

PETROLEUM DEVELOPMENT CORP Weld County CO

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

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

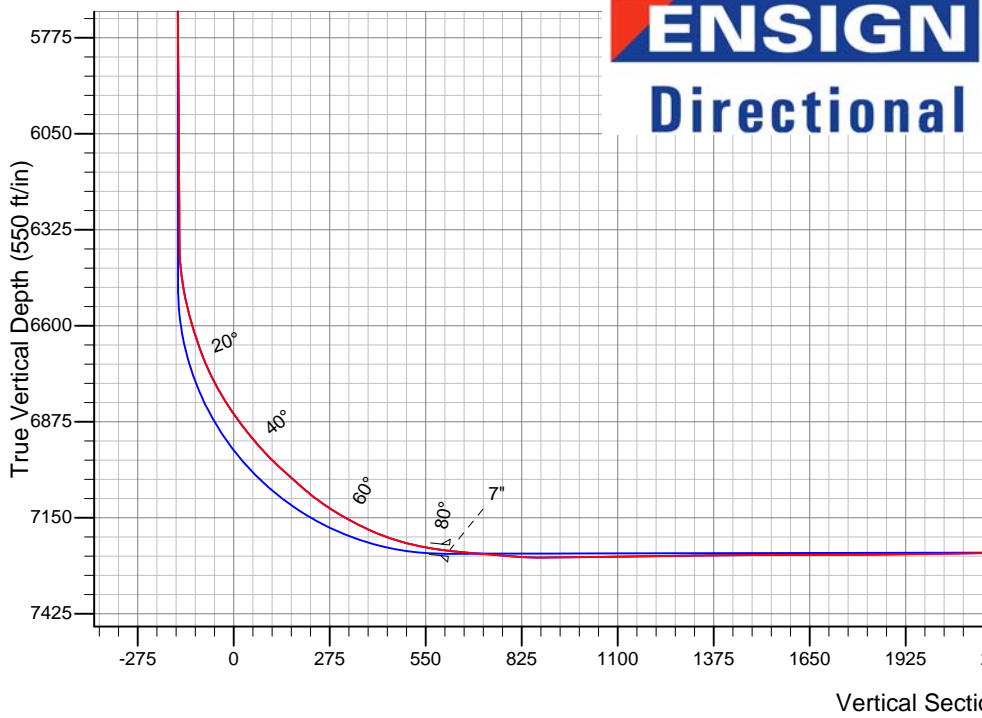
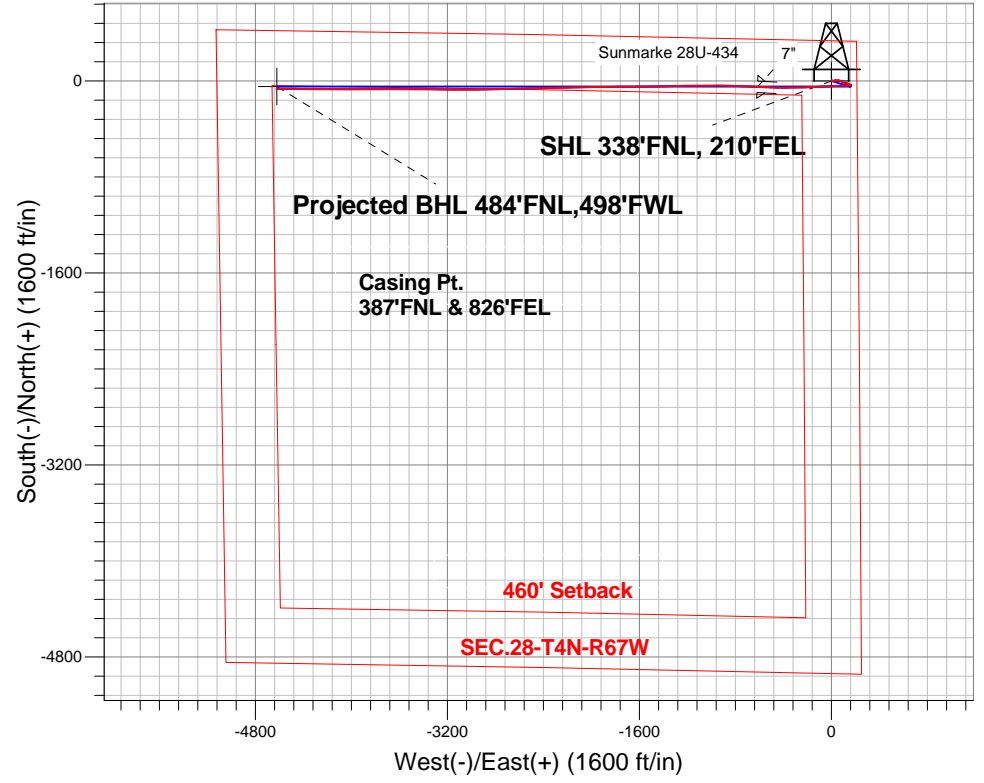
Ground Elevation: 4894.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1349090.16	3170999.64	40.290030	-104.887010	

