

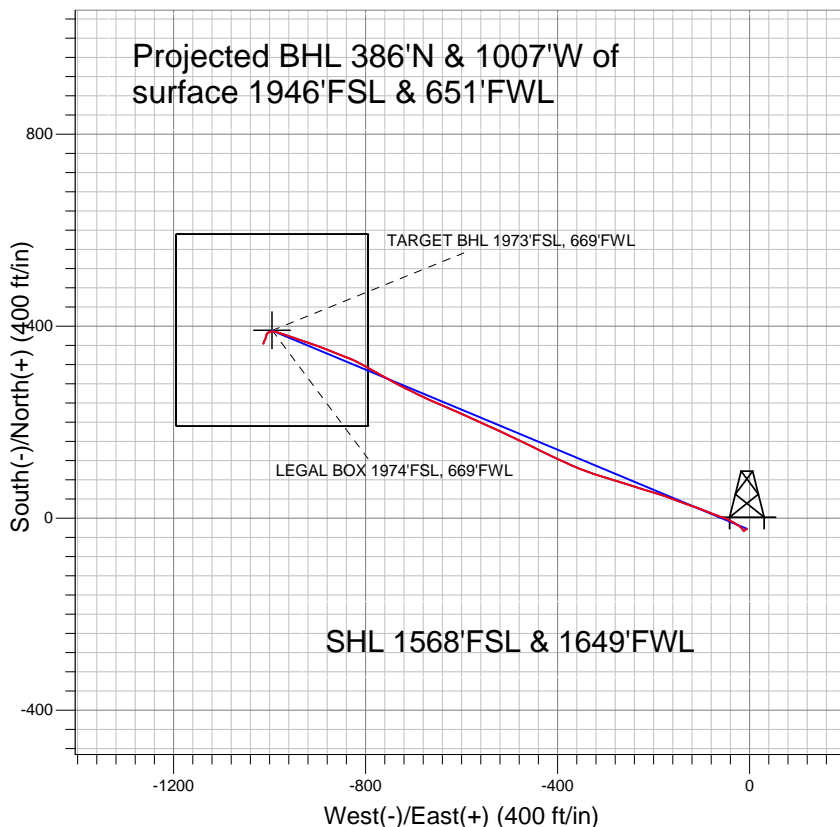
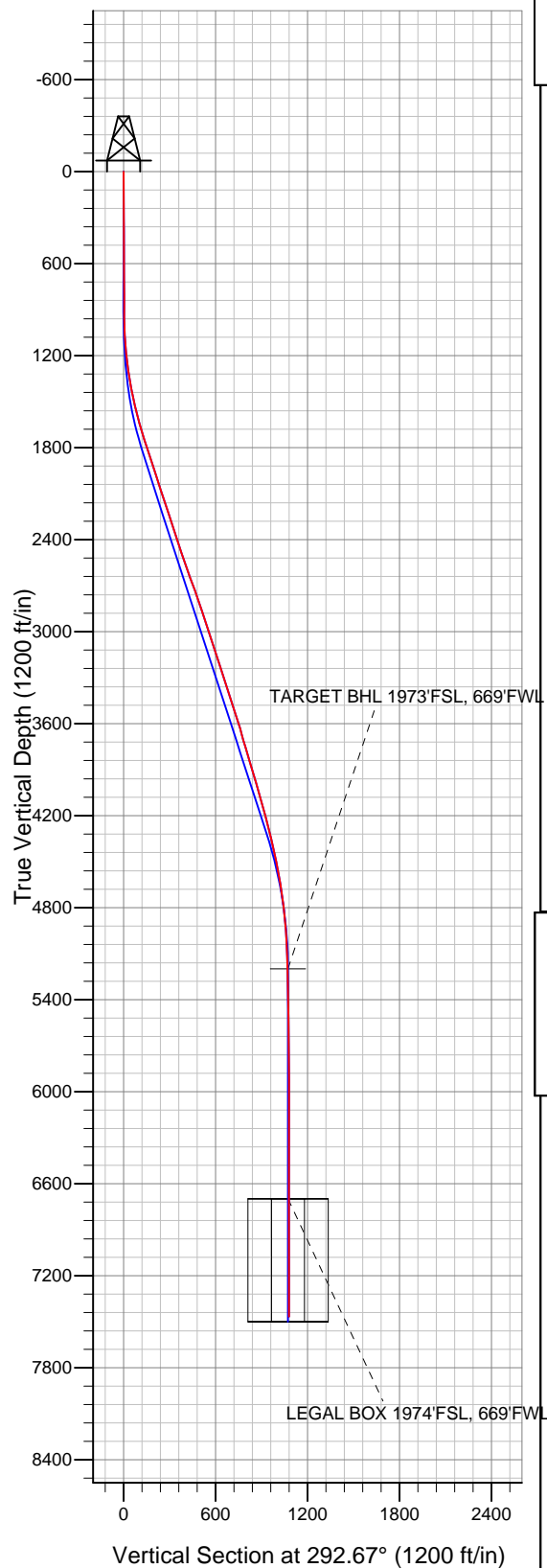
Well Name: **Wedco 13-21DU**

