



Directional Survey Certification

2948 I-70 Business Loop
Grand Junction, CO 81504
(970)-245-9447 Fax (970)-245-9454

Operator	<u>TEP Rocky Mountain, LLC.</u>
Well Name & No.	<u>GM 343-5</u>
County & State	<u>Garfield County, CO</u>
SDI Job No.	<u>OP.003974</u>
Rig	<u>H&P 271</u>

I, Mel Mireles Jr., having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 121 feet to a measured depth of 6,958 feet is true and correct as determined from all available records.


Signature

15-Sep-17
Date

Mel Mireles Jr.
Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 343-5 - Slot A2 (GM 343-5)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Site:	MV 34-5 Pad	MD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Well:	GM 343-5	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	MV 34-5 Pad				
Site Position:		Northing:	1,603,476.79 usft	Latitude:	39.4609066
From:	Map	Easting:	2,258,772.10 usft	Longitude:	-108.1256571
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.66 °

Well	GM 343-5 - Slot A2 (GM 343-5)					
Well Position	+N/-S	0.00 usft	Northing:	1,603,539.28 usft	Latitude:	39.4610813
	+E/-W	0.00 usft	Easting:	2,258,812.78 usft	Longitude:	-108.1255195
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft	Ground Level:	5,977.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/31/2017	9.58	65.77	51,770

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	294.43	

Survey Program	Date	9/15/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
121.00	398.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
482.00	853.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
947.00	6,958.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

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	0.00
121.00	0.26	294.43	121.00	0.11	-0.25	0.27	0.21	0.21	0.21	0.00
First SDI Gyro MWD Survey										
214.00	3.43	12.83	213.94	2.91	0.18	1.05	3.64	3.41	84.30	
306.00	7.48	4.31	305.51	11.57	1.24	3.66	4.48	4.40	-9.26	
398.00	11.17	358.59	396.28	26.46	1.47	9.61	4.13	4.01	-6.22	
Last SDI Gyro MWD Survey										
482.00	14.12	354.75	478.23	44.80	0.33	18.23	3.65	3.51	-4.57	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 343-5 - Slot A2 (GM 343-5)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Site:	MV 34-5 Pad	MD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Well:	GM 343-5	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)
First SDI Surface MWD Survey									
575.00	18.62	356.79	567.44	70.93	-1.54	30.74	4.88	4.84	2.19
668.00	22.27	357.89	654.57	103.38	-3.02	45.51	3.95	3.92	1.18
760.00	26.39	356.93	738.38	141.23	-4.76	62.74	4.50	4.48	-1.04
853.00	30.06	355.17	820.31	185.10	-7.83	83.68	4.05	3.95	-1.89
Last SDI Surface MWD Survey									
947.00	30.16	354.99	901.63	232.08	-11.87	106.79	0.14	0.11	-0.19
First SDI Production MWD Survey									
1,078.00	30.62	355.66	1,014.63	298.13	-17.27	139.02	0.44	0.35	0.51
1,173.00	29.90	354.55	1,096.68	345.82	-21.35	162.47	0.96	-0.76	-1.17
1,268.00	31.50	355.64	1,178.37	394.15	-25.49	186.22	1.78	1.68	1.15
1,362.00	30.90	356.26	1,258.77	442.72	-28.93	209.44	0.72	-0.64	0.66
1,457.00	29.76	356.99	1,340.77	490.61	-31.76	231.82	1.26	-1.20	0.77
1,552.00	30.69	359.47	1,422.86	538.40	-33.22	252.92	1.64	0.98	2.61
1,646.00	31.92	1.14	1,503.17	587.23	-32.95	272.87	1.60	1.31	1.78
1,741.00	31.02	2.08	1,584.20	636.81	-31.56	292.10	1.08	-0.95	0.99
1,836.00	29.10	0.83	1,666.42	684.37	-30.34	310.66	2.13	-2.02	-1.32
1,930.00	31.69	0.69	1,747.49	731.92	-29.71	329.76	2.76	2.76	-0.15
2,025.00	30.83	0.78	1,828.70	781.22	-29.08	349.57	0.91	-0.91	0.09
2,120.00	31.96	0.48	1,909.79	830.70	-28.53	369.54	1.20	1.19	-0.32
2,214.00	31.07	359.64	1,989.92	879.84	-28.48	389.81	1.06	-0.95	-0.89
2,309.00	29.55	0.00	2,071.93	927.78	-28.63	409.78	1.61	-1.60	0.38
2,403.00	27.15	0.18	2,154.65	972.41	-28.56	428.18	2.55	-2.55	0.19
2,497.00	27.69	0.70	2,238.09	1,015.70	-28.23	445.78	0.63	0.57	0.55
2,592.00	26.53	1.42	2,322.65	1,058.98	-27.43	462.95	1.27	-1.22	0.76
2,686.00	25.20	357.75	2,407.24	1,099.97	-27.70	480.15	2.21	-1.41	-3.90
2,781.00	22.97	353.56	2,493.97	1,138.60	-30.57	498.74	2.96	-2.35	-4.41
2,875.00	20.73	353.00	2,581.21	1,173.35	-34.66	516.83	2.39	-2.38	-0.60
2,970.00	18.83	353.58	2,670.60	1,205.27	-38.42	533.46	2.01	-2.00	0.61
3,064.00	17.82	354.00	2,759.84	1,234.65	-41.62	548.52	1.08	-1.07	0.45
3,159.00	16.75	355.07	2,850.55	1,262.75	-44.32	562.60	1.17	-1.13	1.13
3,253.00	16.18	355.52	2,940.69	1,289.30	-46.50	575.57	0.62	-0.61	0.48
3,347.00	14.62	350.96	3,031.32	1,314.08	-49.39	588.45	2.10	-1.66	-4.85
3,442.00	12.84	350.33	3,123.60	1,336.32	-53.05	600.98	1.88	-1.87	-0.66
3,536.00	10.40	349.55	3,215.66	1,354.97	-56.34	611.69	2.60	-2.60	-0.83
3,631.00	8.09	350.43	3,309.42	1,369.99	-59.01	620.33	2.44	-2.43	0.93
3,725.00	5.76	355.20	3,402.73	1,381.22	-60.50	626.33	2.55	-2.48	5.07
3,820.00	3.79	2.76	3,497.40	1,389.10	-60.75	629.82	2.17	-2.07	7.96
3,850.36	3.53	1.58	3,527.69	1,391.04	-60.68	630.55	0.89	-0.86	-3.87
GM 443-5 MVRD									
3,892.71	3.17	359.62	3,569.98	1,393.52	-60.65	631.55	0.89	-0.85	-4.63
GM 343-5 MVRD									
3,914.00	2.99	358.46	3,591.23	1,394.66	-60.67	632.04	0.89	-0.84	-5.46
4,009.00	2.64	353.85	3,686.12	1,399.31	-60.97	634.24	0.44	-0.37	-4.85

