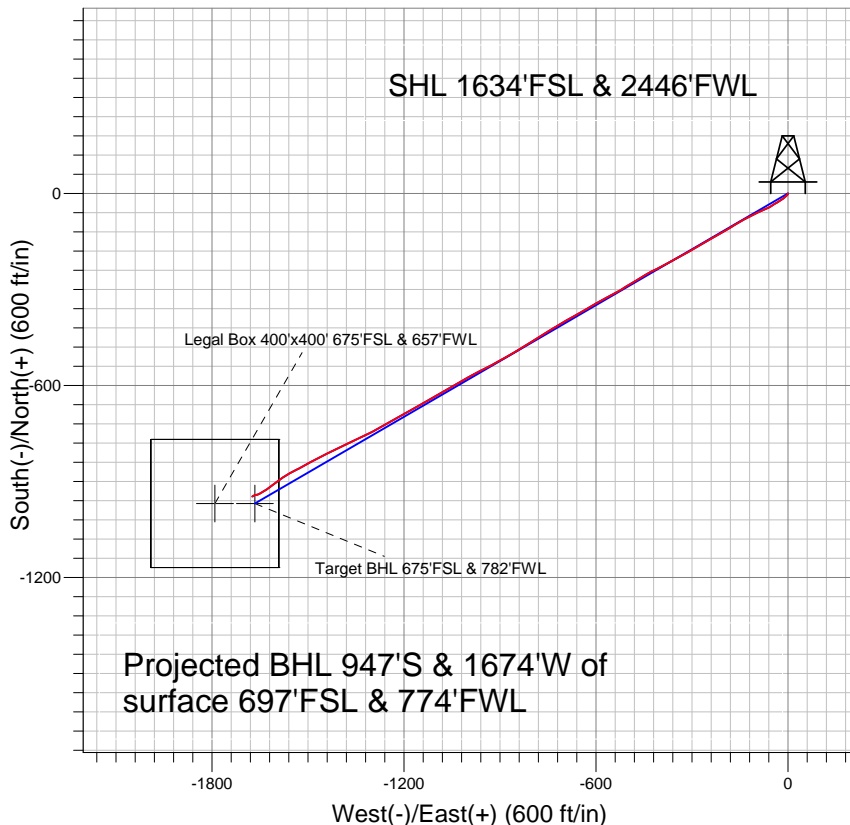
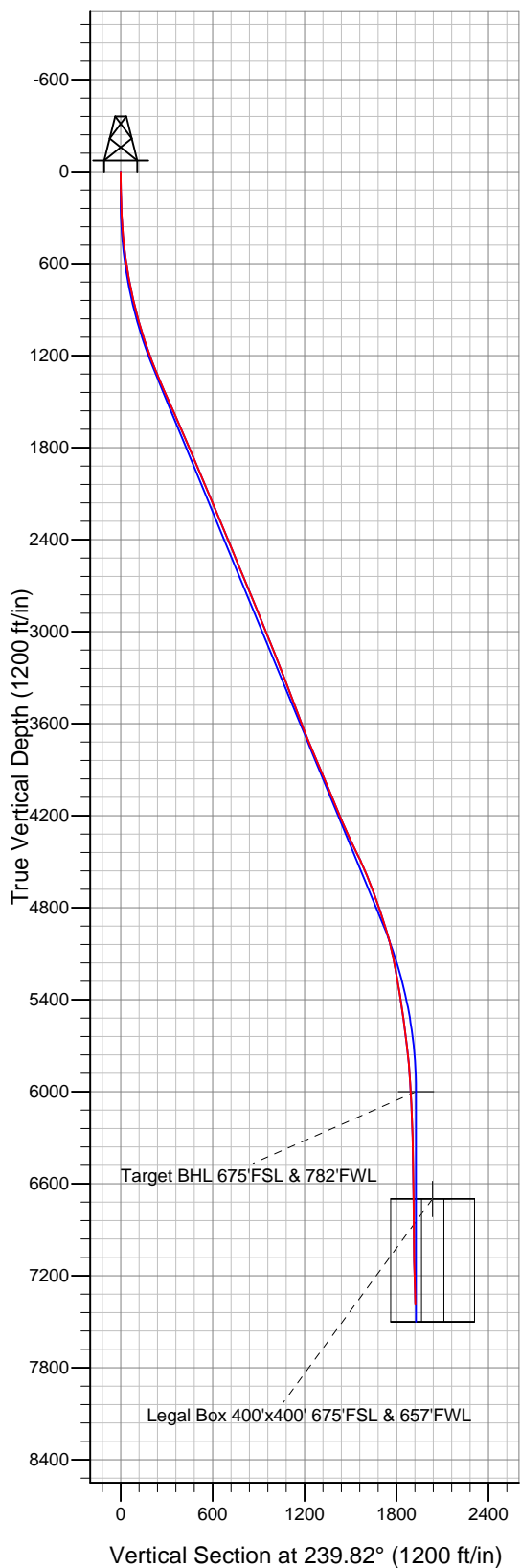


