

Project: Garfield County, CO
 Site: Sec 17, T7S, R93W
 Well: RU 344-8
 Wellbore: Wellbore #1
 Design: Plan 5
 Latitude: 39.450065
 Longitude: -107.795962
 Ground Level: 7861.40
 KB=24' @ 7885.40usft (H&P #318)

PROJECT DETAILS: Garfield County, CO	
Geodetic System: US State Plane 1983	
Datum: North American Datum 1983	
Ellipsoid: GRS 1980	
Zone: Colorado Central Zone	
System Datum: Mean Sea Level	

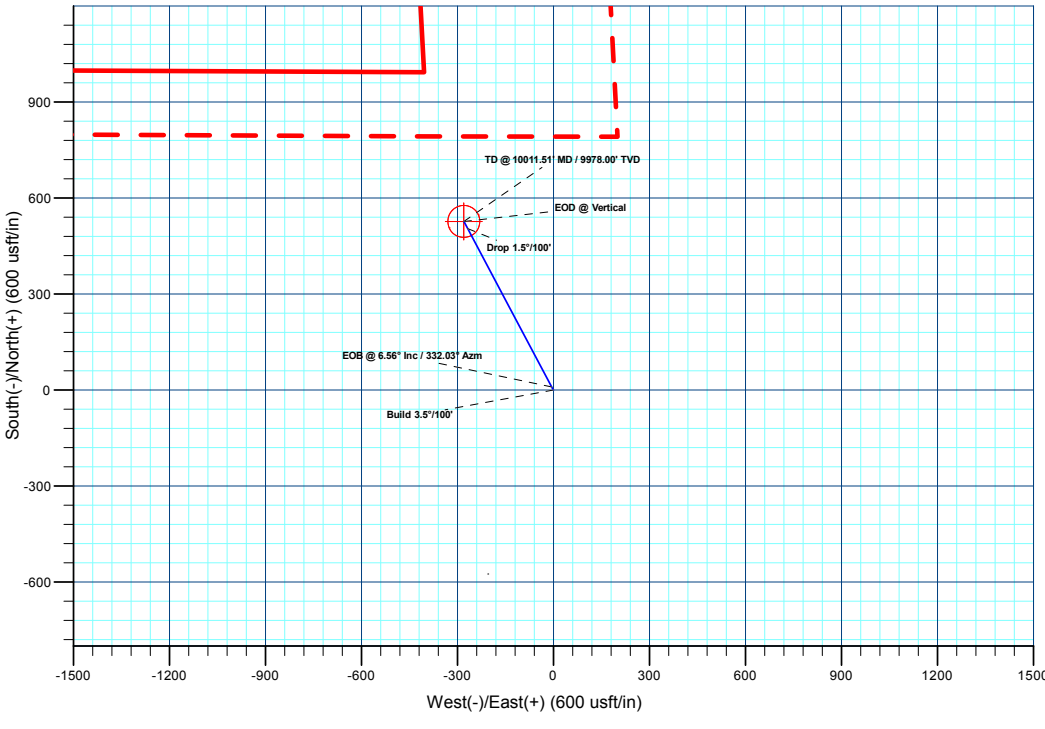
