



## 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 22-23-597
County & State	Garfield County, CO
SDI Job No.	OP.001243 & OP.003082
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 10,229 feet is true and correct as determined from all available records.

  
Signature

03-Aug-17  
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 TR 22-23-597 - Slot A7 (TR 22-23-597)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
<b>Site:</b>	TR 32-23-597 Pad	<b>MD Reference:</b>	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
<b>Well:</b>	TR 22-23-597	<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 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 22-23-597 - Slot A7 (TR 22-23-597)					
Well Position	+N/-S	0.00 usft	Northing:	1,654,869.50 usft	Latitude:	39.5994135
	+E/-W	0.00 usft	Easting:	2,227,620.90 usft	Longitude:	-108.2414307
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	8,545.20 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	6/9/2017	9.75	65.93	51,603

<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	185.68	

<b>Survey Program</b>	<b>Date</b>	8/3/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
124.00	662.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
731.00	2,940.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
3,067.00	10,229.00	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	
124.00	0.79	119.88	124.00	-0.43	0.74	0.35	0.64	0.64	0.00	
<b>First SDI Gyro MWD Survey</b>										
214.00	2.02	149.59	213.97	-2.10	2.08	1.89	1.54	1.37	33.01	
303.00	2.20	196.61	302.91	-5.09	2.39	4.83	1.90	0.20	52.83	
393.00	3.34	262.44	392.83	-7.09	-0.71	7.13	3.51	1.27	73.14	
483.00	4.49	304.72	482.63	-5.43	-6.20	6.02	3.35	1.28	46.98	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well TR 22-23-597 - Slot A7 (TR 22-23-597)
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<b>Site:</b>	TR 32-23-597 Pad	<b>MD Reference:</b>	GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)
<b>Well:</b>	TR 22-23-597	<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)
572.00	8.01	300.85	571.09	-0.27	-14.39	1.69	3.98	3.96	-4.35
662.00	12.40	297.77	659.65	7.46	-28.33	-4.61	4.91	4.88	-3.42
731.00	14.33	301.54	726.78	15.37	-42.17	-11.12	3.07	2.80	5.46
<b>First SDI Surface MWD Survey</b>									
820.00	16.53	300.60	812.56	27.58	-62.45	-21.26	2.49	2.47	-1.06
909.00	17.78	298.25	897.60	40.46	-85.32	-31.81	1.61	1.40	-2.64
999.00	19.51	295.12	982.88	53.35	-111.04	-42.09	2.22	1.92	-3.48
1,094.00	19.70	294.32	1,072.37	66.67	-139.99	-52.49	0.35	0.20	-0.84
1,188.00	17.74	294.82	1,161.39	79.21	-167.43	-62.25	2.09	-2.09	0.53
1,283.00	16.74	299.92	1,252.13	92.11	-192.43	-72.61	1.91	-1.05	5.37
1,378.00	18.03	298.84	1,342.79	106.03	-217.16	-84.01	1.40	1.36	-1.14
1,472.00	17.84	298.10	1,432.22	119.83	-242.61	-95.22	0.32	-0.20	-0.79
1,567.00	18.84	296.98	1,522.39	133.64	-269.12	-106.34	1.12	1.05	-1.18
1,662.00	18.34	296.73	1,612.44	147.32	-296.13	-117.28	0.53	-0.53	-0.26
1,757.00	17.17	299.66	1,702.91	160.99	-321.67	-128.35	1.55	-1.23	3.08
1,851.00	17.48	297.81	1,792.65	174.44	-346.21	-139.31	0.67	0.33	-1.97
1,946.00	18.20	293.44	1,883.08	187.00	-372.45	-149.21	1.60	0.76	-4.60
2,041.00	17.72	296.82	1,973.46	199.42	-398.96	-158.95	1.21	-0.51	3.56
2,136.00	15.65	302.36	2,064.46	212.81	-422.69	-169.92	2.75	-2.18	5.83
2,230.00	14.76	299.98	2,155.17	225.58	-443.77	-180.54	1.16	-0.95	-2.53
2,325.00	14.37	299.59	2,247.11	237.44	-464.51	-190.29	0.42	-0.41	-0.41
2,420.00	15.17	298.78	2,338.97	249.25	-485.65	-199.95	0.87	0.84	-0.85
2,515.00	16.36	298.93	2,430.40	261.71	-508.26	-210.11	1.25	1.25	0.16
2,610.00	16.20	299.78	2,521.59	274.76	-531.47	-220.80	0.30	-0.17	0.89
2,705.00	16.35	298.72	2,612.78	287.77	-554.70	-231.44	0.35	0.16	-1.12
2,800.00	15.86	297.65	2,704.06	300.22	-577.92	-241.53	0.60	-0.52	-1.13
2,895.00	16.95	298.31	2,795.19	312.81	-601.62	-251.72	1.16	1.15	0.69
2,940.00	16.80	298.23	2,838.25	319.00	-613.12	-256.73	0.34	-0.33	-0.18
3,067.00	15.83	296.01	2,960.13	335.27	-644.86	-269.79	0.91	-0.76	-1.75
<b>First SDI Production MWD Survey</b>									
3,162.00	16.97	298.38	3,051.27	347.55	-668.70	-279.64	1.39	1.20	2.49
3,256.00	15.04	295.31	3,141.62	359.28	-691.80	-289.03	2.24	-2.05	-3.27
3,351.00	14.95	298.56	3,233.39	370.41	-713.71	-297.94	0.89	-0.09	3.42
3,445.00	16.00	298.73	3,323.98	382.43	-735.72	-307.72	1.12	1.12	0.18
3,540.00	17.15	301.37	3,415.03	396.02	-759.16	-318.92	1.45	1.21	2.78
3,634.00	19.70	304.28	3,504.21	412.16	-784.09	-332.52	2.88	2.71	3.10
3,729.00	21.19	303.22	3,593.22	430.59	-811.68	-348.12	1.62	1.57	-1.12
3,823.00	21.73	302.94	3,680.71	449.36	-840.50	-363.94	0.58	0.57	-0.30
3,918.00	21.02	302.16	3,769.17	467.99	-869.68	-379.60	0.81	-0.75	-0.82
4,012.00	20.49	300.05	3,857.07	485.20	-898.19	-393.90	0.97	-0.56	-2.24
4,107.00	20.14	298.21	3,946.16	501.26	-927.00	-407.03	0.77	-0.37	-1.94
4,201.00	21.58	299.22	4,034.00	517.35	-956.35	-420.13	1.58	1.53	1.07

