

Noble Energy Inc.- Weld County, CO (Grid North)

Well Name: **Wahlert AC23-69HN**

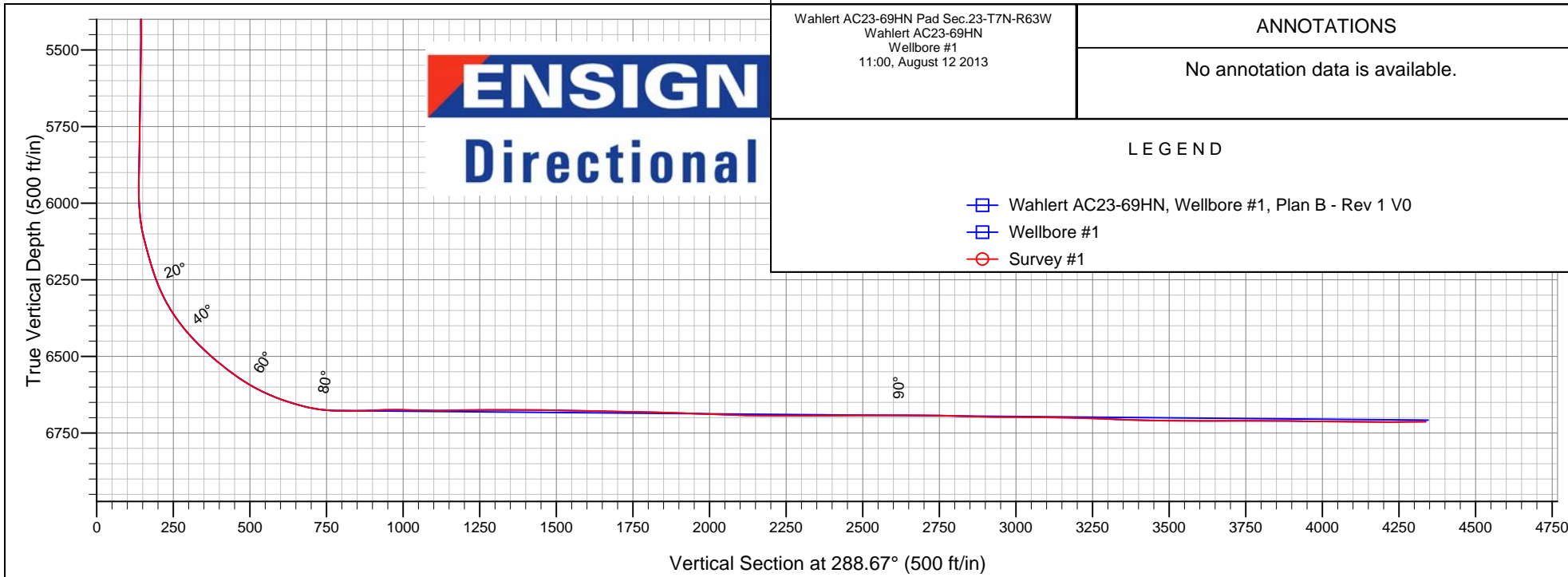
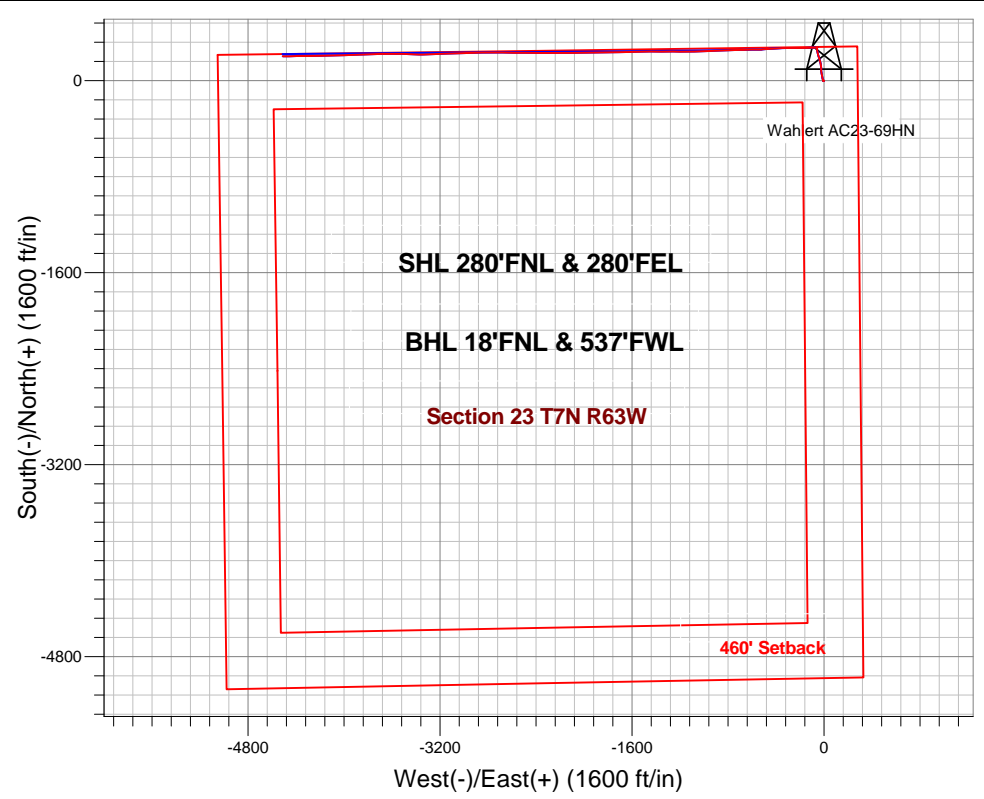
Surface Location: Wahlert AC23-69HN Pad Sec.23-T7N-R63W
 North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
 Ground Elevation: 4790.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1450908.25	3307048.47	40.565890	-104.394800	

