

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

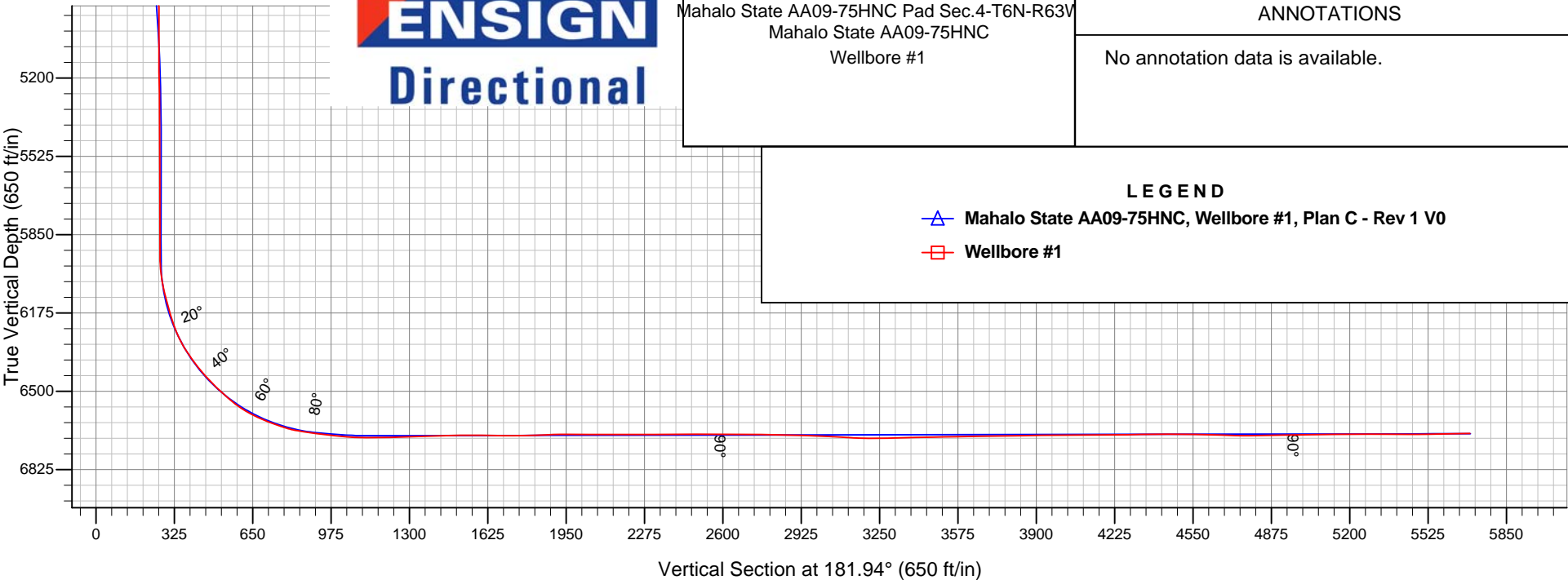
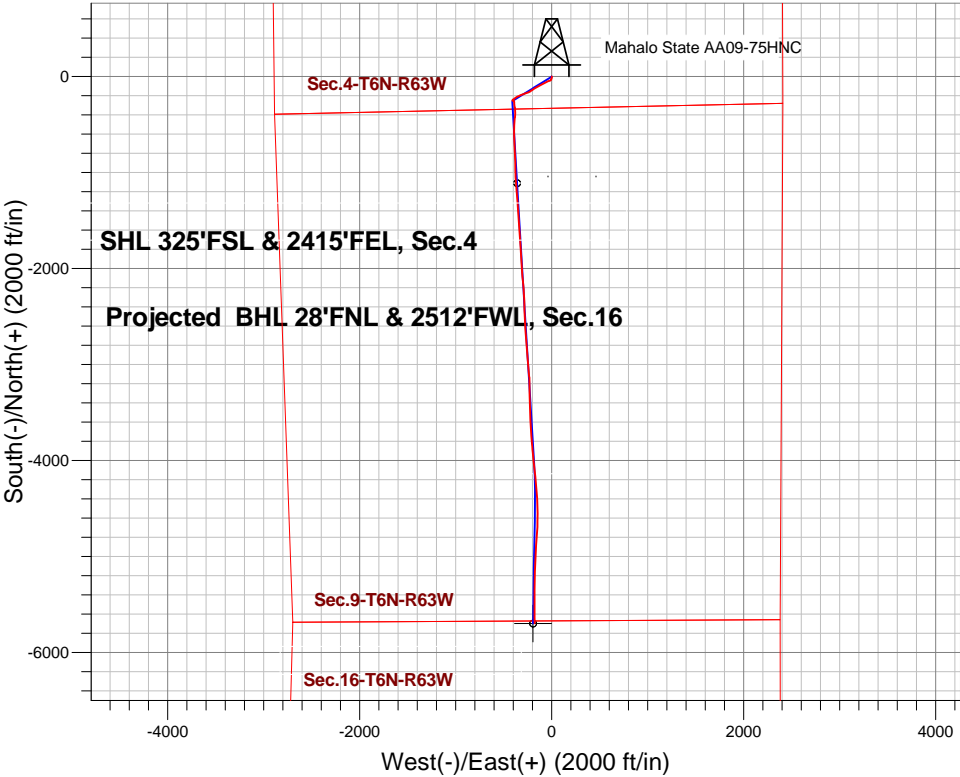
Well Name: Mahalo State AA09-75HNC

