

Well Name: **Leffler 2SD**

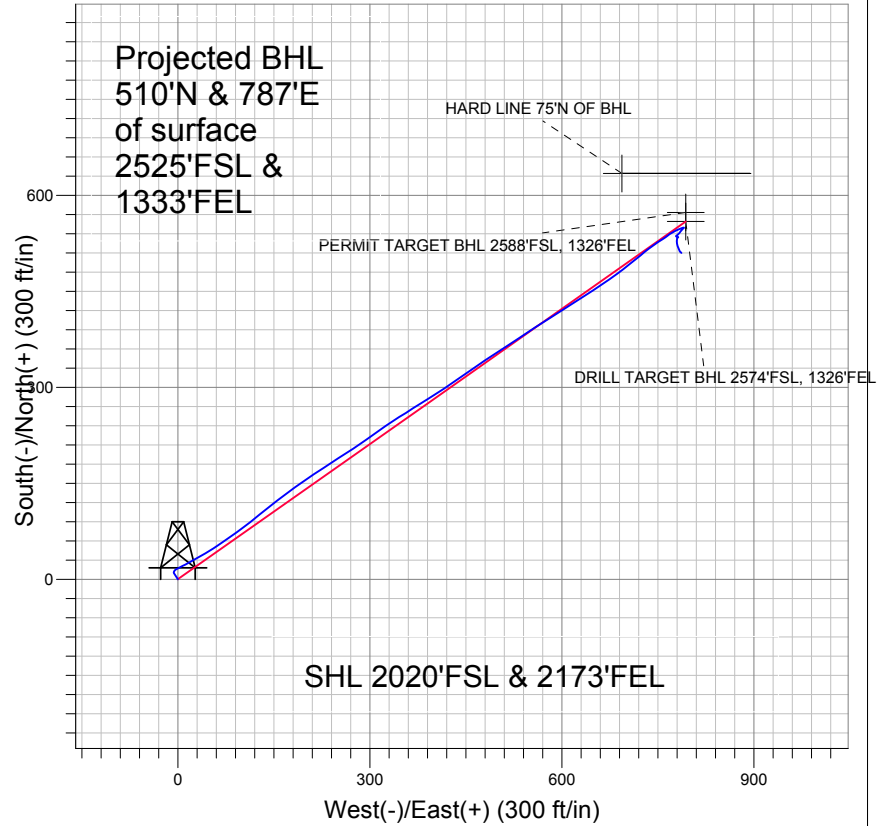
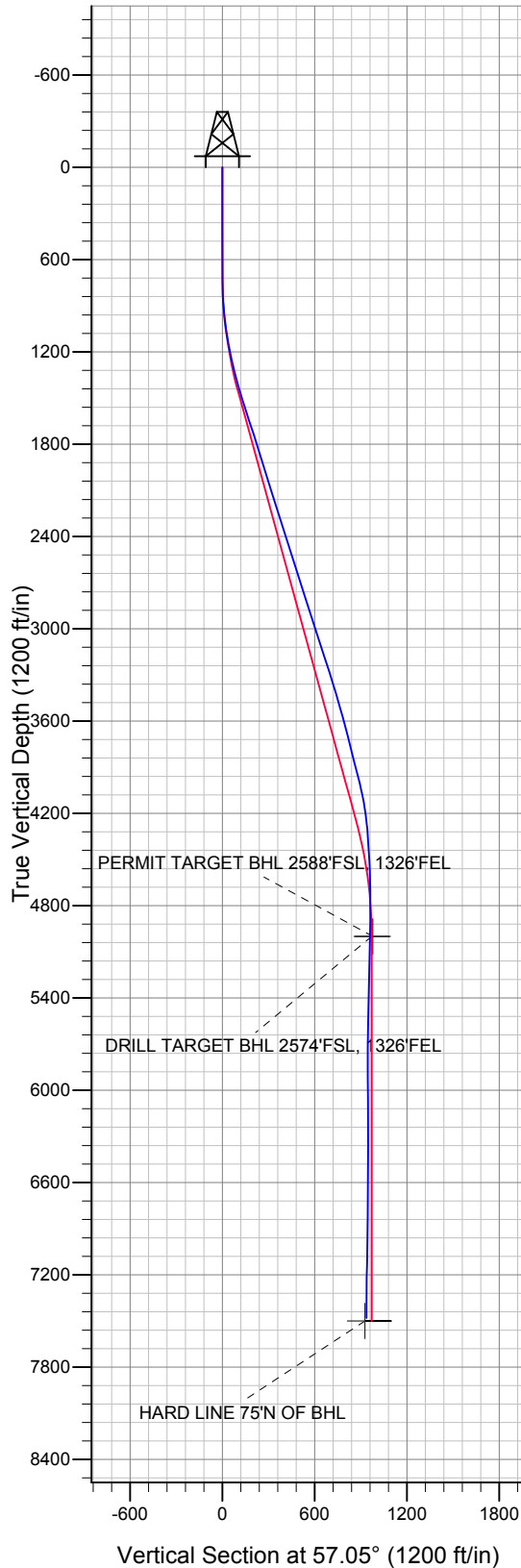
Surface Location: Leffler 2SD Pad Sec.2-T6N-R66W  
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4860.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1431804.24	3210357.07	40° 30' 58.464 N	104° 44' 36.240 W	