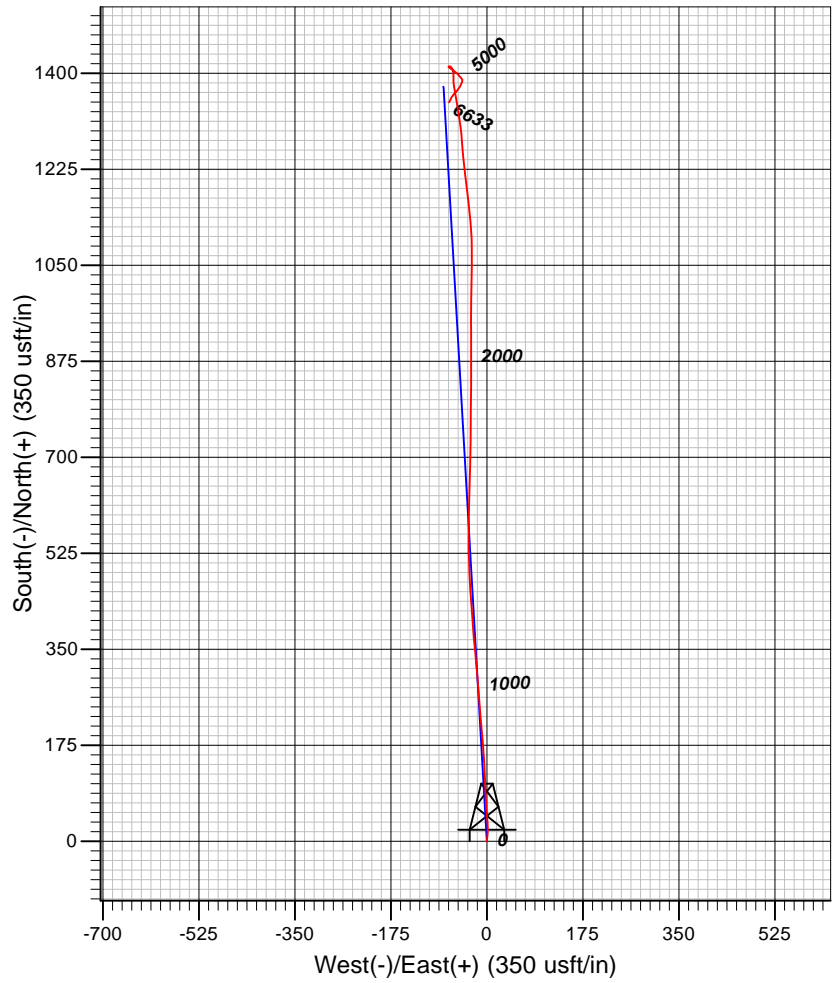
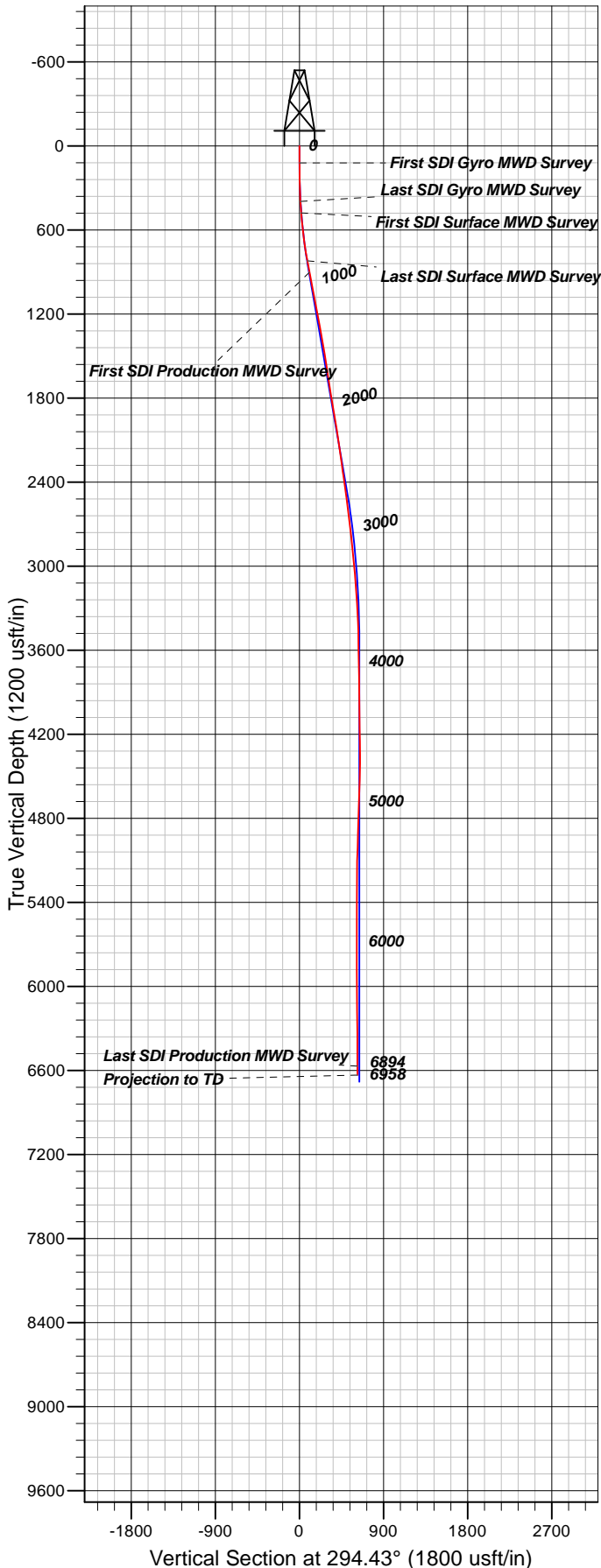
Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 343-5 - Slot A2 (GM 343-5)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Site:	MV 34-5 Pad	MD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Well:	GM 343-5	North Reference:	True
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)	
4,104.00	2.15	349.25	3,781.04	1,403.24	-61.54	636.38	0.55	-0.52	-4.84	
4,198.00	1.85	340.49	3,874.98	1,406.40	-62.37	638.45	0.45	-0.32	-9.32	
4,293.00	1.61	326.83	3,969.94	1,408.96	-63.61	640.64	0.50	-0.25	-14.38	
4,387.00	1.16	320.38	4,063.91	1,410.80	-64.94	642.61	0.51	-0.48	-6.86	
4,482.00	1.13	301.76	4,158.89	1,412.03	-66.35	644.40	0.39	-0.03	-19.60	
4,576.00	1.10	269.15	4,252.87	1,412.51	-68.04	646.14	0.67	-0.03	-34.69	
4,671.00	1.06	243.19	4,347.86	1,412.10	-69.74	647.51	0.51	-0.04	-27.33	
4,765.00	1.72	125.63	4,441.84	1,410.88	-69.37	646.67	2.56	0.70	-125.06	
4,860.00	2.61	123.80	4,536.77	1,408.85	-66.41	643.14	0.94	0.94	-1.93	
4,954.00	2.73	126.07	4,630.67	1,406.34	-62.82	638.84	0.17	0.13	2.41	
5,049.00	2.69	128.01	4,725.56	1,403.64	-59.24	634.45	0.11	-0.04	2.04	
5,144.00	2.64	132.78	4,820.46	1,400.78	-55.88	630.21	0.24	-0.05	5.02	
5,238.00	2.75	136.05	4,914.36	1,397.68	-52.72	626.06	0.20	0.12	3.48	
5,333.00	2.90	139.57	5,009.24	1,394.21	-49.58	621.76	0.24	0.16	3.71	
