

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

Well Name: **Wahlert AC23-68-1HN**

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

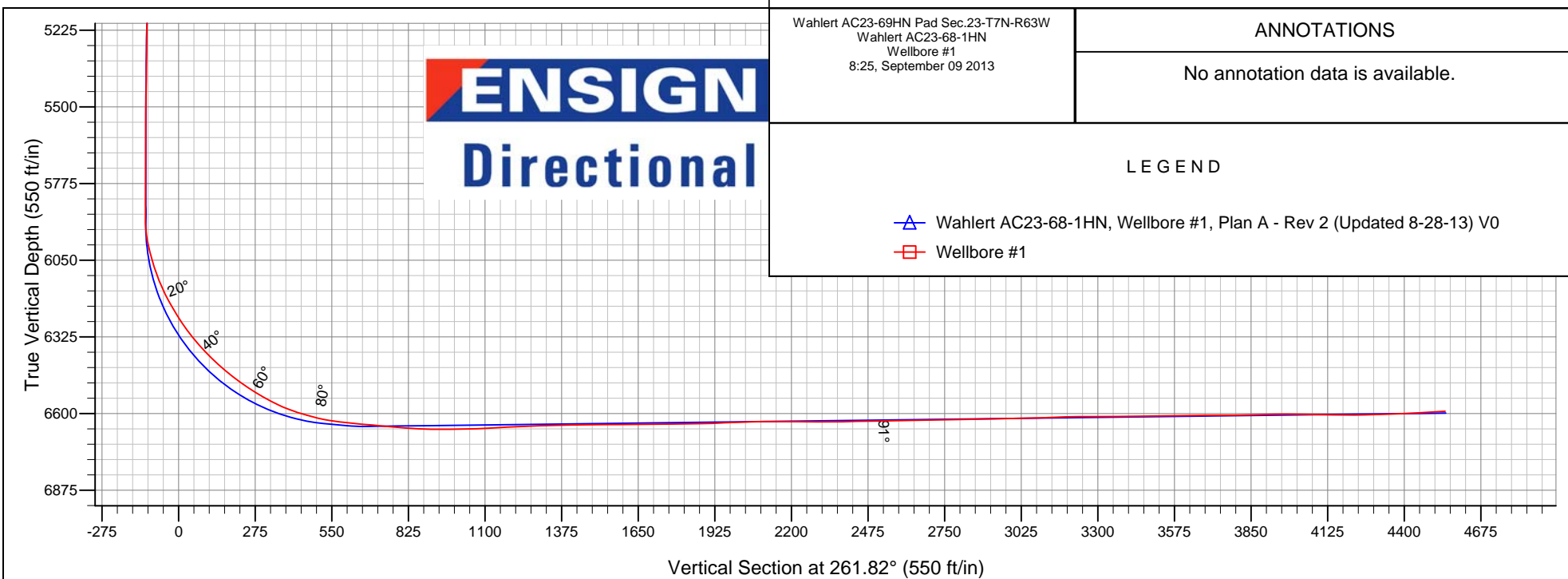
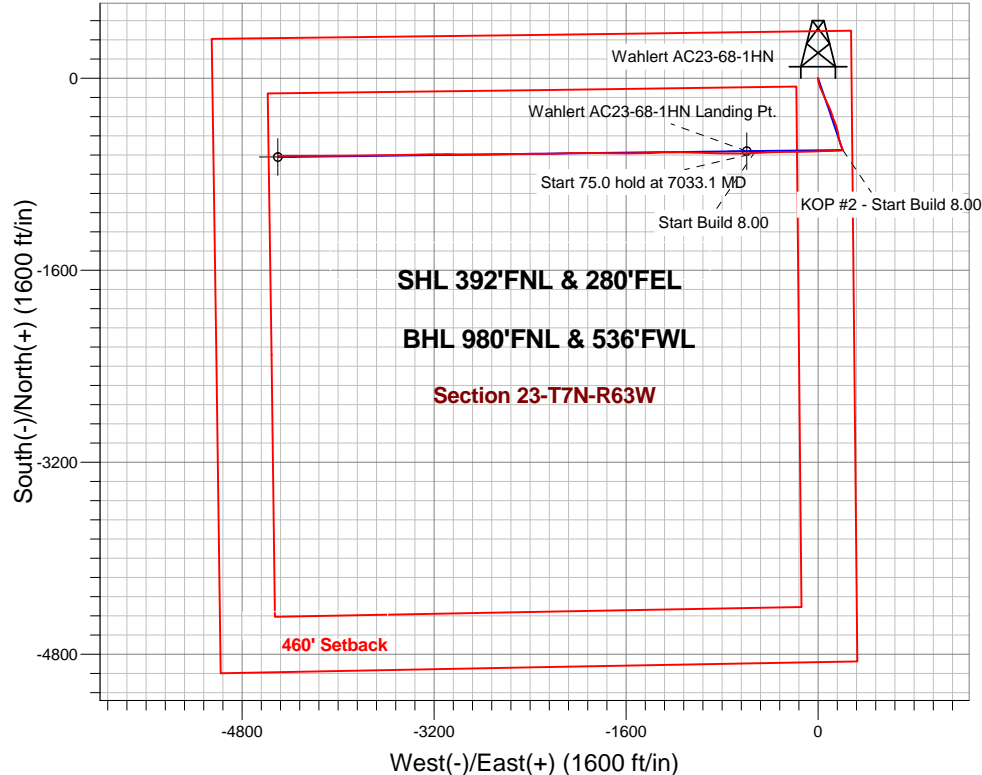
Ground Elevation: 4787.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1450795.32	3307049.88	40.565580	-104.394800	

