



TEP Rocky Mountain LLC

Garfield County, CO NAD83

MV 5-10 Pad

Federal GM 434-10 - Slot A2

OH

Plan: Plan #2 21Sept2016 jcsdi

Standard Planning Report

22 September, 2016



www.scientificdrilling.com



Database:	Grand Junction District	Local Co-ordinate Reference:	Well Federal GM 434-10 - Slot A2
Company:	TEP Rocky Mountain LLC	TVD Reference:	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
Project:	Garfield County, CO NAD83	MD Reference:	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
Site:	MV 5-10 Pad	North Reference:	True
Well:	Federal GM 434-10	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2 21Sept2016 jcsdi		

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	MV 5-10 Pad				
Site Position:		Northing:	1,600,344.70 usft	Latitude:	39.4529509
From:	Map	Easting:	2,266,881.70 usft	Longitude:	-108.0966291
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.64 °

Well	Federal GM 434-10 - Slot A2					
Well Position	+N/-S	-17.72 usft	Northing:	1,600,328.40 usft	Latitude:	39.4529023
	+E/-W	-49.41 usft	Easting:	2,266,831.80 usft	Longitude:	-108.0968041
Position Uncertainty	0.00 usft		Wellhead Elevation:	0.00 usft	Ground Level:	6,148.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2016	9/13/2016	9.72	65.58	51,587

Design	Plan #2 21Sept2016 jcsdi			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	160.58

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
130.00	0.00	0.00	130.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,038.80	40.90	160.58	963.58	-293.13	103.32	4.50	4.50	0.00	160.58	
4,151.64	40.90	160.58	3,316.56	-2,215.16	780.81	0.00	0.00	0.00	0.00	
5,787.49	0.00	0.00	4,817.00	-2,742.79	966.79	2.50	-2.50	0.00	180.00	GM 434-10 KMV
7,697.49	0.00	0.00	6,727.00	-2,742.79	966.79	0.00	0.00	0.00	0.00	GM 434-10 PBHL

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Project:	Garfield County, CO NAD83	MD Reference:	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
Site:	MV 5-10 Pad	North Reference:	True
Well:	Federal GM 434-10	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2 21Sept2016 jcsdi		

