



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.	NR 511-3
County & State	Garfield County, CO
SDI Job No.	OP.011946
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 122 feet to a measured depth of 10,679 feet is true and correct as determined from all available records.

A handwritten signature in black ink, appearing to read 'Mel Mireles Jr.', written over a horizontal line.

Signature

09-Aug-18

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well NR 511-3 - Slot NR 511-3 (A4)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Site:	NR 23-3 Pad	MD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Well:	NR 511-3	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Project	Garfield County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		NR 23-3 Pad			
Site Position:		Northing:	1,634,904.55 usft	Latitude:	39.5525224
From:	Map	Easting:	2,329,757.66 usft	Longitude:	-107.8772377
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.50 °

Well	NR 511-3 - Slot NR 511-3 (A4)					
Well Position	+N/-S	0.00 usft	Northing:	1,634,940.64 usft	Latitude:	39.5526195
	+E/-W	0.00 usft	Easting:	2,329,730.77 usft	Longitude:	-107.8773363
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,720.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/29/2018	9.45	65.80	51,553

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	325.11	

Survey Program	Date	8/9/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
122.00	489.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
559.00	1,051.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,091.00	10,679.00	Survey #3 - Production MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	

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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
122.00	0.18	258.93	122.00	-0.04	-0.19	0.08	0.15	0.15	0.00	
First SDI Gyro MWD Survey										
213.00	2.02	286.00	212.98	0.38	-1.87	1.38	2.05	2.02	29.75	
305.00	3.26	287.05	304.88	1.59	-5.93	4.70	1.35	1.35	1.14	
397.00	4.75	314.56	396.66	5.03	-11.15	10.50	2.60	1.62	29.90	
489.00	7.92	328.45	488.09	13.11	-17.18	20.58	3.80	3.45	15.10	
Last SDI Gyro MWD Survey										

