



TEP Rocky Mountain LLC

Garfield County, CO NAD83

SG 11-22 Pad

SG 321-22 - Slot SG 321-22 (B4)

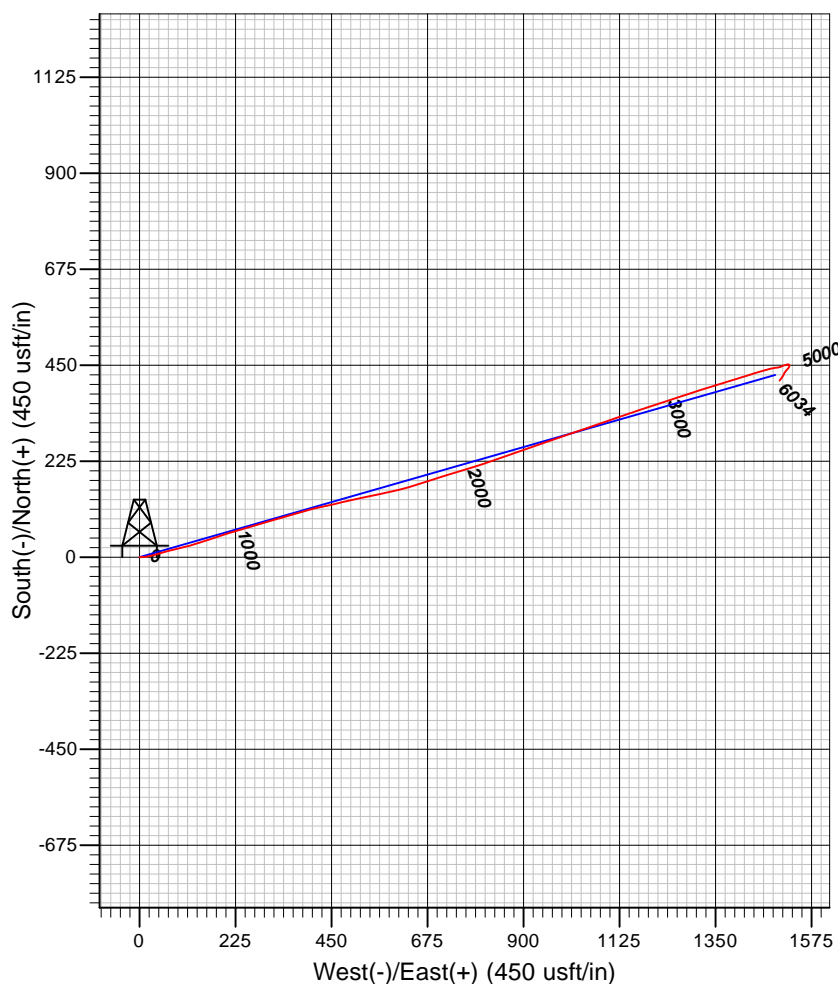
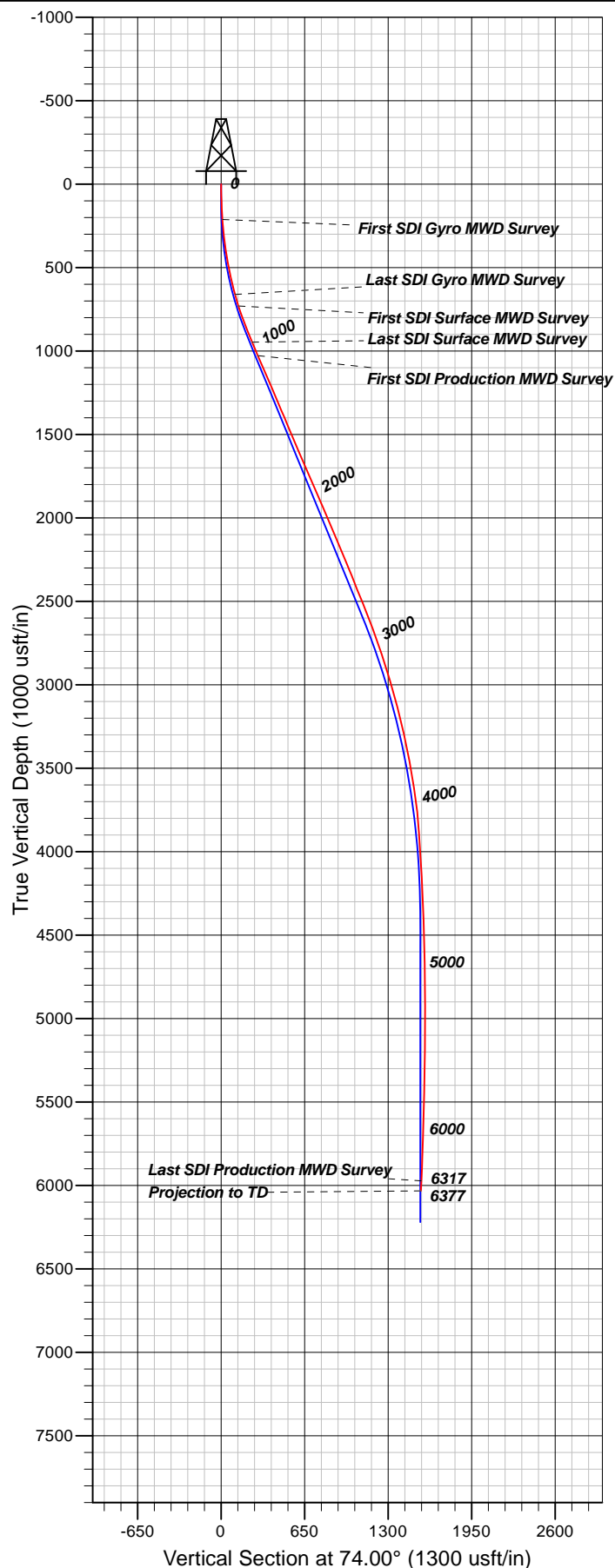
OH

