

Well Name: **Detterer FD 24-37D**

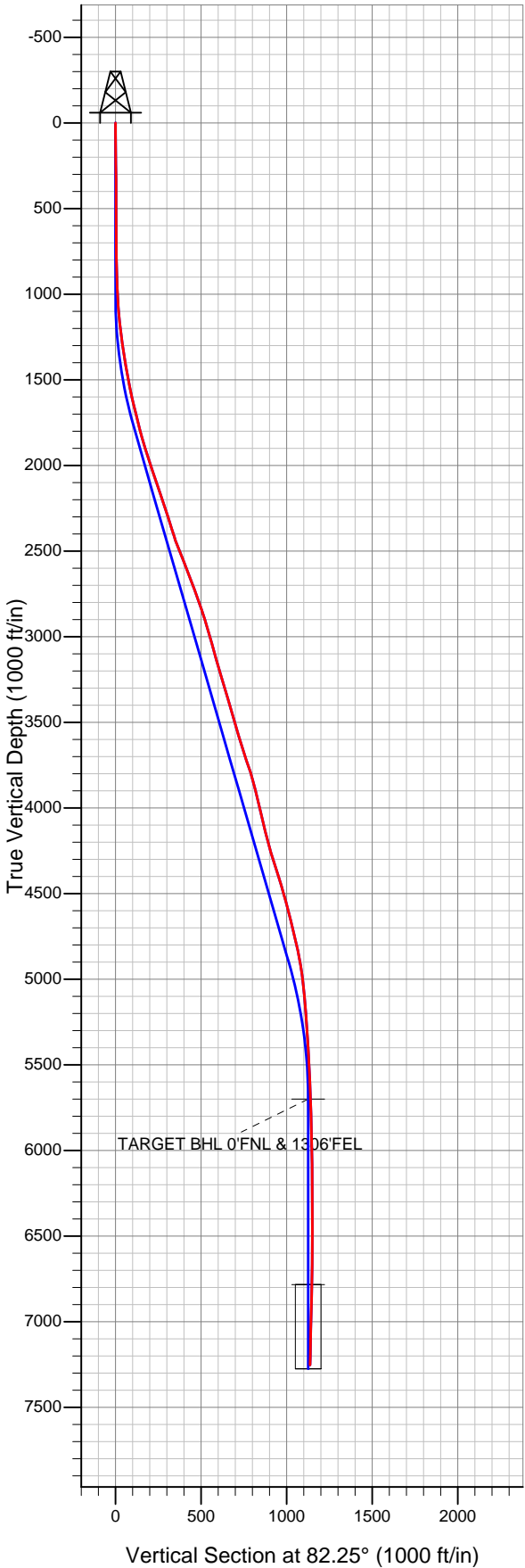
Surface Location: Detterer FD 25-6D Pad Sec.25-T6N-R67W
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4744.0

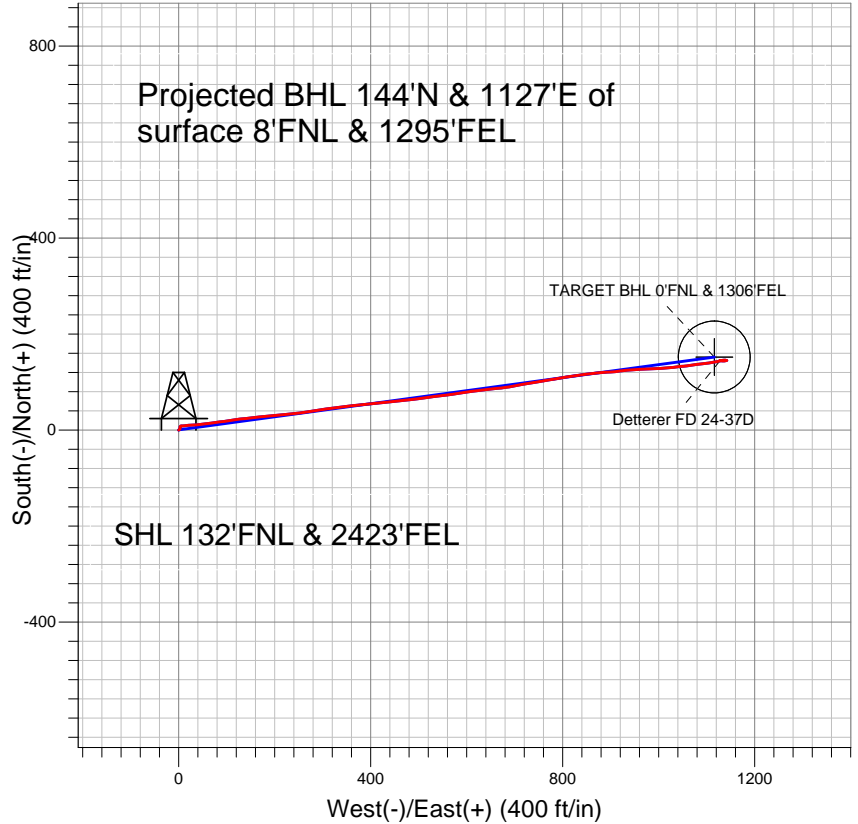
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1412902.53	3183299.86	40.464950	-104.841219

