



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.	TR 24-23-597
County & State	Garfield County, CO
SDI Job No.	OP.000980 & OP.003528
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 124 feet to a measured depth of 10,483 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

21-Aug-17

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well TR 24-23-597 - Slot A2 (TR 24-23-597)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
Site:	TR 32-23-597 Pad	MD Reference:	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
Well:	TR 24-23-597	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		TR 32-23-597 Pad			
Site Position:		Northing:	1,654,899.00 usft	Latitude:	39.5994964
From:	Map	Easting:	2,227,644.00 usft	Longitude:	-108.2413519
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.73 °

Well		TR 24-23-597 - Slot A2 (TR 24-23-597)				
Well Position	+N/-S	0.00 usft	Northing:	1,654,840.00 usft	Latitude:	39.5993307
	+E/-W	0.00 usft	Easting:	2,227,597.80 usft	Longitude:	-108.2415095
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,545.20 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	4/28/2017	9.77	65.93	51,616

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	212.79	

Survey Program	Date	8/21/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
124.00	770.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
842.00	2,944.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
3,068.00	10,483.00	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	
124.00	0.09	334.34	124.00	0.09	-0.04	-0.05	0.07	0.07	0.00	
First Gyro MWD Survey										
216.00	1.50	204.61	215.99	-0.94	-0.57	1.10	1.69	1.53	-141.01	
308.00	3.96	204.70	307.88	-4.92	-2.40	5.44	2.67	2.67	0.10	
402.00	6.69	214.89	401.47	-12.37	-6.89	14.13	3.06	2.90	10.84	
494.00	9.59	214.37	492.53	-23.09	-14.29	27.15	3.15	3.15	-0.57	

