

Project: Garfield County, CO
 Site: Sec 17, T7S, R93W
 Well: RU 541-17
 Wellbore: Wellbore #1
 Design: Plan 4
 Latitude: 39.449965
 Longitude: -107.795828
 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 541-17, 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 541-17

			7861.40		
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1596970.60	2351761.52	39.449965	-107.795828

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

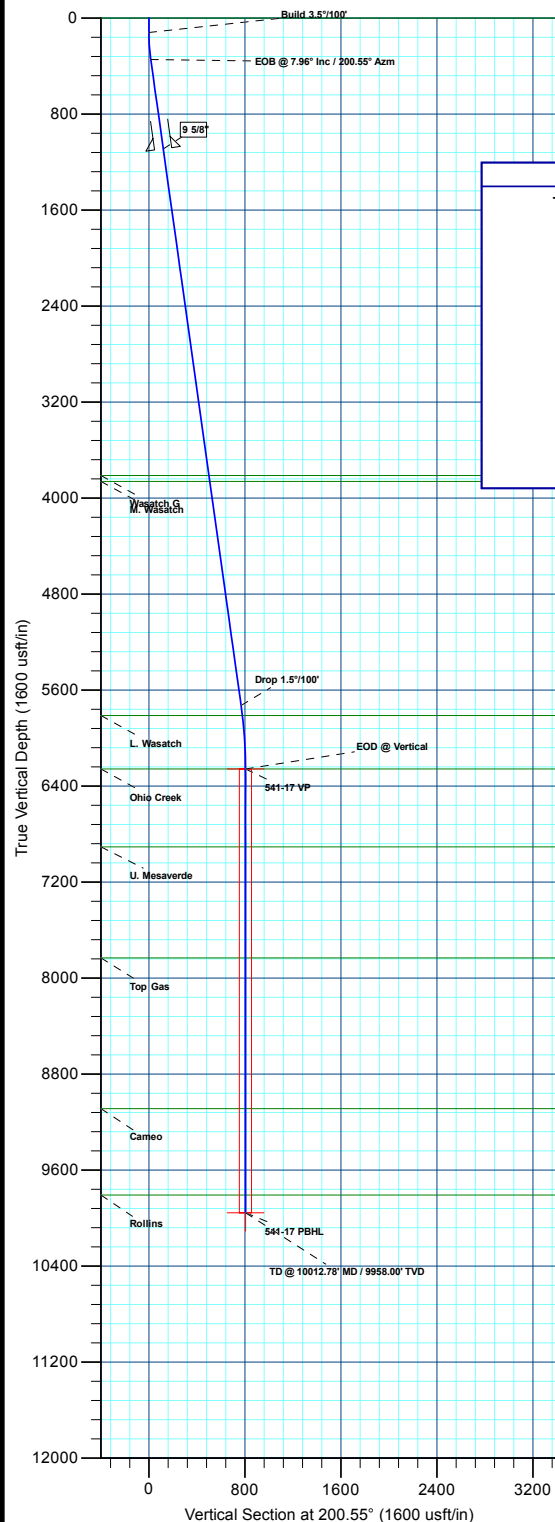
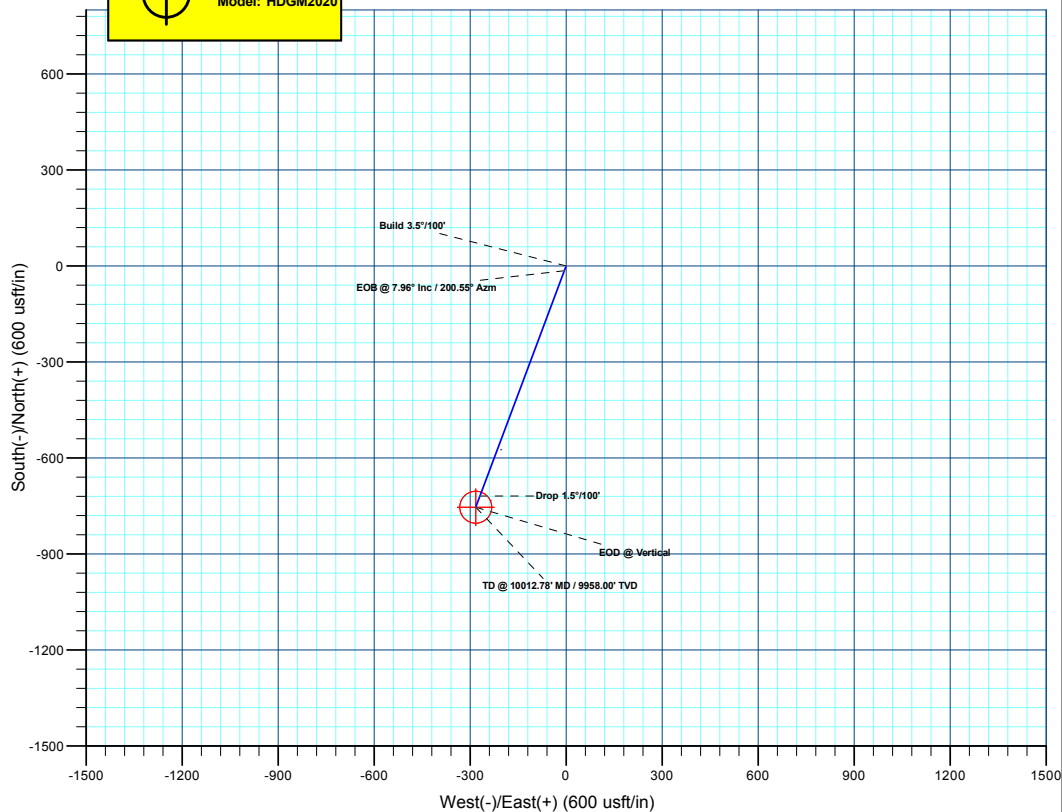
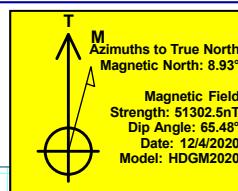
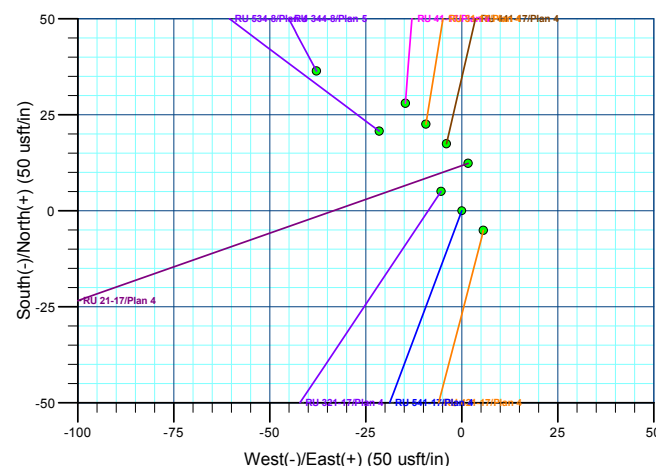
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
541-17 VP	6258.00	-753.84	-282.56	1596224.14	2351460.00	39.447895	-107.796829	Point
541-17 PBHL	9958.00	-753.84	-282.56	1596224.14	2351460.00	39.447895	-107.796829	Circle (Radius: 50.00)

