



#### Well Details: RWF 43-7

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	1627442.90	2317151.20	39.5311303	-107.9212248	RWF 43-7 (A14)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well RWF 43-7 - Slot RWF 43-7 (A14), True North  
 Vertical (TVD) Reference: GL 6174.5' & RKB 24' @ 6198.50usft (H&P 318)  
 Section (VS) Reference: Slot - RWF 43-7 (A14)(0.00N, 0.00E)  
 Measured Depth Reference: GL 6174.5' & RKB 24' @ 6198.50usft (H&P 318)  
 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

17:10, August 08 2019  
 Created By: Mel Mireles Jr.



## Directional Survey Certification

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

<b>Operator</b>	TEP Rocky Mountain, LLC.
<b>Well Name &amp; No.</b>	RWF 43-7
<b>County &amp; State</b>	Garfield County, CO
<b>SDI Job No.</b>	OP.020186
<b>Rig</b>	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 9,736 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

08-Aug-19

Date

### **Mel Mireles Jr.**

Grand Junction Assistant Well Planner  
Scientific Drilling - Colorado District

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well RWF 43-7 - Slot RWF 43-7 (A14)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6174.5' & RKB 24' @ 6198.50usft (H&P 318)
<b>Site:</b>	DOE 1-M-18 Pad	<b>MD Reference:</b>	GL 6174.5' & RKB 24' @ 6198.50usft (H&P 318)
<b>Well:</b>	RWF 43-7	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Grand Junction District

<b>Project</b>	Garfield County, CO NAD83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

Site		DOE 1-M-18 Pad			
Site Position:		Northing:	1,627,441.60 usft	Latitude:	39.5311260
From:	Map	Easting:	2,317,141.30 usft	Longitude:	-107.9212595
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.53 °

Well	RWF 43-7 - Slot RWF 43-7 (A14)					
Well Position	+N/-S	0.00 usft	Northing:	1,627,442.90 usft	Latitude:	39.5311303
	+E/-W	0.00 usft	Easting:	2,317,151.20 usft	Longitude:	-107.9212245
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,174.50 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	7/31/2019	9.32	65.75	51,462

