

Well Name: **Walters 21-ODU**

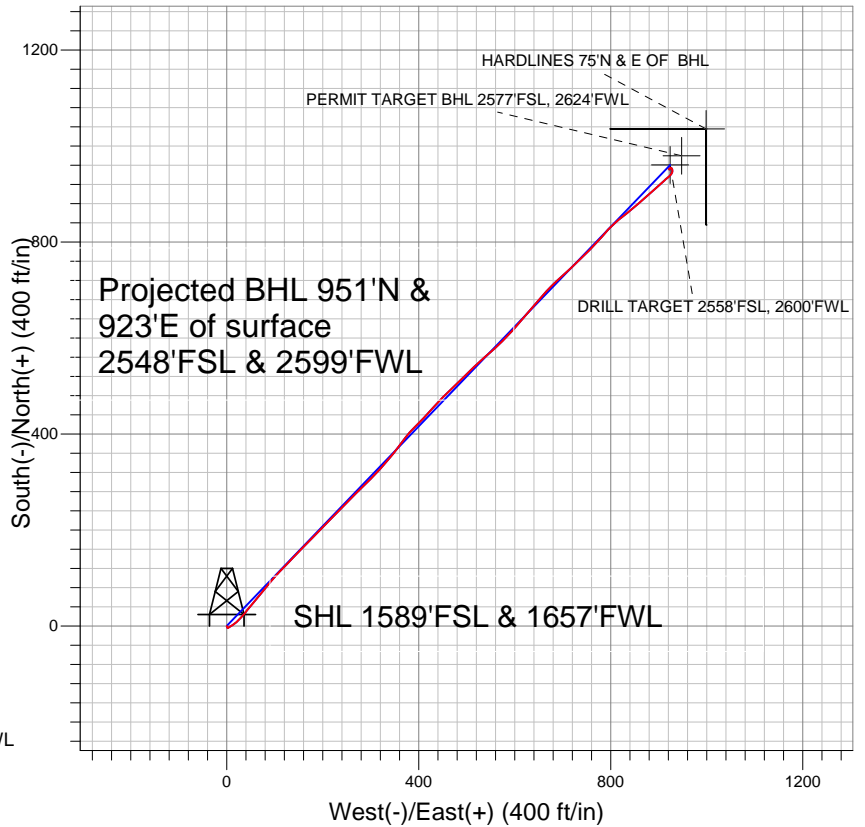
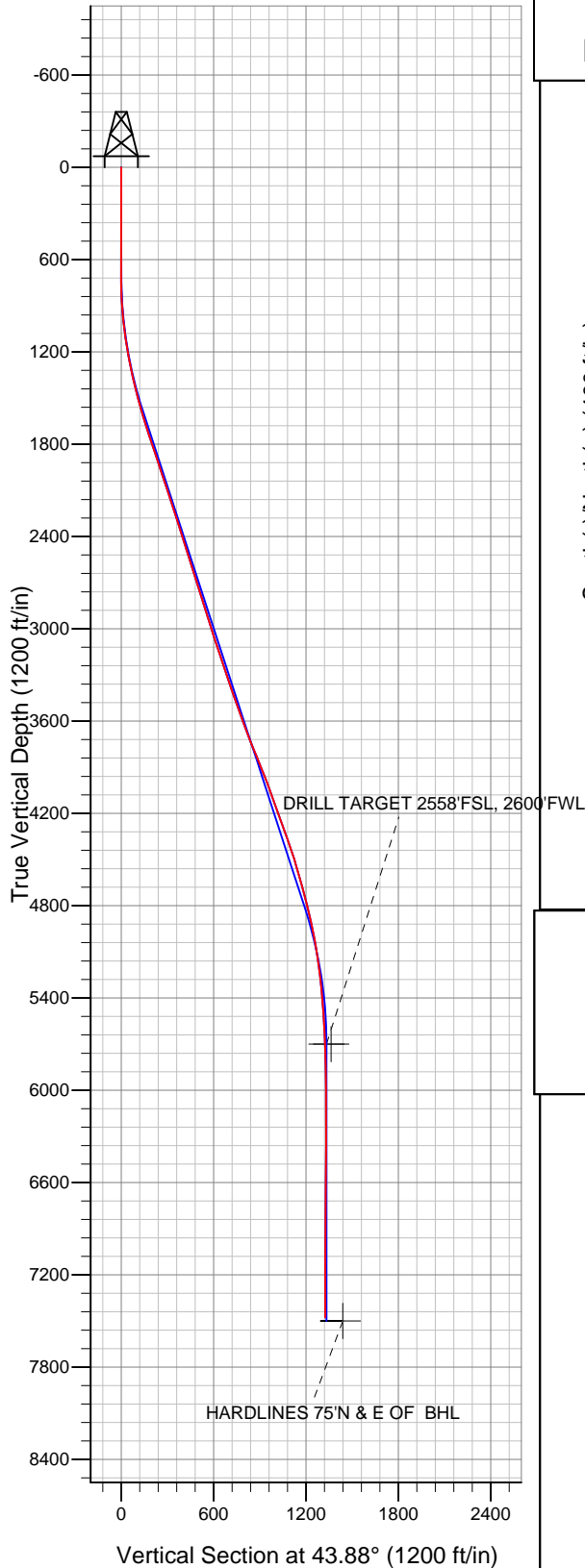
Surface Location: Walters/Wedco/Ryland Pad Sec.21-T4N-R67W  
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4940.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1351058.85	3167490.83	40° 17' 43.800 N	104° 53' 58.344 W
Original Well Elev WELL @ 4953.0ft (Original Well Elev)					

