



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 13-3
County & State	Garfield County, CO
SDI Job No.	OP.013659
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 121 feet to a measured depth of 10,142 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

17-Oct-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 13-3 - Slot NR 13-3 (A9)
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 13-3	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 13-3 - Slot NR 13-3 (A9)				
Well Position	+N/-S	0.00 usft	Northing:	1,634,910.57 usft	Latitude:	39.5525386
	+E/-W	0.00 usft	Easting:	2,329,753.18 usft	Longitude:	-107.8772541
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	10/8/2018	9.43	65.78	51,530

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	242.38	

Survey Program	Date	10/17/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
121.00	580.00	Survey #1 - Gyro MWD Survey (OH)	Gyro MWD 105	Gyro MWD Error Model Ver 1.0.5	
654.00	1,069.00	Survey #2 - Surface MWD Survey (OH)	MWD+HDGM	OWSG MWD + HDGM	
1,181.00	10,142.00	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	
121.00	0.18	88.33	121.00	0.01	0.19	-0.17	0.15	0.15	0.00	
First SDI Gyro MWD Survey										
213.00	0.97	228.43	213.00	-0.51	-0.25	0.45	1.21	0.86	152.28	
305.00	2.64	256.64	304.95	-1.51	-2.89	3.26	2.00	1.82	30.66	
397.00	3.17	257.17	396.83	-2.57	-7.43	7.78	0.58	0.58	0.58	
489.00	5.01	259.37	488.59	-3.87	-13.86	14.08	2.01	2.00	2.39	
580.00	7.13	278.26	579.09	-3.80	-23.36	22.46	3.17	2.33	20.76	

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Site:	NR 23-3 Pad	MD Reference:	GL 6720' & RKB 24' @ 6744.00usft
Well:	NR 13-3	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)
Last SDI Gyro MWD Survey									
654.00	9.88	286.38	652.27	-1.34	-34.00	30.75	4.05	3.72	10.97
First SDI Surface MWD Survey									
745.00	13.62	287.40	741.34	4.06	-51.72	43.94	4.12	4.11	1.12
839.00	14.71	287.35	832.48	10.93	-73.67	60.21	1.16	1.16	-0.05
934.00	13.13	289.08	924.69	18.06	-95.38	76.14	1.72	-1.66	1.82
1,028.00	14.07	295.16	1,016.06	26.40	-115.82	90.38	1.82	1.00	6.47
1,069.00	14.51	294.55	1,055.79	30.66	-125.00	96.54	1.13	1.07	-1.49
Last SDI Surface MWD Survey									
1,181.00	15.45	295.90	1,163.98	43.00	-151.18	114.02	0.90	0.84	1.21
First SDI Production MWD Survey									
1,276.00	15.72	294.09	1,255.49	53.78	-174.31	129.52	0.59	0.28	-1.91
1,370.00	16.29	292.90	1,345.85	64.11	-198.08	145.79	0.70	0.61	-1.27
1,465.00	15.92	297.89	1,437.12	75.39	-221.87	161.64	1.51	-0.39	5.25
1,559.00	15.64	297.25	1,527.58	87.22	-244.53	176.23	0.35	-0.30	-0.68
1,654.00	15.77	296.58	1,619.04	98.86	-267.46	191.15	0.23	0.14	-0.71
1,748.00	15.56	296.13	1,709.54	110.13	-290.21	206.08	0.26	-0.22	-0.48
1,843.00	15.45	295.30	1,801.09	121.15	-313.09	221.24	0.26	-0.12	-0.87
1,937.00	15.04	293.23	1,891.78	131.31	-335.61	236.49	0.72	-0.44	-2.20
2,032.00	14.68	292.35	1,983.60	140.75	-358.07	252.02	0.45	-0.38	-0.93
2,126.00	14.60	290.59	2,074.55	149.45	-380.18	267.58	0.48	-0.09	-1.87
2,221.00	14.60	293.40	2,166.48	158.41	-402.38	283.09	0.75	0.00	2.96
2,315.00	14.60	290.86	2,257.45	167.34	-424.32	298.39	0.68	0.00	-2.70
2,410.00	14.51	294.81	2,349.40	176.59	-446.31	313.59	1.05	-0.09	4.16
2,504.00	14.42	298.85	2,440.43	187.18	-467.25	327.23	1.08	-0.10	4.30
2,599.00	14.30	296.52	2,532.46	198.13	-488.11	340.64	0.62	-0.13	-2.45
2,693.00	14.16	293.93	2,623.58	207.98	-509.01	354.59	0.69	-0.15	-2.76
2,788.00	13.89	298.41	2,715.75	218.12	-529.66	368.19	1.18	-0.28	4.72
2,882.00	14.07	296.31	2,806.96	228.55	-549.83	381.22	0.57	0.19	-2.23
2,977.00	14.02	295.03	2,899.12	238.54	-570.60	395.00	0.33	-0.05	-1.35
3,071.00	14.41	293.42	2,990.24	248.00	-591.65	409.26	0.59	0.41	-1.71
3,166.00	14.33	291.82	3,082.27	257.07	-613.42	424.34	0.43	-0.08	-1.68
3,261.00	14.42	297.36	3,174.30	266.88	-634.84	438.77	1.45	0.09	5.83
3,355.00	14.60	294.99	3,265.31	277.26	-655.97	452.69	0.66	0.19	-2.52
3,450.00	14.65	293.33	3,357.23	287.08	-677.85	467.53	0.44	0.05	-1.75
3,544.00	14.67	293.23	3,448.17	296.48	-699.71	482.53	0.03	0.02	-0.11
3,639.00	13.87	290.70	3,540.24	305.25	-721.41	497.70	1.07	-0.84	-2.66
3,734.00	15.30	293.40	3,632.17	314.25	-743.57	513.15	1.67	1.51	2.84
3,828.00	15.04	293.05	3,722.90	323.95	-766.17	528.69	0.29	-0.28	-0.37
3,923.00	14.77	292.26	3,814.70	333.37	-788.72	544.30	0.36	-0.28	-0.83
4,017.00	15.80	296.56	3,905.38	343.63	-811.26	559.51	1.63	1.10	4.57
4,112.00	15.39	296.83	3,996.88	355.10	-834.08	574.41	0.44	-0.43	0.28
4,206.00	14.95	295.34	4,087.61	365.92	-856.17	588.97	0.63	-0.47	-1.59
4,301.00	14.42	293.58	4,179.50	375.90	-878.08	603.76	0.73	-0.56	-1.85

