

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: Alm 33V-234

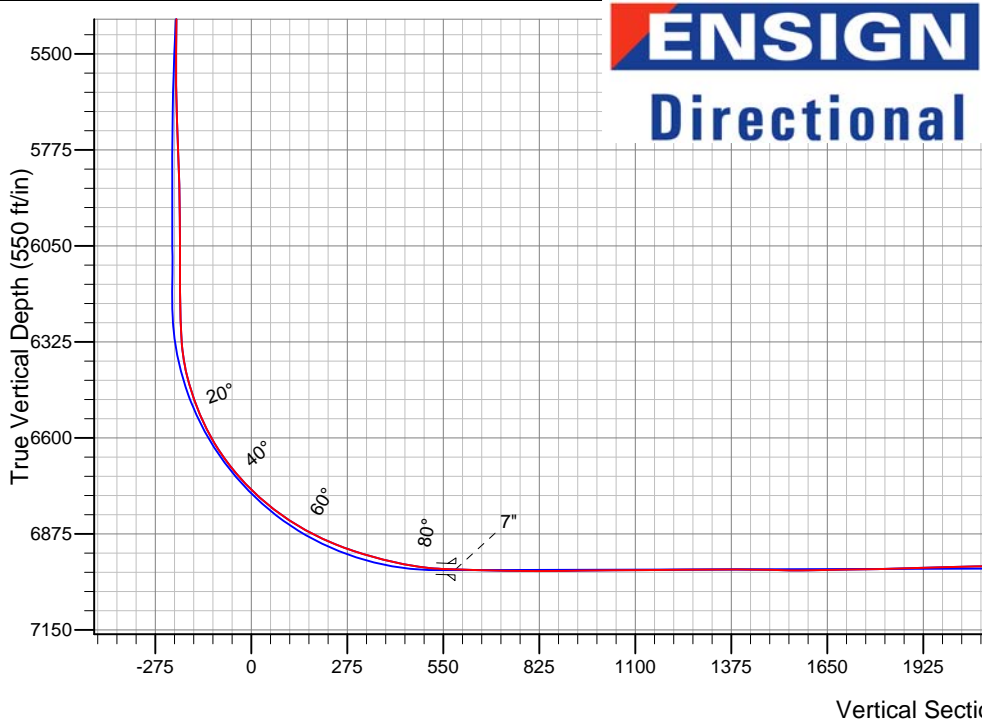
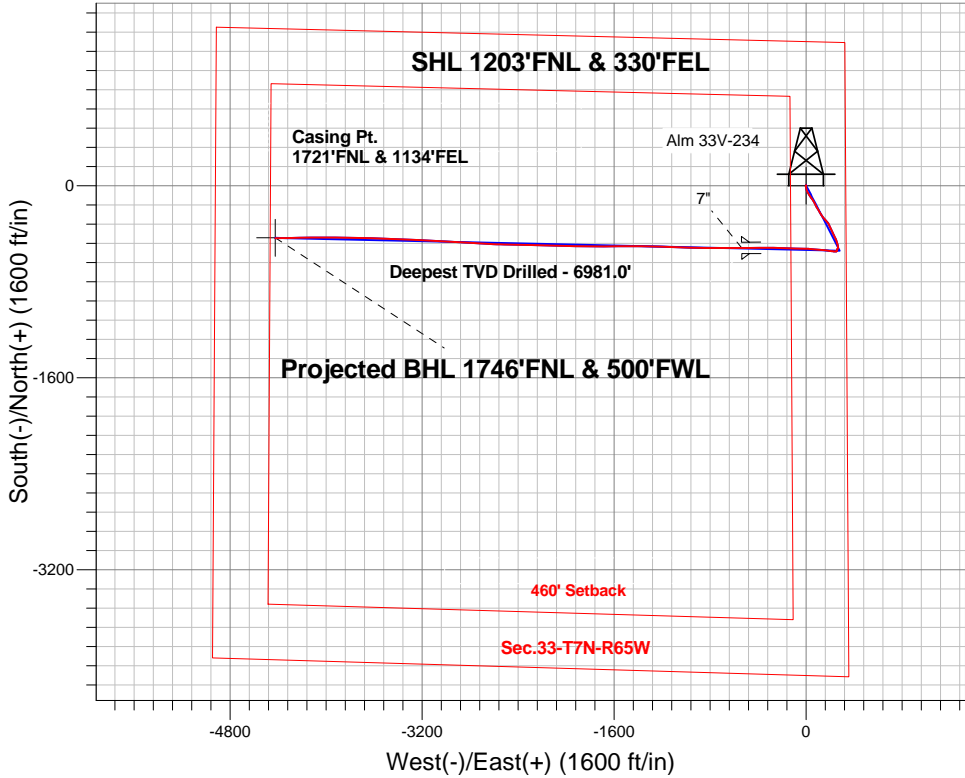
Surface Location: Alm 33V-HZ Pad South Sec.33-T7N-R65W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4790.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1438723.15	3233474.94	40.534660	-104.660020	
Ensign Rig #134 RKB - 13' WELL @ 4803.0ft (Ensign Rig #134 RKB - 13')						