Surface Location: Mahalo State AA09-75HNC Pad Sec.4-T6N-R63W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4695.0
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1430206.56 3294500.82 40.509490 -104.440850
PD 829 RKB - 16' WELL @ 4711.0ft (PD 829 RKB - 16')

FINAL SURVEY

05-123-39055

Projected Bottom Hole Location
11862'MD 6675'TVD 5695'S & 176'W of SHL
91.4 degree Incl @ 178.82 degree AZM



Mahalo State AA09-75HNC Pad Sec.4-T6N-R63W
Mahalo State AA09-75HNC
Wellbore #1

ANNOTATIONS

No annotation data is available.

LEGEND

- Mahalo State AA09-75HNC, Wellbore #1, Plan C - Rev 1 V0
- Wellbore #1



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

Sec.4-T6N-R63W

Mahalo State AA09-75HNC Pad Sec.4-T6N-R63W

Mahalo State AA09-75HNC

Wellbore #1

Design: Wellbore #1

Final Survey

12 February, 2015

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Mahalo State AA09-75HNC
Project:	Sec.4-T6N-R63W	TVD Reference:	WELL @ 4711.0ft (PD 829 RKB - 16')
Site:	Mahalo State AA09-75HNC Pad Sec.4-T6N-R63W	MD Reference:	WELL @ 4711.0ft (PD 829 RKB - 16')
Well:	Mahalo State AA09-75HNC	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	Sec.4-T6N-R63W, 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		Mahalo State AA09-75HNC Pad Sec.4-T6N-R63W			
Site Position:		Northing:	1,430,207.90 ft	Latitude:	40.509490
From:	Lat/Long	Easting:	3,294,612.04 ft	Longitude:	-104.440450
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.68 °

Well	Mahalo State AA09-75HNC					
Well Position	+N/-S	0.0 ft	Northing:	1,430,206.56 ft	Latitude:	40.509490
	+E/-W	0.0 ft	Easting:	3,294,500.82 ft	Longitude:	-104.440850
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,695.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/31/2014	8.22	67.07	52,849

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	181.94	

Survey Program		Date	2/12/2015		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
342.0	691.0	Surface (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
920.0	6,982.0	Intermediate/Curve (Wellbore #1)	MWD	MWD - Standard	
7,074.0	11,862.0	Lateral (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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
342.0	0.60	132.57	342.0	-1.2	1.3	1.2	0.18
691.0	1.00	181.47	691.0	-5.5	2.6	5.4	0.22
920.0	1.50	205.30	919.9	-10.2	1.3	10.2	0.31
1,009.0	1.60	202.80	1,008.9	-12.4	0.3	12.4	0.14
1,098.0	1.70	201.00	1,097.8	-14.8	-0.7	14.8	0.13
1,193.0	1.80	203.20	1,192.8	-17.5	-1.8	17.5	0.13
1,287.0	1.80	194.70	1,286.7	-20.2	-2.7	20.3	0.28
1,382.0	1.50	184.90	1,381.7	-22.9	-3.2	23.0	0.43
1,477.0	1.60	194.50	1,476.7	-25.5	-3.7	25.6	0.29

