

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Sunmarke 28V-304**

Surface Location: Sunmarke 28V-HZ Pad Sec.28-T4N-R67W

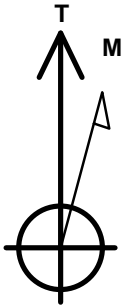
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4906.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1347957.32	3171018.63	40.286920	-104.886970	
RKB - 15' WELL @ 4921.0ft (RKB - 15')						

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1470'FNL, 211'FEL		0.0	0.0	Point
BHL 1380'FNL, 500'FWL	7126.0	171.7	-4617.2	Point



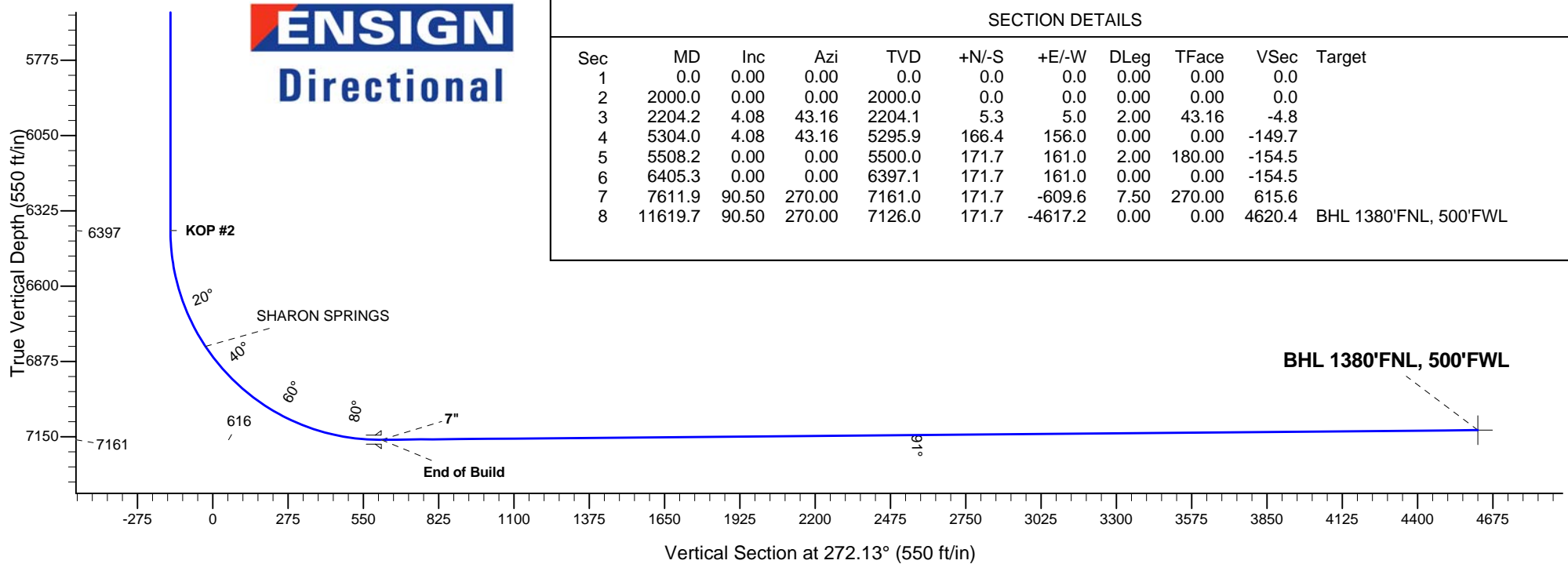
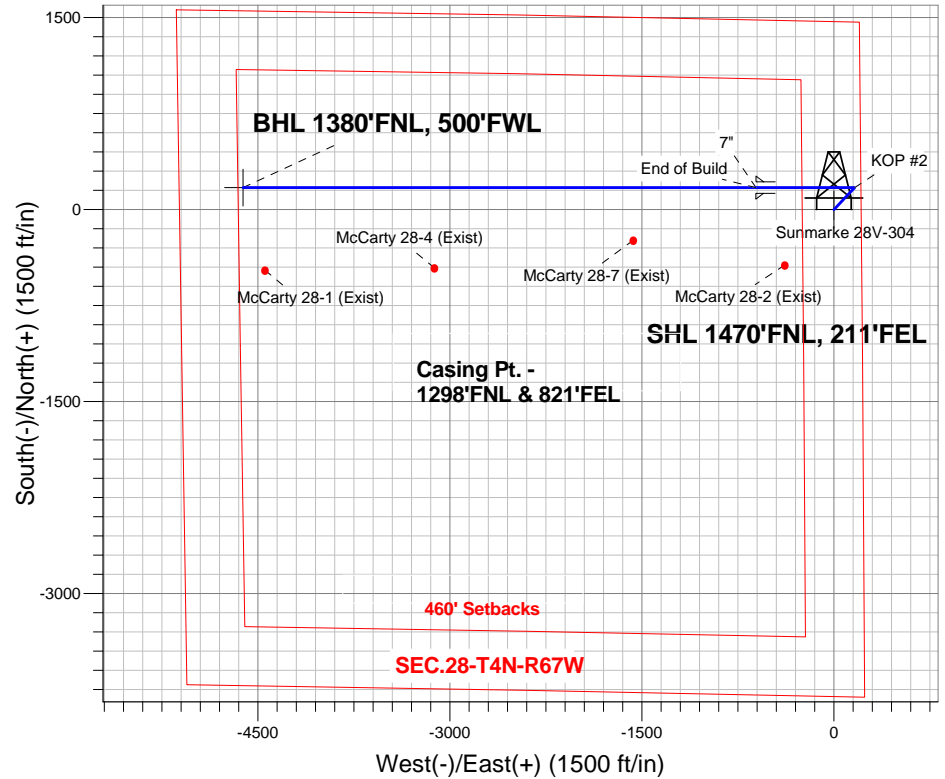
Azimuths to True North
Magnetic North: 8.59°

Magnetic Field
Strength: 52801.8snT
Dip Angle: 66.86°
Date: 11/21/2013
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
2000.0	2000.0	KOP #1
6397.1	6405.3	KOP #2
7161.0	7611.9	End of Build

Sunmarke 28V-HZ Pad Sec.28-T4N-R67W
Sunmarke 28V-304
Plan #1 (11-18-13)
9:31, November 21 2013





Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T4N-R67W

Sunmarke 28V-HZ Pad Sec.28-T4N-R67W

Sunmarke 28V-304

Wellbore #1

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

Standard Planning Report

21 November, 2013

Database:	Landmark	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Project:	SEC.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-18-13)		

Project	SEC.28-T4N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site						Sunmarke 28V-HZ Pad Sec.28-T4N-R67W											
Site Position:						Northing:			1,347,957.33ft			Latitude:			40.286920		
From:			Lat/Long			Easting:			3,171,018.63ft			Longitude:			-104.886970		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.40 °		

Well	Sunmarke 28V-304					
Well Position	+N/-S	0.0 ft	Northing:	1,347,957.32 ft	Latitude:	40.286920
	+E/-W	0.0 ft	Easting:	3,171,018.63 ft	Longitude:	-104.886970
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,906.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/21/2013	8.59	66.86	52,802

Design	Plan #1 (11-18-13)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	272.13

Plan Sections										
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	
2,204.2	4.08	43.16	2,204.1	5.3	5.0	2.00	2.00	0.00	43.16	
5,304.0	4.08	43.16	5,295.9	166.4	156.0	0.00	0.00	0.00	0.00	
5,508.2	0.00	0.00	5,500.0	171.7	161.0	2.00	-2.00	0.00	180.00	
6,405.3	0.00	0.00	6,397.1	171.7	161.0	0.00	0.00	0.00	0.00	
7,611.9	90.50	270.00	7,161.0	171.7	-609.6	7.50	7.50	0.00	270.00	
11,619.7	90.50	270.00	7,126.0	171.7	-4,617.2	0.00	0.00	0.00	0.00	BHL 1380°FNL, 500

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Project:	SEC.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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
SHL 1470'FNL, 211'FEL									
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
KOP #1									
2,100.0	2.00	43.16	2,100.0	1.3	1.2	-1.1	2.00	2.00	0.00
2,200.0	4.00	43.16	2,199.8	5.1	4.8	-4.6	2.00	2.00	0.00
2,204.2	4.08	43.16	2,204.1	5.3	5.0	-4.8	2.00	2.00	0.00
2,300.0	4.08	43.16	2,299.6	10.3	9.6	-9.3	0.00	0.00	0.00
2,400.0	4.08	43.16	2,399.3	15.5	14.5	-13.9	0.00	0.00	0.00
2,500.0	4.08	43.16	2,499.1	20.7	19.4	-18.6	0.00	0.00	0.00
2,600.0	4.08	43.16	2,598.8	25.9	24.3	-23.3	0.00	0.00	0.00
2,700.0	4.08	43.16	2,698.6	31.1	29.1	-28.0	0.00	0.00	0.00
2,800.0	4.08	43.16	2,798.3	36.3	34.0	-32.6	0.00	0.00	0.00
2,900.0	4.08	43.16	2,898.1	41.5	38.9	-37.3	0.00	0.00	0.00
3,000.0	4.08	43.16	2,997.8	46.7	43.8	-42.0	0.00	0.00	0.00
3,100.0	4.08	43.16	3,097.6	51.8	48.6	-46.7	0.00	0.00	0.00
3,200.0	4.08	43.16	3,197.3	57.0	53.5	-51.3	0.00	0.00	0.00
3,300.0	4.08	43.16	3,297.0	62.2	58.4	-56.0	0.00	0.00	0.00
3,400.0	4.08	43.16	3,396.8	67.4	63.2	-60.7	0.00	0.00	0.00
3,500.0	4.08	43.16	3,496.5	72.6	68.1	-65.4	0.00	0.00	0.00
3,600.0	4.08	43.16	3,596.3	77.8	73.0	-70.0	0.00	0.00	0.00
3,643.8	4.08	43.16	3,640.0	80.1	75.1	-72.1	0.00	0.00	0.00
PARKMAN									
3,700.0	4.08	43.16	3,696.0	83.0	77.9	-74.7	0.00	0.00	0.00
3,800.0	4.08	43.16	3,795.8	88.2	82.7	-79.4	0.00	0.00	0.00
3,900.0	4.08	43.16	3,895.5	93.4	87.6	-84.1	0.00	0.00	0.00
4,000.0	4.08	43.16	3,995.3	98.6	92.5	-88.8	0.00	0.00	0.00
4,100.0	4.08	43.16	4,095.0	103.8	97.4	-93.4	0.00	0.00	0.00
4,155.1	4.08	43.16	4,150.0	106.7	100.0	-96.0	0.00	0.00	0.00
SUSSEX									
4,200.0	4.08	43.16	4,194.8	109.0	102.2	-98.1	0.00	0.00	0.00
4,300.0	4.08	43.16	4,294.5	114.2	107.1	-102.8	0.00	0.00	0.00
4,400.0	4.08	43.16	4,394.2	119.4	112.0	-107.5	0.00	0.00	0.00

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Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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	4.08	43.16	4,494.0	124.6	116.8	-112.1	0.00	0.00	0.00
4,600.0	4.08	43.16	4,593.7	129.8	121.7	-116.8	0.00	0.00	0.00
4,669.4	4.08	43.16	4,663.0	133.4	125.1	-120.1	0.00	0.00	0.00
SHANNON									
4,700.0	4.08	43.16	4,693.5	135.0	126.6	-121.5	0.00	0.00	0.00
4,800.0	4.08	43.16	4,793.2	140.2	131.5	-126.2	0.00	0.00	0.00
4,900.0	4.08	43.16	4,893.0	145.4	136.3	-130.8	0.00	0.00	0.00
5,000.0	4.08	43.16	4,992.7	150.6	141.2	-135.5	0.00	0.00	0.00
5,100.0	4.08	43.16	5,092.5	155.8	146.1	-140.2	0.00	0.00	0.00
5,200.0	4.08	43.16	5,192.2	161.0	151.0	-144.9	0.00	0.00	0.00
5,300.0	4.08	43.16	5,292.0	166.2	155.8	-149.5	0.00	0.00	0.00
5,304.0	4.08	43.16	5,295.9	166.4	156.0	-149.7	0.00	0.00	0.00
5,400.0	2.16	43.16	5,391.8	170.2	159.6	-153.2	2.00	-2.00	0.00
5,500.0	0.16	43.16	5,491.8	171.7	161.0	-154.5	2.00	-2.00	0.00
5,508.2	0.00	0.00	5,500.0	171.7	161.0	-154.5	2.00	-2.00	0.00
5,600.0	0.00	0.00	5,591.8	171.7	161.0	-154.5	0.00	0.00	0.00
5,700.0	0.00	0.00	5,691.8	171.7	161.0	-154.5	0.00	0.00	0.00
5,800.0	0.00	0.00	5,791.8	171.7	161.0	-154.5	0.00	0.00	0.00
5,900.0	0.00	0.00	5,891.8	171.7	161.0	-154.5	0.00	0.00	0.00
6,000.0	0.00	0.00	5,991.8	171.7	161.0	-154.5	0.00	0.00	0.00
6,100.0	0.00	0.00	6,091.8	171.7	161.0	-154.5	0.00	0.00	0.00
6,200.0	0.00	0.00	6,191.8	171.7	161.0	-154.5	0.00	0.00	0.00
6,300.0	0.00	0.00	6,291.8	171.7	161.0	-154.5	0.00	0.00	0.00
6,400.0	0.00	0.00	6,391.8	171.7	161.0	-154.5	0.00	0.00	0.00
6,405.3	0.00	0.00	6,397.1	171.7	161.0	-154.5	0.00	0.00	0.00
KOP #2									
6,500.0	7.10	270.00	6,491.5	171.7	155.1	-148.6	7.50	7.50	0.00
6,600.0	14.60	270.00	6,589.7	171.7	136.3	-129.8	7.50	7.50	0.00
6,700.0	22.10	270.00	6,684.5	171.7	104.9	-98.4	7.50	7.50	0.00
6,800.0	29.60	270.00	6,774.5	171.7	61.3	-54.9	7.50	7.50	0.00
6,853.5	33.62	270.00	6,820.0	171.7	33.2	-26.8	7.50	7.50	0.00
SHARON SPRINGS									
6,900.0	37.10	270.00	6,857.9	171.7	6.3	0.1	7.50	7.50	0.00
7,000.0	44.60	270.00	6,933.5	171.7	-59.0	65.4	7.50	7.50	0.00
7,100.0	52.10	270.00	6,999.9	171.7	-133.7	140.0	7.50	7.50	0.00
7,200.0	59.60	270.00	7,056.0	171.7	-216.4	222.6	7.50	7.50	0.00
7,300.0	67.10	270.00	7,100.8	171.7	-305.7	311.9	7.50	7.50	0.00
7,400.0	74.60	270.00	7,133.6	171.7	-400.1	406.2	7.50	7.50	0.00
7,500.0	82.10	270.00	7,153.8	171.7	-498.0	504.0	7.50	7.50	0.00
7,600.0	89.60	270.00	7,161.0	171.7	-597.7	603.6	7.50	7.50	0.00
7,611.9	90.50	270.00	7,161.0	171.7	-609.6	615.5	7.50	7.50	0.00
End of Build - 7"									
7,700.0	90.50	270.00	7,160.2	171.7	-697.7	703.6	0.00	0.00	0.00
7,800.0	90.50	270.00	7,159.3	171.7	-797.7	803.5	0.00	0.00	0.00
7,900.0	90.50	270.00	7,158.5	171.7	-897.7	903.4	0.00	0.00	0.00
8,000.0	90.50	270.00	7,157.6	171.7	-997.7	1,003.3	0.00	0.00	0.00
8,100.0	90.50	270.00	7,156.7	171.7	-1,097.6	1,103.3	0.00	0.00	0.00
8,200.0	90.50	270.00	7,155.8	171.7	-1,197.6	1,203.2	0.00	0.00	0.00
8,300.0	90.50	270.00	7,155.0	171.7	-1,297.6	1,303.1	0.00	0.00	0.00
8,400.0	90.50	270.00	7,154.1	171.7	-1,397.6	1,403.0	0.00	0.00	0.00
8,500.0	90.50	270.00	7,153.2	171.7	-1,497.6	1,503.0	0.00	0.00	0.00
8,600.0	90.50	270.00	7,152.4	171.7	-1,597.6	1,602.9	0.00	0.00	0.00