**PETROLEUM DEVELOPMENT CORP Weld County CO**



**LEGEND**

- Knieval 14-12D, Wellbore #1, Plan #3 (2-15-11) V0
- Wellbore #1
- Survey #1

**Final Survey Plot**

Projected Final Survey -  
7733' MD & 7389' TVD @ 1923' VS  
1.1 deg Inc 234.8 deg AZ

Project: SEC.12-T6N-R67W  
Site: Knieval 23-12D Pad Sec.12-T6N-R67W  
Well: Knieval 14-12D  
Plan: Wellbore #1



## **Directional**

# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.12-T6N-R67W**

**Knievel 23-12D Pad Sec.12-T6N-R67W**

**Knievel 14-12D**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**18 May, 2011**

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Knievel 14-12D
<b>Project:</b>	SEC.12-T6N-R67W	<b>TVD Reference:</b>	WELL @ 4881.0ft (Original Well Elev)
<b>Site:</b>	Knievel 23-12D Pad Sec.12-T6N-R67W	<b>MD Reference:</b>	WELL @ 4881.0ft (Original Well Elev)
<b>Well:</b>	Knievel 14-12D	<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>	Landmark

<b>Project</b>	SEC.12-T6N-R67W, Weld 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		Using geodetic scale factor

Site	Knievel 23-12D Pad Sec.12-T6N-R67W				
Site Position:		Northing:	1,425,300.57 ft	Latitude:	40.498990
From:	Lat/Long	Easting:	3,182,868.18 ft	Longitude:	-104.842440
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.42 °

Well	Knievel 14-12D					
Well Position	+N-S	0.0 ft	Northing:	1,425,234.98 ft	Latitude:	40.498810
	+E-W	0.0 ft	Easting:	3,182,868.67 ft	Longitude:	-104.842440
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,868.0 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	2/21/2011	8.96	67.13	53,207

