



## **TEP Rocky Mountain LLC**

**Garfield County, CO NAD83**

**SG 11-22 Pad**

**SG 11-22 - Slot SG 11-22 (A5)**

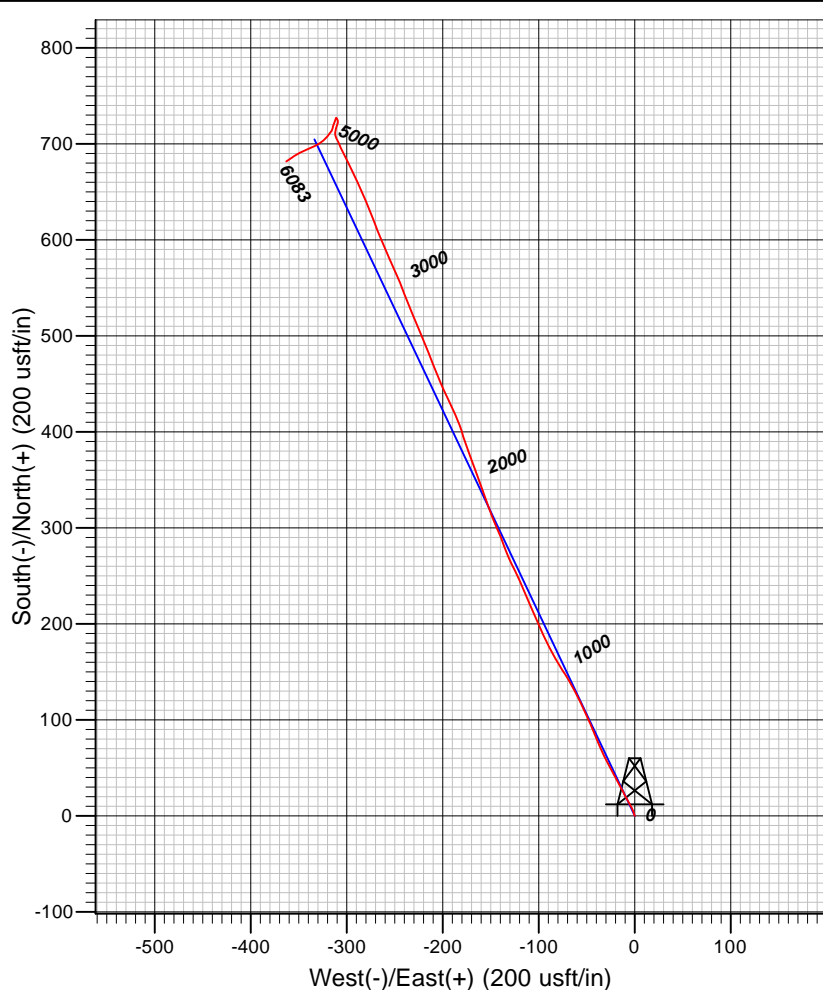
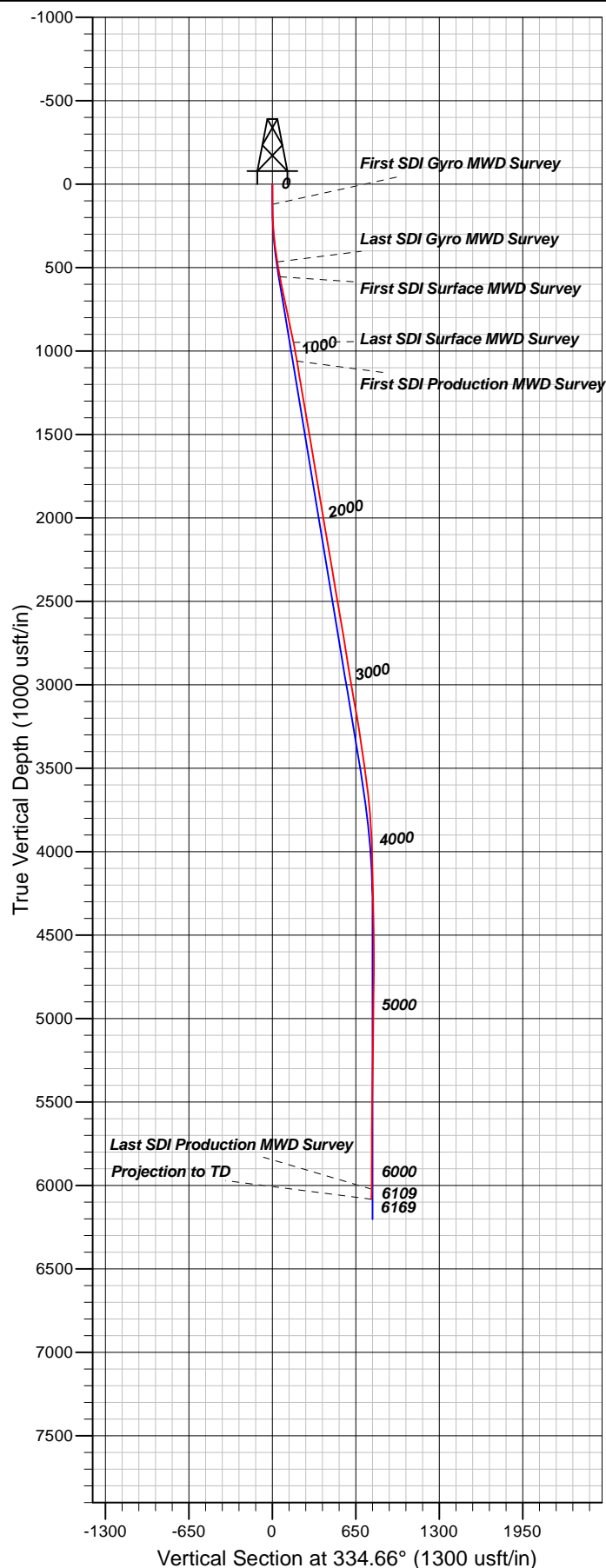
**OH**