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Project:	Garfield County, CO NAD83	TVD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Site:	NR 23-3 Pad	MD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Well:	NR 511-3	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	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)	
559.00	10.55	327.01	557.18	22.60	-23.19	31.80	3.77	3.76	-2.06	
First SDI Surface MWD Survey										
651.00	14.14	327.53	647.04	39.15	-33.81	51.45	3.90	3.90	0.57	
746.00	17.89	326.85	738.33	61.16	-48.03	77.64	3.95	3.95	-0.72	
840.00	20.37	326.30	827.14	86.86	-65.00	108.43	2.65	2.64	-0.59	
935.00	23.21	327.85	915.34	116.47	-84.14	143.67	3.05	2.99	1.63	
1,051.00	26.48	328.01	1,020.59	157.77	-110.01	192.34	2.82	2.82	0.14	
Last SDI Surface MWD Survey										
1,091.00	26.74	326.95	1,056.35	172.88	-119.65	210.24	1.35	0.65	-2.65	
First SDI Production MWD Survey										
1,179.00	26.68	331.82	1,134.97	206.89	-139.77	249.65	2.49	-0.07	5.53	
1,273.00	26.20	330.31	1,219.14	243.52	-160.02	291.28	0.88	-0.51	-1.61	
1,368.00	27.45	331.76	1,303.92	281.03	-180.77	333.92	1.49	1.32	1.53	
1,463.00	27.66	331.43	1,388.14	319.69	-201.67	377.58	0.27	0.22	-0.35	
1,557.00	27.79	330.67	1,471.35	357.95	-222.84	421.08	0.40	0.14	-0.81	
1,651.00	27.87	329.02	1,554.48	395.89	-244.89	464.81	0.82	0.09	-1.76	
1,746.00	28.31	327.79	1,638.29	433.99	-268.32	509.46	0.77	0.46	-1.29	
1,840.00	27.17	329.90	1,721.49	471.42	-290.97	553.12	1.60	-1.21	2.24	
1,935.00	27.61	329.28	1,805.84	509.11	-313.09	596.69	0.55	0.46	-0.65	
2,029.00	27.50	327.24	1,889.17	546.09	-335.96	640.10	1.01	-0.12	-2.17	
2,124.00	27.79	331.04	1,973.34	583.91	-358.56	684.05	1.88	0.31	4.00	
2,218.00	28.17	330.36	2,056.35	622.37	-380.14	727.94	0.53	0.40	-0.72	
2,313.00	28.93	329.20	2,139.80	661.60	-403.00	773.19	0.99	0.80	-1.22	
2,407.00	27.70	329.99	2,222.55	700.05	-425.57	817.64	1.37	-1.31	0.84	
2,502.00	27.61	327.88	2,306.70	737.81	-448.31	861.63	1.04	-0.09	-2.22	
2,596.00	26.82	331.39	2,390.30	774.88	-470.05	904.47	1.90	-0.84	3.73	
2,691.00	26.73	330.33	2,475.11	812.26	-490.89	947.05	0.51	-0.09	-1.12	
2,785.00	27.07	328.42	2,558.94	848.85	-512.56	989.45	0.99	0.36	-2.03	
2,880.00	26.82	331.90	2,643.63	886.17	-533.97	1,032.32	1.68	-0.26	3.66	
2,974.00	26.16	331.21	2,727.76	923.04	-553.94	1,073.98	0.77	-0.70	-0.73	
3,069.00	26.56	330.07	2,812.89	959.80	-574.62	1,115.96	0.68	0.42	-1.20	
3,164.00	26.45	328.07	2,897.90	996.16	-596.41	1,158.25	0.95	-0.12	-2.11	
3,258.00	27.26	330.25	2,981.77	1,032.62	-618.16	1,200.60	1.36	0.86	2.32	
3,353.00	27.17	329.11	3,066.25	1,070.12	-640.10	1,243.91	0.56	-0.09	-1.20	
3,447.00	27.88	327.96	3,149.61	1,107.17	-662.77	1,287.27	0.94	0.76	-1.22	
3,542.00	27.51	332.19	3,233.74	1,145.41	-684.80	1,331.23	2.11	-0.39	4.45	
3,637.00	27.77	331.02	3,317.90	1,184.18	-705.76	1,375.02	0.63	0.27	-1.23	
3,731.00	28.54	329.63	3,400.77	1,222.71	-727.72	1,419.19	1.08	0.82	-1.48	
3,826.00	27.79	334.33	3,484.53	1,262.25	-748.79	1,463.68	2.46	-0.79	4.95	
3,920.00	26.20	333.27	3,568.29	1,300.54	-767.62	1,505.85	1.77	-1.69	-1.13	
4,015.00	25.83	333.09	3,653.66	1,337.73	-786.42	1,547.11	0.40	-0.39	-0.19	
4,110.00	26.64	337.02	3,738.88	1,375.79	-804.10	1,588.45	2.02	0.85	4.14	
4,204.00	28.05	337.55	3,822.38	1,415.62	-820.77	1,630.65	1.52	1.50	0.56	
4,299.00	27.44	337.28	3,906.46	1,456.46	-837.75	1,673.86	0.66	-0.64	-0.28	

