



Project: Mesa County, CO
 Site: Bruton 30-01 Pad
 Well: Bruton 19-18E
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.255219
 Longitude: -107.806175
 Ground Level: 7425.0
 well @ 7455.0usft (H&P #522)



PROJECT DETAILS: Mesa 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 Bruton 19-18E, True North
 Vertical (TVD) Reference: well @ 7455.0usft (H&P #522)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7455.0usft (H&P #522)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 19-18E

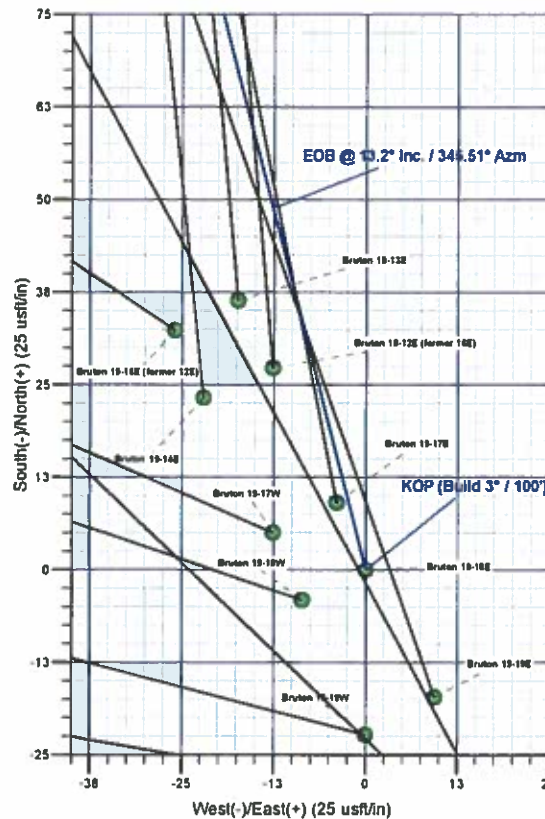
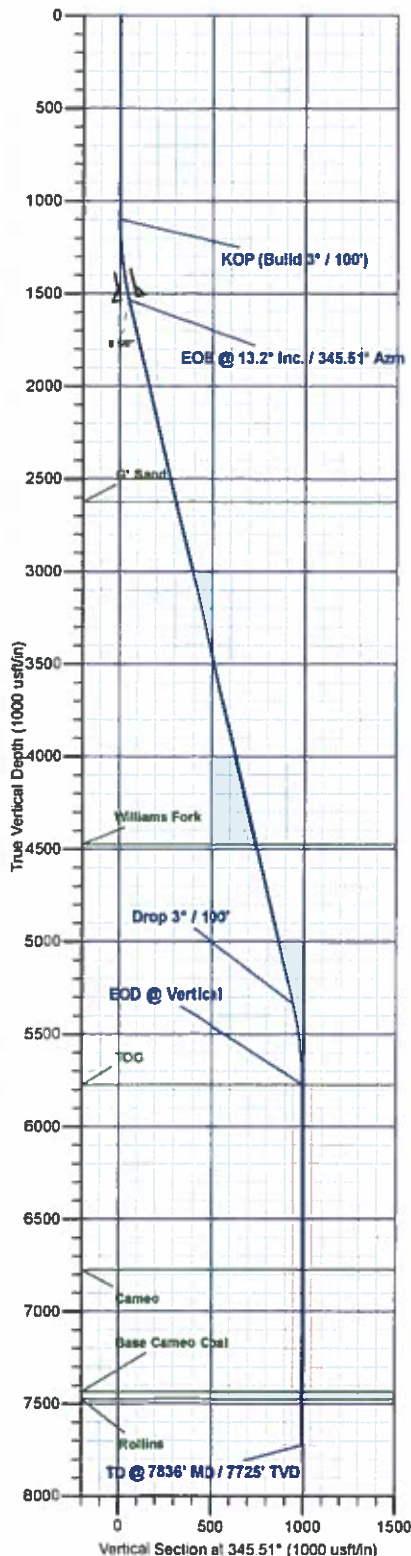
+N/-S	+E/-W	Northing	Ground Level: Easting	7425.0 Latitude	Longitude
0.0	0.0	1526136.12	2347846.18	39.255219	-107.806175

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BRUTON 19-18E	7725.0	961.0	-248.3	1527163.13	2346818.33	39.257858	-107.807052