Ensign 32 RKB - 15' WELL @ 4909.0ft (Ensign 32 RKB - 15')

FINAL SURVEY

Projected Bottom Hole Location
 11651'MD 7254'TVD 66'S & 4622'W of SHL
 90.3 degree Incl @ 269.8 degree AZM

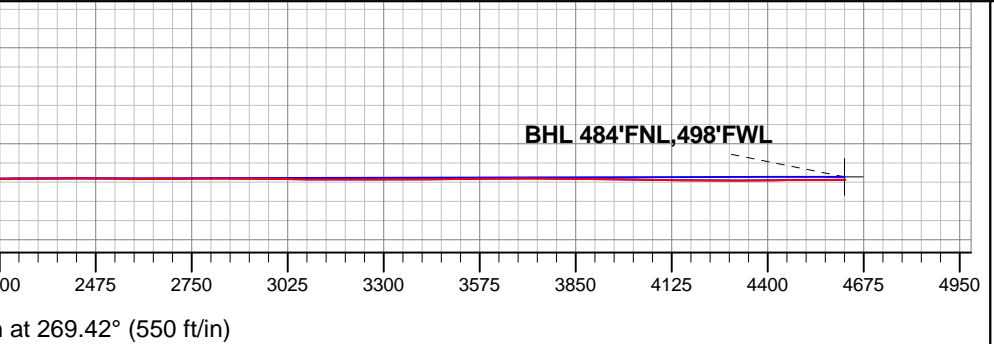


Sunmarke 28U-HZ Pad Sec.28-T4N-R67W
 Sunmarke 28U-434
 Wellbore #1
 11:01, August 11 2014

ANNOTATIONS
 No annotation data is available.

LEGEND

- Sunmarke 28U-434, Wellbore #1, Plan #4 (7-28-14) V0
- Wellbore #1
- Survey #1





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.28-T4N-R67W

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

Sunmarke 28U-434

Wellbore #1

Survey: Survey #1

Standard Survey Report

11 August, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28U-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4909.0ft (Ensign 32 RKB - 15')
Site:	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4909.0ft (Ensign 32 RKB - 15')
Well:	Sunmarke 28U-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 28U-HZ Pad Sec.28-T4N-R67W				
Site Position:		Northing:	1,349,119.31 ft	Latitude:	40.290110
From:	Lat/Long	Easting:	3,170,999.44 ft	Longitude:	-104.887010
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.40 °

Well	Sunmarke 28U-434					
Well Position	+N/-S	0.0 ft	Northing:	1,349,090.16 ft	Latitude:	40.290030
	+E/-W	0.0 ft	Easting:	3,170,999.64 ft	Longitude:	-104.887010
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,894.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/28/2014	8.50	66.83	52,732

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	269.42	

Survey Program	Date	8/11/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
153.0	11,651.0	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	51.80	1.0	0.0	0.0	0.0	0.33	0.33	0.00	
SHL 338°FNL, 210°FEL										
153.0	0.50	51.80	153.0	0.4	0.5	-0.5	0.33	0.33	0.00	
245.0	0.50	14.00	245.0	1.1	0.9	-0.9	0.35	0.00	-41.09	
337.0	0.70	43.00	337.0	1.9	1.4	-1.4	0.39	0.22	31.52	
428.0	0.80	79.40	428.0	2.4	2.4	-2.4	0.53	0.11	40.00	
519.0	0.60	84.80	519.0	2.5	3.5	-3.5	0.23	-0.22	5.93	
611.0	0.90	62.60	611.0	2.9	4.6	-4.7	0.45	0.33	-24.13	
702.0	0.60	44.10	702.0	3.6	5.6	-5.6	0.42	-0.33	-20.33	
793.0	0.70	66.90	793.0	4.1	6.5	-6.5	0.30	0.11	25.05	
888.0	0.40	121.30	888.0	4.2	7.3	-7.3	0.60	-0.32	57.26	