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

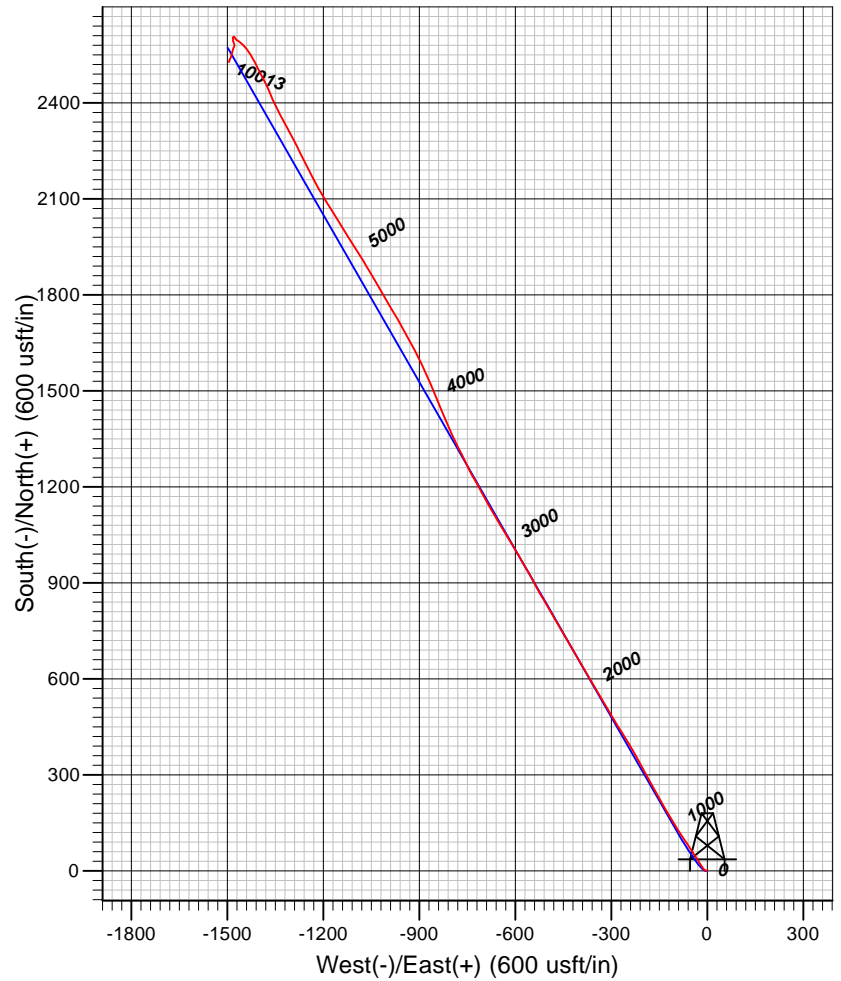
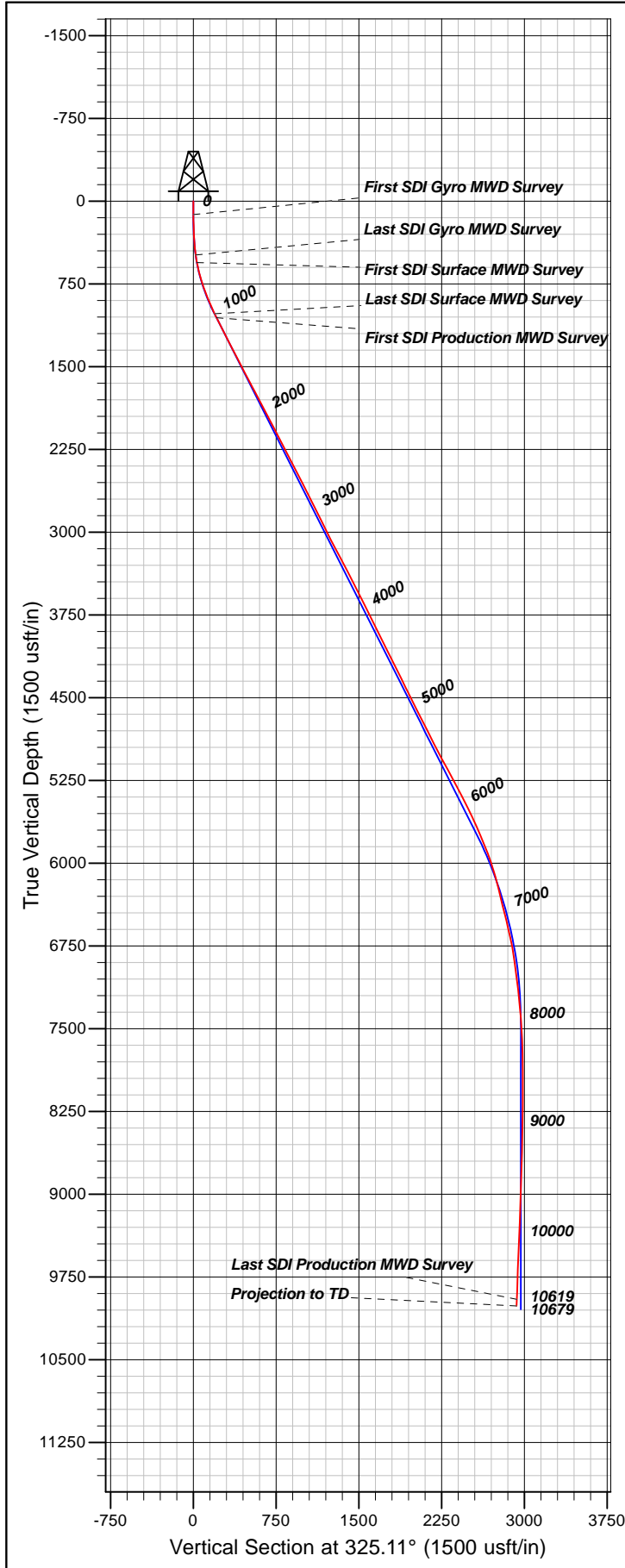
Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,393.00	26.37	337.79	3,990.28	1,495.76	-854.01	1,715.40	1.16	-1.14	0.54
4,488.00	27.41	335.29	4,075.01	1,535.16	-871.13	1,757.51	1.62	1.09	-2.63
4,582.00	27.00	334.56	4,158.61	1,574.09	-889.34	1,799.86	0.56	-0.44	-0.78
4,676.00	26.03	333.59	4,242.72	1,611.83	-907.68	1,841.31	1.13	-1.03	-1.03
4,771.00	27.03	331.60	4,327.72	1,649.49	-927.22	1,883.37	1.41	1.05	-2.09
4,866.00	25.57	331.19	4,412.88	1,686.44	-947.36	1,925.21	1.55	-1.54	-0.43
4,960.00	27.58	330.21	4,496.95	1,723.11	-967.95	1,967.06	2.19	2.14	-1.04
5,055.00	27.01	329.85	4,581.37	1,760.85	-989.71	2,010.46	0.62	-0.60	-0.38
5,149.00	26.24	329.93	4,665.40	1,797.29	-1,010.85	2,052.44	0.82	-0.82	0.09
5,243.00	27.56	329.33	4,749.23	1,833.98	-1,032.35	2,094.84	1.43	1.40	-0.64
5,338.00	25.77	329.60	4,834.12	1,870.69	-1,054.02	2,137.35	1.89	-1.88	0.28
5,432.00	27.61	328.05	4,918.11	1,906.81	-1,075.88	2,179.48	2.09	1.96	-1.65
5,526.00	26.88	327.45	5,001.68	1,943.20	-1,098.84	2,222.46	0.83	-0.78	-0.64
