



## Directional Survey Certification

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

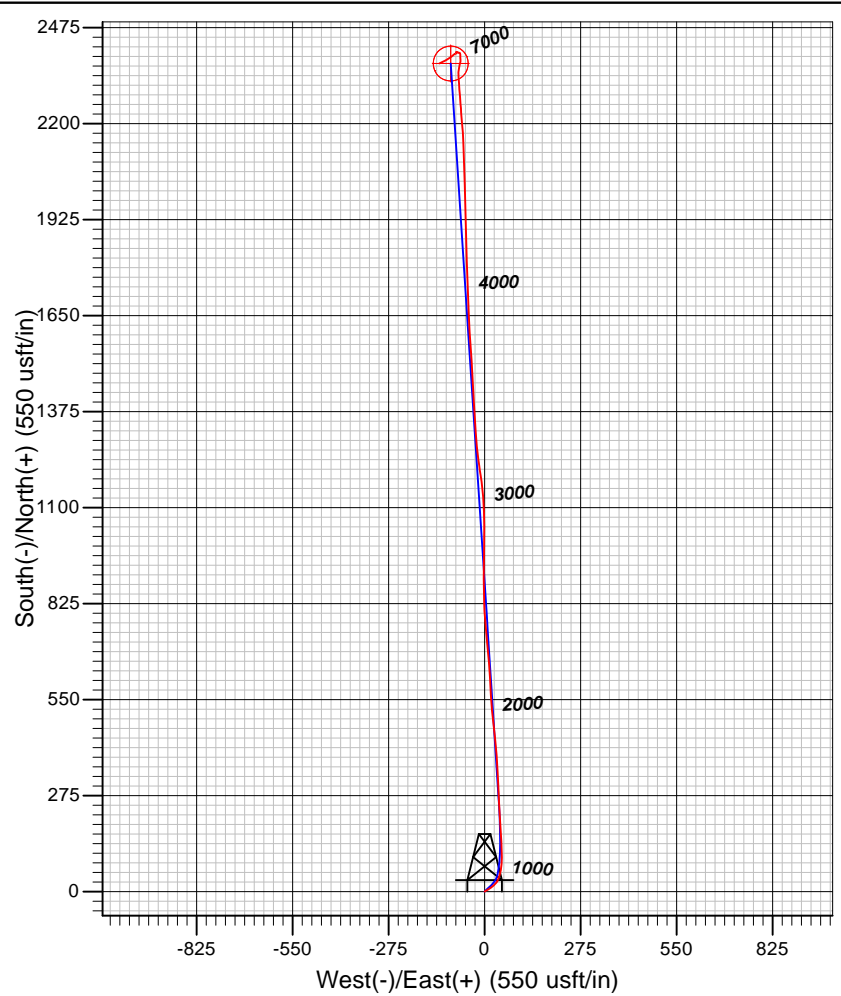
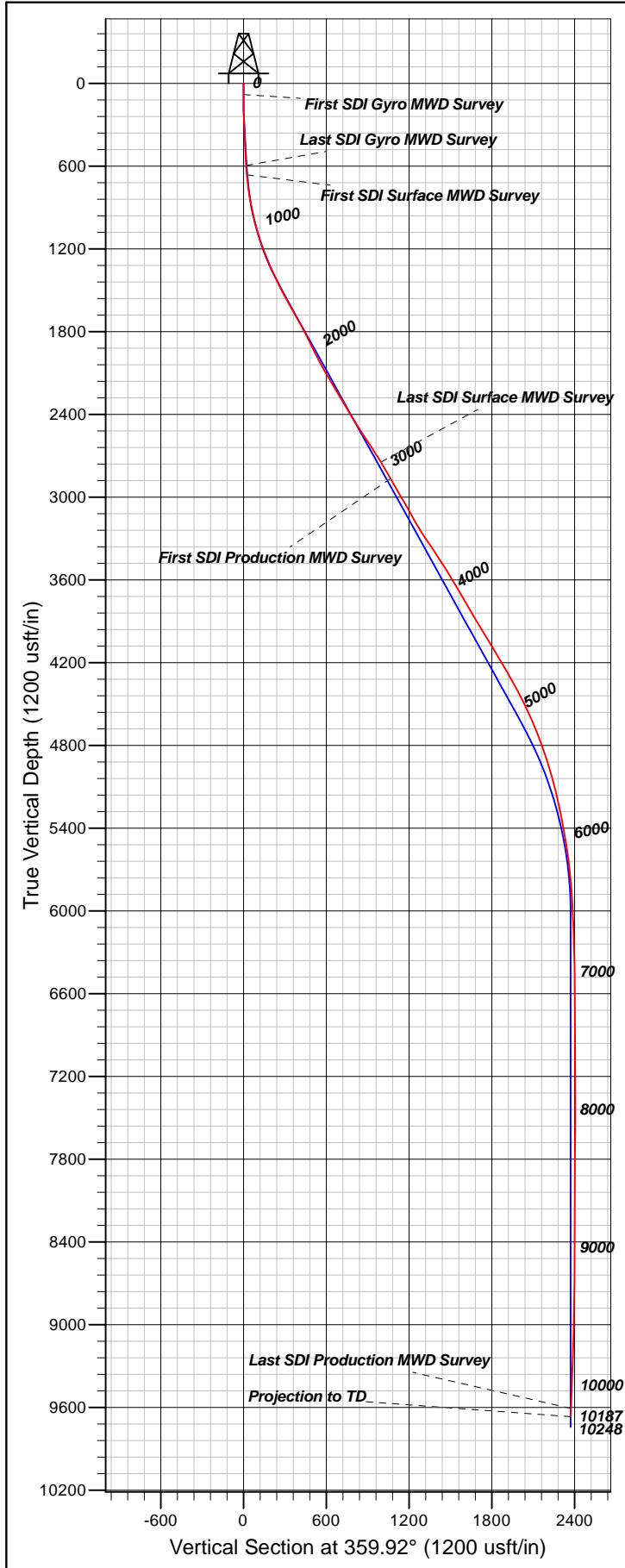
Operator	TEP Rocky Mountain, LLC.
Well Name & No.	TR 43-27-597
County & State	Garfield County, CO
SDI Job No.	420217DEFK416867 & OP.000541
Rig	H&P 318