FINAL SURVEY

Projected Bottom Hole Location  
11383'MD 6967'TVD 436'S & 4425'W of SHL  
90.2 degree Incl @ 269.0 degree AZM



Alm 33V-HZ Pad South Sec.33-T7N-R65W  
Alm 33V-234  
Wellbore #1

ANNOTATIONS

TVD	MD	Annotation
6981.0	7760.0	Deepest TVD Drilled - 6981.0

LEGEND

- Alm 33V-234, Wellbore #1, Plan #4 (4-9-15) V0
- Wellbore #1
- Survey #1

BHL 1746\'FNL & 500\'FWL



# **PETROLEUM DEVELOPMENT CORP Weld County CO**

**Sec.33-T7N-R65W**

**Alm 33V-HZ Pad South Sec.33-T7N-R65W**

**Alm 33V-234**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**15 April, 2015**

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Alm 33V-234
<b>Project:</b>	Sec.33-T7N-R65W	<b>TVD Reference:</b>	WELL @ 4803.0ft (Ensign Rig #134 RKB - 13')
<b>Site:</b>	Alm 33V-HZ Pad South Sec.33-T7N-R65W	<b>MD Reference:</b>	WELL @ 4803.0ft (Ensign Rig #134 RKB - 13')
<b>Well:</b>	Alm 33V-234	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

<b>Project</b>	Sec.33-T7N-R65W, Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

Site		Alm 33V-HZ Pad South Sec.33-T7N-R65W			
Site Position:		Northing:	1,438,694.05 ft	Latitude:	40.534580
From:	Lat/Long	Easting:	3,233,475.22 ft	Longitude:	-104.660020
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.54 °

Well	Alm 33V-234					
Well Position	+N-S	0.0 ft	Northing:	1,438,723.15 ft	Latitude:	40.534660
	+E-W	0.0 ft	Easting:	3,233,474.94 ft	Longitude:	-104.660020
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,790.0 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	4/7/2015	8.30	67.04	52,811