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Project:	SEC.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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	90.50	270.00	7,151.5	171.7	-1,697.6	1,702.8	0.00	0.00	0.00
8,800.0	90.50	270.00	7,150.6	171.7	-1,797.6	1,802.8	0.00	0.00	0.00
8,900.0	90.50	270.00	7,149.7	171.7	-1,897.6	1,902.7	0.00	0.00	0.00
9,000.0	90.50	270.00	7,148.9	171.7	-1,997.6	2,002.6	0.00	0.00	0.00
9,100.0	90.50	270.00	7,148.0	171.7	-2,097.6	2,102.5	0.00	0.00	0.00
9,200.0	90.50	270.00	7,147.1	171.7	-2,197.6	2,202.5	0.00	0.00	0.00
9,300.0	90.50	270.00	7,146.2	171.7	-2,297.6	2,302.4	0.00	0.00	0.00
9,400.0	90.50	270.00	7,145.4	171.7	-2,397.6	2,402.3	0.00	0.00	0.00
9,500.0	90.50	270.00	7,144.5	171.7	-2,497.6	2,502.2	0.00	0.00	0.00
9,600.0	90.50	270.00	7,143.6	171.7	-2,597.6	2,602.2	0.00	0.00	0.00
9,700.0	90.50	270.00	7,142.8	171.7	-2,697.6	2,702.1	0.00	0.00	0.00
9,800.0	90.50	270.00	7,141.9	171.7	-2,797.6	2,802.0	0.00	0.00	0.00
9,900.0	90.50	270.00	7,141.0	171.7	-2,897.6	2,902.0	0.00	0.00	0.00
10,000.0	90.50	270.00	7,140.1	171.7	-2,997.6	3,001.9	0.00	0.00	0.00
10,100.0	90.50	270.00	7,139.3	171.7	-3,097.6	3,101.8	0.00	0.00	0.00
10,200.0	90.50	270.00	7,138.4	171.7	-3,197.6	3,201.7	0.00	0.00	0.00
10,300.0	90.50	270.00	7,137.5	171.7	-3,297.6	3,301.7	0.00	0.00	0.00
10,400.0	90.50	270.00	7,136.6	171.7	-3,397.6	3,401.6	0.00	0.00	0.00
10,500.0	90.50	270.00	7,135.8	171.7	-3,497.6	3,501.5	0.00	0.00	0.00
10,600.0	90.50	270.00	7,134.9	171.7	-3,597.6	3,601.4	0.00	0.00	0.00
10,700.0	90.50	270.00	7,134.0	171.7	-3,697.5	3,701.4	0.00	0.00	0.00
10,800.0	90.50	270.00	7,133.2	171.7	-3,797.5	3,801.3	0.00	0.00	0.00
10,900.0	90.50	270.00	7,132.3	171.7	-3,897.5	3,901.2	0.00	0.00	0.00
11,000.0	90.50	270.00	7,131.4	171.7	-3,997.5	4,001.2	0.00	0.00	0.00
11,100.0	90.50	270.00	7,130.5	171.7	-4,097.5	4,101.1	0.00	0.00	0.00
11,200.0	90.50	270.00	7,129.7	171.7	-4,197.5	4,201.0	0.00	0.00	0.00
11,300.0	90.50	270.00	7,128.8	171.7	-4,297.5	4,300.9	0.00	0.00	0.00
11,400.0	90.50	270.00	7,127.9	171.7	-4,397.5	4,400.9	0.00	0.00	0.00
11,500.0	90.50	270.00	7,127.0	171.7	-4,497.5	4,500.8	0.00	0.00	0.00
11,600.0	90.50	270.00	7,126.2	171.7	-4,597.5	4,600.7	0.00	0.00	0.00
11,619.7	90.50	270.00	7,126.0	171.7	-4,617.2	4,620.4	0.00	0.00	0.00
BHL 1380'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 1380'FNL, 500'F ¹	0.00	0.00	7,126.0	171.7	-4,617.2	1,348,097.06	3,166,400.55	40.287390	-104.903520
- plan hits target center									
- Point									
SHL 1470'FNL, 211'F ¹	0.00	0.00	1.0	0.0	0.0	1,347,957.33	3,171,018.63	40.286920	-104.886970
- plan hits target center									
- Point									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,611.9	7,161.0	7"	7	7-1/2

Database:	Landmark	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Project:	SEC.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-18-13)		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,643.8	3,640.0	PARKMAN				
4,155.1	4,150.0	SUSSEX				
4,669.4	4,663.0	SHANNON				
6,853.5	6,820.0	SHARON SPRINGS				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
2,000.0	2,000.0	0.0	0.0	KOP #1	
6,405.3	6,397.1	171.7	161.0	KOP #2	
7,611.9	7,161.0	171.7	-609.6	End of Build	



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T4N-R67W

Sunmarke 28V-HZ Pad Sec.28-T4N-R67W

Sunmarke 28V-304

Wellbore #1

Plan #1 (11-18-13)

Anticollision Report

21 November, 2013



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (11-18-13)
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	Stations
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 1,000.0ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program		Date	11/21/2013		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	11,619.7	Plan #1 (11-18-13) (Wellbore #1)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Existing wells - Sec.28-T4N-R67W						
McCarty 28-1 (Exist) - Wellbore #1 - Wellbore #1	11,449.6	7,194.5	644.9	375.0	2.390	CC, ES
McCarty 28-1 (Exist) - Wellbore #1 - Wellbore #1	11,500.0	7,194.0	646.8	375.6	2.385	SF
McCarty 28-2 (Exist) - Wellbore #1 - Wellbore #1	2,000.0	1,996.0	579.8	535.5	13.087	CC
McCarty 28-2 (Exist) - Wellbore #1 - Wellbore #1	7,400.0	7,129.6	605.4	443.0	3.728	ES
McCarty 28-2 (Exist) - Wellbore #1 - Wellbore #1	7,450.0	7,141.3	608.5	445.1	3.723	SF
McCarty 28-4 (Exist) - Wellbore #1 - Wellbore #1	10,124.4	7,188.0	626.8	393.9	2.691	CC, ES
McCarty 28-4 (Exist) - Wellbore #1 - Wellbore #1	10,200.0	7,187.4	631.4	396.4	2.687	SF
McCarty 28-7 (Exist) - Wellbore #1 - Wellbore #1	8,570.3	7,157.6	412.1	221.9	2.167	CC, ES
McCarty 28-7 (Exist) - Wellbore #1 - Wellbore #1	8,600.0	7,157.4	413.1	222.2	2.164	SF
Sunmarke 28V-HZ Pad Sec.28-T4N-R67W						
Sunmarke 28V-234 - Wellbore #1 - Plan #1 (11-18-13)	966.3	967.3	61.9	57.8	15.026	CC
Sunmarke 28V-234 - Wellbore #1 - Plan #1 (11-18-13)	1,000.0	1,001.0	61.9	57.7	14.495	ES
Sunmarke 28V-234 - Wellbore #1 - Plan #1 (11-18-13)	11,619.7	11,513.7	532.9	274.1	2.059	SF
Sunmarke 28V-434 - Wellbore #1 - Plan #1 (11-18-13)	1,500.0	1,500.0	29.1	22.6	4.471	CC, ES
Sunmarke 28V-434 - Wellbore #1 - Plan #1 (11-18-13)	11,619.7	11,718.1	303.4	71.8	1.310	Level 3, SF
Sunmarke 28W-414 - Wellbore #1 - Plan #1 (11-18-13)	566.0	568.0	91.1	88.7	39.187	CC
Sunmarke 28W-414 - Wellbore #1 - Plan #1 (11-18-13)	600.0	601.9	91.1	88.6	36.778	ES
Sunmarke 28W-414 - Wellbore #1 - Plan #1 (11-18-13)	11,619.7	11,741.3	826.8	570.0	3.221	SF

Offset Design	Existing wells - Sec.28-T4N-R67W - McCarty 28-1 (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:	0.0ft
Survey Program:	7600-UNKNOWN											Offset Well Error:	0.0ft
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	
10,700.0	7,134.0	7,201.0	7,201.0	105.1	144.0	-90.58	-473.2	-4,447.1	988.8	739.7	249.12	3.969	
10,800.0	7,133.2	7,200.2	7,200.2	107.9	144.0	-90.50	-473.2	-4,447.1	915.3	663.4	251.88	3.634	
10,900.0	7,132.3	7,199.3	7,199.3	110.7	144.0	-90.43	-473.2	-4,447.1	847.3	592.7	254.64	3.327	
11,000.0	7,131.4	7,198.4	7,198.4	113.4	144.0	-90.35	-473.2	-4,447.1	786.1	528.7	257.40	3.054	
11,100.0	7,130.5	7,197.5	7,197.5	116.2	144.0	-90.27	-473.2	-4,447.1	733.5	473.4	260.16	2.820	
11,200.0	7,129.7	7,196.7	7,196.7	119.0	143.9	-90.19	-473.2	-4,447.1	691.5	428.6	262.92	2.630	
11,300.0	7,128.8	7,195.8	7,195.8	121.8	143.9	-90.12	-473.2	-4,447.1	662.0	396.3	265.69	2.492	
11,400.0	7,127.9	7,194.9	7,194.9	124.6	143.9	-90.04	-473.2	-4,447.1	646.8	378.3	268.45	2.409	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design												Existing wells - Sec.28-T4N-R67W - McCarty 28-1 (Exist) - Wellbore #1 - Wellbore #1		Offset Site Error:		0.0 ft	
Survey Program: 7600-UNKNOWN														Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance										
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre +N/-S	Offset Wellbore Centre +E/-W	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)						
11,449.6	7,127.5	7,194.5	7,194.5	125.9	143.9	-90.00	-473.2	-4,447.1	644.9	375.0	269.82	2.390	CC, ES				
11,500.0	7,127.0	7,194.0	7,194.0	127.3	143.9	-89.96	-473.2	-4,447.1	646.8	375.6	271.21	2.385	SF				
11,600.0	7,126.2	7,193.2	7,193.2	130.1	143.9	-89.88	-473.2	-4,447.1	662.2	388.2	273.98	2.417					
11,619.7	7,126.0	7,193.0	7,193.0	130.7	143.9	-89.87	-473.2	-4,447.1	666.9	392.4	274.52	2.429					