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Well:	TR 24-23-597	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)
587.00	12.40	214.89	583.81	-37.68	-24.37	44.87	3.02	3.02	0.56
679.00	15.31	212.34	673.13	-56.04	-36.52	66.89	3.23	3.16	-2.77
770.00	18.56	213.75	760.17	-78.24	-51.00	93.40	3.60	3.57	1.55
Last Gyro MWD Survey									
842.00	20.22	212.36	828.08	-98.28	-64.03	117.30	2.39	2.31	-1.93
First SDI Surface MWD Survey									
935.00	22.65	211.27	914.65	-127.17	-81.93	151.27	2.65	2.61	-1.17
1,027.00	25.93	213.99	998.49	-159.00	-102.37	189.10	3.77	3.57	2.96
1,126.00	27.00	217.10	1,087.12	-194.87	-128.03	233.16	1.77	1.08	3.14
1,221.00	29.37	214.99	1,170.85	-231.16	-154.40	277.95	2.71	2.49	-2.22
1,315.00	29.81	216.80	1,252.59	-268.76	-181.62	324.29	1.06	0.47	1.93
1,410.00	29.63	217.19	1,335.10	-306.37	-209.96	371.26	0.28	-0.19	0.41
1,505.00	29.46	212.80	1,417.76	-344.72	-236.81	418.04	2.29	-0.18	-4.62
1,600.00	30.83	209.96	1,499.91	-385.45	-261.63	465.72	2.08	1.44	-2.99
1,694.00	29.93	209.56	1,581.00	-426.72	-285.22	513.19	0.98	-0.96	-0.43
1,789.00	28.98	211.99	1,663.72	-466.86	-309.11	559.87	1.61	-1.00	2.56
1,884.00	28.84	213.50	1,746.89	-505.48	-333.95	605.79	0.78	-0.15	1.59
1,979.00	29.01	213.40	1,830.04	-543.82	-359.28	651.74	0.19	0.18	-0.11
2,073.00	29.20	212.04	1,912.17	-582.29	-383.99	697.46	0.73	0.20	-1.45
2,168.00	27.35	214.38	1,995.83	-619.94	-408.61	742.45	2.27	-1.95	2.46
2,263.00	25.98	212.10	2,080.73	-655.58	-431.99	785.07	1.80	-1.44	-2.40
2,357.00	24.97	211.48	2,165.59	-689.95	-453.29	825.50	1.11	-1.07	-0.66
2,452.00	24.80	211.65	2,251.77	-724.01	-474.22	865.46	0.19	-0.18	0.18
2,548.00	25.74	215.78	2,338.59	-758.06	-496.97	906.41	2.08	0.98	4.30
2,642.00	24.89	214.29	2,423.56	-790.97	-520.05	946.57	1.13	-0.90	-1.59
2,737.00	24.62	214.12	2,509.83	-823.86	-542.41	986.34	0.29	-0.28	-0.18
2,832.00	25.43	215.57	2,595.91	-856.84	-565.38	1,026.50	1.07	0.85	1.53
2,927.00	26.15	215.02	2,681.45	-890.57	-589.26	1,067.79	0.80	0.76	-0.58
2,944.00	25.76	215.35	2,696.73	-896.66	-593.54	1,075.22	2.45	-2.29	1.94
Last SDI Surface MWD Survey									
3,068.00	25.94	211.18	2,808.34	-941.84	-623.18	1,129.26	1.47	0.15	-3.36
First SDI Production MWD Survey									
3,162.00	26.82	209.77	2,892.55	-977.84	-644.35	1,170.99	1.15	0.94	-1.50
3,257.00	27.31	211.57	2,977.14	-1,015.01	-666.40	1,214.18	1.00	0.52	1.89
3,351.00	26.12	213.46	3,061.11	-1,050.65	-689.10	1,256.43	1.56	-1.27	2.01
3,446.00	24.09	213.64	3,147.13	-1,084.24	-711.37	1,296.73	2.14	-2.14	0.19
3,540.00	21.53	214.65	3,233.77	-1,114.40	-731.81	1,333.16	2.75	-2.72	1.07
3,635.00	19.35	216.71	3,322.79	-1,141.36	-751.13	1,366.29	2.42	-2.29	2.17
3,730.00	21.46	215.92	3,411.82	-1,168.06	-770.74	1,399.34	2.24	2.22	-0.83
3,824.00	23.70	215.93	3,498.61	-1,197.28	-791.92	1,435.38	2.38	2.38	0.01
3,919.00	25.68	216.89	3,584.92	-1,229.21	-815.48	1,474.98	2.13	2.08	1.01
4,013.00	27.35	216.45	3,669.03	-1,262.87	-840.53	1,516.85	1.79	1.78	-0.47
4,108.00	26.82	212.76	3,753.62	-1,298.45	-865.10	1,560.06	1.85	-0.56	-3.88