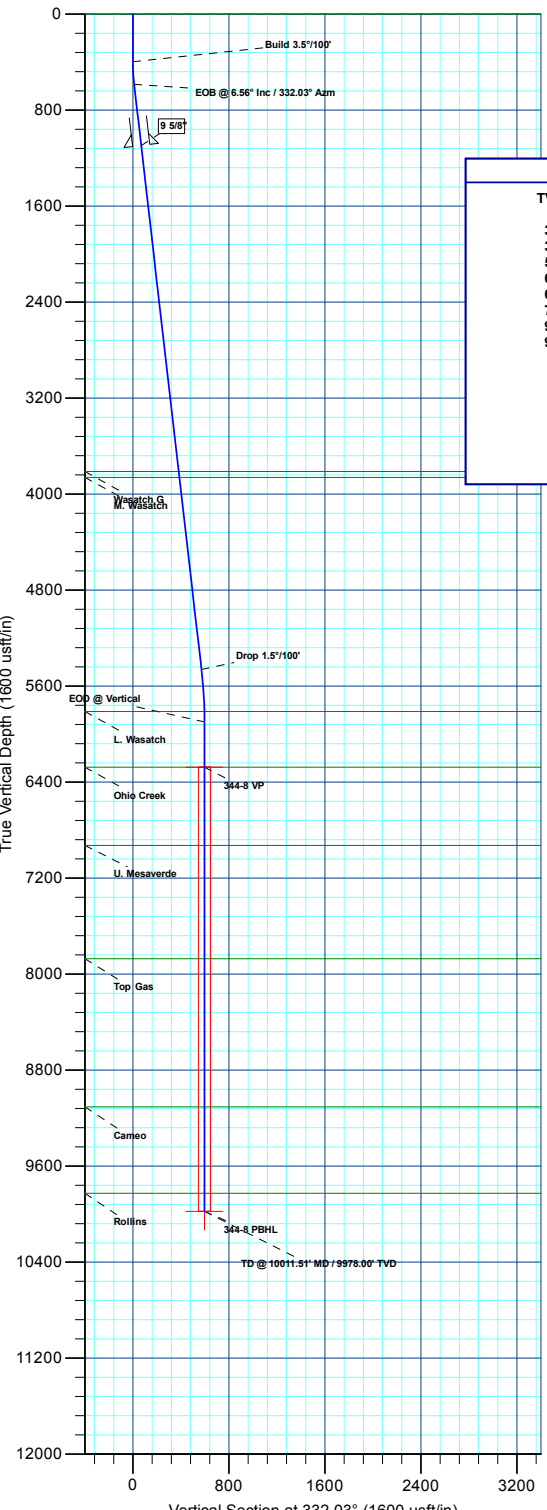
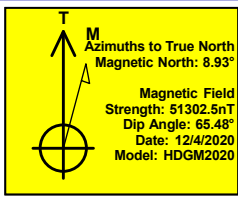
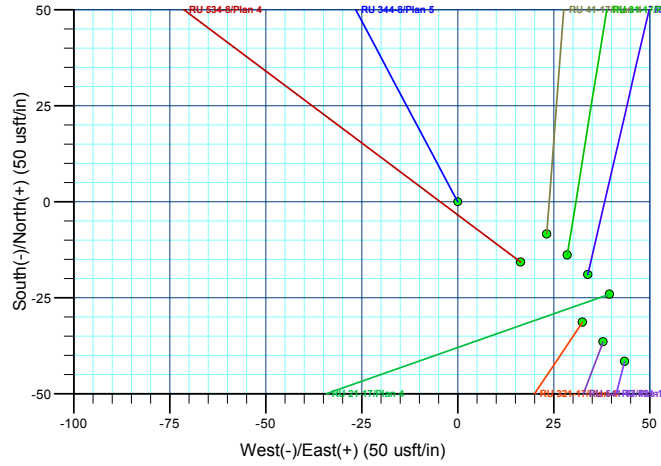
REFERENCE INFORMATION	
Co-ordinate (N/E) Reference: Well RU 344-8, True North	
Vertical (TVD) Reference: KB=24' @ 7885.40usft (H&P #318)	
Section (VS) Reference: Slot - (0.00N, 0.00E)	
Measured Depth Reference: KB=24' @ 7885.40usft (H&P #318)	
Calculation Method: Minimum Curvature	