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

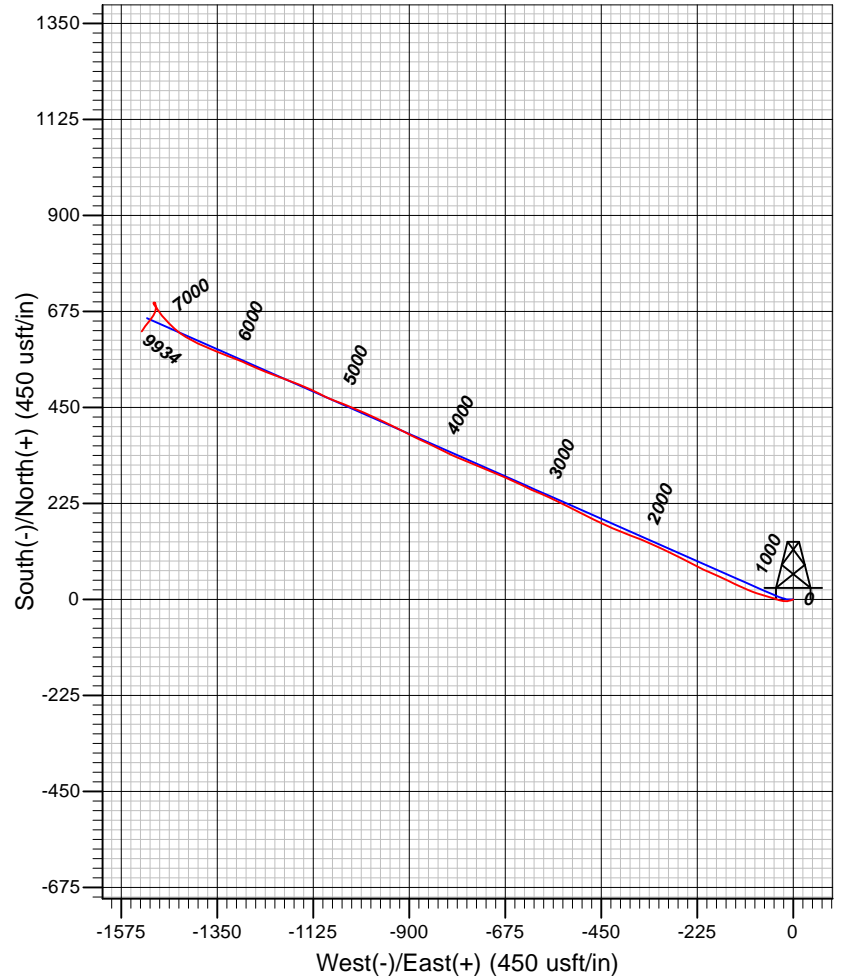
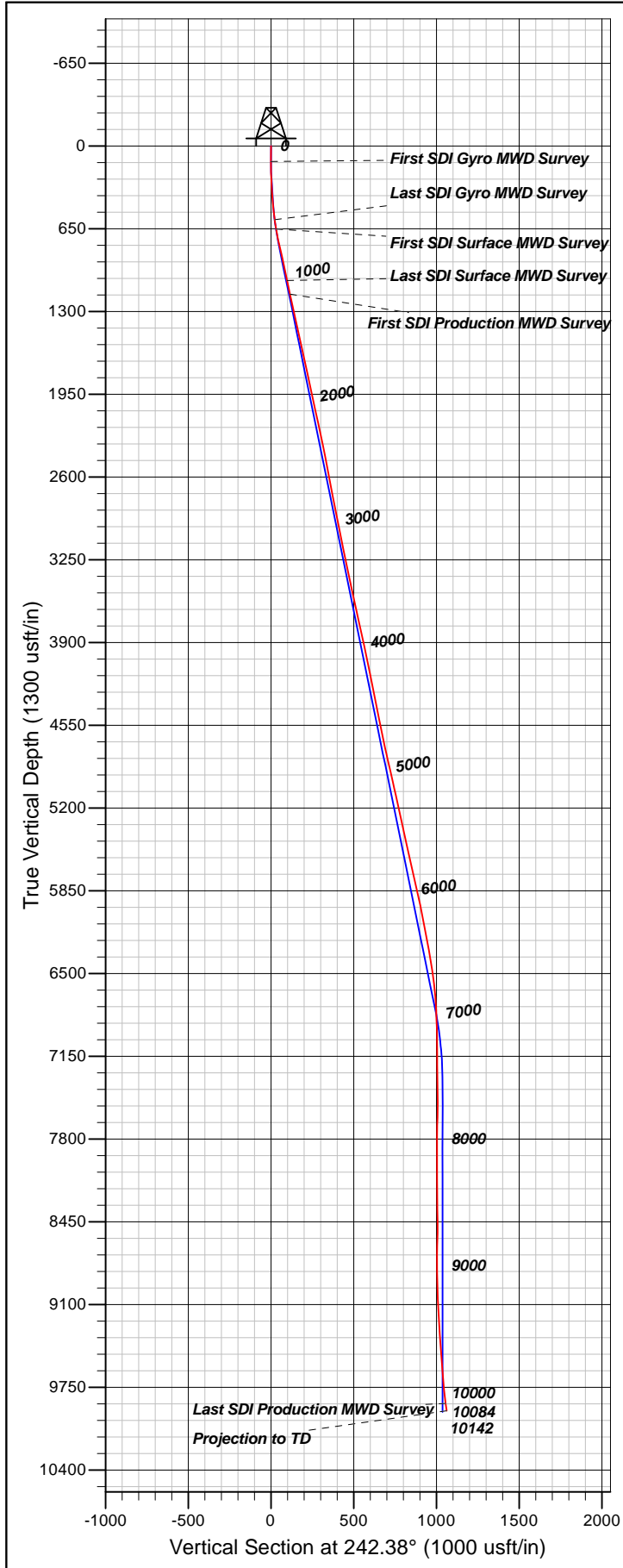
Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,395.00	15.65	298.15	4,270.29	386.56	-899.99	618.23	1.82	1.31	4.86	
4,490.00	14.42	296.83	4,362.03	397.95	-921.84	632.32	1.34	-1.29	-1.39	
4,585.00	13.63	295.78	4,454.20	408.15	-942.48	645.87	0.87	-0.83	-1.11	
4,680.00	15.57	296.04	4,546.13	418.62	-964.02	660.10	2.04	2.04	0.27	
4,774.00	14.77	294.20	4,636.85	429.07	-986.28	674.98	0.99	-0.85	-1.96	
4,868.00	13.89	292.70	4,727.93	438.33	-1,007.62	689.59	1.02	-0.94	-1.60	
4,963.00	15.49	292.47	4,819.82	447.58	-1,029.86	705.01	1.69	1.68	-0.24	
5,057.00	15.19	292.07	4,910.47	457.01	-1,052.88	721.03	0.34	-0.32	-0.43	
5,152.00	14.79	290.85	5,002.24	466.00	-1,075.74	737.13	0.54	-0.42	-1.28	
5,247.00	16.21	294.72	5,093.78	475.86	-1,099.12	753.27	1.85	1.49	4.07	
5,341.00	15.98	296.44	5,184.10	487.11	-1,122.62	768.88	0.56	-0.24	1.83	
5,435.00	15.34	294.45	5,274.61	498.02	-1,145.53	784.12	0.89	-0.68	-2.12	
5,530.00	14.75	291.88	5,366.35	507.73	-1,168.19	799.70	0.94	-0.62	-2.71	