**Design: OH**

## **Standard Survey Report**

**22 February, 2019**





#### Well Details: SG 11-22

TVD Reference: GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318) Level: 6092.40  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.00 0.00 1591235.00 2264542.40 39.4277668 -108.1039855 SG 11-22 (A5)

#### REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well SG 11-22 - Slot SG 11-22 (A5), True North  
 Vertical (TVD) Reference: GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)  
 Section (VS) Reference: Slot - SG 11-22 (A5)(0.00N, 0.00E)  
 Measured Depth Reference: GL 6092.4' & RKB 24' @ 6116.40usft (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

16:25, February 22 2019  
 Created By: Mel Mireles Jr.



## 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>	SG 11-22
<b>County &amp; State</b>	Garfield County, CO
<b>SDI Job No.</b>	OP.016705
<b>Rig</b>	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 6,169 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

22-Feb-19

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 SG 11-22 - Slot SG 11-22 (A5)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
<b>Site:</b>	SG 11-22 Pad	<b>MD Reference:</b>	GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
<b>Well:</b>	SG 11-22	<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		SG 11-22 Pad			
Site Position:		Northing:	1,591,239.00 usft	Latitude:	39.4277783
From:	Map	Easting:	2,264,548.70 usft	Longitude:	-108.1039637
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.64 °

Well	SG 11-22 - Slot SG 11-22 (A5)					
Well Position	+N/-S	0.00 usft	Northing:	1,591,235.00 usft	Latitude:	39.4277668
	+E/-W	0.00 usft	Easting:	2,264,542.40 usft	Longitude:	-108.1039856
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,092.40 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	2/18/2019	9.38	65.58	51,623

<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	334.66	

<b>Survey Program</b>	<b>Date</b>	2/22/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
122.00	469.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
561.00	968.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,082.00	6,169.00	Survey #3 - Production MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	

<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	330.47	122.00	0.65	-0.37	0.74	0.57	0.57	0.00	
<b>First SDI Gyro MWD Survey</b>										
213.00	3.34	345.15	212.93	3.69	-1.32	3.90	2.93	2.90	16.13	
306.00	6.33	330.47	305.59	10.78	-4.54	11.68	3.45	3.22	-15.78	
398.00	9.68	332.58	396.69	22.06	-10.61	24.48	3.65	3.64	2.29	
469.00	12.30	331.33	466.38	33.99	-16.98	37.99	3.71	3.69	-1.76	
<b>Last SDI Gyro MWD Survey</b>										