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
120.00	0.00	0.00	120.00	0.00	0.00	0.00	0.00	Build 3.5°/100'
347.39	7.96	200.55	346.66	-14.76	-5.53	15.77	15.77	EOB @ 7.96° Inc / 200.55° Azm
5782.20	7.96	200.55	5729.12	-719.39	-269.65	768.27	768.27	Drop 1.5°/100'
6312.78	0.00	0.00	6258.00	-753.84	-282.56	805.06	805.06	EOD @ Vertical
10012.78	0.00	0.00	9958.00	-753.84	-282.56	805.06	805.06	TD @ 10012.78' MD / 9958.00' TVD

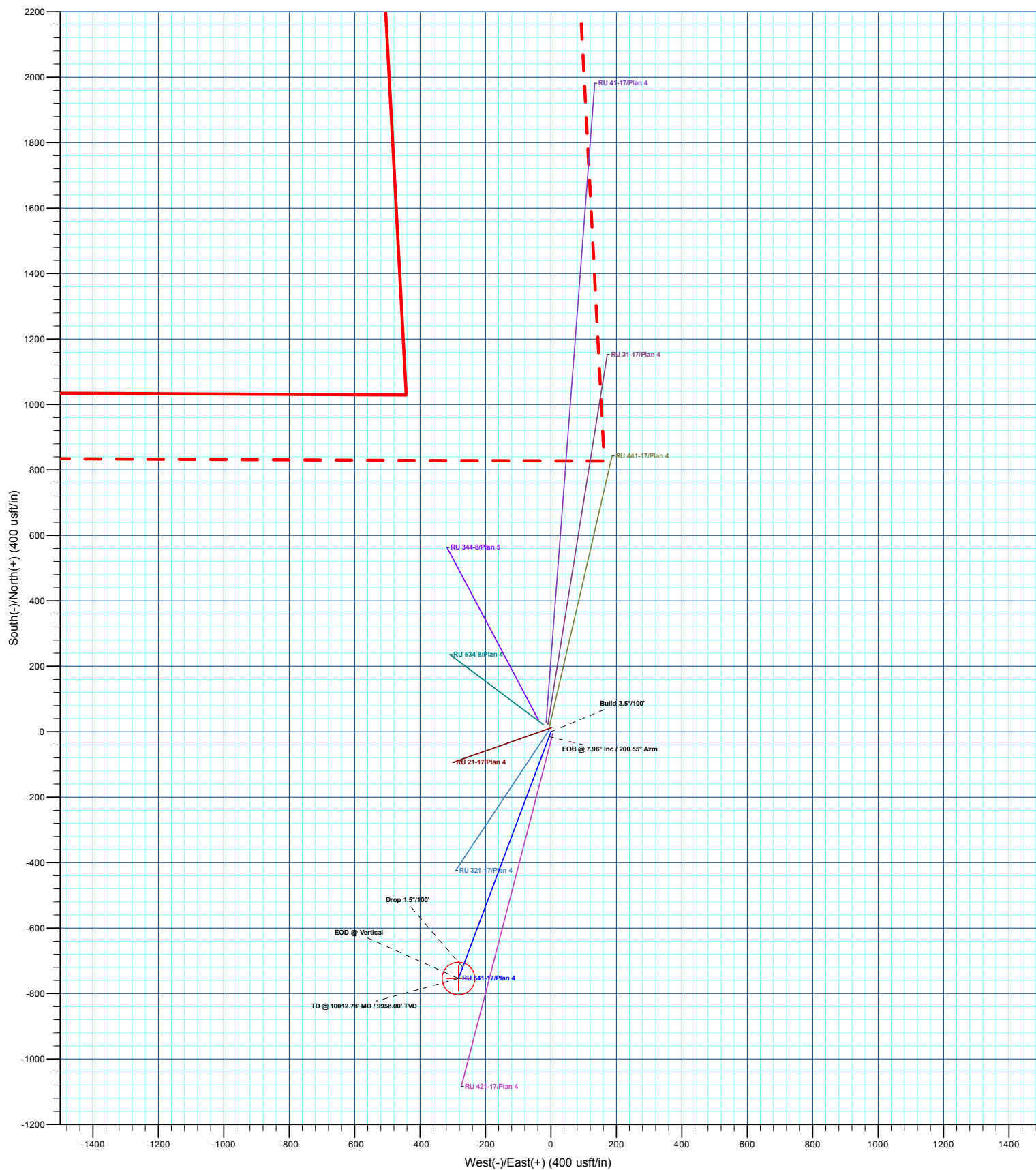
FORMATION TOP DETAILS

TVDPath	MDPath	Formation
0.00	0.00	U. Wasatch
3813.00	3847.44	Wasatch G
3863.00	3897.93	M. Wasatch
5813.00	5866.77	L. Wasatch
6258.00	6312.78	Ohio Creek
6908.00	6962.78	U. Mesaverde
7833.00	7887.78	Top Gas
9088.00	9142.78	Cameo
9808.00	9862.78	Rollins



