



## 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>	GM 334-5
<b>County &amp; State</b>	Garfield County, CO
<b>SDI Job No.</b>	OP.004890
<b>Rig</b>	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 122 feet to a measured depth of 6,875 feet is true and correct as determined from all available records.

  
Signature

27-Oct-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 GM 334-5 - Slot A12 (GM 334-5)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
<b>Site:</b>	MV 34-5 Pad	<b>MD Reference:</b>	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
<b>Well:</b>	GM 334-5	<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		MV 34-5 Pad			
Site Position:		Northing:	1,603,476.79 usft	Latitude:	39.4609066
From:	Map	Easting:	2,258,772.10 usft	Longitude:	-108.1256571
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.66 °

Well	GM 334-5 - Slot A12 (GM 334-5)					
Well Position	+N/-S	0.00 usft	Northing:	1,603,476.75 usft	Latitude:	39.4609065
	+E/-W	0.00 usft	Easting:	2,258,772.13 usft	Longitude:	-108.1256570
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,977.00 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	10/9/2017	9.57	65.77	51,757

<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	268.64	

<b>Survey Program</b>	<b>Date</b>	10/27/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
122.00	305.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
381.00	935.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,075.00	6,875.00	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	
122.00	0.62	276.94	122.00	0.08	-0.66	0.65	0.51	0.51	0.00	
<b>First SDI Gyro MWD Survey</b>										
212.00	4.05	269.91	211.91	0.13	-4.32	4.31	3.82	3.81	-7.81	
305.00	8.36	266.22	304.34	-0.32	-14.35	14.36	4.65	4.63	-3.97	
<b>Last SDI Gyro MWD Survey</b>										
381.00	12.65	267.32	379.05	-1.07	-28.18	28.20	5.65	5.64	1.45	
<b>First SDI Surface MWD Survey</b>										

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well GM 334-5 - Slot A12 (GM 334-5)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
<b>Site:</b>	MV 34-5 Pad	<b>MD Reference:</b>	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
<b>Well:</b>	GM 334-5	<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)
473.00	17.77	266.72	467.80	-2.35	-52.28	52.32	5.57	5.57	-0.65
565.00	22.69	269.43	554.10	-3.33	-84.06	84.11	5.44	5.35	2.95
657.00	26.53	268.84	637.73	-3.92	-122.36	122.42	4.18	4.17	-0.64
750.00	31.92	270.31	718.86	-4.21	-167.75	167.80	5.85	5.80	1.58
841.00	33.43	269.19	795.46	-4.43	-216.87	216.91	1.79	1.66	-1.23
935.00	32.94	266.47	874.13	-6.37	-268.27	268.35	1.67	-0.52	-2.89
<b>Last SDI Surface MWD Survey</b>									
1,075.00	32.40	263.79	991.99	-12.77	-343.56	343.76	1.10	-0.39	-1.91
<b>First SDI Production MWD Survey</b>									
1,169.00	32.86	265.64	1,071.15	-17.44	-394.02	394.32	1.17	0.49	1.97
1,264.00	32.16	268.17	1,151.27	-20.20	-444.99	445.35	1.61	-0.74	2.66
1,359.00	31.22	267.00	1,232.11	-22.30	-494.85	495.24	1.18	-0.99	-1.23
1,453.00	31.34	270.88	1,312.45	-23.20	-543.63	544.02	2.15	0.13	4.13
1,548.00	29.93	268.59	1,394.19	-23.40	-592.03	592.42	1.93	-1.48	-2.41
1,643.00	29.99	272.11	1,476.50	-23.11	-639.45	639.82	1.85	0.06	3.71
1,737.00	28.68	269.66	1,558.45	-22.38	-685.49	685.82	1.89	-1.39	-2.61
1,832.00	29.86	272.06	1,641.32	-21.66	-731.92	732.23	1.75	1.24	2.53
1,926.00	31.16	272.16	1,722.31	-19.91	-779.61	779.86	1.38	1.38	0.11
2,021.00	32.08	272.45	1,803.20	-17.90	-829.37	829.57	0.98	0.97	0.31
2,116.00	32.64	272.36	1,883.45	-15.77	-880.18	880.30	0.59	0.59	-0.09
2,210.00	31.61	270.57	1,963.06	-14.48	-930.14	930.22	1.49	-1.10	-1.90
2,305.00	29.63	272.51	2,044.81	-13.20	-978.50	978.54	2.33	-2.08	2.04
2,399.00	28.03	270.72	2,127.16	-11.91	-1,023.81	1,023.80	1.93	-1.70	-1.90
2,493.00	27.19	268.97	2,210.45	-12.02	-1,067.37	1,067.35	1.24	-0.89	-1.86
2,588.00	26.05	272.66	2,295.39	-11.44	-1,109.91	1,109.87	2.11	-1.20	3.88
2,682.00	23.87	272.84	2,380.60	-9.54	-1,149.53	1,149.43	2.32	-2.32	0.19
2,777.00	20.94	271.88	2,468.42	-8.03	-1,185.70	1,185.56	3.11	-3.08	-1.01
2,872.00	19.25	273.85	2,557.64	-6.42	-1,218.29	1,218.10	1.92	-1.78	2.07
2,966.00	16.33	278.32	2,647.14	-3.47	-1,246.84	1,246.57	3.43	-3.11	4.76
3,060.00	13.92	276.63	2,737.87	-0.25	-1,271.15	1,270.80	2.61	-2.56	-1.80
3,155.00	12.09	274.51	2,830.43	1.85	-1,292.42	1,292.01	1.99	-1.93	-2.23
3,249.00	10.33	272.89	2,922.64	3.05	-1,310.65	1,310.21	1.90	-1.87	-1.72
3,344.00	10.04	274.25	3,016.14	4.10	-1,327.42	1,326.95	0.40	-0.31	1.43
3,438.00	8.20	272.80	3,108.95	5.03	-1,342.29	1,341.79	1.97	-1.96	-1.54
3,532.00	7.81	273.05	3,202.03	5.70	-1,355.36	1,354.84	0.42	-0.41	0.27
3,627.00	7.44	270.89	3,296.19	6.14	-1,367.95	1,367.42	0.49	-0.39	-2.27
3,721.00	5.74	272.13	3,389.57	6.41	-1,378.74	1,378.20	1.81	-1.81	1.32
3,793.28	3.81	273.96	3,461.60	6.71	-1,384.75	1,384.20	2.67	-2.66	2.53
<b>GM 434-5 MVRD</b>									
3,814.99	3.24	274.93	3,483.26	6.81	-1,386.08	1,385.53	2.67	-2.66	4.47
<b>GM 334-5 MVRD</b>									
3,816.00	3.21	274.98	3,484.27	6.81	-1,386.14	1,385.58	2.67	-2.66	5.31
3,911.00	0.74	304.53	3,579.21	7.39	-1,389.29	1,388.72	2.73	-2.60	31.11
4,005.00	0.79	276.84	3,673.20	7.81	-1,390.44	1,389.86	0.39	0.05	-29.46

