216.44	1,166.08	2,487.43	1.86	-1.82	-1.01	
5,892.00	19.26	32.07	5,220.36	2,244.86	1,183.32	2,520.14	2.64	-2.58	1.64	
5,986.00	17.20	32.69	5,309.64	2,269.69	1,199.06	2,548.98	2.20	-2.19	0.66	
6,081.00	15.44	29.18	5,400.81	2,292.56	1,212.82	2,575.26	2.12	-1.85	-3.69	
6,175.00	14.00	25.30	5,491.72	2,313.76	1,223.78	2,598.99	1.86	-1.53	-4.13	
6,269.00	13.59	24.22	5,583.01	2,334.11	1,233.17	2,621.35	0.52	-0.44	-1.15	
6,363.00	14.34	26.08	5,674.23	2,354.64	1,242.81	2,643.98	0.93	0.80	1.98	
6,457.00	13.28	27.83	5,765.51	2,374.65	1,252.97	2,666.29	1.21	-1.13	1.86	
6,552.00	13.48	27.78	5,857.94	2,394.09	1,263.23	2,688.13	0.21	0.21	-0.05	
6,647.00	13.92	28.25	5,950.23	2,413.95	1,273.80	2,710.46	0.48	0.46	0.49	
6,741.00	12.04	24.37	6,041.83	2,432.85	1,283.19	2,731.47	2.20	-2.00	-4.13	
6,836.00	10.20	26.51	6,135.04	2,449.40	1,291.04	2,749.73	1.98	-1.94	2.25	
6,930.00	8.77	26.95	6,227.75	2,463.24	1,298.00	2,765.15	1.52	-1.52	0.47	
7,024.00	7.25	28.76	6,320.83	2,474.83	1,304.10	2,778.16	1.64	-1.62	1.93	
7,118.00	5.21	32.99	6,414.27	2,483.61	1,309.28	2,788.21	2.22	-2.17	4.50	
7,212.00	4.67	28.99	6,507.93	2,490.53	1,313.46	2,796.18	0.68	-0.57	-4.26	
7,307.00	4.04	28.79	6,602.65	2,496.85	1,316.95	2,803.32	0.66	-0.66	-0.21	
7,401.00	3.11	33.32	6,696.47	2,501.88	1,319.94	2,809.10	1.03	-0.99	4.82	
7,495.00	2.49	22.10	6,790.35	2,505.90	1,322.11	2,813.63	0.88	-0.66	-11.94	
7,589.00	2.22	28.60	6,884.28	2,509.39	1,323.75	2,817.48	0.40	-0.29	6.91	
7,684.00	2.83	36.74	6,979.18	2,512.89	1,326.03	2,821.56	0.74	0.64	8.57	
7,778.00	3.08	50.55	7,073.06	2,516.35	1,329.37	2,825.99	0.80	0.27	14.69	
7,873.00	1.99	30.10	7,167.97	2,519.40	1,332.17	2,829.84	1.47	-1.15	-21.53	
7,967.00	1.07	352.35	7,261.93	2,521.68	1,332.87	2,832.22	1.40	-0.98	-40.16	
8,061.00	0.78	287.59	7,355.92	2,522.75	1,332.15	2,832.95	1.09	-0.31	-68.89	
8,156.00	1.88	251.27	7,450.90	2,522.44	1,330.05	2,831.92	1.40	1.16	-38.23	
8,250.00	2.46	240.64	7,544.83	2,520.96	1,326.83	2,829.38	0.75	0.62	-11.31	
8,345.00	1.72	237.84	7,639.77	2,519.20	1,323.85	2,826.66	0.79	-0.78	-2.95	
8,439.00	2.37	207.65	7,733.71	2,516.73	1,321.75	2,823.60	1.31	0.69	-32.12	