Plan: Plan 4 (RU 541-17/Wellbore #1)

Created By: Chase Chambers Date: 10:56, December 11 2020



Plan: Plan 4 (RU 541-17/Wellbore #1)

Created By: Chase Chambers Date: 10:57, December 11 2020



Terra Energy Partners, LLP

Garfield County, CO

Sec 17, T7S, R93W

RU 541-17

Wellbore #1

Plan: Plan 4

QES Well Planning Report

11 December, 2020



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well RU 541-17
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 541-17	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 4		

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 541-17					
Well Position	+N/-S	-12.40 usft	Northing:	1,596,970.60 usft	Latitude:	39.449965
	+E/-W	-1.69 usft	Easting:	2,351,761.52 usft	Longitude:	-107.795828
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 4			
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	200.55

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	
120.00	0.00	0.00	120.00	0.00	0.00	0.00	0.00	0.00	0.00	
347.39	7.96	200.55	346.66	-14.76	-5.53	3.50	3.50	0.00	200.55	
5,782.20	7.96	200.55	5,729.12	-719.39	-269.65	0.00	0.00	0.00	0.00	
6,312.78	0.00	0.00	6,258.00	-753.84	-282.56	1.50	-1.50	0.00	180.00	541-17 VP
10,012.78	0.00	0.00	9,958.00	-753.84	-282.56	0.00	0.00	0.00	0.00	541-17 PBHL

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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 541-17	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 4		

