



## 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.	GM 532-5
County & State	Garfield County, CO
SDI Job No.	OP.004324
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 122 feet to a measured depth of 7,305 feet is true and correct as determined from all available records.

  
Signature

22-Sep-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 532-5 - Slot A5 (GM 532-5)
<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 532-5	<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 532-5 - Slot A5 (GM 532-5)					
Well Position	+N/-S	0.00 usft	Northing:	1,603,520.43 usft	Latitude:	39.4610286
	+E/-W	0.00 usft	Easting:	2,258,800.52 usft	Longitude:	-108.1255610
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	9/13/2017	9.57	65.77	51,765

<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	320.82	

<b>Survey Program</b>	<b>Date</b>	9/20/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
122.00	491.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
584.00	941.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,078.00	7,305.00	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	0.70	343.39	122.00	0.71	-0.21	0.69	0.57	0.57	0.00	
<b>First SDI Gyro MWD Survey</b>										
215.00	3.08	329.50	214.94	3.41	-1.64	3.68	2.59	2.56	-14.94	
307.00	6.77	320.01	306.59	9.70	-6.38	11.55	4.09	4.01	-10.32	
399.00	13.55	328.97	397.10	23.10	-15.44	27.66	7.55	7.37	9.74	
491.00	15.75	318.52	486.11	41.70	-29.27	50.81	3.73	2.39	-11.36	
<b>Last SDI Gyro MWD Survey</b>										

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well GM 532-5 - Slot A5 (GM 532-5)
<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 532-5	<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)	
584.00	19.00	316.41	574.86	62.13	-48.07	78.53	3.56	3.49	-2.27	
<b>First SDI Surface MWD Survey</b>										
677.00	22.52	318.43	661.81	86.42	-70.33	111.43	3.86	3.78	2.17	
754.00	26.59	320.64	731.83	110.79	-91.06	143.41	5.42	5.29	2.87	
847.00	29.11	321.53	814.05	144.60	-118.33	186.85	2.75	2.71	0.96	
941.00	32.39	320.99	894.83	182.08	-148.41	234.90	3.50	3.49	-0.57	
<b>Last SDI Surface MWD Survey</b>										
1,078.00	33.14	320.70	1,010.03	239.57	-195.23	309.04	0.56	0.55	-0.21	
<b>First SDI Production MWD Survey</b>										
1,173.00	32.34	320.88	1,089.94	279.38	-227.71	360.42	0.85	-0.84	0.19	
1,267.00	32.71	320.97	1,169.19	318.61	-259.57	410.96	0.40	0.39	0.10	
1,362.00	33.94	321.79	1,248.57	359.39	-292.14	463.15	1.38	1.29	0.86	
1,457.00	31.85	320.70	1,328.34	399.63	-324.42	514.74	2.29	-2.20	-1.15	
1,551.00	32.42	320.74	1,407.93	438.34	-356.08	564.74	0.61	0.61	0.04	
1,646.00	33.39	320.82	1,487.69	478.32	-388.71	616.34	1.02	1.02	0.08	
1,741.00	33.75	321.20	1,566.85	519.15	-421.76	668.87	0.44	0.38	0.40	
1,835.00	34.06	320.34	1,644.86	559.76	-454.92	721.31	0.61	0.33	-0.91	
1,930.00	34.32	317.84	1,723.45	600.10	-489.88	774.66	1.50	0.27	-2.63	
2,025.00	35.10	318.67	1,801.54	640.46	-525.89	828.70	0.96	0.82	0.87	
2,119.00	34.96	321.79	1,878.52	681.92	-560.40	882.64	1.91	-0.15	3.32	
2,214.00	34.82	324.14	1,956.45	725.29	-593.12	936.93	1.42	-0.15	2.47	
2,308.00	34.21	326.39	2,033.91	769.05	-623.47	990.02	1.50	-0.65	2.39	
2,403.00	34.79	323.93	2,112.20	813.20	-654.22	1,043.67	1.59	0.61	-2.59	
2,497.00	34.58	321.22	2,189.50	855.67	-686.71	1,097.12	1.66	-0.22	-2.88	
2,592.00	34.81	321.93	2,267.61	898.03	-720.32	1,151.19	0.49	0.24	0.75	
2,686.00	34.99	319.69	2,344.71	939.71	-754.30	1,204.97	1.38	0.19	-2.38	
2,781.00	33.88	318.01	2,423.06	980.16	-789.64	1,258.65	1.54	-1.17	-1.77	
2,875.00	32.45	316.75	2,501.75	1,018.01	-824.45	1,309.98	1.69	-1.52	-1.34	
2,969.00	31.04	317.32	2,581.68	1,054.20	-858.16	1,359.32	1.53	-1.50	0.61	
3,064.00	30.51	319.21	2,663.31	1,090.46	-890.52	1,407.88	1.16	-0.56	1.99	
3,158.00	31.66	322.64	2,743.82	1,128.14	-921.08	1,456.39	2.25	1.22	3.65	
3,253.00	33.39	325.04	2,823.92	1,169.38	-951.19	1,507.39	2.27	1.82	2.53	
3,347.00	35.86	325.24	2,901.26	1,213.21	-981.71	1,560.64	2.63	2.63	0.21	
3,441.00	35.13	324.27	2,977.79	1,257.78	-1,013.21	1,615.09	0.98	-0.78	-1.03	
3,536.00	35.70	324.22	3,055.22	1,302.46	-1,045.37	1,670.04	0.60	0.60	-0.05	
3,631.00	34.71	323.59	3,132.84	1,346.71	-1,077.63	1,724.73	1.11	-1.04	-0.66	
3,725.00	33.26	323.94	3,210.78	1,389.09	-1,108.69	1,777.20	1.56	-1.54	0.37	
3,819.00	31.66	324.05	3,290.09	1,429.90	-1,138.35	1,827.57	1.70	-1.70	0.12	
3,914.00	30.84	324.43	3,371.31	1,469.89	-1,167.15	1,876.77	0.89	-0.86	0.40	
4,009.00	27.87	324.43	3,454.10	1,507.77	-1,194.24	1,923.24	3.13	-3.13	0.00	
4,103.00	25.18	323.14	3,538.20	1,541.65	-1,219.02	1,965.16	2.93	-2.86	-1.37	
4,130.21	24.92	322.75	3,562.85	1,550.84	-1,225.96	1,976.67	1.13	-0.96	-1.42	
<b>GM 333-5 MVRD</b>										
4,198.00	24.27	321.76	3,624.49	1,573.15	-1,243.23	2,004.87	1.13	-0.96	-1.47	

