



## Directional Survey Certification

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

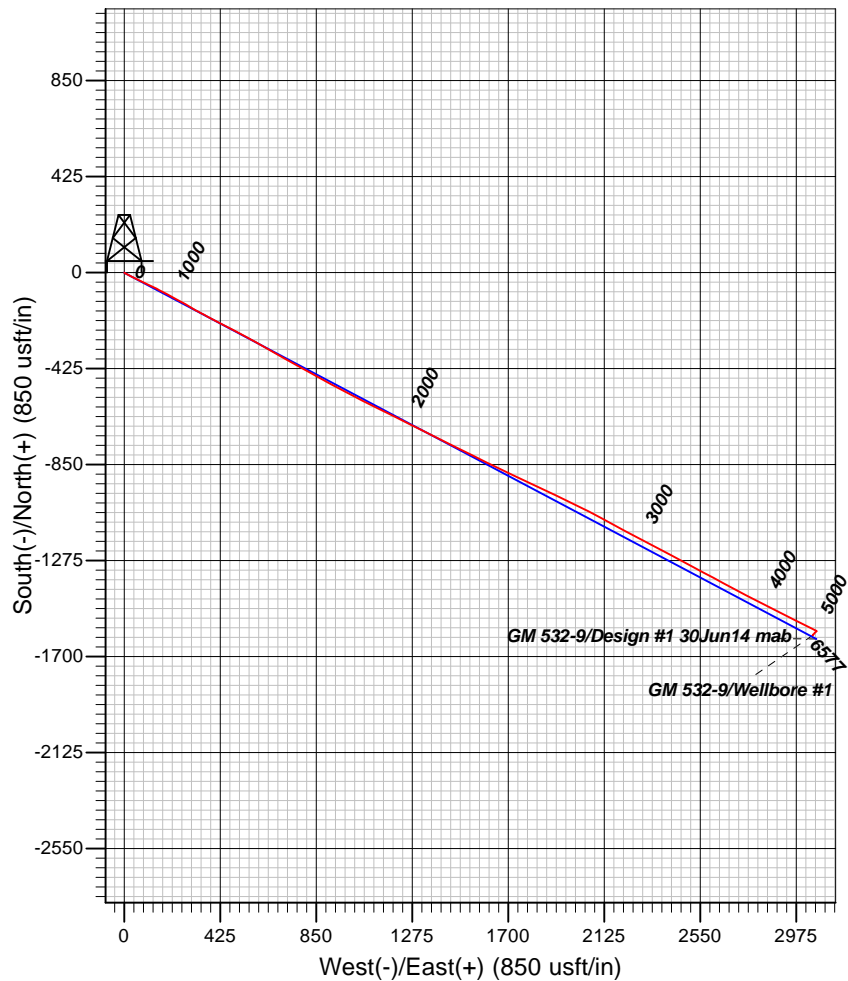
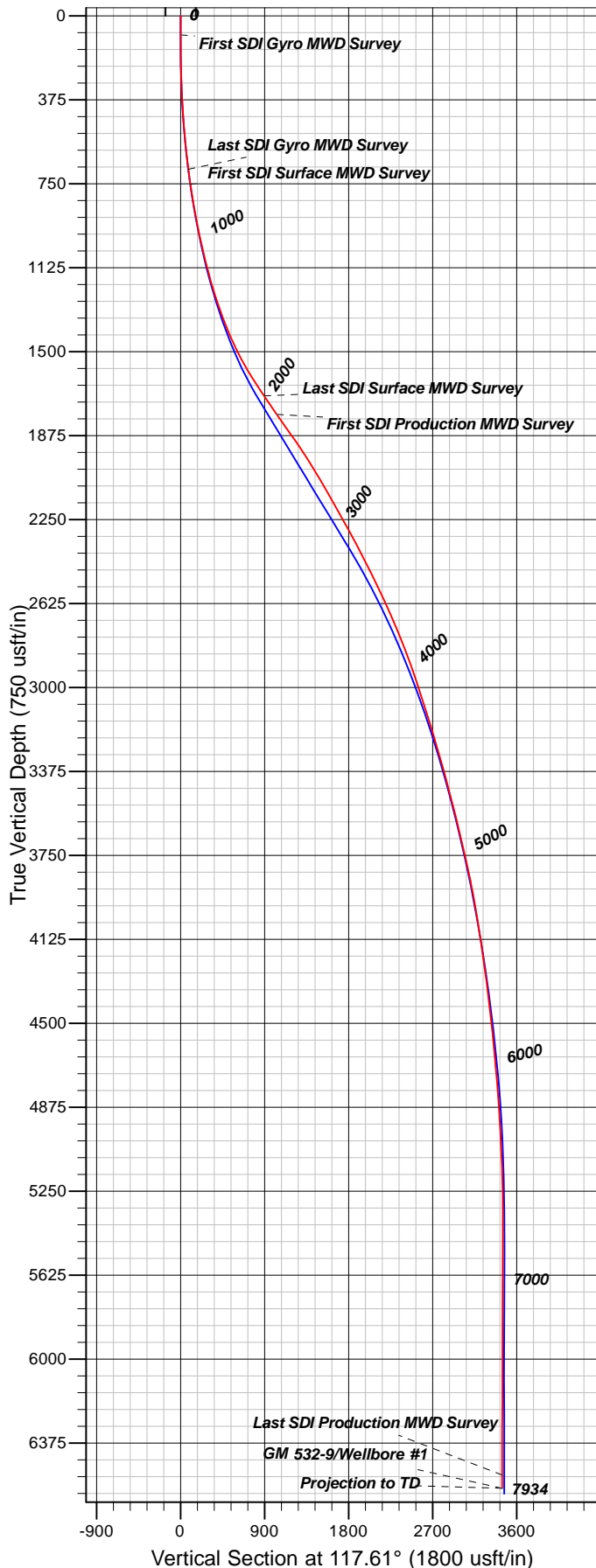
<b>Operator</b>	Terra Energy Partners
<b>Well Name &amp; No.</b>	GM 532-9
<b>County &amp; State</b>	Garfield, CO
<b>SDI Job No.</b>	420716DEFK370940
<b>Rig</b>	H&P 318