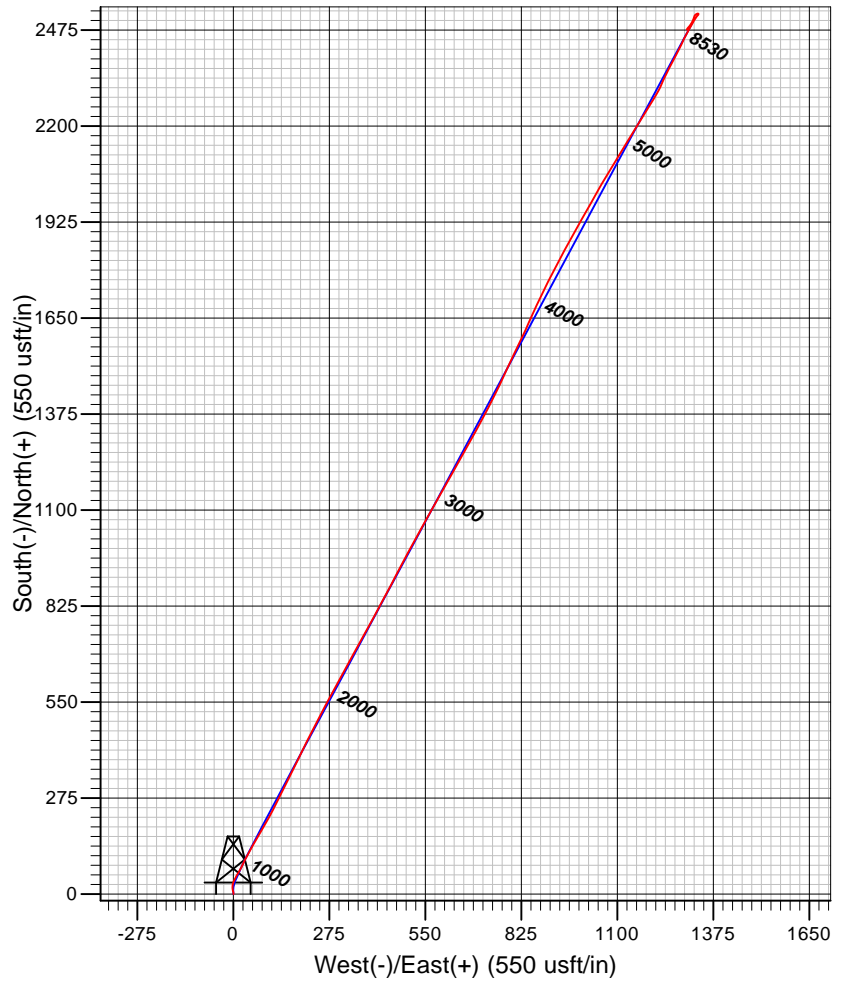
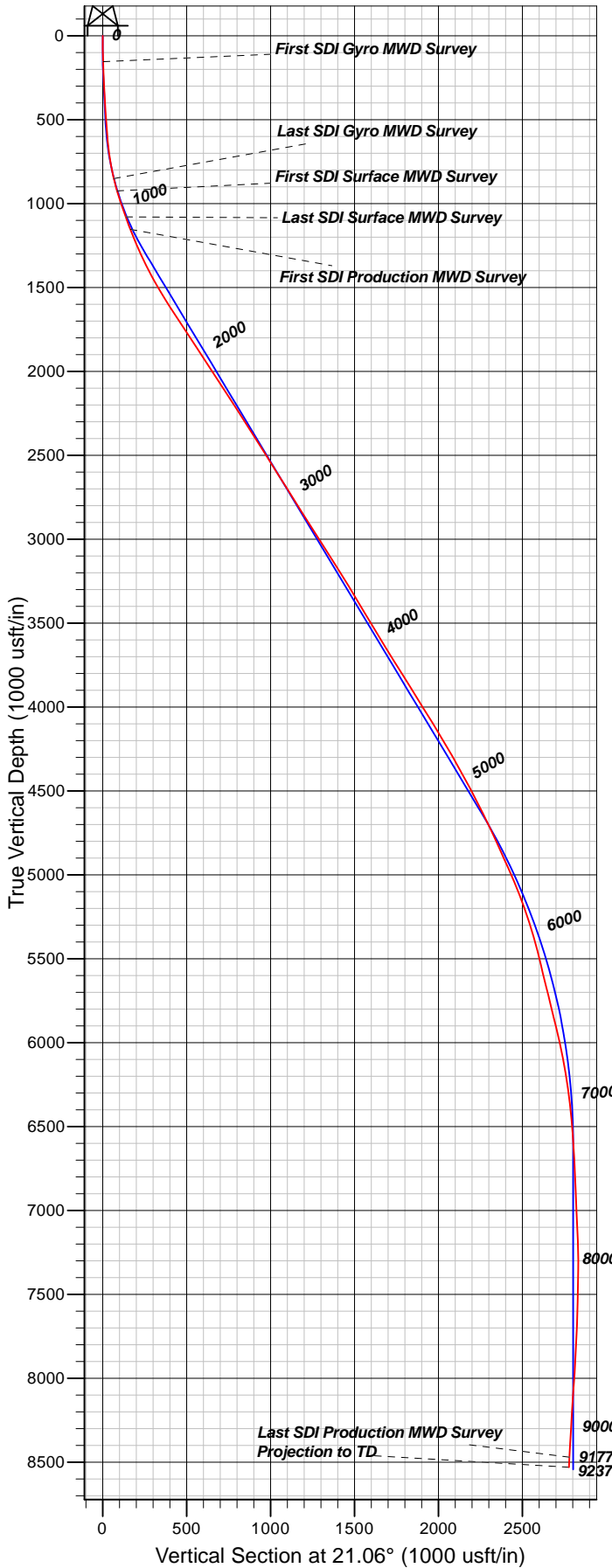
Scientific Drilling, Intl
Survey Report