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	264.41	

<b>Survey Program</b>	<b>Date</b>	4/15/2015			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
71.0	11,383.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
1.0	0.01	18.70	1.0	0.0	0.0	0.0	0.56	0.56	0.00	
<b>SHL 1203'FNL &amp; 330'FEL</b>										
71.0	0.40	18.70	71.0	0.2	0.1	-0.1	0.56	0.56	0.00	
174.0	0.60	14.10	174.0	1.1	0.3	-0.4	0.20	0.19	-4.47	
256.0	0.70	15.50	256.0	2.0	0.6	-0.8	0.12	0.12	1.71	
349.0	0.50	38.00	349.0	2.9	1.0	-1.2	0.33	-0.22	24.19	
441.0	0.30	3.70	441.0	3.4	1.2	-1.6	0.33	-0.22	-37.28	
533.0	0.40	340.00	533.0	4.0	1.1	-1.5	0.19	0.11	-25.76	
625.0	0.40	352.10	625.0	4.6	1.0	-1.4	0.09	0.00	13.15	
718.0	0.30	306.20	718.0	5.0	0.7	-1.2	0.31	-0.11	-49.35	
810.0	0.40	258.10	810.0	5.1	0.2	-0.7	0.33	0.11	-52.28	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Alm 33V-234
<b>Project:</b>	Sec.33-T7N-R65W	<b>TVD Reference:</b>	WELL @ 4803.0ft (Ensign Rig #134 RKB - 13')
<b>Site:</b>	Alm 33V-HZ Pad South Sec.33-T7N-R65W	<b>MD Reference:</b>	WELL @ 4803.0ft (Ensign Rig #134 RKB - 13')
<b>Well:</b>	Alm 33V-234	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
878.0	0.50	260.90	878.0	5.0	-0.3	-0.2	0.15	0.15	4.12
1,015.0	1.10	289.70	1,015.0	5.4	-2.1	1.6	0.51	0.44	21.02
1,108.0	2.10	178.30	1,107.9	4.0	-2.9	2.5	2.91	1.08	-119.79
1,200.0	2.10	181.60	1,199.9	0.6	-2.9	2.8	0.13	0.00	3.59
1,292.0	4.20	170.00	1,291.7	-4.4	-2.4	2.8	2.37	2.28	-12.61
1,384.0	4.30	170.90	1,383.5	-11.1	-1.2	2.3	0.13	0.11	0.98
1,477.0	5.80	168.10	1,476.1	-19.2	0.3	1.6	1.63	1.61	-3.01
1,569.0	5.50	166.00	1,567.7	-28.0	2.3	0.4	0.40	-0.33	-2.28
1,662.0	7.40	158.10	1,660.1	-37.9	5.6	-1.9	2.25	2.04	-8.49
1,754.0	9.20	153.70	1,751.1	-50.0	11.1	-6.2	2.07	1.96	-4.78
1,847.0	9.00	149.30	1,842.9	-62.9	18.1	-11.9	0.78	-0.22	-4.73
1,939.0	9.20	147.30	1,933.8	-75.3	25.7	-18.3	0.41	0.22	-2.17
2,032.0	8.50	148.20	2,025.7	-87.4	33.4	-24.7	0.77	-0.75	0.97
2,124.0	8.00	145.60	2,116.7	-98.4	40.6	-30.8	0.68	-0.54	-2.83
2,216.0	7.00	141.20	2,207.9	-108.1	47.7	-37.0	1.25	-1.09	-4.78
2,309.0	6.70	139.40	2,300.3	-116.6	54.8	-43.2	0.40	-0.32	-1.94
2,401.0	7.10	155.10	2,391.6	-125.8	60.7	-48.1	2.09	0.43	17.07
2,494.0	6.50	153.00	2,484.0	-135.7	65.5	-52.0	0.70	-0.65	-2.26
2,586.0	8.60	152.30	2,575.2	-146.5	71.0	-56.4	2.28	2.28	-0.76