Ensign 121 RKB - 13' WELL @ 4803.0ft (Ensign 121 RKB - 13')

FINAL SURVEY

Projected Bottom Hole Location
 10841' MD 6715' TVD 203' N & 4510' W of SHL
 90.6 degree Incl @ 269.2 degree AZM



Wahlert AC23-69HN Pad Sec.23-T7N-R63W
 Wahlert AC23-69HN
 Wellbore #1
 11:00, August 12 2013

ANNOTATIONS
 No annotation data is available.

LEGEND

- Wahlert AC23-69HN, Wellbore #1, Plan B - Rev 1 V0
- Wellbore #1
- Survey #1



Noble Energy Inc.- Weld County, CO (Grid North)

Sec.23-T7N-R63W

Wahlert AC23-69HN Pad Sec.23-T7N-R63W

Wahlert AC23-69HN

Wellbore #1

Design: Wellbore #1

Standard Survey Report

12 August, 2013

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Wahlert AC23-69HN
Project:	Sec.23-T7N-R63W	TVD Reference:	WELL @ 4803.0ft (Ensign 121 RKB - 13')
Site:	Wahlert AC23-69HN Pad Sec.23-T7N-R63W	MD Reference:	WELL @ 4803.0ft (Ensign 121 RKB - 13')
Well:	Wahlert AC23-69HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	Sec.23-T7N-R63W, Weld County, CO		
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	Wahlert AC23-69HN Pad Sec.23-T7N-R63W				
Site Position:		Northing:	1,450,908.26 ft	Latitude:	40.565890
From:	Lat/Long	Easting:	3,307,048.47 ft	Longitude:	-104.394800
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.71 °

Well	Wahlert AC23-69HN					
Well Position	+N/-S	0.0 ft	Northing:	1,450,908.25 ft	Latitude:	40.565890
	+E/-W	0.0 ft	Easting:	3,307,048.47 ft	Longitude:	-104.394800
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,790.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/29/2013	8.39	67.17	53,033

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	288.67	

Survey Program	Date	8/12/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
350.0	10,841.0	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	
350.0	0.60	187.32	350.0	-1.8	-0.2	-0.4	0.17	0.17	0.00	
706.0	0.30	71.32	706.0	-3.4	0.4	-1.5	0.22	-0.08	-32.58	
740.0	0.40	262.70	740.0	-3.4	0.4	-1.4	2.05	0.29	-495.94	
835.0	0.40	245.70	835.0	-3.5	-0.3	-0.9	0.12	0.00	-17.89	
929.0	0.50	276.30	929.0	-3.6	-1.0	-0.3	0.27	0.11	32.55	
1,024.0	0.40	279.80	1,024.0	-3.5	-1.7	0.5	0.11	-0.11	3.68	
1,119.0	0.40	265.20	1,119.0	-3.5	-2.4	1.1	0.11	0.00	-15.37	
1,213.0	0.30	309.30	1,213.0	-3.4	-2.9	1.6	0.30	-0.11	46.91	
1,305.0	0.40	293.30	1,305.0	-3.1	-3.4	2.2	0.15	0.11	-17.39	
1,399.0	0.40	288.40	1,399.0	-2.9	-4.0	2.8	0.04	0.00	-5.21	
1,494.0	0.70	268.90	1,494.0	-2.8	-4.9	3.7	0.37	0.32	-20.53	

