

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Sunmarke 28V-434**

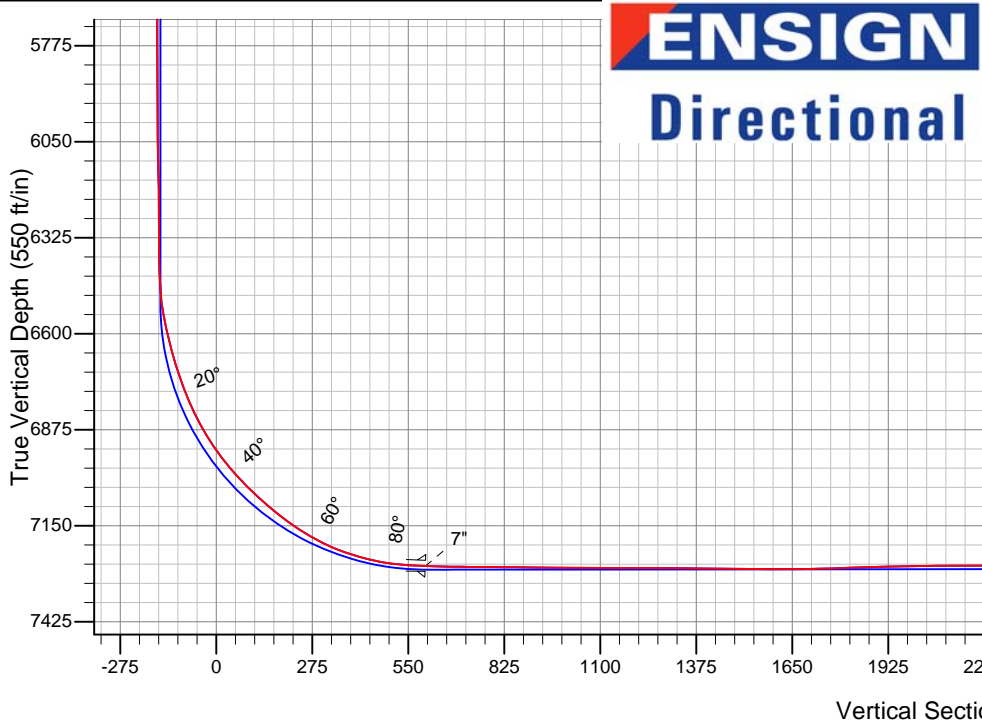
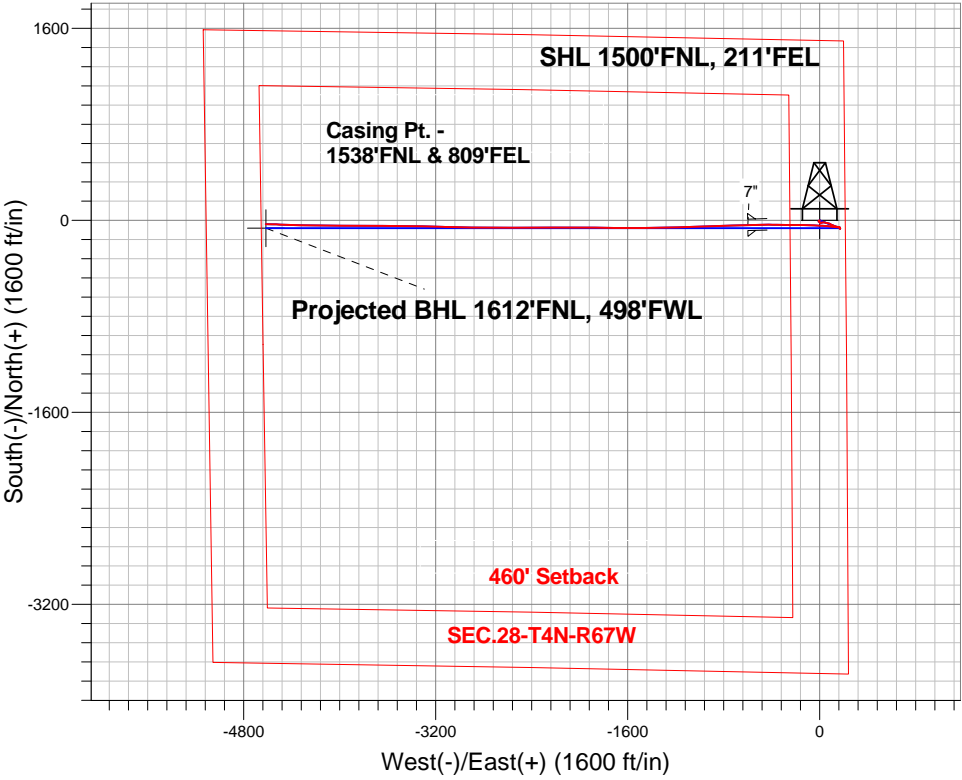
Surface Location: Sunmarke 28V-HZ Pad Sec.28-T4N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4907.0

