



# **Departure**

## **Energy Services (US) LP**

### **Foundation Energy**

**Rio Blanco County, Colorado  
SWSW Sec 18-T1S-R103W  
Banta Ridge Federal #6-18-1-103  
Wellbore #1**

**Design: Wellbore #1**

### **Final Survey Report**

**18 September, 2012**





Company Name: Foundation Energy

Banta Ridge Federal #6-18-1-103  
 North American Datum 1983  
 GRS 1980  
 Colorado Northern Zone  
 North Ref: True  
 WELL @ 6074.00ft (RKB @ 10')  
 39.957406°N  
 109.005367°W



**Departure**  
 Energy Services (US) LP

Project: Rio Blanco County, Colorado  
 Site: SWSW Sec 18-T1S-R103W  
 Well: Banta Ridge Federal #6-18-1-103  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

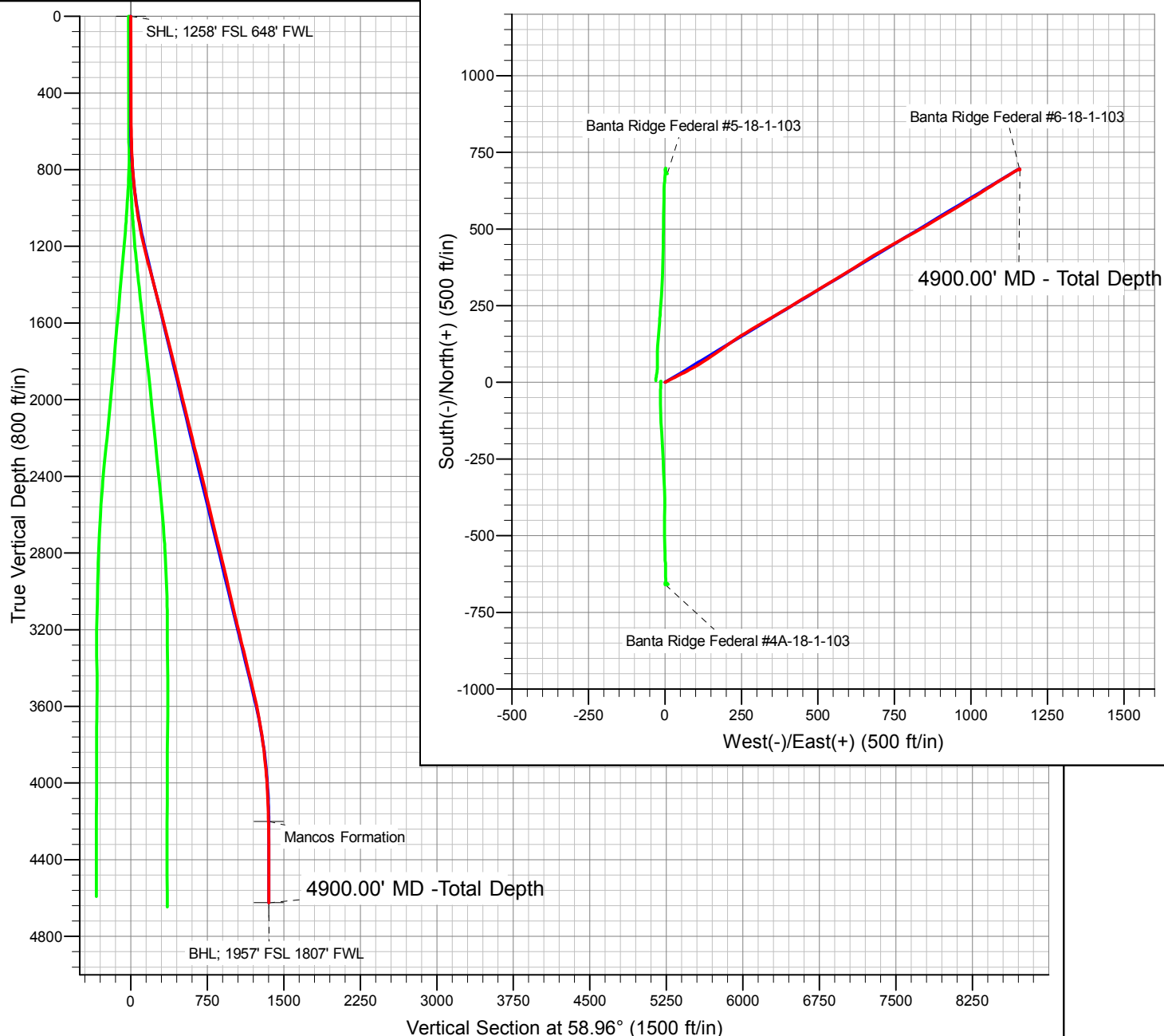


Azimuths to True North  
 Magnetic North: 10.71°

Magnetic Field  
 Strength: 52249.0snT  
 Dip Angle: 65.90°  
 Date: 8/13/2012  
 Model: IGRF2010

### ANNOTATIONS

MD	Inc	Azi	+N/-S	+E/-W	Vsect	Departure	Annotation
4855.00	0.80	158.50	693.57	1160.17	1351.67	1356.97	4855.00 - Last Survey
4900.00	0.80	158.50	692.98	1160.40	1351.57	1357.60	Straight line projection to TD - 4900.00'





<b>Company:</b>	Foundation Energy	<b>Local Co-ordinate Reference:</b>	Well Banta Ridge Federal #6-18-1-103
<b>Project:</b>	Rio Blanco County, Colorado	<b>TVD Reference:</b>	WELL @ 6074.00ft (RKB @ 10")
<b>Site:</b>	SWSW Sec 18-T1S-R103W	<b>MD Reference:</b>	WELL @ 6074.00ft (RKB @ 10")
<b>Well:</b>	Banta Ridge Federal #6-18-1-103	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

<b>Project</b>	Rio Blanco County, Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		

Site		SWSW Sec 18-T1S-R103W			
Site Position:		Northing:	1,246,760.38 ft	Latitude:	39.957422°N
From:	Lat/Long	Easting:	2,017,576.26 ft	Longitude:	109.005472°W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-2.27 °