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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Build 3.5°/100'									
120.00	0.00	0.00	120.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	2.80	200.55	199.97	-1.83	-0.69	1.95	3.50	3.50	0.00
300.00	6.30	200.55	299.64	-9.26	-3.47	9.89	3.50	3.50	0.00
EOB @ 7.96° Inc / 200.55° Azm									
347.39	7.96	200.55	346.66	-14.76	-5.53	15.77	3.50	3.50	0.00
400.00	7.96	200.55	398.76	-21.59	-8.09	23.05	0.00	0.00	0.00
500.00	7.96	200.55	497.80	-34.55	-12.95	36.90	0.00	0.00	0.00
600.00	7.96	200.55	596.84	-47.52	-17.81	50.74	0.00	0.00	0.00
700.00	7.96	200.55	695.87	-60.48	-22.67	64.59	0.00	0.00	0.00
800.00	7.96	200.55	794.91	-73.45	-27.53	78.44	0.00	0.00	0.00
900.00	7.96	200.55	893.95	-86.41	-32.39	92.28	0.00	0.00	0.00
1,000.00	7.96	200.55	992.98	-99.38	-37.25	106.13	0.00	0.00	0.00
9 5/8"									
1,100.00	7.96	200.55	1,092.02	-112.34	-42.11	119.97	0.00	0.00	0.00
1,200.00	7.96	200.55	1,191.06	-125.31	-46.97	133.82	0.00	0.00	0.00
1,300.00	7.96	200.55	1,290.09	-138.27	-51.83	147.67	0.00	0.00	0.00
1,400.00	7.96	200.55	1,389.13	-151.24	-56.69	161.51	0.00	0.00	0.00
1,500.00	7.96	200.55	1,488.17	-164.20	-61.55	175.36	0.00	0.00	0.00
1,600.00	7.96	200.55	1,587.20	-177.17	-66.41	189.20	0.00	0.00	0.00
1,700.00	7.96	200.55	1,686.24	-190.13	-71.27	203.05	0.00	0.00	0.00
1,800.00	7.96	200.55	1,785.28	-203.10	-76.13	216.89	0.00	0.00	0.00
1,900.00	7.96	200.55	1,884.31	-216.06	-80.99	230.74	0.00	0.00	0.00
2,000.00	7.96	200.55	1,983.35	-229.03	-85.85	244.59	0.00	0.00	0.00
2,100.00	7.96	200.55	2,082.39	-241.99	-90.71	258.43	0.00	0.00	0.00
2,200.00	7.96	200.55	2,181.43	-254.96	-95.57	272.28	0.00	0.00	0.00
2,300.00	7.96	200.55	2,280.46	-267.92	-100.43	286.12	0.00	0.00	0.00
2,400.00	7.96	200.55	2,379.50	-280.89	-105.28	299.97	0.00	0.00	0.00
2,500.00	7.96	200.55	2,478.54	-293.85	-110.14	313.82	0.00	0.00	0.00
2,600.00	7.96	200.55	2,577.57	-306.82	-115.00	327.66	0.00	0.00	0.00
2,700.00	7.96	200.55	2,676.61	-319.78	-119.86	341.51	0.00	0.00	0.00
2,800.00	7.96	200.55	2,775.65	-332.75	-124.72	355.35	0.00	0.00	0.00
2,900.00	7.96	200.55	2,874.68	-345.71	-129.58	369.20	0.00	0.00	0.00
3,000.00	7.96	200.55	2,973.72	-358.68	-134.44	383.05	0.00	0.00	0.00
3,100.00	7.96	200.55	3,072.76	-371.64	-139.30	396.89	0.00	0.00	0.00
3,200.00	7.96	200.55	3,171.79	-384.61	-144.16	410.74	0.00	0.00	0.00
3,300.00	7.96	200.55	3,270.83	-397.57	-149.02	424.58	0.00	0.00	0.00
3,400.00	7.96	200.55	3,369.87	-410.54	-153.88	438.43	0.00	0.00	0.00
3,500.00	7.96	200.55	3,468.90	-423.50	-158.74	452.28	0.00	0.00	0.00
3,600.00	7.96	200.55	3,567.94	-436.47	-163.60	466.12	0.00	0.00	0.00
3,700.00	7.96	200.55	3,666.98	-449.43	-168.46	479.97	0.00	0.00	0.00
3,800.00	7.96	200.55	3,766.01	-462.40	-173.32	493.81	0.00	0.00	0.00
Wasatch G									
3,847.44	7.96	200.55	3,813.00	-468.55	-175.63	500.38	0.00	0.00	0.00
M. Wasatch									
3,897.93	7.96	200.55	3,863.00	-475.09	-178.08	507.37	0.00	0.00	0.00
3,900.00	7.96	200.55	3,865.05	-475.36	-178.18	507.66	0.00	0.00	0.00
4,000.00	7.96	200.55	3,964.09	-488.33	-183.04	521.51	0.00	0.00	0.00
4,100.00	7.96	200.55	4,063.12	-501.29	-187.90	535.35	0.00	0.00	0.00
4,200.00	7.96	200.55	4,162.16	-514.26	-192.76	549.20	0.00	0.00	0.00

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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 541-17	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 4		