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<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
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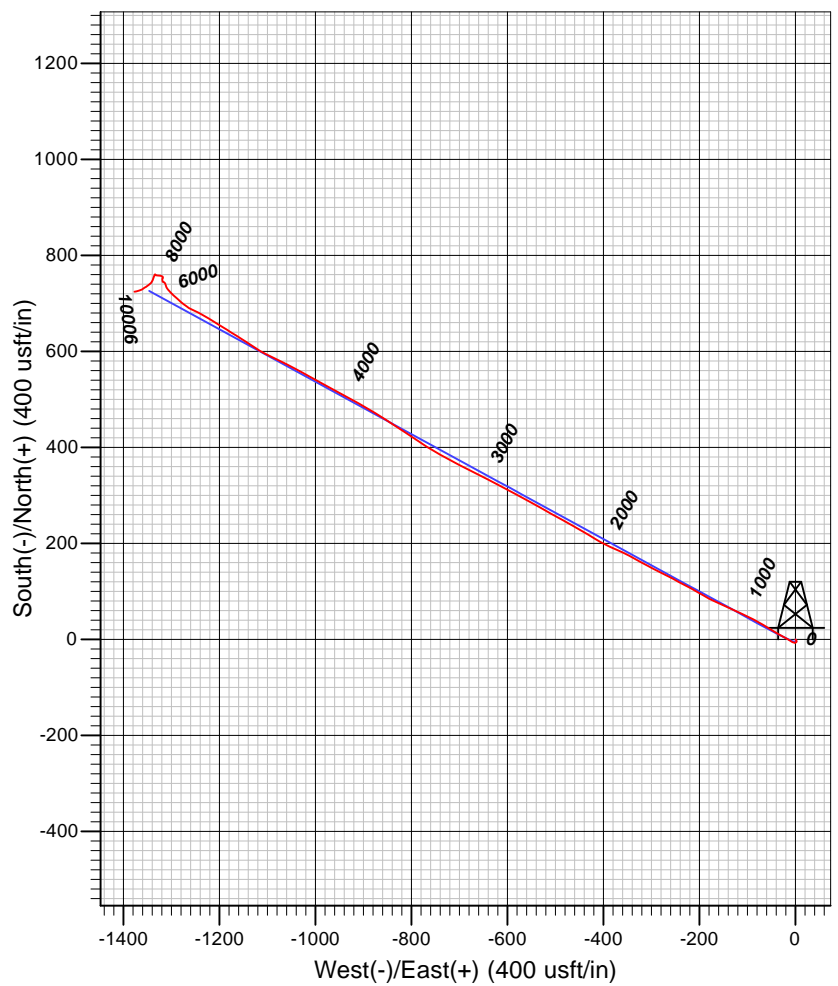
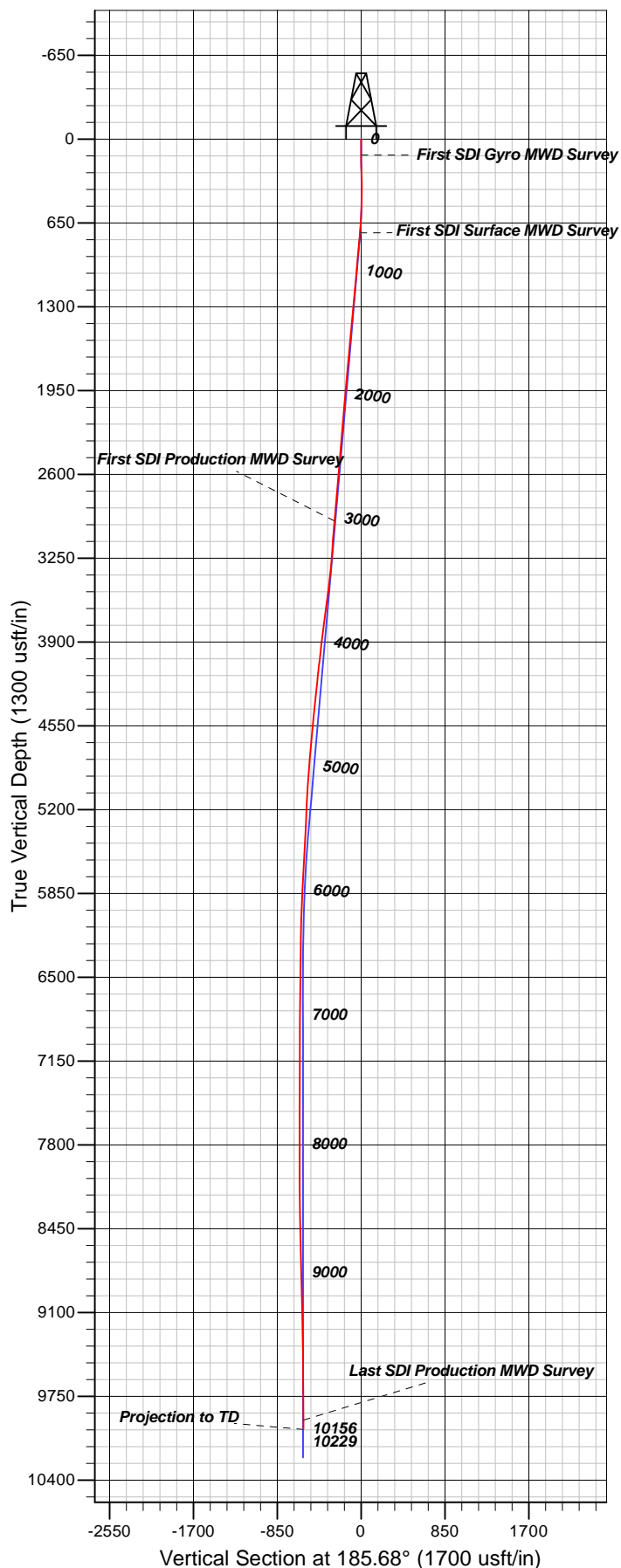
Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,296.00	19.26	297.77	4,123.02	533.18	-985.46	-433.00	2.50	-2.44	-1.53
4,390.00	21.10	299.26	4,211.25	548.67	-1,013.95	-445.60	2.03	1.96	1.59
4,485.00	20.05	297.77	4,300.19	564.62	-1,043.27	-458.57	1.23	-1.11	-1.57
4,579.00	18.99	296.36	4,388.79	578.92	-1,071.24	-470.03	1.23	-1.13	-1.50
4,674.00	18.07	295.80	4,478.86	592.19	-1,098.35	-480.55	0.99	-0.97	-0.59
4,769.00	17.64	303.23	4,569.30	606.50	-1,123.66	-492.28	2.44	-0.45	7.82
4,863.00	14.68	303.92	4,659.57	620.95	-1,145.46	-504.51	3.16	-3.15	0.73
4,958.00	13.89	300.19	4,751.64	633.40	-1,165.31	-514.93	1.28	-0.83	-3.93
5,052.00	11.96	302.60	4,843.25	644.33	-1,183.27	-524.02	2.13	-2.05	2.56
5,147.00	11.89	302.57	4,936.20	654.90	-1,199.81	-532.91	0.07	-0.07	-0.03
5,241.00	11.21	301.34	5,028.30	664.86	-1,215.77	-541.24	0.77	-0.72	-1.31