Ensign 121 RKB - 13' WELL @ 4800.0ft (Ensign 121 RKB - 13')

FINAL SURVEY

Projected Bottom Hole Location
 11051' MD 6592' TVD 647' S & 4500' W of SHL
 93.8 degree Incl @ 269.9 degree AZM





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

Sec.23-T7N-R63W

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

Wahlert AC23-68-1HN

Wellbore #1

Design: Wellbore #1

Standard Survey Report

09 September, 2013

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Wahlert AC23-68-1HN
Project:	Sec.23-T7N-R63W	TVD Reference:	WELL @ 4800.0ft (Ensign 121 RKB - 13')
Site:	Wahlert AC23-69HN Pad Sec.23-T7N-R63W	MD Reference:	WELL @ 4800.0ft (Ensign 121 RKB - 13')
Well:	Wahlert AC23-68-1HN	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 AC23-68-1HN					
Well Position	+N/-S	0.0 ft	Northing:	1,450,795.32 ft	Latitude:	40.565580
	+E/-W	0.0 ft	Easting:	3,307,049.88 ft	Longitude:	-104.394800
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,787.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/28/2013	8.38	67.17	53,024

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	261.82	

Survey Program	Date	9/9/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
380.0	740.0	Survey #1 (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
834.0	11,051.0	Survey #2 (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	
380.0	0.50	283.50	380.0	0.4	-1.6	1.5	0.13	0.13	0.00	
740.0	0.40	72.50	740.0	1.1	-1.9	1.8	0.24	-0.03	41.39	
834.0	0.40	63.00	834.0	1.4	-1.3	1.1	0.07	0.00	-10.11	
929.0	0.40	32.30	929.0	1.8	-0.9	0.6	0.22	0.00	-32.32	
1,024.0	1.20	161.00	1,024.0	1.1	-0.4	0.2	1.56	0.84	135.47	
1,119.0	3.30	184.70	1,118.9	-2.5	-0.3	0.6	2.37	2.21	24.95	
1,214.0	4.70	174.10	1,213.7	-9.1	-0.1	1.4	1.66	1.47	-11.16	
1,308.0	6.30	166.80	1,307.2	-18.0	1.5	1.1	1.85	1.70	-7.77	
1,400.0	8.10	169.40	1,398.5	-29.3	3.8	0.4	1.99	1.96	2.83	
1,494.0	9.00	165.70	1,491.5	-42.9	6.9	-0.7	1.12	0.96	-3.94	