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	7.96	200.55	4,261.20	-527.22	-197.62	563.04	0.00	0.00	0.00
4,400.00	7.96	200.55	4,360.24	-540.19	-202.48	576.89	0.00	0.00	0.00
4,500.00	7.96	200.55	4,459.27	-553.15	-207.34	590.73	0.00	0.00	0.00
4,600.00	7.96	200.55	4,558.31	-566.12	-212.20	604.58	0.00	0.00	0.00
4,700.00	7.96	200.55	4,657.35	-579.08	-217.06	618.43	0.00	0.00	0.00
4,800.00	7.96	200.55	4,756.38	-592.05	-221.92	632.27	0.00	0.00	0.00
4,900.00	7.96	200.55	4,855.42	-605.01	-226.78	646.12	0.00	0.00	0.00
5,000.00	7.96	200.55	4,954.46	-617.98	-231.64	659.96	0.00	0.00	0.00
5,100.00	7.96	200.55	5,053.49	-630.94	-236.50	673.81	0.00	0.00	0.00
5,200.00	7.96	200.55	5,152.53	-643.91	-241.36	687.66	0.00	0.00	0.00
5,300.00	7.96	200.55	5,251.57	-656.87	-246.22	701.50	0.00	0.00	0.00
5,400.00	7.96	200.55	5,350.60	-669.84	-251.08	715.35	0.00	0.00	0.00
5,500.00	7.96	200.55	5,449.64	-682.80	-255.94	729.19	0.00	0.00	0.00
5,600.00	7.96	200.55	5,548.68	-695.77	-260.80	743.04	0.00	0.00	0.00
5,700.00	7.96	200.55	5,647.71	-708.73	-265.65	756.89	0.00	0.00	0.00
Drop 1.5°/100'									
5,782.20	7.96	200.55	5,729.12	-719.39	-269.65	768.27	0.00	0.00	0.00
5,800.00	7.69	200.55	5,746.76	-721.66	-270.50	770.69	1.50	-1.50	0.00
L. Wasatch									
5,866.77	6.69	200.55	5,813.00	-729.49	-273.43	779.05	1.50	-1.50	0.00
5,900.00	6.19	200.55	5,846.02	-732.98	-274.74	782.78	1.50	-1.50	0.00
6,000.00	4.69	200.55	5,945.57	-741.86	-278.07	792.26	1.50	-1.50	0.00
6,100.00	3.19	200.55	6,045.33	-748.29	-280.48	799.13	1.50	-1.50	0.00
6,200.00	1.69	200.55	6,145.23	-752.28	-281.98	803.39	1.50	-1.50	0.00
6,300.00	0.19	200.55	6,245.22	-753.82	-282.56	805.04	1.50	-1.50	0.00
EOD @ Vertical - Ohio Creek									
6,312.78	0.00	0.00	6,258.00	-753.84	-282.56	805.06	1.50	-1.50	0.00
6,400.00	0.00	0.00	6,345.22	-753.84	-282.56	805.06	0.00	0.00	0.00
6,500.00	0.00	0.00	6,445.22	-753.84	-282.56	805.06	0.00	0.00	0.00
6,600.00	0.00	0.00	6,545.22	-753.84	-282.56	805.06	0.00	0.00	0.00
6,700.00	0.00	0.00	6,645.22	-753.84	-282.56	805.06	0.00	0.00	0.00
6,800.00	0.00	0.00	6,745.22	-753.84	-282.56	805.06	0.00	0.00	0.00
6,900.00	0.00	0.00	6,845.22	-753.84	-282.56	805.06	0.00	0.00	0.00
U. Mesaverde									
6,962.78	0.00	0.00	6,908.00	-753.84	-282.56	805.06	0.00	0.00	0.00
7,000.00	0.00	0.00	6,945.22	-753.84	-282.56	805.06	0.00	0.00	0.00
7,100.00	0.00	0.00	7,045.22	-753.84	-282.56	805.06	0.00	0.00	0.00
7,200.00	0.00	0.00	7,145.22	-753.84	-282.56	805.06	0.00	0.00	0.00
7,300.00	0.00	0.00	7,245.22	-753.84	-282.56	805.06	0.00	0.00	0.00
7,400.00	0.00	0.00	7,345.22	-753.84	-282.56	805.06	0.00	0.00	0.00
7,500.00	0.00	0.00	7,445.22	-753.84	-282.56	805.06	0.00	0.00	0.00
7,600.00	0.00	0.00	7,545.22	-753.84	-282.56	805.06	0.00	0.00	0.00
7,700.00	0.00	0.00	7,645.22	-753.84	-282.56	805.06	0.00	0.00	0.00
7,800.00	0.00	0.00	7,745.22	-753.84	-282.56	805.06	0.00	0.00	0.00
Top Gas									
7,887.78	0.00	0.00	7,833.00	-753.84	-282.56	805.06	0.00	0.00	0.00
7,900.00	0.00	0.00	7,845.22	-753.84	-282.56	805.06	0.00	0.00	0.00
8,000.00	0.00	0.00	7,945.22	-753.84	-282.56	805.06	0.00	0.00	0.00
8,100.00	0.00	0.00	8,045.22	-753.84	-282.56	805.06	0.00	0.00	0.00
8,200.00	0.00	0.00	8,145.22	-753.84	-282.56	805.06	0.00	0.00	0.00
8,300.00	0.00	0.00	8,245.22	-753.84	-282.56	805.06	0.00	0.00	0.00
8,400.00	0.00	0.00	8,345.22	-753.84	-282.56	805.06	0.00	0.00	0.00
8,500.00	0.00	0.00	8,445.22	-753.84	-282.56	805.06	0.00	0.00	0.00