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Site:	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4909.0ft (Ensign 32 RKB - 15')
Well:	Sunmarke 28U-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)
951.0	0.90	186.80	950.9	3.6	7.4	-7.4	1.30	0.79	103.97
1,042.0	1.60	207.30	1,041.9	1.8	6.7	-6.7	0.90	0.77	22.53
1,134.0	0.70	192.70	1,133.9	0.1	6.0	-6.0	1.02	-0.98	-15.87
1,231.0	1.50	92.70	1,230.9	-0.6	7.2	-7.1	1.82	0.82	-103.09
1,326.0	1.40	90.30	1,325.9	-0.6	9.6	-9.6	0.12	-0.11	-2.53
1,420.0	1.00	87.20	1,419.8	-0.6	11.5	-11.5	0.43	-0.43	-3.30
1,515.0	2.20	81.30	1,514.8	-0.3	14.2	-14.2	1.27	1.26	-6.21
1,611.0	2.20	82.90	1,610.7	0.2	17.8	-17.8	0.06	0.00	1.67
1,706.0	1.80	68.80	1,705.7	1.0	21.0	-21.0	0.66	-0.42	-14.84
1,801.0	1.60	67.50	1,800.6	2.0	23.6	-23.6	0.21	-0.21	-1.37
1,896.0	2.50	73.30	1,895.6	3.1	26.8	-26.9	0.97	0.95	6.11
1,989.0	2.20	72.70	1,988.5	4.2	30.5	-30.5	0.32	-0.32	-0.65
2,084.0	2.50	97.50	2,083.4	4.5	34.3	-34.3	1.11	0.32	26.11
2,179.0	2.90	87.30	2,178.3	4.4	38.7	-38.8	0.66	0.42	-10.74
2,274.0	2.90	90.20	2,273.2	4.5	43.5	-43.6	0.15	0.00	3.05
2,369.0	2.90	86.00	2,368.1	4.6	48.3	-48.4	0.22	0.00	-4.42
2,464.0	3.70	90.20	2,462.9	4.8	53.8	-53.8	0.88	0.84	4.42
2,559.0	4.30	94.00	2,557.7	4.5	60.4	-60.5	0.69	0.63	4.00
2,654.0	4.60	103.80	2,652.4	3.4	67.7	-67.7	0.86	0.32	10.32
2,749.0	4.70	109.10	2,747.1	1.2	75.0	-75.1	0.46	0.11	5.58
2,843.0	4.20	120.70	2,840.8	-1.8	81.6	-81.6	1.09	-0.53	12.34
2,938.0	4.00	122.90	2,935.6	-5.4	87.4	-87.4	0.27	-0.21	2.32
3,033.0	4.50	122.60	3,030.3	-9.2	93.3	-93.2	0.53	0.53	-0.32
3,128.0	3.90	126.10	3,125.0	-13.1	99.1	-98.9	0.69	-0.63	3.68
3,223.0	3.40	107.80	3,219.8	-15.9	104.4	-104.2	1.33	-0.53	-19.26
3,318.0	3.00	102.50	3,314.7	-17.3	109.5	-109.3	0.52	-0.42	-5.58
3,413.0	4.00	93.20	3,409.5	-18.0	115.2	-115.0	1.21	1.05	-9.79
3,508.0	3.60	90.80	3,504.3	-18.2	121.5	-121.3	0.45	-0.42	-2.53
3,603.0	3.60	101.80	3,599.1	-18.9	127.4	-127.2	0.73	0.00	11.58
3,698.0	4.50	111.90	3,693.9	-20.9	133.8	-133.6	1.21	0.95	10.63
3,793.0	4.30	112.90	3,788.6	-23.7	140.5	-140.3	0.23	-0.21	1.05
3,887.0	4.20	114.40	3,882.4	-26.5	146.9	-146.6	0.16	-0.11	1.60
3,982.0	3.40	118.80	3,977.1	-29.3	152.6	-152.2	0.90	-0.84	4.63
4,078.0	2.30	115.70	4,073.0	-31.5	156.8	-156.5	1.16	-1.15	-3.23
4,172.0	2.10	117.90	4,167.0	-33.1	160.0	-159.7	0.23	-0.21	2.34
4,268.0	1.80	118.40	4,262.9	-34.6	162.9	-162.5	0.31	-0.31	0.52
4,363.0	1.60	122.50	4,357.9	-36.1	165.3	-164.9	0.25	-0.21	4.32
4,458.0	0.50	162.40	4,452.8	-37.2	166.6	-166.2	1.32	-1.16	42.00
4,553.0	0.30	182.20	4,547.8	-37.8	166.7	-166.3	0.25	-0.21	20.84
4,648.0	0.30	156.70	4,642.8	-38.3	166.8	-166.4	0.14	0.00	-26.84
4,743.0	0.30	185.80	4,737.8	-38.8	166.8	-166.4	0.16	0.00	30.63
4,838.0	0.20	251.10	4,832.8	-39.1	166.7	-166.2	0.30	-0.11	68.74
4,933.0	0.40	290.60	4,927.8	-39.0	166.2	-165.8	0.29	0.21	41.58
5,028.0	0.40	310.30	5,022.8	-38.7	165.6	-165.2	0.14	0.00	20.74
5,123.0	0.40	306.70	5,117.8	-38.2	165.1	-164.7	0.03	0.00	-3.79
5,218.0	0.50	300.80	5,212.8	-37.8	164.5	-164.1	0.12	0.11	-6.21
5,313.0	0.60	300.22	5,307.8	-37.4	163.7	-163.3	0.11	0.11	-0.61
5,408.0	0.70	302.90	5,402.8	-36.8	162.8	-162.4	0.11	0.11	2.82
5,502.0	0.60	305.80	5,496.8	-36.2	161.9	-161.5	0.11	-0.11	3.09
5,598.0	0.50	277.80	5,592.8	-35.9	161.1	-160.7	0.30	-0.10	-29.17
5,693.0	0.40	247.60	5,687.8	-35.9	160.4	-160.0	0.27	-0.11	-31.79
5,788.0	0.50	253.50	5,782.8	-36.2	159.7	-159.3	0.12	0.11	6.21
5,883.0	0.40	248.50	5,877.8	-36.4	159.0	-158.6	0.11	-0.11	-5.26
5,977.0	0.40	275.80	5,971.8	-36.5	158.3	-157.9	0.20	0.00	29.04