<b>Design</b>	OH				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	342.39	

<b>Survey Program</b>	<b>Date</b>	8/8/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
122.00	579.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
652.00	1,279.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,361.00	9,736.00	Survey #3 - Production MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
122.00	0.79	5.45	122.00	0.84	0.08	0.77	0.65	0.65	0.00	
<b>First SDI Gyro Survey</b>										
213.00	3.43	344.00	212.93	4.08	-0.61	4.07	2.98	2.90	-23.57	
305.00	6.42	335.13	304.58	11.39	-3.53	11.93	3.34	3.25	-9.64	
397.00	9.59	335.13	395.67	23.02	-8.92	24.64	3.45	3.45	0.00	
488.00	12.67	337.32	484.95	39.10	-15.96	42.10	3.42	3.38	2.41	
579.00	15.84	335.92	573.14	59.66	-24.88	64.39	3.50	3.48	-1.54	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well RWF 43-7 - Slot RWF 43-7 (A14)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6174.5' & RKB 24' @ 6198.50usft (H&P 318)
<b>Site:</b>	DOE 1-M-18 Pad	<b>MD Reference:</b>	GL 6174.5' & RKB 24' @ 6198.50usft (H&P 318)
<b>Well:</b>	RWF 43-7	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
<b>Last SDI Gyro Survey</b>									
652.00	18.05	339.73	642.96	79.36	-32.86	85.59	3.39	3.03	5.22
<b>First SDI Surface MWD Survey</b>									
746.00	20.40	344.78	731.72	108.84	-42.21	116.51	3.06	2.50	5.37
840.00	23.55	345.52	818.88	142.84	-51.21	151.64	3.36	3.35	0.79
934.00	25.44	347.64	904.42	180.75	-60.23	190.50	2.22	2.01	2.26
1,029.00	27.99	347.71	989.27	222.47	-69.34	233.02	2.68	2.68	0.07
1,123.00	30.22	342.26	1,071.41	266.56	-81.25	278.65	3.68	2.37	-5.80
1,217.00	32.36	341.28	1,151.73	312.93	-96.53	327.47	2.34	2.28	-1.04
1,279.00	33.06	341.37	1,203.90	344.67	-107.26	360.96	1.13	1.13	0.15
<b>Last SDI Surface MWD Survey</b>									
1,361.00	33.24	341.99	1,272.56	387.23	-121.35	405.80	0.47	0.22	0.76
<b>First SDI Production MWD Survey</b>									
1,455.00	33.59	341.46	1,351.02	436.39	-137.58	457.56	0.48	0.37	-0.56
1,550.00	34.03	339.89	1,429.95	486.27	-155.08	510.40	1.03	0.46	-1.65
1,644.00	35.00	338.56	1,507.41	536.06	-173.98	563.57	1.31	1.03	-1.41
1,738.00	33.68	340.14	1,585.02	585.67	-192.69	616.52	1.69	-1.40	1.68
1,833.00	34.38	338.29	1,663.76	635.37	-211.56	669.60	1.32	0.74	-1.95
1,928.00	33.50	339.88	1,742.57	684.90	-230.50	722.54	1.32	-0.93	1.67
2,022.00	31.48	342.07	1,821.86	732.62	-246.98	773.01	2.49	-2.15	2.33
2,116.00	31.83	340.49	1,901.87	779.34	-262.82	822.33	0.96	0.37	-1.68
2,211.00	31.04	343.13	1,982.93	826.39	-278.29	871.86	1.67	-0.83	2.78
2,305.00	31.92	342.95	2,063.10	873.34	-292.61	920.94	0.94	0.94	-0.19
2,399.00	32.62	341.37	2,142.58	921.11	-307.99	971.12	1.17	0.74	-1.68
2,494.00	32.45	345.41	2,222.68	970.05	-322.59	1,022.18	2.29	-0.18	4.25
2,588.00	32.01	345.33	2,302.20	1,018.55	-335.26	1,072.25	0.47	-0.47	-0.09
2,682.00	31.74	345.24	2,382.02	1,066.56	-347.86	1,121.82	0.29	-0.29	-0.10
2,777.00	32.18	345.15	2,462.62	1,115.18	-360.71	1,172.05	0.47	0.46	-0.09
2,871.00	32.71	344.10	2,541.95	1,163.80	-374.09	1,222.44	0.82	0.56	-1.12
2,966.00	33.50	343.66	2,621.53	1,213.65	-388.50	1,274.31	0.87	0.83	-0.46
3,061.00	33.77	343.13	2,700.62	1,264.07	-403.53	1,326.92	0.42	0.28	-0.56
3,155.00	31.83	343.04	2,779.63	1,312.79	-418.35	1,377.83	2.06	-2.06	-0.10
3,250.00	31.30	342.25	2,860.58	1,360.25	-433.18	1,427.56	0.71	-0.56	-0.83
3,344.00	30.43	341.46	2,941.26	1,406.08	-448.19	1,475.78	1.02	-0.93	-0.84
3,439.00	30.60	341.02	3,023.11	1,451.75	-463.71	1,524.01	0.30	0.18	-0.46
3,533.00	30.74	340.61	3,103.96	1,497.04	-479.46	1,571.94	0.27	0.15	-0.44
3,628.00	31.30	339.75	3,185.37	1,543.09	-496.07	1,620.86	0.75	0.59	-0.91
3,723.00	30.95	341.11	3,266.70	1,589.36	-512.52	1,669.93	0.83	-0.37	1.43
3,817.00	30.69	340.40	3,347.42	1,634.83	-528.39	1,718.07	0.48	-0.28	-0.76
3,911.00	30.60	340.14	3,428.29	1,679.93	-544.56	1,765.95	0.17	-0.10	-0.28
4,006.00	30.51	340.23	3,510.10	1,725.36	-560.93	1,814.21	0.11	-0.09	0.09
4,100.00	30.43	343.57	3,591.13	1,770.65	-575.74	1,861.86	1.80	-0.09	3.55
4,194.00	30.30	343.93	3,672.23	1,816.27	-589.04	1,909.36	0.24	-0.14	0.38
4,289.00	30.74	342.86	3,754.07	1,862.50	-602.83	1,957.60	0.74	0.46	-1.13

