

# PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Sunmarke 28U-334**

Surface Location: Sunmarke 28U-HZ Pad Sec.28-T4N-R67W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

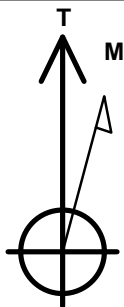
Ground Elevation: 4894.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1349119.29	3170999.44	40.290110	-104.887010	

RKB - 15' WELL @ 4909.0ft (RKB - 15')

## WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 308'FNL, 210'FEL		0.0	0.0	Point
BHL 320'FNL, 500'FWL	7099.0	69.7	-4622.6	Point



Azimuths to True North  
Magnetic North: 8.59°

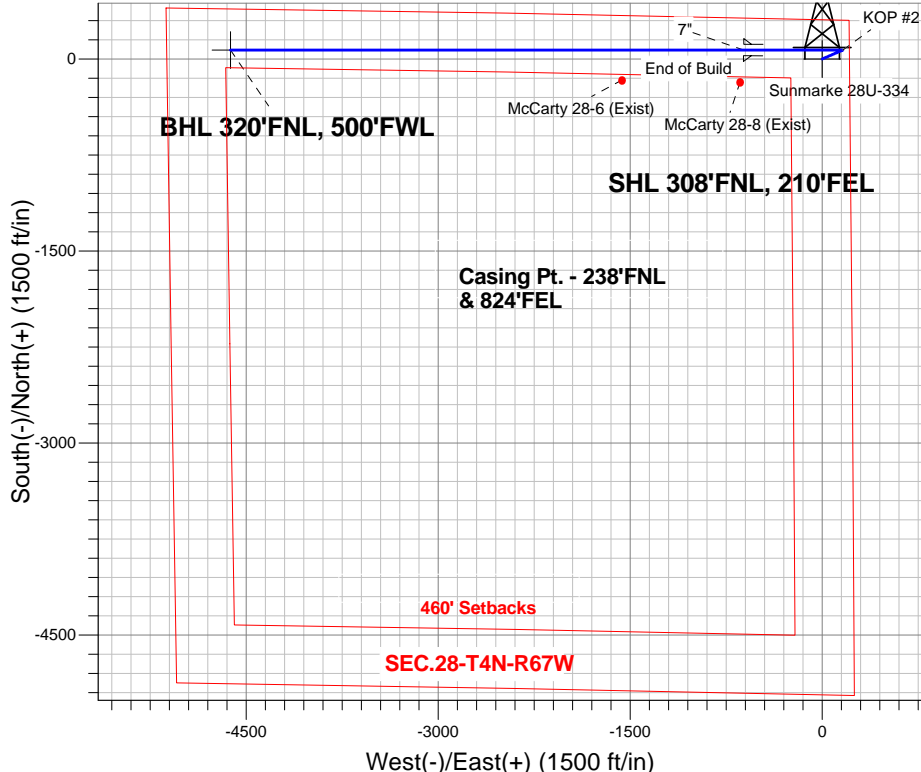
Magnetic Field  
Strength: 52803.8snT  
Dip Angle: 66.86°  
Date: 11/20/2013  
Model: IGRF2010

## ANNOTATIONS

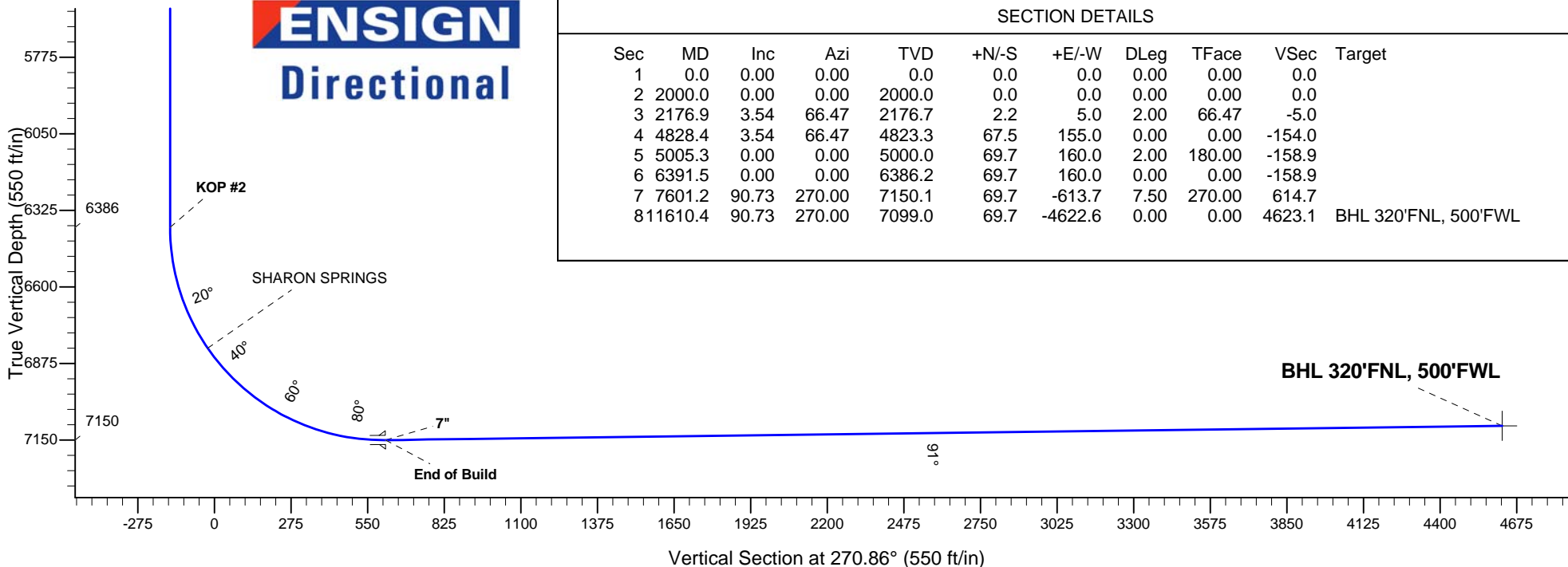
TVD	MD	Annotation
2000.0	2000.0	KOP #1
6386.2	6391.5	KOP #2
7150.1	7601.2	End of Build

Sunmarke 28U-HZ Pad Sec.28-T4N-R67W  
Sunmarke 28U-334  
Plan #1 (11-18-13)  
14:01, November 20 2013

South(-)/North(+) (1500 ft/in)



**ENSIGN**  
Directional



## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2000.0	0.00	0.00	2000.0	0.0	0.0	0.00	0.00	0.0	
3	2176.9	3.54	66.47	2176.7	2.2	5.0	2.00	66.47	-5.0	
4	4828.4	3.54	66.47	4823.3	67.5	155.0	0.00	0.00	-154.0	
5	5005.3	0.00	0.00	5000.0	69.7	160.0	2.00	180.00	-158.9	
6	6391.5	0.00	0.00	6386.2	69.7	160.0	0.00	0.00	-158.9	
7	7601.2	90.73	270.00	7150.1	69.7	-613.7	7.50	270.00	614.7	
8	11610.4	90.73	270.00	7099.0	69.7	-4622.6	0.00	0.00	4623.1	BHL 320'FNL, 500'FWL



## **Directional**

# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.28-T4N-R67W**

**Sunmarke 28U-HZ Pad Sec.28-T4N-R67W**

**Sunmarke 28U-334**

**Wellbore #1**

**Plan: Plan #1 (11-18-13)**

## **Standard Planning Report**

**20 November, 2013**

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Project:</b>	SEC.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-18-13)		

<b>Project</b>	SEC.28-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

Site						Sunmarke 28U-HZ Pad Sec.28-T4N-R67W											
Site Position:						Northing:			1,349,119.31 ft			Latitude:			40.290110		
From:			Lat/Long			Easting:			3,170,999.44 ft			Longitude:			-104.887010		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.40 °		

Well	Sunmarke 28U-334					
Well Position	+N-S	0.0 ft	Northing:	1,349,119.29 ft	Latitude:	40.290110
	+E-W	0.0 ft	Easting:	3,170,999.44 ft	Longitude:	-104.887010
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,894.0 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	11/20/2013	8.59	66.86	52,804

<b>Design</b>	Plan #1 (11-18-13)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<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	270.86

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,176.9	3.54	66.47	2,176.7	2.2	5.0	2.00	2.00	0.00	66.47	
4,828.4	3.54	66.47	4,823.3	67.5	155.0	0.00	0.00	0.00	0.00	
5,005.3	0.00	0.00	5,000.0	69.7	160.0	2.00	-2.00	0.00	180.00	
6,391.5	0.00	0.00	6,386.2	69.7	160.0	0.00	0.00	0.00	0.00	
7,601.2	90.73	270.00	7,150.1	69.7	-613.7	7.50	7.50	0.00	270.00	
11,610.4	90.73	270.00	7,099.0	69.7	-4,622.6	0.00	0.00	0.00	0.00	BHL 320'FNL, 500'

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Project:</b>	SEC.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-18-13)		

## Planned 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
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>SHL 308'FNL, 210'FEL</b>									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>KOP #1</b>									
2,100.0	2.00	66.47	2,100.0	0.7	1.6	-1.6	2.00	2.00	0.00
2,176.9	3.54	66.47	2,176.7	2.2	5.0	-5.0	2.00	2.00	0.00
2,200.0	3.54	66.47	2,199.8	2.7	6.3	-6.3	0.00	0.00	0.00
2,300.0	3.54	66.47	2,299.7	5.2	12.0	-11.9	0.00	0.00	0.00
2,400.0	3.54	66.47	2,399.5	7.7	17.6	-17.5	0.00	0.00	0.00
2,500.0	3.54	66.47	2,499.3	10.1	23.3	-23.1	0.00	0.00	0.00
2,600.0	3.54	66.47	2,599.1	12.6	28.9	-28.7	0.00	0.00	0.00
2,700.0	3.54	66.47	2,698.9	15.1	34.6	-34.4	0.00	0.00	0.00
2,800.0	3.54	66.47	2,798.7	17.5	40.3	-40.0	0.00	0.00	0.00
2,900.0	3.54	66.47	2,898.5	20.0	45.9	-45.6	0.00	0.00	0.00
3,000.0	3.54	66.47	2,998.3	22.4	51.6	-51.2	0.00	0.00	0.00
3,100.0	3.54	66.47	3,098.1	24.9	57.2	-56.8	0.00	0.00	0.00
3,200.0	3.54	66.47	3,197.9	27.4	62.9	-62.5	0.00	0.00	0.00
3,300.0	3.54	66.47	3,297.7	29.8	68.5	-68.1	0.00	0.00	0.00
3,400.0	3.54	66.47	3,397.6	32.3	74.2	-73.7	0.00	0.00	0.00
3,500.0	3.54	66.47	3,497.4	34.8	79.9	-79.3	0.00	0.00	0.00
3,600.0	3.54	66.47	3,597.2	37.2	85.5	-84.9	0.00	0.00	0.00
3,642.9	3.54	66.47	3,640.0	38.3	87.9	-87.3	0.00	0.00	0.00
<b>PARKMAN</b>									
3,700.0	3.54	66.47	3,697.0	39.7	91.2	-90.6	0.00	0.00	0.00
3,800.0	3.54	66.47	3,796.8	42.1	96.8	-96.2	0.00	0.00	0.00
3,900.0	3.54	66.47	3,896.6	44.6	102.5	-101.8	0.00	0.00	0.00
4,000.0	3.54	66.47	3,996.4	47.1	108.1	-107.4	0.00	0.00	0.00
4,100.0	3.54	66.47	4,096.2	49.5	113.8	-113.0	0.00	0.00	0.00
4,153.9	3.54	66.47	4,150.0	50.9	116.8	-116.1	0.00	0.00	0.00
<b>SUSSEX</b>									
4,200.0	3.54	66.47	4,196.0	52.0	119.4	-118.7	0.00	0.00	0.00
4,300.0	3.54	66.47	4,295.8	54.5	125.1	-124.3	0.00	0.00	0.00
4,400.0	3.54	66.47	4,395.7	56.9	130.8	-129.9	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Project:</b>	SEC.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-18-13)		