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6,072.0	0.30	268.90	6,066.8	-36.5	157.7	-157.4	0.11	-0.11	-7.26
6,167.0	0.40	246.50	6,161.8	-36.6	157.2	-156.8	0.18	0.11	-23.58
6,262.0	0.40	234.00	6,256.8	-36.9	156.6	-156.2	0.09	0.00	-13.16
6,325.0	0.40	257.40	6,319.8	-37.1	156.2	-155.8	0.26	0.00	37.14
6,357.0	0.40	233.80	6,351.8	-37.2	156.0	-155.6	0.51	0.00	-73.75
6,389.0	1.50	263.70	6,383.8	-37.3	155.5	-155.1	3.66	3.44	93.44
6,420.0	4.00	265.50	6,414.7	-37.4	154.0	-153.6	8.07	8.06	5.81
6,452.0	6.50	269.10	6,446.6	-37.6	151.1	-150.7	7.88	7.81	11.25
6,484.0	8.80	268.10	6,478.3	-37.7	146.9	-146.5	7.20	7.19	-3.13
6,515.0	11.00	265.10	6,508.9	-38.0	141.5	-141.1	7.29	7.10	-9.68
6,547.0	13.10	263.50	6,540.1	-38.7	134.9	-134.5	6.64	6.56	-5.00
6,579.0	15.00	264.40	6,571.2	-39.5	127.2	-126.8	5.98	5.94	2.81
6,610.0	16.40	266.50	6,601.0	-40.1	118.8	-118.4	4.87	4.52	6.77
6,642.0	17.90	269.80	6,631.6	-40.4	109.4	-109.0	5.59	4.69	10.31
6,673.0	19.70	271.10	6,661.0	-40.4	99.4	-99.0	5.96	5.81	4.19
6,705.0	21.60	270.90	6,690.9	-40.2	88.1	-87.7	5.94	5.94	-0.63
6,737.0	23.80	268.60	6,720.4	-40.2	75.8	-75.3	7.41	6.88	-7.19
6,769.0	26.20	267.90	6,749.4	-40.6	62.2	-61.8	7.56	7.50	-2.19
6,800.0	28.80	267.30	6,776.9	-41.2	47.9	-47.5	8.43	8.39	-1.94
6,832.0	31.40	266.60	6,804.6	-42.1	31.9	-31.5	8.20	8.13	-2.19
6,864.0	33.60	266.20	6,831.6	-43.2	14.8	-14.3	6.91	6.88	-1.25
6,895.0	35.20	266.90	6,857.2	-44.2	-2.7	3.2	5.32	5.16	2.26
6,927.0	36.70	267.30	6,883.1	-45.2	-21.5	21.9	4.74	4.69	1.25
6,959.0	38.60	267.40	6,908.4	-46.1	-41.0	41.5	5.94	5.94	0.31
6,990.0	40.70	267.90	6,932.3	-46.9	-60.8	61.2	6.85	6.77	1.61
7,022.0	42.50	267.60	6,956.2	-47.7	-82.0	82.5	5.66	5.63	-0.94
7,054.0	44.80	266.90	6,979.3	-48.8	-104.1	104.6	7.34	7.19	-2.19
7,086.0	46.60	267.10	7,001.7	-50.0	-126.9	127.4	5.64	5.63	0.63
7,118.0	48.00	267.60	7,023.4	-51.1	-150.4	150.9	4.52	4.38	1.56
7,150.0	48.30	268.20	7,044.7	-52.0	-174.2	174.8	1.68	0.94	1.88
7,181.0	49.30	268.40	7,065.2	-52.6	-197.6	198.1	3.26	3.23	0.65
7,213.0	51.60	269.30	7,085.5	-53.1	-222.2	222.8	7.51	7.19	2.81
7,245.0	54.20	269.30	7,104.8	-53.4	-247.7	248.3	8.13	8.13	0.00
7,276.0	56.80	269.10	7,122.4	-53.8	-273.3	273.8	8.40	8.39	-0.65
7,308.0	59.10	268.80	7,139.4	-54.3	-300.4	300.9	7.23	7.19	-0.94
7,340.0	61.40	268.80	7,155.3	-54.9	-328.2	328.7	7.19	7.19	0.00
7,371.0	63.40	269.00	7,169.6	-55.4	-355.6	356.2	6.48	6.45	0.65
7,403.0	65.10	269.70	7,183.5	-55.7	-384.5	385.0	5.67	5.31	2.19
7,435.0	67.90	270.40	7,196.3	-55.7	-413.8	414.4	8.98	8.75	2.19
7,466.0	70.50	270.90	7,207.3	-55.4	-442.8	443.3	8.52	8.39	1.61
7,498.0	73.50	271.50	7,217.2	-54.7	-473.2	473.7	9.54	9.38	1.88
7,530.0	76.30	271.70	7,225.5	-53.9	-504.1	504.6	8.77	8.75	0.63
7,562.0	78.70	272.00	7,232.4	-52.9	-535.3	535.8	7.56	7.50	0.94
7,593.0	80.70	272.30	7,238.0	-51.7	-565.8	566.3	6.52	6.45	0.97
7,605.0	81.40	272.40	7,239.8	-51.2	-577.6	578.1	5.89	5.83	0.83
7,639.0	83.20	273.10	7,244.4	-49.6	-611.3	611.8	5.67	5.29	2.06
7,643.9	83.41	273.08	7,245.0	-49.4	-616.1	616.6	4.21	4.19	-0.32
7"									
7,670.0	84.50	273.00	7,247.7	-48.0	-642.1	642.5	4.21	4.19	-0.32
7,700.0	85.40	272.70	7,250.4	-46.5	-671.9	672.3	3.16	3.00	-1.00
7,730.0	85.30	272.40	7,252.8	-45.2	-701.8	702.2	1.05	-0.33	-1.00
7,760.0	85.10	272.00	7,255.3	-44.0	-731.6	732.1	1.49	-0.67	-1.33
7,791.0	85.10	272.00	7,258.0	-42.9	-762.5	762.9	0.00	0.00	0.00