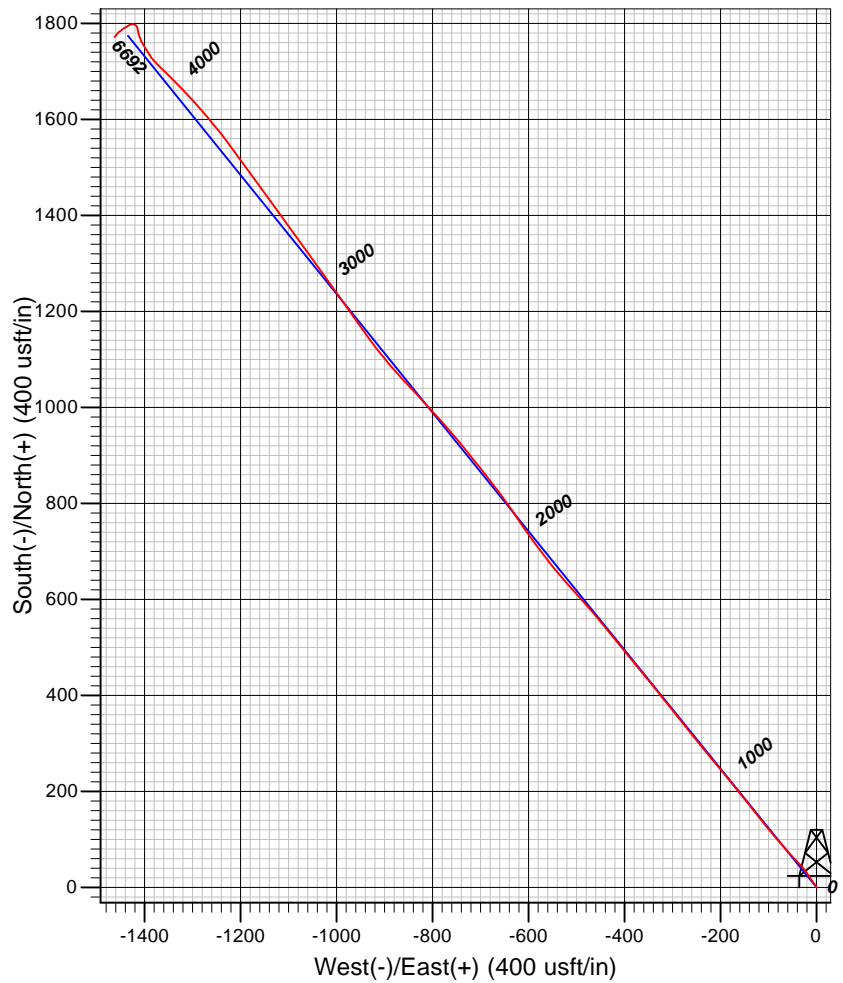
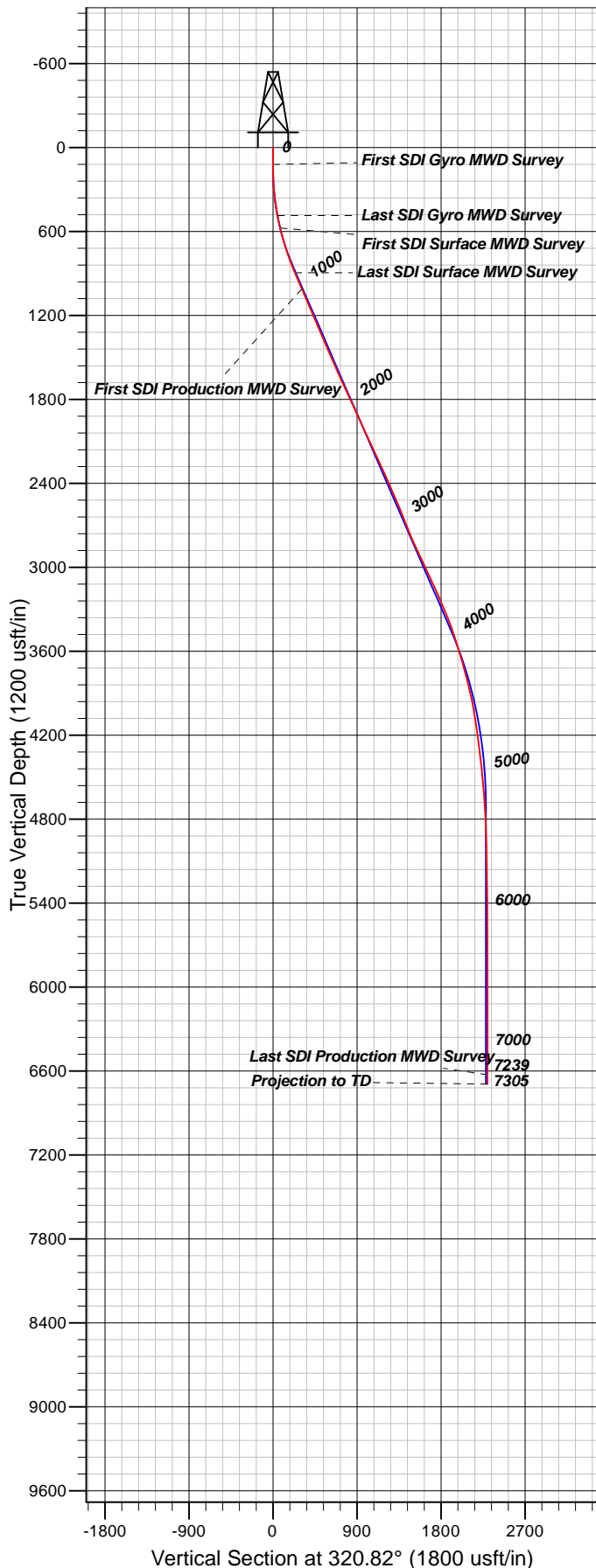
<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well GM 532-5 - Slot A5 (GM 532-5)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
<b>Site:</b>	MV 34-5 Pad	<b>MD Reference:</b>	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
<b>Well:</b>	GM 532-5	<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)	
4,293.00	23.30	320.09	3,711.42	1,602.90	-1,267.37	2,043.18	1.24	-1.02	-1.76	
4,387.00	20.68	317.80	3,798.58	1,629.46	-1,290.45	2,078.35	2.93	-2.79	-2.44	
4,481.00	19.26	316.22	3,886.92	1,652.95	-1,312.33	2,110.38	1.62	-1.51	-1.68	
4,576.00	16.08	317.28	3,977.43	1,673.94	-1,332.10	2,139.14	3.36	-3.35	1.12	
4,670.00	13.54	314.11	4,068.30	1,691.16	-1,348.84	2,163.07	2.84	-2.70	-3.37	
4,765.00	12.53	313.59	4,160.85	1,706.01	-1,364.28	2,184.34	1.07	-1.06	-0.55	
4,860.00	10.87	316.01	4,253.87	1,719.56	-1,377.97	2,203.49	1.82	-1.75	2.55	
4,954.00	10.39	327.26	4,346.27	1,733.07	-1,388.71	2,220.74	2.26	-0.51	11.97	
5,049.00	8.24	329.81	4,440.01	1,746.16	-1,396.77	2,235.98	2.30	-2.26	2.68	
5,144.00	7.88	326.96	4,534.08	1,757.50	-1,403.74	2,249.18	0.57	-0.38	-3.00	
5,238.00	7.44	340.56	4,627.24	1,768.65	-1,409.28	2,261.32	1.98	-0.47	14.47	
5,317.68	6.13	345.00	4,706.37	1,777.62	-1,412.10	2,270.05	1.77	-1.65	5.57	
GM 532-5 KMV										
5,333.00	5.88	346.08	4,721.60	1,779.17	-1,412.50	2,271.51	1.77	-1.61	7.04	
5,427.00	3.93	351.25	4,815.25	1,787.03	-1,414.15	2,278.64	2.13	-2.07	5.50	
5,522.00	2.35	339.63	4,910.11	1,792.07	-1,415.32	2,283.29	1.78	-1.66	-12.23	
5,616.00	1.97	313.63	5,004.04	1,794.99	-1,417.16	2,286.72	1.11	-0.40	-27.66	