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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)
1,572.0	1.50	200.50	1,571.6	-27.9	-4.4	28.0	0.20
1,667.0	0.70	181.50	1,666.6	-29.6	-4.9	29.8	0.91
1,762.0	1.30	172.20	1,761.6	-31.3	-4.7	31.4	0.65
1,857.0	2.60	221.80	1,856.6	-34.0	-6.0	34.2	2.12
1,952.0	2.90	239.60	1,951.4	-36.8	-9.5	37.1	0.95
2,079.0	3.80	239.90	2,078.2	-40.5	-15.9	41.0	0.71
2,169.0	5.80	253.50	2,167.9	-43.3	-22.9	44.1	2.54
2,258.0	7.30	250.00	2,256.3	-46.5	-32.5	47.6	1.74
2,348.0	9.40	244.00	2,345.4	-51.7	-44.5	53.2	2.52
2,438.0	10.60	242.40	2,434.0	-58.8	-58.4	60.7	1.37
2,527.0	11.30	243.10	2,521.4	-66.5	-73.5	69.0	0.80
2,617.0	11.80	244.30	2,609.6	-74.5	-89.6	77.5	0.62
2,706.0	11.20	240.60	2,696.8	-82.7	-105.4	86.2	1.07
2,796.0	12.30	241.60	2,784.9	-91.5	-121.4	95.6	1.24
2,886.0	11.30	238.50	2,873.0	-100.7	-137.4	105.3	1.32
2,975.0	12.40	242.40	2,960.1	-109.7	-153.3	114.8	1.53
3,065.0	11.80	238.90	3,048.1	-118.9	-169.7	124.6	1.05
3,154.0	12.40	237.10	3,135.1	-128.8	-185.5	135.0	0.80
3,244.0	11.50	235.30	3,223.2	-139.1	-201.0	145.9	1.08
3,334.0	10.90	239.20	3,311.4	-148.6	-215.7	155.8	1.07
3,423.0	9.60	237.40	3,399.0	-156.9	-229.2	164.6	1.50
3,513.0	10.10	247.10	3,487.7	-164.0	-242.8	172.2	1.92
3,602.0	10.50	252.10	3,575.3	-169.6	-257.7	178.2	1.10
3,692.0	10.80	251.50	3,663.7	-174.8	-273.5	183.9	0.36
3,782.0	11.10	251.30	3,752.1	-180.2	-289.7	189.9	0.34
3,872.0	12.00	248.30	3,840.3	-186.5	-306.6	196.7	1.20
3,961.0	12.10	247.00	3,927.3	-193.5	-323.8	204.4	0.32
4,051.0	10.80	246.00	4,015.5	-200.6	-340.1	212.1	1.46
4,141.0	9.50	245.70	4,104.1	-207.1	-354.6	219.0	1.45
4,230.0	8.30	234.80	4,192.0	-213.8	-366.6	226.2	2.32
4,320.0	7.60	236.00	4,281.2	-220.9	-376.8	233.6	0.80
4,409.0	6.30	232.20	4,369.5	-227.2	-385.5	240.2	1.55
4,499.0	5.80	235.30	4,459.0	-232.8	-393.2	246.0	0.66
4,589.0	4.90	233.70	4,548.6	-237.7	-400.0	251.1	1.01
4,678.0	3.80	228.80	4,637.4	-241.9	-405.3	255.5	1.30
4,768.0	1.60	208.80	4,727.3	-244.9	-408.2	258.6	2.62
4,857.0	0.90	131.50	4,816.2	-246.5	-408.2	260.2	1.86
4,947.0	0.50	116.40	4,906.2	-247.1	-407.3	260.8	0.49
5,037.0	0.30	67.50	4,996.2	-247.2	-406.8	260.9	0.42
5,126.0	0.10	76.10	5,085.2	-247.1	-406.5	260.8	0.23
5,216.0	0.80	186.60	5,175.2	-247.7	-406.5	261.4	0.93
5,305.0	1.00	170.10	5,264.2	-249.1	-406.4	262.7	0.37
5,395.0	1.00	98.50	5,354.2	-250.0	-405.5	263.6	1.30
5,485.0	1.00	109.30	5,444.2	-250.4	-404.0	263.9	0.21
5,574.0	1.10	107.50	5,533.2	-250.9	-402.4	264.4	0.12