Design: OH

Standard Survey Report

22 February, 2019





Well Details: SG 321-22

TVD Reference: GL 6092.4' & RKB 24' @ 6116.40usft and Level: 6092.40
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1591230.60 2264554.00 39.4277556 -108.1039440 SG 321-22 (B4)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well SG 321-22 - Slot SG 321-22 (B4), True North
 Vertical (TVD) Reference: GL 6092.4' & RKB 24' @ 6116.40usft
 Section (VS) Reference: Slot - SG 321-22 (B4)(0.00N, 0.00E)
 Measured Depth Reference: GL 6092.4' & RKB 24' @ 6116.40usft
 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

15:45, 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

Operator	TEP Rocky Mountain, LLC.
Well Name & No.	SG 321-22
County & State	Garfield County, CO
SDI Job No.	OP.016596
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 213 feet to a measured depth of 6,377 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

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SG 321-22 - Slot SG 321-22 (B4)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft
Site:	SG 11-22 Pad	MD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft
Well:	SG 321-22	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		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 321-22 - Slot SG 321-22 (B4)				
Well Position	+N/-S	0.00 usft	Northing:	1,591,230.60 usft	Latitude:	39.4277556
	+E/-W	0.00 usft	Easting:	2,264,554.00 usft	Longitude:	-108.1039441
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,092.40 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	2/13/2019	9.38	65.58	51,624

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	74.00	

Survey Program	Date	2/22/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
213.00	673.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
747.00	989.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,082.00	6,377.00	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	
213.00	5.19	87.63	212.71	0.40	9.63	9.37	2.44	2.44	0.00	
First SDI Gyro MWD Survey										
306.00	8.45	79.28	305.04	1.84	20.55	20.26	3.65	3.51	-8.98	
398.00	11.26	73.92	395.68	5.59	35.83	35.98	3.21	3.05	-5.83	
489.00	13.90	73.65	484.48	11.13	54.86	55.80	2.90	2.90	-0.30	
581.00	15.84	76.38	573.40	17.20	77.66	79.40	2.24	2.11	2.97	
673.00	19.53	76.38	661.04	23.78	104.82	107.32	4.01	4.01	0.00	