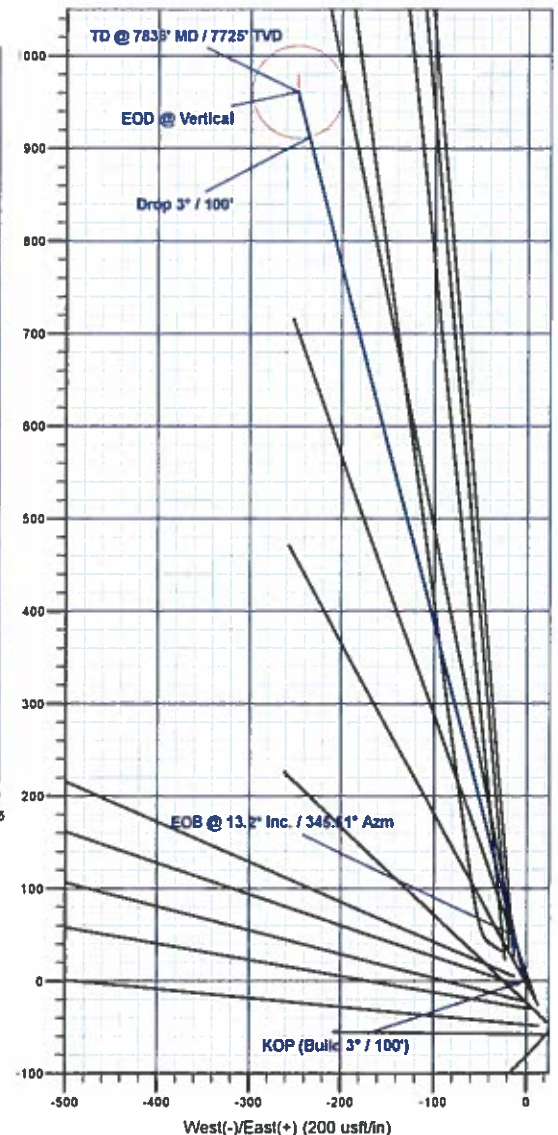
SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	VSeet	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
1100.0	0.00	0.00	1100.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100')
1539.9	13.20	345.51	1539.9	48.8	-12.6	3.00	345.51	50.4	EOB @ 13.2° Inc. / 345.51° Azm
5446.0	13.20	345.51	5339.0	912.2	-235.7	0.00	0.00	942.2	Drop 3° / 100'
5865.9	0.00	0.00	5775.0	961.0	-248.3	3.00	180.00	992.6	EOD @ Vertical
7835.9	0.00	0.00	7725.0	961.0	-248.3	0.00	0.00	992.6	TD @ 7836' MD / 7725' TVD



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2625.0	2658.4	Q' Sand
4475.0	4558.6	Williams Fork
5775.0	5865.9	TOG
6775.0	6865.9	Cameo
7435.0	7545.9	Base Cameo Coal
7475.0	7585.9	Rollins



Plan: Design #1 (Bruton 19-18E/Wellbore #1)

Created By: Will Jircik Date: 15:33, January 09 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-01 Pad

Bruton 19-18E

Wellbore #1

Plan: Design #1

QES Well Planning Report

09 January, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-18E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455.0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455.0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-18E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Mesa 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		Bruton 30-01 Pad			
Site Position:		Northing:	1,526,078.02 usft	Latitude:	39.255061
From:	Lat/Long	Easting:	2,347,056.81 usft	Longitude:	-107.806111
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.45 °

Well	Bruton 19-18E					
Well Position	+N/-S	57.7 usft	Northing:	1,526,136.12 usft	Latitude:	39.255220
	+E/-W	-18.1 usft	Easting:	2,347,040.19 usft	Longitude:	-107.806175
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,425.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/5/2017	9.63	65.43	51,461

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	345.51

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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,539.9	13.20	345.51	1,536.0	48.8	-12.6	3.00	3.00	0.00	345.51	
5,446.0	13.20	345.51	5,339.0	912.2	-235.7	0.00	0.00	0.00	0.00	
5,885.9	0.00	0.00	5,775.0	961.0	-248.3	3.00	-3.00	0.00	180.00	
7,835.9	0.00	0.00	7,725.0	961.0	-248.3	0.00	0.00	0.00	0.00	BRUTON 19-18E



