



Well Details: NR 34-3

TVD Reference: GL 6720' & RKB 24' @ 6744.00usft
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1634904.51 2329770.16 39.5525231 -107.8771933 NR 34-3 (B11)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well NR 34-3 - Slot NR 34-3 (B11), True North
 Vertical (TVD) Reference: GL 6720' & RKB 24' @ 6744.00usft
 Section (VS) Reference: Slot - NR 34-3 (B11)(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

11:59, November 13 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 34-3
County & State	Garfield County, CO
SDI Job No.	OP.014165
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 122 feet to a measured depth of 9,993 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

13-Nov-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 34-3 - Slot NR 34-3 (B11)
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 34-3	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 34-3 - Slot NR 34-3 (B11)					
Well Position	+N/-S	0.00 usft	Northing:	1,634,904.51 usft	Latitude:	39.5525232
	+E/-W	0.00 usft	Easting:	2,329,770.16 usft	Longitude:	-107.8771933
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	10/28/2018	9.42	65.78	51,523

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	138.85	

Survey Program	Date	11/13/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
122.00	397.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
467.00	1,071.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,180.00	9,993.00	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	
122.00	1.14	177.98	121.99	-1.21	0.04	0.94	0.93	0.93	0.00	
First SDI Gyro MWD Survey										
213.00	2.73	160.75	212.94	-4.16	0.79	3.65	1.84	1.75	-18.93	
305.00	3.61	168.49	304.80	-9.07	2.09	8.20	1.06	0.96	8.41	
397.00	6.16	149.77	396.46	-16.18	5.15	15.57	3.23	2.77	-20.35	
Last SDI Gyro MWD Survey										
467.00	8.26	142.70	465.90	-23.42	10.09	24.28	3.25	3.00	-10.10	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well NR 34-3 - Slot NR 34-3 (B11)
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Site:	NR 23-3 Pad	MD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Well:	NR 34-3	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)
First SDI Surface MWD Survey									
558.00	10.40	131.75	555.70	-34.09	20.18	38.95	3.05	2.35	-12.03
651.00	11.51	128.21	647.01	-45.42	33.74	56.40	1.40	1.19	-3.81
745.00	13.02	127.69	738.86	-57.70	49.49	76.01	1.61	1.61	-0.55
840.00	13.27	136.23	831.38	-72.11	65.50	97.40	2.06	0.26	8.99
934.00	11.56	144.40	923.18	-87.57	78.45	117.56	2.60	-1.82	8.69
1,029.00	9.83	141.40	1,016.53	-101.64	89.05	135.13	1.91	-1.82	-3.16
1,071.00	9.76	138.88	1,057.92	-107.13	93.62	142.27	1.03	-0.17	-6.00
Last SDI Surface MWD Survey									
1,180.00	8.97	128.25	1,165.47	-119.35	106.38	159.87	1.74	-0.72	-9.75
First SDI Production MWD Survey									
1,275.00	9.03	128.55	1,259.30	-128.58	118.02	174.48	0.08	0.06	0.32
1,370.00	8.77	130.42	1,353.16	-137.92	129.37	188.98	0.41	-0.27	1.97
1,464.00	11.29	135.12	1,445.72	-149.09	141.32	205.25	2.82	2.68	5.00
1,559.00	10.79	134.55	1,538.96	-161.92	154.22	223.40	0.54	-0.53	-0.60
1,653.00	10.29	134.88	1,631.37	-174.02	166.43	240.55	0.54	-0.53	0.35
1,748.00	9.87	130.83	1,724.91	-185.33	178.61	257.08	0.87	-0.44	-4.26
1,842.00	11.84	131.83	1,817.22	-197.03	191.89	274.63	2.11	2.10	1.06
1,937.00	10.94	133.78	1,910.35	-209.76	205.66	293.28	1.03	-0.95	2.05
2,032.00	13.19	135.19	2,003.25	-223.69	219.81	313.08	2.39	2.37	1.48
2,126.00	12.94	135.61	2,094.81	-238.82	234.73	334.29	0.28	-0.27	0.45
2,221.00	12.50	131.21	2,187.48	-253.20	249.91	355.10	1.12	-0.46	-4.63
2,316.00	12.71	127.21	2,280.19	-266.29	265.96	375.53	0.94	0.22	-4.21
2,410.00	12.34	122.56	2,371.96	-277.95	282.67	395.30	1.14	-0.39	-4.95
2,505.00	12.71	129.65	2,464.70	-290.08	299.27	415.36	1.66	0.39	7.46
2,600.00	12.01	124.58	2,557.50	-302.36	315.46	435.26	1.36	-0.74	-5.34
2,695.00	12.12	131.25	2,650.41	-314.55	331.09	454.72	1.47	0.12	7.02
2,789.00	11.57	135.60	2,742.41	-327.79	345.11	473.91	1.12	-0.59	4.63
2,884.00	11.66	134.30	2,835.47	-341.30	358.64	493.00	0.29	0.09	-1.37
2,978.00	11.37	131.79	2,927.57	-354.11	372.35	511.66	0.62	-0.31	-2.67
3,073.00	12.00	140.80	3,020.61	-368.00	385.58	530.83	2.03	0.66	9.48
3,167.00	11.92	139.20	3,112.57	-382.93	398.09	550.30	0.36	-0.09	-1.70
3,262.00	11.87	137.56	3,205.53	-397.56	411.10	569.88	0.36	-0.05	-1.73
3,356.00	11.69	137.79	3,297.55	-411.75	424.02	589.06	0.20	-0.19	0.24
3,451.00	11.78	135.10	3,390.57	-425.75	437.33	608.36	0.58	0.09	-2.83
3,545.00	11.30	137.23	3,482.67	-439.31	450.36	627.14	0.68	-0.51	2.27
3,640.00	10.38	138.36	3,575.97	-452.53	462.37	645.01	0.99	-0.97	1.19
3,734.00	9.85	137.39	3,668.51	-464.78	473.44	661.51	0.59	-0.56	-1.03
3,828.00	9.76	137.30	3,761.14	-476.55	484.28	677.51	0.10	-0.10	-0.10
3,923.00	9.50	136.95	3,854.80	-488.20	495.09	693.40	0.28	-0.27	-0.37
4,017.00	9.32	136.95	3,947.53	-499.43	505.59	708.76	0.19	-0.19	0.00
4,112.00	8.88	136.42	4,041.34	-510.36	515.89	723.77	0.47	-0.46	-0.56
4,206.00	8.80	135.41	4,134.22	-520.74	525.94	738.20	0.19	-0.09	-1.07
4,301.00	8.29	137.05	4,228.17	-530.93	535.71	752.30	0.59	-0.54	1.73