5,621.00	28.82	328.23	5,085.67	1,980.77	-1,122.46	2,266.79	2.08	2.04	0.82
5,715.00	29.16	328.76	5,167.89	2,019.62	-1,146.26	2,312.27	0.45	0.36	0.56
5,810.00	28.47	327.77	5,251.13	2,058.56	-1,170.34	2,357.98	0.88	-0.73	-1.04
5,905.00	27.05	327.90	5,335.19	2,096.01	-1,193.90	2,402.18	1.50	-1.49	0.14
5,999.00	27.40	331.89	5,418.79	2,133.20	-1,215.45	2,445.01	1.98	0.37	4.24
6,094.00	26.64	332.27	5,503.42	2,171.34	-1,235.66	2,487.85	0.82	-0.80	0.40
6,189.00	25.65	333.15	5,588.69	2,208.53	-1,254.86	2,529.34	1.12	-1.04	0.93
6,283.00	23.57	333.14	5,674.15	2,243.46	-1,272.54	2,568.10	2.21	-2.21	-0.01
6,377.00	23.37	332.69	5,760.37	2,276.79	-1,289.59	2,605.19	0.29	-0.21	-0.48
6,472.00	22.49	332.20	5,847.87	2,309.60	-1,306.70	2,641.90	0.95	-0.93	-0.52
6,567.00	20.36	331.98	5,936.30	2,340.27	-1,322.94	2,676.35	2.24	-2.24	-0.23
6,661.00	17.47	330.88	6,025.21	2,367.03	-1,337.50	2,706.63	3.10	-3.07	-1.17
6,756.00	16.09	335.44	6,116.17	2,391.47	-1,349.91	2,733.77	2.01	-1.45	4.80
6,851.00	14.78	337.12	6,207.74	2,414.61	-1,360.09	2,758.57	1.46	-1.38	1.77
6,946.00	13.72	335.88	6,299.82	2,436.05	-1,369.41	2,781.49	1.16	-1.12	-1.31