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Existing wells - Sec.28-T4N-R67W - McCarty 28-2 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7600-UNKNOWN													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)	Offset Wellbore Centre +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	-138.39	-138.39	-433.5	-385.0	579.8				
100.0	100.0	96.0	96.0	0.1	1.9	-138.39	-138.39	-433.5	-385.0	579.8	577.8	2.03	285.253	
200.0	200.0	196.0	196.0	0.3	3.9	-138.39	-138.39	-433.5	-385.0	579.8	575.5	4.26	136.188	
300.0	300.0	296.0	296.0	0.6	5.9	-138.39	-138.39	-433.5	-385.0	579.8	573.3	6.48	89.446	
400.0	400.0	396.0	396.0	0.8	7.9	-138.39	-138.39	-433.5	-385.0	579.8	571.1	8.71	66.591	
500.0	500.0	496.0	496.0	1.0	9.9	-138.39	-138.39	-433.5	-385.0	579.8	568.9	10.93	53.039	
600.0	600.0	596.0	596.0	1.2	11.9	-138.39	-138.39	-433.5	-385.0	579.8	566.6	13.16	44.070	
700.0	700.0	696.0	696.0	1.5	13.9	-138.39	-138.39	-433.5	-385.0	579.8	564.4	15.38	37.695	
800.0	800.0	796.0	796.0	1.7	15.9	-138.39	-138.39	-433.5	-385.0	579.8	562.2	17.61	32.932	
900.0	900.0	896.0	896.0	1.9	17.9	-138.39	-138.39	-433.5	-385.0	579.8	560.0	19.83	29.238	
1,000.0	1,000.0	996.0	996.0	2.1	19.9	-138.39	-138.39	-433.5	-385.0	579.8	557.7	22.06	26.288	
1,100.0	1,100.0	1,096.0	1,096.0	2.4	21.9	-138.39	-138.39	-433.5	-385.0	579.8	555.5	24.28	23.880	
1,200.0	1,200.0	1,196.0	1,196.0	2.6	23.9	-138.39	-138.39	-433.5	-385.0	579.8	553.3	26.50	21.875	
1,300.0	1,300.0	1,296.0	1,296.0	2.8	25.9	-138.39	-138.39	-433.5	-385.0	579.8	551.1	28.73	20.181	
1,400.0	1,400.0	1,396.0	1,396.0	3.0	27.9	-138.39	-138.39	-433.5	-385.0	579.8	548.8	30.95	18.731	
1,500.0	1,500.0	1,496.0	1,496.0	3.3	29.9	-138.39	-138.39	-433.5	-385.0	579.8	546.6	33.18	17.475	
1,600.0	1,600.0	1,596.0	1,596.0	3.5	31.9	-138.39	-138.39	-433.5	-385.0	579.8	544.4	35.40	16.377	
1,700.0	1,700.0	1,696.0	1,696.0	3.7	33.9	-138.39	-138.39	-433.5	-385.0	579.8	542.2	37.63	15.408	
1,800.0	1,800.0	1,796.0	1,796.0	3.9	35.9	-138.39	-138.39	-433.5	-385.0	579.8	539.9	39.85	14.548	
1,900.0	1,900.0	1,896.0	1,896.0	4.2	37.9	-138.39	-138.39	-433.5	-385.0	579.8	537.7	42.08	13.779	
2,000.0	2,000.0	1,996.0	1,996.0	4.4	39.9	-138.39	-138.39	-433.5	-385.0	579.8	535.5	44.30	13.087 CC	
2,100.0	2,100.0	2,096.0	2,096.0	4.6	41.9	178.45	178.45	-433.5	-385.0	581.5	535.0	46.50	12.507	
2,204.2	2,204.1	2,200.1	2,200.1	4.8	44.0	178.46	178.46	-433.5	-385.0	587.1	538.4	48.71	12.052	
2,300.0	2,299.6	2,295.6	2,295.6	5.0	45.9	178.48	178.48	-433.5	-385.0	593.9	543.1	50.83	11.685	
2,400.0	2,399.3	2,395.3	2,395.3	5.3	47.9	178.50	178.50	-433.5	-385.0	601.0	548.0	53.03	11.333	
2,500.0	2,499.1	2,495.1	2,495.1	5.5	49.9	178.51	178.51	-433.5	-385.0	608.1	552.9	55.24	11.008	
2,600.0	2,598.8	2,594.8	2,594.8	5.7	51.9	178.53	178.53	-433.5	-385.0	615.3	557.8	57.46	10.708	
2,700.0	2,698.6	2,694.6	2,694.6	6.0	53.9	178.55	178.55	-433.5	-385.0	622.4	562.7	59.67	10.431	
2,800.0	2,798.3	2,794.3	2,794.3	6.2	55.9	178.56	178.56	-433.5	-385.0	629.5	567.6	61.88	10.173	
2,900.0	2,898.1	2,894.1	2,894.1	6.4	57.9	178.58	178.58	-433.5	-385.0	636.6	572.5	64.09	9.933	
3,000.0	2,997.8	2,993.8	2,993.8	6.7	59.9	178.60	178.60	-433.5	-385.0	643.7	577.4	66.31	9.709	
3,100.0	3,097.6	3,093.6	3,093.6	6.9	61.9	178.61	178.61	-433.5	-385.0	650.9	582.3	68.52	9.499	
3,200.0	3,197.3	3,193.3	3,193.3	7.2	63.9	178.63	178.63	-433.5	-385.0	658.0	587.2	70.73	9.302	
3,300.0	3,297.0	3,293.0	3,293.0	7.4	65.9	178.64	178.64	-433.5	-385.0	665.1	592.2	72.95	9.117	
3,400.0	3,396.8	3,392.8	3,392.8	7.6	67.9	178.66	178.66	-433.5	-385.0	672.2	597.1	75.16	8.943	
3,500.0	3,496.5	3,492.5	3,492.5	7.9	69.9	178.67	178.67	-433.5	-385.0	679.3	602.0	77.38	8.779	
3,600.0	3,596.3	3,592.3	3,592.3	8.1	71.8	178.68	178.68	-433.5	-385.0	686.5	606.9	79.60	8.624	
3,700.0	3,696.0	3,692.0	3,692.0	8.4	73.8	178.70	178.70	-433.5	-385.0	693.6	611.8	81.81	8.478	
3,800.0	3,795.8	3,791.8	3,791.8	8.6	75.8	178.71	178.71	-433.5	-385.0	700.7	616.7	84.03	8.339	
3,900.0	3,895.5	3,891.5	3,891.5	8.9	77.8	178.72	178.72	-433.5	-385.0	707.8	621.6	86.24	8.207	
4,000.0	3,995.3	3,991.3	3,991.3	9.1	79.8	178.74	178.74	-433.5	-385.0	715.0	626.5	88.46	8.082	
4,100.0	4,095.0	4,091.0	4,091.0	9.4	81.8	178.75	178.75	-433.5	-385.0	722.1	631.4	90.68	7.963	
4,200.0	4,194.8	4,190.8	4,190.8	9.6	83.8	178.76	178.76	-433.5	-385.0	729.2	636.3	92.89	7.850	
4,300.0	4,294.5	4,290.5	4,290.5	9.9	85.8	178.77	178.77	-433.5	-385.0	736.3	641.2	95.11	7.742	
4,400.0	4,394.2	4,390.2	4,390.2	10.1	87.8	178.78	178.78	-433.5	-385.0	743.4	646.1	97.33	7.638	
4,500.0	4,494.0	4,490.0	4,490.0	10.4	89.8	178.80	178.80	-433.5	-385.0	750.6	651.0	99.55	7.540	
4,600.0	4,593.7	4,589.7	4,589.7	10.6	91.8	178.81	178.81	-433.5	-385.0	757.7	655.9	101.76	7.446	
4,700.0	4,693.5	4,689.5	4,689.5	10.9	93.8	178.82	178.82	-433.5	-385.0	764.8	660.8	103.98	7.355	
4,800.0	4,793.2	4,789.2	4,789.2	11.1	95.8	178.83	178.83	-433.5	-385.0	771.9	665.7	106.20	7.269	
4,900.0	4,893.0	4,889.0	4,889.0	11.4	97.8	178.84	178.84	-433.5	-385.0	779.0	670.6	108.42	7.186	
5,000.0	4,992.7	4,988.7	4,988.7	11.6	99.8	178.85	178.85	-433.5	-385.0	786.2	675.5	110.63	7.106	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Existing wells - Sec.28-T4N-R67W - McCarty 28-2 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 7600-UNKNOWN												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance							
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	Warning
5,100.0	5,092.5	5,088.5	5,088.5	11.9	101.8	178.86	-433.5	-385.0	793.3	680.4	112.85	7.029	
5,200.0	5,192.2	5,188.2	5,188.2	12.1	103.8	178.87	-433.5	-385.0	800.4	685.3	115.07	6.956	
5,304.0	5,295.9	5,291.9	5,291.9	12.4	105.8	178.88	-433.5	-385.0	807.8	690.4	117.38	6.882	
5,400.0	5,391.8	5,387.8	5,387.8	12.6	107.8	178.89	-433.5	-385.0	813.0	693.4	119.68	6.793	
5,508.2	5,500.0	5,496.0	5,496.0	12.8	109.9	-137.94	-433.5	-385.0	815.1	692.4	122.70	6.643	
5,600.0	5,591.8	5,587.8	5,587.8	13.0	111.8	-137.94	-433.5	-385.0	815.1	690.4	124.71	6.536	
5,700.0	5,691.8	5,687.8	5,687.8	13.2	113.8	-137.94	-433.5	-385.0	815.1	688.2	126.92	6.422	
5,800.0	5,791.8	5,787.8	5,787.8	13.4	115.8	-137.94	-433.5	-385.0	815.1	686.0	129.13	6.312	
5,900.0	5,891.8	5,887.8	5,887.8	13.6	117.8	-137.94	-433.5	-385.0	815.1	683.8	131.34	6.206	
6,000.0	5,991.8	5,987.8	5,987.8	13.8	119.8	-137.94	-433.5	-385.0	815.1	681.5	133.55	6.103	
6,100.0	6,091.8	6,087.8	6,087.8	14.0	121.8	-137.94	-433.5	-385.0	815.1	679.3	135.76	6.004	
6,200.0	6,191.8	6,187.8	6,187.8	14.2	123.8	-137.94	-433.5	-385.0	815.1	677.1	137.97	5.908	
6,300.0	6,291.8	6,287.8	6,287.8	14.4	125.8	-137.94	-433.5	-385.0	815.1	674.9	140.18	5.815	
6,405.3	6,397.1	6,393.1	6,393.1	14.7	127.9	-137.94	-433.5	-385.0	815.1	672.6	142.51	5.719	
6,450.0	6,441.8	6,437.8	6,437.8	14.7	128.8	-48.06	-433.5	-385.0	814.2	671.4	142.86	5.700	
6,500.0	6,491.5	6,487.5	6,487.5	14.8	129.8	-48.47	-433.5	-385.0	811.2	667.6	143.56	5.650	
6,550.0	6,540.9	6,536.9	6,536.9	14.9	130.7	-49.18	-433.5	-385.0	806.0	662.0	144.02	5.596	
6,600.0	6,589.7	6,585.7	6,585.7	15.0	131.7	-50.19	-433.5	-385.0	798.8	654.5	144.28	5.536	
6,650.0	6,637.6	6,633.6	6,633.6	15.0	132.7	-51.50	-433.5	-385.0	789.6	645.2	144.40	5.468	
6,700.0	6,684.5	6,680.5	6,680.5	15.1	133.6	-53.13	-433.5	-385.0	778.6	634.1	144.48	5.389	
6,750.0	6,730.2	6,726.2	6,726.2	15.1	134.5	-55.08	-433.5	-385.0	766.0	621.4	144.61	5.297	
6,800.0	6,774.5	6,770.5	6,770.5	15.2	135.4	-57.33	-433.5	-385.0	751.9	607.0	144.91	5.189	
6,850.0	6,817.1	6,813.1	6,813.1	15.2	136.3	-59.89	-433.5	-385.0	736.7	591.3	145.48	5.064	
6,900.0	6,857.9	6,853.9	6,853.9	15.3	137.1	-62.72	-433.5	-385.0	720.7	574.3	146.39	4.923	
6,950.0	6,896.8	6,892.8	6,892.8	15.4	137.9	-65.78	-433.5	-385.0	704.1	556.4	147.67	4.768	
7,000.0	6,933.5	6,929.5	6,929.5	15.7	138.6	-69.02	-433.5	-385.0	687.4	538.1	149.29	4.604	
7,050.0	6,967.9	6,963.9	6,963.9	15.9	139.3	-72.35	-433.5	-385.0	671.0	519.8	151.17	4.438	
7,100.0	6,999.9	6,995.9	6,995.9	16.3	139.9	-75.69	-433.5	-385.0	655.3	502.1	153.18	4.278	
7,150.0	7,029.3	7,025.3	7,025.3	16.7	140.5	-78.93	-433.5	-385.0	640.9	485.7	155.17	4.130	
7,200.0	7,056.0	7,052.0	7,052.0	17.2	141.0	-81.98	-433.5	-385.0	628.2	471.2	157.02	4.001	
7,250.0	7,079.9	7,075.9	7,075.9	17.7	141.5	-84.72	-433.5	-385.0	617.9	459.2	158.66	3.894	
7,300.0	7,100.8	7,096.8	7,096.8	18.4	141.9	-87.08	-433.5	-385.0	610.4	450.3	160.07	3.813	
7,350.0	7,118.7	7,114.7	7,114.7	19.1	142.3	-88.99	-433.5	-385.0	606.1	444.8	161.30	3.757	
7,384.3	7,129.3	7,125.3	7,125.3	19.6	142.5	-90.00	-433.5	-385.0	605.2	443.1	162.07	3.734	
7,400.0	7,133.6	7,129.6	7,129.6	19.9	142.6	-90.38	-433.5	-385.0	605.4	443.0	162.40	3.728 ES	