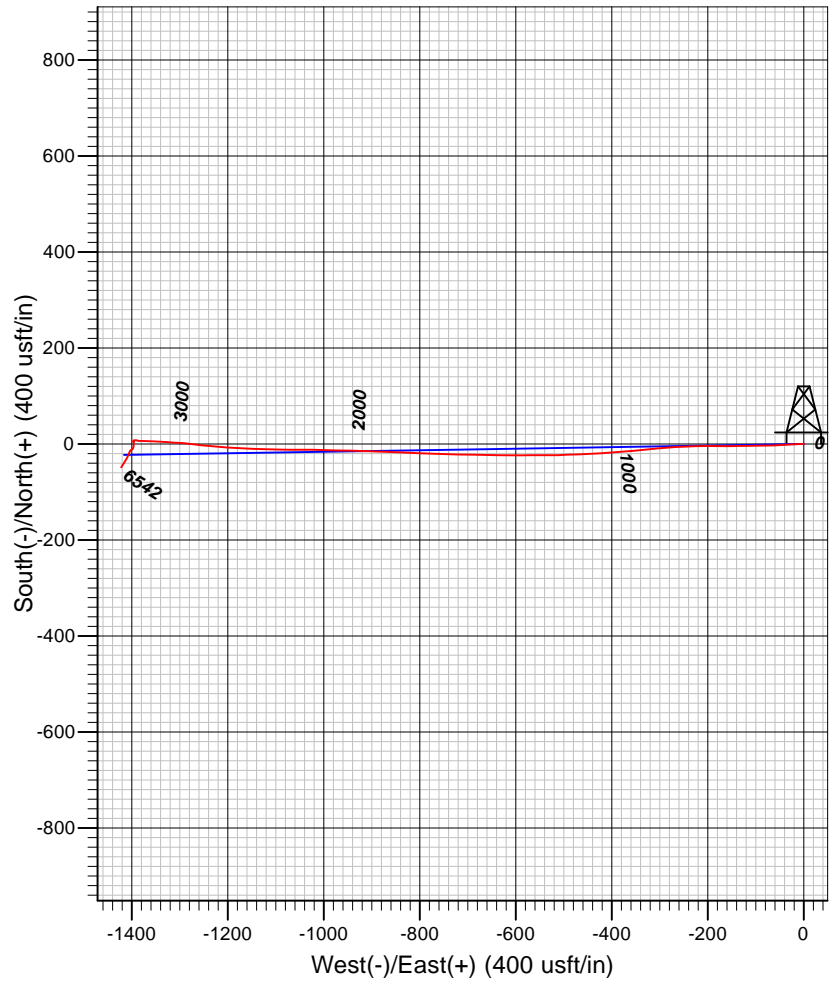
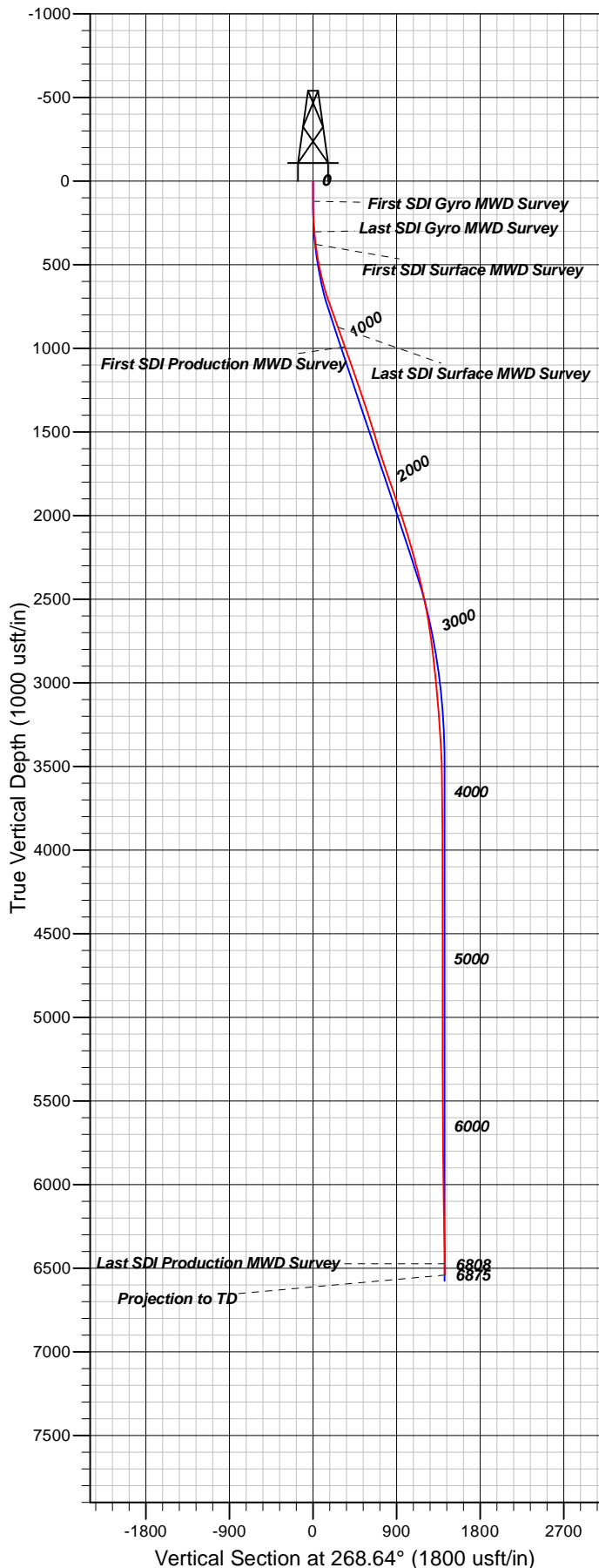
<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well GM 334-5 - Slot A12 (GM 334-5)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
<b>Site:</b>	MV 34-5 Pad	<b>MD Reference:</b>	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
<b>Well:</b>	GM 334-5	<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)	
4,100.00	0.79	272.54	3,768.19	7.92	-1,391.74	1,391.16	0.06	0.00	-4.53	
4,194.00	0.70	249.51	3,862.18	7.75	-1,392.92	1,392.35	0.33	-0.10	-24.50	
4,289.00	0.97	237.03	3,957.17	7.11	-1,394.14	1,393.58	0.34	0.28	-13.14	
4,383.00	0.93	240.83	4,051.16	6.30	-1,395.48	1,394.93	0.08	-0.04	4.04	
4,478.00	1.32	223.84	4,146.14	5.14	-1,396.91	1,396.39	0.54	0.41	-17.88	
4,572.00	0.74	16.32	4,240.14	4.94	-1,397.49	1,396.98	2.13	-0.62	162.21	
4,667.00	0.88	23.89	4,335.13	6.20	-1,397.02	1,396.48	0.19	0.15	7.97	
4,761.00	0.53	34.00	4,429.12	7.22	-1,396.48	1,395.92	0.39	-0.37	10.76	
4,856.00	0.17	111.02	4,524.12	7.53	-1,396.11	1,395.53	0.55	-0.38	81.07	
4,951.00	0.18	125.49	4,619.12	7.39	-1,395.85	1,395.28	0.05	0.01	15.23	
5,045.00	0.37	151.65	4,713.12	7.04	-1,395.59	1,395.03	0.24	0.20	27.83	
5,140.00	0.54	168.09	4,808.11	6.33	-1,395.35	1,394.81	0.22	0.18	17.31	
5,234.00	0.88	187.02	4,902.11	5.18	-1,395.35	1,394.83	0.43	0.36	20.14	
5,329.00	1.03	195.77	4,997.09	3.64	-1,395.67	1,395.19	0.22	0.16	9.21	
