



Well Details: NR 334-3

TVD Reference: GL 6720' & RKB 24' @ 6744.00usft
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1634886.47 2329783.60 39.5524746 -107.877144NR 334-3 (B14)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well NR 334-3 - Slot NR 334-3 (B14), True North
 Vertical (TVD) Reference: GL 6720' & RKB 24' @ 6744.00usft
 Section (VS) Reference: Slot - NR 334-3 (B14)(0.00N, 0.00E)
 Measured Depth Reference: GL 6720' & RKB 24' @ 6744.00usft
 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

12:39, December 10 2018
 Created By: Mel Mireles Jr.



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.	NR 334-3
County & State	Garfield County, CO
SDI Job No.	OP.014764
Rig	H&P 318

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 9,995 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

10-Dec-18

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well NR 334-3 - Slot NR 334-3 (B14)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Site:	NR 23-3 Pad	MD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Well:	NR 334-3	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		NR 23-3 Pad			
Site Position:		Northing:	1,634,904.55 usft	Latitude:	39.5525224
From:	Map	Easting:	2,329,757.66 usft	Longitude:	-107.8772377
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.50 °

Well	NR 334-3 - Slot NR 334-3 (B14)					
Well Position	+N/-S	0.00 usft	Northing:	1,634,886.47 usft	Latitude:	39.5524746
	+E/-W	0.00 usft	Easting:	2,329,783.60 usft	Longitude:	-107.8771440
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,720.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	11/24/2018	9.42	65.78	51,515

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	190.41	

Survey Program	Date	12/10/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
121.00	489.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
558.00	1,053.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,180.00	9,995.00	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	
121.00	1.32	212.70	120.99	-1.17	-0.75	1.29	1.09	1.09	0.00	
First SDI Gyro MWD Survey										
213.00	2.64	200.39	212.93	-4.05	-2.06	4.36	1.50	1.43	-13.38	
305.00	2.90	188.35	304.83	-8.34	-3.14	8.77	0.69	0.28	-13.09	
398.00	4.93	168.40	397.61	-14.58	-2.68	14.83	2.60	2.18	-21.45	
489.00	8.01	153.81	488.02	-24.11	0.91	23.54	3.81	3.38	-16.03	
Last SDI Gyro MWD Survey										