WELL DETAILS: RU 344-8					
7861.40					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1597007.97	2351724.61	39.450065	-107.795962

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)								
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
344-8 VP	6278.00	526.92	-279.81	1597541.79	2351458.21	39.451512	-107.796953	Point
344-8 PBHL	9978.00	526.92	-279.81	1597541.79	2351458.21	39.451512	-107.796953	Circle (Radius: 50.00)

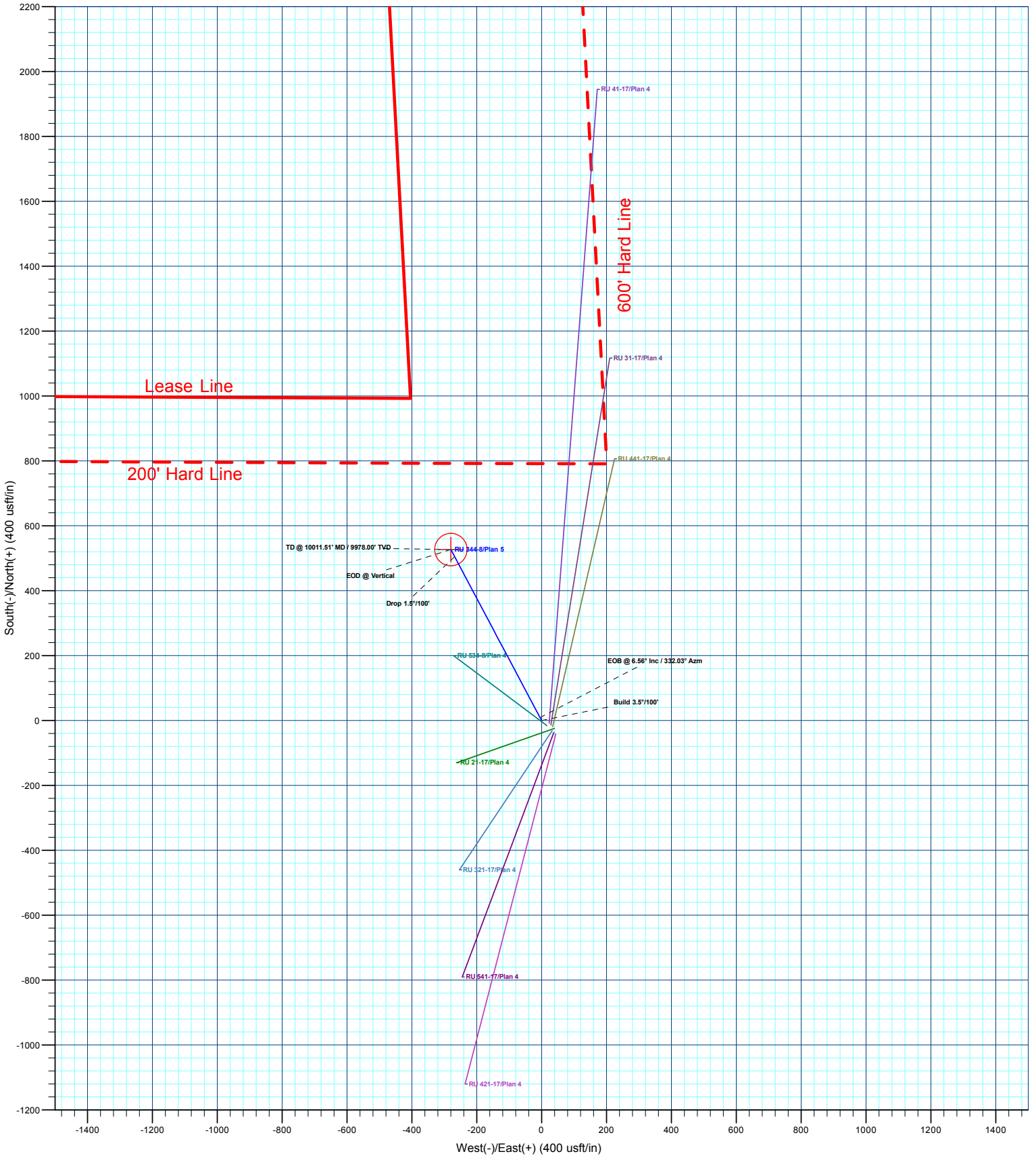
ANNOTATIONS								
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	Build 3.5°/100'
587.46	6.56	332.03	587.05	9.47	-5.03	10.72	10.72	EOB @ 6.56° Inc / 332.03° Azm
5496.12	6.56	332.03	5463.56	504.82	-268.08	571.58	571.58	Drop 1.5°/100'
5933.51	0.00	0.00	5900.00	526.91	-279.81	596.60	596.60	EOD @ Vertical
10011.51	0.00	0.00	9978.00	526.91	-279.81	596.60	596.60	TD @ 10011.51' MD / 9978.00' TVD

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
0.00	0.00	U. Wasatch
3813.00	3834.68	Wasatch G
3863.00	3885.01	M. Wasatch
5813.00	5846.50	L. Wasatch
6278.00	6311.51	Ohio Creek
6928.00	6961.51	U. Mesaverde
7873.00	7906.51	Top Gas
9108.00	9141.51	Cameo
9828.00	9861.51	Rollins