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-18E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455.0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455.0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-18E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP (Build 3° / 100')									
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	3.00	345.51	1,200.0	2.5	-0.7	2.6	3.00	3.00	0.00
1,300.0	6.00	345.51	1,299.8	10.1	-2.6	10.5	3.00	3.00	0.00
1,400.0	9.00	345.51	1,398.8	22.8	-5.9	23.5	3.00	3.00	0.00
1,500.0	12.00	345.51	1,497.1	40.4	-10.4	41.7	3.00	3.00	0.00
8 5/8"									
1,530.0	12.90	345.51	1,526.4	46.7	-12.1	48.2	3.00	3.00	0.00
EOB @ 13.2° Inc. / 345.61° Azm									
1,539.9	13.20	345.51	1,536.0	48.8	-12.6	50.4	3.00	3.00	0.00
1,600.0	13.20	345.51	1,594.5	62.1	-16.1	64.2	0.00	0.00	0.00
1,700.0	13.20	345.51	1,691.9	84.2	-21.8	87.0	0.00	0.00	0.00
1,800.0	13.20	345.51	1,789.3	106.3	-27.5	109.8	0.00	0.00	0.00
1,900.0	13.20	345.51	1,886.6	128.4	-33.2	132.6	0.00	0.00	0.00
2,000.0	13.20	345.51	1,984.0	150.5	-38.9	155.5	0.00	0.00	0.00
2,100.0	13.20	345.51	2,081.3	172.6	-44.6	178.3	0.00	0.00	0.00
2,200.0	13.20	345.51	2,178.7	194.7	-50.3	201.1	0.00	0.00	0.00
2,300.0	13.20	345.51	2,276.0	216.8	-56.0	224.0	0.00	0.00	0.00
2,400.0	13.20	345.51	2,373.4	238.9	-61.7	246.8	0.00	0.00	0.00
2,500.0	13.20	345.51	2,470.8	261.0	-67.5	269.6	0.00	0.00	0.00
2,600.0	13.20	345.51	2,568.1	283.1	-73.2	292.4	0.00	0.00	0.00
G' Sand									
2,658.4	13.20	345.51	2,625.0	296.1	-76.5	305.8	0.00	0.00	0.00
2,700.0	13.20	345.51	2,665.5	305.2	-78.9	315.3	0.00	0.00	0.00
2,800.0	13.20	345.51	2,762.8	327.3	-84.6	338.1	0.00	0.00	0.00
2,900.0	13.20	345.51	2,860.2	349.5	-90.3	360.9	0.00	0.00	0.00
3,000.0	13.20	345.51	2,957.6	371.6	-96.0	383.8	0.00	0.00	0.00
3,100.0	13.20	345.51	3,054.9	393.7	-101.7	406.6	0.00	0.00	0.00
3,200.0	13.20	345.51	3,152.3	415.8	-107.4	429.4	0.00	0.00	0.00
3,300.0	13.20	345.51	3,249.6	437.9	-113.1	452.2	0.00	0.00	0.00
3,400.0	13.20	345.51	3,347.0	460.0	-118.9	475.1	0.00	0.00	0.00
3,500.0	13.20	345.51	3,444.4	482.1	-124.6	497.9	0.00	0.00	0.00
3,600.0	13.20	345.51	3,541.7	504.2	-130.3	520.7	0.00	0.00	0.00
3,700.0	13.20	345.51	3,639.1	526.3	-136.0	543.6	0.00	0.00	0.00
3,800.0	13.20	345.51	3,736.4	548.4	-141.7	566.4	0.00	0.00	0.00
3,900.0	13.20	345.51	3,833.8	570.5	-147.4	589.2	0.00	0.00	0.00
4,000.0	13.20	345.51	3,931.2	592.6	-153.1	612.0	0.00	0.00	0.00
4,100.0	13.20	345.51	4,028.5	614.7	-158.8	634.9	0.00	0.00	0.00
4,200.0	13.20	345.51	4,125.9	636.8	-164.5	657.7	0.00	0.00	0.00
4,300.0	13.20	345.51	4,223.2	658.9	-170.3	680.5	0.00	0.00	0.00
4,400.0	13.20	345.51	4,320.6	681.0	-176.0	703.4	0.00	0.00	0.00
4,500.0	13.20	345.51	4,418.0	703.1	-181.7	726.2	0.00	0.00	0.00
Williams Fork									