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Well:	TR 24-23-597	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)
4,202.00	26.20	214.08	3,837.74	-1,333.47	-888.20	1,602.01	0.91	-0.66	1.40
4,297.00	25.68	215.75	3,923.17	-1,367.55	-911.98	1,643.54	0.94	-0.55	1.76
4,391.00	25.85	216.80	4,007.82	-1,400.48	-936.15	1,684.32	0.52	0.18	1.12
4,486.00	26.29	215.48	4,093.16	-1,434.20	-960.77	1,725.99	0.77	0.46	-1.39
4,580.00	26.91	216.01	4,177.21	-1,468.36	-985.36	1,768.03	0.71	0.66	0.56
4,675.00	27.17	215.04	4,261.82	-1,503.51	-1,010.45	1,811.17	0.54	0.27	-1.02
4,769.00	25.76	215.48	4,345.97	-1,537.72	-1,034.63	1,853.02	1.51	-1.50	0.47
4,864.00	24.18	216.54	4,432.09	-1,570.16	-1,058.20	1,893.05	1.73	-1.66	1.12
4,958.00	22.76	217.21	4,518.31	-1,600.11	-1,080.66	1,930.40	1.54	-1.51	0.71
5,053.00	21.98	216.36	4,606.16	-1,629.06	-1,102.31	1,966.46	0.89	-0.82	-0.89
5,148.00	21.11	215.64	4,694.52	-1,657.28	-1,122.82	2,001.29	0.96	-0.92	-0.76
5,242.00	19.08	215.57	4,782.79	-1,683.54	-1,141.62	2,033.55	2.16	-2.16	-0.07
5,337.00	19.08	217.42	4,872.58	-1,708.50	-1,160.09	2,064.53	0.64	0.00	1.95
5,431.00	16.97	215.31	4,961.96	-1,731.90	-1,177.36	2,093.56	2.35	-2.24	-2.24
5,526.00	15.74	210.74	5,053.12	-1,754.29	-1,191.96	2,120.29	1.87	-1.29	-4.81
5,620.00	14.83	210.04	5,143.79	-1,775.67	-1,204.50	2,145.04	0.99	-0.97	-0.74
5,714.00	15.24	209.96	5,234.57	-1,796.78	-1,216.69	2,169.40	0.44	0.44	-0.09
5,809.00	15.40	208.92	5,326.20	-1,818.64	-1,229.03	2,194.46	0.33	0.17	-1.09
5,903.00	14.50	210.91	5,417.01	-1,839.66	-1,241.11	2,218.67	1.10	-0.96	2.12
5,998.00	12.81	210.73	5,509.33	-1,858.92	-1,252.60	2,241.08	1.78	-1.78	-0.19
6,093.00	12.93	210.66	5,601.94	-1,877.12	-1,263.40	2,262.23	0.13	0.13	-0.07
6,187.00	12.44	212.26	5,693.65	-1,894.73	-1,274.17	2,282.86	0.64	-0.52	1.70
6,282.00	11.08	212.76	5,786.65	-1,911.06	-1,284.57	2,302.22	1.44	-1.43	0.53
6,376.00	9.25	212.04	5,879.17	-1,925.06	-1,293.47	2,318.81	1.95	-1.95	-0.77
6,471.00	7.91	207.04	5,973.11	-1,937.35	-1,300.49	2,332.95	1.61	-1.41	-5.26
6,565.00	7.58	204.26	6,066.25	-1,948.77	-1,305.98	2,345.52	0.53	-0.35	-2.96
6,660.00	6.24	212.41	6,160.56	-1,958.84	-1,311.32	2,356.88	1.74	-1.41	8.58
6,754.00	4.40	216.54	6,254.15	-1,966.05	-1,316.20	2,365.59	2.00	-1.96	4.39
6,849.00	3.43	207.40	6,348.93	-1,971.50	-1,319.68	2,372.05	1.21	-1.02	-9.62
6,880.69	2.82	204.05	6,380.57	-1,973.05	-1,320.44	2,373.77	2.02	-1.93	-10.56
TR 24-23-597 MVRD									
6,943.00	1.67	190.43	6,442.83	-1,975.34	-1,321.22	2,376.12	2.02	-1.84	-21.86
7,038.00	0.88	124.52	6,537.81	-1,977.12	-1,320.87	2,377.42	1.62	-0.83	-69.38
7,132.00	0.88	123.37	6,631.80	-1,977.92	-1,319.68	2,377.45	0.02	0.00	-1.22
7,227.00	0.35	176.90	6,726.80	-1,978.61	-1,319.05	2,377.69	0.77	-0.56	56.35
7,321.00	1.14	231.39	6,820.79	-1,979.48	-1,319.77	2,378.81	1.04	0.84	57.97
7,416.00	0.70	275.95	6,915.78	-1,980.01	-1,321.08	2,379.97	0.85	-0.46	46.91
7,511.00	0.70	251.08	7,010.77	-1,980.14	-1,322.21	2,380.69	0.32	0.00	-26.18
7,605.00	1.14	258.55	7,104.76	-1,980.51	-1,323.67	2,381.79	0.48	0.47	7.95
7,699.00	1.06	250.99	7,198.74	-1,980.98	-1,325.41	2,383.13	0.18	-0.09	-8.04
7,794.00	1.58	252.31	7,293.71	-1,981.67	-1,327.48	2,384.83	0.55	0.55	1.39
7,888.00	2.02	216.10	7,387.67	-1,983.40	-1,329.70	2,387.48	1.27	0.47	-38.52