Well	Banta Ridge Federal #6-18-1-103					
Well Position	+N/-S	0.00 ft	Northing:	1,246,753.37 ft	Latitude:	39.957406°N
	+E/-W	0.00 ft	Easting:	2,017,605.44 ft	Longitude:	109.005367°W
Position Uncertainty		0.00 ft	Wellhead Elevation:	6,074.00 ft	Ground Level:	6,064.00 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	8/13/2012	10.71	65.90	52,249

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	58.96	

<b>Survey Program</b>	<b>Date</b>	9/18/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
568.00	4,900.00	Survey #1 (Wellbore #1)			

<b>Survey</b>								
<b>MD (ft)</b>	<b>Inc (°)</b>	<b>Azi (°)</b>	<b>TVD (ft)</b>	<b>N/S (ft)</b>	<b>E/W (ft)</b>	<b>V. Sec (ft)</b>	<b>DLeg (°/100ft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
568.00	0.80	61.20	567.98	1.91	3.47	3.96	0.14	
658.00	2.80	66.60	657.93	3.09	6.04	6.77	2.23	
752.00	5.10	58.80	751.70	6.16	11.72	13.22	2.51	
845.00	9.00	65.10	843.98	11.37	21.86	24.59	4.27	
936.00	12.60	63.10	933.36	18.86	37.18	41.58	3.98	
1,031.00	16.00	62.70	1,025.40	29.55	58.06	64.98	3.58	
1,156.00	22.20	60.90	1,143.46	48.96	94.03	105.82	4.98	
1,218.00	23.00	58.60	1,200.70	60.97	114.61	129.63	1.92	
1,310.00	27.10	56.30	1,284.03	81.97	147.40	168.56	4.58	
1,403.00	26.10	54.40	1,367.19	105.63	181.66	210.11	1.41	
1,494.00	25.70	55.00	1,449.05	128.60	214.10	249.75	0.53	



<b>Company:</b>	Foundation Energy	<b>Local Co-ordinate Reference:</b>	Well Banta Ridge Federal #6-18-1-103
<b>Project:</b>	Rio Blanco County, Colorado	<b>TVD Reference:</b>	WELL @ 6074.00ft (RKB @ 10')
<b>Site:</b>	SWSW Sec 18-T1S-R103W	<b>MD Reference:</b>	WELL @ 6074.00ft (RKB @ 10')
<b>Well:</b>	Banta Ridge Federal #6-18-1-103	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