Slot

## PETROLEUM DEVELOPMENT CORP Weld County CO



### LEGEND

- △ Walters 21-ODU, Wellbore #1, Plan #1 (6-4-10) V0
- Wellbore #1
- Survey #1

## Final Survey Plot

Projected Final Survey -  
 7677'MD & 7477'TVD @ 1325'VS  
 0.4 deg Inc 116.4 deg AZ

Project: SEC.21-T4N-R67W  
 Site: Walters/Wedco/Ryland Pad Sec.21-T4N-R67W  
 Well: Walters 21-ODU  
 Plan: Wellbore #1



## **Directional**

# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.21-T4N-R67W**

**Walters/Wedco/Ryland Pad Sec.21-T4N-R67W**

**Walters 21-ODU**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**02 May, 2011**

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Site Walters/Wedco/Ryland Pad Sec.21-T4N-R67W
<b>Project:</b>	SEC.21-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4953.0ft (Original Well Elev)
<b>Site:</b>	Walters/Wedco/Ryland Pad Sec.21-T4N-R67W	<b>MD Reference:</b>	WELL @ 4953.0ft (Original Well Elev)
<b>Well:</b>	Walters 21-ODU	<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.21-T4N-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

<b>Site</b>	Walters/Wedco/Ryland Pad Sec.21-T4N-R67W		
<b>Site Position:</b>		<b>Northing:</b>	1,351,058.86 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,167,490.83 ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"
		<b>Latitude:</b>	40° 17' 43.800 N
		<b>Longitude:</b>	104° 53' 58.344 W
		<b>Grid Convergence:</b>	0.39 °

<b>Well</b>	Walters 21-ODU		
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b> 1,351,058.85 ft
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b> 3,167,490.83 ft
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40° 17' 43.800 N
		<b>Longitude:</b>	104° 53' 58.344 W
		<b>Ground Level:</b>	4,940.0 ft

<b>Wellbore</b>	Wellbore #1		
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>
	IGRF200510	12/31/2009	9.09
			<b>Dip Angle (°)</b>
			67.00
			<b>Field Strength (nT)</b>
			53,234

<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>
	0.0	0.0	0.0
			<b>Direction (°)</b>
			43.88

<b>Survey Program</b>	<b>Date</b> 5/2/2011		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>
703.0	7,677.0	Survey #1 (Wellbore #1)	MWD
			<b>Description</b>
			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
703.0	0.70	159.80	703.0	-4.0	1.5	-1.9	0.10	0.10	0.00
796.0	1.70	58.50	796.0	-3.9	2.9	-0.8	2.11	1.08	-108.92
890.0	3.70	57.30	889.9	-1.5	6.6	3.5	2.13	2.13	-1.28
983.0	6.10	57.50	982.5	2.8	13.3	11.2	2.58	2.58	0.22
1,077.0	7.50	47.00	1,075.9	9.7	22.0	22.2	1.99	1.49	-11.17
1,170.0	10.40	41.30	1,167.7	20.1	32.0	36.7	3.26	3.12	-6.13
1,263.0	11.30	38.60	1,259.0	33.5	43.2	54.1	1.11	0.97	-2.90
1,356.0	12.00	40.70	1,350.1	48.0	55.2	72.8	0.88	0.75	2.26
1,449.0	13.00	38.40	1,440.9	63.5	68.0	92.9	1.20	1.08	-2.47
1,542.0	14.90	39.40	1,531.2	80.9	82.1	115.2	2.06	2.04	1.08
1,635.0	17.20	41.20	1,620.6	100.5	98.7	140.9	2.53	2.47	1.94