5,624.00	13.37	289.41	5,457.54	515.80	-1,189.55	814.88	1.60	-1.47	-2.63	
5,719.00	14.65	290.46	5,549.71	523.65	-1,211.16	830.39	1.37	1.35	1.11	
5,813.00	14.25	290.24	5,640.73	531.81	-1,233.15	846.09	0.43	-0.43	-0.23	
5,908.00	16.09	295.25	5,732.42	541.47	-1,256.03	861.89	2.38	1.94	5.27	
6,003.00	15.65	293.40	5,823.80	552.17	-1,279.70	877.90	0.71	-0.46	-1.95	
6,097.00	14.42	291.73	5,914.58	561.54	-1,302.21	893.50	1.39	-1.31	-1.78	
6,192.00	12.84	291.38	6,006.91	569.77	-1,323.03	908.13	1.67	-1.66	-0.37	
6,286.00	13.54	293.14	6,098.43	577.90	-1,342.87	921.94	0.86	0.74	1.87	
6,381.00	12.49	289.27	6,190.99	585.66	-1,362.80	936.00	1.44	-1.11	-4.07	
6,475.00	12.93	295.07	6,282.69	593.47	-1,381.92	949.32	1.44	0.47	6.17	
6,570.00	13.63	297.01	6,375.15	603.06	-1,401.52	962.24	0.87	0.74	2.04	
6,665.00	12.75	300.08	6,467.64	613.40	-1,420.57	974.32	1.18	-0.93	3.23	
6,760.00	11.26	305.89	6,560.56	624.09	-1,437.15	984.06	2.02	-1.57	6.12	
6,854.00	9.68	312.38	6,653.00	634.80	-1,450.43	990.86	2.09	-1.68	6.90	
6,949.00	8.53	315.64	6,746.80	645.22	-1,461.25	995.62	1.33	-1.21	3.43	