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well PA 431-26 - Slot PA 431-26 (A8)
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 431-26	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)	
8,533.00	3.17	197.10	7,827.60	2,512.52	1,320.09	2,819.08	1.01	0.85	-11.22	
8,628.00	3.56	199.35	7,922.44	2,507.23	1,318.34	2,813.51	0.43	0.41	2.37	
8,722.00	3.86	203.56	8,016.24	2,501.57	1,316.11	2,807.43	0.43	0.32	4.48	
8,817.00	3.73	207.29	8,111.03	2,495.90	1,313.41	2,801.16	0.29	-0.14	3.93	
8,911.00	3.42	217.17	8,204.85	2,490.95	1,310.32	2,795.43	0.73	-0.33	10.51	
9,005.00	3.44	221.38	8,298.68	2,486.59	1,306.76	2,790.09	0.27	0.02	4.48	
9,100.00	3.82	219.99	8,393.49	2,482.03	1,302.84	2,784.43	0.41	0.40	-1.46	
9,177.00	2.55	210.34	8,470.37	2,478.59	1,300.32	2,780.31	1.78	-1.64	-12.54	
Last SDI Production MWD Survey										
9,177.25	2.55	210.29	8,470.62	2,478.58	1,300.32	2,780.30	1.78	-1.57	-18.69	
9,237.00	2.55	210.29	8,530.31	2,476.28	1,298.98	2,777.67	0.00	0.00	0.00	
Projection to TD - PBHL(PA 431-26)										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
154.00	153.97	2.59	0.32	First SDI Gyro MWD Survey	
856.00	851.78	64.81	16.37	Last SDI Gyro MWD Survey	
931.00	924.28	81.64	25.60	First SDI Surface MWD Survey	
1,095.00	1,079.81	127.83	49.23	Last SDI Surface MWD Survey	
1,174.00	1,153.62	152.25	63.28	First SDI Production MWD Survey	
9,177.00	8,470.37	2,478.59	1,300.32	Last SDI Production MWD Survey	
9,237.00	8,530.31	2,476.28	1,298.98	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____



Well Details: PA 431-26

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	1614399.60	2303928.60	39.4943573	-107.9668304 PA 431-26 (A8)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well PA 431-26 - Slot PA 431-26 (A8), True North
 Vertical (TVD) Reference: GL 5637' & RKB 24' @ 5661.00usft (H&P 271)
 Section (VS) Reference: Slot - PA 431-26 (A8)(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

16:25, July 05 2018
 Created By: Mel Mireles Jr.