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well NR 34-3 - Slot NR 34-3 (B11)
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 34-3	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)
4,395.00	8.68	130.65	4,321.14	-540.51	545.71	766.09	1.09	0.41	-6.81
4,489.00	10.40	139.48	4,413.84	-551.58	556.60	781.60	2.40	1.83	9.39
4,584.00	10.27	138.43	4,507.30	-564.44	567.79	798.64	0.24	-0.14	-1.11
4,678.00	9.50	139.74	4,599.90	-576.62	578.37	814.78	0.85	-0.82	1.39
4,772.00	8.91	142.17	4,692.69	-588.29	587.85	829.80	0.75	-0.63	2.59
4,867.00	11.21	134.93	4,786.23	-600.63	598.90	846.36	2.76	2.42	-7.62
4,961.00	10.99	132.60	4,878.47	-613.15	611.96	864.39	0.53	-0.23	-2.48
5,055.00	10.64	133.90	4,970.80	-625.23	624.81	881.94	0.45	-0.37	1.38
5,150.00	10.17	135.90	5,064.24	-637.33	636.97	899.05	0.62	-0.49	2.11
5,244.00	9.47	135.80	5,156.86	-648.84	648.13	915.06	0.74	-0.74	-0.11
5,338.00	9.22	141.41	5,249.62	-660.27	658.22	930.31	1.00	-0.27	5.97
5,433.00	11.25	133.62	5,343.10	-672.61	669.68	947.14	2.58	2.14	-8.20
5,527.00	10.97	137.04	5,435.34	-685.48	682.41	965.21	0.76	-0.30	3.64
5,622.00	10.29	135.40	5,528.71	-698.14	694.53	982.72	0.78	-0.72	-1.73
5,716.00	9.87	135.27	5,621.26	-709.84	706.09	999.14	0.45	-0.45	-0.14
5,810.00	9.94	134.40	5,713.86	-721.24	717.56	1,015.27	0.18	0.07	-0.93
5,905.00	9.23	137.86	5,807.54	-732.63	728.53	1,031.06	0.96	-0.75	3.64
5,999.00	10.12	135.96	5,900.20	-744.15	739.33	1,046.84	1.01	0.95	-2.02
6,094.00	9.86	138.38	5,993.76	-756.23	750.53	1,063.31	0.52	-0.27	2.55
6,189.00	9.43	140.56	6,087.41	-768.32	760.88	1,079.23	0.59	-0.45	2.29
6,284.00	10.33	141.56	6,181.00	-781.01	771.12	1,095.51	0.96	0.95	1.05
6,378.00	12.05	134.66	6,273.22	-794.51	783.34	1,113.72	2.32	1.83	-7.34
6,473.00	10.99	125.52	6,366.31	-806.74	797.77	1,132.42	2.22	-1.12	-9.62
6,567.00	10.37	117.77	6,458.69	-815.89	812.55	1,149.04	1.66	-0.66	-8.24
6,662.00	9.41	103.64	6,552.29	-821.70	827.66	1,163.36	2.74	-1.01	-14.87
6,756.00	7.47	89.22	6,645.28	-823.43	841.24	1,173.60	3.04	-2.06	-15.34
6,851.00	5.19	77.54	6,739.69	-822.42	851.61	1,179.67	2.74	-2.40	-12.29
6,945.00	3.25	67.60	6,833.44	-820.49	858.23	1,182.57	2.20	-2.06	-10.57
7,039.00	2.61	61.68	6,927.31	-818.46	862.58	1,183.90	0.75	-0.68	-6.30
7,133.00	1.43	78.42	7,021.25	-817.21	865.61	1,184.95	1.39	-1.26	17.81
7,228.00	1.14	107.33	7,116.23	-817.25	867.67	1,186.34	0.74	-0.31	30.43
7,322.00	1.14	35.35	7,210.22	-816.77	869.11	1,186.92	1.43	0.00	-76.57
7,405.18	1.29	20.98	7,293.38	-815.22	869.92	1,186.29	0.41	0.18	-17.27
NR 34-3 BTV									
7,418.00	1.32	19.09	7,306.19	-814.94	870.02	1,186.15	0.41	0.23	-14.76
7,511.00	1.15	20.49	7,399.17	-813.06	870.70	1,185.17	0.19	-0.18	1.51
7,606.00	0.35	325.83	7,494.17	-811.92	870.87	1,184.43	1.04	-0.84	-57.54
7,700.00	0.53	55.04	7,588.16	-811.44	871.06	1,184.20	0.67	0.19	94.90
7,795.00	0.88	65.58	7,683.16	-810.88	872.09	1,184.45	0.39	0.37	11.09
7,889.00	0.44	74.11	7,777.15	-810.48	873.09	1,184.81	0.48	-0.47	9.07
7,984.00	0.70	143.89	7,872.15	-810.85	873.79	1,185.55	0.72	0.27	73.45
8,077.00	0.62	124.82	7,965.14	-811.60	874.53	1,186.60	0.25	-0.09	-20.51
8,171.00	0.97	21.55	8,059.13	-811.15	875.24	1,186.73	1.35	0.37	-109.86
8,266.00	0.79	10.74	8,154.12	-809.76	875.66	1,185.96	0.26	-0.19	-11.38