Planned 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	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130.00	0.00	0.00	130.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	3.15	160.58	199.96	-1.81	0.64	1.92	4.50	4.50	0.00	0.00
300.00	7.65	160.58	299.50	-10.69	3.77	11.33	4.50	4.50	0.00	0.00
400.00	12.15	160.58	397.98	-26.90	9.48	28.52	4.50	4.50	0.00	0.00
500.00	16.65	160.58	494.81	-50.35	17.75	53.38	4.50	4.50	0.00	0.00
600.00	21.15	160.58	589.40	-80.89	28.51	85.77	4.50	4.50	0.00	0.00
700.00	25.65	160.58	681.15	-118.34	41.71	125.47	4.50	4.50	0.00	0.00
800.00	30.15	160.58	769.50	-162.46	57.26	172.25	4.50	4.50	0.00	0.00
900.00	34.65	160.58	853.92	-212.98	75.07	225.82	4.50	4.50	0.00	0.00
1,000.00	39.15	160.58	933.86	-269.59	95.03	285.85	4.50	4.50	0.00	0.00
1,038.80	40.90	160.58	963.58	-293.13	103.32	310.80	4.50	4.50	0.00	0.00
1,088.80	40.90	160.58	1,001.37	-324.00	114.20	343.53	0.00	0.00	0.00	0.00
9 5/8" @ 1088' MD										
1,100.00	40.90	160.58	1,009.84	-330.91	116.64	350.87	0.00	0.00	0.00	0.00
1,200.00	40.90	160.58	1,085.43	-392.66	138.40	416.34	0.00	0.00	0.00	0.00
1,300.00	40.90	160.58	1,161.01	-454.40	160.17	481.80	0.00	0.00	0.00	0.00
1,400.00	40.90	160.58	1,236.60	-516.15	181.93	547.27	0.00	0.00	0.00	0.00
1,500.00	40.90	160.58	1,312.19	-577.89	203.70	612.74	0.00	0.00	0.00	0.00
1,600.00	40.90	160.58	1,387.78	-639.64	225.46	678.21	0.00	0.00	0.00	0.00
1,700.00	40.90	160.58	1,463.37	-701.38	247.23	743.68	0.00	0.00	0.00	0.00
1,800.00	40.90	160.58	1,538.96	-763.13	268.99	809.15	0.00	0.00	0.00	0.00
1,900.00	40.90	160.58	1,614.55	-824.88	290.75	874.62	0.00	0.00	0.00	0.00
2,000.00	40.90	160.58	1,690.14	-886.62	312.52	940.09	0.00	0.00	0.00	0.00
2,100.00	40.90	160.58	1,765.73	-948.37	334.28	1,005.56	0.00	0.00	0.00	0.00
2,200.00	40.90	160.58	1,841.32	-1,010.11	356.05	1,071.03	0.00	0.00	0.00	0.00
2,300.00	40.90	160.58	1,916.91	-1,071.86	377.81	1,136.50	0.00	0.00	0.00	0.00
2,400.00	40.90	160.58	1,992.50	-1,133.60	399.58	1,201.96	0.00	0.00	0.00	0.00
2,431.09	40.90	160.58	2,016.00	-1,152.80	406.34	1,222.32	0.00	0.00	0.00	0.00
G_Sand										
2,500.00	40.90	160.58	2,068.09	-1,195.35	421.34	1,267.43	0.00	0.00	0.00	0.00
2,570.00	40.90	160.58	2,121.00	-1,238.57	436.57	1,313.26	0.00	0.00	0.00	0.00
G_Sand Base										
2,600.00	40.90	160.58	2,143.68	-1,257.09	443.10	1,332.90	0.00	0.00	0.00	0.00
2,700.00	40.90	160.58	2,219.27	-1,318.84	464.87	1,398.37	0.00	0.00	0.00	0.00
2,800.00	40.90	160.58	2,294.86	-1,380.59	486.63	1,463.84	0.00	0.00	0.00	0.00
2,900.00	40.90	160.58	2,370.45	-1,442.33	508.40	1,529.31	0.00	0.00	0.00	0.00
3,000.00	40.90	160.58	2,446.04	-1,504.08	530.16	1,594.78	0.00	0.00	0.00	0.00
3,100.00	40.90	160.58	2,521.63	-1,565.82	551.93	1,660.25	0.00	0.00	0.00	0.00
3,200.00	40.90	160.58	2,597.22	-1,627.57	573.69	1,725.72	0.00	0.00	0.00	0.00
3,300.00	40.90	160.58	2,672.81	-1,689.31	595.45	1,791.19	0.00	0.00	0.00	0.00
3,400.00	40.90	160.58	2,748.40	-1,751.06	617.22	1,856.66	0.00	0.00	0.00	0.00
3,500.00	40.90	160.58	2,823.99	-1,812.81	638.98	1,922.12	0.00	0.00	0.00	0.00
3,600.00	40.90	160.58	2,899.58	-1,874.55	660.75	1,987.59	0.00	0.00	0.00	0.00
3,700.00	40.90	160.58	2,975.17	-1,936.30	682.51	2,053.06	0.00	0.00	0.00	0.00
3,800.00	40.90	160.58	3,050.76	-1,998.04	704.28	2,118.53	0.00	0.00	0.00	0.00
3,900.00	40.90	160.58	3,126.35	-2,059.79	726.04	2,184.00	0.00	0.00	0.00	0.00
4,000.00	40.90	160.58	3,201.94	-2,121.53	747.80	2,249.47	0.00	0.00	0.00	0.00
4,100.00	40.90	160.58	3,277.53	-2,183.28	769.57	2,314.94	0.00	0.00	0.00	0.00
4,151.64	40.90	160.58	3,316.56	-2,215.16	780.81	2,348.75	0.00	0.00	0.00	0.00
4,200.00	39.69	160.58	3,353.45	-2,244.66	791.20	2,380.02	2.50	-2.50	0.00	0.00

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Wellbore:	OH		
Design:	Plan #2 21Sept2016 jcsdi		