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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)
1,589.0	0.60	328.50	1,589.0	-2.3	-5.7	4.7	0.69	-0.11	62.74
1,684.0	0.60	324.10	1,684.0	-1.5	-6.3	5.4	0.05	0.00	-4.63
1,778.0	0.40	309.80	1,778.0	-0.9	-6.8	6.1	0.25	-0.21	-15.21
1,873.0	0.20	212.80	1,873.0	-0.8	-7.1	6.5	0.49	-0.21	-102.11
1,968.0	1.80	346.20	1,967.9	0.5	-7.6	7.3	2.05	1.68	140.42
2,063.0	3.20	348.50	2,062.8	4.5	-8.5	9.5	1.48	1.47	2.42
2,158.0	4.30	344.50	2,157.6	10.6	-9.9	12.8	1.19	1.16	-4.21
2,252.0	5.60	351.20	2,251.3	18.5	-11.6	16.9	1.51	1.38	7.13
2,347.0	5.40	343.90	2,345.9	27.4	-13.5	21.6	0.77	-0.21	-7.68
2,442.0	5.50	354.70	2,440.4	36.2	-15.2	26.0	1.08	0.11	11.37
2,537.0	5.50	350.10	2,535.0	45.2	-16.4	30.0	0.46	0.00	-4.84
2,631.0	4.40	345.20	2,628.6	53.1	-18.1	34.2	1.25	-1.17	-5.21
2,726.0	5.30	346.40	2,723.3	60.9	-20.1	38.5	0.95	0.95	1.26
2,821.0	5.40	2.20	2,817.9	69.6	-20.9	42.1	1.55	0.11	16.63
2,916.0	5.70	345.90	2,912.4	78.7	-21.9	45.9	1.68	0.32	-17.16
3,011.0	3.70	358.70	3,007.1	86.3	-23.1	49.5	2.36	-2.11	13.47
3,106.0	5.50	2.10	3,101.8	93.9	-23.0	51.9	1.92	1.89	3.58
3,200.0	4.60	357.00	3,195.4	102.2	-23.1	54.6	1.07	-0.96	-5.43
3,295.0	4.70	355.50	3,290.1	109.9	-23.6	57.5	0.17	0.11	-1.58
3,390.0	4.70	352.70	3,384.8	117.6	-24.4	60.7	0.24	0.00	-2.95
3,485.0	5.10	353.40	3,479.5	125.7	-25.3	64.2	0.43	0.42	0.74
3,580.0	5.00	349.90	3,574.1	134.0	-26.6	68.0	0.34	-0.11	-3.68
3,674.0	5.10	347.60	3,667.7	142.1	-28.2	72.2	0.24	0.11	-2.45
3,769.0	5.10	347.50	3,762.4	150.3	-30.0	76.5	0.01	0.00	-0.11
3,864.0	5.40	345.90	3,857.0	158.8	-32.0	81.1	0.35	0.32	-1.68
3,959.0	5.40	344.50	3,951.5	167.4	-34.3	86.1	0.14	0.00	-1.47
4,053.0	5.30	344.30	4,045.1	175.9	-36.6	91.0	0.11	-0.11	-0.21
4,148.0	5.20	342.90	4,139.7	184.2	-39.1	96.0	0.17	-0.11	-1.47
4,243.0	4.80	343.60	4,234.4	192.1	-41.5	100.8	0.43	-0.42	0.74
4,338.0	4.60	345.00	4,329.1	199.6	-43.6	105.2	0.24	-0.21	1.47
4,432.0	4.50	338.50	4,422.8	206.7	-45.9	109.6	0.56	-0.11	-6.91
4,527.0	4.60	339.90	4,517.5	213.7	-48.6	114.4	0.16	0.11	1.47
4,622.0	4.50	345.00	4,612.2	220.9	-50.9	118.9	0.44	-0.11	5.37
4,717.0	4.90	349.40	4,706.8	228.5	-52.6	122.9	0.57	0.42	4.63
4,811.0	5.20	346.90	4,800.5	236.6	-54.3	127.1	0.40	0.32	-2.66
4,906.0	4.50	355.60	4,895.1	244.5	-55.5	130.9	1.07	-0.74	9.16
5,001.0	5.60	355.00	4,989.8	252.8	-56.2	134.2	1.16	1.16	-0.63
5,096.0	5.50	352.60	5,084.3	262.0	-57.2	138.0	0.27	-0.11	-2.53
5,191.0	4.00	348.20	5,179.0	269.7	-58.5	141.7	1.62	-1.58	-4.63
5,285.0	2.00	4.20	5,272.9	274.6	-59.0	143.8	2.29	-2.13	17.02
5,380.0	0.90	1.20	5,367.8	277.0	-58.9	144.4	1.16	-1.16	-3.16
5,475.0	0.40	12.60	5,462.8	278.0	-58.8	144.7	0.54	-0.53	12.00
5,569.0	1.10	134.60	5,556.8	277.7	-58.1	143.9	1.44	0.74	129.79
5,664.0	0.80	127.00	5,651.8	276.7	-56.9	142.5	0.34	-0.32	-8.00
5,759.0	1.10	93.60	5,746.8	276.2	-55.5	141.0	0.65	0.32	-35.16
5,854.0	1.20	71.80	5,841.8	276.5	-53.6	139.3	0.47	0.11	-22.95
5,948.0	1.30	78.30	5,935.7	277.0	-51.6	137.6	0.18	0.11	6.91
6,043.0	5.20	264.10	6,030.6	276.8	-54.9	140.6	6.84	4.11	-183.37
6,138.0	16.10	263.40	6,123.9	274.8	-72.3	156.4	11.47	11.47	-0.74
6,233.0	17.90	268.90	6,214.7	273.0	-100.0	182.1	2.54	1.89	5.79
6,328.0	27.30	270.30	6,302.3	272.9	-136.4	216.6	9.91	9.89	1.47
6,422.0	37.50	268.90	6,381.6	272.4	-186.7	264.1	10.88	10.85	-1.49
6,517.0	46.10	270.30	6,452.3	272.1	-250.0	323.9	9.11	9.05	1.47