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

Survey									
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7,824.0	85.50	271.60	7,260.7	-41.9	-795.4	795.8	1.71	1.21	-1.21
7,854.0	86.50	271.00	7,262.7	-41.2	-825.3	825.7	3.88	3.33	-2.00
7,884.0	88.30	270.50	7,264.1	-40.8	-855.3	855.6	6.23	6.00	-1.67
7,916.0	90.00	271.00	7,264.6	-40.4	-887.3	887.6	5.54	5.31	1.56
7,945.0	90.20	270.70	7,264.5	-40.0	-916.3	916.6	1.24	0.69	-1.03
7,975.0	90.40	270.20	7,264.4	-39.8	-946.3	946.6	1.80	0.67	-1.67
8,005.0	90.90	270.20	7,264.0	-39.6	-976.3	976.6	1.67	1.67	0.00
8,036.0	91.00	270.10	7,263.5	-39.6	-1,007.3	1,007.6	0.46	0.32	-0.32
8,066.0	91.00	270.20	7,263.0	-39.5	-1,037.2	1,037.6	0.33	0.00	0.33
8,097.0	91.30	270.00	7,262.4	-39.4	-1,068.2	1,068.6	1.16	0.97	-0.65
8,127.0	91.40	270.10	7,261.7	-39.4	-1,098.2	1,098.6	0.47	0.33	0.33
8,158.0	91.10	269.40	7,261.0	-39.5	-1,129.2	1,129.6	2.46	-0.97	-2.26
8,188.0	90.90	268.80	7,260.5	-40.0	-1,159.2	1,159.6	2.11	-0.67	-2.00
8,219.0	90.70	269.00	7,260.0	-40.6	-1,190.2	1,190.6	0.91	-0.65	0.65
8,249.0	90.70	268.70	7,259.7	-41.2	-1,220.2	1,220.6	1.00	0.00	-1.00
8,280.0	90.80	268.80	7,259.3	-41.9	-1,251.2	1,251.6	0.46	0.32	0.32
8,310.0	90.80	268.80	7,258.8	-42.5	-1,281.2	1,281.5	0.00	0.00	0.00
8,341.0	90.90	268.60	7,258.4	-43.2	-1,312.2	1,312.5	0.72	0.32	-0.65
8,371.0	90.70	268.60	7,258.0	-44.0	-1,342.2	1,342.5	0.67	-0.67	0.00
8,402.0	90.40	268.90	7,257.7	-44.6	-1,373.1	1,373.5	1.37	-0.97	0.97
8,434.0	90.00	269.20	7,257.6	-45.2	-1,405.1	1,405.5	1.56	-1.25	0.94
8,465.0	90.10	269.50	7,257.5	-45.5	-1,436.1	1,436.5	1.02	0.32	0.97
8,497.0	90.10	269.50	7,257.5	-45.8	-1,468.1	1,468.5	0.00	0.00	0.00
8,528.0	90.30	269.40	7,257.4	-46.1	-1,499.1	1,499.5	0.72	0.65	-0.32
8,558.0	90.30	269.40	7,257.2	-46.4	-1,529.1	1,529.5	0.00	0.00	0.00
8,589.0	90.30	269.50	7,257.0	-46.7	-1,560.1	1,560.5	0.32	0.00	0.32
8,621.0	90.20	269.50	7,256.9	-47.0	-1,592.1	1,592.5	0.31	-0.31	0.00
8,653.0	90.30	269.50	7,256.8	-47.3	-1,624.1	1,624.5	0.31	0.31	0.00
8,685.0	90.40	269.50	7,256.6	-47.5	-1,656.1	1,656.5	0.31	0.31	0.00
8,716.0	90.30	269.60	7,256.4	-47.8	-1,687.1	1,687.5	0.46	-0.32	0.32
8,748.0	90.10	269.50	7,256.3	-48.0	-1,719.1	1,719.5	0.70	-0.63	-0.31
8,780.0	90.10	269.40	7,256.2	-48.3	-1,751.1	1,751.5	0.31	0.00	-0.31
8,811.0	90.20	269.40	7,256.1	-48.7	-1,782.1	1,782.5	0.32	0.32	0.00
8,843.0	90.40	269.10	7,256.0	-49.1	-1,814.1	1,814.5	1.13	0.63	-0.94
8,875.0	90.40	269.20	7,255.7	-49.6	-1,846.1	1,846.5	0.31	0.00	0.31
8,906.0	90.60	269.00	7,255.5	-50.0	-1,877.1	1,877.5	0.91	0.65	-0.65
8,938.0	90.70	268.90	7,255.1	-50.6	-1,909.1	1,909.5	0.44	0.31	-0.31
8,970.0	90.70	269.20	7,254.7	-51.2	-1,941.1	1,941.5	0.94	0.00	0.94
9,001.0	90.90	269.20	7,254.3	-51.6	-1,972.1	1,972.5	0.65	0.65	0.00
9,033.0	90.90	269.40	7,253.8	-52.0	-2,004.1	2,004.5	0.62	0.00	0.63
9,065.0	91.10	269.40	7,253.2	-52.3	-2,036.1	2,036.5	0.63	0.63	0.00
9,096.0	91.40	269.30	7,252.5	-52.7	-2,067.1	2,067.5	1.02	0.97	-0.32
9,128.0	91.50	269.30	7,251.7	-53.1	-2,099.1	2,099.5	0.31	0.31	0.00
9,159.0	90.70	269.50	7,251.1	-53.4	-2,130.0	2,130.5	2.66	-2.58	0.65
9,191.0	90.60	269.30	7,250.8	-53.7	-2,162.0	2,162.5	0.70	-0.31	-0.63
9,223.0	90.70	269.00	7,250.4	-54.2	-2,194.0	2,194.5	0.99	0.31	-0.94
9,254.0	90.70	269.00	7,250.0	-54.7	-2,225.0	2,225.5	0.00	0.00	0.00
9,286.0	90.60	268.80	7,249.7	-55.4	-2,257.0	2,257.5	0.70	-0.31	-0.63
9,317.0	90.40	268.50	7,249.4	-56.1	-2,288.0	2,288.5	1.16	-0.65	-0.97
9,349.0	90.30	268.30	7,249.2	-57.0	-2,320.0	2,320.5	0.70	-0.31	-0.63
9,381.0	90.00	268.30	7,249.1	-57.9	-2,352.0	2,352.5	0.94	-0.94	0.00
9,412.0	89.70	268.20	7,249.2	-58.9	-2,383.0	2,383.4	1.02	-0.97	-0.32
9,444.0	89.60	268.00	7,249.4	-59.9	-2,415.0	2,415.4	0.70	-0.31	-0.63