## Planned 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)
4,500.0	3.54	66.47	4,495.5	59.4	136.4	-135.5	0.00	0.00	0.00
4,600.0	3.54	66.47	4,595.3	61.9	142.1	-141.1	0.00	0.00	0.00
4,667.9	3.54	66.47	4,663.0	63.5	145.9	-144.9	0.00	0.00	0.00
<b>SHANNON</b>									
4,700.0	3.54	66.47	4,695.1	64.3	147.7	-146.7	0.00	0.00	0.00
4,800.0	3.54	66.47	4,794.9	66.8	153.4	-152.4	0.00	0.00	0.00
4,828.4	3.54	66.47	4,823.3	67.5	155.0	-154.0	0.00	0.00	0.00
4,900.0	2.11	66.47	4,894.7	68.9	158.2	-157.2	2.00	-2.00	0.00
5,000.0	0.11	66.47	4,994.7	69.7	160.0	-158.9	2.00	-2.00	0.00
5,005.3	0.00	0.00	5,000.0	69.7	160.0	-158.9	2.00	-2.00	0.00
5,100.0	0.00	0.00	5,094.7	69.7	160.0	-158.9	0.00	0.00	0.00
5,200.0	0.00	0.00	5,194.7	69.7	160.0	-158.9	0.00	0.00	0.00
5,300.0	0.00	0.00	5,294.7	69.7	160.0	-158.9	0.00	0.00	0.00
5,400.0	0.00	0.00	5,394.7	69.7	160.0	-158.9	0.00	0.00	0.00
5,500.0	0.00	0.00	5,494.7	69.7	160.0	-158.9	0.00	0.00	0.00
5,600.0	0.00	0.00	5,594.7	69.7	160.0	-158.9	0.00	0.00	0.00
5,700.0	0.00	0.00	5,694.7	69.7	160.0	-158.9	0.00	0.00	0.00
5,800.0	0.00	0.00	5,794.7	69.7	160.0	-158.9	0.00	0.00	0.00
5,900.0	0.00	0.00	5,894.7	69.7	160.0	-158.9	0.00	0.00	0.00
6,000.0	0.00	0.00	5,994.7	69.7	160.0	-158.9	0.00	0.00	0.00
6,100.0	0.00	0.00	6,094.7	69.7	160.0	-158.9	0.00	0.00	0.00
6,200.0	0.00	0.00	6,194.7	69.7	160.0	-158.9	0.00	0.00	0.00
6,300.0	0.00	0.00	6,294.7	69.7	160.0	-158.9	0.00	0.00	0.00
6,391.5	0.00	0.00	6,386.2	69.7	160.0	-158.9	0.00	0.00	0.00
<b>KOP #2</b>									
6,400.0	0.64	270.00	6,394.7	69.7	160.0	-158.9	7.52	7.52	0.00
6,500.0	8.14	270.00	6,494.4	69.7	152.3	-151.2	7.50	7.50	0.00
6,600.0	15.64	270.00	6,592.1	69.7	131.7	-130.7	7.50	7.50	0.00
6,700.0	23.14	270.00	6,686.4	69.7	98.5	-97.5	7.50	7.50	0.00
6,800.0	30.64	270.00	6,775.5	69.7	53.3	-52.3	7.50	7.50	0.00
6,852.8	34.60	270.00	6,820.0	69.7	24.9	-23.8	7.50	7.50	0.00
<b>SHARON SPRINGS</b>									
6,900.0	38.14	270.00	6,858.0	69.7	-3.1	4.1	7.50	7.50	0.00
7,000.0	45.64	270.00	6,932.4	69.7	-69.8	70.9	7.50	7.50	0.00
7,100.0	53.14	270.00	6,997.4	69.7	-145.7	146.7	7.50	7.50	0.00
7,200.0	60.64	270.00	7,052.0	69.7	-229.4	230.4	7.50	7.50	0.00
7,300.0	68.14	270.00	7,095.2	69.7	-319.5	320.5	7.50	7.50	0.00
7,400.0	75.64	270.00	7,126.3	69.7	-414.5	415.5	7.50	7.50	0.00
7,500.0	83.14	270.00	7,144.7	69.7	-512.7	513.7	7.50	7.50	0.00
7,600.0	90.64	270.00	7,150.1	69.7	-612.5	613.5	7.50	7.50	0.00
7,601.2	90.73	270.00	7,150.1	69.7	-613.7	614.6	7.50	7.50	0.00
<b>End of Build - 7"</b>									
7,700.0	90.73	270.00	7,148.8	69.7	-712.5	713.4	0.00	0.00	0.00
7,800.0	90.73	270.00	7,147.5	69.7	-812.5	813.4	0.00	0.00	0.00
7,900.0	90.73	270.00	7,146.3	69.7	-912.4	913.4	0.00	0.00	0.00
8,000.0	90.73	270.00	7,145.0	69.7	-1,012.4	1,013.4	0.00	0.00	0.00
8,100.0	90.73	270.00	7,143.7	69.7	-1,112.4	1,113.4	0.00	0.00	0.00
8,200.0	90.73	270.00	7,142.5	69.7	-1,212.4	1,213.3	0.00	0.00	0.00
8,300.0	90.73	270.00	7,141.2	69.7	-1,312.4	1,313.3	0.00	0.00	0.00
8,400.0	90.73	270.00	7,139.9	69.7	-1,412.4	1,413.3	0.00	0.00	0.00
8,500.0	90.73	270.00	7,138.6	69.7	-1,512.4	1,513.3	0.00	0.00	0.00
8,600.0	90.73	270.00	7,137.4	69.7	-1,612.4	1,613.3	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Project:</b>	SEC.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-18-13)		

## Planned 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)
8,700.0	90.73	270.00	7,136.1	69.7	-1,712.4	1,713.2	0.00	0.00	0.00
8,800.0	90.73	270.00	7,134.8	69.7	-1,812.4	1,813.2	0.00	0.00	0.00
8,900.0	90.73	270.00	7,133.5	69.7	-1,912.4	1,913.2	0.00	0.00	0.00
9,000.0	90.73	270.00	7,132.3	69.7	-2,012.4	2,013.2	0.00	0.00	0.00
9,100.0	90.73	270.00	7,131.0	69.7	-2,112.3	2,113.2	0.00	0.00	0.00
9,200.0	90.73	270.00	7,129.7	69.7	-2,212.3	2,213.1	0.00	0.00	0.00
9,300.0	90.73	270.00	7,128.4	69.7	-2,312.3	2,313.1	0.00	0.00	0.00
9,400.0	90.73	270.00	7,127.2	69.7	-2,412.3	2,413.1	0.00	0.00	0.00
9,500.0	90.73	270.00	7,125.9	69.7	-2,512.3	2,513.1	0.00	0.00	0.00
9,600.0	90.73	270.00	7,124.6	69.7	-2,612.3	2,613.1	0.00	0.00	0.00
9,700.0	90.73	270.00	7,123.3	69.7	-2,712.3	2,713.0	0.00	0.00	0.00
9,800.0	90.73	270.00	7,122.1	69.7	-2,812.3	2,813.0	0.00	0.00	0.00
9,900.0	90.73	270.00	7,120.8	69.7	-2,912.3	2,913.0	0.00	0.00	0.00
10,000.0	90.73	270.00	7,119.5	69.7	-3,012.3	3,013.0	0.00	0.00	0.00
10,100.0	90.73	270.00	7,118.2	69.7	-3,112.3	3,113.0	0.00	0.00	0.00
10,200.0	90.73	270.00	7,117.0	69.7	-3,212.3	3,212.9	0.00	0.00	0.00
10,300.0	90.73	270.00	7,115.7	69.7	-3,312.3	3,312.9	0.00	0.00	0.00
10,400.0	90.73	270.00	7,114.4	69.7	-3,412.2	3,412.9	0.00	0.00	0.00
10,500.0	90.73	270.00	7,113.1	69.7	-3,512.2	3,512.9	0.00	0.00	0.00
10,600.0	90.73	270.00	7,111.9	69.7	-3,612.2	3,612.9	0.00	0.00	0.00
10,700.0	90.73	270.00	7,110.6	69.7	-3,712.2	3,712.8	0.00	0.00	0.00
10,800.0	90.73	270.00	7,109.3	69.7	-3,812.2	3,812.8	0.00	0.00	0.00
10,900.0	90.73	270.00	7,108.1	69.7	-3,912.2	3,912.8	0.00	0.00	0.00
11,000.0	90.73	270.00	7,106.8	69.7	-4,012.2	4,012.8	0.00	0.00	0.00
11,100.0	90.73	270.00	7,105.5	69.7	-4,112.2	4,112.8	0.00	0.00	0.00
11,200.0	90.73	270.00	7,104.2	69.7	-4,212.2	4,212.7	0.00	0.00	0.00
11,300.0	90.73	270.00	7,103.0	69.7	-4,312.2	4,312.7	0.00	0.00	0.00
11,400.0	90.73	270.00	7,101.7	69.7	-4,412.2	4,412.7	0.00	0.00	0.00
11,500.0	90.73	270.00	7,100.4	69.7	-4,512.2	4,512.7	0.00	0.00	0.00
11,600.0	90.73	270.00	7,099.1	69.7	-4,612.1	4,612.7	0.00	0.00	0.00
11,610.4	90.73	270.00	7,099.0	69.7	-4,622.6	4,623.1	0.00	0.00	0.00
BHL 320'FNL, 500'FWL									

## Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
BHL 320'FNL, 500'FW	0.00	0.00	7,099.0	69.7	-4,622.6	1,349,157.00	3,166,376.68	40.290300	-104.903580
- plan hits target center									
- Point									
SHL 308'FNL, 210'FE	0.00	0.00	1.0	0.0	0.0	1,349,119.31	3,170,999.44	40.290110	-104.887010
- plan hits target center									
- Point									

## Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,601.2	7,150.1	7"	7	7-1/2

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Project:</b>	SEC.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-18-13)		

#### Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,642.9	3,640.0	PARKMAN			
4,153.9	4,150.0	SUSSEX			
4,667.9	4,663.0	SHANNON			
6,852.8	6,820.0	SHARON SPRINGS			

#### Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,000.0	2,000.0	0.0	0.0	KOP #1
6,391.5	6,386.2	69.7	160.0	KOP #2
7,601.2	7,150.1	69.7	-613.7	End of Build



## **Directional**

# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**SEC.28-T4N-R67W**

**Sunmarke 28U-HZ Pad Sec.28-T4N-R67W**

**Sunmarke 28U-334**

**Wellbore #1**

**Plan #1 (11-18-13)**

## **Anticollision Report**

**20 November, 2013**







<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> Existing wells - Sec.28-T4N-R67W - McCarty 28-6 (Exist) - Wellbore #1 - Wellbore #1													<b>Offset Site Error:</b>	0.0 ft
Survey Program: 7600-UNKNOWN													<b>Offset Well Error:</b>	0.0 ft
Reference	Offset	Semi Major Axis		Distance									Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
9,200.0	7,129.7	7,144.7	7,144.7	64.2	142.9	-87.98	-163.9	-1,565.1	688.1	481.2	206.98	3.325		
9,300.0	7,128.4	7,143.4	7,143.4	66.9	142.9	-87.67	-163.9	-1,565.1	782.9	573.3	209.62	3.735		
9,400.0	7,127.2	7,142.2	7,142.2	69.7	142.8	-87.35	-163.9	-1,565.1	878.9	666.6	212.27	4.140		
9,500.0	7,125.9	7,140.9	7,140.9	72.4	142.8	-87.04	-163.9	-1,565.1	975.6	760.7	214.92	4.540		