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well NR 334-3 - Slot NR 334-3 (B14)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Site:	NR 23-3 Pad	MD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Well:	NR 334-3	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)
558.00	11.43	150.04	556.02	-34.35	6.45	32.62	5.04	4.96	-5.46
First SDI Surface MWD Survey									
650.00	14.27	147.00	645.71	-51.76	17.18	47.80	3.17	3.09	-3.30
744.00	14.68	146.53	736.73	-71.41	30.05	64.81	0.45	0.44	-0.50
839.00	13.10	149.31	828.95	-90.71	42.19	81.60	1.80	-1.66	2.93
933.00	13.27	150.74	920.47	-109.28	52.90	97.93	0.39	0.18	1.52
1,027.00	14.37	151.66	1,011.75	-128.96	63.71	115.33	1.19	1.17	0.98
1,053.00	14.68	153.38	1,036.92	-134.75	66.72	120.48	2.04	1.19	6.62
Last SDI Surface MWD Survey									
1,180.00	15.02	147.72	1,159.68	-163.05	82.72	145.42	1.17	0.27	-4.46
First SDI Production MWD Survey									
1,275.00	15.03	148.75	1,251.43	-183.98	95.68	163.68	0.28	0.01	1.08
1,369.00	13.83	139.85	1,342.48	-203.00	109.25	179.92	2.68	-1.28	-9.47
1,464.00	13.71	138.17	1,434.75	-220.06	124.08	194.03	0.44	-0.13	-1.77
1,558.00	13.32	135.42	1,526.15	-236.08	139.11	207.07	0.80	-0.41	-2.93
1,653.00	13.45	133.43	1,618.57	-251.47	154.81	219.37	0.50	0.14	-2.09
1,748.00	12.92	131.83	1,711.06	-266.14	170.75	230.93	0.68	-0.56	-1.68
1,842.00	13.37	137.56	1,802.60	-281.17	185.92	242.97	1.47	0.48	6.10
1,937.00	13.28	136.35	1,895.04	-297.18	200.86	256.01	0.31	-0.09	-1.27
2,031.00	13.72	146.27	1,986.46	-314.26	214.51	270.35	2.50	0.47	10.55
2,126.00	14.13	146.01	2,078.67	-333.24	227.24	286.72	0.44	0.43	-0.27
2,220.00	14.08	144.58	2,169.83	-352.08	240.28	302.89	0.37	-0.05	-1.52
2,315.00	14.27	143.83	2,261.94	-370.94	253.89	318.99	0.28	0.20	-0.79
2,410.00	14.46	140.47	2,353.97	-389.55	268.35	334.67	0.90	0.20	-3.54
2,505.00	14.95	148.90	2,445.87	-409.19	282.23	351.48	2.31	0.52	8.87
2,599.00	15.01	149.63	2,536.68	-430.07	294.65	369.78	0.21	0.06	0.78
2,694.00	15.02	147.13	2,628.43	-451.03	307.55	388.06	0.68	0.01	-2.63
2,789.00	15.36	145.49	2,720.12	-471.73	321.36	405.93	0.58	0.36	-1.73
2,883.00	15.58	143.41	2,810.71	-492.13	335.94	423.36	0.63	0.23	-2.21
2,978.00	15.60	142.44	2,902.22	-512.50	351.33	440.61	0.28	0.02	-1.02
3,073.00	15.82	146.93	2,993.67	-533.48	366.18	458.56	1.30	0.23	4.73
3,167.00	16.07	146.25	3,084.05	-555.03	380.40	477.19	0.33	0.27	-0.72
3,262.00	15.99	144.98	3,175.36	-576.68	395.22	495.81	0.38	-0.08	-1.34
3,356.00	15.68	144.92	3,265.79	-597.68	409.95	513.80	0.33	-0.33	-0.06
3,451.00	15.21	145.20	3,357.36	-618.42	424.44	531.58	0.50	-0.49	0.29
3,546.00	14.37	145.09	3,449.21	-638.32	438.30	548.65	0.88	-0.88	-0.12
3,640.00	13.42	144.82	3,540.46	-656.80	451.26	564.49	1.01	-1.01	-0.29
3,734.00	12.80	144.17	3,632.01	-674.16	463.64	579.33	0.68	-0.66	-0.69
3,829.00	12.78	142.96	3,724.65	-691.08	476.13	593.71	0.28	-0.02	-1.27
3,923.00	12.57	142.77	3,816.36	-707.52	488.58	607.64	0.23	-0.22	-0.20
4,018.00	11.81	142.39	3,909.22	-723.45	500.76	621.11	0.80	-0.80	-0.40
4,112.00	13.45	144.68	4,000.94	-739.99	512.96	635.17	1.82	1.74	2.44
4,206.00	13.33	143.44	4,092.39	-757.62	525.73	650.20	0.33	-0.13	-1.32
4,301.00	13.14	143.23	4,184.87	-775.06	538.72	665.01	0.21	-0.20	-0.22