Original Well Elev WELL @ 4758.0ft (Original Well Elev)

Slot



Great Western



LEGEND

- ◆ Detterer FD 24-37D, Wellbore #1, Plan #1 (11-06-12) R V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
 7408'MD & 7252'TVD @ 1136'VS
 0.9 deg Inc 267.20 deg AZ

Project: SEC.25-T6N-R67W
 Site: Detterer FD 25-6D Pad Sec.25-T6N-R67W
 Well: Detterer FD 24-37D
 Plan: Wellbore #1



Directional

Great Western

SEC.25-T6N-R67W

Detterer FD 25-6D Pad Sec.25-T6N-R67W

Detterer FD 24-37D

Wellbore #1

Survey: Survey #1

Standard Survey Report

16 November, 2012

Company:	Great Western	Local Co-ordinate Reference:	Well Dettterer FD 24-37D
Project:	SEC.25-T6N-R67W	TVD Reference:	WELL @ 4758.0ft (Original Well Elev)
Site:	Dettterer FD 25-6D Pad Sec.25-T6N-R67W	MD Reference:	WELL @ 4758.0ft (Original Well Elev)
Well:	Dettterer FD 24-37D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.25-T6N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site		Dettterer FD 25-6D Pad Sec.25-T6N-R67W			
Site Position:		Northing:	1,412,893.64 ft	Latitude:	40.464925
From:	Lat/Long	Easting:	3,183,328.31 ft	Longitude:	-104.841117
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.43 °

Well	Dettterer FD 24-37D					
Well Position	+N/-S	0.0 ft	Northing:	1,412,902.53 ft	Latitude:	40.464950
	+E/-W	0.0 ft	Easting:	3,183,299.86 ft	Longitude:	-104.841219
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,744.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/6/2012	8.72	67.04	53,011

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	82.25	

Survey Program	Date	11/16/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
60.0	7,408.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
60.0	0.50	124.40	60.0	-0.1	0.2	0.2	0.83	0.83	0.00	
149.0	0.90	47.10	149.0	0.1	1.0	1.1	1.04	0.45	-86.85	
241.0	0.90	47.00	241.0	1.1	2.1	2.2	0.00	0.00	-0.11	
332.0	0.60	39.30	332.0	1.9	2.9	3.2	0.35	-0.33	-8.46	
423.0	0.80	24.70	423.0	2.9	3.5	3.9	0.29	0.22	-16.04	
513.0	1.10	328.80	513.0	4.2	3.3	3.8	1.03	0.33	-62.11	
604.0	1.10	8.20	603.9	5.8	3.0	3.7	0.81	0.00	43.30	
661.0	1.10	51.60	660.9	6.7	3.5	4.4	1.43	0.00	76.14	
755.0	0.60	15.20	754.9	7.7	4.3	5.3	0.76	-0.53	-38.72	
850.0	1.80	89.20	849.9	8.2	6.0	7.0	1.82	1.26	77.89	
945.0	1.80	84.50	944.9	8.4	8.9	10.0	0.16	0.00	-4.95	
1,040.0	3.30	84.80	1,039.8	8.8	13.1	14.2	1.58	1.58	0.32	