COMPASS 2003.21 Build 46

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 7600-UNKNOWN													Offset Well Error:	0.0 ft
Existing wells - Sec.28-T4N-R67W - McCarty 28-8 (Exist) - Wellbore #1 - Wellbore #1														
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
4,900.0	4,894.7	4,891.7	4,891.7	11.2	97.8	-173.66	-178.5	-641.6	837.3	728.8	108.50	7.717		
5,005.3	5,000.0	4,997.0	4,997.0	11.3	99.9	-107.20	-178.5	-641.6	839.2	727.9	111.28	7.541		
5,100.0	5,094.7	5,091.7	5,091.7	11.5	101.8	-107.20	-178.5	-641.6	839.2	725.8	113.36	7.403		
5,200.0	5,194.7	5,191.7	5,191.7	11.7	103.8	-107.20	-178.5	-641.6	839.2	723.6	115.57	7.261		
5,300.0	5,294.7	5,291.7	5,291.7	11.9	105.8	-107.20	-178.5	-641.6	839.2	721.4	117.78	7.125		
5,400.0	5,394.7	5,391.7	5,391.7	12.2	107.8	-107.20	-178.5	-641.6	839.2	719.2	119.99	6.994		
5,500.0	5,494.7	5,491.7	5,491.7	12.4	109.8	-107.20	-178.5	-641.6	839.2	717.0	122.20	6.867		
5,600.0	5,594.7	5,591.7	5,591.7	12.6	111.8	-107.20	-178.5	-641.6	839.2	714.8	124.42	6.745		
5,700.0	5,694.7	5,691.7	5,691.7	12.8	113.8	-107.20	-178.5	-641.6	839.2	712.5	126.63	6.627		
5,800.0	5,794.7	5,791.7	5,791.7	13.0	115.8	-107.20	-178.5	-641.6	839.2	710.3	128.85	6.513		
5,900.0	5,894.7	5,891.7	5,891.7	13.2	117.8	-107.20	-178.5	-641.6	839.2	708.1	131.06	6.403		
6,000.0	5,994.7	5,991.7	5,991.7	13.4	119.8	-107.20	-178.5	-641.6	839.2	705.9	133.27	6.297		
6,100.0	6,094.7	6,091.7	6,091.7	13.7	121.8	-107.20	-178.5	-641.6	839.2	703.7	135.49	6.194		
6,200.0	6,194.7	6,191.7	6,191.7	13.9	123.8	-107.20	-178.5	-641.6	839.2	701.5	137.70	6.094		
6,300.0	6,294.7	6,291.7	6,291.7	14.1	125.8	-107.20	-178.5	-641.6	839.2	699.3	139.92	5.998		
6,391.5	6,386.2	6,383.2	6,383.2	14.3	127.7	-107.20	-178.5	-641.6	839.2	697.2	141.95	5.912		
6,400.0	6,394.7	6,391.7	6,391.7	14.3	127.8	-17.20	-178.5	-641.6	839.1	697.4	141.77	5.919		
6,450.0	6,444.7	6,441.7	6,441.7	14.4	128.8	-17.29	-178.5	-641.6	837.0	694.6	142.47	5.875		
6,500.0	6,494.4	6,491.4	6,491.4	14.5	129.8	-17.52	-178.5	-641.6	831.8	689.2	142.63	5.832		
6,550.0	6,543.6	6,540.6	6,540.6	14.5	130.8	-17.90	-178.5	-641.6	823.5	681.3	142.22	5.791		
6,600.0	6,592.1	6,589.1	6,589.1	14.6	131.8	-18.43	-178.5	-641.6	812.2	670.9	141.26	5.749		
6,650.0	6,639.8	6,636.8	6,636.8	14.7	132.7	-19.13	-178.5	-641.6	797.9	658.1	139.78	5.708		
6,700.0	6,686.4	6,683.4	6,683.4	14.7	133.7	-20.03	-178.5	-641.6	780.7	642.9	137.82	5.664		
6,750.0	6,731.7	6,728.7	6,728.7	14.8	134.6	-21.15	-178.5	-641.6	760.7	625.2	135.44	5.616		
6,800.0	6,775.5	6,772.5	6,772.5	14.9	135.5	-22.54	-178.5	-641.6	738.0	605.2	132.74	5.559		
6,850.0	6,817.7	6,814.7	6,814.7	15.0	136.3	-24.23	-178.5	-641.6	712.7	582.8	129.88	5.488		
6,900.0	6,858.0	6,855.0	6,855.0	15.1	137.1	-26.29	-178.5	-641.6	685.1	558.0	127.06	5.392		
6,950.0	6,896.3	6,893.3	6,893.3	15.3	137.9	-28.80	-178.5	-641.6	655.2	530.6	124.59	5.259		
7,000.0	6,932.4	6,929.4	6,929.4	15.6	138.6	-31.83	-178.5	-641.6	623.4	500.5	122.86	5.074		
7,050.0	6,966.1	6,963.1	6,963.1	15.9	139.3	-35.48	-178.5	-641.6	589.7	467.3	122.37	4.819		
7,100.0	6,997.4	6,994.4	6,994.4	16.2	139.9	-39.83	-178.5	-641.6	554.6	431.0	123.60	4.487		
7,150.0	7,026.1	7,023.1	7,023.1	16.6	140.5	-44.95	-178.5	-641.6	518.3	391.3	126.94	4.083		
7,200.0	7,052.0	7,049.0	7,049.0	17.1	141.0	-50.84	-178.5	-641.6	481.2	348.8	132.36	3.635		
7,250.0	7,075.1	7,072.1	7,072.1	17.7	141.4	-57.35	-178.5	-641.6	443.8	304.5	139.32	3.185		
7,300.0	7,095.2	7,092.2	7,092.2	18.4	141.8	-64.20	-178.5	-641.6	406.6	259.9	146.74	2.771		
7,350.0	7,112.3	7,109.3	7,109.3	19.1	142.2	-70.98	-178.5	-641.6	370.5	217.1	153.46	2.415		
7,400.0	7,126.3	7,123.3	7,123.3	19.9	142.5	-77.21	-178.5	-641.6	336.4	177.8	158.63	2.121		
7,450.0	7,137.1	7,134.1	7,134.1	20.8	142.7	-82.46	-178.5	-641.6	305.6	143.5	162.10	1.885		
7,500.0	7,144.7	7,141.7	7,141.7	21.7	142.8	-86.45	-178.5	-641.6	279.7	115.4	164.22	1.703		
7,550.0	7,149.0	7,146.0	7,146.0	22.7	142.9	-89.01	-178.5	-641.6	260.5	94.9	165.57	1.573		
7,601.2	7,150.1	7,147.1	7,147.1	23.7	142.9	-90.08	-178.5	-641.6	249.7	83.1	166.65	1.499 Level 3		
7,629.2	7,149.7	7,146.7	7,146.7	24.3	142.9	-90.00	-178.5	-641.6	248.2	80.9	167.23	1.484 Level 3, CC, ES, SF		
7,700.0	7,148.8	7,145.8	7,145.8	25.8	142.9	-89.79	-178.5	-641.6	258.1	89.4	168.71	1.530		
7,800.0	7,147.5	7,144.5	7,144.5	28.0	142.9	-89.50	-178.5	-641.6	301.3	130.3	170.91	1.763		
7,900.0	7,146.3	7,143.3	7,143.3	30.4	142.9	-89.20	-178.5	-641.6	367.3	194.1	173.21	2.121		
8,000.0	7,145.0	7,142.0	7,142.0	32.8	142.8	-88.91	-178.5	-641.6	446.2	270.6	175.57	2.541		
8,100.0	7,143.7	7,140.7	7,140.7	35.2	142.8	-88.62	-178.5	-641.6	532.2	354.2	177.99	2.990		
8,200.0	7,142.5	7,139.5	7,139.5	37.7	142.8	-88.32	-178.5	-641.6	622.4	441.9	180.45	3.449		
8,300.0	7,141.2	7,138.2	7,138.2	40.3	142.8	-88.03	-178.5	-641.6	715.2	532.3	182.94	3.909		
8,400.0	7,139.9	7,136.9	7,136.9	42.9	142.7	-87.73	-178.5	-641.6	809.7	624.3	185.46	4.366		
8,500.0	7,138.6	7,135.6	7,135.6	45.5	142.7	-87.44	-178.5	-641.6	905.4	717.4	188.00	4.816		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Sunmarke 28U-HZ Pad Sec.28-T4N-R67W - Sunmarke 28U-434 - Wellbore #1 - Plan #1 (11-18-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-180.00	-180.00	-29.1	0.0	29.1				
100.0	100.0	100.0	100.0	0.1	0.1	-180.00	-180.00	-29.1	0.0	29.1	28.9	0.22	129.629	
200.0	200.0	200.0	200.0	0.3	0.3	-180.00	-180.00	-29.1	0.0	29.1	28.5	0.67	43.210	
300.0	300.0	300.0	300.0	0.6	0.6	-180.00	-180.00	-29.1	0.0	29.1	28.0	1.12	25.926	
400.0	400.0	400.0	400.0	0.8	0.8	-180.00	-180.00	-29.1	0.0	29.1	27.6	1.57	18.518	
500.0	500.0	500.0	500.0	1.0	1.0	-180.00	-180.00	-29.1	0.0	29.1	27.1	2.02	14.403	
600.0	600.0	600.0	600.0	1.2	1.2	-180.00	-180.00	-29.1	0.0	29.1	26.7	2.47	11.784	
700.0	700.0	700.0	700.0	1.5	1.5	-180.00	-180.00	-29.1	0.0	29.1	26.2	2.92	9.971	
800.0	800.0	800.0	800.0	1.7	1.7	-180.00	-180.00	-29.1	0.0	29.1	25.8	3.37	8.642	
900.0	900.0	900.0	900.0	1.9	1.9	-180.00	-180.00	-29.1	0.0	29.1	25.3	3.82	7.625	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-180.00	-180.00	-29.1	0.0	29.1	24.9	4.27	6.823	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	-180.00	-180.00	-29.1	0.0	29.1	24.4	4.72	6.173	
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	-180.00	-180.00	-29.1	0.0	29.1	24.0	5.17	5.636	
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-180.00	-180.00	-29.1	0.0	29.1	23.5	5.62	5.185	
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-180.00	-180.00	-29.1	0.0	29.1	23.1	6.07	4.801	
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.3	-180.00	-180.00	-29.1	0.0	29.1	22.6	6.52	4.470 CC, ES	
1,600.0	1,600.0	1,599.2	1,599.2	3.5	3.5	177.76	177.76	-30.4	1.2	30.4	23.5	6.94	4.381	
1,700.0	1,700.0	1,698.2	1,698.1	3.7	3.6	172.08	172.08	-34.1	4.7	34.5	27.1	7.34	4.693	
1,800.0	1,800.0	1,798.0	1,797.6	3.9	3.8	166.26	166.26	-39.1	9.6	40.4	32.6	7.76	5.203	
1,900.0	1,900.0	1,897.7	1,897.1	4.2	4.0	161.95	161.95	-44.2	14.4	46.5	38.4	8.17	5.696	
2,000.0	2,000.0	1,997.5	1,996.6	4.4	4.2	158.67	158.67	-49.2	19.2	52.9	44.3	8.60	6.159	
2,100.0	2,100.0	2,097.2	2,096.1	4.6	4.4	91.18	91.18	-54.3	24.0	59.5	50.5	9.01	6.602	
2,176.9	2,176.7	2,173.9	2,172.6	4.8	4.6	92.63	92.63	-58.1	27.8	64.6	55.3	9.33	6.924	
2,200.0	2,199.8	2,197.0	2,195.6	4.8	4.7	93.31	93.31	-59.3	28.9	66.1	56.7	9.43	7.018	
2,300.0	2,299.7	2,296.7	2,295.1	5.0	4.9	95.95	95.95	-64.3	33.7	73.0	63.2	9.85	7.411	
2,400.0	2,399.5	2,396.4	2,394.5	5.2	5.1	98.12	98.12	-69.4	38.5	80.0	69.7	10.28	7.780	
2,500.0	2,499.3	2,496.1	2,494.0	5.5	5.3	99.95	99.95	-74.4	43.3	87.1	76.3	10.72	8.123	
2,600.0	2,599.1	2,595.8	2,593.5	5.7	5.6	101.50	101.50	-79.4	48.2	94.2	83.0	11.16	8.442	
2,700.0	2,698.9	2,695.6	2,693.0	5.9	5.8	102.83	102.83	-84.5	53.0	101.4	89.8	11.61	8.738	
2,800.0	2,798.7	2,795.3	2,792.4	6.1	6.0	103.99	103.99	-89.5	57.8	108.7	96.6	12.06	9.014	
2,900.0	2,898.5	2,895.0	2,891.9	6.4	6.3	105.00	105.00	-94.6	62.6	116.0	103.4	12.51	9.270	
3,000.0	2,998.3	2,994.7	2,991.4	6.6	6.5	105.89	105.89	-99.6	67.5	123.3	110.3	12.97	9.508	
3,100.0	3,098.1	3,094.4	3,090.8	6.8	6.8	106.68	106.68	-104.6	72.3	130.6	117.2	13.43	9.731	
3,200.0	3,197.9	3,194.1	3,190.3	7.1	7.0	107.38	107.38	-109.7	77.1	138.0	124.1	13.89	9.938	
3,300.0	3,297.7	3,293.8	3,289.8	7.3	7.3	108.02	108.02	-114.7	81.9	145.4	131.0	14.35	10.131	
3,400.0	3,397.6	3,393.6	3,389.2	7.5	7.5	108.59	108.59	-119.8	86.8	152.8	138.0	14.82	10.312	
3,500.0	3,497.4	3,493.3	3,488.7	7.8	7.7	109.11	109.11	-124.8	91.6	160.2	144.9	15.29	10.482	
3,600.0	3,597.2	3,593.0	3,588.2	8.0	8.0	109.58	109.58	-129.8	96.4	167.7	151.9	15.76	10.641	
3,700.0	3,697.0	3,692.7	3,687.7	8.3	8.2	110.01	110.01	-134.9	101.2	175.1	158.9	16.23	10.791	
3,800.0	3,796.8	3,792.4	3,787.1	8.5	8.5	110.41	110.41	-139.9	106.0	182.6	165.9	16.70	10.932	
3,900.0	3,896.6	3,892.1	3,886.6	8.7	8.7	110.78	110.78	-145.0	110.9	190.0	172.8	17.17	11.065	
4,000.0	3,996.4	3,991.8	3,986.1	9.0	9.0	111.12	111.12	-150.0	115.7	197.5	179.8	17.65	11.190	
4,100.0	4,096.2	4,091.6	4,085.5	9.2	9.3	111.43	111.43	-155.0	120.5	205.0	186.8	18.12	11.308	