7,450.0	7,145.3	7,141.3	7,141.3	20.7	142.8	-91.22	-433.5	-385.0	608.5	445.1	163.45	3.723 SF	
7,500.0	7,153.8	7,149.8	7,149.8	21.6	143.0	-91.47	-433.5	-385.0	615.6	451.1	164.51	3.742	
7,550.0	7,159.0	7,155.0	7,155.0	22.6	143.1	-91.11	-433.5	-385.0	626.7	461.1	165.58	3.785	
7,600.0	7,161.0	7,157.0	7,157.0	23.5	143.1	-90.14	-433.5	-385.0	641.5	474.8	166.64	3.849	
7,611.9	7,161.0	7,157.0	7,157.0	23.8	143.1	-89.81	-433.5	-385.0	645.5	478.6	166.87	3.868	
7,700.0	7,160.2	7,156.2	7,156.2	25.6	143.1	-89.74	-433.5	-385.0	681.2	512.5	168.70	4.038	
7,800.0	7,159.3	7,155.3	7,155.3	27.8	143.1	-89.66	-433.5	-385.0	732.5	561.6	170.89	4.286	
7,900.0	7,158.5	7,154.5	7,154.5	30.1	143.1	-89.58	-433.5	-385.0	793.1	619.9	173.18	4.580	
8,000.0	7,157.6	7,153.6	7,153.6	32.5	143.1	-89.49	-433.5	-385.0	861.1	685.6	175.55	4.905	
8,100.0	7,156.7	7,152.7	7,152.7	35.0	143.1	-89.41	-433.5	-385.0	934.9	756.9	177.98	5.253	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Existing wells - Sec.28-T4N-R67W - McCarty 28-4 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 7600-UNKNOWN													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		
9,400.0	7,145.4	7,194.4	7,194.4	69.3	143.9	-90.58	-455.2	-3,121.9	957.9	744.7	213.19	4.493		
9,500.0	7,144.5	7,193.5	7,193.5	72.1	143.9	-90.50	-455.2	-3,121.9	884.7	668.8	215.90	4.098		
9,600.0	7,143.6	7,192.6	7,192.6	74.8	143.9	-90.42	-455.2	-3,121.9	817.2	598.6	218.62	3.738		
9,700.0	7,142.8	7,191.8	7,191.8	77.5	143.8	-90.34	-455.2	-3,121.9	757.0	535.6	221.35	3.420		
9,800.0	7,141.9	7,190.9	7,190.9	80.3	143.8	-90.26	-455.2	-3,121.9	705.8	481.7	224.08	3.150		
9,900.0	7,141.0	7,190.0	7,190.0	83.0	143.8	-90.18	-455.2	-3,121.9	665.8	439.0	226.81	2.935		
10,000.0	7,140.1	7,189.1	7,189.1	85.8	143.8	-90.10	-455.2	-3,121.9	639.1	409.5	229.54	2.784		
10,100.0	7,139.3	7,188.3	7,188.3	88.5	143.8	-90.02	-455.2	-3,121.9	627.3	395.0	232.28	2.701		
10,124.4	7,139.0	7,188.0	7,188.0	89.2	143.8	-90.00	-455.2	-3,121.9	626.8	393.9	232.95	2.691 CC, ES		
10,200.0	7,138.4	7,187.4	7,187.4	91.3	143.7	-89.94	-455.2	-3,121.9	631.4	396.4	235.02	2.687 SF		
10,300.0	7,137.5	7,186.5	7,186.5	94.1	143.7	-89.86	-455.2	-3,121.9	651.0	413.2	237.77	2.738		
10,400.0	7,136.6	7,185.6	7,185.6	96.8	143.7	-89.78	-455.2	-3,121.9	684.8	444.3	240.51	2.847		
10,500.0	7,135.8	7,184.8	7,184.8	99.6	143.7	-89.70	-455.2	-3,121.9	730.8	487.5	243.26	3.004		
10,600.0	7,134.9	7,183.9	7,183.9	102.4	143.7	-89.62	-455.2	-3,121.9	786.9	540.9	246.01	3.199		
10,700.0	7,134.0	7,183.0	7,183.0	105.1	143.7	-89.54	-455.2	-3,121.9	851.0	602.3	248.76	3.421		
10,800.0	7,133.2	7,182.2	7,182.2	107.9	143.6	-89.46	-455.2	-3,121.9	921.6	670.1	251.51	3.664		
10,900.0	7,132.3	7,181.3	7,181.3	110.7	143.6	-89.38	-455.2	-3,121.9	997.3	743.0	254.26	3.922		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design		Existing wells - Sec.28-T4N-R67W - McCarty 28-7 (Exist) - Wellbore #1 - Wellbore #1										Offset Site Error:	0.0 ft	
Survey Program: 7600-UNKNOWN													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)			
7,700.0	7,160.2	7,165.2	7,165.2	25.6	143.3	-91.06	-240.4	-1,567.9	962.9	794.0	168.87	5.702		
7,800.0	7,159.3	7,164.3	7,164.3	27.8	143.3	-90.93	-240.4	-1,567.9	873.6	702.5	171.06	5.107		
7,900.0	7,158.5	7,163.5	7,163.5	30.1	143.3	-90.81	-240.4	-1,567.9	786.8	613.4	173.36	4.538		
8,000.0	7,157.6	7,162.6	7,162.6	32.5	143.3	-90.69	-240.4	-1,567.9	703.6	527.8	175.74	4.003		
8,100.0	7,156.7	7,161.7	7,161.7	35.0	143.2	-90.57	-240.4	-1,567.9	625.3	447.1	178.17	3.509		
8,200.0	7,155.8	7,160.8	7,160.8	37.5	143.2	-90.45	-240.4	-1,567.9	554.0	373.3	180.66	3.066		
8,300.0	7,155.0	7,160.0	7,160.0	40.0	143.2	-90.33	-240.4	-1,567.9	492.8	309.6	183.19	2.690		
8,400.0	7,154.1	7,159.1	7,159.1	42.6	143.2	-90.21	-240.4	-1,567.9	445.9	260.1	185.74	2.400		
8,500.0	7,153.2	7,158.2	7,158.2	45.2	143.2	-90.09	-240.4	-1,567.9	418.0	229.7	188.33	2.220		
8,570.3	7,152.6	7,157.6	7,157.6	47.0	143.2	-90.00	-240.4	-1,567.9	412.1	221.9	190.16	2.167 CC, ES		
8,600.0	7,152.4	7,157.4	7,157.4	47.8	143.1	-89.96	-240.4	-1,567.9	413.1	222.2	190.94	2.164 SF		
8,700.0	7,151.5	7,156.5	7,156.5	50.5	143.1	-89.84	-240.4	-1,567.9	432.0	238.4	193.56	2.232		
8,800.0	7,150.6	7,155.6	7,155.6	53.1	143.1	-89.72	-240.4	-1,567.9	471.8	275.5	196.20	2.404		
8,900.0	7,149.7	7,154.7	7,154.7	55.8	143.1	-89.60	-240.4	-1,567.9	527.7	328.9	198.86	2.654		
9,000.0	7,148.9	7,153.9	7,153.9	58.5	143.1	-89.48	-240.4	-1,567.9	595.3	393.8	201.52	2.954		
9,100.0	7,148.0	7,153.0	7,153.0	61.2	143.1	-89.36	-240.4	-1,567.9	671.1	466.9	204.20	3.286		
9,200.0	7,147.1	7,152.1	7,152.1	63.9	143.0	-89.24	-240.4	-1,567.9	752.5	545.6	206.88	3.637		
9,300.0	7,146.2	7,151.2	7,151.2	66.6	143.0	-89.11	-240.4	-1,567.9	838.0	628.4	209.58	3.998		
9,400.0	7,145.4	7,150.4	7,150.4	69.3	143.0	-88.99	-240.4	-1,567.9	926.4	714.1	212.27	4.364		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-234 - 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	1.0	1.0	0.0	0.0	180.00	180.00	-61.9	0.0	61.9	61.9	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	180.00	180.00	-61.9	0.0	61.9	61.7	0.23	272.793	
200.0	200.0	201.0	201.0	0.3	0.3	180.00	180.00	-61.9	0.0	61.9	61.3	0.68	91.535	
300.0	300.0	301.0	301.0	0.6	0.6	180.00	180.00	-61.9	0.0	61.9	60.8	1.13	54.994	
400.0	400.0	401.0	401.0	0.8	0.8	180.00	180.00	-61.9	0.0	61.9	60.4	1.58	39.304	
500.0	500.0	501.0	501.0	1.0	1.0	180.00	180.00	-61.9	0.0	61.9	59.9	2.03	30.579	
600.0	600.0	601.0	601.0	1.2	1.2	180.00	180.00	-61.9	0.0	61.9	59.5	2.47	25.025	
700.0	700.0	701.0	701.0	1.5	1.5	180.00	180.00	-61.9	0.0	61.9	59.0	2.92	21.178	
800.0	800.0	801.0	801.0	1.7	1.7	180.00	180.00	-61.9	0.0	61.9	58.6	3.37	18.356	
900.0	900.0	901.0	901.0	1.9	1.9	180.00	180.00	-61.9	0.0	61.9	58.1	3.82	16.198	
966.3	966.3	967.3	967.3	2.1	2.1	180.00	180.00	-61.9	0.0	61.9	57.8	4.12	15.026 CC	
1,000.0	1,000.0	1,001.0	1,001.0	2.1	2.1	180.00	180.00	-61.9	0.0	61.9	57.7	4.27	14.495 ES	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.3	179.24	179.24	-63.5	0.8	63.5	58.8	4.69	13.523	
1,200.0	1,200.0	1,196.9	1,196.8	2.6	2.5	177.26	177.26	-67.9	3.2	68.1	63.0	5.09	13.364	
1,300.0	1,300.0	1,295.3	1,294.8	2.8	2.7	174.55	174.55	-75.0	7.2	75.6	70.1	5.51	13.738	
1,400.0	1,400.0	1,394.9	1,394.0	3.0	2.9	172.14	172.14	-82.8	11.4	83.9	78.0	5.92	14.170	
1,500.0	1,500.0	1,494.5	1,493.2	3.3	3.1	170.18	170.18	-90.7	15.7	92.3	86.0	6.35	14.546	
1,600.0	1,600.0	1,594.1	1,592.4	3.5	3.4	168.54	168.54	-98.5	20.0	100.8	94.1	6.78	14.874	
1,700.0	1,700.0	1,693.7	1,691.6	3.7	3.6	167.16	167.16	-106.3	24.2	109.4	102.2	7.22	15.158	
1,800.0	1,800.0	1,793.3	1,790.8	3.9	3.8	165.98	165.98	-114.1	28.5	118.0	110.4	7.66	15.407	
1,900.0	1,900.0	1,892.9	1,890.0	4.2	4.1	164.95	164.95	-121.9	32.8	126.7	118.6	8.11	15.626	
2,000.0	2,000.0	1,992.5	1,989.2	4.4	4.3	164.07	164.07	-129.7	37.0	135.4	126.8	8.56	15.818	
2,100.0	2,100.0	2,092.0	2,088.3	4.6	4.6	120.55	120.55	-137.5	41.3	145.0	136.0	8.95	16.197	
2,204.2	2,204.1	2,195.5	2,191.4	4.8	4.9	121.36	121.36	-145.6	45.7	156.9	147.5	9.40	16.687	
2,300.0	2,299.6	2,290.5	2,286.0	5.0	5.1	122.66	122.66	-153.1	49.8	168.8	159.0	9.83	17.176	
2,400.0	2,399.3	2,389.6	2,384.8	5.3	5.4	123.84	123.84	-160.8	54.0	181.4	171.1	10.28	17.645	
2,500.0	2,499.1	2,488.8	2,483.5	5.5	5.7	124.87	124.87	-168.6	58.3	193.9	183.2	10.73	18.074	
2,600.0	2,598.8	2,587.9	2,582.3	5.7	5.9	125.77	125.77	-176.4	62.5	206.6	195.4	11.19	18.467	
2,700.0	2,698.6	2,687.1	2,681.0	6.0	6.2	126.57	126.57	-184.1	66.8	219.3	207.6	11.64	18.829	
2,800.0	2,798.3	2,786.2	2,779.8	6.2	6.5	127.28	127.28	-191.9	71.0	232.0	219.9	12.11	19.163	
2,900.0	2,898.1	2,885.4	2,878.5	6.4	6.7	127.91	127.91	-199.7	75.3	244.7	232.2	12.57	19.471	
3,000.0	2,997.8	2,984.5	2,977.3	6.7	7.0	128.48	128.48	-207.5	79.5	257.5	244.5	13.03	19.757	
3,100.0	3,097.6	3,083.7	3,076.0	6.9	7.3	129.00	129.00	-215.2	83.8	270.3	256.8	13.50	20.022	
3,200.0	3,197.3	3,182.8	3,174.8	7.2	7.6	129.48	129.48	-223.0	88.0	283.2	269.2	13.97	20.268	
3,300.0	3,297.0	3,282.0	3,273.5	7.4	7.8	129.91	129.91	-230.8	92.3	296.0	281.6	14.44	20.498	
3,400.0	3,396.8	3,381.1	3,372.3	7.6	8.1	130.30	130.30	-238.6	96.5	308.8	293.9	14.91	20.713	
3,500.0	3,496.5	3,480.3	3,471.0	7.9	8.4	130.67	130.67	-246.3	100.8	321.7	306.3	15.38	20.914	
3,600.0	3,596.3	3,579.4	3,569.8	8.1	8.7	131.00	131.00	-254.1	105.0	334.6	318.7	15.86	21.102	
3,700.0	3,696.0	3,678.6	3,668.5	8.4	8.9	131.31	131.31	-261.9	109.3	347.5	331.2	16.33	21.279	
3,800.0	3,795.8	3,777.7	3,767.3	8.6	9.2	131.60	131.60	-269.6	113.5	360.4	343.6	16.80	21.446	
3,900.0	3,895.5	3,876.9	3,866.0	8.9	9.5	131.87	131.87	-277.4	117.7	373.3	356.0	17.28	21.603	