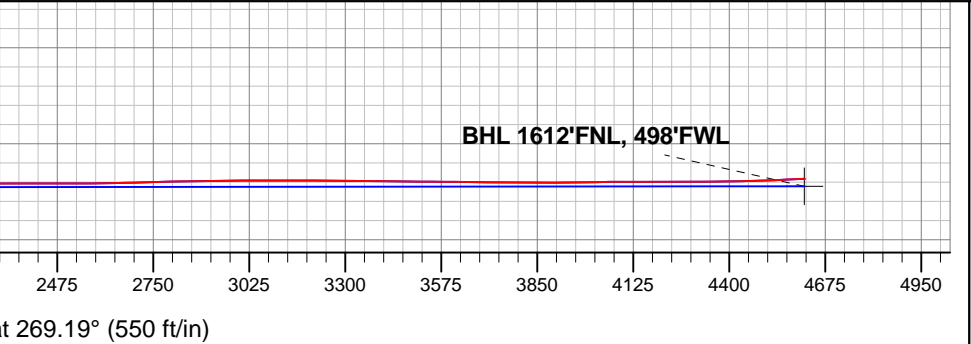
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1347928.18	3171018.83	40.286840	-104.886970	
RKB - 15' WELL @ 4922.0ft (RKB - 15')						

FINAL SURVEY

Projected Bottom Hole Location
11704'MD 7251'TVD 32'S & 4616'W of SHL
92.6 degree Incl @ 271.0 degree AZM



Sunmarke 28V-HZ Pad Sec.28-T4N-R67W Sunmarke 28V-434 Wellbore #1 9:36, October 09 2014	ANNOTATIONS
	No annotation data is available.
LEGEND	
Sunmarke 28V-434, Wellbore #1, Plan #3 (9-24-14)R V0	
Wellbore #1	
Survey #1	





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T4N-R67W

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

Sunmarke 28V-434

Wellbore #1

Survey: Survey #1

Standard Survey Report

09 October, 2014

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Well:	Sunmarke 28V-434	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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-434					
Well Position	+N-S	0.0 ft	Northing:	1,347,928.18 ft	Latitude:	40.286840
	+E-W	0.0 ft	Easting:	3,171,018.83 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	9/22/2014	8.48	66.83	52,714

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	269.19	

Survey Program	Date	10/9/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
143.0	11,704.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

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	136.50	1.0	0.0	0.0	0.0	0.21	0.21	0.00
SHL 1500'FNL, 211'FEL									
143.0	0.30	136.50	143.0	-0.3	0.3	-0.3	0.21	0.21	0.00
234.0	0.00	153.20	234.0	-0.4	0.4	-0.4	0.33	-0.33	0.00
326.0	0.40	228.40	326.0	-0.7	0.2	-0.2	0.43	0.43	0.00
417.0	0.40	252.00	417.0	-1.0	-0.4	0.4	0.18	0.00	25.93
509.0	1.10	265.20	509.0	-1.1	-1.5	1.6	0.78	0.76	14.35
600.0	0.80	229.40	600.0	-1.6	-2.9	2.9	0.71	-0.33	-39.34
692.0	0.60	198.50	692.0	-2.5	-3.5	3.6	0.46	-0.22	-33.59
783.0	0.80	209.90	783.0	-3.5	-4.0	4.1	0.27	0.22	12.53
895.0	1.20	238.60	894.9	-4.8	-5.4	5.5	0.56	0.36	25.63