I, Mel Mireles Jr., having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 82 feet to a measured depth of 10,248 feet is true and correct as determined from all available records.

  
Signature

01-May-17  
Date

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



TVD Reference: GL 8465' & RKB 24' @ 8489.00usft (H&P 318) & B&B 1011 Level: 8465.00  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.00 0.00 1647210.50 2223369.90 39.5780433 -108.2556853 Slot TR 43-27-597 (A11)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Chevron TR 43-27-597 - Slot TR 43-27-597 (A11), True North  
Vertical (TVD) Reference: GL 8465' & RKB 24' @ 8489.00usft (H&P 318)  
Section (VS) Reference: Slot - TR 43-27-597 (A11)(0.00N, 0.00E)  
Measured Depth Reference: GL 8465' & RKB 24' @ 8489.00usft (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

17:28, May 01 2017  
Created By: Janie Collins

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well Chevron TR 43-27-597 - Slot TR 43-27-597 (A11)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 8465' & RKB 24' @ 8489.00usft (H&P 318)
<b>Site:</b>	TR 44-27-597 Pad	<b>MD Reference:</b>	GL 8465' & RKB 24' @ 8489.00usft (H&P 318)
<b>Well:</b>	Chevron TR 43-27-597	<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		TR 44-27-597 Pad					
Site Position:		Northing:	1,647,210.50	usft	Latitude:	39.5780433	
From:	Map	Easting:	2,223,369.90	usft	Longitude:	-108.2556853	
Position Uncertainty:	0.00	usft	Slot Radius:	13.20	in	Grid Convergence:	-1.74 °

Well	Chevron TR 43-27-597 - Slot TR 43-27-597 (A11)					
Well Position	+N/-S	0.00 usft	Northing:	1,647,210.50 usft	Latitude:	39.5780433
	+E/-W	0.00 usft	Easting:	2,223,369.90 usft	Longitude:	-108.2556853
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,465.00 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	2/8/2017	9.82	65.92	51,671
	HDGM	4/9/2017	9.80	65.92	51,652