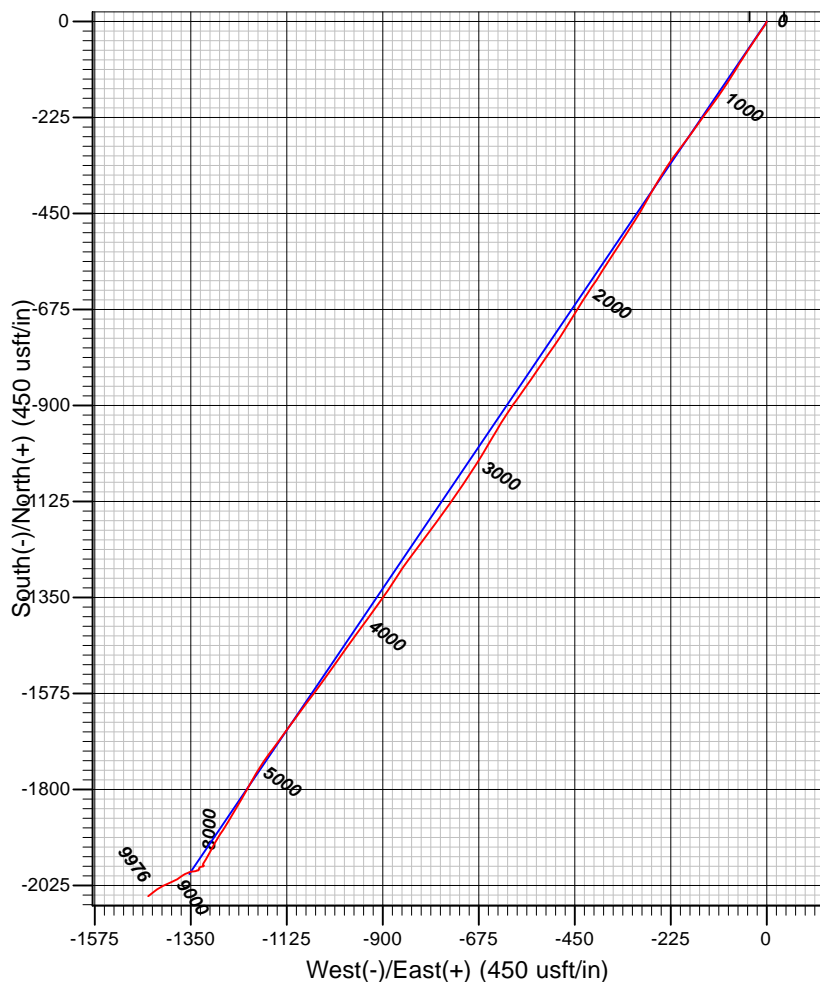
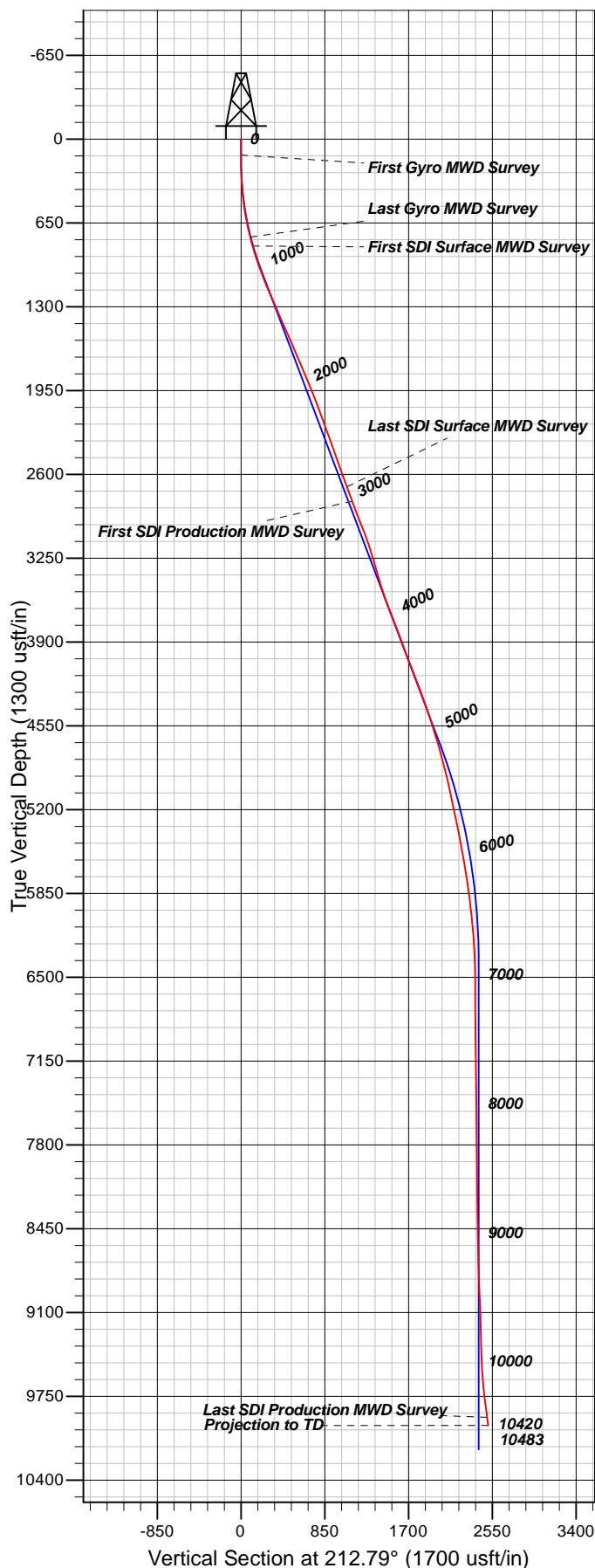
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7,983.00	0.53	169.25	7,482.65	-1,985.18	-1,330.60	2,389.47	1.79	-1.57	-49.32	
8,077.00	0.53	169.69	7,576.64	-1,986.04	-1,330.44	2,390.10	0.00	0.00	0.47	
8,172.00	0.97	206.34	7,671.63	-1,987.19	-1,330.72	2,391.22	0.66	0.46	38.58	
8,266.00	1.49	215.66	7,765.61	-1,988.90	-1,331.78	2,393.23	0.59	0.55	9.91	
8,361.00	0.68	267.18	7,860.60	-1,989.93	-1,333.07	2,394.80	1.26	-0.85	54.23	
8,455.00	1.12	282.22	7,954.58	-1,989.76	-1,334.52	2,395.44	0.53	0.47	16.00	
8,549.00	0.32	219.96	8,048.58	-1,989.77	-1,335.59	2,396.03	1.08	-0.85	-66.23	
8,643.00	0.63	242.83	8,142.57	-1,990.21	-1,336.22	2,396.73	0.38	0.33	24.33	
8,738.00	1.58	250.02	8,237.56	-1,990.89	-1,337.91	2,398.23	1.01	1.00	7.57	
8,832.00	1.52	264.61	8,331.52	-1,991.45	-1,340.37	2,400.03	0.42	-0.06	15.52	
8,926.00	2.02	263.21	8,425.48	-1,991.77	-1,343.26	2,401.86	0.53	0.53	-1.49	
9,021.00	1.94	259.54	8,520.42	-1,992.26	-1,346.50	2,404.03	0.16	-0.08	-3.86	
9,115.00	2.46	257.67	8,614.35	-1,992.97	-1,350.04	2,406.55	0.56	0.55	-1.99	
9,210.00	2.58	250.92	8,709.26	-1,994.11	-1,354.05	2,409.67	0.34	0.13	-7.11	
9,304.00	3.18	246.93	8,803.14	-1,995.82	-1,358.45	2,413.50	0.67	0.64	-4.24	