5,711.00	1.85	305.06	5,098.99	1,797.00	-1,419.60	2,289.81	0.33	-0.13	-9.02	
5,805.00	1.85	283.44	5,192.94	1,798.22	-1,422.32	2,292.48	0.74	0.00	-23.00	
5,900.00	1.93	265.69	5,287.89	1,798.46	-1,425.40	2,294.61	0.62	0.08	-18.68	
5,994.00	1.00	240.34	5,381.86	1,797.94	-1,427.70	2,295.65	1.18	-0.99	-26.97	
6,089.00	1.41	253.43	5,476.84	1,797.19	-1,429.54	2,296.24	0.52	0.43	13.78	
6,183.00	1.49	251.18	5,570.81	1,796.47	-1,431.80	2,297.11	0.10	0.09	-2.39	
6,278.00	1.76	234.49	5,665.77	1,795.22	-1,434.16	2,297.63	0.57	0.28	-17.57	
6,373.00	2.11	235.19	5,760.72	1,793.38	-1,436.78	2,297.86	0.37	0.37	0.74	
6,467.00	2.37	242.48	5,854.65	1,791.49	-1,439.93	2,298.39	0.41	0.28	7.76	
6,562.00	2.73	240.46	5,949.55	1,789.47	-1,443.64	2,299.16	0.39	0.38	-2.13	
6,657.00	1.95	225.94	6,044.47	1,787.23	-1,446.77	2,299.40	1.03	-0.82	-15.28	
6,752.00	1.90	231.25	6,139.42	1,785.12	-1,449.16	2,299.28	0.19	-0.05	5.59	
6,847.00	1.76	237.91	6,234.37	1,783.36	-1,451.62	2,299.47	0.27	-0.15	7.01	
6,941.00	1.58	221.21	6,328.33	1,781.62	-1,453.70	2,299.43	0.55	-0.19	-17.77	
7,036.00	1.93	223.59	6,423.29	1,779.47	-1,455.66	2,299.01	0.38	0.37	2.51	
7,130.00	2.27	216.35	6,517.22	1,776.83	-1,457.86	2,298.35	0.46	0.36	-7.70	
7,225.00	2.37	224.73	6,612.15	1,773.92	-1,460.35	2,297.67	0.37	0.11	8.82	
7,239.00	2.20	225.78	6,626.13	1,773.52	-1,460.75	2,297.62	1.25	-1.21	7.50	
Last SDI Production MWD Survey										
7,288.23	2.20	225.78	6,675.33	1,772.20	-1,462.11	2,297.45	0.00	0.00	0.00	
GM 333-5 PBHL										
7,303.08	2.20	225.78	6,690.17	1,771.81	-1,462.51	2,297.40	0.00	0.00	0.00	
GM 532-5 PBHL										
7,305.00	2.20	225.78	6,692.09	1,771.76	-1,462.57	2,297.39	0.00	0.00	0.00	
Projection to TD										