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	239.82	

<b>Survey Program</b>	<b>Date</b> 5/18/2011			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
119.0	7,733.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
119.0	1.50	196.50	119.0	-1.5	-0.4	1.1	1.26	1.26	0.00	
210.0	2.10	217.70	209.9	-4.0	-1.8	3.5	0.97	0.66	23.30	
301.0	2.90	228.40	300.9	-6.8	-4.5	7.3	1.01	0.88	11.76	
392.0	4.20	224.00	391.7	-10.7	-8.6	12.8	1.46	1.43	-4.84	
483.0	6.10	233.60	482.3	-16.0	-14.8	20.8	2.29	2.09	10.55	
576.0	8.30	237.70	574.6	-22.5	-24.4	32.4	2.43	2.37	4.41	
670.0	10.10	241.10	667.4	-30.1	-37.4	47.5	2.00	1.91	3.62	
710.0	10.90	235.50	706.7	-34.0	-43.6	54.7	3.24	2.00	-14.00	
805.0	12.00	242.10	799.8	-43.7	-59.7	73.6	1.80	1.16	6.95	
900.0	14.50	247.80	892.3	-52.8	-79.5	95.2	2.97	2.63	6.00	
995.0	15.80	243.50	984.0	-63.1	-102.0	119.9	1.81	1.37	-4.53	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Knievel 14-12D
<b>Project:</b>	SEC.12-T6N-R67W	<b>TVD Reference:</b>	WELL @ 4881.0ft (Original Well Elev)
<b>Site:</b>	Knievel 23-12D Pad Sec.12-T6N-R67W	<b>MD Reference:</b>	WELL @ 4881.0ft (Original Well Elev)
<b>Well:</b>	Knievel 14-12D	<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>	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)
1,090.0	17.60	243.60	1,075.0	-75.2	-126.5	147.1	1.89	1.89	0.11
1,185.0	19.00	237.90	1,165.2	-89.8	-152.4	176.9	2.39	1.47	-6.00
1,279.0	21.60	239.20	1,253.3	-106.8	-180.3	209.5	2.81	2.77	1.38
1,374.0	22.90	240.00	1,341.2	-125.0	-211.3	245.5	1.41	1.37	0.84
1,469.0	23.60	240.00	1,428.5	-143.8	-243.8	283.0	0.74	0.74	0.00
1,564.0	24.70	240.10	1,515.2	-163.2	-277.5	321.9	1.16	1.16	0.11
1,659.0	23.80	240.90	1,601.8	-182.4	-311.4	360.9	1.01	-0.95	0.84
1,754.0	23.10	240.90	1,689.0	-200.8	-344.4	398.7	0.74	-0.74	0.00
1,849.0	23.00	242.30	1,776.4	-218.5	-377.2	435.9	0.59	-0.11	1.47
1,944.0	23.40	242.80	1,863.7	-235.7	-410.4	473.2	0.47	0.42	0.53
2,039.0	22.80	239.87	1,951.1	-253.6	-443.1	510.5	1.36	-0.63	-3.08
2,134.0	23.30	238.70	2,038.5	-272.6	-475.0	547.7	0.71	0.53	-1.23
2,228.0	22.90	238.50	2,125.0	-291.8	-506.5	584.6	0.43	-0.43	-0.21
2,333.0	22.50	241.20	2,221.8	-312.1	-541.6	625.1	1.06	-0.38	2.57
2,418.0	22.60	241.70	2,300.3	-327.7	-570.2	657.6	0.25	0.12	0.59
2,513.0	22.50	240.40	2,388.1	-345.3	-602.1	694.1	0.54	-0.11	-1.37
2,608.0	22.40	239.80	2,475.9	-363.4	-633.5	730.3	0.26	-0.11	-0.63
2,700.0	22.70	240.10	2,560.8	-381.1	-664.1	765.6	0.35	0.33	0.33
2,798.0	23.60	240.10	2,651.0	-400.3	-697.5	804.2	0.92	0.92	0.00
2,892.0	22.20	239.40	2,737.5	-418.7	-729.1	840.7	1.52	-1.49	-0.74
2,988.0	21.70	239.20	2,826.6	-437.0	-759.9	876.6	0.53	-0.52	-0.21
3,083.0	21.60	235.20	2,914.9	-456.0	-789.4	911.6	1.56	-0.11	-4.21
3,178.0	23.20	240.30	3,002.7	-475.3	-820.0	947.8	2.65	1.68	5.37
3,271.0	22.20	238.00	3,088.5	-493.7	-850.8	983.6	1.44	-1.08	-2.47
3,368.0	21.30	242.10	3,178.6	-511.6	-881.9	1,019.6	1.82	-0.93	4.23
3,462.0	20.70	240.00	3,266.4	-527.9	-911.4	1,053.2	1.02	-0.64	-2.23
3,558.0	21.10	242.70	3,356.1	-544.3	-941.4	1,087.5	1.09	0.42	2.81
3,651.0	20.60	243.10	3,443.0	-559.4	-970.9	1,120.5	0.56	-0.54	0.43
3,748.0	21.10	240.80	3,533.6	-575.6	-1,001.3	1,155.0	0.99	0.52	-2.37
3,841.0	20.20	239.20	3,620.6	-592.0	-1,029.8	1,187.8	1.14	-0.97	-1.72
3,936.0	22.60	239.80	3,709.1	-609.6	-1,059.6	1,222.5	2.54	2.53	0.63
4,031.0	23.30	240.70	3,796.6	-628.0	-1,091.8	1,259.5	0.82	0.74	0.95
4,127.0	23.30	240.70	3,884.7	-646.6	-1,124.9	1,297.5	0.00	0.00	0.00
4,221.0	22.20	239.10	3,971.4	-664.8	-1,156.4	1,333.8	1.34	-1.17	-1.70
4,316.0	22.00	242.20	4,059.5	-682.3	-1,187.5	1,369.5	1.25	-0.21	3.26
4,411.0	22.50	240.30	4,147.4	-699.6	-1,219.0	1,405.5	0.92	0.53	-2.00
4,505.0	24.10	240.60	4,233.7	-717.9	-1,251.4	1,442.7	1.71	1.70	0.32
4,599.0	24.30	240.30	4,319.5	-736.9	-1,284.9	1,481.2	0.25	0.21	-0.32
4,695.0	26.20	244.50	4,406.3	-755.9	-1,321.2	1,522.1	2.72	1.98	4.38
4,790.0	25.50	244.80	4,491.8	-773.6	-1,358.6	1,563.4	0.75	-0.74	0.32
4,885.0	22.40	244.50	4,578.6	-790.1	-1,393.5	1,601.8	3.27	-3.26	-0.32
4,980.0	20.90	243.50	4,666.9	-805.5	-1,425.0	1,636.7	1.63	-1.58	-1.05
5,075.0	19.60	243.50	4,756.0	-820.1	-1,454.4	1,669.5	1.37	-1.37	0.00
5,169.0	18.30	241.80	4,844.9	-834.1	-1,481.5	1,700.0	1.50	-1.38	-1.81
5,264.0	17.30	240.80	4,935.4	-848.1	-1,507.0	1,729.1	1.10	-1.05	-1.05
5,359.0	14.20	242.90	5,026.8	-860.3	-1,529.7	1,754.8	3.32	-3.26	2.21
5,454.0	12.30	239.90	5,119.3	-870.7	-1,548.8	1,776.6	2.13	-2.00	-3.16
5,549.0	10.30	240.80	5,212.4	-879.9	-1,565.0	1,795.2	2.11	-2.11	0.95
5,644.0	9.10	239.70	5,306.0	-887.8	-1,578.9	1,811.2	1.28	-1.26	-1.16
5,739.0	9.10	232.40	5,399.9	-896.2	-1,591.3	1,826.2	1.21	0.00	-7.68
5,834.0	8.10	229.90	5,493.8	-905.1	-1,602.4	1,840.2	1.12	-1.05	-2.63
5,929.0	7.30	231.80	5,587.9	-913.1	-1,612.3	1,852.8	0.88	-0.84	2.00
6,024.0	7.10	235.80	5,682.2	-920.2	-1,621.9	1,864.6	0.57	-0.21	4.21