4,000.0	3,995.3	3,976.0	3,964.8	9.1	9.8	132.12	132.12	-285.2	122.0	386.2	368.5	17.76	21.751	
4,100.0	4,095.0	4,075.2	4,063.5	9.4	10.0	132.35	132.35	-293.0	126.2	399.1	380.9	18.23	21.891	
4,200.0	4,194.8	4,174.3	4,162.3	9.6	10.3	132.57	132.57	-300.7	130.5	412.1	393.4	18.71	22.023	
4,300.0	4,294.5	4,273.4	4,261.0	9.9	10.6	132.78	132.78	-308.5	134.7	425.0	405.8	19.19	22.149	
4,400.0	4,394.2	4,372.6	4,359.8	10.1	10.9	132.97	132.97	-316.3	139.0	437.9	418.3	19.67	22.268	
4,500.0	4,494.0	4,471.7	4,458.5	10.4	11.2	133.16	133.16	-324.1	143.2	450.9	430.7	20.15	22.381	
4,600.0	4,593.7	4,570.9	4,557.3	10.6	11.4	133.33	133.33	-331.8	147.5	463.8	443.2	20.63	22.488	
4,700.0	4,693.5	4,670.0	4,656.1	10.9	11.7	133.49	133.49	-339.6	151.7	476.8	455.7	21.11	22.591	
4,800.0	4,793.2	4,771.2	4,756.8	11.1	12.0	133.65	133.65	-347.5	156.0	489.7	468.1	21.59	22.686	
4,900.0	4,893.0	4,888.9	4,874.2	11.4	12.2	133.97	133.97	-354.2	159.7	500.5	478.4	22.07	22.680	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-234 - 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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,992.7	5,007.2	4,992.5	11.6	12.4	134.52		-356.6	161.0	507.5	485.0	22.53	22.522	
5,100.0	5,092.5	5,108.2	5,093.5	11.9	12.6	135.10		-356.6	161.0	512.6	489.6	22.98	22.306	
5,200.0	5,192.2	5,207.9	5,193.2	12.1	12.8	135.65		-356.6	161.0	517.6	494.2	23.41	22.111	
5,304.0	5,295.9	5,311.6	5,296.9	12.4	13.0	136.22		-356.6	161.0	523.0	499.1	23.86	21.916	
5,400.0	5,391.8	5,407.5	5,392.8	12.6	13.1	136.66		-356.6	161.0	526.8	502.5	24.27	21.703	
5,508.2	5,500.0	5,515.7	5,501.0	12.8	13.3	-180.00		-356.6	161.0	528.2	502.8	25.44	20.767	
5,600.0	5,591.8	5,607.5	5,592.8	13.0	13.5	-180.00		-356.6	161.0	528.2	502.5	25.77	20.497	
5,700.0	5,691.8	5,707.5	5,692.8	13.2	13.6	-180.00		-356.6	161.0	528.2	502.1	26.16	20.192	
5,800.0	5,791.8	5,807.5	5,792.8	13.4	13.8	-180.00		-356.6	161.0	528.2	501.7	26.55	19.896	
5,900.0	5,891.8	5,907.5	5,892.8	13.6	14.0	-180.00		-356.6	161.0	528.2	501.3	26.94	19.606	
6,000.0	5,991.8	6,007.5	5,992.8	13.8	14.2	-180.00		-356.6	161.0	528.2	500.9	27.34	19.324	
6,100.0	6,091.8	6,107.5	6,092.8	14.0	14.3	-180.00		-356.6	161.0	528.2	500.5	27.73	19.048	
6,200.0	6,191.8	6,207.5	6,192.8	14.2	14.5	-180.00		-356.6	161.0	528.2	500.1	28.13	18.779	
6,300.0	6,291.8	6,307.5	6,292.8	14.4	14.7	-180.00		-356.6	161.0	528.2	499.7	28.53	18.517	
6,329.4	6,321.2	6,336.8	6,322.2	14.5	14.7	-179.94		-356.6	160.4	528.2	499.6	28.64	18.442	
6,405.3	6,397.1	6,412.1	6,397.1	14.7	14.9	-179.23		-356.6	153.9	528.3	499.4	28.94	18.258	
6,450.0	6,441.8	6,455.8	6,440.2	14.7	14.9	-88.58		-356.6	146.7	528.4	500.0	28.45	18.571	
6,500.0	6,491.5	6,504.3	6,487.5	14.8	15.0	-87.86		-356.6	135.8	528.6	500.0	28.60	18.482	
6,550.0	6,540.9	6,552.4	6,533.6	14.9	15.0	-87.15		-356.6	122.2	528.9	500.2	28.74	18.406	
6,600.0	6,589.7	6,600.0	6,578.2	15.0	15.1	-86.46		-356.6	105.8	529.3	500.4	28.86	18.338	
6,650.0	6,637.6	6,647.5	6,621.7	15.0	15.1	-85.78		-356.6	86.7	529.7	500.7	28.99	18.273	
6,700.0	6,684.5	6,694.5	6,663.5	15.1	15.2	-85.13		-356.6	65.2	530.2	501.1	29.12	18.206	
6,750.0	6,730.2	6,741.2	6,703.6	15.1	15.2	-84.49		-356.6	41.3	530.7	501.5	29.27	18.131	
6,800.0	6,774.5	6,787.6	6,742.0	15.2	15.2	-83.88		-356.6	15.2	531.3	501.9	29.45	18.039	
6,850.0	6,817.1	6,833.7	6,778.4	15.2	15.3	-83.30		-356.6	-13.0	531.9	502.2	29.68	17.924	
6,900.0	6,857.9	6,879.5	6,812.9	15.3	15.3	-82.75		-356.6	-43.2	532.5	502.6	29.96	17.776	
6,950.0	6,896.8	6,925.1	6,845.4	15.4	15.4	-82.22		-356.6	-75.2	533.2	502.9	30.31	17.589	
7,000.0	6,933.5	6,970.5	6,875.7	15.7	15.4	-81.73		-356.6	-108.9	533.8	503.1	30.76	17.355	
7,050.0	6,967.9	7,015.6	6,903.9	15.9	15.6	-81.27		-356.6	-144.1	534.5	503.2	31.31	17.073	
7,100.0	6,999.9	7,060.5	6,929.8	16.3	16.0	-80.85		-356.6	-180.8	535.1	503.1	31.97	16.739	
7,150.0	7,029.3	7,105.3	6,953.4	16.7	16.5	-80.47		-356.6	-218.9	535.7	502.9	32.76	16.354	
7,200.0	7,056.0	7,150.0	6,974.8	17.2	17.0	-80.12		-356.6	-258.1	536.2	502.6	33.68	15.922	
7,250.0	7,079.9	7,194.4	6,993.6	17.7	17.5	-79.80		-356.6	-298.3	536.7	502.0	34.74	15.449	
7,300.0	7,100.8	7,238.7	7,010.1	18.4	18.2	-79.53		-356.6	-339.4	537.2	501.3	35.95	14.944	
7,350.0	7,118.7	7,282.9	7,024.2	19.1	18.9	-79.30		-356.6	-381.4	537.6	500.3	37.28	14.419	
7,400.0	7,133.6	7,327.1	7,035.7	19.9	19.6	-79.11		-356.6	-424.0	537.9	499.2	38.75	13.883	
7,450.0	7,145.3	7,371.1	7,044.8	20.7	20.4	-78.96		-356.6	-467.1	538.2	497.9	40.33	13.347	
7,500.0	7,153.8	7,415.2	7,051.4	21.6	21.2	-78.85		-356.6	-510.6	538.4	496.4	42.01	12.817	
7,550.0	7,159.0	7,459.1	7,055.5	22.6	22.1	-78.78		-356.6	-554.4	538.5	494.8	43.78	12.301	
7,600.0	7,161.0	7,503.1	7,057.0	23.5	23.0	-78.76		-356.6	-598.3	538.6	493.0	45.63	11.804	
7,611.9	7,161.0	7,514.4	7,057.0	23.8	23.2	-78.76		-356.6	-609.6	538.6	492.5	46.10	11.683	
7,700.0	7,160.2	7,602.5	7,057.0	25.6	25.1	-78.84		-356.6	-697.7	538.4	488.7	49.77	10.819	
7,800.0	7,159.3	7,702.5	7,057.0	27.8	27.4	-78.93		-356.6	-797.7	538.3	484.1	54.17	9.937	
7,900.0	7,158.5	7,802.5	7,057.0	30.1	29.7	-79.02		-356.6	-897.7	538.1	479.3	58.76	9.158	
8,000.0	7,157.6	7,902.4	7,057.0	32.5	32.1	-79.11		-356.6	-997.7	537.9	474.4	63.50	8.471	
8,100.0	7,156.7	8,002.4	7,057.0	35.0	34.6	-79.21		-356.6	-1,097.6	537.8	469.4	68.37	7.866	
8,200.0	7,155.8	8,102.4	7,057.0	37.5	37.1	-79.30		-356.6	-1,197.6	537.6	464.3	73.33	7.331	
8,300.0	7,155.0	8,202.4	7,057.0	40.0	39.7	-79.39		-356.6	-1,297.6	537.4	459.1	78.37	6.858	
8,400.0	7,154.1	8,302.4	7,057.0	42.6	42.3	-79.48		-356.6	-1,397.6	537.3	453.8	83.48	6.436	
8,500.0	7,153.2	8,402.4	7,057.0	45.2	44.9	-79.57		-356.6	-1,497.6	537.1	448.5	88.64	6.060	
8,600.0	7,152.4	8,502.4	7,057.0	47.8	47.5	-79.66		-356.6	-1,597.6	537.0	443.1	93.85	5.722	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design		Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-234 - 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							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
8,700.0	7,151.5	8,602.4	7,057.0	50.5	50.2	-79.75	-356.6	-1,697.6	536.8	437.7	99.10	5.417		
8,800.0	7,150.6	8,702.4	7,057.0	53.1	52.9	-79.85	-356.6	-1,797.6	536.6	432.3	104.38	5.141		
8,900.0	7,149.7	8,802.4	7,057.0	55.8	55.6	-79.94	-356.6	-1,897.6	536.5	426.8	109.69	4.891		
9,000.0	7,148.9	8,902.4	7,057.0	58.5	58.3	-80.03	-356.6	-1,997.6	536.3	421.3	115.03	4.663		
9,100.0	7,148.0	9,002.4	7,057.0	61.2	61.0	-80.12	-356.6	-2,097.6	536.2	415.8	120.39	4.454		
9,200.0	7,147.1	9,102.4	7,057.0	63.9	63.7	-80.21	-356.6	-2,197.6	536.0	410.3	125.77	4.262		
9,300.0	7,146.2	9,202.4	7,057.0	66.6	66.4	-80.31	-356.6	-2,297.6	535.9	404.7	131.17	4.086		
9,400.0	7,145.4	9,302.4	7,057.0	69.3	69.1	-80.40	-356.6	-2,397.6	535.8	399.2	136.58	3.923		
9,500.0	7,144.5	9,402.4	7,057.0	72.1	71.9	-80.49	-356.6	-2,497.6	535.6	393.6	142.01	3.772		
9,600.0	7,143.6	9,502.4	7,057.0	74.8	74.6	-80.58	-356.6	-2,597.6	535.5	388.0	147.45	3.631		
9,700.0	7,142.8	9,602.4	7,057.0	77.5	77.3	-80.67	-356.6	-2,697.6	535.3	382.4	152.91	3.501		
9,800.0	7,141.9	9,702.4	7,057.0	80.3	80.1	-80.77	-356.6	-2,797.6	535.2	376.8	158.37	3.379		
9,900.0	7,141.0	9,802.4	7,057.0	83.0	82.9	-80.86	-356.6	-2,897.6	535.0	371.2	163.85	3.265		
10,000.0	7,140.1	9,902.4	7,057.0	85.8	85.6	-80.95	-356.6	-2,997.6	534.9	365.6	169.33	3.159		
10,100.0	7,139.3	10,002.4	7,057.0	88.5	88.4	-81.04	-356.6	-3,097.6	534.8	359.9	174.83	3.059		
10,200.0	7,138.4	10,102.4	7,057.0	91.3	91.1	-81.14	-356.6	-3,197.6	534.6	354.3	180.33	2.965		
10,300.0	7,137.5	10,202.4	7,057.0	94.1	93.9	-81.23	-356.6	-3,297.6	534.5	348.7	185.84	2.876		
10,400.0	7,136.6	10,302.4	7,057.0	96.8	96.7	-81.32	-356.6	-3,397.6	534.4	343.0	191.35	2.793		
10,500.0	7,135.8	10,402.4	7,057.0	99.6	99.4	-81.41	-356.6	-3,497.6	534.2	337.4	196.87	2.714		
10,600.0	7,134.9	10,502.3	7,057.0	102.4	102.2	-81.51	-356.6	-3,597.6	534.1	331.7	202.40	2.639		
10,700.0	7,134.0	10,602.3	7,057.0	105.1	105.0	-81.60	-356.6	-3,697.5	534.0	326.0	207.93	2.568		
10,800.0	7,133.2	10,702.3	7,057.0	107.9	107.8	-81.69	-356.6	-3,797.5	533.8	320.4	213.47	2.501		
10,900.0	7,132.3	10,802.3	7,057.0	110.7	110.5	-81.78	-356.6	-3,897.5	533.7	314.7	219.02	2.437		
11,000.0	7,131.4	10,902.3	7,057.0	113.4	113.3	-81.88	-356.6	-3,997.5	533.6	309.0	224.57	2.376		
11,100.0	7,130.5	11,002.3	7,057.0	116.2	116.1	-81.97	-356.6	-4,097.5	533.5	303.4	230.12	2.318		
11,200.0	7,129.7	11,102.3	7,057.0	119.0	118.9	-82.06	-356.6	-4,197.5	533.4	297.7	235.68	2.263		
11,300.0	7,128.8	11,202.3	7,057.0	121.8	121.7	-82.15	-356.6	-4,297.5	533.2	292.0	241.24	2.210		