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	Slot
-21.9	-5.6	1351036.96	3167485.40	40° 17' 43.584 N	104° 53' 58.416 W	
Original Well Elev WELL @ 4953.0ft (Original Well Elev)						

**PETROLEUM DEVELOPMENT CORP Weld County CO**



**LEGEND**

- ✚ Wedco 13-21DU, Wellbore #1, Plan #1 (6-4-10) V0
- ☐ Wellbore #1
- Survey #1

**Final Survey Plot**

Projected Final Survey -  
7620'MD & 7467'TVD @ 1078'VS  
1.1 deg Inc 198.1 deg AZ

Project: SEC.21-T4N-R67W  
Site: Walters/Wedco/Ryland Pad Sec.21-T4N-R67W  
Well: Wedco 13-21DU  
Plan: Wellbore #1



## **Directional**

# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.21-T4N-R67W**

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

**Wedco 13-21DU**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**03 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>	Wedco 13-21DU	<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>	Wedco 13-21DU		
<b>Well Position</b>	<b>+N/-S</b>	-21.9 ft	<b>Northing:</b>
	<b>+E/-W</b>	-5.6 ft	<b>Easting:</b>
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40° 17' 43.584 N
		<b>Longitude:</b>	104° 53' 58.416 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	-21.9	-5.6
			<b>Direction (°)</b>
			292.67

<b>Survey Program</b>	<b>Date</b> 5/3/2011		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>
705.0	7,620.0	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	-21.9	-5.6	0.0	0.00	0.00	0.00
705.0	0.80	232.90	705.0	-24.8	-9.5	2.5	0.11	0.11	0.00
798.0	0.80	237.90	798.0	-25.6	-10.6	3.2	0.08	0.00	5.38
892.0	0.90	235.00	892.0	-26.3	-11.7	4.0	0.12	0.11	-3.09
986.0	1.20	331.90	985.9	-25.9	-12.8	5.1	1.69	0.32	103.09
1,079.0	3.20	328.70	1,078.9	-22.8	-14.6	8.0	2.15	2.15	-3.44
1,173.0	5.50	306.80	1,172.6	-17.9	-19.6	14.5	2.98	2.45	-23.30
1,266.0	8.00	301.90	1,265.0	-11.8	-28.6	25.2	2.76	2.69	-5.27
1,359.0	9.80	297.50	1,356.8	-4.7	-41.2	39.4	2.07	1.94	-4.73
1,452.0	10.90	289.10	1,448.3	1.8	-56.5	56.1	2.01	1.18	-9.03
1,545.0	13.70	291.20	1,539.2	8.7	-75.1	75.9	3.05	3.01	2.26
1,639.0	15.50	291.00	1,630.1	17.2	-97.2	99.6	1.92	1.91	-0.21