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Survey									
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6,612.0	51.50	269.10	6,514.9	271.6	-321.4	391.5	5.76	5.68	-1.26
6,707.0	57.50	265.90	6,570.0	268.2	-398.7	463.5	6.88	6.32	-3.37
6,802.0	66.20	265.70	6,614.8	262.1	-482.1	540.6	9.16	9.16	-0.21
6,897.0	72.90	271.00	6,648.0	259.6	-571.0	624.0	8.78	7.05	5.58
6,944.0	75.50	268.00	6,660.8	259.2	-616.2	666.7	8.27	5.53	-6.38
6,992.0	81.10	267.00	6,670.5	257.1	-663.1	710.6	11.84	11.67	-2.08
7,031.0	85.00	268.20	6,675.3	255.5	-701.8	746.7	10.46	10.00	3.08
7,081.0	90.00	268.20	6,677.4	253.9	-751.7	793.5	10.00	10.00	0.00
7,114.0	89.30	268.00	6,677.6	252.9	-784.7	824.4	2.21	-2.12	-0.61
7,209.0	93.00	268.50	6,675.7	250.0	-879.6	913.4	3.93	3.89	0.53
7,304.0	88.10	266.40	6,674.8	245.7	-974.5	1,001.9	5.61	-5.16	-2.21
7,399.0	89.70	270.30	6,676.7	243.0	-1,069.4	1,090.9	4.44	1.68	4.11
7,493.0	91.10	270.10	6,676.0	243.3	-1,163.4	1,180.1	1.50	1.49	-0.21
7,588.0	90.20	269.40	6,674.9	242.9	-1,258.4	1,270.0	1.20	-0.95	-0.74
7,683.0	90.10	269.90	6,674.7	242.3	-1,353.4	1,359.8	0.54	-0.11	0.53
7,777.0	89.30	270.80	6,675.2	242.9	-1,447.4	1,449.0	1.28	-0.85	0.96
7,872.0	88.90	268.50	6,676.7	242.3	-1,542.4	1,538.8	2.46	-0.42	-2.42
7,967.0	88.80	268.70	6,678.6	240.0	-1,637.3	1,628.0	0.24	-0.11	0.21
8,062.0	88.50	268.50	6,680.8	237.7	-1,732.3	1,717.2	0.38	-0.32	-0.21
8,157.0	89.60	267.80	6,682.4	234.6	-1,827.2	1,806.2	1.37	1.16	-0.74
8,251.0	87.80	268.70	6,684.5	231.7	-1,921.1	1,894.3	2.14	-1.91	0.96
8,346.0	87.80	269.90	6,688.2	230.6	-2,016.1	1,983.8	1.26	0.00	1.26
8,441.0	88.20	270.60	6,691.5	231.0	-2,111.0	2,073.9	0.85	0.42	0.74
8,536.0	89.90	270.80	6,693.0	232.2	-2,206.0	2,164.2	1.80	1.79	0.21
8,631.0	89.10	269.80	6,693.9	232.7	-2,301.0	2,254.4	1.35	-0.84	-1.05
8,726.0	90.90	270.60	6,693.9	233.0	-2,396.0	2,344.5	2.07	1.89	0.84