7,040.00	14.51	334.65	6,390.98	2,456.87	-1,379.00	2,804.06	0.90	0.84	-1.31
7,135.00	14.05	333.17	6,483.04	2,477.92	-1,389.30	2,827.21	0.62	-0.48	-1.56
7,230.00	12.93	332.45	6,575.42	2,497.63	-1,399.43	2,849.17	1.19	-1.18	-0.76
7,324.00	12.40	332.18	6,667.13	2,515.88	-1,409.00	2,869.62	0.57	-0.56	-0.29
7,419.00	10.46	331.22	6,760.24	2,532.46	-1,417.91	2,888.32	2.05	-2.04	-1.01
7,514.00	8.27	330.28	6,853.97	2,545.95	-1,425.45	2,903.70	2.31	-2.31	-0.99
7,608.00	8.18	326.65	6,947.01	2,557.41	-1,432.48	2,917.12	0.56	-0.10	-3.86
7,703.00	6.51	326.47	7,041.22	2,567.55	-1,439.17	2,929.26	1.76	-1.76	-0.19
7,797.00	7.12	315.75	7,134.56	2,576.16	-1,446.18	2,940.33	1.50	0.65	-11.40
7,891.00	6.42	311.12	7,227.91	2,583.79	-1,454.20	2,951.18	0.94	-0.74	-4.93
7,986.00	5.36	305.55	7,322.41	2,589.86	-1,461.82	2,960.51	1.27	-1.12	-5.86
8,081.00	4.32	306.26	7,417.07	2,594.56	-1,468.31	2,968.08	1.10	-1.09	0.75
8,108.48	3.88	308.21	7,444.47	2,595.75	-1,469.88	2,969.95	1.67	-1.59	7.10
NR 511-3 BTV									
8,175.00	2.85	315.38	7,510.88	2,598.32	-1,472.81	2,973.74	1.67	-1.55	10.78
8,269.00	2.29	331.13	7,604.79	2,601.63	-1,475.36	2,977.91	0.95	-0.60	16.76