Project: Garfield County, CO
Site: Sec 17, T7S, R93W
Well: RU 344-8
Design: Plan 5
Latitude: 39.450065
Longitude: -107.795962
Ground Level: 7861.40
KB=24' @ 7885.40usft (H&P #318)



Plan: Plan 5 (RU 344-8/Wellbore #1)
Created By: Chase Chambers Date: 10:32, December 11 2020



Terra Energy Partners, LLP

**Garfield County, CO
Sec 17, T7S, R93W
RU 344-8**

Wellbore #1

Plan: Plan 5

QES Well Planning Report

11 December, 2020



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well RU 344-8
Company:	Terra Energy Partners, LLP	TVD Reference:	KB=24' @ 7885.40usft (H&P #318)
Project:	Garfield County, CO	MD Reference:	KB=24' @ 7885.40usft (H&P #318)
Site:	Sec 17, T7S, R93W	North Reference:	True
Well:	RU 344-8	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 5		

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

Site	Sec 17, T7S, R93W				
Site Position:		Northing:	1,596,982.95 usft	Latitude:	39.449999
From:	Lat/Long	Easting:	2,351,763.53 usft	Longitude:	-107.795822
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.45 °

Well	RU 344-8					
Well Position	+N/-S	24.03 usft	Northing:	1,597,007.96 usft	Latitude:	39.450065
	+E/-W	-39.53 usft	Easting:	2,351,724.61 usft	Longitude:	-107.795962
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	7,861.40 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM2020	12/4/2020	8.93	65.48	51,302.50000000

Design	Plan 5				
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	332.03	

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	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
587.46	6.56	332.03	587.05	9.47	-5.03	3.50	3.50	0.00	332.03	
5,496.12	6.56	332.03	5,463.56	504.82	-268.08	0.00	0.00	0.00	0.00	
5,933.51	0.00	0.00	5,900.00	526.91	-279.81	1.50	-1.50	0.00	180.00	
10,011.51	0.00	0.00	9,978.00	526.91	-279.81	0.00	0.00	0.00	0.00	344-8 PBHL

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well RU 344-8
Company:	Terra Energy Partners, LLP	TVD Reference:	KB=24' @ 7885.40usft (H&P #318)
Project:	Garfield County, CO	MD Reference:	KB=24' @ 7885.40usft (H&P #318)
Site:	Sec 17, T7S, R93W	North Reference:	True
Well:	RU 344-8	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 5		