7,044.00	7.39	317.84	6,840.88	654.79	-1,470.28	999.19	1.24	-1.20	2.32	
7,139.00	6.68	318.28	6,935.17	663.44	-1,478.06	1,002.07	0.75	-0.75	0.46	
7,233.00	5.01	326.28	7,028.68	670.94	-1,483.98	1,003.84	1.97	-1.78	8.51	
7,328.00	4.04	329.53	7,123.38	677.27	-1,487.98	1,004.44	1.06	-1.02	3.42	
7,421.00	3.25	329.09	7,216.19	682.36	-1,490.99	1,004.76	0.85	-0.85	-0.47	
7,517.00	2.81	321.35	7,312.06	686.53	-1,493.86	1,005.36	0.62	-0.46	-8.06	
7,548.68	2.68	317.49	7,343.70	687.68	-1,494.84	1,005.70	0.72	-0.42	-12.18	
NR 13-3 BTV										
7,611.00	2.46	308.79	7,405.96	689.59	-1,496.87	1,006.61	0.72	-0.35	-13.96	
7,706.00	2.02	337.37	7,500.89	692.41	-1,499.10	1,007.28	1.25	-0.46	30.08	
7,800.00	1.36	27.40	7,594.85	694.93	-1,499.23	1,006.22	1.65	-0.70	53.22	
7,895.00	1.06	91.61	7,689.83	695.91	-1,497.83	1,004.53	1.38	-0.32	67.59	
7,989.00	0.94	133.99	7,783.82	695.35	-1,496.41	1,003.53	0.78	-0.13	45.09	
8,084.00	0.97	143.64	7,878.81	694.16	-1,495.37	1,003.16	0.17	0.03	10.16	
8,178.00	0.88	174.05	7,972.80	692.80	-1,494.82	1,003.31	0.52	-0.10	32.35	
8,272.00	0.35	277.50	8,066.79	692.12	-1,495.03	1,003.81	1.08	-0.56	110.05	