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<b>Site:</b>	DOE 1-M-18 Pad	<b>MD Reference:</b>	GL 6174.5' & RKB 24' @ 6198.50usft (H&P 318)
<b>Well:</b>	RWF 43-7	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)	
4,383.00	31.14	342.25	3,834.70	1,908.61	-617.32	2,005.93	0.54	0.43	-0.65	
4,478.00	31.20	342.36	3,915.98	1,955.45	-632.26	2,055.10	0.09	0.06	0.12	
4,572.00	31.74	341.63	3,996.15	2,002.12	-647.43	2,104.17	0.70	0.57	-0.78	
4,667.00	32.10	341.46	4,076.79	2,049.77	-663.33	2,154.39	0.39	0.38	-0.18	
4,761.00	29.90	341.72	4,157.36	2,095.70	-678.62	2,202.80	2.34	-2.34	0.28	
4,856.00	29.36	341.28	4,239.94	2,140.24	-693.53	2,249.76	0.61	-0.57	-0.46	
4,950.00	28.31	342.43	4,322.28	2,183.31	-707.65	2,295.09	1.26	-1.12	1.22	
5,045.00	28.40	341.99	4,405.88	2,226.28	-721.44	2,340.21	0.24	0.09	-0.46	
5,139.00	26.82	343.66	4,489.18	2,267.89	-734.31	2,383.77	1.87	-1.68	1.78	
5,234.00	25.85	343.04	4,574.32	2,308.26	-746.39	2,425.90	1.06	-1.02	-0.65	
5,329.00	26.12	342.16	4,659.71	2,347.98	-758.83	2,467.52	0.50	0.28	-0.93	
5,423.00	23.92	345.50	4,744.89	2,386.13	-769.95	2,507.25	2.78	-2.34	3.55	
5,517.00	21.46	347.96	4,831.61	2,421.41	-778.31	2,543.40	2.80	-2.62	2.62	
5,612.00	21.02	347.61	4,920.16	2,455.04	-785.59	2,577.66	0.48	-0.46	-0.37	
5,706.00	18.47	347.52	5,008.62	2,486.05	-792.42	2,609.29	2.71	-2.71	-0.10	
5,801.00	16.71	347.52	5,099.18	2,514.08	-798.63	2,637.88	1.85	-1.85	0.00	
5,895.00	15.56	347.35	5,189.47	2,539.58	-804.31	2,663.90	1.22	-1.22	-0.18	
5,990.00	16.39	348.33	5,280.80	2,565.14	-809.81	2,689.93	0.92	0.87	1.03	
6,084.00	16.09	347.96	5,371.05	2,590.87	-815.21	2,716.08	0.34	-0.32	-0.39	
6,179.00	15.48	346.91	5,462.47	2,616.09	-820.83	2,741.82	0.71	-0.64	-1.11	
6,273.00	14.51	345.41	5,553.27	2,639.71	-826.63	2,766.09	1.11	-1.03	-1.60	
6,368.00	12.75	344.53	5,645.59	2,661.33	-832.43	2,788.45	1.87	-1.85	-0.93	
6,462.00	13.19	344.36	5,737.19	2,681.65	-838.09	2,809.54	0.47	0.47	-0.18	
6,557.00	12.40	342.86	5,829.83	2,701.84	-844.01	2,830.57	0.90	-0.83	-1.58	
6,651.00	11.43	342.95	5,921.81	2,720.39	-849.72	2,849.97	1.03	-1.03	0.10	
6,745.00	11.52	345.77	6,013.93	2,738.39	-854.76	2,868.66	0.60	0.10	3.00	
6,840.00	9.94	349.72	6,107.27	2,755.65	-858.55	2,886.26	1.83	-1.66	4.16	
6,934.00	10.11	349.11	6,199.83	2,771.74	-861.56	2,902.50	0.21	0.18	-0.65	
7,029.00	9.81	347.59	6,293.40	2,787.83	-864.88	2,918.84	0.42	-0.32	-1.60	
7,123.00	8.97	347.26	6,386.14	2,802.80	-868.21	2,934.12	0.90	-0.89	-0.35	
7,218.00	8.35	346.47	6,480.05	2,816.73	-871.46	2,948.38	0.66	-0.65	-0.83	
7,312.00	7.90	345.21	6,573.11	2,829.61	-874.71	2,961.64	0.51	-0.48	-1.34	
7,373.89	7.47	345.11	6,634.44	2,837.61	-876.82	2,969.90	0.70	-0.70	-0.17	
RWF 43-7 KMV										
7,406.00	7.24	345.05	6,666.29	2,841.58	-877.88	2,974.01	0.70	-0.70	-0.18	