11,400.0	7,127.9	11,302.3	7,057.0	124.6	124.4	-82.25	-356.6	-4,397.5	533.1	286.3	246.81	2.160		
11,500.0	7,127.0	11,402.3	7,057.0	127.3	127.2	-82.34	-356.6	-4,497.5	533.0	280.6	252.38	2.112		
11,600.0	7,126.2	11,502.3	7,057.0	130.1	130.0	-82.43	-356.6	-4,597.5	532.9	274.9	257.95	2.066		
11,612.0	7,126.1	11,513.7	7,057.0	130.5	130.3	-82.44	-356.6	-4,608.9	532.9	274.3	258.61	2.061		
11,619.7	7,126.0	11,513.7	7,057.0	130.7	130.3	-82.44	-356.6	-4,608.9	532.9	274.1	258.82	2.059 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-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)		
0.0	0.0	0.0	0.0	0.0	0.0	-180.00	-29.1	0.0	29.1				
100.0	100.0	100.0	100.0	0.1	0.1	-180.00	-29.1	0.0	29.1	28.9	0.22	129.647	
200.0	200.0	200.0	200.0	0.3	0.3	-180.00	-29.1	0.0	29.1	28.5	0.67	43.216	
300.0	300.0	300.0	300.0	0.6	0.6	-180.00	-29.1	0.0	29.1	28.0	1.12	25.929	
400.0	400.0	400.0	400.0	0.8	0.8	-180.00	-29.1	0.0	29.1	27.6	1.57	18.521	
500.0	500.0	500.0	500.0	1.0	1.0	-180.00	-29.1	0.0	29.1	27.1	2.02	14.405	
600.0	600.0	600.0	600.0	1.2	1.2	-180.00	-29.1	0.0	29.1	26.7	2.47	11.786	
700.0	700.0	700.0	700.0	1.5	1.5	-180.00	-29.1	0.0	29.1	26.2	2.92	9.973	
800.0	800.0	800.0	800.0	1.7	1.7	-180.00	-29.1	0.0	29.1	25.8	3.37	8.643	
900.0	900.0	900.0	900.0	1.9	1.9	-180.00	-29.1	0.0	29.1	25.3	3.82	7.626	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-180.00	-29.1	0.0	29.1	24.9	4.27	6.824	
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	-180.00	-29.1	0.0	29.1	24.4	4.72	6.174	
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	-180.00	-29.1	0.0	29.1	24.0	5.17	5.637	
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	-180.00	-29.1	0.0	29.1	23.5	5.62	5.186	
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	-180.00	-29.1	0.0	29.1	23.1	6.07	4.802	
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.3	-180.00	-29.1	0.0	29.1	22.6	6.52	4.471 CC, ES	
1,600.0	1,600.0	1,599.6	1,599.6	3.5	3.5	176.92	-29.8	1.6	29.8	22.9	6.95	4.294	
1,700.0	1,700.0	1,699.2	1,699.1	3.7	3.7	169.24	-31.6	6.0	32.1	24.8	7.36	4.366	
1,800.0	1,800.0	1,799.1	1,798.8	3.9	3.9	162.15	-33.5	10.8	35.2	27.4	7.78	4.527	
1,900.0	1,900.0	1,899.0	1,898.6	4.2	4.1	156.27	-35.4	15.6	38.7	30.5	8.20	4.725	
2,000.0	2,000.0	1,998.8	1,998.3	4.4	4.3	151.41	-37.4	20.4	42.6	34.0	8.62	4.941	
2,100.0	2,100.0	2,098.7	2,098.0	4.6	4.5	106.19	-39.3	25.2	47.2	38.1	9.06	5.207	
2,204.2	2,204.1	2,202.8	2,201.9	4.8	4.7	108.28	-41.3	30.2	53.1	43.5	9.51	5.581	
2,300.0	2,299.6	2,298.3	2,297.3	5.0	4.9	111.50	-43.2	34.7	59.1	49.2	9.92	5.957	
2,400.0	2,399.3	2,398.0	2,397.0	5.3	5.1	114.23	-45.1	39.5	65.6	55.2	10.36	6.330	
2,500.0	2,499.1	2,497.8	2,496.6	5.5	5.4	116.46	-47.1	44.3	72.2	61.4	10.81	6.681	
2,600.0	2,598.8	2,597.5	2,596.2	5.7	5.6	118.31	-49.0	49.1	78.9	67.7	11.26	7.009	
2,700.0	2,698.6	2,697.3	2,695.8	6.0	5.8	119.87	-50.9	53.9	85.7	74.0	11.71	7.317	
2,800.0	2,798.3	2,797.0	2,795.4	6.2	6.0	121.20	-52.9	58.7	92.5	80.4	12.17	7.604	
2,900.0	2,898.1	2,896.7	2,895.0	6.4	6.3	122.35	-54.8	63.4	99.4	86.8	12.63	7.872	
3,000.0	2,997.8	2,996.5	2,994.6	6.7	6.5	123.35	-56.7	68.2	106.3	93.2	13.09	8.122	
3,100.0	3,097.6	3,096.2	3,094.2	6.9	6.7	124.23	-58.7	73.0	113.2	99.7	13.55	8.357	
3,200.0	3,197.3	3,196.0	3,193.8	7.2	7.0	125.00	-60.6	77.8	120.2	106.2	14.01	8.576	
3,300.0	3,297.0	3,295.7	3,293.5	7.4	7.2	125.69	-62.6	82.6	127.2	112.7	14.48	8.782	
3,400.0	3,396.8	3,395.5	3,393.1	7.6	7.4	126.31	-64.5	87.4	134.2	119.2	14.95	8.976	
3,500.0	3,496.5	3,495.2	3,492.7	7.9	7.7	126.87	-66.4	92.2	141.2	125.8	15.42	9.158	
3,600.0	3,596.3	3,595.0	3,592.3	8.1	7.9	127.37	-68.4	96.9	148.2	132.3	15.88	9.329	
3,700.0	3,696.0	3,694.7	3,691.9	8.4	8.1	127.83	-70.3	101.7	155.2	138.9	16.36	9.490	
3,800.0	3,795.8	3,794.5	3,791.5	8.6	8.4	128.25	-72.2	106.5	162.3	145.4	16.83	9.643	
3,900.0	3,895.5	3,894.2	3,891.1	8.9	8.6	128.64	-74.2	111.3	169.3	152.0	17.30	9.787	
4,000.0	3,995.3	3,993.9	3,990.7	9.1	8.8	128.99	-76.1	116.1	176.4	158.6	17.77	9.923	
4,100.0	4,095.0	4,093.7	4,090.3	9.4	9.1	129.32	-78.0	120.9	183.4	165.2	18.25	10.053	
4,200.0	4,194.8	4,193.4	4,190.0	9.6	9.3	129.62	-80.0	125.7	190.5	171.8	18.72	10.175	
4,300.0	4,294.5	4,293.2	4,289.6	9.9	9.6	129.90	-81.9	130.4	197.6	178.4	19.20	10.292	
4,400.0	4,394.2	4,392.9	4,389.2	10.1	9.8	130.16	-83.8	135.2	204.6	185.0	19.67	10.403	
4,500.0	4,494.0	4,492.7	4,488.8	10.4	10.0	130.41	-85.8	140.0	211.7	191.6	20.15	10.508	
4,600.0	4,593.7	4,592.4	4,588.4	10.6	10.3	130.63	-87.7	144.8	218.8	198.2	20.62	10.609	
4,700.0	4,693.5	4,692.2	4,688.0	10.9	10.5	130.85	-89.7	149.6	225.9	204.8	21.10	10.705	
4,800.0	4,793.2	4,791.9	4,787.6	11.1	10.8	131.05	-91.6	154.4	233.0	211.4	21.58	10.796	
4,900.0	4,893.0	4,891.3	4,888.7	11.4	11.0	131.29	-93.5	159.0	239.9	217.9	22.05	10.882	
5,000.0	4,992.7	4,996.9	4,992.4	11.6	11.2	132.14	-94.3	161.0	245.6	223.1	22.49	10.921	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,092.5	5,096.9	5,092.5	11.9	11.4	133.35		-94.3	161.0	250.5	227.6	22.93	10.924	
5,200.0	5,192.2	5,196.6	5,192.2	12.1	11.6	134.51		-94.3	161.0	255.4	232.1	23.37	10.931	
5,304.0	5,295.9	5,300.4	5,295.9	12.4	11.8	135.67		-94.3	161.0	260.7	236.9	23.82	10.943	
5,400.0	5,391.8	5,396.2	5,391.8	12.6	12.0	136.51		-94.3	161.0	264.5	240.2	24.23	10.916	
5,508.2	5,500.0	5,504.4	5,500.0	12.8	12.2	-180.00		-94.3	161.0	265.9	241.7	24.28	10.953	
5,600.0	5,591.8	5,596.2	5,591.8	13.0	12.4	-180.00		-94.3	161.0	265.9	241.3	24.65	10.791	
5,700.0	5,691.8	5,696.2	5,691.8	13.2	12.6	-180.00		-94.3	161.0	265.9	240.9	25.07	10.610	
5,800.0	5,791.8	5,796.2	5,791.8	13.4	12.8	-180.00		-94.3	161.0	265.9	240.5	25.49	10.435	
5,900.0	5,891.8	5,896.2	5,891.8	13.6	13.0	-180.00		-94.3	161.0	265.9	240.0	25.91	10.265	
6,000.0	5,991.8	5,996.2	5,991.8	13.8	13.2	-180.00		-94.3	161.0	265.9	239.6	26.33	10.100	
6,100.0	6,091.8	6,096.2	6,091.8	14.0	13.4	-180.00		-94.3	161.0	265.9	239.2	26.75	9.940	
6,200.0	6,191.8	6,196.2	6,191.8	14.2	13.6	-180.00		-94.3	161.0	265.9	238.8	27.18	9.785	
6,300.0	6,291.8	6,296.2	6,291.8	14.4	13.8	-180.00		-94.3	161.0	265.9	238.3	27.60	9.634	
6,405.3	6,397.1	6,401.5	6,397.1	14.7	14.0	-180.00		-94.3	161.0	265.9	237.9	28.05	9.480	
6,414.6	6,406.4	6,410.8	6,406.4	14.7	14.0	-90.01		-94.3	161.0	265.9	237.5	28.43	9.354	
6,450.0	6,441.8	6,446.2	6,441.8	14.7	14.1	-90.28		-94.3	161.0	265.9	237.4	28.57	9.308	
6,500.0	6,491.5	6,496.0	6,491.5	14.8	14.2	-91.25		-94.3	161.0	266.0	237.2	28.76	9.249	
6,550.0	6,540.9	6,546.0	6,541.6	14.9	14.3	-92.70		-94.3	160.0	266.2	237.3	28.94	9.201	
6,600.0	6,589.7	6,596.6	6,592.0	15.0	14.4	-94.15		-94.3	155.6	266.7	237.6	29.09	9.167	
6,650.0	6,637.6	6,647.7	6,642.4	15.0	14.5	-95.58		-94.3	147.9	267.2	238.0	29.22	9.145	
6,700.0	6,684.5	6,699.2	6,692.8	15.1	14.5	-96.99		-94.3	136.7	268.0	238.6	29.35	9.131	
6,750.0	6,730.2	6,751.3	6,742.7	15.1	14.6	-98.37		-94.3	122.0	268.9	239.4	29.46	9.125	
6,800.0	6,774.5	6,803.8	6,791.9	15.2	14.7	-99.71		-94.3	103.7	269.9	240.3	29.58	9.123	
6,850.0	6,817.1	6,856.8	6,840.2	15.2	14.8	-101.01		-94.3	81.9	271.0	241.3	29.71	9.122	
6,900.0	6,857.9	6,910.3	6,887.3	15.3	14.8	-102.25		-94.3	56.5	272.2	242.4	29.86	9.116	
6,950.0	6,896.8	6,964.3	6,932.9	15.4	14.9	-103.43		-94.3	27.6	273.5	243.5	30.06	9.099	
7,000.0	6,933.5	7,018.7	6,976.7	15.7	15.1	-104.55		-94.3	-4.7	274.9	244.5	30.32	9.065	
7,050.0	6,967.9	7,073.6	7,018.4	15.9	15.3	-105.60		-94.3	-40.3	276.2	245.6	30.67	9.007	
7,100.0	6,999.9	7,129.0	7,057.8	16.3	15.5	-106.57		-94.3	-79.2	277.6	246.5	31.12	8.921	
7,150.0	7,029.3	7,184.8	7,094.5	16.7	15.9	-107.47		-94.3	-121.2	278.9	247.2	31.69	8.800	
7,200.0	7,056.0	7,240.9	7,128.3	17.2	16.3	-108.28		-94.3	-166.0	280.2	247.7	32.41	8.643	
7,250.0	7,079.9	7,297.4	7,158.9	17.7	16.8	-109.01		-94.3	-213.5	281.4	248.1	33.30	8.450	
7,300.0	7,100.8	7,354.3	7,186.0	18.4	17.5	-109.64		-94.3	-263.5	282.4	248.1	34.36	8.220	
7,350.0	7,118.7	7,411.4	7,209.5	19.1	18.2	-110.19		-94.3	-315.6	283.4	247.8	35.60	7.961	
7,400.0	7,133.6	7,468.8	7,229.0	19.9	19.1	-110.64		-94.3	-369.5	284.2	247.2	37.01	7.679	
7,450.0	7,145.3	7,526.4	7,244.5	20.7	20.0	-110.99		-94.3	-424.9	284.9	246.3	38.59	7.382	
7,500.0	7,153.8	7,584.2	7,255.9	21.6	21.0	-111.25		-94.3	-481.6	285.3	245.0	40.32	7.077	
7,550.0	7,159.0	7,639.8	7,262.8	22.6	22.1	-111.42		-94.3	-536.8	285.7	243.6	42.15	6.779	
7,600.0	7,161.0	7,689.7	7,268.0	23.5	23.1	-111.94		-94.3	-586.4	286.9	243.0	43.87	6.539	
7,611.9	7,161.0	7,701.8	7,269.3	23.8	23.3	-112.14		-94.3	-598.4	287.4	243.1	44.27	6.491	
7,700.0	7,160.2	7,799.2	7,275.2	25.6	25.4	-113.38		-94.3	-695.6	289.8	242.2	47.53	6.097	
7,800.0	7,159.3	7,901.4	7,275.3	27.8	27.6	-113.57		-94.3	-797.8	290.1	238.6	51.59	5.624	