I, Janie Collins, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 85 feet to a measured depth of 7,934 feet is true and correct as determined from all available records.

  
\_\_\_\_\_  
Signature

15-Jul-16  
\_\_\_\_\_  
Date

**Janie Collins**  
Colorado District Well Planner  
Scientific Drilling International



#### Well Details: GM 532-9

+N/-S	+E/-W	TVD Reference: KB @ 6111.00usft (HP 318)	Ground Level: 6087.00	Slot
0.00	0.00	North	East	B04
1601963.08	2260347.70	39.4568773	-108.1199243	

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well GM 532-9 - Slot B04, True North  
 Vertical (TVD) Reference: KB @ 6111.00usft (HP 318)  
 Section (VS) Reference: Slot - B04(0.00N, 0.00E)  
 Measured Depth Reference: KB @ 6111.00usft (HP 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: Wellbore #1

11:30, July 15 2016  
 Created By: Janie Collins

<b>Company:</b>	Terra Energy Partners	<b>Local Co-ordinate Reference:</b>	Well GM 532-9 - Slot B04
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	KB @ 6111.00usft (HP 318)
<b>Site:</b>	MV 16-9 Pad	<b>MD Reference:</b>	KB @ 6111.00usft (HP 318)
<b>Well:</b>	GM 532-9	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<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 16-9 Pad			
Site Position:		Northing:	1,601,987.28 usft	Latitude:	39.4569441
From:	Map	Easting:	2,260,352.30 usft	Longitude:	-108.1199106
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.65 °

Well	GM 532-9 - Slot B04					
Well Position	+N/-S	0.00 usft	Northing:	1,601,963.08 usft	Latitude:	39.4568774
	+E/-W	0.00 usft	Easting:	2,260,347.70 usft	Longitude:	-108.1199244
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,087.00 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	BGGM2016	5/19/2016	9.76	65.59	51,621

<b>Design</b>	Wellbore #1				
<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	117.61	