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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)
5,664.0	1.10	107.40	5,623.2	-251.4	-400.8	264.9	0.00
5,754.0	1.20	103.80	5,713.1	-251.9	-399.1	265.3	0.14
5,843.0	1.60	98.40	5,802.1	-252.3	-396.9	265.6	0.47
5,933.0	1.50	80.10	5,892.1	-252.3	-394.5	265.5	0.56
5,978.0	1.40	94.50	5,937.1	-252.2	-393.4	265.4	0.84
6,023.0	4.00	164.90	5,982.0	-253.8	-392.4	266.9	8.37
6,067.0	8.50	171.50	6,025.7	-258.5	-391.6	271.6	10.34
6,112.0	11.70	174.00	6,070.0	-266.3	-390.6	279.4	7.18
6,157.0	15.20	178.00	6,113.8	-276.7	-389.9	289.8	8.04
6,202.0	15.90	176.90	6,157.2	-288.8	-389.4	301.8	1.69
6,247.0	17.10	168.50	6,200.3	-301.4	-387.7	314.4	5.93
6,292.0	21.80	169.30	6,242.7	-316.1	-384.8	329.0	10.46
6,337.0	26.70	174.70	6,283.8	-334.4	-382.3	347.2	11.94
6,382.0	31.60	178.40	6,323.0	-356.3	-381.1	369.0	11.60
6,426.0	35.00	180.60	6,359.8	-380.4	-380.9	393.1	8.20
6,471.0	37.90	183.00	6,396.0	-407.1	-381.8	419.9	7.18
6,516.0	42.30	185.70	6,430.4	-436.0	-384.0	448.8	10.51
6,561.0	43.90	186.10	6,463.3	-466.6	-387.1	479.5	3.61
6,606.0	47.00	182.40	6,494.9	-498.6	-389.5	511.5	9.04
6,650.0	48.00	183.20	6,524.6	-531.0	-391.1	543.9	2.64
6,695.0	52.70	181.00	6,553.3	-565.6	-392.3	578.6	11.10
6,740.0	58.20	179.10	6,578.8	-602.6	-392.3	615.6	12.71
6,785.0	64.30	176.60	6,600.4	-642.0	-390.8	654.9	14.40
6,830.0	68.00	177.20	6,618.6	-683.1	-388.6	695.9	8.31
6,874.0	68.90	177.20	6,634.8	-724.0	-386.6	736.7	2.05
6,919.0	72.20	177.20	6,649.8	-766.4	-384.5	779.0	7.33
6,964.0	78.70	177.50	6,661.1	-809.9	-382.5	822.4	14.46
6,982.0	80.90	178.10	6,664.3	-827.6	-381.8	840.1	12.65
7,074.0	83.00	178.89	6,677.1	-918.6	-379.5	931.0	2.44
7,106.0	83.20	178.71	6,681.0	-950.4	-378.8	962.7	0.84
7,137.0	83.70	178.52	6,684.5	-981.2	-378.0	993.4	1.72
7,169.0	85.00	177.60	6,687.7	-1,013.0	-377.0	1,025.2	4.97
7,200.0	86.60	176.97	6,689.9	-1,043.9	-375.5	1,056.0	5.54
7,232.0	88.10	176.36	6,691.4	-1,075.8	-373.6	1,087.9	5.06
7,263.0	89.40	176.32	6,692.1	-1,106.7	-371.7	1,118.7	4.20
7,267.1	89.56	176.28	6,692.1	-1,110.8	-371.4	1,122.7	3.98
Mahalo State AA09-75HNC Landing Pt.							
7,294.0	90.60	176.03	6,692.1	-1,137.7	-369.6	1,149.5	3.98
7,389.0	91.60	175.03	6,690.3	-1,232.3	-362.2	1,243.9	1.49
7,478.0	91.90	175.85	6,687.6	-1,321.0	-355.1	1,332.3	0.98
7,568.0	91.90	175.75	6,684.6	-1,410.7	-348.5	1,421.7	0.11
7,658.0	90.60	175.63	6,682.6	-1,500.5	-341.8	1,511.2	1.45
7,747.0	89.10	176.78	6,682.8	-1,589.3	-335.9	1,599.7	2.12
7,837.0	89.70	176.40	6,683.8	-1,679.1	-330.5	1,689.3	0.79