4,200.0	4,196.0	4,191.3	4,185.0	9.5	9.5	111.72	111.72	-160.1	125.3	212.4	193.8	18.60	11.420	
4,300.0	4,295.8	4,291.0	4,284.5	9.7	9.8	112.00	112.00	-165.1	130.2	219.9	200.9	19.08	11.527	
4,400.0	4,395.7	4,390.7	4,383.9	10.0	10.0	112.25	112.25	-170.2	135.0	227.4	207.9	19.56	11.627	
4,500.0	4,495.5	4,490.4	4,483.4	10.2	10.3	112.49	112.49	-175.2	139.8	234.9	214.9	20.04	11.723	
4,600.0	4,595.3	4,590.1	4,582.9	10.4	10.5	112.71	112.71	-180.2	144.6	242.4	221.9	20.52	11.814	
4,700.0	4,695.1	4,689.8	4,682.4	10.7	10.8	112.92	112.92	-185.3	149.5	249.9	228.9	21.00	11.900	
4,800.0	4,794.9	4,789.6	4,781.8	10.9	11.0	113.12	113.12	-190.3	154.3	257.4	235.9	21.48	11.983	
4,828.4	4,823.3	4,818.6	4,810.8	11.0	11.1	113.18	113.18	-191.8	155.7	259.5	237.9	21.62	12.005	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Sunmarke 28U-HZ Pad Sec.28-T4N-R67W - Sunmarke 28U-434 - Wellbore #1 - Plan #1 (11-18-13)										Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
4,900.0	4,894.7	4,895.2	4,887.2	11.2	11.3	113.40	-194.7	158.5	263.7	241.7	21.94	12.016		
5,005.3	5,000.0	5,007.9	5,000.0	11.3	11.5	180.00	-196.3	160.0	265.9	243.9	22.08	12.045		
5,100.0	5,094.7	5,102.7	5,094.7	11.5	11.7	180.00	-196.3	160.0	265.9	243.5	22.45	11.845		
5,200.0	5,194.7	5,202.7	5,194.7	11.7	11.9	180.00	-196.3	160.0	265.9	243.1	22.86	11.635		
5,300.0	5,294.7	5,302.7	5,294.7	11.9	12.0	180.00	-196.3	160.0	265.9	242.7	23.26	11.431		
5,400.0	5,394.7	5,402.7	5,394.7	12.2	12.2	180.00	-196.3	160.0	265.9	242.3	23.67	11.233		
5,500.0	5,494.7	5,502.7	5,494.7	12.4	12.4	180.00	-196.3	160.0	265.9	241.9	24.08	11.042		
5,600.0	5,594.7	5,602.7	5,594.7	12.6	12.6	180.00	-196.3	160.0	265.9	241.4	24.50	10.856		
5,700.0	5,694.7	5,702.7	5,694.7	12.8	12.8	180.00	-196.3	160.0	265.9	241.0	24.91	10.676		
5,800.0	5,794.7	5,802.7	5,794.7	13.0	13.0	180.00	-196.3	160.0	265.9	240.6	25.32	10.502		
5,900.0	5,894.7	5,902.7	5,894.7	13.2	13.2	180.00	-196.3	160.0	265.9	240.2	25.74	10.332		
6,000.0	5,994.7	6,002.7	5,994.7	13.4	13.4	180.00	-196.3	160.0	265.9	239.8	26.16	10.167		
6,100.0	6,094.7	6,102.7	6,094.7	13.7	13.6	180.00	-196.3	160.0	265.9	239.4	26.57	10.008		
6,200.0	6,194.7	6,202.7	6,194.7	13.9	13.8	180.00	-196.3	160.0	265.9	238.9	26.99	9.852		
6,300.0	6,294.7	6,302.7	6,294.7	14.1	14.0	180.00	-196.3	160.0	265.9	238.5	27.41	9.702		
6,391.5	6,386.2	6,394.1	6,386.2	14.3	14.2	180.00	-196.3	160.0	265.9	238.1	27.80	9.567		
6,391.7	6,386.4	6,394.4	6,386.4	14.3	14.2	180.00	-196.3	160.0	265.9	238.1	27.80	9.567		
6,400.0	6,394.7	6,402.7	6,394.7	14.3	14.2	-90.01	-196.3	160.0	265.9	237.8	28.11	9.461		
6,404.0	6,398.7	6,406.7	6,398.7	14.3	14.2	-90.02	-196.3	160.0	265.9	237.8	28.12	9.456		
6,450.0	6,444.7	6,452.6	6,444.7	14.4	14.3	-90.48	-196.3	160.0	265.9	237.7	28.29	9.400		
6,500.0	6,494.4	6,502.5	6,494.6	14.5	14.4	-91.58	-196.3	159.7	266.0	237.6	28.46	9.347		
6,550.0	6,543.6	6,552.9	6,544.8	14.5	14.5	-92.79	-196.3	156.6	266.3	237.6	28.61	9.307		
6,600.0	6,592.1	6,603.6	6,595.1	14.6	14.5	-93.99	-196.3	150.1	266.6	237.8	28.74	9.276		
6,650.0	6,639.8	6,654.7	6,645.3	14.7	14.6	-95.17	-196.3	140.3	267.0	238.2	28.86	9.252		
6,700.0	6,686.4	6,706.2	6,695.0	14.7	14.7	-96.33	-196.3	126.9	267.6	238.6	28.98	9.234		
6,750.0	6,731.7	6,758.2	6,744.2	14.8	14.7	-97.46	-196.3	110.2	268.2	239.1	29.09	9.219		
6,800.0	6,775.5	6,810.5	6,792.4	14.9	14.8	-98.56	-196.3	89.9	269.0	239.7	29.23	9.203		
6,850.0	6,817.7	6,863.2	6,839.4	15.0	14.8	-99.62	-196.3	66.2	269.8	240.4	29.38	9.182		
6,900.0	6,858.0	6,916.2	6,885.1	15.1	14.9	-100.64	-196.3	39.2	270.6	241.1	29.58	9.150		
6,950.0	6,896.3	6,969.7	6,929.0	15.3	15.0	-101.61	-196.3	8.8	271.5	241.7	29.83	9.102		
7,000.0	6,932.4	7,023.5	6,971.0	15.6	15.0	-102.52	-196.3	-24.9	272.5	242.3	30.17	9.032		
7,050.0	6,966.1	7,077.7	7,010.8	15.9	15.2	-103.37	-196.3	-61.7	273.4	242.8	30.60	8.934		
7,100.0	6,997.4	7,132.2	7,048.1	16.2	15.5	-104.16	-196.3	-101.4	274.3	243.2	31.16	8.805		
7,150.0	7,026.1	7,187.1	7,082.7	16.6	15.9	-104.89	-196.3	-144.0	275.2	243.4	31.84	8.643		
7,200.0	7,052.0	7,242.2	7,114.3	17.1	16.4	-105.54	-196.3	-189.1	276.1	243.4	32.68	8.447		
7,250.0	7,075.1	7,297.6	7,142.6	17.7	16.9	-106.13	-196.3	-236.7	276.9	243.2	33.69	8.218		
7,300.0	7,095.2	7,353.2	7,167.6	18.4	17.6	-106.64	-196.3	-286.4	277.6	242.7	34.87	7.961		
7,350.0	7,112.3	7,409.1	7,188.9	19.1	18.4	-107.07	-196.3	-338.0	278.2	242.0	36.22	7.681		
7,400.0	7,126.3	7,465.1	7,206.5	19.9	19.3	-107.42	-196.3	-391.2	278.7	241.0	37.73	7.387		
7,450.0	7,137.1	7,521.3	7,220.1	20.8	20.2	-107.70	-196.3	-445.7	279.2	239.8	39.40	7.085		
7,500.0	7,144.7	7,577.6	7,229.7	21.7	21.2	-107.89	-196.3	-501.1	279.4	238.2	41.20	6.783		
7,550.0	7,149.0	7,630.1	7,235.6	22.7	22.3	-108.10	-196.3	-553.4	279.8	236.8	43.04	6.502		
7,601.2	7,150.1	7,681.7	7,240.9	23.7	23.3	-108.84	-196.3	-604.7	281.2	236.4	44.82	6.273		
7,700.0	7,148.8	7,789.2	7,246.5	25.8	25.6	-110.16	-196.3	-712.0	283.3	234.7	48.63	5.826		
7,800.0	7,147.5	7,889.5	7,246.7	28.0	27.9	-110.44	-196.3	-812.3	283.8	231.0	52.77	5.379		
7,900.0	7,146.3	7,989.5	7,246.9	30.4	30.2	-110.72	-196.3	-912.3	284.3	227.3	57.06	4.983		
8,000.0	7,145.0	8,089.5	7,247.1	32.8	32.6	-111.00	-196.3	-1,012.2	284.9	223.4	61.48	4.633		
8,100.0	7,143.7	8,189.4	7,247.3	35.2	35.1	-111.27	-196.3	-1,112.2	285.4	219.4	66.00	4.324		
8,200.0	7,142.5	8,289.4	7,247.5	37.7	37.6	-111.54	-196.3	-1,212.2	285.9	215.3	70.58	4.051		
8,300.0	7,141.2	8,389.4	7,247.6	40.3	40.2	-111.82	-196.3	-1,312.2	286.5	211.2	75.23	3.808		
8,400.0	7,139.9	8,489.4	7,247.8	42.9	42.8	-112.09	-196.3	-1,412.2	287.0	207.1	79.91	3.592		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Sunmarke 28U-HZ Pad Sec.28-T4N-R67W - Sunmarke 28U-434 - Wellbore #1 - Plan #1 (11-18-13)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance				Warning		
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses			Minimum Separation
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
8,500.0	7,138.6	8,589.4	7,248.0	45.5	45.4	-112.36	-196.3	-1,512.2	287.6	202.9	84.63	3.398	
8,600.0	7,137.4	8,689.4	7,248.2	48.1	48.0	-112.63	-196.3	-1,612.2	288.1	198.8	89.37	3.224	
8,700.0	7,136.1	8,789.4	7,248.4	50.8	50.7	-112.90	-196.3	-1,712.2	288.7	194.6	94.12	3.067	
8,800.0	7,134.8	8,889.4	7,248.6	53.4	53.3	-113.17	-196.3	-1,812.2	289.3	190.4	98.89	2.925	
8,900.0	7,133.5	8,989.4	7,248.8	56.1	56.0	-113.43	-196.3	-1,912.1	289.8	186.2	103.66	2.796	
9,000.0	7,132.3	9,089.3	7,249.0	58.8	58.7	-113.70	-196.3	-2,012.1	290.4	182.0	108.43	2.678	
9,100.0	7,131.0	9,189.3	7,249.2	61.5	61.4	-113.96	-196.3	-2,112.1	291.0	177.8	113.21	2.571	
9,200.0	7,129.7	9,289.3	7,249.4	64.2	64.1	-114.22	-196.3	-2,212.1	291.6	173.6	117.98	2.472	
9,300.0	7,128.4	9,389.3	7,249.6	66.9	66.8	-114.49	-196.3	-2,312.1	292.2	169.5	122.74	2.381	
9,400.0	7,127.2	9,489.3	7,249.8	69.7	69.6	-114.75	-196.3	-2,412.1	292.8	165.3	127.50	2.297	
9,500.0	7,125.9	9,589.3	7,250.0	72.4	72.3	-115.01	-196.3	-2,512.1	293.5	161.2	132.24	2.219	
9,600.0	7,124.6	9,689.3	7,250.1	75.1	75.0	-115.27	-196.3	-2,612.1	294.1	157.1	136.98	2.147	
9,700.0	7,123.3	9,789.3	7,250.3	77.9	77.8	-115.52	-196.3	-2,712.1	294.7	153.0	141.71	2.080	
9,800.0	7,122.1	9,889.3	7,250.5	80.6	80.5	-115.78	-196.3	-2,812.0	295.3	148.9	146.42	2.017	
9,900.0	7,120.8	9,989.2	7,250.7	83.4	83.3	-116.04	-196.3	-2,912.0	296.0	144.9	151.12	1.959	
10,000.0	7,119.5	10,089.2	7,250.9	86.1	86.0	-116.29	-196.3	-3,012.0	296.6	140.8	155.80	1.904	
10,100.0	7,118.2	10,189.2	7,251.1	88.9	88.8	-116.54	-196.3	-3,112.0	297.3	136.8	160.47	1.853	
10,200.0	7,117.0	10,289.2	7,251.3	91.6	91.6	-116.80	-196.3	-3,212.0	297.9	132.8	165.12	1.804	
10,300.0	7,115.7	10,389.2	7,251.5	94.4	94.3	-117.05	-196.3	-3,312.0	298.6	128.8	169.76	1.759	
10,400.0	7,114.4	10,489.2	7,251.7	97.2	97.1	-117.30	-196.3	-3,412.0	299.3	124.9	174.37	1.716	
10,500.0	7,113.1	10,589.2	7,251.9	99.9	99.9	-117.55	-196.3	-3,512.0	299.9	121.0	178.98	1.676	
10,600.0	7,111.9	10,689.2	7,252.1	102.7	102.6	-117.79	-196.3	-3,612.0	300.6	117.1	183.56	1.638	
10,700.0	7,110.6	10,789.2	7,252.3	105.5	105.4	-118.04	-196.3	-3,711.9	301.3	113.2	188.12	1.602	
10,800.0	7,109.3	10,889.1	7,252.4	108.3	108.2	-118.29	-196.3	-3,811.9	302.0	109.3	192.67	1.568	
10,900.0	7,108.1	10,989.1	7,252.6	111.0	111.0	-118.53	-196.3	-3,911.9	302.7	105.5	197.20	1.535	
11,000.0	7,106.8	11,089.1	7,252.8	113.8	113.7	-118.77	-196.3	-4,011.9	303.4	101.7	201.70	1.504	
11,100.0	7,105.5	11,189.1	7,253.0	116.6	116.5	-119.02	-196.3	-4,111.9	304.1	97.9	206.19	1.475 Level 3	
11,200.0	7,104.2	11,289.1	7,253.2	119.4	119.3	-119.26	-196.3	-4,211.9	304.8	94.2	210.66	1.447 Level 3	
11,300.0	7,103.0	11,389.1	7,253.4	122.1	122.1	-119.50	-196.3	-4,311.9	305.6	90.4	215.11	1.420 Level 3	
11,400.0	7,101.7	11,489.1	7,253.6	124.9	124.9	-119.73	-196.3	-4,411.9	306.3	86.7	219.53	1.395 Level 3	
11,500.0	7,100.4	11,589.1	7,253.8	127.7	127.6	-119.97	-196.3	-4,511.9	307.0	83.1	223.94	1.371 Level 3	
11,600.0	7,099.1	11,689.1	7,254.0	130.5	130.4	-120.21	-196.3	-4,611.8	307.7	79.4	228.33	1.348 Level 3	
11,610.4	7,099.0	11,697.1	7,254.0	130.7	130.7	-120.23	-196.3	-4,619.9	307.8	79.2	228.65	1.346 Level 3, SF	