5,424.00	1.29	191.80	5,092.07	1.77	-1,396.12	1,395.68	0.29	0.27	-4.18	
5,518.00	1.30	178.70	5,186.05	-0.33	-1,396.31	1,395.93	0.31	0.01	-13.94	
5,613.00	1.05	174.68	5,281.03	-2.28	-1,396.21	1,395.87	0.28	-0.26	-4.23	
5,707.00	1.38	193.53	5,375.01	-4.24	-1,396.39	1,396.10	0.55	0.35	20.05	
5,802.00	1.56	191.51	5,469.98	-6.62	-1,396.92	1,396.68	0.20	0.19	-2.13	
5,896.00	1.93	198.80	5,563.93	-9.37	-1,397.68	1,397.51	0.46	0.39	7.76	
5,991.00	1.38	254.55	5,658.90	-11.19	-1,399.30	1,399.17	1.71	-0.58	58.68	
6,085.00	1.71	232.61	5,752.87	-12.34	-1,401.51	1,401.40	0.71	0.35	-23.34	
6,179.00	1.72	221.89	5,846.82	-14.24	-1,403.56	1,403.51	0.34	0.01	-11.40	
6,273.00	2.02	201.69	5,940.77	-16.83	-1,405.12	1,405.12	0.77	0.32	-21.49	
6,367.00	2.96	203.93	6,034.68	-20.59	-1,406.71	1,406.81	1.01	1.00	2.38	
6,462.00	3.28	198.88	6,129.54	-25.40	-1,408.59	1,408.79	0.44	0.34	-5.32	
6,557.00	3.43	209.17	6,224.38	-30.46	-1,410.85	1,411.18	0.65	0.16	10.83	
6,651.00	3.96	212.59	6,318.19	-35.65	-1,413.97	1,414.42	0.61	0.56	3.64	
6,745.00	3.87	213.39	6,411.97	-41.03	-1,417.47	1,418.04	0.11	-0.10	0.85	
6,808.00	3.96	211.98	6,474.82	-44.65	-1,419.79	1,420.45	0.21	0.14	-2.24	
Last SDI Production MWD Survey										
6,875.00	3.96	211.98	6,541.66	-48.58	-1,422.24	1,422.99	0.00	0.00	0.00	
Projection to TD - GM 334-5 PBHL - GM 434-5 PBHL										