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Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Well:	Sunmarke 28V-434	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
939.0	1.60	236.20	938.9	-5.4	-6.3	6.4	0.92	0.91	-5.45
1,030.0	2.10	223.00	1,029.9	-7.3	-8.5	8.6	0.72	0.55	-14.51
1,122.0	1.60	168.10	1,121.8	-9.8	-9.4	9.5	1.92	-0.54	-59.67
1,217.0	2.30	114.60	1,216.8	-11.9	-7.4	7.5	1.96	0.74	-56.32
1,311.0	2.00	120.50	1,310.7	-13.5	-4.2	4.4	0.40	-0.32	6.28
1,406.0	1.50	114.40	1,405.7	-14.9	-1.7	1.9	0.56	-0.53	-6.42
1,501.0	0.80	150.70	1,500.7	-15.9	-0.2	0.4	1.03	-0.74	38.21
1,595.0	0.50	141.00	1,594.7	-16.8	0.4	-0.1	0.34	-0.32	-10.32
1,690.0	0.60	148.00	1,689.7	-17.6	0.9	-0.6	0.13	0.11	7.37
1,784.0	0.90	158.80	1,783.6	-18.7	1.4	-1.1	0.35	0.32	11.49
1,879.0	0.80	163.50	1,878.6	-20.0	1.9	-1.6	0.13	-0.11	4.95
1,973.0	1.10	160.00	1,972.6	-21.5	2.4	-2.1	0.32	0.32	-3.72
2,068.0	1.10	161.80	2,067.6	-23.2	3.0	-2.6	0.04	0.00	1.89
2,163.0	1.50	65.40	2,162.6	-23.6	4.4	-4.0	2.06	0.42	-101.47
2,258.0	1.70	66.40	2,257.6	-22.5	6.8	-6.5	0.21	0.21	1.05
2,353.0	3.80	72.70	2,352.4	-21.0	11.1	-10.8	2.23	2.21	6.63
2,448.0	3.30	67.60	2,447.3	-19.0	16.6	-16.4	0.62	-0.53	-5.37
2,543.0	4.90	85.60	2,542.0	-17.7	23.2	-22.9	2.14	1.68	18.95
2,637.0	4.80	87.20	2,635.7	-17.2	31.1	-30.9	0.18	-0.11	1.70
2,733.0	5.10	106.40	2,731.3	-18.2	39.2	-39.0	1.75	0.31	20.00
2,828.0	4.40	101.10	2,826.0	-20.1	46.9	-46.6	0.87	-0.74	-5.58
2,922.0	4.10	100.70	2,919.7	-21.4	53.7	-53.4	0.32	-0.32	-0.43
3,017.0	3.60	99.00	3,014.5	-22.5	60.0	-59.7	0.54	-0.53	-1.79
3,112.0	4.70	105.40	3,109.3	-24.0	66.7	-66.3	1.25	1.16	6.74
3,207.0	4.30	104.20	3,204.0	-25.9	73.9	-73.5	0.43	-0.42	-1.26
3,302.0	3.90	102.20	3,298.7	-27.4	80.5	-80.1	0.45	-0.42	-2.11
3,397.0	5.30	122.90	3,393.4	-30.5	87.3	-86.9	2.26	1.47	21.79
3,492.0	5.20	118.20	3,488.0	-34.9	94.8	-94.3	0.46	-0.11	-4.95
3,587.0	4.80	117.10	3,582.7	-38.8	102.2	-101.6	0.43	-0.42	-1.16
3,682.0	4.40	111.30	3,677.4	-41.9	109.1	-108.5	0.65	-0.42	-6.11
3,777.0	4.30	111.60	3,772.1	-44.5	115.8	-115.2	0.11	-0.11	0.32
3,872.0	4.20	110.80	3,866.8	-47.1	122.4	-121.7	0.12	-0.11	-0.84
3,967.0	4.00	110.40	3,961.6	-49.5	128.7	-128.0	0.21	-0.21	-0.42
4,062.0	3.40	106.20	4,056.4	-51.4	134.5	-133.8	0.69	-0.63	-4.42
4,157.0	3.20	104.00	4,151.2	-52.8	139.8	-139.0	0.25	-0.21	-2.32
4,252.0	3.00	100.40	4,246.1	-53.9	144.8	-144.0	0.29	-0.21	-3.79
4,347.0	2.90	98.50	4,341.0	-54.7	149.6	-148.9	0.15	-0.11	-2.00
4,442.0	2.80	100.30	4,435.9	-55.5	154.3	-153.5	0.14	-0.11	1.89
4,537.0	2.30	96.30	4,530.8	-56.1	158.5	-157.7	0.56	-0.53	-4.21
4,632.0	2.00	90.90	4,625.7	-56.4	162.0	-161.2	0.38	-0.32	-5.68
4,727.0	1.60	135.30	4,720.7	-57.3	164.6	-163.8	1.48	-0.42	46.74
4,822.0	1.50	136.60	4,815.6	-59.2	166.4	-165.6	0.11	-0.11	1.37
4,916.0	1.30	144.70	4,909.6	-60.9	167.9	-167.0	0.30	-0.21	8.62
5,011.0	0.90	148.80	5,004.6	-62.5	168.9	-168.0	0.43	-0.42	4.32
5,106.0	0.80	161.50	5,099.6	-63.7	169.5	-168.6	0.22	-0.11	13.37
5,201.0	0.60	165.60	5,194.6	-64.8	169.8	-168.9	0.22	-0.21	4.32
5,296.0	0.50	171.90	5,289.6	-65.7	170.0	-169.1	0.12	-0.11	6.63
5,391.0	0.50	156.00	5,384.5	-66.5	170.2	-169.3	0.15	0.00	-16.74
5,486.0	0.40	159.80	5,479.5	-67.2	170.5	-169.5	0.11	-0.11	4.00
5,581.0	0.40	184.50	5,574.5	-67.8	170.6	-169.6	0.18	0.00	26.00
5,675.0	0.10	225.67	5,668.5	-68.2	170.5	-169.5	0.35	-0.32	43.80
5,770.0	0.30	330.70	5,763.5	-68.1	170.3	-169.4	0.36	0.21	110.56
5,865.0	0.70	326.70	5,858.5	-67.4	169.9	-168.9	0.42	0.42	-4.21
5,960.0	0.80	330.90	5,953.5	-66.3	169.2	-168.3	0.12	0.11	4.42