7,900.0	7,158.5	8,001.4	7,275.2	30.1	30.0	-113.71		-94.3	-897.8	290.5	234.7	55.79	5.206	
8,000.0	7,157.6	8,101.3	7,275.2	32.5	32.4	-113.85		-94.3	-997.8	290.8	230.6	60.13	4.836	
8,100.0	7,156.7	8,201.3	7,275.1	35.0	34.8	-113.99		-94.3	-1,097.8	291.1	226.5	64.57	4.508	
8,200.0	7,155.8	8,301.3	7,275.0	37.5	37.3	-114.13		-94.3	-1,197.7	291.4	222.3	69.10	4.217	
8,300.0	7,155.0	8,401.3	7,274.9	40.0	39.9	-114.27		-94.3	-1,297.7	291.7	218.0	73.69	3.959	
8,400.0	7,154.1	8,501.3	7,274.8	42.6	42.5	-114.41		-94.3	-1,397.7	292.1	213.7	78.34	3.728	
8,500.0	7,153.2	8,601.3	7,274.7	45.2	45.1	-114.55		-94.3	-1,497.7	292.4	209.4	83.03	3.522	
8,600.0	7,152.4	8,701.3	7,274.6	47.8	47.7	-114.69		-94.3	-1,597.7	292.7	205.0	87.75	3.336	
8,700.0	7,151.5	8,801.3	7,274.5	50.5	50.3	-114.83		-94.3	-1,697.7	293.0	200.5	92.49	3.168	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28V-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 (ft)	Offset (ft)	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
8,800.0	7,150.6	8,901.3	7,274.5	53.1	53.0	-114.97	-94.3	-1,797.7	293.4	196.1	97.26	3.016	
8,900.0	7,149.7	9,001.3	7,274.4	55.8	55.7	-115.11	-94.3	-1,897.7	293.7	191.7	102.04	2.878	
9,000.0	7,148.9	9,101.3	7,274.3	58.5	58.4	-115.25	-94.3	-1,997.7	294.0	187.2	106.84	2.752	
9,100.0	7,148.0	9,201.3	7,274.2	61.2	61.1	-115.39	-94.3	-2,097.7	294.4	182.7	111.64	2.637	
9,200.0	7,147.1	9,301.3	7,274.1	63.9	63.8	-115.52	-94.3	-2,197.7	294.7	178.3	116.45	2.531	
9,300.0	7,146.2	9,401.3	7,274.0	66.6	66.5	-115.66	-94.3	-2,297.7	295.0	173.8	121.27	2.433	
9,400.0	7,145.4	9,501.3	7,273.9	69.3	69.2	-115.80	-94.3	-2,397.7	295.4	169.3	126.09	2.343	
9,500.0	7,144.5	9,601.3	7,273.8	72.1	72.0	-115.94	-94.3	-2,497.7	295.7	164.8	130.90	2.259	
9,600.0	7,143.6	9,701.3	7,273.8	74.8	74.7	-116.07	-94.3	-2,597.7	296.1	160.4	135.72	2.181	
9,700.0	7,142.8	9,801.3	7,273.7	77.5	77.4	-116.21	-94.3	-2,697.7	296.4	155.9	140.54	2.109	
9,800.0	7,141.9	9,901.3	7,273.6	80.3	80.2	-116.35	-94.3	-2,797.7	296.8	151.4	145.35	2.042	
9,900.0	7,141.0	10,001.3	7,273.5	83.0	82.9	-116.48	-94.3	-2,897.7	297.1	147.0	150.16	1.979	
10,000.0	7,140.1	10,101.3	7,273.4	85.8	85.7	-116.62	-94.3	-2,997.7	297.5	142.5	154.97	1.920	
10,100.0	7,139.3	10,201.3	7,273.3	88.5	88.4	-116.75	-94.3	-3,097.7	297.8	138.1	159.77	1.864	
10,200.0	7,138.4	10,301.3	7,273.2	91.3	91.2	-116.89	-94.3	-3,197.7	298.2	133.6	164.57	1.812	
10,300.0	7,137.5	10,401.3	7,273.1	94.1	94.0	-117.02	-94.3	-3,297.7	298.5	129.2	169.36	1.763	
10,400.0	7,136.6	10,501.3	7,273.1	96.8	96.7	-117.16	-94.3	-3,397.7	298.9	124.8	174.14	1.716	
10,500.0	7,135.8	10,601.3	7,273.0	99.6	99.5	-117.29	-94.3	-3,497.7	299.3	120.3	178.92	1.673	
10,600.0	7,134.9	10,701.3	7,272.9	102.4	102.3	-117.42	-94.3	-3,597.7	299.6	115.9	183.69	1.631	
10,700.0	7,134.0	10,801.3	7,272.8	105.1	105.0	-117.56	-94.3	-3,697.7	300.0	111.5	188.45	1.592	
10,800.0	7,133.2	10,901.3	7,272.7	107.9	107.8	-117.69	-94.3	-3,797.7	300.3	107.1	193.20	1.555	
10,900.0	7,132.3	11,001.3	7,272.6	110.7	110.6	-117.82	-94.3	-3,897.7	300.7	102.8	197.95	1.519	
11,000.0	7,131.4	11,101.3	7,272.5	113.4	113.4	-117.95	-94.3	-3,997.7	301.1	98.4	202.68	1.485 Level 3	
11,100.0	7,130.5	11,201.3	7,272.5	116.2	116.2	-118.09	-94.3	-4,097.7	301.4	94.0	207.41	1.453 Level 3	
11,200.0	7,129.7	11,301.2	7,272.4	119.0	118.9	-118.22	-94.3	-4,197.7	301.8	89.7	212.13	1.423 Level 3	
11,300.0	7,128.8	11,401.2	7,272.3	121.8	121.7	-118.35	-94.3	-4,297.7	302.2	85.3	216.84	1.394 Level 3	
11,400.0	7,127.9	11,501.2	7,272.2	124.6	124.5	-118.48	-94.3	-4,397.6	302.6	81.0	221.54	1.366 Level 3	
11,500.0	7,127.0	11,601.2	7,272.1	127.3	127.3	-118.61	-94.3	-4,497.6	302.9	76.7	226.23	1.339 Level 3	
11,600.0	7,126.2	11,701.2	7,272.0	130.1	130.0	-118.74	-94.3	-4,597.6	303.3	72.4	230.90	1.314 Level 3	
11,619.7	7,126.0	11,718.1	7,272.0	130.7	130.4	-118.76	-94.3	-4,614.5	303.4	71.8	231.61	1.310 Level 3, SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28W-414 - 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	2.0	2.0	0.0	0.0	180.00	180.00	-91.1	0.0	91.1	91.1	0.00	N/A	
100.0	100.0	102.0	102.0	0.1	0.1	180.00	180.00	-91.1	0.0	91.1	90.8	0.23	397.241	
200.0	200.0	202.0	202.0	0.3	0.3	180.00	180.00	-91.1	0.0	91.1	90.4	0.68	134.168	
300.0	300.0	302.0	302.0	0.6	0.6	180.00	180.00	-91.1	0.0	91.1	89.9	1.13	80.714	
400.0	400.0	402.0	402.0	0.8	0.8	180.00	180.00	-91.1	0.0	91.1	89.5	1.58	57.719	
500.0	500.0	502.0	502.0	1.0	1.0	180.00	180.00	-91.1	0.0	91.1	89.0	2.03	44.921	
566.0	566.0	568.0	568.0	1.2	1.2	180.00	180.00	-91.1	0.0	91.1	88.7	2.32	39.187 CC	
600.0	600.0	601.9	601.9	1.2	1.2	180.00	180.00	-91.1	0.0	91.1	88.6	2.48	36.778 ES	
700.0	700.0	700.0	700.0	1.5	1.4	179.70	179.70	-92.7	0.5	92.8	89.9	2.90	32.041	
800.0	800.0	795.7	795.6	1.7	1.6	178.90	178.90	-97.5	1.9	97.7	94.4	3.30	29.632	
900.0	900.0	892.0	891.5	1.9	1.8	177.73	177.73	-105.3	4.2	105.9	102.2	3.72	28.512	
1,000.0	1,000.0	988.8	987.7	2.1	2.0	176.37	176.37	-116.2	7.4	117.3	113.2	4.15	28.270	
1,100.0	1,100.0	1,088.1	1,086.1	2.4	2.3	175.16	175.16	-128.1	10.9	129.6	125.0	4.60	28.190	
1,200.0	1,200.0	1,187.3	1,184.5	2.6	2.6	174.15	174.15	-140.1	14.3	141.9	136.8	5.05	28.078	
1,300.0	1,300.0	1,286.5	1,283.0	2.8	2.9	173.31	173.31	-152.0	17.8	154.2	148.7	5.52	27.945	
1,400.0	1,400.0	1,385.7	1,381.4	3.0	3.2	172.59	172.59	-163.9	21.3	166.5	160.6	5.99	27.805	
1,500.0	1,500.0	1,484.9	1,479.8	3.3	3.5	171.96	171.96	-175.8	24.8	178.9	172.5	6.47	27.665	
1,600.0	1,600.0	1,584.1	1,578.3	3.5	3.8	171.42	171.42	-187.7	28.3	191.3	184.4	6.95	27.528	
1,700.0	1,700.0	1,683.3	1,676.7	3.7	4.1	170.95	170.95	-199.6	31.8	203.7	196.3	7.44	27.397	
1,800.0	1,800.0	1,782.6	1,775.1	3.9	4.4	170.53	170.53	-211.6	35.3	216.2	208.2	7.93	27.274	
1,900.0	1,900.0	1,881.8	1,873.6	4.2	4.7	170.16	170.16	-223.5	38.8	228.6	220.2	8.42	27.158	
2,000.0	2,000.0	1,981.0	1,972.0	4.4	5.0	169.82	169.82	-235.4	42.3	241.0	232.1	8.91	27.049	
2,100.0	2,100.0	2,080.1	2,070.3	4.6	5.3	126.45	126.45	-247.3	45.8	254.5	245.5	9.06	28.106	
2,204.2	2,204.1	2,183.0	2,172.4	4.8	5.7	126.84	126.84	-259.7	49.4	270.8	261.2	9.52	28.455	
2,300.0	2,299.6	2,277.3	2,266.0	5.0	6.0	127.66	127.66	-271.0	52.7	286.8	276.8	9.95	28.817	
2,400.0	2,399.3	2,375.8	2,363.7	5.3	6.3	128.42	128.42	-282.8	56.2	303.5	293.1	10.41	29.157	
2,500.0	2,499.1	2,474.3	2,461.5	5.5	6.6	129.10	129.10	-294.7	59.6	320.3	309.5	10.87	29.465	
2,600.0	2,598.8	2,572.8	2,559.2	5.7	6.9	129.71	129.71	-306.5	63.1	337.2	325.9	11.34	29.744	
2,700.0	2,698.6	2,671.3	2,656.9	6.0	7.3	130.26	130.26	-318.3	66.6	354.1	342.3	11.80	29.998	
2,800.0	2,798.3	2,769.9	2,754.7	6.2	7.6	130.77	130.77	-330.1	70.0	371.0	358.7	12.27	30.230	
2,900.0	2,898.1	2,868.4	2,852.4	6.4	7.9	131.23	131.23	-342.0	73.5	387.9	375.2	12.74	30.443	
3,000.0	2,997.8	2,966.9	2,950.1	6.7	8.2	131.65	131.65	-353.8	77.0	404.9	391.7	13.22	30.639	
3,100.0	3,097.6	3,065.4	3,047.9	6.9	8.5	132.03	132.03	-365.6	80.4	421.9	408.2	13.69	30.819	
3,200.0	3,197.3	3,163.9	3,145.6	7.2	8.9	132.39	132.39	-377.5	83.9	438.9	424.7	14.16	30.986	
3,300.0	3,297.0	3,262.4	3,243.3	7.4	9.2	132.72	132.72	-389.3	87.4	455.9	441.3	14.64	31.141	
3,400.0	3,396.8	3,360.9	3,341.1	7.6	9.5	133.03	133.03	-401.1	90.8	472.9	457.8	15.12	31.285	
3,500.0	3,496.5	3,459.4	3,438.8	7.9	9.8	133.31	133.31	-413.0	94.3	490.0	474.4	15.59	31.419	
3,600.0	3,596.3	3,557.9	3,536.5	8.1	10.2	133.58	133.58	-424.8	97.8	507.0	490.9	16.07	31.544	
3,700.0	3,696.0	3,656.4	3,634.3	8.4	10.5	133.83	133.83	-436.6	101.2	524.1	507.5	16.55	31.662	
3,800.0	3,795.8	3,754.9	3,732.0	8.6	10.8	134.06	134.06	-448.5	104.7	541.2	524.1	17.03	31.771	
3,900.0	3,895.5	3,853.5	3,829.8	8.9	11.1	134.28	134.28	-460.3	108.2	558.2	540.7	17.51	31.875	
4,000.0	3,995.3	3,952.0	3,927.5	9.1	11.5	134.49	134.49	-472.1	111.6	575.3	557.3	17.99	31.972	
4,100.0	4,095.0	4,050.5	4,025.2	9.4	11.8	134.68	134.68	-484.0	115.1	592.4	573.9	18.48	32.063	
4,200.0	4,194.8	4,149.0	4,123.0	9.6	12.1	134.86	134.86	-495.8	118.5	609.5	590.6	18.96	32.150	
4,300.0	4,294.5	4,247.5	4,220.7	9.9	12.4	135.04	135.04	-507.6	122.0	626.6	607.2	19.44	32.231	
4,400.0	4,394.2	4,346.0	4,318.4	10.1	12.8	135.20	135.20	-519.5	125.5	643.7	623.8	19.92	32.308	
4,500.0	4,494.0	4,444.5	4,416.2	10.4	13.1	135.36	135.36	-531.3	128.9	660.8	640.4	20.41	32.382	
4,600.0	4,593.7	4,543.0	4,513.9	10.6	13.4	135.50	135.50	-543.1	132.4	678.0	657.1	20.89	32.451	
4,700.0	4,693.5	4,641.5	4,611.6	10.9	13.7	135.65	135.65	-555.0	135.9	695.1	673.7	21.38	32.517	
4,800.0	4,793.2	4,740.0	4,709.4	11.1	14.1	135.78	135.78	-566.8	139.3	712.2	690.4	21.86	32.580	
4,900.0	4,893.0	4,838.5	4,807.1	11.4	14.4	135.91	135.91	-578.6	142.8	729.3	707.0	22.35	32.640	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28W-414 - 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