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28U-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4909.0ft (Ensign 32 RKB - 15')
Site:	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4909.0ft (Ensign 32 RKB - 15')
Well:	Sunmarke 28U-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)
9,476.0	89.60	267.80	7,249.6	-61.1	-2,446.9	2,447.4	0.62	0.00	-0.63
9,507.0	89.40	268.00	7,249.9	-62.2	-2,477.9	2,478.4	0.91	-0.65	0.65
9,539.0	89.60	268.30	7,250.2	-63.3	-2,509.9	2,510.4	1.13	0.63	0.94
9,571.0	89.50	268.20	7,250.4	-64.2	-2,541.9	2,542.4	0.44	-0.31	-0.31
9,603.0	89.60	268.00	7,250.7	-65.3	-2,573.9	2,574.4	0.70	0.31	-0.63
9,634.0	89.80	268.20	7,250.8	-66.3	-2,604.8	2,605.4	0.91	0.65	0.65
9,666.0	89.90	269.00	7,250.9	-67.1	-2,636.8	2,637.4	2.52	0.31	2.50
9,698.0	90.30	269.20	7,250.9	-67.6	-2,668.8	2,669.4	1.40	1.25	0.63
9,729.0	90.60	269.20	7,250.6	-68.1	-2,699.8	2,700.4	0.97	0.97	0.00
9,761.0	90.40	269.50	7,250.3	-68.4	-2,731.8	2,732.4	1.13	-0.63	0.94
9,793.0	90.50	269.10	7,250.1	-68.8	-2,763.8	2,764.4	1.29	0.31	-1.25
9,824.0	90.40	269.60	7,249.9	-69.2	-2,794.8	2,795.4	1.64	-0.32	1.61
9,856.0	90.10	269.90	7,249.7	-69.3	-2,826.8	2,827.4	1.33	-0.94	0.94
9,888.0	89.80	269.70	7,249.7	-69.4	-2,858.8	2,859.4	1.13	-0.94	-0.63
9,919.0	89.50	269.40	7,249.9	-69.7	-2,889.8	2,890.4	1.37	-0.97	-0.97
9,951.0	89.50	269.10	7,250.2	-70.1	-2,921.8	2,922.4	0.94	0.00	-0.94
9,983.0	89.50	269.20	7,250.5	-70.5	-2,953.8	2,954.4	0.31	0.00	0.31
10,014.0	89.30	269.10	7,250.8	-71.0	-2,984.8	2,985.4	0.72	-0.65	-0.32
10,046.0	89.20	269.20	7,251.2	-71.5	-3,016.8	3,017.4	0.44	-0.31	0.31
10,077.0	89.10	269.20	7,251.7	-71.9	-3,047.8	3,048.4	0.32	-0.32	0.00
10,109.0	89.40	269.90	7,252.1	-72.2	-3,079.8	3,080.4	2.38	0.94	2.19
10,141.0	89.60	270.20	7,252.4	-72.1	-3,111.8	3,112.4	1.13	0.63	0.94
10,172.0	89.80	270.30	7,252.6	-72.0	-3,142.8	3,143.3	0.72	0.65	0.32
10,204.0	89.90	270.30	7,252.6	-71.8	-3,174.8	3,175.3	0.31	0.31	0.00
10,236.0	90.00	270.40	7,252.7	-71.6	-3,206.8	3,207.3	0.44	0.31	0.31