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,054.0	1.30	331.70	6,047.5	-64.8	168.4	-167.5	0.53	0.53	0.85
6,149.0	1.40	320.00	6,142.5	-63.0	167.2	-166.3	0.31	0.11	-12.32
6,244.0	1.20	320.60	6,237.5	-61.3	165.8	-164.9	0.21	-0.21	0.63
6,339.0	1.10	308.50	6,332.4	-60.0	164.4	-163.6	0.28	-0.11	-12.74
6,402.0	0.90	294.90	6,395.4	-59.4	163.5	-162.7	0.49	-0.32	-21.59
6,434.0	0.90	293.70	6,427.4	-59.2	163.1	-162.2	0.06	0.00	-3.75
6,465.0	2.80	268.00	6,458.4	-59.1	162.1	-161.2	6.54	6.13	-82.90
6,497.0	5.70	269.40	6,490.3	-59.1	159.7	-158.9	9.07	9.06	4.38
6,529.0	8.40	275.10	6,522.1	-59.0	155.8	-154.9	8.71	8.44	17.81
6,560.0	10.60	275.90	6,552.6	-58.5	150.7	-149.9	7.11	7.10	2.58
6,592.0	12.40	274.30	6,584.0	-57.9	144.3	-143.5	5.71	5.63	-5.00
6,624.0	13.60	274.50	6,615.2	-57.3	137.2	-136.3	3.75	3.75	0.63
6,655.0	15.40	275.50	6,645.2	-56.7	129.4	-128.6	5.86	5.81	3.23
6,687.0	16.80	277.30	6,675.9	-55.7	120.6	-119.8	4.64	4.38	5.63
6,719.0	18.10	277.50	6,706.5	-54.4	111.1	-110.3	4.07	4.06	0.63
6,750.0	19.60	277.40	6,735.8	-53.1	101.2	-100.4	4.84	4.84	-0.32
6,782.0	21.40	276.60	6,765.8	-51.8	90.1	-89.3	5.69	5.63	-2.50
6,814.0	23.40	276.40	6,795.4	-50.4	77.9	-77.2	6.25	6.25	-0.63
6,845.0	25.60	275.40	6,823.6	-49.1	65.2	-64.5	7.22	7.10	-3.23
6,877.0	27.80	275.20	6,852.2	-47.8	50.8	-50.2	6.88	6.88	-0.63
6,908.0	30.40	274.50	6,879.2	-46.5	35.8	-35.2	8.46	8.39	-2.26
6,940.0	33.00	273.60	6,906.5	-45.3	19.0	-18.4	8.26	8.13	-2.81
6,972.0	35.30	273.00	6,932.9	-44.3	1.1	-0.5	7.26	7.19	-1.88
7,004.0	37.70	272.80	6,958.7	-43.3	-17.9	18.5	7.51	7.50	-0.63
7,035.0	40.00	272.50	6,982.8	-42.4	-37.3	37.9	7.44	7.42	-0.97
7,067.0	42.10	271.70	7,006.9	-41.6	-58.3	58.9	6.76	6.56	-2.50
7,098.0	44.50	271.80	7,029.5	-41.0	-79.6	80.1	7.75	7.74	0.32
7,130.0	46.70	270.60	7,051.9	-40.5	-102.4	103.0	7.38	6.88	-3.75
7,162.0	47.80	271.20	7,073.6	-40.1	-125.9	126.5	3.70	3.44	1.88
7,193.0	48.50	270.00	7,094.3	-39.9	-149.0	149.6	3.66	2.26	-3.87
7,225.0	51.60	271.00	7,114.8	-39.7	-173.5	174.1	9.98	9.69	3.13
7,257.0	53.60	270.80	7,134.3	-39.3	-199.0	199.5	6.27	6.25	-0.63
7,288.0	55.90	271.00	7,152.2	-38.9	-224.3	224.8	7.44	7.42	0.65
7,320.0	58.20	270.70	7,169.6	-38.5	-251.1	251.6	7.23	7.19	-0.94
7,351.0	60.80	270.70	7,185.3	-38.2	-277.8	278.3	8.39	8.39	0.00
7,383.0	63.50	270.60	7,200.2	-37.8	-306.1	306.6	8.44	8.44	-0.31
7,415.0	67.30	270.50	7,213.6	-37.6	-335.2	335.7	11.88	11.88	-0.31
7,446.0	70.60	271.60	7,224.7	-37.0	-364.1	364.6	11.15	10.65	3.55
7,478.0	72.40	271.20	7,234.8	-36.3	-394.5	394.9	5.75	5.63	-1.25
7,510.0	75.50	270.40	7,243.7	-35.9	-425.2	425.7	9.98	9.69	-2.50
7,541.0	78.30	269.30	7,250.7	-35.9	-455.4	455.9	9.67	9.03	-3.55
7,572.0	81.20	268.60	7,256.2	-36.5	-485.9	486.4	9.62	9.35	-2.26
7,604.0	83.40	269.60	7,260.5	-37.0	-517.6	518.1	7.54	6.88	3.13
7,635.0	86.10	269.30	7,263.4	-37.3	-548.5	548.9	8.76	8.71	-0.97
7,647.0	86.80	268.70	7,264.1	-37.5	-560.4	560.9	7.68	5.83	-5.00
7,685.0	88.04	268.70	7,265.8	-38.4	-598.4	598.9	3.27	3.27	0.00
7"									
7,696.0	88.40	268.70	7,266.2	-38.6	-609.4	609.9	3.27	3.27	0.00
7,727.0	88.80	267.30	7,266.9	-39.7	-640.3	640.8	4.70	1.29	-4.52
7,757.0	88.80	267.50	7,267.5	-41.1	-670.3	670.8	0.67	0.00	0.67
7,788.0	89.50	267.40	7,268.0	-42.4	-701.3	701.8	2.28	2.26	-0.32
7,818.0	89.80	267.60	7,268.2	-43.7	-731.2	731.8	1.20	1.00	0.67
7,848.0	89.70	267.50	7,268.3	-45.0	-761.2	761.8	0.47	-0.33	-0.33