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Knievel 14-12D
<b>Project:</b>	SEC.12-T6N-R67W	<b>TVD Reference:</b>	WELL @ 4881.0ft (Original Well Elev)
<b>Site:</b>	Knievel 23-12D Pad Sec.12-T6N-R67W	<b>MD Reference:</b>	WELL @ 4881.0ft (Original Well Elev)
<b>Well:</b>	Knievel 14-12D	<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>	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)
6,119.0	5.80	238.00	5,776.6	-926.0	-1,630.8	1,875.3	1.39	-1.37	2.32
6,214.0	4.70	237.80	5,871.2	-930.6	-1,638.2	1,883.9	1.16	-1.16	-0.21
6,308.0	3.50	242.40	5,964.9	-934.0	-1,644.0	1,890.7	1.32	-1.28	4.89
6,345.0	3.15	240.31	6,001.8	-935.0	-1,645.8	1,892.8	1.01	-0.96	-5.65
<b>Target BHL 675'FSL &amp; 782'FWL</b>									
6,403.0	2.60	235.90	6,059.8	-936.6	-1,648.3	1,895.7	1.01	-0.94	-7.60
6,498.0	2.20	246.70	6,154.7	-938.5	-1,651.8	1,899.7	0.63	-0.42	11.37
6,593.0	1.80	245.00	6,249.7	-939.8	-1,654.8	1,903.0	0.43	-0.42	-1.79
6,688.0	1.30	253.70	6,344.6	-940.8	-1,657.2	1,905.5	0.58	-0.53	9.16
6,783.0	1.00	253.10	6,439.6	-941.3	-1,659.0	1,907.3	0.32	-0.32	-0.63
6,876.0	0.90	250.10	6,532.6	-941.8	-1,660.5	1,908.9	0.12	-0.11	-3.23
6,973.0	0.50	253.50	6,629.6	-942.2	-1,661.6	1,910.0	0.41	-0.41	3.51
7,044.6	0.50	254.25	6,701.1	-942.3	-1,662.2	1,910.6	0.01	0.00	1.05
<b>Legal Box 400'x400' 675'FSL &amp; 657'FWL</b>									
7,068.0	0.50	254.50	6,724.6	-942.4	-1,662.4	1,910.8	0.01	0.00	1.05
7,163.0	0.50	253.80	6,819.6	-942.6	-1,663.2	1,911.6	0.01	0.00	-0.74
7,258.0	0.70	266.70	6,914.6	-942.8	-1,664.2	1,912.5	0.25	0.21	13.58
7,353.0	1.00	267.60	7,009.6	-942.8	-1,665.6	1,913.8	0.32	0.32	0.95
7,448.0	1.30	245.80	7,104.5	-943.3	-1,667.4	1,915.6	0.55	0.32	-22.95
7,543.0	1.50	240.60	7,199.5	-944.4	-1,669.5	1,917.9	0.25	0.21	-5.47
7,638.0	1.60	240.00	7,294.5	-945.6	-1,671.7	1,920.5	0.11	0.11	-0.63
7,733.0	1.10	234.80	7,389.5	-946.8	-1,673.6	1,922.7	0.54	-0.53	-5.47

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