10,268.0	90.10	270.30	7,252.6	-71.4	-3,238.8	3,239.3	0.44	0.31	-0.31
10,299.0	90.00	270.30	7,252.6	-71.3	-3,269.8	3,270.3	0.32	-0.32	0.00
10,331.0	90.20	270.40	7,252.6	-71.1	-3,301.8	3,302.3	0.70	0.63	0.31
10,363.0	90.10	270.50	7,252.5	-70.8	-3,333.8	3,334.3	0.44	-0.31	0.31
10,394.0	90.30	270.60	7,252.4	-70.5	-3,364.8	3,365.3	0.72	0.65	0.32
10,426.0	90.30	271.00	7,252.2	-70.1	-3,396.8	3,397.3	1.25	0.00	1.25
10,458.0	90.50	271.00	7,252.0	-69.5	-3,428.8	3,429.3	0.63	0.63	0.00
10,490.0	90.50	271.00	7,251.7	-69.0	-3,460.8	3,461.3	0.00	0.00	0.00
10,521.0	90.50	270.80	7,251.4	-68.5	-3,491.8	3,492.3	0.65	0.00	-0.65
10,553.0	90.50	270.50	7,251.1	-68.1	-3,523.7	3,524.3	0.94	0.00	-0.94
10,584.0	90.50	270.50	7,250.9	-67.9	-3,554.7	3,555.3	0.00	0.00	0.00
10,616.0	90.40	270.30	7,250.6	-67.6	-3,586.7	3,587.2	0.70	-0.31	-0.63
10,648.0	90.50	270.20	7,250.4	-67.5	-3,618.7	3,619.2	0.44	0.31	-0.31
10,680.0	90.70	269.80	7,250.0	-67.5	-3,650.7	3,651.2	1.40	0.63	-1.25
10,711.0	90.50	270.20	7,249.7	-67.5	-3,681.7	3,682.2	1.44	-0.65	1.29
10,743.0	90.10	269.80	7,249.5	-67.5	-3,713.7	3,714.2	1.77	-1.25	-1.25
10,775.0	89.60	269.40	7,249.6	-67.7	-3,745.7	3,746.2	2.00	-1.56	-1.25
10,806.0	89.40	269.00	7,249.9	-68.1	-3,776.7	3,777.2	1.44	-0.65	-1.29
10,838.0	89.50	269.10	7,250.2	-68.7	-3,808.7	3,809.2	0.44	0.31	0.31
10,870.0	89.40	269.50	7,250.5	-69.1	-3,840.7	3,841.2	1.29	-0.31	1.25
10,901.0	89.20	270.00	7,250.9	-69.2	-3,871.7	3,872.2	1.74	-0.65	1.61
10,932.0	89.10	270.30	7,251.3	-69.1	-3,902.7	3,903.2	1.02	-0.32	0.97
10,964.0	88.90	270.30	7,251.9	-69.0	-3,934.7	3,935.2	0.63	-0.63	0.00
10,996.0	88.90	270.40	7,252.5	-68.8	-3,966.7	3,967.2	0.31	0.00	0.31
11,028.0	89.30	270.20	7,253.0	-68.6	-3,998.7	3,999.2	1.40	1.25	-0.63
11,059.0	89.20	270.10	7,253.4	-68.5	-4,029.7	4,030.2	0.46	-0.32	-0.32
11,091.0	89.10	270.00	7,253.9	-68.5	-4,061.7	4,062.2	0.44	-0.31	-0.31
11,123.0	89.30	270.00	7,254.3	-68.5	-4,093.7	4,094.2	0.63	0.63	0.00
11,155.0	89.20	270.30	7,254.8	-68.4	-4,125.7	4,126.2	0.99	-0.31	0.94