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-18E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455 0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455 0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-18E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)
4,558.6	13.20	345.51	4,475.0	716.0	-185.0	739.6	0.00	0.00	0.00
4,600.0	13.20	345.51	4,515.3	725.2	-187.4	749.0	0.00	0.00	0.00
4,700.0	13.20	345.51	4,612.7	747.3	-193.1	771.8	0.00	0.00	0.00
4,800.0	13.20	345.51	4,710.0	769.4	-198.8	794.7	0.00	0.00	0.00
4,900.0	13.20	345.51	4,807.4	791.5	-204.5	817.5	0.00	0.00	0.00
5,000.0	13.20	345.51	4,904.8	813.6	-210.2	840.3	0.00	0.00	0.00
5,100.0	13.20	345.51	5,002.1	835.7	-215.9	863.2	0.00	0.00	0.00
5,200.0	13.20	345.51	5,099.5	857.8	-221.7	886.0	0.00	0.00	0.00
5,300.0	13.20	345.51	5,196.8	879.9	-227.4	908.8	0.00	0.00	0.00
5,400.0	13.20	345.51	5,294.2	902.0	-233.1	931.6	0.00	0.00	0.00
Drop 3° / 100'									
5,446.0	13.20	345.51	5,339.0	912.2	-235.7	942.2	0.00	0.00	0.00
5,500.0	11.58	345.51	5,391.7	923.4	-238.6	953.7	3.00	-3.00	0.00
5,600.0	8.58	345.51	5,490.2	940.3	-243.0	971.2	3.00	-3.00	0.00
5,700.0	5.58	345.51	5,589.4	952.3	-246.1	983.5	3.00	-3.00	0.00
5,800.0	2.58	345.51	5,689.1	959.1	-247.8	990.7	3.00	-3.00	0.00
EOD @ Vertical - TOG									
5,885.9	0.00	0.00	5,775.0	961.0	-248.3	992.6	3.00	-3.00	0.00
5,900.0	0.00	0.00	5,789.1	961.0	-248.3	992.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,889.1	961.0	-248.3	992.6	0.00	0.00	0.00
6,100.0	0.00	0.00	5,989.1	961.0	-248.3	992.6	0.00	0.00	0.00
6,200.0	0.00	0.00	6,089.1	961.0	-248.3	992.6	0.00	0.00	0.00
6,300.0	0.00	0.00	6,189.1	961.0	-248.3	992.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,289.1	961.0	-248.3	992.6	0.00	0.00	0.00
6,500.0	0.00	0.00	6,389.1	961.0	-248.3	992.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,489.1	961.0	-248.3	992.6	0.00	0.00	0.00
6,700.0	0.00	0.00	6,589.1	961.0	-248.3	992.6	0.00	0.00	0.00
6,800.0	0.00	0.00	6,689.1	961.0	-248.3	992.6	0.00	0.00	0.00
Cameo									
6,885.9	0.00	0.00	6,775.0	961.0	-248.3	992.6	0.00	0.00	0.00
6,900.0	0.00	0.00	6,789.1	961.0	-248.3	992.6	0.00	0.00	0.00
7,000.0	0.00	0.00	6,889.1	961.0	-248.3	992.6	0.00	0.00	0.00
7,100.0	0.00	0.00	6,989.1	961.0	-248.3	992.6	0.00	0.00	0.00
7,200.0	0.00	0.00	7,089.1	961.0	-248.3	992.6	0.00	0.00	0.00
7,300.0	0.00	0.00	7,189.1	961.0	-248.3	992.6	0.00	0.00	0.00
7,400.0	0.00	0.00	7,289.1	961.0	-248.3	992.6	0.00	0.00	0.00
7,500.0	0.00	0.00	7,389.1	961.0	-248.3	992.6	0.00	0.00	0.00
Base Cameo Coal									
7,545.9	0.00	0.00	7,435.0	961.0	-248.3	992.6	0.00	0.00	0.00
Rollins									
7,585.9	0.00	0.00	7,475.0	961.0	-248.3	992.6	0.00	0.00	0.00
7,600.0	0.00	0.00	7,489.1	961.0	-248.3	992.6	0.00	0.00	0.00
7,700.0	0.00	0.00	7,589.1	961.0	-248.3	992.6	0.00	0.00	0.00
7,800.0	0.00	0.00	7,689.1	961.0	-248.3	992.6	0.00	0.00	0.00
TD @ 7836' MD / 7725' TVD									
7,835.9	0.00	0.00	7,725.0	961.0	-248.3	992.6	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-18E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455.0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455.0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-18E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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
BRUTON 19-18E - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,725.0	961.0	-248.3	1,527,103.13	2,346,816.33	39.257858	-107.807052

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,526.4	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,658.4	2,625.0	G' Sand			
4,558.6	4,475.0	Williams Fork			
5,885.9	5,775.0	TOG			
6,885.9	6,775.0	Cameo			
7,545.9	7,435.0	Base Cameo Coal			
7,585.9	7,475.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,100.0	1,100.0	0.0	0.0	KOP (Build 3° / 100')
1,539.9	1,536.0	48.8	-12.6	EOB @ 13.2° Inc. / 345.51° Azm
5,446.0	5,339.0	912.2	-235.7	Drop 3° / 100'
5,885.9	5,775.0	961.0	-248.3	EOD @ Vertical
7,835.9	7,725.0	961.0	-248.3	TD @ 7836' MD / 7725' TVD