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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7,879.0	89.50	267.00	7,268.5	-46.5	-792.2	792.8	1.74	-0.65	-1.61
7,909.0	89.40	268.00	7,268.8	-47.8	-822.2	822.7	3.35	-0.33	3.33
7,940.0	89.50	267.60	7,269.1	-49.0	-853.1	853.7	1.33	0.32	-1.29
7,970.0	89.20	268.40	7,269.5	-50.1	-883.1	883.7	2.85	-1.00	2.67
8,000.0	89.30	268.60	7,269.8	-50.8	-913.1	913.7	0.75	0.33	0.67
8,031.0	89.30	268.50	7,270.2	-51.6	-944.1	944.7	0.32	0.00	-0.32
8,061.0	89.50	268.80	7,270.5	-52.3	-974.1	974.7	1.20	0.67	1.00
8,092.0	89.60	268.50	7,270.8	-53.1	-1,005.1	1,005.7	1.02	0.32	-0.97
8,122.0	89.80	268.70	7,270.9	-53.8	-1,035.1	1,035.7	0.94	0.67	0.67
8,152.0	89.80	268.50	7,271.0	-54.5	-1,065.0	1,065.7	0.67	0.00	-0.67
8,183.0	89.80	268.10	7,271.2	-55.5	-1,096.0	1,096.7	1.29	0.00	-1.29
8,213.0	89.90	268.10	7,271.2	-56.5	-1,126.0	1,126.7	0.33	0.33	0.00
8,243.0	90.00	268.00	7,271.3	-57.5	-1,156.0	1,156.7	0.47	0.33	-0.33
8,274.0	90.20	268.40	7,271.2	-58.4	-1,187.0	1,187.7	1.44	0.65	1.29
8,304.0	90.30	268.10	7,271.1	-59.4	-1,217.0	1,217.7	1.05	0.33	-1.00
8,335.0	89.70	268.50	7,271.1	-60.3	-1,248.0	1,248.7	2.33	-1.94	1.29
8,365.0	89.10	269.10	7,271.4	-60.9	-1,277.9	1,278.7	2.83	-2.00	2.00
8,395.0	89.30	269.30	7,271.8	-61.3	-1,307.9	1,308.7	0.94	0.67	0.67
8,425.0	89.30	269.20	7,272.2	-61.7	-1,337.9	1,338.7	0.33	0.00	-0.33
8,455.0	89.30	269.10	7,272.5	-62.2	-1,367.9	1,368.7	0.33	0.00	-0.33
8,485.0	89.40	269.60	7,272.9	-62.5	-1,397.9	1,398.7	1.70	0.33	1.67
8,515.0	89.50	269.60	7,273.2	-62.7	-1,427.9	1,428.7	0.33	0.33	0.00
8,545.0	89.50	269.40	7,273.4	-63.0	-1,457.9	1,458.7	0.67	0.00	-0.67
8,575.0	89.50	269.50	7,273.7	-63.3	-1,487.9	1,488.7	0.33	0.00	0.33
8,606.0	89.60	270.00	7,273.9	-63.4	-1,518.9	1,519.7	1.64	0.32	1.61
8,636.0	89.70	270.10	7,274.1	-63.4	-1,548.9	1,549.7	0.47	0.33	0.33
8,666.0	89.90	270.10	7,274.2	-63.3	-1,578.9	1,579.7	0.67	0.67	0.00
8,697.0	89.80	269.80	7,274.3	-63.3	-1,609.9	1,610.6	1.02	-0.32	-0.97
8,727.0	90.00	270.00	7,274.4	-63.4	-1,639.9	1,640.6	0.94	0.67	0.67
8,757.0	90.20	268.70	7,274.3	-63.7	-1,669.9	1,670.6	4.38	0.67	-4.33
8,787.0	90.90	270.20	7,274.0	-64.0	-1,699.9	1,700.6	5.52	2.33	5.00
8,818.0	91.20	270.80	7,273.4	-63.8	-1,730.9	1,731.6	2.16	0.97	1.94
8,848.0	91.40	270.50	7,272.8	-63.4	-1,760.9	1,761.6	1.20	0.67	-1.00
8,878.0	92.40	270.70	7,271.8	-63.1	-1,790.9	1,791.6	3.40	3.33	0.67
8,909.0	92.30	270.40	7,270.5	-62.8	-1,821.8	1,822.6	1.02	-0.32	-0.97
8,939.0	91.70	270.70	7,269.5	-62.5	-1,851.8	1,852.5	2.24	-2.00	1.00
8,969.0	91.40	271.20	7,268.6	-62.0	-1,881.8	1,882.5	1.94	-1.00	1.67
8,999.0	91.30	271.00	7,267.9	-61.4	-1,911.8	1,912.5	0.75	-0.33	-0.67
9,030.0	91.50	271.30	7,267.2	-60.8	-1,942.8	1,943.4	1.16	0.65	0.97
9,060.0	91.60	271.00	7,266.4	-60.2	-1,972.8	1,973.4	1.05	0.33	-1.00
9,090.0	90.90	270.90	7,265.7	-59.7	-2,002.8	2,003.4	2.36	-2.33	-0.33
9,122.0	90.80	270.90	7,265.2	-59.2	-2,034.7	2,035.4	0.31	-0.31	0.00
9,154.0	90.70	270.50	7,264.8	-58.8	-2,066.7	2,067.4	1.29	-0.31	-1.25
9,185.0	90.10	270.20	7,264.6	-58.6	-2,097.7	2,098.4	2.16	-1.94	-0.97
9,217.0	90.10	270.10	7,264.5	-58.6	-2,129.7	2,130.4	0.31	0.00	-0.31
9,249.0	90.10	269.60	7,264.5	-58.6	-2,161.7	2,162.4	1.56	0.00	-1.56
9,280.0	90.40	270.00	7,264.4	-58.8	-2,192.7	2,193.3	1.61	0.97	1.29
9,312.0	90.60	269.80	7,264.1	-58.8	-2,224.7	2,225.3	0.88	0.63	-0.63
9,343.0	90.70	269.80	7,263.7	-58.9	-2,255.7	2,256.3	0.32	0.32	0.00
9,375.0	89.70	269.40	7,263.6	-59.1	-2,287.7	2,288.3	3.37	-3.13	-1.25
9,406.0	89.50	269.30	7,263.8	-59.5	-2,318.7	2,319.3	0.72	-0.65	-0.32
9,438.0	89.60	269.50	7,264.1	-59.8	-2,350.7	2,351.3	0.70	0.31	0.63
9,470.0	89.60	269.30	7,264.3	-60.2	-2,382.7	2,383.3	0.62	0.00	-0.63