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Site:	Wahlert AC23-69HN Pad Sec.23-T7N-R63W	MD Reference:	WELL @ 4800.0ft (Ensign 121 RKB - 13')
Well:	Wahlert AC23-68-1HN	North Reference:	Grid
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)
1,588.0	8.40	164.10	1,584.4	-56.6	10.6	-2.4	0.69	-0.64	-1.70
1,683.0	8.10	160.60	1,678.4	-69.6	14.7	-4.6	0.62	-0.32	-3.68
1,778.0	7.40	154.10	1,772.5	-81.4	19.6	-7.8	1.18	-0.74	-6.84
1,872.0	8.30	157.80	1,865.6	-93.1	24.8	-11.3	1.10	0.96	3.94
1,967.0	8.50	156.90	1,959.6	-106.0	30.1	-14.7	0.25	0.21	-0.95
2,062.0	7.90	153.70	2,053.7	-118.3	35.8	-18.6	0.79	-0.63	-3.37
2,157.0	9.00	151.60	2,147.6	-130.7	42.2	-23.2	1.20	1.16	-2.21
2,252.0	9.40	161.00	2,241.4	-144.5	48.3	-27.2	1.64	0.42	9.89
2,347.0	9.20	155.50	2,335.2	-158.8	53.9	-30.8	0.96	-0.21	-5.79
2,442.0	9.50	155.50	2,428.9	-172.8	60.3	-35.1	0.32	0.32	0.00
2,537.0	10.20	159.50	2,522.5	-187.8	66.5	-39.1	1.03	0.74	4.21
2,631.0	10.20	156.70	2,615.0	-203.3	72.8	-43.1	0.53	0.00	-2.98
2,726.0	10.00	153.70	2,708.5	-218.4	79.7	-47.8	0.59	-0.21	-3.16
2,821.0	9.80	151.10	2,802.1	-232.9	87.3	-53.3	0.52	-0.21	-2.74
2,916.0	9.40	149.20	2,895.8	-246.6	95.2	-59.1	0.54	-0.42	-2.00
3,011.0	10.20	157.40	2,989.4	-261.0	102.4	-64.2	1.69	0.84	8.63
3,106.0	10.50	162.50	3,082.9	-277.1	108.2	-67.7	1.01	0.32	5.37
3,200.0	10.10	160.20	3,175.4	-293.0	113.6	-70.7	0.61	-0.43	-2.45
3,295.0	10.00	166.40	3,268.9	-308.8	118.3	-73.2	1.14	-0.11	6.53
3,390.0	9.80	162.90	3,362.5	-324.6	122.7	-75.2	0.67	-0.21	-3.68
3,485.0	9.10	159.50	3,456.2	-339.3	127.7	-78.1	0.94	-0.74	-3.58
3,579.0	8.80	157.30	3,549.1	-352.9	133.0	-81.5	0.48	-0.32	-2.34
3,674.0	8.90	156.20	3,642.9	-366.4	138.8	-85.3	0.21	0.11	-1.16
3,769.0	7.40	160.20	3,737.0	-378.8	143.9	-88.5	1.69	-1.58	4.21
3,864.0	7.30	159.50	3,831.2	-390.3	148.0	-91.0	0.14	-0.11	-0.74
3,958.0	7.60	159.00	3,924.4	-401.7	152.4	-93.6	0.33	0.32	-0.53
4,053.0	7.50	158.80	4,018.6	-413.3	156.9	-96.4	0.11	-0.11	-0.21
4,148.0	8.00	167.60	4,112.7	-425.5	160.5	-98.3	1.35	0.53	9.26
4,243.0	8.50	171.10	4,206.7	-438.9	163.0	-98.9	0.75	0.53	3.68
4,337.0	8.80	172.60	4,299.7	-452.9	165.0	-98.9	0.40	0.32	1.60
4,432.0	8.30	173.10	4,393.6	-466.9	166.8	-98.6	0.53	-0.53	0.53
4,527.0	9.80	169.00	4,487.4	-481.7	169.1	-98.9	1.72	1.58	-4.32
4,622.0	8.90	166.20	4,581.1	-496.8	172.4	-100.0	1.06	-0.95	-2.95
4,717.0	7.90	164.50	4,675.1	-510.2	175.9	-101.5	1.08	-1.05	-1.79
4,811.0	7.90	164.10	4,768.2	-522.6	179.4	-103.2	0.06	0.00	-0.43
4,906.0	9.10	162.90	4,862.2	-536.1	183.4	-105.3	1.28	1.26	-1.26
5,001.0	8.40	160.10	4,956.1	-549.8	188.0	-107.8	0.86	-0.74	-2.95
5,096.0	8.10	159.00	5,050.1	-562.6	192.8	-110.7	0.36	-0.32	-1.16
5,190.0	6.10	163.40	5,143.4	-573.5	196.6	-112.9	2.20	-2.13	4.68
5,285.0	4.70	163.80	5,238.0	-582.1	199.1	-114.2	1.47	-1.47	0.42
5,380.0	2.90	157.80	5,332.7	-588.1	201.1	-115.3	1.94	-1.89	-6.32
5,474.0	2.70	158.70	5,426.6	-592.3	202.8	-116.4	0.22	-0.21	0.96
5,569.0	1.90	151.80	5,521.6	-595.8	204.3	-117.5	0.89	-0.84	-7.26
5,664.0	0.90	163.60	5,616.5	-597.9	205.3	-118.1	1.09	-1.05	12.42
5,759.0	0.90	157.40	5,711.5	-599.3	205.8	-118.4	0.10	0.00	-6.53
5,853.0	0.90	143.50	5,805.5	-600.6	206.5	-118.9	0.23	0.00	-14.79
5,948.0	0.50	158.50	5,900.5	-601.6	207.1	-119.4	0.46	-0.42	15.79
6,043.0	12.60	267.30	5,994.7	-602.5	196.9	-109.1	13.44	12.74	114.53
6,138.0	18.70	269.60	6,086.2	-603.0	171.3	-83.7	6.45	6.42	2.42
6,232.0	26.90	265.90	6,172.8	-604.7	134.9	-47.5	8.85	8.72	-3.94
6,327.0	32.80	269.40	6,255.1	-606.5	87.7	-0.5	6.47	6.21	3.68
6,422.0	39.20	267.70	6,331.9	-608.0	31.9	54.9	6.82	6.74	-1.79
6,517.0	46.10	268.40	6,401.8	-610.1	-32.4	118.9	7.28	7.26	0.74
6,612.0	52.10	268.00	6,463.9	-612.4	-104.1	190.2	6.32	6.32	-0.42