<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>	Wedco 13-21DU	<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)
1,732.0	17.40	289.30	1,719.3	26.3	-121.9	125.9	2.11	2.04	-1.83
1,825.0	18.30	290.10	1,807.8	35.9	-148.7	154.4	1.00	0.97	0.86
1,918.0	18.40	290.30	1,896.1	46.0	-176.2	183.6	0.13	0.11	0.22
2,011.0	17.90	285.00	1,984.5	54.8	-203.8	212.4	1.85	-0.54	-5.70
2,105.0	18.40	289.30	2,073.8	63.4	-231.7	241.6	1.52	0.53	4.57
2,198.0	18.30	286.30	2,162.1	72.4	-259.6	270.7	1.02	-0.11	-3.23
2,290.0	18.20	286.50	2,249.5	80.5	-287.3	299.4	0.13	-0.11	0.22
2,384.0	18.10	287.40	2,338.8	89.0	-315.3	328.5	0.32	-0.11	0.96
2,477.0	17.70	291.80	2,427.3	98.6	-342.2	357.0	1.52	-0.43	4.73
2,570.0	19.30	293.20	2,515.5	109.9	-369.4	386.5	1.79	1.72	1.51
2,663.0	20.20	294.50	2,603.0	122.6	-398.2	417.9	1.08	0.97	1.40
2,756.0	20.30	296.50	2,690.3	136.5	-427.2	450.1	0.75	0.11	2.15
2,849.0	18.50	295.80	2,778.0	150.1	-454.9	480.9	1.95	-1.94	-0.75
2,942.0	19.00	295.70	2,866.1	163.1	-481.9	510.8	0.54	0.54	-0.11
3,035.0	18.50	295.30	2,954.1	176.0	-508.8	540.6	0.56	-0.54	-0.43
3,128.0	17.90	295.80	3,042.5	188.5	-535.1	569.6	0.67	-0.65	0.54
3,221.0	17.30	293.60	3,131.1	200.2	-560.6	597.7	0.96	-0.65	-2.37
3,314.0	17.90	294.80	3,219.8	211.8	-586.2	625.8	0.75	0.65	1.29
3,408.0	17.80	291.80	3,309.2	223.2	-612.7	654.7	0.98	-0.11	-3.19
3,501.0	18.70	294.30	3,397.6	234.6	-639.5	683.8	1.28	0.97	2.69
3,594.0	18.50	293.90	3,485.7	246.7	-666.6	713.4	0.26	-0.22	-0.43
3,687.0	17.60	296.80	3,574.1	259.0	-692.6	742.2	1.37	-0.97	3.12
3,781.0	15.20	295.50	3,664.3	270.7	-716.4	768.7	2.58	-2.55	-1.38
3,874.0	16.30	297.90	3,753.8	282.1	-738.9	793.9	1.37	1.18	2.58
3,967.0	16.60	300.10	3,843.0	294.9	-762.0	820.0	0.74	0.32	2.37
4,060.0	17.10	299.10	3,932.0	308.2	-785.4	846.8	0.62	0.54	-1.08
4,154.0	16.20	299.40	4,022.1	321.3	-808.9	873.5	0.96	-0.96	0.32
4,247.0	15.50	291.40	4,111.5	332.2	-831.8	898.9	2.46	-0.75	-8.60
4,339.0	15.50	291.70	4,200.2	341.3	-854.7	923.4	0.09	0.00	0.33
4,432.0	14.50	291.20	4,290.0	350.1	-877.1	947.5	1.08	-1.08	-0.54
4,525.0	13.30	290.20	4,380.3	358.0	-898.0	969.8	1.32	-1.29	-1.08
4,618.0	12.10	289.50	4,471.0	364.9	-917.2	990.2	1.30	-1.29	-0.75
4,712.0	10.20	288.30	4,563.2	370.8	-934.4	1,008.4	2.04	-2.02	-1.28
4,805.0	8.80	288.90	4,655.0	375.7	-948.9	1,023.7	1.51	-1.51	0.65
4,898.0	7.50	287.00	4,747.0	379.8	-961.5	1,036.8	1.43	-1.40	-2.04
4,991.0	6.00	290.70	4,839.4	383.3	-971.8	1,047.7	1.68	-1.61	3.98
5,084.0	4.60	287.90	4,932.0	386.1	-979.9	1,056.3	1.53	-1.51	-3.01
5,177.0	3.10	285.90	5,024.8	388.0	-985.9	1,062.5	1.62	-1.61	-2.15
5,270.0	1.60	278.00	5,117.7	388.8	-989.6	1,066.3	1.65	-1.61	-8.49
5,352.4	1.51	274.13	5,200.1	389.1	-991.8	1,068.4	0.17	-0.11	-4.70
TARGET BHL 1973'FSL, 669'FWL									
5,363.0	1.50	273.60	5,210.6	389.1	-992.1	1,068.7	0.17	-0.10	-5.01
5,456.0	1.40	267.20	5,303.6	389.1	-994.4	1,070.9	0.20	-0.11	-6.88
5,549.0	1.50	260.40	5,396.6	388.9	-996.8	1,072.9	0.21	0.11	-7.31
5,643.0	1.40	249.00	5,490.6	388.3	-999.0	1,074.8	0.32	-0.11	-12.13
5,736.0	1.10	249.00	5,583.5	387.5	-1,000.9	1,076.2	0.32	-0.32	0.00
5,829.0	1.10	250.10	5,676.5	386.9	-1,002.6	1,077.6	0.02	0.00	1.18
5,922.0	0.70	234.30	5,769.5	386.3	-1,003.9	1,078.5	0.50	-0.43	-16.99
6,015.0	0.60	214.50	5,862.5	385.5	-1,004.7	1,078.9	0.26	-0.11	-21.29
6,108.0	0.50	203.90	5,955.5	384.8	-1,005.1	1,079.0	0.15	-0.11	-11.40
6,202.0	0.60	203.20	6,049.5	383.9	-1,005.5	1,079.0	0.11	0.11	-0.74
6,295.0	0.50	204.30	6,142.5	383.1	-1,005.8	1,079.0	0.11	-0.11	1.18
6,388.0	0.70	203.60	6,235.5	382.2	-1,006.2	1,079.1	0.22	0.22	-0.75