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Well:	Sunmarke 28V-434	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,501.0	89.80	269.30	7,264.5	-60.5	-2,413.7	2,414.3	0.65	0.65	0.00
9,533.0	90.00	269.20	7,264.5	-61.0	-2,445.7	2,446.3	0.70	0.63	-0.31
9,564.0	90.30	269.70	7,264.4	-61.3	-2,476.7	2,477.3	1.88	0.97	1.61
9,596.0	90.40	270.10	7,264.2	-61.3	-2,508.7	2,509.3	1.29	0.31	1.25
9,627.0	90.50	269.80	7,264.0	-61.3	-2,539.7	2,540.3	1.02	0.32	-0.97
9,659.0	90.60	269.80	7,263.7	-61.4	-2,571.7	2,572.3	0.31	0.31	0.00
9,690.0	90.70	269.90	7,263.3	-61.5	-2,602.7	2,603.3	0.46	0.32	0.32
9,722.0	91.00	270.00	7,262.9	-61.6	-2,634.7	2,635.3	0.99	0.94	0.31
9,753.0	91.00	269.90	7,262.3	-61.6	-2,665.7	2,666.3	0.32	0.00	-0.32
9,785.0	91.20	270.10	7,261.7	-61.6	-2,697.7	2,698.3	0.88	0.63	0.63
9,816.0	91.40	270.40	7,261.0	-61.5	-2,728.7	2,729.3	1.16	0.65	0.97
9,848.0	91.50	270.20	7,260.2	-61.3	-2,760.7	2,761.3	0.70	0.31	-0.63
9,879.0	91.70	270.40	7,259.3	-61.1	-2,791.7	2,792.3	0.91	0.65	0.65
9,910.0	91.80	270.20	7,258.4	-61.0	-2,822.7	2,823.2	0.72	0.32	-0.65
9,942.0	90.90	270.70	7,257.6	-60.7	-2,854.6	2,855.2	3.22	-2.81	1.56
9,973.0	90.60	270.50	7,257.2	-60.4	-2,885.6	2,886.2	1.16	-0.97	-0.65
10,004.0	90.80	271.10	7,256.9	-59.9	-2,916.6	2,917.2	2.04	0.65	1.94
10,036.0	90.90	270.70	7,256.4	-59.4	-2,948.6	2,949.2	1.29	0.31	-1.25
10,068.0	90.90	270.90	7,255.9	-59.0	-2,980.6	2,981.2	0.62	0.00	0.63
10,100.0	90.10	271.70	7,255.6	-58.3	-3,012.6	3,013.1	3.54	-2.50	2.50
10,131.0	90.10	271.60	7,255.5	-57.4	-3,043.6	3,044.1	0.32	0.00	-0.32
10,163.0	90.20	271.20	7,255.5	-56.6	-3,075.6	3,076.1	1.29	0.31	-1.25
10,195.0	90.50	271.40	7,255.3	-55.9	-3,107.6	3,108.1	1.13	0.94	0.63
10,226.0	90.70	271.60	7,254.9	-55.1	-3,138.6	3,139.0	0.91	0.65	0.65
10,258.0	89.40	271.60	7,254.9	-54.2	-3,170.5	3,171.0	4.06	-4.06	0.00
10,289.0	89.10	271.70	7,255.3	-53.3	-3,201.5	3,202.0	1.02	-0.97	0.32