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Well:	Wahlert AC23-68-1HN	North Reference:	Grid
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)
6,707.0	57.40	270.30	6,518.8	-613.5	-181.6	267.1	5.92	5.58	2.42
6,802.0	64.50	269.20	6,564.9	-613.9	-264.6	349.3	7.54	7.47	-1.16
6,897.0	73.20	267.70	6,599.1	-616.3	-353.1	437.2	9.28	9.16	-1.58
6,944.0	74.80	268.00	6,612.1	-618.0	-398.2	482.2	3.46	3.40	0.64
6,992.0	79.80	268.20	6,622.6	-619.5	-445.0	528.7	10.42	10.42	0.42
7,033.0	83.00	267.10	6,628.7	-621.2	-485.5	569.0	8.24	7.80	-2.68
7,115.0	84.90	268.40	6,637.4	-624.4	-567.0	650.1	2.80	2.32	1.59
7,142.8	84.96	268.40	6,639.8	-625.2	-594.7	677.6	0.21	0.21	0.00
Wahlert AC23-68-1HN Landing Pt.									
7,162.0	85.00	268.40	6,641.5	-625.7	-613.8	696.6	0.21	0.21	0.00
7,209.0	84.90	268.70	6,645.7	-626.9	-660.6	743.1	0.67	-0.21	0.64
7,256.0	85.30	269.60	6,649.7	-627.6	-707.4	789.6	2.09	0.85	1.91
7,304.0	86.30	271.20	6,653.2	-627.3	-755.3	836.9	3.92	2.08	3.33
7,351.0	87.80	271.30	6,655.6	-626.2	-802.2	883.2	3.20	3.19	0.21
7,399.0	89.90	271.70	6,656.6	-625.0	-850.2	930.5	4.45	4.38	0.83
7,446.0	90.60	271.50	6,656.4	-623.7	-897.2	976.8	1.55	1.49	-0.43
7,493.0	91.10	271.50	6,655.7	-622.4	-944.1	1,023.1	1.06	1.06	0.00
7,588.0	92.90	271.50	6,652.4	-620.0	-1,039.1	1,116.7	1.89	1.89	0.00
7,683.0	92.70	271.00	6,647.7	-617.9	-1,133.9	1,210.3	0.57	-0.21	-0.53
7,778.0	92.30	269.40	6,643.6	-617.6	-1,228.8	1,304.2	1.73	-0.42	-1.68
7,872.0	90.40	268.00	6,641.4	-619.7	-1,322.8	1,397.5	2.51	-2.02	-1.49
7,967.0	90.80	267.70	6,640.4	-623.3	-1,417.7	1,492.0	0.53	0.42	-0.32
8,062.0	90.40	269.60	6,639.4	-625.5	-1,512.7	1,586.3	2.04	-0.42	2.00
8,157.0	90.80	268.90	6,638.4	-626.7	-1,607.6	1,680.5	0.85	0.42	-0.74
8,252.0	90.30	271.00	6,637.5	-626.8	-1,702.6	1,774.5	2.27	-0.53	2.21
8,347.0	91.20	271.20	6,636.2	-625.0	-1,797.6	1,868.3	0.97	0.95	0.21
8,441.0	92.50	271.00	6,633.2	-623.2	-1,891.5	1,961.0	1.40	1.38	-0.21
8,536.0	91.90	269.20	6,629.5	-623.0	-1,986.5	2,054.9	2.00	-0.63	-1.89
8,631.0	89.00	268.50	6,628.8	-624.9	-2,081.4	2,149.2	3.14	-3.05	-0.74