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Planned Survey									
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8,600.00	0.00	0.00	8,545.22	-753.84	-282.56	805.06	0.00	0.00	0.00
8,700.00	0.00	0.00	8,645.22	-753.84	-282.56	805.06	0.00	0.00	0.00
8,800.00	0.00	0.00	8,745.22	-753.84	-282.56	805.06	0.00	0.00	0.00
8,900.00	0.00	0.00	8,845.22	-753.84	-282.56	805.06	0.00	0.00	0.00
9,000.00	0.00	0.00	8,945.22	-753.84	-282.56	805.06	0.00	0.00	0.00
9,100.00	0.00	0.00	9,045.22	-753.84	-282.56	805.06	0.00	0.00	0.00
Cameo									
9,142.78	0.00	0.00	9,088.00	-753.84	-282.56	805.06	0.00	0.00	0.00
9,200.00	0.00	0.00	9,145.22	-753.84	-282.56	805.06	0.00	0.00	0.00
9,300.00	0.00	0.00	9,245.22	-753.84	-282.56	805.06	0.00	0.00	0.00
9,400.00	0.00	0.00	9,345.22	-753.84	-282.56	805.06	0.00	0.00	0.00
9,500.00	0.00	0.00	9,445.22	-753.84	-282.56	805.06	0.00	0.00	0.00
9,600.00	0.00	0.00	9,545.22	-753.84	-282.56	805.06	0.00	0.00	0.00
9,700.00	0.00	0.00	9,645.22	-753.84	-282.56	805.06	0.00	0.00	0.00
9,800.00	0.00	0.00	9,745.22	-753.84	-282.56	805.06	0.00	0.00	0.00
Rollins									
9,862.78	0.00	0.00	9,808.00	-753.84	-282.56	805.06	0.00	0.00	0.00
9,900.00	0.00	0.00	9,845.22	-753.84	-282.56	805.06	0.00	0.00	0.00
10,000.00	0.00	0.00	9,945.22	-753.84	-282.56	805.06	0.00	0.00	0.00
TD @ 10012.78' MD / 9958.00' TVD									
10,012.78	0.00	0.00	9,958.00	-753.84	-282.56	805.06	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
- hit/miss target									
- Shape									
541-17 VP	0.00	0.00	6,258.00	-753.84	-282.56	1,596,224.14	2,351,460.00	39.447895	-107.796829
- plan hits target center									
- Point									
541-17 PBHL	0.00	0.00	9,958.00	-753.84	-282.56	1,596,224.14	2,351,460.00	39.447895	-107.796829
- plan hits target center									
- Circle (radius 50.00)									

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,100.00	1,092.02	9 5/8"	9-5/8	12-1/4	

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well RU 541-17
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 541-17	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 4		

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
0.00	0.00	U. Wasatch			
3,847.44	3,813.00	Wasatch G			
3,897.93	3,863.00	M. Wasatch			
5,866.77	5,813.00	L. Wasatch			
6,312.78	6,258.00	Ohio Creek			
6,962.78	6,908.00	U. Mesaverde			
7,887.78	7,833.00	Top Gas			
9,142.78	9,088.00	Cameo			
9,862.78	9,808.00	Rollins			

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
120.00	120.00	0.00	0.00	Build 3.5°/100'
347.39	346.66	-14.76	-5.53	EOB @ 7.96° Inc / 200.55° Azm
5,782.20	5,729.12	-719.39	-269.65	Drop 1.5°/100'
6,312.78	6,258.00	-753.84	-282.56	EOD @ Vertical
10,012.78	9,958.00	-753.84	-282.56	TD @ 10012.78' MD / 9958.00' TVD