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Sunmarke 28U-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-214 - Wellbore #1 - Plan #1 (11-18-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-180.00	-180.00	-61.9	0.0	61.9				
100.0	100.0	100.0	100.0	0.1	0.1	-180.00	-180.00	-61.9	0.0	61.9	61.7	0.22	275.521	
200.0	200.0	200.0	200.0	0.3	0.3	-180.00	-180.00	-61.9	0.0	61.9	61.3	0.67	91.840	
300.0	300.0	300.0	300.0	0.6	0.6	-180.00	-180.00	-61.9	0.0	61.9	60.8	1.12	55.104	
400.0	400.0	400.0	400.0	0.8	0.8	-180.00	-180.00	-61.9	0.0	61.9	60.4	1.57	39.360	
500.0	500.0	500.0	500.0	1.0	1.0	-180.00	-180.00	-61.9	0.0	61.9	59.9	2.02	30.613	
600.0	600.0	600.0	600.0	1.2	1.2	-180.00	-180.00	-61.9	0.0	61.9	59.5	2.47	25.047	
700.0	700.0	700.0	700.0	1.5	1.5	-180.00	-180.00	-61.9	0.0	61.9	59.0	2.92	21.194	
800.0	800.0	800.0	800.0	1.7	1.7	-180.00	-180.00	-61.9	0.0	61.9	58.6	3.37	18.368	
900.0	900.0	900.0	900.0	1.9	1.9	-180.00	-180.00	-61.9	0.0	61.9	58.1	3.82	16.207	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-180.00	-180.00	-61.9	0.0	61.9	57.7	4.27	14.501 CC, ES	
1,100.0	1,100.0	1,098.0	1,098.0	2.4	2.3	179.43	179.43	-63.5	0.6	63.5	58.8	4.69	13.548	
1,200.0	1,200.0	1,195.8	1,195.6	2.6	2.5	177.90	177.90	-68.1	2.5	68.3	63.2	5.09	13.428	
1,300.0	1,300.0	1,293.2	1,292.6	2.8	2.7	175.77	175.77	-75.8	5.6	76.4	70.9	5.50	13.894	
1,400.0	1,400.0	1,392.6	1,391.6	3.0	2.9	173.72	173.72	-85.2	9.4	86.1	80.1	5.92	14.527	
1,500.0	1,500.0	1,492.1	1,490.6	3.3	3.1	172.09	172.09	-94.5	13.1	95.8	89.5	6.36	15.062	
1,600.0	1,600.0	1,591.6	1,589.6	3.5	3.4	170.76	170.76	-103.8	16.9	105.7	98.9	6.81	15.512	
1,700.0	1,700.0	1,691.1	1,688.6	3.7	3.6	169.65	169.65	-113.1	20.7	115.6	108.3	7.27	15.893	
1,800.0	1,800.0	1,790.6	1,787.5	3.9	3.9	168.72	168.72	-122.5	24.4	125.5	117.7	7.74	16.218	
1,900.0	1,900.0	1,890.1	1,886.5	4.2	4.1	167.93	167.93	-131.8	28.2	135.4	127.2	8.21	16.497	
2,000.0	2,000.0	1,989.6	1,985.5	4.4	4.4	167.25	167.25	-141.1	31.9	145.4	136.7	8.69	16.738	
2,100.0	2,100.0	2,089.0	2,084.4	4.6	4.7	100.61	100.61	-150.4	35.7	155.7	146.8	8.94	17.418	
2,176.9	2,176.7	2,165.4	2,160.4	4.8	4.9	101.29	101.29	-157.6	38.6	164.1	154.8	9.27	17.700	
2,200.0	2,199.8	2,188.4	2,183.3	4.8	4.9	101.63	101.63	-159.7	39.5	166.7	157.3	9.37	17.786	
2,300.0	2,299.7	2,287.7	2,282.0	5.0	5.2	102.99	102.99	-169.1	43.2	177.9	168.1	9.81	18.136	
2,400.0	2,399.5	2,386.9	2,380.8	5.2	5.5	104.20	104.20	-178.4	47.0	189.3	179.0	10.25	18.455	
2,500.0	2,499.3	2,486.2	2,479.6	5.5	5.8	105.26	105.26	-187.7	50.7	200.7	190.0	10.70	18.746	
2,600.0	2,599.1	2,585.5	2,578.4	5.7	6.0	106.22	106.22	-197.0	54.5	212.1	201.0	11.16	19.012	
2,700.0	2,698.9	2,684.8	2,677.1	5.9	6.3	107.07	107.07	-206.3	58.2	223.7	212.0	11.61	19.256	
2,800.0	2,798.7	2,784.1	2,775.9	6.1	6.6	107.84	107.84	-215.6	62.0	235.2	223.1	12.08	19.480	
2,900.0	2,898.5	2,883.3	2,874.7	6.4	6.9	108.54	108.54	-224.9	65.7	246.8	234.3	12.54	19.686	
3,000.0	2,998.3	2,982.6	2,973.5	6.6	7.2	109.17	109.17	-234.2	69.5	258.5	245.5	13.00	19.876	
3,100.0	3,098.1	3,081.9	3,072.2	6.8	7.5	109.75	109.75	-243.5	73.2	270.1	256.7	13.47	20.052	
3,200.0	3,197.9	3,181.2	3,171.0	7.1	7.7	110.29	110.29	-252.8	77.0	281.8	267.9	13.94	20.215	
3,300.0	3,297.7	3,280.5	3,269.8	7.3	8.0	110.78	110.78	-262.1	80.8	293.5	279.1	14.41	20.366	
3,400.0	3,397.6	3,379.7	3,368.5	7.5	8.3	111.23	111.23	-271.4	84.5	305.3	290.4	14.89	20.506	
3,500.0	3,497.4	3,479.0	3,467.3	7.8	8.6	111.65	111.65	-280.7	88.3	317.0	301.7	15.36	20.637	
3,600.0	3,597.2	3,578.3	3,566.1	8.0	8.9	112.04	112.04	-290.0	92.0	328.8	313.0	15.84	20.760	
3,700.0	3,697.0	3,677.6	3,664.9	8.3	9.2	112.40	112.40	-299.3	95.8	340.6	324.3	16.32	20.874	
3,800.0	3,796.8	3,776.9	3,763.6	8.5	9.5	112.74	112.74	-308.7	99.5	352.4	335.6	16.79	20.981	
3,900.0	3,896.6	3,876.2	3,862.4	8.7	9.8	113.05	113.05	-318.0	103.3	364.2	346.9	17.27	21.082	
4,000.0	3,996.4	3,975.4	3,961.2	9.0	10.1	113.35	113.35	-327.3	107.0	376.0	358.2	17.76	21.177	
4,100.0	4,096.2	4,074.7	4,060.0	9.2	10.4	113.63	113.63	-336.6	110.8	387.8	369.6	18.24	21.266	
4,200.0	4,196.0	4,174.0	4,158.7	9.5	10.7	113.89	113.89	-345.9	114.5	399.7	380.9	18.72	21.350	
4,300.0	4,295.8	4,273.3	4,257.5	9.7	10.9	114.13	114.13	-355.2	118.3	411.5	392.3	19.20	21.430	
4,400.0	4,395.7	4,372.6	4,356.3	10.0	11.2	114.37	114.37	-364.5	122.0	423.3	403.7	19.69	21.505	
4,500.0	4,495.5	4,471.8	4,455.0	10.2	11.5	114.59	114.59	-373.8	125.8	435.2	415.0	20.17	21.576	
4,600.0	4,495.3	4,471.1	4,453.8	10.4	11.8	114.80	114.80	-383.1	129.6	447.1	426.4	20.66	21.644	
4,700.0	4,495.1	4,470.4	4,452.6	10.7	12.1	114.99	114.99	-392.4	133.3	458.9	437.8	21.14	21.708	
4,800.0	4,494.9	4,469.7	4,451.4	10.9	12.4	115.18	115.18	-401.7	137.1	470.8	449.2	21.63	21.769	
4,828.4	4,482.3	4,479.9	4,479.4	11.0	12.5	115.23	115.23	-404.4	138.1	474.2	452.4	21.77	21.786	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Sunmarke 28U-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-214 - Wellbore #1 - Plan #1 (11-18-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,894.7	4,869.0	4,850.2	11.2	12.7	115.41	-411.0	140.8	482.3	460.2	22.10	21.820		
5,005.3	5,000.0	4,973.7	4,954.4	11.3	13.0	-178.22	-420.8	144.8	492.9	469.2	23.68	20.812		
5,100.0	5,094.7	5,068.0	5,048.1	11.5	13.3	-178.66	-429.7	148.3	501.6	477.5	24.15	20.772		
5,200.0	5,194.7	5,167.5	5,147.1	11.7	13.6	-179.11	-439.0	152.1	510.9	486.3	24.66	20.718		
5,300.0	5,294.7	5,274.2	5,253.3	11.9	13.9	-179.56	-448.7	156.0	520.0	494.9	25.18	20.654		
5,400.0	5,394.7	5,394.3	5,373.1	12.2	14.1	-179.89	-456.0	158.9	526.1	500.4	25.64	20.515		
5,500.0	5,494.7	5,514.8	5,493.6	12.4	14.3	-180.00	-458.6	160.0	528.2	502.2	26.07	20.265		
5,600.0	5,594.7	5,615.9	5,594.7	12.6	14.5	180.00	-458.6	160.0	528.2	501.8	26.45	19.968		
5,700.0	5,694.7	5,715.9	5,694.7	12.8	14.7	180.00	-458.6	160.0	528.2	501.4	26.83	19.690		
5,800.0	5,794.7	5,815.9	5,794.7	13.0	14.8	180.00	-458.6	160.0	528.2	501.0	27.20	19.418		
5,900.0	5,894.7	5,915.9	5,894.7	13.2	15.0	180.00	-458.6	160.0	528.2	500.7	27.58	19.152		
6,000.0	5,994.7	6,015.9	5,994.7	13.4	15.1	180.00	-458.6	160.0	528.2	500.3	27.96	18.893		
6,100.0	6,094.7	6,115.9	6,094.7	13.7	15.3	180.00	-458.6	160.0	528.2	499.9	28.34	18.638		
6,200.0	6,194.7	6,215.9	6,194.7	13.9	15.5	180.00	-458.6	160.0	528.2	499.5	28.72	18.390		
6,264.1	6,258.8	6,280.0	6,258.8	14.0	15.6	180.00	-458.6	160.0	528.2	499.3	28.97	18.233		
6,300.0	6,294.7	6,315.9	6,294.7	14.1	15.6	-179.99	-458.6	159.9	528.2	499.1	29.11	18.147		
6,312.9	6,307.7	6,328.8	6,307.6	14.1	15.6	-179.95	-458.6	159.5	528.2	499.1	29.16	18.116		
6,391.5	6,386.2	6,406.7	6,385.2	14.3	15.7	-179.22	-458.6	152.8	528.3	498.8	29.45	17.941		