2,681.0	8.40	151.00	2,669.1	-158.8	77.7	-61.9	0.29	-0.21	-1.37
2,777.0	8.20	151.60	2,764.1	-171.0	84.4	-67.3	0.23	-0.21	0.63
2,872.0	8.00	149.50	2,858.2	-182.6	90.9	-72.7	0.38	-0.21	-2.21
2,967.0	8.00	145.10	2,952.2	-193.8	98.1	-78.7	0.64	0.00	-4.63
3,062.0	9.80	152.60	3,046.1	-206.4	105.6	-85.0	2.25	1.89	7.89
3,157.0	9.90	148.90	3,139.7	-220.5	113.5	-91.5	0.67	0.11	-3.89
3,252.0	10.00	148.20	3,233.3	-234.5	122.1	-98.7	0.17	0.11	-0.74
3,347.0	9.90	146.10	3,326.8	-248.3	131.0	-106.2	0.40	-0.11	-2.21
3,443.0	9.20	141.50	3,421.5	-261.2	140.4	-114.3	1.08	-0.73	-4.79
3,538.0	8.90	141.00	3,515.3	-272.8	149.7	-122.4	0.33	-0.32	-0.53
3,633.0	9.00	137.10	3,609.2	-284.0	159.4	-131.0	0.65	0.11	-4.11
3,728.0	8.60	134.90	3,703.0	-294.4	169.5	-140.0	0.55	-0.42	-2.32
3,823.0	7.80	139.10	3,797.1	-304.3	178.8	-148.3	1.05	-0.84	4.42
3,918.0	8.80	156.30	3,891.1	-315.9	185.9	-154.2	2.80	1.05	18.11
4,013.0	9.50	154.90	3,984.9	-329.6	192.1	-159.1	0.77	0.74	-1.47
4,109.0	9.80	153.10	4,079.5	-344.1	199.2	-164.7	0.44	0.31	-1.88
4,204.0	9.60	152.60	4,173.2	-358.3	206.5	-170.6	0.23	-0.21	-0.53
4,299.0	9.20	155.30	4,266.9	-372.3	213.3	-176.0	0.63	-0.42	2.84
4,396.0	8.90	156.30	4,362.7	-386.2	219.6	-180.9	0.35	-0.31	1.03
4,489.0	8.60	156.00	4,454.6	-399.1	225.3	-185.4	0.33	-0.32	-0.32
4,584.0	8.40	154.20	4,548.6	-411.8	231.2	-190.0	0.35	-0.21	-1.89
4,680.0	8.30	153.70	4,643.5	-424.4	237.3	-194.9	0.13	-0.10	-0.52
4,775.0	7.20	154.40	4,737.7	-435.9	242.9	-199.3	1.16	-1.16	0.74
4,870.0	6.10	153.70	4,832.0	-445.8	247.7	-203.1	1.16	-1.16	-0.74
4,965.0	5.40	155.60	4,926.6	-454.4	251.8	-206.4	0.76	-0.74	2.00
5,060.0	7.10	166.00	5,021.0	-464.1	255.1	-208.7	2.14	1.79	10.95
5,155.0	7.00	166.90	5,115.3	-475.5	257.8	-210.3	0.16	-0.11	0.95
5,251.0	6.60	166.50	5,210.6	-486.5	260.4	-211.8	0.42	-0.42	-0.42
5,346.0	5.60	165.80	5,305.1	-496.3	262.9	-213.3	1.06	-1.05	-0.74
5,441.0	4.80	169.80	5,399.7	-504.7	264.7	-214.3	0.92	-0.84	4.21
5,535.0	4.00	172.70	5,493.4	-511.9	265.8	-214.7	0.88	-0.85	3.09
5,631.0	3.00	172.80	5,589.2	-517.7	266.6	-214.9	1.04	-1.04	0.10
5,726.0	3.20	223.00	5,684.1	-522.1	265.1	-212.9	2.77	0.21	52.84
5,916.0	2.50	222.80	5,873.9	-529.0	258.6	-205.9	0.37	-0.37	-0.11
6,011.0	2.40	172.70	5,968.8	-532.5	257.5	-204.4	2.19	-0.11	-52.74