5,336.00	9.98	300.19	5,121.68	673.81	-1,230.77	-548.66	1.31	-1.29	-1.21
5,430.00	9.05	297.35	5,214.38	681.30	-1,244.38	-554.76	1.11	-0.99	-3.02
5,525.00	8.40	293.67	5,308.28	687.52	-1,257.37	-559.67	0.90	-0.68	-3.87
5,619.00	8.53	305.54	5,401.27	694.33	-1,269.34	-565.26	1.86	0.14	12.63
5,714.00	7.43	311.98	5,495.35	702.53	-1,279.64	-572.40	1.49	-1.16	6.78
5,808.00	6.38	312.19	5,588.66	710.10	-1,288.02	-579.11	1.12	-1.12	0.22
5,903.00	5.80	310.86	5,683.13	716.79	-1,295.57	-585.01	0.63	-0.61	-1.40
5,997.00	5.28	319.30	5,776.69	723.17	-1,301.98	-590.73	1.03	-0.55	8.98
6,092.00	5.10	320.00	5,871.30	729.72	-1,307.54	-596.70	0.20	-0.19	0.74
6,186.00	3.74	341.52	5,965.02	735.83	-1,311.20	-602.42	2.26	-1.45	22.89
6,281.00	3.61	337.49	6,059.83	741.53	-1,313.33	-607.88	0.30	-0.14	-4.24
6,375.00	2.29	281.16	6,153.72	744.63	-1,316.30	-610.67	3.21	-1.40	-59.93
6,470.00	1.13	340.51	6,248.68	745.88	-1,318.48	-611.70	2.07	-1.22	62.47
6,564.00	1.30	353.65	6,342.66	747.82	-1,318.91	-613.58	0.35	0.18	13.98
6,623.96	1.19	350.03	6,402.61	749.11	-1,319.09	-614.84	0.23	-0.18	-6.03