<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	359.92	

<b>Survey Program</b>	<b>Date</b>	5/1/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
82.00	596.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
665.00	2,987.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
3,125.00	10,248.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

<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	
82.00	0.00	0.00	82.00	0.00	0.00	0.00	0.00	0.00	0.00	
<b>First SDI Gyro MWD Survey</b>										
148.00	1.23	60.21	147.99	0.35	0.61	0.35	1.86	1.86	0.00	
238.00	3.26	56.16	237.92	2.26	3.58	2.25	2.26	2.26	-4.50	
328.00	4.49	58.62	327.71	5.52	8.71	5.50	1.38	1.37	2.73	
418.00	4.75	57.39	417.42	9.36	14.86	9.34	0.31	0.29	-1.37	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well Chevron TR 43-27-597 - Slot TR 43-27-597 (A11)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 8465' & RKB 24' @ 8489.00usft (H&P 318)
<b>Site:</b>	TR 44-27-597 Pad	<b>MD Reference:</b>	GL 8465' & RKB 24' @ 8489.00usft (H&P 318)
<b>Well:</b>	Chevron TR 43-27-597	<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)
507.00	4.49	56.43	506.13	13.27	20.87	13.24	0.30	-0.29	-1.08
596.00	5.72	46.58	594.78	18.25	26.99	18.21	1.69	1.38	-11.07
<b>Last SDI Gyro MWD Survey</b>									
665.00	6.93	38.85	663.36	23.85	32.10	23.81	2.14	1.75	-11.20
<b>First SDI Surface MWD Survey</b>									
754.00	8.01	24.45	751.61	33.68	38.03	33.62	2.42	1.21	-16.18
844.00	10.65	17.55	840.41	47.32	43.14	47.26	3.18	2.93	-7.67
934.00	12.12	7.81	928.65	64.61	46.93	64.54	2.68	1.63	-10.82
1,024.00	14.53	2.80	1,016.22	85.25	48.77	85.18	2.97	2.68	-5.57
1,118.00	17.07	358.64	1,106.67	110.83	49.01	110.76	2.96	2.70	-4.43
1,212.00	19.81	357.19	1,195.83	140.54	47.91	140.47	2.96	2.91	-1.54
1,306.00	23.30	355.82	1,283.25	175.00	45.77	174.93	3.75	3.71	-1.46
1,401.00	24.84	357.06	1,369.98	213.67	43.38	213.60	1.71	1.62	1.31
1,495.00	25.90	357.41	1,454.92	253.89	41.44	253.83	1.14	1.13	0.37
1,590.00	28.03	356.85	1,539.58	296.91	39.27	296.86	2.26	2.24	-0.59
1,684.00	29.70	357.02	1,621.90	342.23	36.85	342.17	1.78	1.78	0.18
1,779.00	29.96	356.24	1,704.32	389.40	34.07	389.35	0.49	0.27	-0.82
1,873.00	27.67	354.10	1,786.67	434.54	30.28	434.49	2.67	-2.44	-2.28
1,968.00	25.93	352.45	1,871.47	477.07	25.29	477.04	1.99	-1.83	-1.74
2,062.00	26.79	355.25	1,955.70	518.56	20.83	518.53	1.61	0.91	2.98
2,156.00	28.35	357.21	2,039.02	561.97	17.99	561.94	1.92	1.66	2.09
2,250.00	30.48	356.64	2,120.90	608.06	15.51	608.04	2.29	2.27	-0.61
2,345.00	30.70	355.66	2,202.68	656.30	12.26	656.28	0.57	0.23	-1.03
2,441.00	30.91	354.42	2,285.13	705.27	8.01	705.26	0.70	0.22	-1.29
2,535.00	30.66	355.00	2,365.89	753.18	3.57	753.17	0.41	-0.27	0.62
2,630.00	32.44	356.18	2,446.84	802.74	-0.24	802.74	1.98	1.87	1.24
2,724.00	33.42	359.21	2,525.75	853.78	-2.27	853.78	2.04	1.04	3.22
2,818.00	33.42	0.20	2,604.20	905.55	-2.54	905.55	0.58	0.00	1.05
2,913.00	32.14	0.99	2,684.07	956.98	-2.01	956.98	1.42	-1.35	0.83
2,987.00	31.13	0.68	2,747.08	995.79	-1.44	995.79	1.38	-1.36	-0.42
<b>Last SDI Surface MWD Survey</b>									
3,125.00	29.36	359.50	2,866.29	1,065.29	-1.32	1,065.29	1.35	-1.28	-0.86
<b>First SDI Production MWD Survey</b>									
3,217.00	30.50	356.52	2,946.02	1,111.15	-2.93	1,111.16	2.04	1.24	-3.24
3,312.00	31.48	353.23	3,027.47	1,159.85	-7.32	1,159.86	2.06	1.03	-3.46
3,406.00	27.86	351.22	3,109.13	1,205.95	-13.57	1,205.97	3.99	-3.85	-2.14
3,501.00	30.23	353.29	3,192.18	1,251.65	-19.75	1,251.67	2.71	2.49	2.18
3,595.00	33.69	354.83	3,271.92	1,301.13	-24.87	1,301.16	3.78	3.68	1.64
3,689.00	34.29	357.32	3,349.86	1,353.54	-28.45	1,353.58	1.61	0.64	2.65
3,783.00	33.06	357.32	3,428.09	1,405.61	-30.89	1,405.65	1.31	-1.31	0.00
3,878.00	32.54	356.62	3,507.94	1,457.00	-33.61	1,457.04	0.68	-0.55	-0.74
3,972.00	30.78	355.09	3,587.95	1,506.20	-37.16	1,506.26	2.06	-1.87	-1.63
4,067.00	30.92	356.64	3,669.51	1,554.79	-40.67	1,554.85	0.85	0.15	1.63