8,726.0	90.00	267.50	6,629.6	-628.2	-2,176.4	2,243.6	1.49	1.05	-1.05
8,821.0	90.40	270.30	6,629.3	-630.1	-2,271.3	2,337.9	2.98	0.42	2.95
8,916.0	91.20	269.80	6,628.0	-630.0	-2,366.3	2,431.9	0.99	0.84	-0.53
9,011.0	90.70	269.20	6,626.4	-630.8	-2,461.3	2,526.0	0.82	-0.53	-0.63
9,105.0	91.50	268.70	6,624.6	-632.5	-2,555.3	2,619.3	1.00	0.85	-0.53
9,200.0	90.90	268.70	6,622.6	-634.7	-2,650.2	2,713.6	0.63	-0.63	0.00
9,295.0	90.60	269.90	6,621.3	-635.9	-2,745.2	2,807.8	1.30	-0.32	1.26
9,390.0	91.50	270.10	6,619.6	-635.9	-2,840.2	2,901.8	0.97	0.95	0.21
9,485.0	90.70	269.90	6,617.8	-635.9	-2,935.2	2,995.8	0.87	-0.84	-0.21
9,580.0	92.30	271.90	6,615.3	-634.4	-3,030.1	3,089.6	2.70	1.68	2.11
9,675.0	91.50	269.40	6,612.1	-633.3	-3,125.1	3,183.4	2.76	-0.84	-2.63
9,769.0	90.00	269.20	6,610.9	-634.4	-3,219.0	3,276.6	1.61	-1.60	-0.21
9,864.0	90.70	269.60	6,610.3	-635.4	-3,314.0	3,370.7	0.85	0.74	0.42
9,958.0	90.30	268.50	6,609.5	-637.0	-3,408.0	3,464.0	1.25	-0.43	-1.17
10,053.0	91.40	268.50	6,608.1	-639.5	-3,503.0	3,558.3	1.16	1.16	0.00
10,148.0	90.10	267.80	6,606.9	-642.5	-3,597.9	3,652.7	1.55	-1.37	-0.74
10,243.0	90.40	270.10	6,606.4	-644.3	-3,692.9	3,747.0	2.44	0.32	2.42
10,338.0	91.50	269.90	6,604.9	-644.3	-3,787.9	3,841.0	1.18	1.16	-0.21
10,432.0	91.10	270.30	6,602.7	-644.1	-3,881.9	3,934.0	0.60	-0.43	0.43
10,527.0	89.10	269.80	6,602.6	-644.0	-3,976.8	4,028.0	2.17	-2.11	-0.53
10,622.0	88.90	268.90	6,604.2	-645.1	-4,071.8	4,122.2	0.97	-0.21	-0.95
10,717.0	90.20	269.80	6,605.0	-646.2	-4,166.8	4,216.4	1.66	1.37	0.95
10,811.0	91.50	269.80	6,603.6	-646.5	-4,260.8	4,309.4	1.38	1.38	0.00
10,906.0	92.50	269.80	6,600.3	-646.8	-4,355.7	4,403.5	1.05	1.05	0.00

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

Survey									
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10,996.0	93.80	269.90	6,595.3	-647.1	-4,445.6	4,492.4	1.45	1.44	0.11
11,051.0	93.80	269.90	6,591.7	-647.2	-4,500.5	4,546.8	0.00	0.00	0.00
Wahlert AC23-68-1HN BHL 990'FNL & 535'FWL									

Checked By: _____ Approved By: _____ Date: _____