Company:	Great Western	Local Co-ordinate Reference:	Well Dettterer FD 24-37D
Project:	SEC.25-T6N-R67W	TVD Reference:	WELL @ 4758.0ft (Original Well Elev)
Site:	Dettterer FD 25-6D Pad Sec.25-T6N-R67W	MD Reference:	WELL @ 4758.0ft (Original Well Elev)
Well:	Dettterer FD 24-37D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
1,135.0	5.70	82.70	1,134.5	9.6	20.5	21.7	2.53	2.53	-2.21	
1,229.0	7.30	89.80	1,227.9	10.3	31.1	32.2	1.90	1.70	7.55	
1,324.0	8.40	84.30	1,322.0	11.0	44.1	45.2	1.40	1.16	-5.79	
1,419.0	9.90	81.30	1,415.8	12.9	59.1	60.3	1.66	1.58	-3.16	
1,514.0	11.10	83.10	1,509.2	15.2	76.2	77.6	1.31	1.26	1.89	
1,609.0	12.30	81.30	1,602.2	17.8	95.3	96.8	1.32	1.26	-1.89	
1,703.0	13.90	82.00	1,693.7	20.9	116.4	118.1	1.71	1.70	0.74	
1,798.0	14.70	84.70	1,785.8	23.6	139.7	141.6	1.10	0.84	2.84	
1,893.0	16.00	82.70	1,877.4	26.4	164.7	166.7	1.48	1.37	-2.11	
1,985.0	19.00	84.70	1,965.1	29.4	192.2	194.4	3.33	3.26	2.17	
2,080.0	19.10	84.70	2,054.9	32.3	223.0	225.4	0.11	0.11	0.00	
2,175.0	17.70	82.90	2,145.1	35.5	252.8	255.3	1.59	-1.47	-1.89	
2,269.0	18.30	79.90	2,234.5	39.8	281.6	284.4	1.17	0.64	-3.19	
2,364.0	17.50	82.60	2,324.9	44.3	310.4	313.5	1.21	-0.84	2.84	
2,459.0	18.70	83.80	2,415.2	47.8	339.7	343.1	1.32	1.26	1.26	
2,554.0	21.90	84.30	2,504.3	51.2	372.5	376.0	3.37	3.37	0.53	
2,649.0	22.20	83.40	2,592.3	55.0	407.9	411.6	0.48	0.32	-0.95	
2,743.0	19.60	83.10	2,680.1	59.0	441.2	445.2	2.77	-2.77	-0.32	
2,838.0	19.80	84.80	2,769.6	62.3	473.1	477.2	0.64	0.21	1.79	
2,933.0	19.10	82.40	2,859.1	65.8	504.5	508.8	1.12	-0.74	-2.53	
3,028.0	16.00	82.00	2,949.7	69.7	532.9	537.4	3.27	-3.26	-0.42	
3,123.0	15.40	84.50	3,041.2	72.7	558.4	563.1	0.95	-0.63	2.63	
3,217.0	16.10	80.40	3,131.6	76.1	583.7	588.6	1.40	0.74	-4.36	
3,312.0	17.30	82.00	3,222.6	80.3	610.7	615.9	1.35	1.26	1.68	
3,409.0	16.40	82.90	3,315.5	84.0	638.5	644.0	0.97	-0.93	0.93	
3,504.0	15.10	85.50	3,406.9	86.6	664.2	669.8	1.56	-1.37	2.74	
3,598.0	16.40	79.70	3,497.4	89.9	689.5	695.3	2.17	1.38	-6.17	
3,693.0	17.80	79.90	3,588.2	94.9	716.9	723.2	1.47	1.47	0.21	
3,788.0	18.10	80.60	3,678.5	99.8	745.8	752.5	0.39	0.32	0.74	
3,883.0	18.00	80.30	3,768.9	104.7	774.8	781.9	0.14	-0.11	-0.32	