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well NR 334-3 - Slot NR 334-3 (B14)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Site:	NR 23-3 Pad	MD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Well:	NR 334-3	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)	
4,396.00	12.21	144.41	4,277.55	-791.88	551.03	679.33	1.02	-0.98	1.24	
4,490.00	12.05	144.41	4,369.45	-807.95	562.52	693.05	0.17	-0.17	0.00	
4,585.00	11.77	143.63	4,462.41	-823.81	574.04	706.58	0.34	-0.29	-0.82	
4,680.00	11.33	144.56	4,555.48	-839.22	585.20	719.72	0.50	-0.46	0.98	
4,773.00	13.14	148.89	4,646.37	-855.71	595.96	734.00	2.18	1.95	4.66	
4,868.00	12.78	146.60	4,738.95	-873.73	607.32	749.66	0.66	-0.38	-2.41	
4,962.00	12.25	147.00	4,830.71	-890.77	618.48	764.41	0.57	-0.56	0.43	
5,056.00	11.89	147.19	4,922.64	-907.27	629.16	778.72	0.39	-0.38	0.20	
5,151.00	11.71	148.18	5,015.63	-923.69	639.54	792.99	0.29	-0.19	1.04	
5,245.00	13.54	145.04	5,107.35	-940.82	650.88	807.78	2.08	1.95	-3.34	
5,339.00	13.22	145.27	5,198.80	-958.67	663.31	823.10	0.35	-0.34	0.24	
5,434.00	12.93	147.23	5,291.34	-976.53	675.25	838.51	0.56	-0.31	2.06	
5,528.00	12.14	151.08	5,383.10	-994.03	685.72	853.83	1.22	-0.84	4.10	
5,622.00	13.89	143.63	5,474.69	-1,011.77	697.19	869.20	2.58	1.86	-7.93	
5,716.00	13.42	144.14	5,566.03	-1,029.69	710.27	884.47	0.52	-0.50	0.54	
5,811.00	13.24	143.75	5,658.47	-1,047.40	723.16	899.56	0.21	-0.19	-0.41	
5,905.00	11.78	145.21	5,750.24	-1,063.96	735.00	913.71	1.59	-1.55	1.55	
6,000.00	12.12	141.74	5,843.18	-1,079.76	746.71	927.13	0.84	0.36	-3.65	
6,094.00	12.63	141.00	5,934.99	-1,095.49	759.29	940.33	0.57	0.54	-0.79	
6,189.00	14.68	140.55	6,027.30	-1,112.86	773.48	954.85	2.16	2.16	-0.47	
6,283.00	14.18	141.80	6,118.34	-1,131.11	788.17	970.15	0.63	-0.53	1.33	
6,378.00	13.76	142.56	6,210.53	-1,149.22	802.23	985.42	0.48	-0.44	0.80	
6,472.00	10.99	142.86	6,302.34	-1,165.24	814.44	998.98	2.95	-2.95	0.32	
6,567.00	9.82	143.74	6,395.77	-1,178.99	824.70	1,010.65	1.24	-1.23	0.93	
6,662.00	8.97	141.26	6,489.50	-1,191.30	834.12	1,021.05	0.99	-0.89	-2.61	
6,756.00	7.47	134.58	6,582.53	-1,201.31	843.06	1,029.28	1.89	-1.60	-7.11	
6,851.00	5.74	127.58	6,676.90	-1,208.54	851.23	1,034.92	2.01	-1.82	-7.37	
6,945.00	3.90	120.54	6,770.56	-1,213.03	857.71	1,038.17	2.05	-1.96	-7.49	
7,040.00	2.73	124.06	6,865.40	-1,215.94	862.36	1,040.19	1.25	-1.23	3.71	
7,134.00	0.71	165.21	6,959.36	-1,217.76	864.37	1,041.61	2.39	-2.15	43.78	
7,229.00	0.64	205.83	7,054.35	-1,218.81	864.29	1,042.65	0.50	-0.07	42.76	
7,323.00	1.21	221.70	7,148.34	-1,220.02	863.40	1,044.01	0.66	0.61	16.88	
7,417.00	0.79	41.50	7,242.33	-1,220.28	863.17	1,044.30	2.13	-0.45	191.28	
7,438.17	1.00	46.32	7,263.50	-1,220.04	863.40	1,044.03	1.06	0.99	22.79	
NR 334-3 BTV										
7,512.00	1.76	53.89	7,337.31	-1,218.93	864.78	1,042.68	1.06	1.03	10.25	
7,606.00	1.41	57.76	7,431.27	-1,217.46	866.92	1,040.85	0.39	-0.37	4.12	
7,700.00	0.97	61.80	7,525.25	-1,216.46	868.60	1,039.57	0.48	-0.47	4.30	
7,795.00	0.53	14.97	7,620.24	-1,215.66	869.42	1,038.63	0.76	-0.46	-49.29	
7,889.00	0.19	325.40	7,714.24	-1,215.11	869.45	1,038.09	0.46	-0.36	-52.73	
7,984.00	0.36	292.30	7,809.24	-1,214.87	869.08	1,037.92	0.24	0.18	-34.84	
8,078.00	0.88	236.37	7,903.24	-1,215.16	868.21	1,038.36	0.79	0.55	-59.50	
8,173.00	1.32	236.20	7,998.22	-1,216.17	866.69	1,039.63	0.46	0.46	-0.18	
8,267.00	0.97	201.37	8,092.20	-1,217.51	865.50	1,041.16	0.81	-0.37	-37.05	