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Site Walters/Wedco/Ryland Pad Sec.21-T4N-R67W
<b>Project:</b>	SEC.21-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4953.0ft (Original Well Elev)
<b>Site:</b>	Walters/Wedco/Ryland Pad Sec.21-T4N-R67W	<b>MD Reference:</b>	WELL @ 4953.0ft (Original Well Elev)
<b>Well:</b>	Walters 21-ODU	<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)
1,728.0	18.00	44.60	1,709.2	121.1	117.9	169.0	1.40	0.86	3.66
1,821.0	19.00	43.60	1,797.4	142.3	138.4	198.5	1.13	1.08	-1.08
1,915.0	18.10	43.70	1,886.5	163.9	159.0	228.4	0.96	-0.96	0.11
2,008.0	18.60	44.20	1,974.8	185.0	179.4	257.7	0.56	0.54	0.54
2,101.0	18.60	45.10	2,062.9	206.1	200.2	287.4	0.31	0.00	0.97
2,194.0	17.50	44.60	2,151.3	226.6	220.5	316.2	1.19	-1.18	-0.54
2,288.0	17.50	42.70	2,241.0	247.0	240.0	344.4	0.61	0.00	-2.02
2,381.0	18.40	46.30	2,329.5	267.4	260.1	373.1	1.54	0.97	3.87
2,474.0	16.70	45.90	2,418.1	286.9	280.3	401.1	1.83	-1.83	-0.43
2,567.0	18.10	44.20	2,506.9	306.5	300.0	428.9	1.60	1.51	-1.83
2,660.0	18.10	42.00	2,595.3	327.6	319.8	457.8	0.73	0.00	-2.37
2,753.0	17.90	40.40	2,683.7	349.2	338.7	486.5	0.57	-0.22	-1.72
2,846.0	16.60	36.10	2,772.5	370.9	355.8	513.9	1.96	-1.40	-4.62
2,939.0	17.50	38.40	2,861.5	392.5	372.3	541.0	1.21	0.97	2.47
3,032.0	17.50	45.00	2,950.2	413.4	390.9	568.9	2.13	0.00	7.10
3,125.0	18.10	43.20	3,038.7	433.8	410.6	597.3	0.88	0.65	-1.94
3,218.0	18.00	42.00	3,127.1	455.0	430.1	626.1	0.41	-0.11	-1.29
3,312.0	18.50	44.90	3,216.4	476.4	450.4	655.6	1.10	0.53	3.09
3,405.0	18.60	46.30	3,304.6	497.1	471.5	685.1	0.49	0.11	1.51
3,498.0	19.20	44.60	3,392.6	518.2	493.0	715.2	0.88	0.65	-1.83
3,591.0	19.50	46.80	3,480.3	539.7	515.0	746.0	0.85	0.32	2.37
3,684.0	19.90	49.10	3,567.9	560.7	538.3	777.3	0.94	0.43	2.47
3,778.0	19.70	45.90	3,656.3	582.2	561.8	809.1	1.17	-0.21	-3.40
3,871.0	22.60	45.00	3,743.0	605.8	585.7	842.6	3.14	3.12	-0.97
3,964.0	22.00	41.30	3,829.1	631.5	609.8	877.9	1.64	-0.65	-3.98
4,058.0	22.50	39.10	3,916.1	658.7	632.8	913.4	1.03	0.53	-2.34
4,151.0	20.70	41.30	4,002.6	684.8	654.9	947.5	2.12	-1.94	2.37
4,244.0	19.10	44.50	4,090.0	708.0	676.4	979.2	2.08	-1.72	3.44
4,338.0	20.00	47.80	4,178.6	729.8	699.1	1,010.6	1.52	0.96	3.51
4,432.0	20.60	47.70	4,266.7	751.7	723.2	1,043.1	0.64	0.64	-0.11
4,525.0	18.60	45.70	4,354.4	773.1	745.9	1,074.3	2.27	-2.15	-2.15
4,618.0	19.20	41.80	4,442.3	794.9	766.7	1,104.4	1.50	0.65	-4.19
4,711.0	16.90	41.50	4,530.8	816.4	785.9	1,133.2	2.48	-2.47	-0.32
4,804.0	16.00	47.10	4,620.0	835.2	804.2	1,159.5	1.96	-0.97	6.02
4,898.0	14.10	51.20	4,710.7	851.2	822.6	1,183.8	2.32	-2.02	4.36
4,991.0	14.50	50.00	4,800.9	865.8	840.4	1,206.6	0.54	0.43	-1.29
5,084.0	13.20	49.80	4,891.1	880.2	857.4	1,228.7	1.40	-1.40	-0.22
5,177.0	11.20	49.70	4,982.0	892.9	872.4	1,248.3	2.15	-2.15	-0.11
5,270.0	9.40	47.80	5,073.5	903.8	884.9	1,264.9	1.97	-1.94	-2.04
5,363.0	8.00	47.10	5,165.5	913.3	895.3	1,278.9	1.51	-1.51	-0.75
5,456.0	6.90	47.80	5,257.7	921.5	904.2	1,290.9	1.19	-1.18	0.75
5,549.0	5.60	48.50	5,350.1	928.2	911.7	1,301.0	1.40	-1.40	0.75
5,642.0	4.10	50.20	5,442.8	933.4	917.7	1,308.9	1.62	-1.61	1.83
5,735.0	3.60	47.80	5,535.6	937.4	922.4	1,315.1	0.56	-0.54	-2.58
5,828.0	3.00	36.70	5,628.4	941.4	926.0	1,320.4	0.94	-0.65	-11.94
5,900.3	2.57	19.22	5,700.6	944.4	927.7	1,323.7	1.31	-0.59	-24.19
<b>DRILL TARGET 2558'FSL, 2600'FWL</b>									
5,901.4	2.57	18.91	5,701.7	944.5	927.7	1,323.8	1.31	-0.40	-27.82
<b>PERMIT TARGET BHL 2577'FSL, 2624'FWL</b>									
5,922.0	2.50	13.00	5,722.3	945.3	927.9	1,324.6	1.31	-0.33	-28.67
6,015.0	1.50	356.00	5,815.3	948.5	928.3	1,327.2	1.24	-1.08	-18.28
6,108.0	1.20	354.90	5,908.2	950.7	928.1	1,328.6	0.32	-0.32	-1.18
6,201.0	0.60	324.10	6,001.2	952.1	927.8	1,329.3	0.81	-0.65	-33.12