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Site:	NR 23-3 Pad	MD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Well:	NR 34-3	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)
8,360.00	0.18	267.29	8,248.12	-809.13	875.63	1,185.47	0.90	-0.65	-110.05
8,454.00	0.35	49.06	8,342.12	-808.95	875.70	1,185.38	0.54	0.18	150.82
8,549.00	0.07	63.32	8,437.12	-808.73	875.97	1,185.39	0.30	-0.29	15.01
8,643.00	0.18	174.65	8,531.12	-808.85	876.04	1,185.53	0.23	0.12	118.44
8,738.00	1.00	167.18	8,626.11	-809.81	876.24	1,186.38	0.87	0.86	-7.86
8,833.00	0.62	167.89	8,721.10	-811.12	876.53	1,187.55	0.40	-0.40	0.75
8,927.00	0.35	193.73	8,815.10	-811.90	876.57	1,188.16	0.36	-0.29	27.49
9,021.00	1.06	240.84	8,909.09	-812.60	875.74	1,188.15	0.92	0.76	50.12
9,116.00	2.02	248.66	9,004.06	-813.64	873.41	1,187.40	1.03	1.01	8.23
9,210.00	3.34	249.89	9,097.95	-815.18	869.30	1,185.85	1.41	1.40	1.31
9,305.00	3.96	238.38	9,192.76	-817.85	863.91	1,184.32	1.01	0.65	-12.12
9,399.00	3.96	235.30	9,286.54	-821.40	858.47	1,183.42	0.23	0.00	-3.28
9,494.00	4.75	233.19	9,381.26	-825.63	852.63	1,182.75	0.85	0.83	-2.22
9,588.00	4.31	227.65	9,474.97	-830.34	846.90	1,182.53	0.66	-0.47	-5.89
9,682.00	4.30	222.54	9,568.70	-835.31	841.91	1,182.99	0.41	-0.01	-5.44
9,775.00	4.34	229.33	9,661.44	-840.18	836.88	1,183.34	0.55	0.04	7.30
9,870.00	4.37	224.10	9,756.17	-845.12	831.64	1,183.61	0.42	0.03	-5.51
9,934.00	4.40	222.73	9,819.98	-848.67	828.27	1,184.08	0.17	0.05	-2.14
Last SDI Production MWD Survey									
9,993.00	4.40	222.73	9,878.80	-852.00	825.20	1,184.56	0.00	0.00	0.00
Projection to TD - NR 34-3 PBHL									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
122.00	121.99	-1.21	0.04	First SDI Gyro MWD Survey
397.00	396.46	-16.18	5.15	Last SDI Gyro MWD Survey
467.00	465.90	-23.42	10.09	First SDI Surface MWD Survey
1,071.00	1,057.92	-107.13	93.62	Last SDI Surface MWD Survey
1,180.00	1,165.47	-119.35	106.38	First SDI Production MWD Survey
9,934.00	9,819.98	-848.67	828.27	Last SDI Production MWD Survey
9,993.00	9,878.80	-852.00	825.20	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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