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well SG 11-22 - Slot SG 11-22 (A5)
<b>Project:</b>	Garfield County, CO NAD83	<b>TVD Reference:</b>	GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
<b>Site:</b>	SG 11-22 Pad	<b>MD Reference:</b>	GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
<b>Well:</b>	SG 11-22	<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)	
561.00	14.04	331.89	555.95	52.44	-26.94	58.92	1.90	1.89	0.61	
First SDI Surface MWD Survey										
653.00	15.03	337.10	645.01	73.27	-36.85	81.99	1.78	1.08	5.66	
747.00	15.68	337.09	735.66	96.20	-46.53	106.86	0.69	0.69	-0.01	
841.00	15.11	333.58	826.29	118.87	-56.93	131.80	1.16	-0.61	-3.73	
936.00	13.66	330.85	918.31	139.76	-67.90	155.37	1.68	-1.53	-2.87	
968.00	13.45	329.13	949.41	146.25	-71.65	162.85	1.42	-0.66	-5.38	
Last SDI Surface MWD Survey										
1,082.00	13.09	328.47	1,060.37	168.64	-85.21	188.88	0.34	-0.32	-0.58	
First SDI Production MWD Survey										
1,177.00	13.22	336.54	1,152.88	187.77	-95.16	210.43	1.94	0.14	8.49	
1,271.00	11.96	335.87	1,244.62	206.52	-103.42	230.91	1.35	-1.34	-0.71	
1,365.00	13.28	337.65	1,336.35	225.40	-111.51	251.43	1.46	1.40	1.89	
1,460.00	12.54	335.52	1,428.95	244.88	-119.93	272.64	0.93	-0.78	-2.24	
1,554.00	11.17	333.19	1,520.94	262.29	-128.27	291.95	1.54	-1.46	-2.48	
1,648.00	12.83	340.45	1,612.89	280.25	-135.87	311.44	2.38	1.77	7.72	
1,743.00	11.91	335.83	1,705.69	299.14	-143.41	331.73	1.42	-0.97	-4.86	
1,837.00	13.48	340.21	1,797.39	318.30	-151.09	352.34	1.96	1.67	4.66	
1,932.00	12.51	340.15	1,889.95	338.39	-158.33	373.60	1.02	-1.02	-0.06	
2,026.00	11.42	339.95	1,981.91	356.71	-164.98	393.00	1.16	-1.16	-0.21	
2,120.00	13.33	339.43	2,073.72	375.60	-171.98	413.07	2.04	2.03	-0.55	
2,215.00	11.65	343.23	2,166.47	395.04	-178.60	433.47	1.97	-1.77	4.00	
2,309.00	13.27	337.67	2,258.26	414.11	-185.43	453.63	2.14	1.72	-5.91	
2,403.00	11.22	332.93	2,350.12	432.23	-193.70	473.55	2.43	-2.18	-5.04	
2,498.00	13.20	337.77	2,442.97	450.51	-202.01	493.62	2.34	2.08	5.09	
2,592.00	12.72	337.67	2,534.57	470.01	-210.00	514.67	0.51	-0.51	-0.11	
2,686.00	12.70	338.19	2,626.27	489.18	-217.77	535.32	0.12	-0.02	0.55	
2,781.00	12.01	337.81	2,719.07	508.03	-225.38	555.61	0.73	-0.73	-0.40	
2,875.00	11.78	336.40	2,811.05	525.88	-232.92	574.96	0.39	-0.24	-1.50	
2,970.00	11.06	340.50	2,904.17	543.35	-239.84	593.72	1.14	-0.76	4.32	
3,064.00	13.05	335.05	2,996.09	561.48	-247.33	613.31	2.44	2.12	-5.80	
3,159.00	12.95	337.93	3,088.66	581.07	-255.85	634.66	0.69	-0.11	3.03	
3,253.00	12.68	336.05	3,180.32	600.25	-264.00	655.49	0.53	-0.29	-2.00	
3,348.00	11.72	339.46	3,273.17	618.82	-271.62	675.53	1.26	-1.01	3.59	
3,442.00	10.84	338.39	3,365.36	635.98	-278.22	693.86	0.96	-0.94	-1.14	
3,536.00	10.62	334.96	3,457.71	652.04	-285.14	711.34	0.72	-0.23	-3.65	
3,631.00	9.57	334.10	3,551.24	667.08	-292.30	728.00	1.12	-1.11	-0.91	
3,725.00	9.12	334.64	3,643.99	680.84	-298.90	743.26	0.49	-0.48	0.57	
3,820.00	6.80	333.20	3,738.07	692.67	-304.66	756.41	2.45	-2.44	-1.52	
3,914.00	4.34	338.83	3,831.62	700.95	-308.46	765.52	2.68	-2.62	5.99	
4,009.00	3.95	331.81	3,926.37	707.19	-311.30	772.38	0.67	-0.41	-7.39	
4,103.00	2.43	14.42	4,020.24	711.97	-312.33	777.14	2.89	-1.62	45.33	
4,198.00	2.28	16.50	4,115.16	715.73	-311.30	780.10	0.18	-0.16	2.19	
4,292.00	1.90	17.66	4,209.10	719.01	-310.29	782.63	0.41	-0.40	1.23	