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<b>Site:</b>	TR 44-27-597 Pad	<b>MD Reference:</b>	GL 8465' & RKB 24' @ 8489.00usft (H&P 318)
<b>Well:</b>	Chevron TR 43-27-597	<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)
4,162.00	30.57	356.87	3,751.16	1,603.28	-43.42	1,603.34	0.39	-0.37	0.24
4,256.00	29.99	358.06	3,832.34	1,650.62	-45.52	1,650.69	0.89	-0.62	1.27
4,351.00	31.04	358.20	3,914.18	1,698.83	-47.09	1,698.90	1.11	1.11	0.15
4,445.00	31.87	358.02	3,994.36	1,747.86	-48.71	1,747.93	0.89	0.88	-0.19
4,539.00	30.78	357.65	4,074.66	1,796.69	-50.55	1,796.77	1.18	-1.16	-0.39
4,634.00	30.51	358.02	4,156.39	1,845.08	-52.38	1,845.16	0.35	-0.28	0.39
4,728.00	30.51	358.72	4,237.38	1,892.78	-53.74	1,892.86	0.38	0.00	0.74
4,823.00	29.63	358.46	4,319.59	1,940.37	-54.91	1,940.45	0.94	-0.93	-0.27
4,918.00	28.05	358.73	4,402.80	1,986.18	-56.04	1,986.26	1.67	-1.66	0.28
5,012.00	26.12	357.85	4,486.49	2,028.96	-57.30	2,029.04	2.10	-2.05	-0.94
5,106.00	24.51	358.54	4,571.46	2,069.13	-58.58	2,069.21	1.74	-1.71	0.73
5,201.00	22.95	358.73	4,658.43	2,107.35	-59.49	2,107.43	1.64	-1.64	0.20
5,295.00	20.82	357.00	4,745.65	2,142.36	-60.77	2,142.44	2.37	-2.27	-1.84
5,389.00	18.73	355.56	4,834.10	2,174.09	-62.81	2,174.18	2.28	-2.22	-1.53
5,484.00	17.32	354.60	4,924.44	2,203.38	-65.33	2,203.47	1.52	-1.48	-1.01
5,578.00	16.63	356.98	5,014.34	2,230.74	-67.35	2,230.83	1.04	-0.73	2.53
5,673.00	14.95	355.12	5,105.76	2,256.53	-69.11	2,256.62	1.85	-1.77	-1.96
5,767.00	11.87	355.47	5,197.18	2,278.25	-70.91	2,278.35	3.28	-3.28	0.37
5,862.00	11.26	355.91	5,290.25	2,297.24	-72.34	2,297.34	0.65	-0.64	0.46
5,956.00	10.56	356.19	5,382.55	2,314.99	-73.57	2,315.09	0.75	-0.74	0.30
6,051.00	9.81	355.41	5,476.05	2,331.74	-74.79	2,331.85	0.80	-0.79	-0.82
6,145.00	8.61	1.96	5,568.84	2,346.76	-75.19	2,346.86	1.69	-1.28	6.97
6,239.00	6.33	13.14	5,662.04	2,358.84	-73.77	2,358.94	2.87	-2.43	11.89
6,333.00	5.98	15.34	5,755.50	2,368.61	-71.30	2,368.71	0.45	-0.37	2.34
6,427.00	4.75	8.66	5,849.09	2,377.18	-69.42	2,377.28	1.47	-1.31	-7.11
6,521.00	2.90	352.05	5,942.88	2,383.38	-69.16	2,383.48	2.27	-1.97	-17.67
6,601.58	2.71	357.46	6,023.36	2,387.30	-69.53	2,387.40	0.40	-0.23	6.72
TR 43-27-597 MVRD									
6,616.00	2.68	358.51	6,037.77	2,387.98	-69.55	2,388.08	0.40	-0.22	7.26
6,710.00	2.46	355.65	6,131.67	2,392.19	-69.76	2,392.29	0.27	-0.23	-3.04
6,805.00	1.32	1.98	6,226.62	2,395.32	-69.88	2,395.41	1.22	-1.20	6.66
6,901.00	1.28	358.86	6,322.59	2,397.49	-69.86	2,397.59	0.08	-0.04	-3.25
6,996.00	1.23	345.28	6,417.57	2,399.54	-70.14	2,399.64	0.32	-0.05	-14.29
7,090.00	0.88	328.14	6,511.56	2,401.13	-70.78	2,401.23	0.50	-0.37	-18.23
7,185.00	0.70	313.81	6,606.55	2,402.15	-71.58	2,402.25	0.28	-0.19	-15.08
7,279.00	0.88	272.73	6,700.54	2,402.58	-72.72	2,402.68	0.62	0.19	-43.70
7,373.00	1.23	258.09	6,794.52	2,402.41	-74.43	2,402.51	0.47	0.37	-15.57
7,468.00	1.14	320.32	6,889.51	2,402.92	-76.03	2,403.03	1.29	-0.09	65.51
7,562.00	0.44	338.95	6,983.50	2,403.98	-76.75	2,404.09	0.78	-0.74	19.82
7,656.00	0.35	310.03	7,077.50	2,404.50	-77.10	2,404.61	0.23	-0.10	-30.77
7,750.00	0.53	266.76	7,171.49	2,404.66	-77.76	2,404.77	0.39	0.19	-46.03
7,845.00	0.26	15.34	7,266.49	2,404.85	-78.14	2,404.96	0.70	-0.28	114.29
7,939.00	0.17	244.25	7,360.49	2,404.99	-78.21	2,405.10	0.42	-0.10	-139.46