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)	
U. Wasatch										
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
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Build 3.5°/100'										
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	3.50	332.03	499.94	2.70	-1.43	3.05	3.50	3.50	3.50	0.00
EOB @ 6.56° Inc / 332.03° Azm										
587.46	6.56	332.03	587.05	9.47	-5.03	10.72	3.50	3.50	3.50	0.00
600.00	6.56	332.03	599.51	10.73	-5.70	12.15	0.00	0.00	0.00	0.00
700.00	6.56	332.03	698.85	20.83	-11.06	23.58	0.00	0.00	0.00	0.00
800.00	6.56	332.03	798.20	30.92	-16.42	35.01	0.00	0.00	0.00	0.00
900.00	6.56	332.03	897.54	41.01	-21.78	46.43	0.00	0.00	0.00	0.00
1,000.00	6.56	332.03	996.89	51.10	-27.14	57.86	0.00	0.00	0.00	0.00
9 5/8"										
1,100.00	6.56	332.03	1,096.23	61.19	-32.49	69.28	0.00	0.00	0.00	0.00
1,200.00	6.56	332.03	1,195.58	71.28	-37.85	80.71	0.00	0.00	0.00	0.00
1,300.00	6.56	332.03	1,294.92	81.37	-43.21	92.14	0.00	0.00	0.00	0.00
1,400.00	6.56	332.03	1,394.27	91.47	-48.57	103.56	0.00	0.00	0.00	0.00
1,500.00	6.56	332.03	1,493.61	101.56	-53.93	114.99	0.00	0.00	0.00	0.00
1,600.00	6.56	332.03	1,592.96	111.65	-59.29	126.41	0.00	0.00	0.00	0.00
1,700.00	6.56	332.03	1,692.30	121.74	-64.65	137.84	0.00	0.00	0.00	0.00
1,800.00	6.56	332.03	1,791.65	131.83	-70.01	149.27	0.00	0.00	0.00	0.00
1,900.00	6.56	332.03	1,890.99	141.92	-75.37	160.69	0.00	0.00	0.00	0.00
2,000.00	6.56	332.03	1,990.34	152.01	-80.72	172.12	0.00	0.00	0.00	0.00
2,100.00	6.56	332.03	2,089.68	162.10	-86.08	183.54	0.00	0.00	0.00	0.00
2,200.00	6.56	332.03	2,189.03	172.20	-91.44	194.97	0.00	0.00	0.00	0.00
2,300.00	6.56	332.03	2,288.38	182.29	-96.80	206.40	0.00	0.00	0.00	0.00
2,400.00	6.56	332.03	2,387.72	192.38	-102.16	217.82	0.00	0.00	0.00	0.00
2,500.00	6.56	332.03	2,487.07	202.47	-107.52	229.25	0.00	0.00	0.00	0.00
2,600.00	6.56	332.03	2,586.41	212.56	-112.88	240.67	0.00	0.00	0.00	0.00
2,700.00	6.56	332.03	2,685.76	222.65	-118.24	252.10	0.00	0.00	0.00	0.00
2,800.00	6.56	332.03	2,785.10	232.74	-123.60	263.53	0.00	0.00	0.00	0.00
2,900.00	6.56	332.03	2,884.45	242.84	-128.95	274.95	0.00	0.00	0.00	0.00
3,000.00	6.56	332.03	2,983.79	252.93	-134.31	286.38	0.00	0.00	0.00	0.00
3,100.00	6.56	332.03	3,083.14	263.02	-139.67	297.80	0.00	0.00	0.00	0.00
3,200.00	6.56	332.03	3,182.48	273.11	-145.03	309.23	0.00	0.00	0.00	0.00
3,300.00	6.56	332.03	3,281.83	283.20	-150.39	320.66	0.00	0.00	0.00	0.00
3,400.00	6.56	332.03	3,381.17	293.29	-155.75	332.08	0.00	0.00	0.00	0.00
3,500.00	6.56	332.03	3,480.52	303.38	-161.11	343.51	0.00	0.00	0.00	0.00
3,600.00	6.56	332.03	3,579.86	313.48	-166.47	354.93	0.00	0.00	0.00	0.00
3,700.00	6.56	332.03	3,679.21	323.57	-171.83	366.36	0.00	0.00	0.00	0.00
3,800.00	6.56	332.03	3,778.55	333.66	-177.18	377.79	0.00	0.00	0.00	0.00
Wasatch G										
3,834.68	6.56	332.03	3,813.00	337.16	-179.04	381.75	0.00	0.00	0.00	0.00
M. Wasatch										
3,885.01	6.56	332.03	3,863.00	342.24	-181.74	387.50	0.00	0.00	0.00	0.00
3,900.00	6.56	332.03	3,877.90	343.75	-182.54	389.21	0.00	0.00	0.00	0.00
4,000.00	6.56	332.03	3,977.24	353.84	-187.90	400.64	0.00	0.00	0.00	0.00
4,100.00	6.56	332.03	4,076.59	363.93	-193.26	412.06	0.00	0.00	0.00	0.00
4,200.00	6.56	332.03	4,175.93	374.02	-198.62	423.49	0.00	0.00	0.00	0.00
4,300.00	6.56	332.03	4,275.28	384.11	-203.98	434.92	0.00	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well RU 344-8
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Project:	Garfield County, CO	MD Reference:	KB=24' @ 7885.40usft (H&P #318)
Site:	Sec 17, T7S, R93W	North Reference:	True
Well:	RU 344-8	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 5		