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Site Walters/Wedco/Ryland Pad Sec.21-T4N-R67W
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<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)
6,294.0	0.50	321.10	6,094.2	952.8	927.2	1,329.5	0.11	-0.11	-3.23
6,387.0	0.40	324.50	6,187.2	953.4	926.8	1,329.6	0.11	-0.11	3.66
6,480.0	0.20	321.50	6,280.2	953.8	926.5	1,329.7	0.22	-0.22	-3.23
6,573.0	0.30	321.50	6,373.2	954.1	926.2	1,329.7	0.11	0.11	0.00
6,666.0	0.40	272.10	6,466.2	954.3	925.8	1,329.5	0.33	0.11	-53.12
6,760.0	0.40	256.00	6,560.2	954.2	925.1	1,329.0	0.12	0.00	-17.13
6,853.0	0.60	242.90	6,653.2	953.9	924.4	1,328.3	0.25	0.22	-14.09
6,946.0	0.60	246.90	6,746.2	953.5	923.5	1,327.4	0.05	0.00	4.30
7,039.0	0.60	247.50	6,839.2	953.1	922.6	1,326.5	0.01	0.00	0.65
7,132.0	0.50	226.40	6,932.2	952.6	921.8	1,325.7	0.24	-0.11	-22.69
7,226.0	0.40	235.30	7,026.2	952.2	921.3	1,324.9	0.13	-0.11	9.47
7,319.0	0.20	166.00	7,119.2	951.8	921.1	1,324.5	0.41	-0.22	-74.52
7,412.0	0.20	132.70	7,212.2	951.6	921.2	1,324.4	0.12	0.00	-35.81
7,505.0	0.40	104.40	7,305.2	951.4	921.6	1,324.6	0.26	0.22	-30.43
7,598.0	0.50	117.80	7,398.2	951.1	922.3	1,324.9	0.16	0.11	14.41
7,677.0	0.40	116.40	7,477.2	950.8	922.9	1,325.0	0.13	-0.13	-1.77
HARDLINES 75'N & E OF BHL									

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