TR 22-23-597 MVRD									
6,658.00	1.13	347.67	6,436.64	749.78	-1,319.22	-615.50	0.23	-0.18	-6.94
6,753.00	0.84	5.26	6,531.63	751.39	-1,319.36	-617.09	0.44	-0.31	18.52
6,847.00	0.70	67.41	6,625.62	752.30	-1,318.76	-618.05	0.86	-0.15	66.12
6,941.00	0.60	44.47	6,719.61	752.87	-1,317.89	-618.71	0.29	-0.11	-24.40
7,036.00	0.70	0.17	6,814.61	753.80	-1,317.54	-619.67	0.53	0.11	-46.63
7,130.00	0.89	338.66	6,908.60	755.06	-1,317.80	-620.89	0.37	0.20	-22.88
7,224.00	0.59	309.05	7,002.59	756.04	-1,318.44	-621.81	0.51	-0.32	-31.50
7,318.00	0.79	300.58	7,096.58	756.68	-1,319.38	-622.35	0.24	0.21	-9.01
7,413.00	1.14	284.23	7,191.57	757.24	-1,320.86	-622.77	0.47	0.37	-17.21
7,507.00	1.45	278.50	7,285.55	757.65	-1,322.94	-622.96	0.36	0.33	-6.10
7,602.00	1.41	276.30	7,380.52	757.95	-1,325.29	-623.03	0.07	-0.04	-2.32
7,697.00	1.23	279.05	7,475.49	758.24	-1,327.46	-623.11	0.20	-0.19	2.89
7,791.00	1.79	273.51	7,569.46	758.49	-1,329.92	-623.11	0.61	0.60	-5.89
7,885.00	1.14	286.96	7,663.43	758.85	-1,332.28	-623.24	0.78	-0.69	14.31
7,980.00	1.32	284.94	7,758.41	759.41	-1,334.24	-623.60	0.19	0.19	-2.13