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SG 321-22 - Slot SG 321-22 (B4)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft
Site:	SG 11-22 Pad	MD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft
Well:	SG 321-22	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)
Last SDI Gyro MWD Survey									
747.00	22.93	73.36	730.01	30.82	130.66	134.10	4.82	4.59	-4.08
First SDI Surface MWD Survey									
841.00	25.80	70.76	815.63	42.81	167.53	172.84	3.26	3.05	-2.77
936.00	27.90	72.71	900.38	56.23	208.28	215.71	2.40	2.21	2.05
989.00	28.84	74.07	947.02	63.42	232.41	240.89	2.15	1.77	2.57
Last SDI Surface MWD Survey									
1,082.00	29.90	74.25	1,028.06	75.87	276.29	286.50	1.14	1.14	0.19
First SDI Production MWD Survey									
1,177.00	29.05	73.90	1,110.77	88.69	321.24	333.24	0.91	-0.89	-0.37
1,271.00	28.58	72.59	1,193.13	101.75	364.62	378.54	0.84	-0.50	-1.39
1,365.00	28.69	76.67	1,275.64	113.68	408.03	423.56	2.08	0.12	4.34
1,460.00	29.84	77.94	1,358.51	123.88	453.34	469.92	1.38	1.21	1.34
1,554.00	28.03	76.54	1,440.78	133.91	497.69	515.32	2.06	-1.93	-1.49
1,648.00	29.05	78.55	1,523.36	143.58	541.54	560.14	1.49	1.09	2.14
1,743.00	29.16	78.18	1,606.36	152.90	586.80	606.21	0.22	0.12	-0.39
1,837.00	29.50	73.12	1,688.32	164.31	631.37	652.20	2.66	0.36	-5.38
1,932.00	29.86	72.22	1,770.86	178.32	676.27	699.23	0.60	0.38	-0.95
2,026.00	28.62	72.81	1,852.88	192.12	720.07	745.13	1.35	-1.32	0.63
2,120.00	29.19	73.85	1,935.17	205.15	763.59	790.56	0.81	0.61	1.11
2,214.00	29.46	71.16	2,017.13	218.99	807.49	836.57	1.43	0.29	-2.86
2,308.00	28.46	69.90	2,099.37	234.16	850.40	882.00	1.25	-1.06	-1.34
2,403.00	28.50	70.43	2,182.88	249.53	893.01	927.20	0.27	0.04	0.56
2,497.00	28.83	71.85	2,265.36	264.10	935.68	972.23	0.81	0.35	1.51
2,591.00	27.33	71.50	2,348.29	278.01	977.68	1,016.44	1.61	-1.60	-0.37
2,686.00	27.80	70.77	2,432.51	292.22	1,019.28	1,060.34	0.61	0.49	-0.77
2,780.00	28.07	71.27	2,515.55	306.54	1,060.92	1,104.32	0.38	0.29	0.53
2,875.00	26.69	70.75	2,599.91	320.76	1,102.24	1,147.95	1.47	-1.45	-0.55
2,969.00	25.34	71.05	2,684.38	334.25	1,141.19	1,189.12	1.44	-1.44	0.32
3,064.00	24.28	70.71	2,770.61	347.30	1,178.86	1,228.92	1.13	-1.12	-0.36
3,158.00	22.73	71.29	2,856.81	359.51	1,214.30	1,266.36	1.67	-1.65	0.62
3,253.00	21.19	71.99	2,944.92	370.71	1,248.01	1,301.85	1.64	-1.62	0.74
3,347.00	20.06	72.83	3,032.89	380.72	1,279.57	1,334.95	1.24	-1.20	0.89
3,442.00	19.07	73.00	3,122.41	390.07	1,309.98	1,366.75	1.04	-1.04	0.18
3,536.00	17.62	73.21	3,211.63	398.67	1,338.29	1,396.34	1.54	-1.54	0.22
3,630.00	16.47	72.10	3,301.50	406.88	1,364.59	1,423.88	1.27	-1.22	-1.18
3,725.00	14.50	73.03	3,393.04	414.49	1,388.78	1,449.23	2.09	-2.07	0.98
3,819.00	13.25	71.98	3,484.30	421.25	1,410.28	1,471.77	1.36	-1.33	-1.12
3,914.00	11.74	72.83	3,577.05	427.48	1,429.87	1,492.31	1.60	-1.59	0.89
4,008.00	10.75	74.09	3,669.24	432.70	1,447.44	1,510.64	1.09	-1.05	1.34
4,103.00	7.93	73.56	3,762.97	436.99	1,462.25	1,526.05	2.97	-2.97	-0.56
4,197.00	5.55	75.15	3,856.31	439.99	1,472.86	1,537.09	2.54	-2.53	1.69
4,292.00	5.24	78.31	3,950.89	442.04	1,481.55	1,546.00	0.45	-0.33	3.33
4,386.00	4.23	79.45	4,044.57	443.55	1,489.16	1,553.74	1.08	-1.07	1.21