<b>Survey Program</b>	<b>Date</b>	7/12/2016			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
85.00	693.00	Survey #1 - Gyro Survey (Wellbore #1)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
763.00	2,023.00	Survey #2 - Surface MWD Survey (Wellbo	SDI MWD	SDI MWD - Standard ver 1.0.1	
2,183.00	7,934.00	Survey #3 - Production MWD Survey (Wel	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	
85.00	0.26	56.87	85.00	0.11	0.16	0.09	0.31	0.31	0.00	
<b>First SDI Gyro MWD Survey</b>										
148.00	1.14	114.61	147.99	-0.08	0.85	0.79	1.63	1.40	91.65	
239.00	3.17	124.80	238.93	-1.89	3.74	4.19	2.26	2.23	11.20	
329.00	5.63	120.41	328.65	-5.55	9.59	11.07	2.76	2.73	-4.88	
420.00	8.62	118.12	418.94	-11.02	19.46	22.35	3.30	3.29	-2.52	
511.00	11.88	115.66	508.48	-18.29	33.92	38.54	3.61	3.58	-2.70	
602.00	14.34	114.35	597.10	-27.00	52.63	59.15	2.72	2.70	-1.44	

<b>Company:</b>	Terra Energy Partners	<b>Local Co-ordinate Reference:</b>	Well GM 532-9 - Slot B04
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	KB @ 6111.00usft (HP 318)
<b>Site:</b>	MV 16-9 Pad	<b>MD Reference:</b>	KB @ 6111.00usft (HP 318)
<b>Well:</b>	GM 532-9	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<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)
693.00	16.36	118.48	684.85	-37.76	74.17	83.22	2.52	2.22	4.54
Last SDI Gyro MWD Survey									
763.00	19.22	116.27	751.50	-47.56	93.17	104.60	4.20	4.09	-3.16
First SDI Surface MWD Survey									
854.00	22.50	114.00	836.52	-61.27	122.52	136.96	3.71	3.60	-2.49
944.00	24.75	117.89	918.98	-77.09	154.91	172.99	3.04	2.50	4.32
1,035.00	27.31	118.17	1,000.74	-95.86	190.15	212.92	2.82	2.81	0.31
1,126.00	30.41	118.86	1,080.43	-116.84	228.73	256.84	3.43	3.41	0.76
1,217.00	33.59	119.10	1,157.59	-140.21	270.91	305.04	3.50	3.49	0.26
1,308.00	36.42	119.63	1,232.12	-165.81	316.40	357.21	3.13	3.11	0.58
1,403.00	40.19	117.78	1,306.66	-194.05	368.05	416.07	4.15	3.97	-1.95
1,497.00	43.45	117.61	1,376.70	-223.17	423.54	478.74	3.47	3.47	-0.18
1,591.00	47.01	117.67	1,442.89	-254.13	482.65	545.46	3.79	3.79	0.06
1,685.00	50.27	118.18	1,505.00	-287.17	544.98	616.01	3.49	3.47	0.54