5,000.0	4,992.7	4,937.1	4,904.8	11.6	14.7	136.03		-590.5	146.3	746.5	723.7	22.83	32.697	
5,100.0	5,092.5	5,035.6	5,002.6	11.9	15.0	136.14		-602.3	149.7	763.6	740.3	23.32	32.751	
5,200.0	5,192.2	5,134.1	5,100.3	12.1	15.4	136.25		-614.1	153.2	780.8	757.0	23.80	32.803	
5,304.0	5,295.9	5,258.8	5,224.2	12.4	15.7	136.41		-628.0	157.3	797.7	773.4	24.33	32.794	
5,400.0	5,391.8	5,389.3	5,354.4	12.6	15.9	136.72		-637.2	160.0	808.3	783.5	24.82	32.572	
5,508.2	5,500.0	5,537.0	5,502.0	12.8	16.2	180.00		-640.7	161.0	812.4	784.0	28.39	28.620	
5,600.0	5,591.8	5,628.8	5,593.8	13.0	16.3	180.00		-640.7	161.0	812.4	783.7	28.70	28.311	
5,700.0	5,691.8	5,728.8	5,693.8	13.2	16.4	180.00		-640.7	161.0	812.4	783.4	29.04	27.973	
5,800.0	5,791.8	5,828.8	5,793.8	13.4	16.6	180.00		-640.7	161.0	812.4	783.0	29.39	27.640	
5,900.0	5,891.8	5,928.8	5,893.8	13.6	16.7	180.00		-640.7	161.0	812.4	782.7	29.74	27.313	
6,000.0	5,991.8	6,028.8	5,993.8	13.8	16.8	180.00		-640.7	161.0	812.4	782.3	30.10	26.992	
6,100.0	6,091.8	6,128.8	6,093.8	14.0	17.0	180.00		-640.7	161.0	812.4	781.9	30.45	26.676	
6,200.0	6,191.8	6,228.8	6,193.8	14.2	17.1	180.00		-640.7	161.0	812.4	781.6	30.81	26.366	
6,300.0	6,291.8	6,328.8	6,293.8	14.4	17.3	180.00		-640.7	161.0	812.4	781.2	31.17	26.061	
6,405.3	6,397.1	6,434.1	6,399.1	14.7	17.4	180.00		-640.7	161.0	812.4	780.8	31.55	25.746	
6,414.6	6,406.4	6,443.4	6,408.4	14.7	17.4	-90.00		-640.7	161.0	812.4	783.6	28.83	28.175	
6,450.0	6,441.8	6,478.8	6,443.8	14.7	17.5	-90.09		-640.7	161.0	812.4	783.4	28.96	28.048	
6,500.0	6,491.5	6,528.6	6,493.5	14.8	17.6	-90.41		-640.7	161.0	812.4	783.3	29.13	27.891	
6,550.0	6,540.9	6,578.7	6,543.6	14.9	17.6	-90.88		-640.7	159.9	812.5	783.2	29.28	27.752	
6,600.0	6,589.7	6,629.3	6,594.0	15.0	17.7	-91.35		-640.7	155.5	812.6	783.2	29.41	27.628	
6,650.0	6,637.6	6,680.3	6,644.4	15.0	17.8	-91.82		-640.7	147.7	812.8	783.3	29.54	27.518	
6,700.0	6,684.5	6,731.9	6,694.7	15.1	17.8	-92.28		-640.7	136.4	813.1	783.4	29.66	27.415	
6,750.0	6,730.2	6,783.9	6,744.6	15.1	17.9	-92.73		-640.7	121.6	813.3	783.6	29.78	27.313	
6,800.0	6,774.5	6,836.4	6,793.8	15.2	17.9	-93.18		-640.7	103.3	813.7	783.8	29.91	27.202	
6,850.0	6,817.1	6,889.4	6,842.0	15.2	18.0	-93.61		-640.7	81.4	814.0	784.0	30.07	27.071	
6,900.0	6,857.9	6,942.8	6,889.0	15.3	18.0	-94.02		-640.7	56.0	814.4	784.2	30.27	26.905	
6,950.0	6,896.8	6,996.8	6,934.6	15.4	18.0	-94.43		-640.7	27.1	814.9	784.3	30.53	26.690	
7,000.0	6,933.5	7,051.2	6,978.3	15.7	18.1	-94.81		-640.7	-5.3	815.3	784.4	30.87	26.411	
7,050.0	6,967.9	7,106.0	7,020.0	15.9	18.1	-95.17		-640.7	-41.0	815.8	784.4	31.31	26.051	
7,100.0	6,999.9	7,161.3	7,059.2	16.3	18.2	-95.51		-640.7	-79.8	816.2	784.3	31.88	25.604	
7,150.0	7,029.3	7,217.0	7,095.9	16.7	18.3	-95.82		-640.7	-121.8	816.6	784.1	32.59	25.060	
7,200.0	7,056.0	7,273.1	7,129.6	17.2	18.4	-96.11		-640.7	-166.6	817.1	783.6	33.46	24.422	
7,250.0	7,079.9	7,329.6	7,160.1	17.7	18.6	-96.36		-640.7	-214.1	817.5	783.0	34.50	23.697	
7,300.0	7,100.8	7,386.3	7,187.1	18.4	18.9	-96.59		-640.7	-264.0	817.8	782.1	35.71	22.899	
7,350.0	7,118.7	7,443.4	7,210.5	19.1	19.3	-96.79		-640.7	-316.0	818.2	781.0	37.11	22.047	
7,400.0	7,133.6	7,500.7	7,230.0	19.9	20.0	-96.95		-640.7	-369.9	818.4	779.8	38.68	21.160	
7,450.0	7,145.3	7,558.2	7,245.5	20.7	20.8	-97.08		-640.7	-425.2	818.7	778.2	40.41	20.257	
7,500.0	7,153.8	7,615.8	7,256.7	21.6	21.7	-97.17		-640.7	-481.8	818.8	776.5	42.29	19.361	
7,550.0	7,159.0	7,671.4	7,263.7	22.6	22.7	-97.24		-640.7	-536.9	818.9	774.7	44.24	18.509	
7,600.0	7,161.0	7,721.3	7,268.9	23.5	23.7	-97.43		-640.7	-586.5	819.4	773.2	46.16	17.749	
7,611.9	7,161.0	7,733.4	7,270.2	23.8	23.9	-97.51		-640.7	-598.5	819.5	772.9	46.63	17.574	
7,700.0	7,160.2	7,830.6	7,276.1	25.6	25.9	-97.98		-640.7	-695.6	820.3	769.9	50.43	16.266	
7,800.0	7,159.3	7,932.6	7,276.3	27.8	28.1	-98.06		-640.7	-797.5	820.5	765.6	54.86	14.956	
7,900.0	7,158.5	8,032.6	7,276.5	30.1	30.4	-98.13		-640.7	-897.5	820.6	761.2	59.43	13.808	
8,000.0	7,157.6	8,132.6	7,276.6	32.5	32.8	-98.20		-640.7	-997.5	820.8	756.6	64.16	12.793	
8,100.0	7,156.7	8,232.6	7,276.7	35.0	35.2	-98.26		-640.7	-1,097.5	820.9	751.9	69.01	11.897	
8,200.0	7,155.8	8,332.5	7,276.8	37.5	37.7	-98.33		-640.7	-1,197.5	821.1	747.1	73.95	11.103	
8,300.0	7,155.0	8,432.5	7,277.0	40.0	40.2	-98.40		-640.7	-1,297.5	821.2	742.2	78.97	10.399	
8,400.0	7,154.1	8,532.5	7,277.1	42.6	42.8	-98.47		-640.7	-1,397.5	821.4	737.3	84.06	9.771	
8,500.0	7,153.2	8,632.5	7,277.2	45.2	45.4	-98.54		-640.7	-1,497.5	821.5	732.3	89.20	9.210	
8,600.0	7,152.4	8,732.5	7,277.3	47.8	48.0	-98.61		-640.7	-1,597.5	821.7	727.3	94.39	8.705	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Offset Design		Sunmarke 28V-HZ Pad Sec.28-T4N-R67W - Sunmarke 28W-414 - 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)						
8,700.0	7,151.5	8,832.5	7,277.4	50.5	50.6	-98.68	-640.7	-1,697.5	821.8	722.2	99.61	8.251					
8,800.0	7,150.6	8,932.5	7,277.6	53.1	53.3	-98.74	-640.7	-1,797.5	822.0	717.1	104.86	7.839					
8,900.0	7,149.7	9,032.5	7,277.7	55.8	55.9	-98.81	-640.7	-1,897.5	822.1	712.0	110.14	7.464					
9,000.0	7,148.9	9,132.5	7,277.8	58.5	58.6	-98.88	-640.7	-1,997.5	822.3	706.8	115.44	7.123					
9,100.0	7,148.0	9,232.5	7,277.9	61.2	61.3	-98.95	-640.7	-2,097.5	822.4	701.7	120.75	6.811					
9,200.0	7,147.1	9,332.5	7,278.1	63.9	64.0	-99.02	-640.7	-2,197.4	822.6	696.5	126.09	6.524					
9,300.0	7,146.2	9,432.5	7,278.2	66.6	66.7	-99.09	-640.7	-2,297.4	822.7	691.3	131.44	6.259					
9,400.0	7,145.4	9,532.5	7,278.3	69.3	69.4	-99.15	-640.7	-2,397.4	822.9	686.1	136.80	6.015					
9,500.0	7,144.5	9,632.5	7,278.4	72.1	72.2	-99.22	-640.7	-2,497.4	823.0	680.9	142.17	5.789					
9,600.0	7,143.6	9,732.5	7,278.5	74.8	74.9	-99.29	-640.7	-2,597.4	823.2	675.7	147.55	5.579					
9,700.0	7,142.8	9,832.5	7,278.7	77.5	77.6	-99.36	-640.7	-2,697.4	823.4	670.4	152.94	5.384					
9,800.0	7,141.9	9,932.5	7,278.8	80.3	80.4	-99.43	-640.7	-2,797.4	823.5	665.2	158.34	5.201					
9,900.0	7,141.0	10,032.5	7,278.9	83.0	83.1	-99.50	-640.7	-2,897.4	823.7	660.0	163.74	5.031					
10,000.0	7,140.1	10,132.5	7,279.0	85.8	85.8	-99.56	-640.7	-2,997.4	823.9	654.7	169.14	4.871					
10,100.0	7,139.3	10,232.5	7,279.2	88.5	88.6	-99.63	-640.7	-3,097.4	824.0	649.5	174.55	4.721					
10,200.0	7,138.4	10,332.4	7,279.3	91.3	91.4	-99.70	-640.7	-3,197.4	824.2	644.2	179.97	4.580					
10,300.0	7,137.5	10,432.4	7,279.4	94.1	94.1	-99.77	-640.7	-3,297.4	824.4	639.0	185.38	4.447					
10,400.0	7,136.6	10,532.4	7,279.5	96.8	96.9	-99.84	-640.7	-3,397.4	824.5	633.7	190.80	4.321					
10,500.0	7,135.8	10,632.4	7,279.6	99.6	99.6	-99.91	-640.7	-3,497.4	824.7	628.5	196.23	4.203					
10,600.0	7,134.9	10,732.4	7,279.8	102.4	102.4	-99.97	-640.7	-3,597.4	824.9	623.2	201.65	4.091					
10,700.0	7,134.0	10,832.4	7,279.9	105.1	105.2	-100.04	-640.7	-3,697.4	825.0	618.0	207.08	3.984					
10,800.0	7,133.2	10,932.4	7,280.0	107.9	107.9	-100.11	-640.7	-3,797.4	825.2	612.7	212.50	3.883					
10,900.0	7,132.3	11,032.4	7,280.1	110.7	110.7	-100.18	-640.7	-3,897.4	825.4	607.5	217.93	3.787					
11,000.0	7,131.4	11,132.4	7,280.3	113.4	113.5	-100.25	-640.7	-3,997.4	825.6	602.2	223.36	3.696					
11,100.0	7,130.5	11,232.4	7,280.4	116.2	116.3	-100.31	-640.7	-4,097.4	825.7	597.0	228.79	3.609					
11,200.0	7,129.7	11,332.4	7,280.5	119.0	119.0	-100.38	-640.7	-4,197.3	825.9	591.7	234.22	3.526					
11,300.0	7,128.8	11,432.4	7,280.6	121.8	121.8	-100.45	-640.7	-4,297.3	826.1	586.5	239.65	3.447					
11,400.0	7,127.9	11,532.4	7,280.7	124.6	124.6	-100.52	-640.7	-4,397.3	826.3	581.2	245.08	3.372					
11,500.0	7,127.0	11,632.4	7,280.9	127.3	127.4	-100.58	-640.7	-4,497.3	826.5	576.0	250.51	3.299					
11,600.0	7,126.2	11,732.4	7,281.0	130.1	130.2	-100.65	-640.7	-4,597.3	826.6	570.7	255.94	3.230					
11,619.7	7,126.0	11,741.3	7,281.0	130.7	130.4	-100.66	-640.7	-4,606.2	826.8	570.0	256.71	3.221 SF					

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4921.0ft (RKB - 15')

Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Sunmarke 28V-304

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.40°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-304
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Reference Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 28V-304	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-18-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4921.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Sunmarke 28V-304
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.40°