10,321.0	89.10	271.40	7,255.8	-52.4	-3,233.5	3,233.9	0.94	0.00	-0.94
10,352.0	89.20	271.40	7,256.3	-51.7	-3,264.5	3,264.9	0.32	0.32	0.00
10,384.0	89.40	271.30	7,256.7	-50.9	-3,296.5	3,296.9	0.70	0.63	-0.31
10,416.0	89.60	271.60	7,256.9	-50.1	-3,328.5	3,328.9	1.13	0.63	0.94
10,447.0	89.10	271.20	7,257.3	-49.3	-3,359.5	3,359.8	2.07	-1.61	-1.29
10,479.0	89.10	270.40	7,257.8	-48.9	-3,391.5	3,391.8	2.50	0.00	-2.50
10,511.0	89.30	270.70	7,258.2	-48.6	-3,423.5	3,423.8	1.13	0.63	0.94
10,542.0	89.50	270.80	7,258.6	-48.2	-3,454.5	3,454.8	0.72	0.65	0.32
10,573.0	89.60	270.70	7,258.8	-47.8	-3,485.5	3,485.8	0.46	0.32	-0.32
10,605.0	89.80	271.30	7,259.0	-47.2	-3,517.4	3,517.8	1.98	0.63	1.88
10,637.0	90.00	271.50	7,259.0	-46.4	-3,549.4	3,549.7	0.88	0.63	0.63
10,669.0	89.20	271.10	7,259.3	-45.7	-3,581.4	3,581.7	2.80	-2.50	-1.25
10,701.0	89.30	270.10	7,259.7	-45.4	-3,613.4	3,613.7	3.14	0.31	-3.13
10,732.0	89.50	270.50	7,260.0	-45.2	-3,644.4	3,644.7	1.44	0.65	1.29
10,764.0	89.90	270.80	7,260.2	-44.8	-3,676.4	3,676.7	1.56	1.25	0.94
10,796.0	89.30	270.40	7,260.4	-44.5	-3,708.4	3,708.7	2.25	-1.88	-1.25
10,827.0	89.20	269.10	7,260.8	-44.6	-3,739.4	3,739.7	4.21	-0.32	-4.19
10,859.0	89.40	268.80	7,261.2	-45.2	-3,771.4	3,771.7	1.13	0.63	-0.94
10,891.0	89.50	268.90	7,261.5	-45.9	-3,803.4	3,803.7	0.44	0.31	0.31
10,922.0	89.80	269.30	7,261.7	-46.4	-3,834.4	3,834.7	1.61	0.97	1.29
10,954.0	90.00	269.60	7,261.7	-46.7	-3,866.4	3,866.7	1.13	0.63	0.94
10,986.0	90.40	270.30	7,261.6	-46.7	-3,898.4	3,898.7	2.52	1.25	2.19
11,017.0	90.50	270.70	7,261.4	-46.4	-3,929.4	3,929.6	1.33	0.32	1.29
11,049.0	90.60	270.50	7,261.1	-46.1	-3,961.4	3,961.6	0.70	0.31	-0.63
11,080.0	90.90	270.80	7,260.7	-45.7	-3,992.4	3,992.6	1.37	0.97	0.97
11,112.0	91.00	270.70	7,260.1	-45.3	-4,024.4	4,024.6	0.44	0.31	-0.31
11,144.0	90.60	271.20	7,259.7	-44.8	-4,056.4	4,056.6	2.00	-1.25	1.56
11,175.0	89.90	271.00	7,259.6	-44.2	-4,087.4	4,087.6	2.35	-2.26	-0.65