1,780.00	53.86	119.61	1,563.40	-323.39	610.55	690.90	3.96	3.78	1.51
1,874.00	56.32	119.60	1,617.19	-361.47	677.57	767.93	2.62	2.62	-0.01
1,968.00	57.96	119.06	1,668.19	-400.14	746.40	846.85	1.81	1.74	-0.57
2,023.00	58.39	118.39	1,697.19	-422.60	787.38	893.57	1.30	0.78	-1.22
Last SDI Surface MWD Survey									
2,183.00	59.08	119.50	1,780.23	-488.79	907.06	1,030.30	0.73	0.43	0.69
First SDI Production MWD Survey									
2,277.00	59.69	117.31	1,828.11	-527.27	978.21	1,111.18	2.11	0.65	-2.33
2,371.00	59.57	116.93	1,875.63	-564.24	1,050.40	1,192.28	0.37	-0.13	-0.40
2,465.00	58.46	116.17	1,924.03	-600.26	1,122.48	1,272.85	1.37	-1.18	-0.81
2,559.00	57.01	116.64	1,974.20	-635.60	1,193.67	1,352.31	1.60	-1.54	0.50
2,654.00	55.14	116.55	2,027.22	-670.89	1,264.16	1,431.12	1.97	-1.97	-0.09
2,748.00	54.43	116.63	2,081.43	-705.27	1,332.83	1,507.91	0.76	-0.76	0.09
2,842.00	54.03	116.51	2,136.37	-739.38	1,401.04	1,584.16	0.44	-0.43	-0.13
2,936.00	53.90	116.20	2,191.67	-773.13	1,469.16	1,660.16	0.30	-0.14	-0.33
3,030.00	52.83	116.11	2,247.76	-806.38	1,536.86	1,735.57	1.14	-1.14	-0.10
3,124.00	53.20	115.80	2,304.31	-839.24	1,604.38	1,810.62	0.47	0.39	-0.33
3,219.00	51.40	116.38	2,362.41	-872.29	1,671.88	1,885.76	1.96	-1.89	0.61
3,313.00	50.92	115.95	2,421.36	-904.58	1,737.60	1,958.95	0.62	-0.51	-0.46
3,408.00	50.26	114.95	2,481.67	-936.12	1,803.87	2,032.29	1.07	-0.69	-1.05
3,502.00	49.22	114.64	2,542.42	-966.20	1,868.99	2,103.94	1.13	-1.11	-0.33
3,596.00	47.66	116.27	2,604.78	-996.42	1,932.50	2,174.22	2.11	-1.66	1.73
3,690.00	47.16	115.33	2,668.39	-1,026.54	1,994.80	2,243.39	0.91	-0.53	-1.00
3,785.00	45.25	118.09	2,734.14	-1,057.33	2,056.05	2,311.93	2.90	-2.01	2.91
3,879.00	43.22	117.70	2,801.49	-1,088.01	2,114.00	2,377.50	2.18	-2.16	-0.41
3,974.00	40.94	118.24	2,872.00	-1,117.86	2,170.23	2,441.16	2.43	-2.40	0.57
4,068.00	39.02	118.45	2,944.02	-1,146.54	2,223.38	2,501.55	2.05	-2.04	0.22
4,162.00	38.82	118.24	3,017.16	-1,174.57	2,275.36	2,560.60	0.25	-0.21	-0.22
4,257.00	37.02	117.18	3,092.10	-1,201.73	2,327.04	2,618.98	2.01	-1.89	-1.12
4,352.00	36.80	117.41	3,168.06	-1,227.89	2,377.74	2,676.03	0.27	-0.23	0.24