3,978.0	14.90	81.50	3,860.0	109.0	801.4	808.8	3.28	-3.26	1.26	
4,072.0	12.80	81.50	3,951.2	112.3	823.6	831.3	2.23	-2.23	0.00	
4,167.0	13.40	81.20	4,043.8	115.6	844.9	852.8	0.64	0.63	-0.32	
4,262.0	14.20	85.00	4,136.0	118.3	867.4	875.4	1.27	0.84	4.00	
4,357.0	15.70	86.20	4,227.8	120.1	891.8	899.9	1.61	1.58	1.26	
4,452.0	18.00	83.80	4,318.7	122.6	919.3	927.4	2.53	2.42	-2.53	
4,546.0	17.10	85.70	4,408.3	125.2	947.5	955.7	1.13	-0.96	2.02	
4,641.0	15.70	86.80	4,499.5	126.9	974.2	982.5	1.51	-1.47	1.16	
4,736.0	14.40	88.90	4,591.2	127.9	998.9	1,007.0	1.48	-1.37	2.21	
4,831.0	14.60	82.90	4,683.2	129.6	1,022.6	1,030.7	1.59	0.21	-6.32	
4,926.0	13.10	85.00	4,775.4	132.0	1,045.2	1,053.5	1.67	-1.58	2.21	
5,021.0	10.50	81.90	4,868.4	134.2	1,064.5	1,072.9	2.82	-2.74	-3.26	
5,115.0	8.10	82.20	4,961.2	136.3	1,079.5	1,088.1	2.55	-2.55	0.32	
5,210.0	6.20	82.90	5,055.4	137.8	1,091.3	1,099.9	2.00	-2.00	0.74	
5,305.0	4.70	83.30	5,150.0	138.9	1,100.2	1,108.9	1.58	-1.58	0.42	
5,400.0	3.90	82.00	5,244.7	139.8	1,107.3	1,116.0	0.85	-0.84	-1.37	
5,495.0	3.60	79.70	5,339.5	140.8	1,113.4	1,122.2	0.35	-0.32	-2.42	
5,622.0	3.20	80.60	5,466.3	142.1	1,120.8	1,129.8	0.32	-0.31	0.71	
5,715.0	2.50	74.10	5,559.2	143.1	1,125.3	1,134.4	0.83	-0.75	-6.99	
5,855.4	1.97	78.05	5,699.5	144.4	1,130.6	1,139.8	0.40	-0.38	2.81	
TARGET BHL 0'FNL & 1306'FEL										
5,873.0	1.90	78.70	5,717.1	144.5	1,131.2	1,140.4	0.40	-0.38	3.70	
6,061.0	1.10	79.90	5,905.0	145.5	1,136.1	1,145.3	0.43	-0.43	0.64	
6,254.0	0.80	111.00	6,098.0	145.3	1,139.1	1,148.3	0.30	-0.16	16.11	

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6,444.0	0.70	100.00	6,288.0	144.6	1,141.5	1,150.6	0.09	-0.05	-5.79	
6,633.0	0.30	272.20	6,477.0	144.4	1,142.2	1,151.2	0.53	-0.21	91.11	
6,823.0	0.70	261.00	6,667.0	144.3	1,140.5	1,149.6	0.22	0.21	-5.89	
6,939.4	1.13	260.16	6,783.4	144.0	1,138.7	1,147.7	0.37	0.37	-0.72	
TARGET CIRCLE 0'FNL & 1306'FEL										
7,013.0	1.40	259.90	6,856.9	143.7	1,137.1	1,146.1	0.37	0.37	-0.36	
7,202.0	1.50	281.20	7,045.9	143.8	1,132.4	1,141.4	0.29	0.05	11.27	
7,358.0	1.10	272.60	7,201.8	144.2	1,128.9	1,138.0	0.28	-0.26	-5.51	
7,408.0	0.90	267.20	7,251.8	144.2	1,128.0	1,137.2	0.44	-0.40	-10.80	

Checked By: _____ Approved By: _____ Date: _____