Planned 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)	
4,300.00	37.19	160.58	3,431.77	-2,303.28	811.87	2,442.18	2.50	-2.50	0.00	
4,400.00	34.69	160.58	3,512.73	-2,358.63	831.38	2,500.87	2.50	-2.50	0.00	
4,500.00	32.19	160.58	3,596.17	-2,410.60	849.69	2,555.96	2.50	-2.50	0.00	
4,600.00	29.69	160.58	3,681.94	-2,459.08	866.78	2,607.37	2.50	-2.50	0.00	
4,613.86	29.34	160.58	3,694.00	-2,465.52	869.05	2,614.20	2.50	-2.50	0.00	
MVRD										
4,700.00	27.19	160.58	3,769.86	-2,503.99	882.61	2,654.98	2.50	-2.50	0.00	
4,800.00	24.69	160.58	3,859.79	-2,545.23	897.15	2,698.72	2.50	-2.50	0.00	
4,900.00	22.19	160.58	3,951.53	-2,582.74	910.37	2,738.49	2.50	-2.50	0.00	
5,000.00	19.69	160.58	4,044.92	-2,616.44	922.25	2,774.22	2.50	-2.50	0.00	
5,100.00	17.19	160.58	4,139.78	-2,646.27	932.76	2,805.85	2.50	-2.50	0.00	
5,200.00	14.69	160.58	4,235.93	-2,672.16	941.89	2,833.30	2.50	-2.50	0.00	
5,300.00	12.19	160.58	4,333.18	-2,694.08	949.62	2,856.54	2.50	-2.50	0.00	
5,400.00	9.69	160.58	4,431.36	-2,711.97	955.92	2,875.51	2.50	-2.50	0.00	
5,500.00	7.19	160.58	4,530.27	-2,725.81	960.80	2,890.18	2.50	-2.50	0.00	
5,600.00	4.69	160.58	4,629.72	-2,735.56	964.24	2,900.53	2.50	-2.50	0.00	
5,700.00	2.19	160.58	4,729.53	-2,741.21	966.23	2,906.52	2.50	-2.50	0.00	
5,787.49	0.00	0.00	4,817.00	-2,742.79	966.79	2,908.19	2.50	-2.50	0.00	
KMVGAS - GM 434-10 KMV										
5,800.00	0.00	0.00	4,829.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
5,900.00	0.00	0.00	4,929.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
6,000.00	0.00	0.00	5,029.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
6,100.00	0.00	0.00	5,129.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
6,200.00	0.00	0.00	5,229.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
6,300.00	0.00	0.00	5,329.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
6,400.00	0.00	0.00	5,429.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
6,500.00	0.00	0.00	5,529.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
6,600.00	0.00	0.00	5,629.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
6,700.00	0.00	0.00	5,729.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
6,800.00	0.00	0.00	5,829.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
6,900.00	0.00	0.00	5,929.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,029.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
7,056.49	0.00	0.00	6,086.00	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
CME0										
7,100.00	0.00	0.00	6,129.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
7,200.00	0.00	0.00	6,229.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
7,300.00	0.00	0.00	6,329.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
7,400.00	0.00	0.00	6,429.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
7,500.00	0.00	0.00	6,529.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
7,547.49	0.00	0.00	6,577.00	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
RLNS										
7,600.00	0.00	0.00	6,629.51	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
7,697.49	0.00	0.00	6,727.00	-2,742.79	966.79	2,908.19	0.00	0.00	0.00	
GM 434-10 PBHL										

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Company:	TEP Rocky Mountain LLC	TVD Reference:	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
Project:	Garfield County, CO NAD83	MD Reference:	GL 6148' & RKB 24' @ 6172.00usft (H&P 318)
Site:	MV 5-10 Pad	North Reference:	True
Well:	Federal GM 434-10	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2 21Sept2016 jcsdi		

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
GM 434-10 KMV - plan hits target center - Circle (radius 25.00)	0.00	0.00	4,817.00	-2,742.79	966.79	1,597,559.10	2,267,719.80	39.4453720	-108.0933807
GM 434-10 PBHL - plan hits target center - Point	0.00	0.00	6,727.00	-2,742.79	966.79	1,597,559.10	2,267,719.80	39.4453720	-108.0933807

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,088.80	1,001.37	9 5/8" @ 1088' MD	9.62	9.62	

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,431.09	2,016.00	G_Sand		0.00	0.00
2,570.00	2,121.00	G_Sand Base		0.00	0.00
4,613.86	3,694.00	MVRD		0.00	0.00
5,787.49	4,817.00	KMVGAS		0.00	0.00
7,056.49	6,086.00	CME0		0.00	0.00
7,547.49	6,577.00	RLNS		0.00	0.00