Original Well Elev WELL @ 4873.0ft (Original Well Elev)

## PETROLEUM DEVELOPMENT CORP Weld County CO



### LEGEND

- Leffler 2SD, Wellbore #1, Plan #2 (8-23-10) V0
- Wellbore #1

## Final Survey Plot

Projected Final Survey -  
 7615'MD & 7480'TVD @ 937' VS  
 2.5 deg Inc 136.8 deg AZ

Project: SEC.2-T6N-R66W  
 Site: Leffler 2SD Pad Sec.2-T6N-R66W  
 Well: Leffler 2SD  
 Plan: Wellbore #1



## **Directional**

# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.2-T6N-R66W**

**Leffler 2SD Pad Sec.2-T6N-R66W**

**Leffler 2SD**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**12 January, 2011**

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Site Leffler 2SD Pad Sec.2-T6N-R66W
<b>Project:</b>	SEC.2-T6N-R66W	<b>TVD Reference:</b>	WELL @ 4873.0ft (Original Well Elev)
<b>Site:</b>	Leffler 2SD Pad Sec.2-T6N-R66W	<b>MD Reference:</b>	WELL @ 4873.0ft (Original Well Elev)
<b>Well:</b>	Leffler 2SD	<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.2-T6N-R66W, 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	Leffler 2SD Pad Sec.2-T6N-R66W				
Site Position:		Northing:	1,431,804.25 ft	Latitude:	40° 30' 58.464 N
From:	Lat/Long	Easting:	3,210,357.07 ft	Longitude:	104° 44' 36.240 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.49 °

Well	Leffler 2SD					
Well Position	+N-S	0.0 ft	Northing:	1,431,804.24 ft	Latitude:	40° 30' 58.464 N
	+E-W	0.0 ft	Easting:	3,210,357.07 ft	Longitude:	104° 44' 36.240 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,860.0 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	8/23/2010	8.97	67.18	53,280