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)	
4,400.00	6.56	332.03	4,374.62	394.21	-209.34	446.34	0.00	0.00	0.00	
4,500.00	6.56	332.03	4,473.97	404.30	-214.70	457.77	0.00	0.00	0.00	
4,600.00	6.56	332.03	4,573.31	414.39	-220.06	469.19	0.00	0.00	0.00	
4,700.00	6.56	332.03	4,672.66	424.48	-225.41	480.62	0.00	0.00	0.00	
4,800.00	6.56	332.03	4,772.00	434.57	-230.77	492.05	0.00	0.00	0.00	
4,900.00	6.56	332.03	4,871.35	444.66	-236.13	503.47	0.00	0.00	0.00	
5,000.00	6.56	332.03	4,970.69	454.75	-241.49	514.90	0.00	0.00	0.00	
5,100.00	6.56	332.03	5,070.04	464.85	-246.85	526.32	0.00	0.00	0.00	
5,200.00	6.56	332.03	5,169.38	474.94	-252.21	537.75	0.00	0.00	0.00	
5,300.00	6.56	332.03	5,268.73	485.03	-257.57	549.17	0.00	0.00	0.00	
5,400.00	6.56	332.03	5,368.07	495.12	-262.93	560.60	0.00	0.00	0.00	
Drop 1.5°/100'										
5,496.12	6.56	332.03	5,463.56	504.82	-268.08	571.58	0.00	0.00	0.00	
5,500.00	6.50	332.03	5,467.42	505.21	-268.28	572.02	1.50	-1.50	0.00	
5,600.00	5.00	332.03	5,566.91	514.06	-272.98	582.05	1.50	-1.50	0.00	
5,700.00	3.50	332.03	5,666.63	520.61	-276.46	589.46	1.50	-1.50	0.00	
5,800.00	2.00	332.03	5,766.52	524.85	-278.71	594.27	1.50	-1.50	0.00	
L. Wasatch										
5,846.50	1.31	332.03	5,813.00	526.04	-279.34	595.61	1.50	-1.50	0.00	
5,900.00	0.50	332.03	5,866.49	526.78	-279.74	596.45	1.50	-1.50	0.00	
EOD @ Vertical										
5,933.51	0.00	0.00	5,900.00	526.91	-279.81	596.60	1.50	-1.50	0.00	
6,000.00	0.00	0.00	5,966.49	526.91	-279.81	596.60	0.00	0.00	0.00	
6,100.00	0.00	0.00	6,066.49	526.91	-279.81	596.60	0.00	0.00	0.00	
6,200.00	0.00	0.00	6,166.49	526.91	-279.81	596.60	0.00	0.00	0.00	
6,300.00	0.00	0.00	6,266.49	526.91	-279.81	596.60	0.00	0.00	0.00	
Ohio Creek										
6,311.51	0.00	0.00	6,278.00	526.91	-279.81	596.60	0.00	0.00	0.00	
6,400.00	0.00	0.00	6,366.49	526.91	-279.81	596.60	0.00	0.00	0.00	
6,500.00	0.00	0.00	6,466.49	526.91	-279.81	596.60	0.00	0.00	0.00	
6,600.00	0.00	0.00	6,566.49	526.91	-279.81	596.60	0.00	0.00	0.00	
6,700.00	0.00	0.00	6,666.49	526.91	-279.81	596.60	0.00	0.00	0.00	
6,800.00	0.00	0.00	6,766.49	526.91	-279.81	596.60	0.00	0.00	0.00	
6,900.00	0.00	0.00	6,866.49	526.91	-279.81	596.60	0.00	0.00	0.00	
U. Mesaverde										
6,961.51	0.00	0.00	6,928.00	526.91	-279.81	596.60	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,966.49	526.91	-279.81	596.60	0.00	0.00	0.00	
7,100.00	0.00	0.00	7,066.49	526.91	-279.81	596.60	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,166.49	526.91	-279.81	596.60	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,266.49	526.91	-279.81	596.60	0.00	0.00	0.00	
7,400.00	0.00	0.00	7,366.49	526.91	-279.81	596.60	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,466.49	526.91	-279.81	596.60	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,566.49	526.91	-279.81	596.60	0.00	0.00	0.00	
7,700.00	0.00	0.00	7,666.49	526.91	-279.81	596.60	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,766.49	526.91	-279.81	596.60	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,866.49	526.91	-279.81	596.60	0.00	0.00	0.00	
Top Gas										
7,906.51	0.00	0.00	7,873.00	526.91	-279.81	596.60	0.00	0.00	0.00	
8,000.00	0.00	0.00	7,966.49	526.91	-279.81	596.60	0.00	0.00	0.00	
8,100.00	0.00	0.00	8,066.49	526.91	-279.81	596.60	0.00	0.00	0.00	
8,200.00	0.00	0.00	8,166.49	526.91	-279.81	596.60	0.00	0.00	0.00	
8,300.00	0.00	0.00	8,266.49	526.91	-279.81	596.60	0.00	0.00	0.00	
8,400.00	0.00	0.00	8,366.49	526.91	-279.81	596.60	0.00	0.00	0.00	