6,400.0	6,394.7	6,415.1	6,393.5	14.3	15.8	-89.09	-458.6	151.6	528.3	500.0	28.31	18.660		
6,450.0	6,444.7	6,463.8	6,441.5	14.4	15.8	-88.36	-458.6	142.8	528.5	500.0	28.48	18.556		
6,500.0	6,494.4	6,512.2	6,488.4	14.5	15.9	-87.64	-458.6	131.2	528.7	500.1	28.63	18.467		
6,550.0	6,543.6	6,560.2	6,534.1	14.5	15.9	-86.93	-458.6	116.7	529.0	500.2	28.77	18.390		
6,600.0	6,592.1	6,607.8	6,578.5	14.6	16.0	-86.24	-458.6	99.5	529.4	500.5	28.89	18.322		
6,650.0	6,639.8	6,655.0	6,621.4	14.7	16.0	-85.56	-458.6	79.7	529.8	500.8	29.02	18.256		
6,700.0	6,686.4	6,701.9	6,662.7	14.7	16.0	-84.91	-458.6	57.5	530.4	501.2	29.16	18.189		
6,750.0	6,731.7	6,750.0	6,703.5	14.8	16.1	-84.26	-458.6	32.2	530.9	501.6	29.32	18.110		
6,800.0	6,775.5	6,794.8	6,740.1	14.9	16.1	-83.67	-458.6	6.3	531.5	502.0	29.50	18.017		
6,850.0	6,817.7	6,840.8	6,776.0	15.0	16.2	-83.09	-458.6	-22.5	532.1	502.4	29.73	17.897		
6,900.0	6,858.0	6,886.5	6,809.9	15.1	16.2	-82.55	-458.6	-53.2	532.8	502.8	30.03	17.744		
6,950.0	6,896.3	6,932.0	6,841.7	15.3	16.3	-82.03	-458.6	-85.7	533.4	503.0	30.41	17.543		
7,000.0	6,932.4	6,977.3	6,871.4	15.6	16.3	-81.54	-458.6	-119.8	534.1	503.2	30.87	17.303		
7,050.0	6,966.1	7,022.3	6,898.9	15.9	16.4	-81.09	-458.6	-155.5	534.7	503.3	31.44	17.008		
7,100.0	6,997.4	7,067.2	6,924.1	16.2	16.6	-80.68	-458.6	-192.5	535.3	503.2	32.13	16.660		
7,150.0	7,026.1	7,111.8	6,947.1	16.6	17.0	-80.30	-458.6	-230.8	535.9	503.0	32.96	16.262		
7,200.0	7,052.0	7,156.4	6,967.7	17.1	17.4	-79.96	-458.6	-270.3	536.5	502.6	33.92	15.818		
7,250.0	7,075.1	7,200.0	6,985.6	17.7	18.0	-79.66	-458.6	-310.1	537.0	502.0	35.01	15.340		
7,300.0	7,095.2	7,245.0	7,001.7	18.4	18.6	-79.39	-458.6	-352.1	537.4	501.2	36.26	14.820		
7,350.0	7,112.3	7,289.2	7,015.0	19.1	19.3	-79.17	-458.6	-394.2	537.8	500.2	37.65	14.286		
7,400.0	7,126.3	7,333.3	7,025.9	19.9	20.0	-78.99	-458.6	-436.9	538.2	499.0	39.15	13.744		
7,450.0	7,137.1	7,377.3	7,034.3	20.8	20.8	-78.85	-458.6	-480.2	538.4	497.6	40.78	13.203		
7,500.0	7,144.7	7,421.3	7,040.2	21.7	21.7	-78.75	-458.6	-523.7	538.6	496.1	42.50	12.672		
7,550.0	7,149.0	7,465.2	7,043.5	22.7	22.5	-78.69	-458.6	-567.5	538.7	494.4	44.32	12.156		
7,601.2	7,150.1	7,511.0	7,044.4	23.7	23.5	-78.68	-458.6	-613.3	538.7	492.4	46.27	11.644		
7,700.0	7,148.8	7,609.7	7,044.0	25.8	25.6	-78.77	-458.6	-712.1	538.5	488.1	50.41	10.683		
7,800.0	7,147.5	7,709.7	7,043.6	28.0	27.8	-78.87	-458.6	-812.1	538.4	483.5	54.84	9.817		
7,900.0	7,146.3	7,809.7	7,043.2	30.4	30.2	-78.96	-458.6	-912.1	538.2	478.7	59.45	9.052		
8,000.0	7,145.0	7,909.7	7,042.8	32.8	32.6	-79.05	-458.6	-1,012.0	538.0	473.8	64.22	8.379		
8,100.0	7,143.7	8,009.7	7,042.4	35.2	35.1	-79.15	-458.6	-1,112.0	537.9	468.8	69.09	7.784		
8,200.0	7,142.5	8,109.7	7,042.1	37.7	37.6	-79.24	-458.6	-1,212.0	537.7	463.6	74.07	7.259		
8,300.0	7,141.2	8,209.7	7,041.7	40.3	40.1	-79.33	-458.6	-1,312.0	537.5	458.4	79.12	6.794		
8,400.0	7,139.9	8,309.7	7,041.3	42.9	42.7	-79.43	-458.6	-1,412.0	537.4	453.1	84.24	6.379		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Sunmarke 28U-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-214 - Wellbore #1 - Plan #1 (11-18-13)												Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)				Between Centres (ft)	Between Ellipses (ft)
8,500.0	7,138.6	8,409.7	7,040.9	45.5	45.3	-79.52	-458.6	-1,512.0	537.2	447.8	89.40	6.009	
8,600.0	7,137.4	8,509.7	7,040.5	48.1	48.0	-79.61	-458.6	-1,612.0	537.0	442.4	94.62	5.676	
8,700.0	7,136.1	8,609.7	7,040.1	50.8	50.6	-79.71	-458.6	-1,712.0	536.9	437.0	99.87	5.376	
8,800.0	7,134.8	8,709.7	7,039.8	53.4	53.3	-79.80	-458.6	-1,812.0	536.7	431.6	105.16	5.104	
8,900.0	7,133.5	8,809.7	7,039.4	56.1	56.0	-79.89	-458.6	-1,912.0	536.6	426.1	110.47	4.857	
9,000.0	7,132.3	8,909.7	7,039.0	58.8	58.7	-79.99	-458.6	-2,012.0	536.4	420.6	115.81	4.632	
9,100.0	7,131.0	9,009.7	7,038.6	61.5	61.4	-80.08	-458.6	-2,112.0	536.3	415.1	121.18	4.425	
9,200.0	7,129.7	9,109.7	7,038.2	64.2	64.1	-80.17	-458.6	-2,212.0	536.1	409.5	126.56	4.236	
9,300.0	7,128.4	9,209.7	7,037.8	66.9	66.8	-80.27	-458.6	-2,312.0	536.0	404.0	131.96	4.061	
9,400.0	7,127.2	9,309.7	7,037.5	69.7	69.6	-80.36	-458.6	-2,412.0	535.8	398.4	137.38	3.900	
9,500.0	7,125.9	9,409.7	7,037.1	72.4	72.3	-80.46	-458.6	-2,512.0	535.7	392.8	142.81	3.751	
9,600.0	7,124.6	9,509.7	7,036.7	75.1	75.0	-80.55	-458.6	-2,612.0	535.5	387.3	148.25	3.612	
9,700.0	7,123.3	9,609.7	7,036.3	77.9	77.8	-80.64	-458.6	-2,712.0	535.4	381.7	153.71	3.483	
9,800.0	7,122.1	9,709.7	7,035.9	80.6	80.5	-80.74	-458.6	-2,812.0	535.2	376.0	159.17	3.363	
9,900.0	7,120.8	9,809.7	7,035.5	83.4	83.3	-80.83	-458.6	-2,912.0	535.1	370.4	164.65	3.250	
10,000.0	7,119.5	9,909.7	7,035.2	86.1	86.0	-80.93	-458.6	-3,012.0	534.9	364.8	170.13	3.144	
10,100.0	7,118.2	10,009.6	7,034.8	88.9	88.8	-81.02	-458.6	-3,111.9	534.8	359.2	175.63	3.045	
10,200.0	7,117.0	10,109.6	7,034.4	91.6	91.5	-81.11	-458.6	-3,211.9	534.7	353.5	181.13	2.952	
10,300.0	7,115.7	10,209.6	7,034.0	94.4	94.3	-81.21	-458.6	-3,311.9	534.5	347.9	186.64	2.864	
10,400.0	7,114.4	10,309.6	7,033.6	97.2	97.1	-81.30	-458.6	-3,411.9	534.4	342.2	192.15	2.781	
10,500.0	7,113.1	10,409.6	7,033.2	99.9	99.8	-81.40	-458.6	-3,511.9	534.3	336.6	197.68	2.703	
10,600.0	7,111.9	10,509.6	7,032.8	102.7	102.6	-81.49	-458.6	-3,611.9	534.1	330.9	203.21	2.628	
10,700.0	7,110.6	10,609.6	7,032.5	105.5	105.4	-81.59	-458.6	-3,711.9	534.0	325.2	208.74	2.558	
10,800.0	7,109.3	10,709.6	7,032.1	108.3	108.2	-81.68	-458.6	-3,811.9	533.9	319.6	214.28	2.491	
10,900.0	7,108.1	10,809.6	7,031.7	111.0	110.9	-81.78	-458.6	-3,911.9	533.7	313.9	219.83	2.428	
11,000.0	7,106.8	10,909.6	7,031.3	113.8	113.7	-81.87	-458.6	-4,011.9	533.6	308.2	225.38	2.368	
11,100.0	7,105.5	11,009.6	7,030.9	116.6	116.5	-81.96	-458.6	-4,111.9	533.5	302.6	230.93	2.310	
11,200.0	7,104.2	11,109.6	7,030.5	119.4	119.3	-82.06	-458.6	-4,211.9	533.4	296.9	236.49	2.255	
11,300.0	7,103.0	11,209.6	7,030.2	122.1	122.1	-82.15	-458.6	-4,311.9	533.2	291.2	242.05	2.203	
11,400.0	7,101.7	11,309.6	7,029.8	124.9	124.8	-82.25	-458.6	-4,411.9	533.1	285.5	247.62	2.153	
11,500.0	7,100.4	11,409.6	7,029.4	127.7	127.6	-82.34	-458.6	-4,511.9	533.0	279.8	253.19	2.105	
11,600.0	7,099.1	11,509.6	7,029.0	130.5	130.3	-82.44	-458.6	-4,611.9	532.9	274.2	258.67	2.060	
11,603.1	7,099.1	11,512.0	7,029.0	130.6	130.4	-82.44	-458.6	-4,614.3	532.9	274.1	258.77	2.059	
11,610.4	7,099.0	11,512.0	7,029.0	130.7	130.4	-82.44	-458.6	-4,614.3	532.9	274.0	258.90	2.058 SF	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Sunmarke 28U-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-404 - Wellbore #1 - Plan #1 (11-18-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	180.00	180.00	-91.1	0.0	91.1				