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	57.05	

<b>Survey Program</b>	<b>Date</b>	1/12/2011			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
735.0	7,615.0	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	
735.0	1.80	328.60	734.9	9.8	-6.0	0.3	0.24	0.24	0.00	
828.0	2.60	31.40	827.8	12.9	-5.7	2.3	2.57	0.86	67.53	
921.0	5.20	61.10	920.6	16.7	-0.9	8.4	3.45	2.80	31.94	
1,015.0	7.00	63.40	1,014.1	21.4	8.0	18.3	1.93	1.91	2.45	
1,108.0	9.80	61.50	1,106.1	27.7	20.0	31.8	3.03	3.01	-2.04	
1,201.0	11.50	61.20	1,197.5	35.9	35.1	49.0	1.83	1.83	-0.32	
1,294.0	13.10	57.50	1,288.3	46.0	52.1	68.8	1.92	1.72	-3.98	
1,388.0	14.80	54.80	1,379.5	58.7	70.9	91.4	1.94	1.81	-2.87	
1,481.0	16.70	54.80	1,469.1	73.2	91.5	116.6	2.04	2.04	0.00	
1,574.0	17.90	52.00	1,557.8	89.7	113.7	144.2	1.57	1.29	-3.01	
1,667.0	18.30	50.60	1,646.2	107.8	136.2	173.0	0.64	0.43	-1.51	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Site Leffler 2SD Pad Sec.2-T6N-R66W
<b>Project:</b>	SEC.2-T6N-R66W	<b>TVD Reference:</b>	WELL @ 4873.0ft (Original Well Elev)
<b>Site:</b>	Leffler 2SD Pad Sec.2-T6N-R66W	<b>MD Reference:</b>	WELL @ 4873.0ft (Original Well Elev)
<b>Well:</b>	Leffler 2SD	<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)
1,760.0	18.20	52.10	1,734.6	126.0	159.0	201.9	0.52	-0.11	1.61
1,854.0	16.70	55.00	1,824.2	142.8	181.6	230.1	1.84	-1.60	3.09
1,946.0	17.60	55.40	1,912.1	158.2	203.9	257.2	0.99	0.98	0.43
2,040.0	17.50	56.90	2,001.8	174.0	227.4	285.5	0.49	-0.11	1.60
2,133.0	17.20	56.80	2,090.5	189.2	250.7	313.3	0.32	-0.32	-0.11
2,226.0	17.70	57.40	2,179.3	204.3	274.1	341.1	0.57	0.54	0.65
2,319.0	17.70	53.80	2,267.9	220.3	297.4	369.4	1.18	0.00	-3.87
2,412.0	18.10	54.70	2,356.4	237.0	320.6	397.9	0.52	0.43	0.97
2,505.0	17.70	58.60	2,444.9	252.7	344.5	426.5	1.36	-0.43	4.19
2,598.0	16.80	56.90	2,533.7	267.4	367.8	454.1	1.11	-0.97	-1.83
2,691.0	18.00	58.90	2,622.4	282.2	391.3	481.9	1.44	1.29	2.15
2,785.0	17.90	55.80	2,711.8	297.8	415.7	510.8	1.02	-0.11	-3.30
2,878.0	17.60	54.90	2,800.4	313.9	439.1	539.2	0.44	-0.32	-0.97
2,971.0	18.00	56.20	2,889.0	330.0	462.5	567.6	0.61	0.43	1.40
3,064.0	18.10	55.60	2,977.4	346.2	486.4	596.4	0.23	0.11	-0.65
3,157.0	17.10	57.20	3,066.0	361.7	509.8	624.5	1.19	-1.08	1.72
3,250.0	18.60	55.90	3,154.6	377.5	533.5	653.0	1.67	1.61	-1.40
3,344.0	18.50	57.80	3,243.7	393.8	558.6	682.9	0.65	-0.11	2.02
3,437.0	17.30	57.10	3,332.2	409.2	582.7	711.5	1.31	-1.29	-0.75
3,531.0	16.40	57.60	3,422.1	423.9	605.6	738.8	0.97	-0.96	0.53
3,624.0	15.80	57.80	3,511.5	437.7	627.4	764.5	0.65	-0.65	0.22
3,717.0	15.50	56.80	3,601.0	451.2	648.5	789.6	0.43	-0.32	-1.08
3,810.0	14.30	54.80	3,690.9	464.6	668.3	813.5	1.40	-1.29	-2.15
3,904.0	13.70	54.00	3,782.1	477.9	686.8	836.3	0.67	-0.64	-0.85
3,997.0	14.70	51.80	3,872.3	491.6	705.0	859.0	1.22	1.08	-2.37
4,090.0	14.30	49.80	3,962.3	506.4	723.0	882.1	0.69	-0.43	-2.15
4,183.0	12.40	53.90	4,052.8	519.7	739.9	903.5	2.28	-2.04	4.41
4,276.0	9.80	58.30	4,144.1	529.7	754.7	921.4	2.94	-2.80	4.73
4,369.0	6.70	51.50	4,236.1	537.2	765.7	934.7	3.49	-3.33	-7.31
4,463.0	4.40	60.80	4,329.6	542.4	773.1	943.8	2.62	-2.45	9.89
4,556.0	3.70	65.60	4,422.4	545.4	779.0	950.3	0.84	-0.75	5.16
4,649.0	3.00	68.00	4,515.2	547.5	783.9	955.7	0.77	-0.75	2.58
4,742.0	2.20	70.90	4,608.1	549.0	787.9	959.8	0.87	-0.86	3.12
4,835.0	1.10	94.90	4,701.1	549.5	790.5	962.2	1.37	-1.18	25.81
4,928.0	0.70	231.00	4,794.1	549.1	790.9	962.4	1.80	-0.43	146.34
5,115.0	1.10	227.90	4,981.1	547.2	788.7	959.5	0.22	0.21	-1.66
5,133.5	1.09	227.07	4,999.6	547.0	788.4	959.1	0.10	-0.06	-4.50
PERMIT TARGET BHL 2588'FSL, 1326'FEL									
5,133.7	1.09	227.06	4,999.8	547.0	788.4	959.1	0.10	-0.06	-4.54
DRILL TARGET BHL 2574'FSL, 1326'FEL									
5,302.0	1.00	218.70	5,168.1	544.7	786.3	956.1	0.10	-0.05	-4.97
5,488.0	1.40	218.40	5,354.0	541.7	783.9	952.4	0.22	0.22	-0.16
5,675.0	1.30	224.30	5,541.0	538.4	781.0	948.2	0.09	-0.05	3.16
5,861.0	0.50	258.90	5,726.9	536.7	778.7	945.4	0.50	-0.43	18.60
6,046.0	0.40	128.00	5,911.9	536.1	778.5	944.9	0.44	-0.05	-70.76
6,230.0	0.70	104.00	6,095.9	535.5	780.1	945.8	0.20	0.16	-13.04
6,417.0	0.40	132.20	6,282.9	534.8	781.6	946.8	0.21	-0.16	15.08
6,603.0	0.20	308.80	6,468.9	534.5	781.9	946.8	0.32	-0.11	94.95
6,789.0	0.30	240.00	6,654.9	534.5	781.2	946.3	0.16	0.05	-36.99
6,975.0	0.90	200.90	6,840.9	532.9	780.3	944.6	0.37	0.32	-21.02
7,161.0	1.90	183.50	7,026.8	528.4	779.5	941.6	0.58	0.54	-9.35
7,349.0	3.00	163.10	7,214.7	520.6	780.8	938.4	0.74	0.59	-10.85
7,536.0	2.50	148.20	7,401.5	512.5	784.4	936.9	0.46	-0.27	-7.97

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<b>Well:</b>	Leffler 2SD	<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									
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7,567.0	2.50	136.80	7,432.4	511.4	785.2	937.0	1.60	0.00	-36.77
7,615.0	2.50	136.80	7,480.4	509.9	786.6	937.4	0.00	0.00	0.00
HARD LINE 75°N OF BHL									

Checked By: _____	Approved By: _____	Date: _____
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