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Site:	Sec 17, T7S, R93W	North Reference:	True
Well:	RU 344-8	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 5		

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)	
8,500.00	0.00	0.00	8,466.49	526.91	-279.81	596.60	0.00	0.00	0.00	
8,600.00	0.00	0.00	8,566.49	526.91	-279.81	596.60	0.00	0.00	0.00	
8,700.00	0.00	0.00	8,666.49	526.91	-279.81	596.60	0.00	0.00	0.00	
8,800.00	0.00	0.00	8,766.49	526.91	-279.81	596.60	0.00	0.00	0.00	
8,900.00	0.00	0.00	8,866.49	526.91	-279.81	596.60	0.00	0.00	0.00	
9,000.00	0.00	0.00	8,966.49	526.91	-279.81	596.60	0.00	0.00	0.00	
9,100.00	0.00	0.00	9,066.49	526.91	-279.81	596.60	0.00	0.00	0.00	
Cameo										
9,141.51	0.00	0.00	9,108.00	526.91	-279.81	596.60	0.00	0.00	0.00	
9,200.00	0.00	0.00	9,166.49	526.91	-279.81	596.60	0.00	0.00	0.00	
9,300.00	0.00	0.00	9,266.49	526.91	-279.81	596.60	0.00	0.00	0.00	
9,400.00	0.00	0.00	9,366.49	526.91	-279.81	596.60	0.00	0.00	0.00	
9,500.00	0.00	0.00	9,466.49	526.91	-279.81	596.60	0.00	0.00	0.00	
9,600.00	0.00	0.00	9,566.49	526.91	-279.81	596.60	0.00	0.00	0.00	
9,700.00	0.00	0.00	9,666.49	526.91	-279.81	596.60	0.00	0.00	0.00	
9,800.00	0.00	0.00	9,766.49	526.91	-279.81	596.60	0.00	0.00	0.00	
Rollins										
9,861.51	0.00	0.00	9,828.00	526.91	-279.81	596.60	0.00	0.00	0.00	
9,900.00	0.00	0.00	9,866.49	526.91	-279.81	596.60	0.00	0.00	0.00	
10,000.00	0.00	0.00	9,966.49	526.91	-279.81	596.60	0.00	0.00	0.00	
TD @ 10011.51' MD / 9978.00' TVD										
10,011.51	0.00	0.00	9,978.00	526.91	-279.81	596.60	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
344-8 VP - hit/miss target - Shape - Point	0.00	0.00	6,278.00	526.92	-279.81	1,597,541.78	2,351,458.21	39.451512	-107.796953	
344-8 PBHL - plan hits target center - Circle (radius 50.00)	0.00	0.00	9,978.00	526.92	-279.81	1,597,541.78	2,351,458.21	39.451512	-107.796953	

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,100.00	1,096.23	9 5/8"	9-5/8	12-1/4	

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well RU 344-8
Company:	Terra Energy Partners, LLP	TVD Reference:	KB=24' @ 7885.40usft (H&P #318)
Project:	Garfield County, CO	MD Reference:	KB=24' @ 7885.40usft (H&P #318)
Site:	Sec 17, T7S, R93W	North Reference:	True
Well:	RU 344-8	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 5		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
0.00	0.00	U. Wasatch				
3,834.68	3,813.00	Wasatch G				
3,885.01	3,863.00	M. Wasatch				
5,846.50	5,813.00	L. Wasatch				
6,311.51	6,278.00	Ohio Creek				
6,961.51	6,928.00	U. Mesaverde				
7,906.51	7,873.00	Top Gas				
9,141.51	9,108.00	Cameo				
9,861.51	9,828.00	Rollins				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
400.00	400.00	0.00	0.00	Build 3.5°/100'	
587.46	587.05	9.47	-5.03	EOB @ 6.56° Inc / 332.03° Azm	
5,496.12	5,463.56	504.82	-268.08	Drop 1.5°/100'	
5,933.51	5,900.00	526.91	-279.81	EOD @ Vertical	
10,011.51	9,978.00	526.91	-279.81	TD @ 10011.51' MD / 9978.00' TVD	