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<b>Site:</b>	Alm 33V-HZ Pad South Sec.33-T7N-R65W	<b>MD Reference:</b>	WELL @ 4803.0ft (Ensign Rig #134 RKB - 13')
<b>Well:</b>	Alm 33V-234	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,106.0	2.20	182.10	6,063.7	-536.3	257.7	-204.2	0.45	-0.21	9.89
6,201.0	2.10	188.70	6,158.6	-539.8	257.3	-203.5	0.28	-0.11	6.95
6,296.0	2.10	192.50	6,253.6	-543.3	256.7	-202.5	0.15	0.00	4.00
6,391.0	6.40	261.60	6,348.3	-545.7	251.1	-196.7	6.30	4.53	72.74
6,486.0	15.70	272.10	6,441.5	-546.0	232.9	-178.6	9.98	9.79	11.05
6,581.0	23.50	277.80	6,530.9	-543.0	201.3	-147.4	8.44	8.21	6.00
6,676.0	31.30	277.10	6,615.2	-537.4	158.0	-104.9	8.22	8.21	-0.74
6,771.0	40.10	275.30	6,692.3	-531.5	102.9	-50.6	9.33	9.26	-1.89
6,867.0	47.50	274.40	6,761.5	-525.9	36.7	14.7	7.74	7.71	-0.94
6,962.0	54.70	270.20	6,821.1	-523.1	-37.1	87.8	8.32	7.58	-4.42
7,057.0	62.60	271.60	6,870.5	-521.8	-118.1	168.4	8.41	8.32	1.47
7,152.0	69.00	272.70	6,909.4	-518.5	-204.7	254.2	6.82	6.74	1.16
7,247.0	74.80	270.70	6,938.9	-515.8	-294.9	343.7	6.42	6.11	-2.11
7,342.0	78.30	268.80	6,961.0	-516.2	-387.3	435.7	4.17	3.68	-2.00
7,454.0	87.30	269.70	6,975.1	-517.7	-498.2	546.3	8.08	8.04	0.80
7,493.0	87.91	269.80	6,976.7	-517.9	-537.2	585.1	1.57	1.55	0.26
7"									
7,570.0	89.10	270.00	6,978.7	-518.0	-614.2	661.7	1.57	1.55	0.26
7,665.0	88.80	269.50	6,980.4	-518.4	-709.2	756.3	0.61	-0.32	-0.53
7,760.0	90.50	271.30	6,981.0	-517.7	-804.2	850.8	2.61	1.79	1.89
Deepest TVD Drilled - 6981.0'									
7,855.0	90.70	270.20	6,980.0	-516.5	-899.1	945.2	1.18	0.21	-1.16
7,950.0	90.70	271.80	6,978.9	-514.8	-994.1	1,039.5	1.68	0.00	1.68
8,045.0	90.10	271.60	6,978.2	-512.0	-1,089.1	1,133.8	0.67	-0.63	-0.21
8,140.0	90.60	272.10	6,977.6	-509.0	-1,184.0	1,228.0	0.74	0.53	0.53
8,236.0	90.40	272.50	6,976.8	-505.1	-1,279.9	1,323.1	0.47	-0.21	0.42
8,330.0	89.20	270.20	6,977.1	-502.9	-1,373.9	1,416.4	2.76	-1.28	-2.45
8,425.0	88.80	269.90	6,978.8	-502.8	-1,468.9	1,510.9	0.53	-0.42	-0.32
8,521.0	90.90	269.90	6,979.0	-503.0	-1,564.9	1,606.4	2.19	2.19	0.00
8,616.0	91.10	269.50	6,977.4	-503.5	-1,659.9	1,701.0	0.47	0.21	-0.42
8,711.0	91.50	269.90	6,975.2	-504.0	-1,754.8	1,795.6	0.60	0.42	0.42
8,806.0	91.20	270.40	6,973.0	-503.7	-1,849.8	1,890.1	0.61	-0.32	0.53
8,901.0	92.10	270.60	6,970.2	-502.9	-1,944.8	1,984.5	0.97	0.95	0.21
8,996.0	91.20	271.60	6,967.5	-501.1	-2,039.7	2,078.8	1.42	-0.95	1.05
9,091.0	90.00	272.10	6,966.5	-498.0	-2,134.7	2,173.0	1.37	-1.26	0.53
9,187.0	90.80	272.30	6,965.8	-494.3	-2,230.6	2,268.1	0.86	0.83	0.21
9,282.0	88.60	271.10	6,966.3	-491.5	-2,325.5	2,362.3	2.64	-2.32	-1.26
9,377.0	89.00	271.10	6,968.3	-489.7	-2,420.5	2,456.7	0.42	0.42	0.00
9,472.0	88.80	270.60	6,970.2	-488.3	-2,515.5	2,551.1	0.57	-0.21	-0.53
9,567.0	90.30	273.00	6,970.9	-485.3	-2,610.4	2,645.3	2.98	1.58	2.53
9,662.0	89.80	273.40	6,970.8	-480.0	-2,705.3	2,739.1	0.67	-0.53	0.42
9,758.0	89.90	273.20	6,971.1	-474.5	-2,801.1	2,834.0	0.23	0.10	-0.21
9,853.0	90.30	273.40	6,970.9	-469.0	-2,895.9	2,927.8	0.47	0.42	0.21
9,948.0	90.50	273.70	6,970.2	-463.1	-2,990.8	3,021.6	0.38	0.21	0.32
10,043.0	90.00	272.50	6,969.8	-458.0	-3,085.6	3,115.5	1.37	-0.53	-1.26
10,138.0	90.00	272.70	6,969.8	-453.7	-3,180.5	3,209.6	0.21	0.00	0.21
10,233.0	88.00	271.30	6,971.5	-450.3	-3,275.4	3,303.7	2.57	-2.11	-1.47
10,329.0	90.70	274.10	6,972.6	-445.8	-3,371.3	3,398.7	4.05	2.81	2.92
10,424.0	90.70	272.00	6,971.4	-440.8	-3,466.2	3,492.6	2.21	0.00	-2.21
10,519.0	91.50	272.00	6,969.6	-437.5	-3,561.1	3,586.8	0.84	0.84	0.00
10,614.0	91.00	270.60	6,967.5	-435.3	-3,656.0	3,681.0	1.56	-0.53	-1.47
10,709.0	90.40	272.00	6,966.4	-433.1	-3,751.0	3,775.4	1.60	-0.63	1.47
10,804.0	91.00	269.90	6,965.2	-431.6	-3,846.0	3,869.7	2.30	0.63	-2.21