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Sunmarke 28U-434
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4909.0ft (Ensign 32 RKB - 15')
Site:	Sunmarke 28U-HZ Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4909.0ft (Ensign 32 RKB - 15')
Well:	Sunmarke 28U-434	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
11,186.0	89.50	270.20	7,255.1	-68.3	-4,156.7	4,157.2	1.02	0.97	-0.32
11,218.0	89.80	269.90	7,255.3	-68.2	-4,188.7	4,189.2	1.33	0.94	-0.94
11,250.0	89.90	270.00	7,255.4	-68.3	-4,220.7	4,221.2	0.44	0.31	0.31
11,281.0	90.20	270.20	7,255.4	-68.2	-4,251.7	4,252.2	1.16	0.97	0.65
11,313.0	90.20	270.40	7,255.3	-68.0	-4,283.7	4,284.2	0.62	0.00	0.63
11,345.0	90.30	270.40	7,255.1	-67.8	-4,315.7	4,316.1	0.31	0.31	0.00
11,376.0	90.40	270.50	7,254.9	-67.6	-4,346.7	4,347.1	0.46	0.32	0.32
11,408.0	90.40	270.60	7,254.7	-67.3	-4,378.7	4,379.1	0.31	0.00	0.31
11,440.0	90.40	270.40	7,254.5	-67.0	-4,410.7	4,411.1	0.62	0.00	-0.63
11,471.0	90.10	270.70	7,254.3	-66.7	-4,441.7	4,442.1	1.37	-0.97	0.97
11,503.0	90.10	270.60	7,254.3	-66.3	-4,473.7	4,474.1	0.31	0.00	-0.31
11,535.0	90.20	270.10	7,254.2	-66.1	-4,505.7	4,506.1	1.59	0.31	-1.56
11,566.0	90.50	269.90	7,254.0	-66.1	-4,536.7	4,537.1	1.16	0.97	-0.65
11,597.0	90.30	269.80	7,253.8	-66.2	-4,567.7	4,568.1	0.72	-0.65	-0.32
11,649.2	90.30	269.80	7,253.5	-66.4	-4,619.8	4,620.3	0.00	0.00	0.00
BHL 465'FNL,500'FWL									
11,651.0	90.30	269.80	7,253.5	-66.4	-4,621.7	4,622.1	0.00	0.00	0.00

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,643.9	7,245.0	7"	7	7-1/2

Checked By: _____ Approved By: _____ Date: _____