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Site:	SG 11-22 Pad	MD Reference:	GL 6092.4' & RKB 24' @ 6116.40usft
Well:	SG 321-22	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)	
4,481.00	3.18	86.43	4,139.37	444.35	1,495.24	1,559.80	1.20	-1.11	7.35	
4,575.00	3.55	69.11	4,233.21	445.55	1,500.56	1,565.24	1.15	0.39	-18.43	
4,669.00	3.03	67.88	4,327.06	447.53	1,505.58	1,570.61	0.56	-0.55	-1.31	
4,733.79	2.71	70.06	4,391.77	448.69	1,508.60	1,573.84	0.53	-0.50	3.36	
SG 321-22 BTW										
4,763.00	2.56	71.22	4,420.95	449.14	1,509.87	1,575.18	0.53	-0.50	3.98	
4,858.00	2.35	74.56	4,515.86	450.34	1,513.76	1,579.25	0.27	-0.22	3.52	
4,952.00	1.68	76.48	4,609.80	451.17	1,516.95	1,582.55	0.72	-0.71	2.04	
5,047.00	0.97	82.72	4,704.77	451.60	1,519.11	1,584.74	0.76	-0.75	6.57	
5,141.00	0.93	95.04	4,798.76	451.64	1,520.65	1,586.23	0.22	-0.04	13.11	
5,236.00	0.70	108.62	4,893.75	451.38	1,521.97	1,587.43	0.31	-0.24	14.29	
5,330.00	0.81	154.08	4,987.74	450.60	1,522.81	1,588.02	0.63	0.12	48.36	
5,425.00	1.09	178.03	5,082.73	449.09	1,523.13	1,587.92	0.51	0.29	25.21	
5,519.00	1.41	191.25	5,176.71	447.07	1,522.94	1,587.17	0.46	0.34	14.06	
5,614.00	1.62	214.17	5,271.68	444.81	1,521.95	1,585.60	0.67	0.22	24.13	
5,709.00	2.33	216.75	5,366.62	442.15	1,520.04	1,583.03	0.75	0.75	2.72	
5,803.00	2.51	221.09	5,460.54	439.07	1,517.55	1,579.79	0.27	0.19	4.62	
5,897.00	2.65	223.87	5,554.44	435.95	1,514.69	1,576.18	0.20	0.15	2.96	
5,992.00	2.52	214.06	5,649.34	432.64	1,512.00	1,572.68	0.48	-0.14	-10.33	
6,086.00	2.97	202.12	5,743.24	428.67	1,509.92	1,569.59	0.77	0.48	-12.70	
6,181.00	3.32	210.55	5,838.09	424.02	1,507.60	1,566.07	0.61	0.37	8.87	
6,240.99	3.61	213.65	5,897.97	420.95	1,505.67	1,563.37	0.58	0.48	5.17	
6,317.00	4.06	221.86	5,973.81	416.96	1,502.55	1,559.27	0.93	0.59	10.80	
Last SDI Production MWD Survey										
6,377.00	4.06	221.86	6,033.66	413.79	1,499.71	1,555.67	0.00	0.00	0.00	
Projection to TD - SG 321-22 PBHL										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
213.00	212.71	0.40	9.63	First SDI Gyro MWD Survey	
673.00	661.04	23.78	104.82	Last SDI Gyro MWD Survey	
747.00	730.01	30.82	130.66	First SDI Surface MWD Survey	
989.00	947.02	63.42	232.41	Last SDI Surface MWD Survey	
1,082.00	1,028.06	75.87	276.29	First SDI Production MWD Survey	
6,317.00	5,973.81	416.96	1,502.55	Last SDI Production MWD Survey	
6,377.00	6,033.66	413.79	1,499.71	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____