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP Weld County CO	<b>Local Co-ordinate Reference:</b>	Well Alm 33V-234
<b>Project:</b>	Sec.33-T7N-R65W	<b>TVD Reference:</b>	WELL @ 4803.0ft (Ensign Rig #134 RKB - 13')
<b>Site:</b>	Alm 33V-HZ Pad South Sec.33-T7N-R65W	<b>MD Reference:</b>	WELL @ 4803.0ft (Ensign Rig #134 RKB - 13')
<b>Well:</b>	Alm 33V-234	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,899.0	89.70	269.90	6,964.6	-431.7	-3,941.0	3,964.3	1.37	-1.37	0.00
10,995.0	90.00	269.30	6,964.9	-432.4	-4,037.0	4,059.9	0.70	0.31	-0.63
11,090.0	89.00	269.90	6,965.7	-433.1	-4,132.0	4,154.5	1.23	-1.05	0.63
11,185.0	89.50	269.70	6,966.9	-433.4	-4,226.9	4,249.1	0.57	0.53	-0.21
11,280.0	90.00	269.50	6,967.4	-434.1	-4,321.9	4,343.7	0.57	0.53	-0.21
11,325.0	90.20	269.00	6,967.3	-434.7	-4,366.9	4,388.5	1.20	0.44	-1.11
11,383.0	90.20	269.00	6,967.1	-435.7	-4,424.9	4,446.3	0.00	0.00	0.00
BHL 1743'FNL & 500'FWL									

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,493.0	6,976.7	7"	7	7-1/2

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,760.0	6,981.0	-517.7	-804.2	Deepest TVD Drilled - 6981.0'

Checked By: _____	Approved By: _____	Date: _____
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