<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>Site:</b>	Walters/Wedco/Ryland Pad Sec.21-T4N-R67W	<b>MD Reference:</b>	WELL @ 4953.0ft (Original Well Elev)
<b>Well:</b>	Wedco 13-21DU	<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)	
6,481.0	0.70	193.30	6,328.5	381.2	-1,006.6	1,079.0	0.14	0.00	-11.08	
6,574.0	0.70	190.40	6,421.5	380.0	-1,006.8	1,078.8	0.04	0.00	-3.12	
6,667.0	0.70	190.40	6,514.5	378.9	-1,007.0	1,078.5	0.00	0.00	0.00	
6,761.0	0.40	189.90	6,608.5	378.0	-1,007.2	1,078.3	0.32	-0.32	-0.53	
6,852.4	0.79	197.93	6,699.8	377.1	-1,007.4	1,078.2	0.44	0.43	8.79	
<b>LEGAL BOX 1974'FSL, 669'FWL</b>										
6,854.0	0.80	198.00	6,701.4	377.1	-1,007.4	1,078.2	0.44	0.43	4.38	
6,947.0	0.80	201.40	6,794.4	375.9	-1,007.9	1,078.1	0.05	0.00	3.66	
7,040.0	1.10	196.10	6,887.4	374.4	-1,008.3	1,078.0	0.34	0.32	-5.70	
7,133.0	1.20	211.30	6,980.4	372.7	-1,009.1	1,078.1	0.34	0.11	16.34	
7,227.0	1.10	208.30	7,074.4	371.1	-1,010.0	1,078.3	0.12	-0.11	-3.19	
7,320.0	1.20	205.50	7,167.4	369.4	-1,010.9	1,078.4	0.12	0.11	-3.01	
7,413.0	1.10	202.80	7,260.4	367.7	-1,011.6	1,078.5	0.12	-0.11	-2.90	
7,506.0	1.10	191.80	7,353.3	366.0	-1,012.2	1,078.3	0.23	0.00	-11.83	
7,573.0	1.10	198.10	7,420.3	364.8	-1,012.5	1,078.2	0.18	0.00	9.40	
7,620.0	1.10	198.10	7,467.3	363.9	-1,012.8	1,078.1	0.00	0.00	0.00	

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