7,501.00	6.41	341.99	6,760.62	2,852.41	-881.07	2,985.29	0.95	-0.87	-3.22	
7,596.00	5.96	338.69	6,855.06	2,862.04	-884.50	2,995.52	0.60	-0.47	-3.47	
7,690.00	3.61	344.53	6,948.73	2,869.44	-887.06	3,003.34	2.55	-2.50	6.21	
7,784.00	2.55	352.53	7,042.59	2,874.37	-888.12	3,008.36	1.21	-1.13	8.51	
7,878.00	2.11	341.72	7,136.52	2,878.09	-888.94	3,012.15	0.66	-0.47	-11.50	
7,973.00	1.67	331.00	7,231.46	2,880.96	-890.16	3,015.26	0.59	-0.46	-11.28	
8,067.00	1.46	331.22	7,325.43	2,883.21	-891.40	3,017.77	0.22	-0.22	0.23	
8,162.00	1.23	329.15	7,420.40	2,885.14	-892.50	3,019.95	0.25	-0.24	-2.18	
8,256.00	1.31	347.85	7,514.38	2,887.06	-893.25	3,022.00	0.45	0.09	19.89	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well RWF 43-7 - Slot RWF 43-7 (A14)
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<b>Site:</b>	DOE 1-M-18 Pad	<b>MD Reference:</b>	GL 6174.5' & RKB 24' @ 6198.50usft (H&P 318)
<b>Well:</b>	RWF 43-7	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
8,351.00	0.91	1.50	7,609.36	2,888.87	-893.46	3,023.80	0.50	-0.42	14.37
8,445.00	0.88	323.44	7,703.35	2,890.20	-893.87	3,025.19	0.62	-0.03	-40.49
8,540.00	0.76	327.06	7,798.34	2,891.31	-894.64	3,026.48	0.14	-0.13	3.81
8,634.00	0.77	269.61	7,892.34	2,891.83	-895.61	3,027.27	0.78	0.01	-61.12
8,729.00	1.03	258.77	7,987.32	2,891.66	-897.09	3,027.56	0.33	0.27	-11.41
8,823.00	1.04	264.54	8,081.31	2,891.42	-898.77	3,027.83	0.11	0.01	6.14
8,918.00	1.08	289.00	8,176.29	2,891.63	-900.47	3,028.54	0.47	0.04	25.75
9,012.00	0.64	329.02	8,270.28	2,892.37	-901.58	3,029.58	0.77	-0.47	42.57
9,107.00	0.57	357.21	8,365.28	2,893.29	-901.88	3,030.56	0.32	-0.07	29.67
9,201.00	1.39	88.33	8,459.27	2,893.79	-900.76	3,030.70	1.61	0.87	96.94
9,296.00	2.59	118.29	8,554.21	2,892.81	-897.72	3,028.84	1.63	1.26	31.54
9,390.00	2.57	144.20	8,648.12	2,890.09	-894.61	3,025.31	1.23	-0.02	27.56
9,485.00	3.25	162.51	8,743.00	2,885.80	-892.56	3,020.59	1.20	0.72	19.27
9,579.00	3.78	173.06	8,836.82	2,880.18	-891.38	3,014.88	0.89	0.56	11.22
9,673.00	3.43	176.31	8,930.63	2,874.30	-890.83	3,009.11	0.43	-0.37	3.46
Last SDI Production MWD Survey									
9,736.00	3.43	176.31	8,993.52	2,870.54	-890.59	3,005.45	0.00	0.00	0.00
Projection to TD - RWF 43-7 PBHL									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
122.00	122.00	0.84	0.08	First SDI Gyro Survey
579.00	573.14	59.66	-24.88	Last SDI Gyro Survey
652.00	642.96	79.36	-32.86	First SDI Surface MWD Survey
1,279.00	1,203.90	344.67	-107.26	Last SDI Surface MWD Survey
1,361.00	1,272.56	387.23	-121.35	First SDI Production MWD Survey
9,673.00	8,930.63	2,874.30	-890.83	Last SDI Production MWD Survey
9,736.00	8,993.52	2,870.54	-890.59	Projection to TD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_