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Well:	NR 13-3	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)
8,367.00	0.79	300.26	8,161.79	692.49	-1,495.89	1,004.40	0.51	0.46	23.96
8,461.00	0.79	311.42	8,255.78	693.25	-1,496.93	1,004.97	0.16	0.00	11.87
8,556.00	0.62	293.58	8,350.77	693.88	-1,497.89	1,005.53	0.29	-0.18	-18.78
8,650.00	0.44	245.88	8,444.77	693.94	-1,498.69	1,006.21	0.49	-0.19	-50.74
8,745.00	0.71	38.77	8,539.77	694.25	-1,498.65	1,006.03	1.18	0.28	160.94
8,839.00	0.88	89.85	8,633.76	694.71	-1,497.57	1,004.86	0.75	0.18	54.34
8,934.00	1.09	133.94	8,728.75	694.08	-1,496.19	1,003.92	0.80	0.22	46.41
9,028.00	1.72	162.42	8,822.72	692.12	-1,495.12	1,003.89	0.98	0.67	30.30
9,122.00	2.73	175.72	8,916.65	688.54	-1,494.52	1,005.02	1.20	1.07	14.15
9,216.00	2.99	177.61	9,010.53	683.86	-1,494.25	1,006.95	0.29	0.28	2.01
9,310.00	3.78	186.00	9,104.36	678.33	-1,494.48	1,009.71	0.99	0.84	8.93
9,405.00	3.52	203.05	9,199.17	672.53	-1,495.94	1,013.70	1.17	-0.27	17.95
9,498.00	2.97	214.29	9,292.03	667.91	-1,498.42	1,018.04	0.90	-0.59	12.09
9,594.00	3.52	211.58	9,387.87	663.34	-1,501.36	1,022.76	0.59	0.57	-2.82
9,688.00	4.04	217.20	9,481.67	658.25	-1,504.88	1,028.24	0.68	0.55	5.98
9,782.00	3.52	220.90	9,575.46	653.43	-1,508.77	1,033.92	0.61	-0.55	3.94
9,877.00	3.87	214.92	9,670.27	648.60	-1,512.51	1,039.48	0.55	0.37	-6.29
9,971.00	4.92	215.14	9,763.99	642.70	-1,516.65	1,045.88	1.12	1.12	0.23
10,065.00	6.24	214.74	9,857.54	635.20	-1,521.88	1,053.99	1.40	1.40	-0.43
10,084.00	6.60	215.45	9,876.42	633.47	-1,523.10	1,055.87	1.94	1.89	3.74
Last SDI Production MWD Survey									
10,142.00	6.60	215.45	9,934.04	628.04	-1,526.97	1,061.82	0.00	0.00	0.00
Projection to TD - NR 13-3 PBHL									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
121.00	121.00	0.01	0.19	First SDI Gyro MWD Survey
580.00	579.09	-3.80	-23.36	Last SDI Gyro MWD Survey
654.00	652.27	-1.34	-34.00	First SDI Surface MWD Survey
1,069.00	1,055.79	30.66	-125.00	Last SDI Surface MWD Survey
1,181.00	1,163.98	43.00	-151.18	First SDI Production MWD Survey
10,084.00	9,876.42	633.47	-1,523.10	Last SDI Production MWD Survey
10,142.00	9,934.04	628.04	-1,526.97	Projection to TD

Checked By: _____ Approved By: _____ Date: _____



Well Details: NR 13-3

TVD Reference: GL 6720' & RKB 24' @ 6744.00usft
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1634910.57 2329753.18 39.5525386 -107.8772541 NR 13-3 (A9)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well NR 13-3 - Slot NR 13-3 (A9), True North
 Vertical (TVD) Reference: GL 6720' & RKB 24' @ 6744.00usft
 Section (VS) Reference: Slot - NR 13-3 (A9)(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

11:15, October 17 2018
 Created By: Mel Mireles Jr.