100.0	100.0	100.0	100.0	0.1	0.1	180.00	180.00	-91.1	0.0	91.1	90.8	0.22	405.187	
200.0	200.0	200.0	200.0	0.3	0.3	180.00	180.00	-91.1	0.0	91.1	90.4	0.67	135.062	
300.0	300.0	300.0	300.0	0.6	0.6	180.00	180.00	-91.1	0.0	91.1	89.9	1.12	81.037	
400.0	400.0	400.0	400.0	0.8	0.8	180.00	180.00	-91.1	0.0	91.1	89.5	1.57	57.884	
500.0	500.0	500.0	500.0	1.0	1.0	180.00	180.00	-91.1	0.0	91.1	89.0	2.02	45.021	
600.0	600.0	600.0	600.0	1.2	1.2	180.00	180.00	-91.1	0.0	91.1	88.6	2.47	36.835 CC, ES	
700.0	700.0	697.0	697.0	1.5	1.4	179.75	179.75	-92.7	0.4	92.7	89.8	2.89	32.096	
800.0	800.0	793.7	793.6	1.7	1.6	179.05	179.05	-97.4	1.6	97.6	94.4	3.29	29.662	
900.0	900.0	890.0	889.5	1.9	1.8	178.03	178.03	-105.3	3.6	105.9	102.2	3.71	28.519	
1,000.0	1,000.0	985.7	984.5	2.1	2.0	176.85	176.85	-116.2	6.4	117.4	113.2	4.16	28.254	
1,100.0	1,100.0	1,083.5	1,081.3	2.4	2.3	175.67	175.67	-129.7	9.8	131.4	126.8	4.63	28.397	
1,200.0	1,200.0	1,182.4	1,179.2	2.6	2.6	174.69	174.69	-143.6	13.3	145.7	140.5	5.12	28.438	
1,300.0	1,300.0	1,281.4	1,277.2	2.8	2.9	173.89	173.89	-157.4	16.9	159.9	154.3	5.63	28.405	
1,400.0	1,400.0	1,380.4	1,375.1	3.0	3.2	173.22	173.22	-171.2	20.4	174.2	168.1	6.15	28.330	
1,500.0	1,500.0	1,479.3	1,473.0	3.3	3.5	172.65	172.65	-185.1	23.9	188.5	181.9	6.68	28.235	
1,600.0	1,600.0	1,578.3	1,570.9	3.5	3.9	172.16	172.16	-198.9	27.4	202.9	195.6	7.21	28.132	
1,700.0	1,700.0	1,677.2	1,668.8	3.7	4.2	171.73	171.73	-212.7	30.9	217.2	209.4	7.75	28.026	
1,800.0	1,800.0	1,776.2	1,766.8	3.9	4.5	171.36	171.36	-226.5	34.4	231.5	223.3	8.29	27.922	
1,900.0	1,900.0	1,875.1	1,864.7	4.2	4.9	171.03	171.03	-240.4	37.9	245.9	237.1	8.84	27.822	
2,000.0	2,000.0	1,974.1	1,962.6	4.4	5.2	170.74	170.74	-254.2	41.5	260.3	250.9	9.39	27.727	
2,100.0	2,100.0	2,073.0	2,060.5	4.6	5.5	104.07	104.07	-268.0	45.0	275.1	266.0	9.07	30.325	
2,176.9	2,176.7	2,148.9	2,135.5	4.8	5.8	104.36	104.36	-278.6	47.7	287.0	277.6	9.41	30.495	
2,200.0	2,199.8	2,171.7	2,158.1	4.8	5.9	104.57	104.57	-281.8	48.5	290.7	281.2	9.52	30.547	
2,300.0	2,299.7	2,270.3	2,255.7	5.0	6.2	105.43	105.43	-295.6	52.0	306.6	296.7	9.97	30.754	
2,400.0	2,399.5	2,368.9	2,353.3	5.2	6.6	106.19	106.19	-309.4	55.5	322.6	312.2	10.43	30.935	
2,500.0	2,499.3	2,467.5	2,450.9	5.5	6.9	106.89	106.89	-323.2	59.0	338.7	327.8	10.89	31.094	
2,600.0	2,599.1	2,566.2	2,548.5	5.7	7.3	107.52	107.52	-337.0	62.5	354.8	343.4	11.36	31.234	
2,700.0	2,698.9	2,664.8	2,646.1	5.9	7.6	108.10	108.10	-350.7	66.0	370.9	359.1	11.83	31.359	
2,800.0	2,798.7	2,763.4	2,743.7	6.1	8.0	108.63	108.63	-364.5	69.5	387.1	374.8	12.30	31.469	
2,900.0	2,898.5	2,862.0	2,841.3	6.4	8.3	109.12	109.12	-378.3	73.0	403.3	390.5	12.78	31.568	
3,000.0	2,998.3	2,960.7	2,938.9	6.6	8.7	109.57	109.57	-392.1	76.5	419.5	406.3	13.25	31.656	
3,100.0	3,098.1	3,059.3	3,036.5	6.8	9.0	109.99	109.99	-405.9	80.0	435.8	422.1	13.73	31.735	
3,200.0	3,197.9	3,157.9	3,134.1	7.1	9.4	110.37	110.37	-419.7	83.5	452.1	437.8	14.21	31.807	
3,300.0	3,297.7	3,256.5	3,231.6	7.3	9.7	110.73	110.73	-433.5	87.0	468.3	453.7	14.70	31.871	
3,400.0	3,397.6	3,355.2	3,329.2	7.5	10.1	111.07	111.07	-447.2	90.5	484.7	469.5	15.18	31.930	
3,500.0	3,497.4	3,453.8	3,426.8	7.8	10.4	111.38	111.38	-461.0	94.0	501.0	485.3	15.66	31.983	
3,600.0	3,597.2	3,552.4	3,524.4	8.0	10.8	111.68	111.68	-474.8	97.5	517.3	501.2	16.15	32.031	
3,700.0	3,697.0	3,651.0	3,622.0	8.3	11.1	111.95	111.95	-488.6	101.0	533.7	517.0	16.64	32.075	
3,800.0	3,796.8	3,749.6	3,719.6	8.5	11.5	112.21	112.21	-502.4	104.5	550.0	532.9	17.13	32.116	
3,900.0	3,896.6	3,848.3	3,817.2	8.7	11.8	112.45	112.45	-516.2	108.0	566.4	548.8	17.62	32.153	
4,000.0	3,996.4	3,946.9	3,914.8	9.0	12.2	112.69	112.69	-529.9	111.5	582.8	564.7	18.11	32.187	
4,100.0	4,096.2	4,045.5	4,012.4	9.2	12.5	112.90	112.90	-543.7	115.0	599.2	580.6	18.60	32.218	
4,200.0	4,196.0	4,144.1	4,110.0	9.5	12.9	113.11	113.11	-557.5	118.6	615.6	596.5	19.09	32.247	
4,300.0	4,295.8	4,242.8	4,207.6	9.7	13.2	113.31	113.31	-571.3	122.1	632.0	612.4	19.58	32.274	
4,400.0	4,395.7	4,341.4	4,305.2	10.0	13.6	113.49	113.49	-585.1	125.6	648.4	628.3	20.07	32.299	
4,500.0	4,495.5	4,440.0	4,402.7	10.2	13.9	113.67	113.67	-598.9	129.1	664.8	644.2	20.57	32.322	
4,600.0	4,495.3	4,538.6	4,500.3	10.4	14.3	113.84	113.84	-612.7	132.6	681.2	660.2	21.06	32.343	
4,700.0	4,495.1	4,637.2	4,597.9	10.7	14.7	114.00	114.00	-626.4	136.1	697.6	676.1	21.56	32.363	
4,800.0	4,794.9	4,735.9	4,695.5	10.9	15.0	114.15	114.15	-640.2	139.6	714.1	692.0	22.05	32.381	
4,828.4	4,823.3	4,763.9	4,723.3	11.0	15.1	114.19	114.19	-644.1	140.6	718.8	696.6	22.19	32.386	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Sunmarke 28U-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-404 - Wellbore #1 - Plan #1 (11-18-13)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,894.7	4,834.6	4,793.2	11.2	15.4	114.44		-654.0	143.1	730.2	707.6	22.55	32.384	
5,005.3	5,000.0	4,938.7	4,896.2	11.3	15.7	-178.97		-668.6	146.8	745.6	719.2	26.45	28.194	
5,100.0	5,094.7	5,032.4	4,989.0	11.5	16.1	-179.25		-681.7	150.1	758.8	731.8	26.97	28.134	
5,200.0	5,194.7	5,131.4	5,086.9	11.7	16.4	-179.52		-695.5	153.6	772.7	745.2	27.54	28.056	
5,300.0	5,294.7	5,266.1	5,220.6	11.9	16.8	-179.83		-711.3	157.6	784.5	756.3	28.11	27.909	
5,400.0	5,394.7	5,402.1	5,356.2	12.2	17.0	179.99		-721.0	160.1	791.6	763.0	28.59	27.691	
5,500.0	5,494.7	5,538.7	5,492.8	12.4	17.2	179.93		-724.5	161.0	794.2	765.2	29.01	27.374	
5,600.0	5,594.7	5,640.7	5,594.7	12.6	17.4	179.93		-724.5	161.0	794.2	764.8	29.37	27.044	
5,700.0	5,694.7	5,740.7	5,694.7	12.8	17.5	179.93		-724.5	161.0	794.2	764.5	29.71	26.732	
5,800.0	5,794.7	5,840.7	5,794.7	13.0	17.6	179.93		-724.5	161.0	794.2	764.1	30.05	26.425	
5,900.0	5,894.7	5,940.7	5,894.7	13.2	17.7	179.93		-724.5	161.0	794.2	763.8	30.40	26.124	
6,000.0	5,994.7	6,040.7	5,994.7	13.4	17.9	179.93		-724.5	161.0	794.2	763.4	30.75	25.827	
6,100.0	6,094.7	6,140.7	6,094.7	13.7	18.0	179.93		-724.5	161.0	794.2	763.1	31.10	25.535	
6,200.0	6,194.7	6,240.7	6,194.7	13.9	18.1	179.93		-724.5	161.0	794.2	762.7	31.45	25.249	
6,300.0	6,294.7	6,340.7	6,294.7	14.1	18.3	179.93		-724.5	161.0	794.2	762.4	31.81	24.967	
6,391.5	6,386.2	6,432.1	6,386.2	14.3	18.4	179.93		-724.5	161.0	794.2	762.0	32.14	24.713	
6,400.0	6,394.7	6,440.7	6,394.7	14.3	18.4	-90.08		-724.5	161.0	794.2	765.4	28.78	27.592	
6,450.0	6,444.7	6,490.6	6,444.7	14.4	18.5	-90.23		-724.5	161.0	794.2	765.2	28.95	27.429	
6,500.0	6,494.4	6,540.4	6,494.5	14.5	18.5	-90.62		-724.5	161.0	794.2	765.1	29.11	27.285	
6,550.0	6,543.6	6,590.7	6,544.8	14.5	18.6	-91.09		-724.5	158.8	794.3	765.1	29.25	27.158	
6,600.0	6,592.1	6,641.5	6,595.2	14.6	18.7	-91.55		-724.5	153.2	794.5	765.1	29.38	27.045	