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<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)	
8,074.00	0.70	49.48	7,852.40	760.06	-1,334.85	-624.19	1.93	-0.66	132.49	
8,169.00	0.63	139.18	7,947.39	760.05	-1,334.07	-624.25	0.99	-0.07	94.42	
8,263.00	0.26	68.55	8,041.39	759.73	-1,333.53	-623.99	0.63	-0.39	-75.14	
8,358.00	0.35	305.68	8,136.39	759.98	-1,333.57	-624.23	0.57	0.09	-129.34	
8,454.00	0.84	254.87	8,232.39	759.97	-1,334.49	-624.13	0.70	0.51	-52.93	
8,549.00	2.37	196.61	8,327.35	757.90	-1,335.72	-621.95	2.16	1.61	-61.33	
8,644.00	2.29	206.27	8,422.27	754.32	-1,337.12	-618.25	0.42	-0.08	10.17	
8,739.00	1.49	206.01	8,517.22	751.51	-1,338.50	-615.31	0.84	-0.84	-0.27	
8,833.00	1.85	179.99	8,611.18	748.89	-1,339.04	-612.66	0.88	0.38	-27.68	
8,928.00	2.02	213.13	8,706.13	745.96	-1,339.95	-609.64	1.17	0.18	34.88	
9,022.00	3.78	227.89	8,800.01	742.49	-1,343.16	-605.88	2.02	1.87	15.70	
9,117.00	2.68	230.63	8,894.85	738.98	-1,347.20	-601.99	1.17	-1.16	2.88	
9,211.00	2.25	232.66	8,988.77	736.47	-1,350.36	-599.17	0.47	-0.46	2.16	
9,306.00	1.80	240.30	9,083.71	734.60	-1,353.14	-597.04	0.55	-0.47	8.04	
9,400.00	1.65	240.91	9,177.66	733.21	-1,355.61	-595.41	0.16	-0.16	0.65	
9,495.00	1.65	229.56	9,272.63	731.66	-1,357.84	-593.64	0.34	0.00	-11.95	
9,589.00	1.73	238.78	9,366.59	730.04	-1,360.09	-591.82	0.30	0.09	9.81	
9,684.00	1.85	240.02	9,461.54	728.53	-1,362.64	-590.06	0.13	0.13	1.31	
9,779.00	1.75	254.46	9,556.49	727.38	-1,365.37	-588.64	0.49	-0.11	15.20	
9,873.00	1.80	254.44	9,650.45	726.60	-1,368.17	-587.59	0.05	0.05	-0.02	
9,968.00	1.67	258.83	9,745.40	725.93	-1,370.97	-586.65	0.20	-0.14	4.62	
10,062.00	1.21	251.59	9,839.37	725.35	-1,373.25	-585.84	0.53	-0.49	-7.70	
10,156.00	1.41	261.73	9,933.35	724.87	-1,375.34	-585.16	0.32	0.21	10.79	
Last SDI Production MWD Survey										
10,229.00	1.41	261.73	10,006.33	724.61	-1,377.12	-584.73	0.00	0.00	0.00	
Projection to TD - TR 22-23-597 PBHL										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
124.00	124.00	-0.43	0.74	First SDI Gyro MWD Survey	
731.00	726.78	15.37	-42.17	First SDI Surface MWD Survey	
3,067.00	2,960.13	335.27	-644.86	First SDI Production MWD Survey	
10,156.00	9,933.35	724.87	-1,375.34	Last SDI Production MWD Survey	
10,229.00	10,006.33	724.61	-1,377.12	Projection to TD	

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



#### Well Details: TR 22-23-597

TVD Reference: GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318) Level: 8545.20  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.00 0.00 1654869.50 2227620.90 39.5994135 -108.2414307 (TR 22-23-597)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well TR 22-23-597 - Slot A7 (TR 22-23-597), True North  
 Vertical (TVD) Reference: GL 8545.20' & RKB 24' @ 8569.20usft (H&P 318)  
 Section (VS) Reference: Slot - A7 (TR 22-23-597)(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

12:08, August 03 2017  
 Created By: Mel Mireles Jr.