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
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Survey									
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8,364.00	1.49	332.10	7,699.73	2,604.38	-1,476.85	2,981.02	0.84	-0.84	1.02
8,458.00	0.97	319.35	7,793.71	2,606.06	-1,477.94	2,983.02	0.62	-0.55	-13.56
8,553.00	1.14	274.00	7,888.70	2,606.74	-1,479.41	2,984.42	0.87	0.18	-47.74
8,647.00	1.06	230.93	7,982.68	2,606.26	-1,481.01	2,984.94	0.86	-0.09	-45.82
8,742.00	1.49	226.89	8,077.66	2,604.86	-1,482.60	2,984.70	0.46	0.45	-4.25
8,836.00	1.14	181.80	8,171.63	2,603.09	-1,483.52	2,983.78	1.13	-0.37	-47.97
8,930.00	0.70	128.72	8,265.62	2,601.80	-1,483.10	2,982.48	0.97	-0.47	-56.47
9,025.00	0.48	140.22	8,360.62	2,601.13	-1,482.39	2,981.52	0.26	-0.23	12.11
9,119.00	0.88	164.66	8,454.61	2,600.13	-1,481.95	2,980.45	0.52	0.43	26.00
9,213.00	1.26	180.38	8,548.60	2,598.40	-1,481.77	2,978.93	0.51	0.40	16.72
9,308.00	1.67	191.74	8,643.57	2,596.00	-1,482.06	2,977.12	0.53	0.43	11.96
9,402.00	1.32	176.97	8,737.53	2,593.58	-1,482.28	2,975.26	0.55	-0.37	-15.71
9,496.00	2.02	154.38	8,831.49	2,591.00	-1,481.50	2,972.71	1.01	0.74	-24.03
9,591.00	2.12	163.61	8,926.43	2,587.81	-1,480.28	2,969.39	0.37	0.11	9.72
9,685.00	2.28	153.34	9,020.36	2,584.47	-1,478.95	2,965.89	0.45	0.17	-10.93
9,780.00	2.81	178.46	9,115.27	2,580.45	-1,478.04	2,962.07	1.29	0.56	26.44
9,874.00	3.89	203.16	9,209.11	2,575.21	-1,479.24	2,958.46	1.89	1.15	26.28
9,968.00	4.04	199.38	9,302.89	2,569.16	-1,481.59	2,954.84	0.32	0.16	-4.02
10,063.00	3.61	198.06	9,397.68	2,563.16	-1,483.63	2,951.08	0.46	-0.45	-1.39
10,157.00	4.13	194.20	9,491.46	2,557.06	-1,485.37	2,947.08	0.62	0.55	-4.11
10,251.00	3.59	193.02	9,585.25	2,550.92	-1,486.87	2,942.89	0.58	-0.57	-1.26
10,346.00	3.08	194.64	9,680.09	2,545.55	-1,488.18	2,939.24	0.55	-0.54	1.71
10,440.00	2.99	209.14	9,773.96	2,540.96	-1,490.02	2,936.53	0.82	-0.10	15.43
10,535.00	3.35	198.47	9,868.81	2,536.17	-1,492.10	2,933.79	0.73	0.38	-11.23
10,619.00	3.78	200.17	9,952.65	2,531.24	-1,493.83	2,930.74	0.53	0.51	2.02
Last SDI Production MWD Survey									
10,679.00	3.78	200.17	10,012.52	2,527.53	-1,495.20	2,928.47	0.00	0.00	0.00
Projection to TD - NR 511-3 PBHL									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
122.00	122.00	-0.04	-0.19	First SDI Gyro MWD Survey
489.00	488.09	13.11	-17.18	Last SDI Gyro MWD Survey
559.00	557.18	22.60	-23.19	First SDI Surface MWD Survey
1,051.00	1,020.59	157.77	-110.01	Last SDI Surface MWD Survey
1,091.00	1,056.35	172.88	-119.65	First SDI Production MWD Survey
10,619.00	9,952.65	2,531.24	-1,493.83	Last SDI Production MWD Survey
10,679.00	10,012.52	2,527.53	-1,495.20	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
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Well Details: NR 511-3

TVD Reference: GL 6720' & RKB 24' @ 6744.00usft
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1634940.64 2329730.77 39.5526195 -107.8773363 NR 511-3 (A4)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well NR 511-3 - Slot NR 511-3 (A4), True North
 Vertical (TVD) Reference: GL 6720' & RKB 24' @ 6744.00usft
 Section (VS) Reference: Slot - NR 511-3 (A4)(0.00N, 0.00E)
 Measured Depth Reference: GL 6720' & RKB 24' @ 6744.00usft
 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

13:10, August 09 2018
 Created By: Mel Mireles Jr.