<b>Company:</b>	TEP Rocky Mountain LLC	<b>Local Co-ordinate Reference:</b>	Well SG 11-22 - Slot SG 11-22 (A5)
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<b>Site:</b>	SG 11-22 Pad	<b>MD Reference:</b>	GL 6092.4' & RKB 24' @ 6116.40usft (H&P 318)
<b>Well:</b>	SG 11-22	<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)	
4,387.00	1.67	9.91	4,304.05	721.88	-309.58	784.91	0.35	-0.24	-8.16	
4,439.48	1.45	0.16	4,356.51	723.29	-309.44	786.14	0.65	-0.41	-18.58	
<b>SG 11-22 BTW</b>										
4,481.00	1.32	350.40	4,398.02	724.29	-309.52	787.08	0.65	-0.32	-23.51	
4,575.00	1.43	326.67	4,491.99	726.34	-310.35	789.28	0.61	0.12	-25.24	
4,669.00	0.17	304.77	4,585.98	727.40	-311.11	790.56	1.36	-1.34	-23.30	
4,764.00	0.58	198.51	4,680.98	727.02	-311.37	790.34	0.68	0.43	-111.85	
4,858.00	1.14	192.28	4,774.97	725.66	-311.72	789.25	0.60	0.60	-6.63	
4,953.00	1.58	202.48	4,869.94	723.53	-312.43	787.63	0.53	0.46	10.74	
5,048.00	1.29	207.28	4,964.91	721.36	-313.42	786.10	0.33	-0.31	5.05	
5,142.00	0.86	192.76	5,058.89	719.74	-314.06	784.90	0.54	-0.46	-15.45	
5,236.00	1.10	190.72	5,152.88	718.16	-314.38	783.61	0.26	0.26	-2.17	
5,331.00	1.40	194.64	5,247.86	716.14	-314.84	781.99	0.33	0.32	4.13	
5,425.00	1.79	206.08	5,341.82	713.71	-315.78	780.19	0.53	0.41	12.17	
5,520.00	2.94	225.17	5,436.74	710.66	-318.16	778.45	1.45	1.21	20.09	
5,615.00	3.20	214.79	5,531.60	706.77	-321.40	776.32	0.64	0.27	-10.93	
5,709.00	4.04	230.25	5,625.42	702.50	-325.44	774.19	1.36	0.89	16.45	
5,804.00	6.81	245.80	5,719.99	698.05	-333.16	773.47	3.28	2.92	16.37	
5,898.00	5.70	246.69	5,813.43	693.91	-342.53	773.75	1.19	-1.18	0.95	
5,992.00	5.24	239.63	5,907.00	689.90	-350.52	773.53	0.87	-0.49	-7.51	
6,087.00	4.63	236.39	6,001.65	685.58	-357.45	772.60	0.71	-0.64	-3.41	
6,109.00	4.84	236.23	6,023.57	684.57	-358.96	772.34	0.96	0.95	-0.73	
<b>Last SDI Production MWD Survey</b>										
6,169.00	4.84	236.23	6,083.36	681.76	-363.17	771.60	0.00	0.00	0.00	
<b>Projection to TD - SG 11-22 PBHL</b>										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
122.00	122.00	0.65	-0.37	First SDI Gyro MWD Survey	
469.00	466.38	33.99	-16.98	Last SDI Gyro MWD Survey	
561.00	555.95	52.44	-26.94	First SDI Surface MWD Survey	
968.00	949.41	146.25	-71.65	Last SDI Surface MWD Survey	
1,082.00	1,060.37	168.64	-85.21	First SDI Production MWD Survey	
6,109.00	6,023.57	684.57	-358.96	Last SDI Production MWD Survey	
6,169.00	6,083.36	681.76	-363.17	Projection to TD	

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