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well Chevron TR 43-27-597 - Slot TR 43-27-597 (A11)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 8465' & RKB 24' @ 8489.00usft (H&P 318)
<b>Site:</b>	TR 44-27-597 Pad	<b>MD Reference:</b>	GL 8465' & RKB 24' @ 8489.00usft (H&P 318)
<b>Well:</b>	Chevron TR 43-27-597	<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)	
8,034.00	0.61	230.73	7,455.49	2,404.61	-78.73	2,404.72	0.47	0.46	-14.23	
8,128.00	0.70	293.51	7,549.48	2,404.52	-79.64	2,404.64	0.73	0.10	66.79	
8,222.00	1.41	267.32	7,643.47	2,404.70	-81.32	2,404.81	0.89	0.76	-27.86	
8,316.00	1.06	162.20	7,737.45	2,403.82	-82.21	2,403.93	2.10	-0.37	-111.83	
8,411.00	0.88	132.93	7,832.44	2,402.48	-81.41	2,402.60	0.55	-0.19	-30.81	
8,505.00	0.26	142.60	7,926.44	2,401.82	-80.75	2,401.94	0.67	-0.66	10.29	
8,600.00	0.70	221.53	8,021.43	2,401.21	-81.00	2,401.33	0.74	0.46	83.08	
8,694.00	1.14	236.82	8,115.42	2,400.27	-82.17	2,400.39	0.53	0.47	16.27	
8,789.00	0.38	19.53	8,210.42	2,400.05	-82.85	2,400.17	1.54	-0.80	150.22	
8,883.00	0.62	41.09	8,304.41	2,400.73	-82.42	2,400.85	0.32	0.26	22.94	
8,977.00	0.26	198.24	8,398.41	2,400.91	-82.15	2,401.03	0.92	-0.38	167.18	
9,072.00	1.23	225.48	8,493.40	2,399.99	-82.94	2,400.11	1.06	1.02	28.67	
9,166.00	0.44	276.55	8,587.39	2,399.32	-84.02	2,399.44	1.08	-0.84	54.33	
9,260.00	0.53	253.08	8,681.39	2,399.24	-84.79	2,399.36	0.23	0.10	-24.97	
9,354.00	1.14	247.54	8,775.38	2,398.76	-86.07	2,398.88	0.65	0.65	-5.89	
9,449.00	2.37	231.37	8,870.33	2,397.17	-88.48	2,397.29	1.38	1.29	-17.02	
9,543.00	2.64	229.61	8,964.24	2,394.55	-91.65	2,394.68	0.30	0.29	-1.87	
9,637.00	2.81	232.43	9,058.14	2,391.74	-95.13	2,391.88	0.23	0.18	3.00	
9,732.00	3.08	237.26	9,153.01	2,388.94	-99.12	2,389.09	0.39	0.28	5.08	
9,826.00	3.34	235.24	9,246.86	2,386.02	-103.49	2,386.17	0.30	0.28	-2.15	
9,921.00	3.61	239.19	9,341.69	2,382.91	-108.33	2,383.06	0.38	0.28	4.16	
10,015.00	4.13	243.06	9,435.47	2,379.86	-113.89	2,380.02	0.62	0.55	4.12	
10,110.00	4.22	241.57	9,530.22	2,376.64	-120.02	2,376.82	0.15	0.09	-1.57	
10,187.00	4.48	246.23	9,607.00	2,374.08	-125.26	2,374.26	0.57	0.34	6.05	
Last SDI Production MWD Survey										
10,248.00	4.48	246.23	9,667.81	2,372.16	-129.62	2,372.35	0.00	0.00	0.00	
Projection to TD - TR 43-27-597 PBHL										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
TR 43-27-597 MVRD	0.00	0.00	6,024.00	2,371.74	-97.18	1,649,584.10	2,223,344.70	39.5845547	-108.2560301	
- hit/miss target										
- Shape										
- actual wellpath misses target center by 31.73usft at 6601.58usft MD (6023.36 TVD, 2387.30 N, -69.53 E)										
- Circle (radius 50.00)										
TR 43-27-597 PBHL	0.00	0.00	9,743.00	2,371.74	-97.18	1,649,584.10	2,223,344.70	39.5845547	-108.2560301	
- hit/miss target										
- Shape										
- actual wellpath misses target center by 81.89usft at 10248.00usft MD (9667.81 TVD, 2372.16 N, -129.62 E)										
- Point										

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well Chevron TR 43-27-597 - Slot TR 43-27-597 (A11)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 8465' & RKB 24' @ 8489.00usft (H&P 318)
<b>Site:</b>	TR 44-27-597 Pad	<b>MD Reference:</b>	GL 8465' & RKB 24' @ 8489.00usft (H&P 318)
<b>Well:</b>	Chevron TR 43-27-597	<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

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
82.00	82.00	0.00	0.00	First SDI Gyro MWD Survey
596.00	594.78	18.25	26.99	Last SDI Gyro MWD Survey
665.00	663.36	23.85	32.10	First SDI Surface MWD Survey
2,987.00	2,747.08	995.79	-1.44	Last SDI Surface MWD Survey
3,125.00	2,866.29	1,065.29	-1.32	First SDI Production MWD Survey
10,187.00	9,607.00	2,374.08	-125.26	Last SDI Production MWD Survey
10,248.00	9,667.81	2,372.16	-129.62	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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