5,428.00	2.93	139.13	5,104.12	1,390.55	-46.44	617.38	0.04	0.03	-0.46	
5,522.00	0.83	167.82	5,198.06	1,388.07	-44.72	614.79	2.38	-2.23	30.52	
5,617.00	0.70	188.00	5,293.06	1,386.82	-44.66	614.22	0.31	-0.14	21.24	
5,711.00	1.06	185.28	5,387.05	1,385.38	-44.82	613.77	0.39	0.38	-2.89	
5,806.00	1.13	201.37	5,482.03	1,383.64	-45.24	613.43	0.33	0.07	16.94	
5,900.00	1.32	209.09	5,576.01	1,381.83	-46.10	613.47	0.27	0.20	8.21	
5,995.00	1.76	205.58	5,670.97	1,379.56	-47.26	613.59	0.47	0.46	-3.69	
6,089.00	1.76	204.70	5,764.93	1,376.94	-48.49	613.63	0.03	0.00	-0.94	
6,184.00	1.75	207.83	5,859.88	1,374.33	-49.78	613.72	0.10	-0.01	3.29	
6,278.00	1.92	213.34	5,953.83	1,371.75	-51.31	614.05	0.26	0.18	5.86	
6,373.00	1.99	220.08	6,048.78	1,369.16	-53.25	614.74	0.25	0.07	7.09	
6,467.00	2.24	220.03	6,142.72	1,366.50	-55.48	615.67	0.27	0.27	-0.05	
6,562.00	2.77	225.45	6,237.62	1,363.47	-58.31	617.00	0.61	0.56	5.71	
6,657.00	3.08	221.13	6,332.50	1,359.94	-61.63	618.55	0.40	0.33	-4.55	
6,752.00	2.99	206.66	6,427.37	1,355.80	-64.42	619.38	0.81	-0.09	-15.23	
6,847.00	2.60	204.15	6,522.26	1,351.62	-66.41	619.47	0.43	-0.41	-2.64	
6,894.00	2.79	206.88	6,569.20	1,349.63	-67.36	619.51	0.49	0.40	5.81	
Last SDI Production MWD Survey - GM 443-5 PBHL										
6,958.00	2.79	206.88	6,633.13	1,346.85	-68.77	619.65	0.00	0.00	0.00	
Projection to TD - GM 343-5 PBHL										