9,399.00	3.08	245.89	8,898.00	-1,997.90	-1,363.20	2,417.81	0.12	-0.11	-1.09	
9,493.00	3.49	234.05	8,991.84	-2,000.61	-1,367.82	2,422.60	0.84	0.44	-12.60	
9,588.00	2.99	236.66	9,086.69	-2,003.67	-1,372.23	2,427.56	0.55	-0.53	2.75	
9,682.00	2.14	231.29	9,180.60	-2,006.11	-1,375.65	2,431.46	0.94	-0.90	-5.71	
9,777.00	2.15	230.82	9,275.53	-2,008.35	-1,378.42	2,434.84	0.02	0.01	-0.49	
9,871.00	2.46	240.44	9,369.45	-2,010.46	-1,381.54	2,438.30	0.53	0.33	10.23	
9,966.00	2.94	241.97	9,464.35	-2,012.61	-1,385.46	2,442.24	0.51	0.51	1.61	
10,060.00	5.54	248.36	9,558.08	-2,015.41	-1,391.81	2,448.03	2.81	2.77	6.80	
10,156.00	8.38	246.70	9,653.37	-2,019.89	-1,402.54	2,457.61	2.97	2.96	-1.73	
10,251.00	9.84	240.91	9,747.17	-2,026.58	-1,416.00	2,470.52	1.81	1.54	-6.09	
10,346.00	11.20	235.07	9,840.57	-2,035.81	-1,430.66	2,486.21	1.82	1.43	-6.15	
10,420.00	9.50	232.97	9,913.37	-2,043.60	-1,441.42	2,498.60	2.35	-2.30	-2.84	
Last SDI Production MWD Survey										
10,483.00	9.50	232.97	9,975.50	-2,049.86	-1,449.72	2,508.36	0.00	0.00	0.00	
Projection to TD - TR 24-23-597 PBHL										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
124.00	124.00	0.09	-0.04	First Gyro MWD Survey	
770.00	760.17	-78.24	-51.00	Last Gyro MWD Survey	