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28V-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4921.0ft (RKB - 15')
Site:	Sunmarke 28V-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4921.0ft (RKB - 15')
Well:	Sunmarke 28V-434	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,207.0	89.80	270.80	7,259.7	-43.7	-4,119.4	4,119.6	0.70	-0.31	-0.63
11,239.0	89.90	270.70	7,259.7	-43.3	-4,151.3	4,151.5	0.44	0.31	-0.31
11,271.0	90.00	271.00	7,259.8	-42.8	-4,183.3	4,183.5	0.99	0.31	0.94
11,303.0	90.20	271.40	7,259.7	-42.1	-4,215.3	4,215.5	1.40	0.63	1.25
11,334.0	90.20	270.80	7,259.6	-41.5	-4,246.3	4,246.5	1.94	0.00	-1.94
11,366.0	90.30	271.30	7,259.5	-40.9	-4,278.3	4,278.5	1.59	0.31	1.56
11,397.0	90.60	271.60	7,259.2	-40.2	-4,309.3	4,309.5	1.37	0.97	0.97
11,429.0	90.80	271.70	7,258.8	-39.2	-4,341.3	4,341.4	0.70	0.63	0.31
11,460.0	90.90	272.10	7,258.4	-38.2	-4,372.3	4,372.4	1.33	0.32	1.29
11,492.0	90.70	271.80	7,257.9	-37.1	-4,404.3	4,404.3	1.13	-0.63	-0.94
11,524.0	91.30	271.40	7,257.4	-36.2	-4,436.2	4,436.3	2.25	1.88	-1.25
11,555.0	91.60	271.50	7,256.6	-35.4	-4,467.2	4,467.3	1.02	0.97	0.32
11,586.0	91.80	271.60	7,255.7	-34.6	-4,498.2	4,498.2	0.72	0.65	0.32
11,618.0	92.30	271.60	7,254.5	-33.7	-4,530.2	4,530.2	1.56	1.56	0.00
11,650.0	92.60	271.00	7,253.1	-33.0	-4,562.1	4,562.1	2.09	0.94	-1.88
11,700.9	92.60	271.00	7,250.8	-32.1	-4,612.9	4,612.9	0.00	0.00	0.00
BHL 1645'FNL, 500'FWL									
11,704.0	92.60	271.00	7,250.7	-32.0	-4,616.1	4,616.1	0.00	0.00	0.00

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,685.0	7,265.8	7"	7	7-1/2

Checked By: _____ Approved By: _____ Date: _____