6,650.0	6,639.8	6,692.8	6,645.7	14.7	18.7	-92.01		-724.5	144.2	794.7	765.2	29.49	26.944	
6,700.0	6,686.4	6,744.5	6,695.9	14.7	18.8	-92.47		-724.5	131.7	794.9	765.3	29.61	26.847	
6,750.0	6,731.7	6,796.7	6,745.5	14.8	18.8	-92.91		-724.5	115.7	795.2	765.5	29.73	26.747	
6,800.0	6,775.5	6,849.3	6,794.4	14.9	18.9	-93.35		-724.5	96.1	795.6	765.7	29.87	26.633	
6,850.0	6,817.7	6,902.4	6,842.2	15.0	18.9	-93.77		-724.5	73.1	795.9	765.9	30.04	26.494	
6,900.0	6,858.0	6,956.0	6,888.7	15.1	18.9	-94.17		-724.5	46.5	796.3	766.1	30.26	26.315	
6,950.0	6,896.3	7,010.0	6,933.6	15.3	19.0	-94.56		-724.5	16.4	796.7	766.2	30.55	26.082	
7,000.0	6,932.4	7,064.5	6,976.6	15.6	19.0	-94.93		-724.5	-17.0	797.2	766.2	30.92	25.780	
7,050.0	6,966.1	7,119.4	7,017.4	15.9	19.1	-95.28		-724.5	-53.7	797.6	766.2	31.40	25.400	
7,100.0	6,997.4	7,174.7	7,055.7	16.2	19.1	-95.60		-724.5	-93.6	798.0	766.0	32.01	24.928	
7,150.0	7,026.1	7,230.4	7,091.3	16.6	19.2	-95.90		-724.5	-136.4	798.4	765.7	32.77	24.364	
7,200.0	7,052.0	7,286.4	7,123.8	17.1	19.4	-96.17		-724.5	-182.0	798.8	765.1	33.69	23.710	
7,250.0	7,075.1	7,342.8	7,153.1	17.7	19.5	-96.41		-724.5	-230.1	799.2	764.4	34.78	22.977	
7,300.0	7,095.2	7,399.4	7,178.9	18.4	19.8	-96.62		-724.5	-280.5	799.5	763.5	36.05	22.178	
7,350.0	7,112.3	7,456.3	7,201.0	19.1	20.2	-96.80		-724.5	-333.0	799.8	762.3	37.50	21.327	
7,400.0	7,126.3	7,513.5	7,219.2	19.9	20.8	-96.95		-724.5	-387.1	800.1	760.9	39.12	20.451	
7,450.0	7,137.1	7,570.8	7,233.3	20.8	21.5	-97.06		-724.5	-442.6	800.3	759.4	40.89	19.570	
7,500.0	7,144.7	7,628.2	7,243.2	21.7	22.4	-97.14		-724.5	-499.2	800.4	757.6	42.80	18.702	
7,550.0	7,149.0	7,681.3	7,249.1	22.7	23.4	-97.22		-724.5	-552.0	800.5	755.8	44.72	17.899	
7,601.2	7,150.1	7,732.9	7,254.5	23.7	24.3	-97.48		-724.5	-603.3	801.1	754.4	46.71	17.151	
7,700.0	7,148.8	7,841.8	7,260.1	25.8	26.5	-97.98		-724.5	-712.0	801.9	750.9	50.99	15.727	
7,800.0	7,147.5	7,942.4	7,260.0	28.0	28.7	-98.06		-724.5	-812.6	802.1	746.7	55.43	14.472	
7,900.0	7,146.3	8,042.4	7,259.8	30.4	31.0	-98.14		-724.5	-912.6	802.3	742.2	60.02	13.366	
8,000.0	7,145.0	8,142.4	7,259.7	32.8	33.4	-98.21		-724.5	-1,012.6	802.4	737.6	64.77	12.389	
8,100.0	7,143.7	8,242.4	7,259.5	35.2	35.8	-98.29		-724.5	-1,112.6	802.6	732.9	69.63	11.526	
8,200.0	7,142.5	8,342.4	7,259.3	37.7	38.3	-98.37		-724.5	-1,212.6	802.7	728.1	74.59	10.762	
8,300.0	7,141.2	8,442.4	7,259.2	40.3	40.8	-98.45		-724.5	-1,312.6	802.9	723.3	79.62	10.084	
8,400.0	7,139.9	8,542.4	7,259.0	42.9	43.3	-98.53		-724.5	-1,412.6	803.1	718.4	84.71	9.480	
8,500.0	7,138.6	8,642.4	7,258.9	45.5	45.9	-98.61		-724.5	-1,512.6	803.2	713.4	89.86	8.939	
8,600.0	7,137.4	8,742.4	7,258.7	48.1	48.5	-98.69		-724.5	-1,612.6	803.4	708.4	95.05	8.453	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Sunmarke 28U-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-404 - Wellbore #1 - Plan #1 (11-18-13)												Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance				Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)		Minimum Separation (ft)	Separation Factor
8,700.0	7,136.1	8,842.4	7,258.6	50.8	51.1	-98.77	-724.5	-1,712.6	803.6	703.3	100.27	8.014	
8,800.0	7,134.8	8,942.4	7,258.4	53.4	53.8	-98.84	-724.5	-1,812.6	803.7	698.2	105.52	7.617	
8,900.0	7,133.5	9,042.4	7,258.2	56.1	56.5	-98.92	-724.5	-1,912.6	803.9	693.1	110.80	7.256	
9,000.0	7,132.3	9,142.4	7,258.1	58.8	59.1	-99.00	-724.5	-2,012.6	804.1	688.0	116.10	6.926	
9,100.0	7,131.0	9,242.4	7,257.9	61.5	61.8	-99.08	-724.5	-2,112.5	804.3	682.8	121.41	6.624	
9,200.0	7,129.7	9,342.3	7,257.8	64.2	64.5	-99.16	-724.5	-2,212.5	804.4	677.7	126.75	6.347	
9,300.0	7,128.4	9,442.3	7,257.6	66.9	67.2	-99.24	-724.5	-2,312.5	804.6	672.5	132.09	6.091	
9,400.0	7,127.2	9,542.3	7,257.5	69.7	69.9	-99.32	-724.5	-2,412.5	804.8	667.4	137.45	5.855	
9,500.0	7,125.9	9,642.3	7,257.3	72.4	72.7	-99.39	-724.5	-2,512.5	805.0	662.2	142.82	5.637	
9,600.0	7,124.6	9,742.3	7,257.1	75.1	75.4	-99.47	-724.5	-2,612.5	805.2	657.0	148.19	5.433	
9,700.0	7,123.3	9,842.3	7,257.0	77.9	78.1	-99.55	-724.5	-2,712.5	805.3	651.8	153.57	5.244	
9,800.0	7,122.1	9,942.3	7,256.8	80.6	80.9	-99.63	-724.5	-2,812.5	805.5	646.6	158.96	5.068	
9,900.0	7,120.8	10,042.3	7,256.7	83.4	83.6	-99.71	-724.5	-2,912.5	805.7	641.4	164.35	4.902	
10,000.0	7,119.5	10,142.3	7,256.5	86.1	86.3	-99.79	-724.5	-3,012.5	805.9	636.2	169.75	4.748	
10,100.0	7,118.2	10,242.3	7,256.4	88.9	89.1	-99.86	-724.5	-3,112.5	806.1	630.9	175.16	4.602	
10,200.0	7,117.0	10,342.3	7,256.2	91.6	91.8	-99.94	-724.5	-3,212.5	806.3	625.7	180.56	4.466	
10,300.0	7,115.7	10,442.3	7,256.0	94.4	94.6	-100.02	-724.5	-3,312.5	806.5	620.5	185.97	4.337	
10,400.0	7,114.4	10,542.3	7,255.9	97.2	97.4	-100.10	-724.5	-3,412.5	806.7	615.3	191.38	4.215	
10,500.0	7,113.1	10,642.3	7,255.7	99.9	100.1	-100.18	-724.5	-3,512.5	806.9	610.1	196.79	4.100	
10,600.0	7,111.9	10,742.3	7,255.6	102.7	102.9	-100.26	-724.5	-3,612.5	807.1	604.9	202.20	3.991	
10,700.0	7,110.6	10,842.3	7,255.4	105.5	105.7	-100.33	-724.5	-3,712.4	807.3	599.7	207.62	3.888	
10,800.0	7,109.3	10,942.2	7,255.3	108.3	108.4	-100.41	-724.5	-3,812.4	807.5	594.4	213.03	3.790	
10,900.0	7,108.1	11,042.2	7,255.1	111.0	111.2	-100.49	-724.5	-3,912.4	807.7	589.2	218.45	3.697	
11,000.0	7,106.8	11,142.2	7,254.9	113.8	114.0	-100.57	-724.5	-4,012.4	807.9	584.0	223.87	3.609	
11,100.0	7,105.5	11,242.2	7,254.8	116.6	116.7	-100.64	-724.5	-4,112.4	808.1	578.8	229.28	3.524	
11,200.0	7,104.2	11,342.2	7,254.6	119.4	119.5	-100.72	-724.5	-4,212.4	808.3	573.6	234.70	3.444	
11,300.0	7,103.0	11,442.2	7,254.5	122.1	122.3	-100.80	-724.5	-4,312.4	808.5	568.4	240.11	3.367	
11,400.0	7,101.7	11,542.2	7,254.3	124.9	125.1	-100.88	-724.5	-4,412.4	808.7	563.2	245.52	3.294	
11,500.0	7,100.4	11,642.2	7,254.2	127.7	127.8	-100.96	-724.5	-4,512.4	808.9	558.0	250.94	3.224	
11,600.0	7,099.1	11,741.4	7,254.0	130.5	130.6	-101.03	-724.5	-4,611.6	809.1	552.8	256.33	3.157	
11,610.4	7,099.0	11,741.4	7,254.0	130.7	130.6	-101.03	-724.5	-4,611.6	809.2	552.7	256.51	3.155 SF	



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Sunmarke 28U-334
<b>Project:</b>	SEC.28-T4N-R67W	<b>TVD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Reference Site:</b>	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	<b>MD Reference:</b>	WELL @ 4909.0ft (RKB - 15')
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sunmarke 28U-334	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (11-18-13)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4909.0ft (RKB - 15')

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Sunmarke 28U-334

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.40°