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well GM 343-5 - Slot A2 (GM 343-5)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Site:	MV 34-5 Pad	MD Reference:	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
Well:	GM 343-5	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
121.00	121.00	0.11	-0.25	First SDI Gyro MWD Survey	
398.00	396.28	26.46	1.47	Last SDI Gyro MWD Survey	
482.00	478.23	44.80	0.33	First SDI Surface MWD Survey	
853.00	820.31	185.10	-7.83	Last SDI Surface MWD Survey	
947.00	901.63	232.08	-11.87	First SDI Production MWD Survey	
6,894.00	6,569.20	1,349.63	-67.36	Last SDI Production MWD Survey	
6,958.00	6,633.13	1,346.85	-68.77	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____



Well Details: GM 343-5

TVD Reference: GL 5977' & RKB 24' @ 6001.00usft (H&B 271) and Level: 5977.00					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1603539.29	2258812.78	39.4610813	-108.1255195 A2 (GM 343-5)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well GM 343-5 - Slot A2 (GM 343-5), True North
 Vertical (TVD) Reference: GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
 Section (VS) Reference: Slot - A2 (GM 343-5)(0.00N, 0.00E)
 Measured Depth Reference: GL 5977' & RKB 24' @ 6001.00usft (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

9:51, September 15 2017
 Created By: Mel Mireles Jr.