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey									
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8,362.00	1.71	215.71	8,187.17	-1,219.41	864.38	1,043.23	0.85	0.78	15.09
8,455.00	1.52	237.91	8,280.14	-1,221.19	862.53	1,045.32	0.70	-0.20	23.87
8,549.00	1.32	263.51	8,374.11	-1,221.98	860.39	1,046.48	0.70	-0.21	27.23
8,644.00	0.09	113.75	8,469.10	-1,222.13	859.38	1,046.81	1.47	-1.29	-157.64
8,738.00	0.86	122.12	8,563.10	-1,222.54	860.04	1,047.09	0.82	0.82	8.90
8,832.00	0.68	127.38	8,657.09	-1,223.25	861.08	1,047.61	0.21	-0.19	5.60
8,927.00	1.06	174.13	8,752.08	-1,224.47	861.62	1,048.70	0.81	0.40	49.21
9,022.00	1.58	197.15	8,847.06	-1,226.59	861.32	1,050.85	0.77	0.55	24.23
9,116.00	0.34	159.22	8,941.04	-1,228.09	861.04	1,052.37	1.41	-1.32	-40.35
9,210.00	0.39	358.25	9,035.04	-1,228.03	861.13	1,052.30	0.77	0.05	-171.24
9,305.00	0.65	243.96	9,130.04	-1,227.95	860.63	1,052.30	0.93	0.27	-120.31
9,400.00	1.67	225.38	9,225.02	-1,229.16	859.17	1,053.76	1.13	1.07	-19.56
9,494.00	2.66	229.75	9,318.95	-1,231.53	856.53	1,056.57	1.07	1.05	4.65
9,589.00	3.66	229.19	9,413.80	-1,234.93	852.55	1,060.64	1.05	1.05	-0.59
9,684.00	5.61	232.74	9,508.49	-1,239.73	846.56	1,066.43	2.07	2.05	3.74
9,778.00	5.72	240.22	9,602.03	-1,244.84	838.83	1,072.85	0.79	0.12	7.96
9,872.00	5.91	240.63	9,695.55	-1,249.54	830.55	1,078.97	0.21	0.20	0.44
9,936.00	6.16	243.03	9,759.19	-1,252.71	824.62	1,083.16	0.55	0.39	3.75
Last SDI Production MWD Survey									
9,995.00	6.16	243.03	9,817.85	-1,255.58	818.98	1,087.01	0.00	0.00	0.00
Projection to TD - NR 334-3 PBHL									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
121.00	120.99	-1.17	-0.75	First SDI Gyro MWD Survey
489.00	488.02	-24.11	0.91	Last SDI Gyro MWD Survey
558.00	556.02	-34.35	6.45	First SDI Surface MWD Survey
1,053.00	1,036.92	-134.75	66.72	Last SDI Surface MWD Survey
1,180.00	1,159.68	-163.05	82.72	First SDI Production MWD Survey
9,936.00	9,759.19	-1,252.71	824.62	Last SDI Production MWD Survey
9,995.00	9,817.85	-1,255.58	818.98	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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