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well GM 334-5 - Slot A12 (GM 334-5)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
<b>Site:</b>	MV 34-5 Pad	<b>MD Reference:</b>	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
<b>Well:</b>	GM 334-5	<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)	
122.00	122.00	0.08	-0.66	First SDI Gyro MWD Survey
305.00	304.34	-0.32	-14.35	Last SDI Gyro MWD Survey
381.00	379.05	-1.07	-28.18	First SDI Surface MWD Survey
935.00	874.13	-6.37	-268.27	Last SDI Surface MWD Survey
1,075.00	991.99	-12.77	-343.56	First SDI Production MWD Survey
6,808.00	6,474.82	-44.65	-1,419.79	Last SDI Production MWD Survey
6,875.00	6,541.66	-48.58	-1,422.24	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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#### Well Details: GM 334-5

TVD Reference: GL 5977' & RKB 24' @ 6001.00usft (H&B 271) Level: 5977.00  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.00 0.00 1603476.75 2258772.13 39.4609065 -108.1256570A12 (GM 334-5)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well GM 334-5 - Slot A12 (GM 334-5), True North  
 Vertical (TVD) Reference: GL 5977' & RKB 24' @ 6001.00usft (H&P 271)  
 Section (VS) Reference: Slot - A12 (GM 334-5)(0.00N, 0.00E)  
 Measured Depth Reference: GL 5977' & RKB 24' @ 6001.00usft (H&P 271)  
 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

10:57, October 27 2017  
 Created By: Mel Mireles Jr.