8,821.0	90.10	268.90	6,693.0	232.6	-2,491.0	2,434.4	1.98	-0.84	-1.79
8,915.0	90.70	271.20	6,692.4	232.7	-2,584.9	2,523.4	2.53	0.64	2.45
9,010.0	89.60	271.20	6,692.1	234.6	-2,679.9	2,614.1	1.16	-1.16	0.00
9,105.0	89.70	269.60	6,692.7	235.3	-2,774.9	2,704.3	1.69	0.11	-1.68
9,200.0	88.70	268.20	6,694.0	233.5	-2,869.9	2,793.7	1.81	-1.05	-1.47
9,295.0	88.10	267.70	6,696.7	230.1	-2,964.8	2,882.5	0.82	-0.63	-0.53
9,390.0	89.60	268.90	6,698.6	227.3	-3,059.7	2,971.5	2.02	1.58	1.26
9,485.0	90.20	268.40	6,698.8	225.0	-3,154.7	3,060.8	0.82	0.63	-0.53
9,579.0	88.70	267.00	6,699.7	221.3	-3,248.6	3,148.6	2.18	-1.60	-1.49
9,674.0	88.20	269.40	6,702.2	218.3	-3,343.5	3,237.5	2.58	-0.53	2.53
9,769.0	87.60	271.70	6,705.7	219.2	-3,438.4	3,327.7	2.50	-0.63	2.42
9,863.0	88.60	270.50	6,708.8	221.0	-3,532.4	3,417.3	1.66	1.06	-1.28
9,958.0	89.70	270.30	6,710.3	221.7	-3,627.4	3,507.5	1.18	1.16	-0.21
10,053.0	89.80	269.60	6,710.7	221.6	-3,722.4	3,597.5	0.74	0.11	-0.74
10,148.0	90.40	268.70	6,710.5	220.2	-3,817.3	3,687.0	1.14	0.63	-0.95
10,243.0	89.60	265.70	6,710.5	215.5	-3,912.2	3,775.4	3.27	-0.84	-3.16
10,337.0	89.70	268.50	6,711.1	210.8	-4,006.1	3,862.8	2.98	0.11	2.98
10,432.0	89.20	268.90	6,712.0	208.6	-4,101.1	3,952.1	0.67	-0.53	0.42
10,527.0	89.60	268.90	6,713.0	206.8	-4,196.0	4,041.5	0.42	0.42	0.00
10,622.0	89.30	269.60	6,713.9	205.5	-4,291.0	4,131.1	0.80	-0.32	0.74
10,716.0	90.20	269.20	6,714.3	204.6	-4,385.0	4,219.8	1.05	0.96	-0.43
10,786.0	90.60	269.20	6,713.8	203.6	-4,455.0	4,285.8	0.57	0.57	0.00
10,841.0	90.60	269.20	6,713.2	202.8	-4,510.0	4,337.7	0.00	0.00	0.00

Wahlert AC23-69HN BHL 0'FNL & 535'FWL

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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Checked By: _____	Approved By: _____	Date: _____
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