842.00	828.08	-98.28	-64.03	First SDI Surface MWD Survey	
2,944.00	2,696.73	-896.66	-593.54	Last SDI Surface MWD Survey	
3,068.00	2,808.34	-941.84	-623.18	First SDI Production MWD Survey	
10,420.00	9,913.37	-2,043.60	-1,441.42	Last SDI Production MWD Survey	
10,483.00	9,975.50	-2,049.86	-1,449.72	Projection to TD	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well TR 24-23-597 - Slot A2 (TR 24-23-597)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
Site:	TR 32-23-597 Pad	MD Reference:	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
Well:	TR 24-23-597	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Checked By: _____	Approved By: _____	Date: _____
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Well Details: TR 24-23-597

+N/-S	+E/-W	North	East	Latitude	Longitude	Slot
0.00	0.00	1654840.00	2227597.80	39.5993306	-108.2415035	TR 24-23-597

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well TR 24-23-597 - Slot A2 (TR 24-23-597), True North
 Vertical (TVD) Reference: GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
 Section (VS) Reference: Slot - A2 (TR 24-23-597)(0.00N, 0.00E)
 Measured Depth Reference: GL 8545.20' & RKB 24' @ 8569.20usft (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

13:40, August 21 2017
 Created By: Mel Mireles Jr.