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well GM 532-5 - Slot A5 (GM 532-5)
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<b>Site:</b>	MV 34-5 Pad	<b>MD Reference:</b>	GL 5977' & RKB 24' @ 6001.00usft (H&P 271)
<b>Well:</b>	GM 532-5	<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	0.71	-0.21	First SDI Gyro MWD Survey
491.00	486.11	41.70	-29.27	Last SDI Gyro MWD Survey
584.00	574.86	62.13	-48.07	First SDI Surface MWD Survey
941.00	894.83	182.08	-148.41	Last SDI Surface MWD Survey
1,078.00	1,010.03	239.57	-195.23	First SDI Production MWD Survey
7,239.00	6,626.13	1,773.52	-1,460.75	Last SDI Production MWD Survey
7,305.00	6,692.09	1,771.76	-1,462.57	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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#### Well Details: GM 532-5

TVD Reference: GL 5977' & RKB 24' @ 6001.00usft (H&P 271) and Level: 5977.00  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.00 0.00 1603520.43 2258800.52 39.4610286 -108.1255610 A5 (GM 532-5)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well GM 532-5 - Slot A5 (GM 532-5), True North  
 Vertical (TVD) Reference: GL 5977' & RKB 24' @ 6001.00usft (H&P 271)  
 Section (VS) Reference: Slot - A5 (GM 532-5)(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

11:29, September 22 2017  
 Created By: Mel Mireles Jr.