Survey								
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	
1,588.00	26.10	56.90	1,533.61	151.58	248.11	290.75	0.98	
1,679.00	26.00	59.90	1,615.37	172.52	282.14	330.70	1.45	
1,772.00	25.40	59.60	1,699.17	192.84	316.98	371.02	0.66	
1,866.00	24.50	59.40	1,784.39	212.96	351.15	410.67	0.96	
1,959.00	24.90	59.20	1,868.89	232.80	384.56	449.53	0.44	
2,051.00	24.00	58.80	1,952.63	252.41	417.20	487.61	0.99	
2,141.00	25.20	59.50	2,034.46	271.62	449.37	525.08	1.37	
2,232.00	24.50	59.10	2,117.04	291.14	482.25	563.32	0.79	
2,324.00	24.70	59.00	2,200.69	310.84	515.09	601.62	0.22	
2,418.00	26.00	58.90	2,285.64	331.59	549.57	641.86	1.38	
2,512.00	25.30	58.70	2,370.37	352.67	584.38	682.55	0.75	
2,607.00	24.50	57.80	2,456.54	373.71	618.39	722.54	0.93	
2,702.00	23.20	57.90	2,543.43	394.16	650.91	760.95	1.37	
2,795.00	24.00	58.90	2,628.65	413.66	682.63	798.18	0.96	
2,886.00	24.80	59.80	2,711.52	432.82	714.97	835.77	0.97	
2,980.00	25.10	61.00	2,796.75	452.40	749.44	875.41	0.63	
3,075.00	24.20	61.30	2,883.09	471.52	784.15	915.00	0.96	
3,169.00	23.10	60.50	2,969.19	489.86	817.10	952.68	1.22	
3,264.00	23.40	60.10	3,056.48	508.44	849.67	990.17	0.36	
3,358.00	23.90	58.80	3,142.58	527.60	882.14	1,027.88	0.77	
3,450.00	25.40	59.00	3,226.20	547.42	915.00	1,066.25	1.63	
3,546.00	24.20	59.70	3,313.34	567.95	949.63	1,106.51	1.29	
3,640.00	24.70	57.90	3,398.91	588.11	982.91	1,145.41	0.95	
3,736.00	24.80	58.20	3,486.10	609.38	1,017.01	1,185.60	0.17	
3,829.00	22.40	58.40	3,571.31	628.95	1,048.68	1,222.83	2.58	
3,922.00	18.50	56.90	3,658.43	646.30	1,076.15	1,255.30	4.23	
4,018.00	16.00	59.30	3,750.11	661.37	1,100.29	1,283.76	2.71	
4,112.00	12.30	57.50	3,841.24	673.37	1,119.88	1,306.73	3.96	
4,207.00	9.30	57.20	3,934.55	682.97	1,134.87	1,324.52	3.16	
4,303.00	6.20	62.50	4,029.66	689.56	1,145.99	1,337.45	3.31	
4,394.00	3.90	63.70	4,120.30	693.20	1,153.12	1,345.44	2.53	
4,488.00	1.20	45.40	4,214.20	695.31	1,156.69	1,349.59	2.96	
4,582.00	1.50	75.00	4,308.18	696.32	1,158.58	1,351.73	0.80	
4,677.00	0.80	167.80	4,403.16	695.99	1,159.92	1,352.71	1.83	
4,772.00	0.80	184.70	4,498.15	694.69	1,160.01	1,352.11	0.25	
4,855.00	0.80	158.50	4,581.15	693.57	1,160.17	1,351.67	0.44	
4855.00 - Last Survey								
4,900.00	0.80	158.50	4,626.14	692.98	1,160.40	1,351.57	0.00	
Straight line projection to TD - 4900.00'								



**Company:** Foundation Energy  
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**Well:** Banta Ridge Federal #6-18-1-103  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Banta Ridge Federal #6-18-1-103  
**TVD Reference:** WELL @ 6074.00ft (RKB @ 10')  
**MD Reference:** WELL @ 6074.00ft (RKB @ 10')  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,855.00	4,581.15	693.57	1,160.17	4855.00 - Last Survey
4,900.00	4,626.14	692.98	1,160.40	Straight line projection to TD - 4900.00'

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_