<b>Company:</b>	Terra Energy Partners	<b>Local Co-ordinate Reference:</b>	Well GM 532-9 - Slot B04
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	KB @ 6111.00usft (HP 318)
<b>Site:</b>	MV 16-9 Pad	<b>MD Reference:</b>	KB @ 6111.00usft (HP 318)
<b>Well:</b>	GM 532-9	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<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)
4,446.00	34.92	118.72	3,244.24	-1,253.78	2,426.33	2,731.09	2.16	-2.00	1.39
4,541.00	34.24	118.02	3,322.45	-1,279.41	2,473.77	2,785.00	0.83	-0.72	-0.74
4,635.00	33.94	118.13	3,400.30	-1,304.20	2,520.26	2,837.69	0.33	-0.32	0.12
4,729.00	31.66	117.87	3,479.31	-1,328.11	2,565.21	2,888.61	2.43	-2.43	-0.28
4,824.00	30.09	117.81	3,560.84	-1,350.88	2,608.32	2,937.35	1.65	-1.65	-0.06
4,918.00	30.26	117.73	3,642.11	-1,372.89	2,650.13	2,984.60	0.19	0.18	-0.09
5,012.00	29.64	117.36	3,723.55	-1,394.59	2,691.73	3,031.53	0.69	-0.66	-0.39
5,107.00	27.25	117.83	3,807.08	-1,415.55	2,731.84	3,076.78	2.53	-2.52	0.49
5,201.00	24.95	118.73	3,891.49	-1,435.12	2,768.26	3,118.13	2.48	-2.45	0.96
5,296.00	22.51	118.83	3,978.45	-1,453.53	2,801.76	3,156.34	2.57	-2.57	0.11
5,390.00	20.56	116.10	4,065.88	-1,469.47	2,832.35	3,190.84	2.33	-2.07	-2.90
5,485.00	20.02	116.07	4,154.99	-1,483.95	2,861.94	3,223.77	0.57	-0.57	-0.03
5,579.00	17.89	116.25	4,243.89	-1,497.41	2,889.35	3,254.29	2.27	-2.27	0.19
5,673.00	17.23	117.43	4,333.51	-1,510.21	2,914.65	3,282.65	0.80	-0.70	1.26
5,767.00	15.81	118.79	4,423.62	-1,522.79	2,938.23	3,309.37	1.57	-1.51	1.45
5,861.00	14.07	115.14	4,514.45	-1,533.81	2,959.80	3,333.59	2.10	-1.85	-3.88
5,956.00	13.26	115.32	4,606.76	-1,543.38	2,980.10	3,356.02	0.85	-0.85	0.19
6,050.00	11.49	115.74	4,698.57	-1,552.06	2,998.28	3,376.15	1.89	-1.88	0.45
6,144.00	10.85	117.12	4,790.79	-1,560.16	3,014.59	3,394.35	0.74	-0.68	1.47
6,239.00	9.23	117.36	4,884.33	-1,567.73	3,029.32	3,410.91	1.71	-1.71	0.25
6,333.00	7.41	113.77	4,977.34	-1,573.64	3,041.56	3,424.50	2.01	-1.94	-3.82
6,428.00	6.68	116.99	5,071.62	-1,578.62	3,052.09	3,436.14	0.87	-0.77	3.39
6,527.00	4.04	122.88	5,170.18	-1,583.13	3,060.15	3,445.37	2.72	-2.67	5.95
6,621.00	2.46	129.47	5,264.02	-1,586.21	3,064.49	3,450.64	1.72	-1.68	7.01
6,716.00	0.18	299.71	5,359.00	-1,587.43	3,065.94	3,452.49	2.78	-2.40	179.20
6,810.00	0.64	280.58	5,452.99	-1,587.26	3,065.29	3,451.84	0.50	0.49	-20.35
6,904.00	0.68	257.70	5,546.99	-1,587.28	3,064.23	3,450.91	0.28	0.04	-24.34
6,998.00	0.98	234.95	5,640.98	-1,587.86	3,063.03	3,450.11	0.47	0.32	-24.20
7,093.00	1.00	225.80	5,735.96	-1,588.91	3,061.77	3,449.48	0.17	0.02	-9.63
7,187.00	1.21	215.80	5,829.95	-1,590.28	3,060.60	3,449.08	0.30	0.22	-10.64
7,282.00	1.77	224.75	5,924.91	-1,592.14	3,058.98	3,448.51	0.64	0.59	9.42
7,376.00	1.85	223.07	6,018.87	-1,594.28	3,056.92	3,447.68	0.10	0.09	-1.79
7,470.00	1.98	219.13	6,112.81	-1,596.65	3,054.86	3,446.95	0.20	0.14	-4.19
7,565.00	1.98	217.66	6,207.76	-1,599.22	3,052.82	3,446.33	0.05	0.00	-1.55
7,659.00	1.38	229.19	6,301.72	-1,601.24	3,050.97	3,445.63	0.73	-0.64	12.27
7,753.00	0.96	212.44	6,395.70	-1,602.65	3,049.69	3,445.15	0.57	-0.45	-17.82
7,848.00	1.07	220.98	6,490.68	-1,603.99	3,048.69	3,444.88	0.20	0.12	8.99
7,875.00	0.79	226.06	6,517.68	-1,604.31	3,048.39	3,444.76	1.08	-1.04	18.81
Last SDI Production MWD Survey									
7,934.00	0.79	226.06	6,576.67	-1,604.87	3,047.80	3,444.51	0.00	0.00	0.00
Projection to TD									

<b>Company:</b>	Terra Energy Partners	<b>Local Co-ordinate Reference:</b>	Well GM 532-9 - Slot B04
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<b>Site:</b>	MV 16-9 Pad	<b>MD Reference:</b>	KB @ 6111.00usft (HP 318)
<b>Well:</b>	GM 532-9	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Grand Junction District

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
85.00	85.00	0.11	0.16	First SDI Gyro MWD Survey
693.00	684.85	-37.76	74.17	Last SDI Gyro MWD Survey
763.00	751.50	-47.56	93.17	First SDI Surface MWD Survey
2,023.00	1,697.19	-422.60	787.38	Last SDI Surface MWD Survey
2,183.00	1,780.23	-488.79	907.06	First SDI Production MWD Survey
7,875.00	6,517.68	-1,604.31	3,048.39	Last SDI Production MWD Survey
7,934.00	6,576.67	-1,604.87	3,047.80	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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