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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)
7,927.0	90.90	176.51	6,683.3	-1,768.9	-325.0	1,778.9	1.34
8,016.0	92.50	176.31	6,680.7	-1,857.7	-319.4	1,867.5	1.81
8,106.0	89.70	175.97	6,678.9	-1,947.5	-313.3	1,957.0	3.13
8,195.0	89.70	176.13	6,679.4	-2,036.3	-307.2	2,045.5	0.18
8,285.0	90.60	174.88	6,679.2	-2,126.0	-300.2	2,134.9	1.71
8,375.0	89.40	175.47	6,679.2	-2,215.7	-292.6	2,224.3	1.49
8,465.0	90.10	176.62	6,679.6	-2,305.4	-286.4	2,313.8	1.50
8,555.0	90.80	179.51	6,678.9	-2,395.4	-283.3	2,403.6	3.30
8,644.0	90.10	177.62	6,678.2	-2,484.3	-281.1	2,492.4	2.26
8,734.0	89.70	177.40	6,678.3	-2,574.2	-277.2	2,582.2	0.51
8,824.0	89.90	176.14	6,678.6	-2,664.1	-272.1	2,671.8	1.42
8,914.0	89.40	175.30	6,679.2	-2,753.9	-265.4	2,761.3	1.09
9,003.0	88.30	174.35	6,681.0	-2,842.5	-257.4	2,849.6	1.63
9,093.0	88.50	176.02	6,683.5	-2,932.1	-249.8	2,938.9	1.87
9,183.0	87.50	175.10	6,686.6	-3,021.8	-242.9	3,028.3	1.51
9,272.0	86.10	174.23	6,691.6	-3,110.3	-234.6	3,116.4	1.85
9,362.0	89.50	179.59	6,695.1	-3,200.0	-229.8	3,206.0	7.05
9,452.0	91.60	180.27	6,694.2	-3,290.0	-229.7	3,295.9	2.45
9,541.0	91.60	178.25	6,691.7	-3,379.0	-228.5	3,384.8	2.27
9,631.0	90.50	177.74	6,690.1	-3,468.9	-225.4	3,474.5	1.35
9,721.0	91.90	177.94	6,688.2	-3,558.8	-222.0	3,564.3	1.57
9,811.0	90.50	176.51	6,686.3	-3,648.7	-217.6	3,654.0	2.22
9,900.0	90.30	176.00	6,685.7	-3,737.5	-211.8	3,742.5	0.62
9,990.0	92.00	175.47	6,683.9	-3,827.2	-205.1	3,832.0	1.98
10,080.0	89.70	174.38	6,682.5	-3,916.8	-197.2	3,921.3	2.83
10,170.0	90.60	173.64	6,682.3	-4,006.3	-187.8	4,010.4	1.29
10,259.0	90.60	175.05	6,681.4	-4,094.9	-179.0	4,098.6	1.58
10,301.1	90.37	174.24	6,681.0	-4,136.9	-175.1	4,140.4	2.01
WP							
10,349.0	90.10	173.31	6,680.8	-4,184.4	-169.9	4,187.8	2.01
10,439.0	90.70	174.25	6,680.2	-4,273.9	-160.1	4,276.9	1.24
10,528.0	91.20	176.33	6,678.7	-4,362.6	-152.8	4,365.3	2.40
10,618.0	90.00	178.36	6,677.8	-4,452.5	-148.6	4,455.0	2.62
10,707.0	88.80	180.53	6,678.7	-4,541.5	-147.8	4,543.9	2.79
10,797.0	88.70	180.08	6,680.7	-4,631.4	-148.3	4,633.8	0.51
10,887.0	88.30	182.35	6,683.0	-4,721.4	-150.2	4,723.8	2.56
10,976.0	90.30	184.33	6,684.1	-4,810.2	-155.3	4,812.7	3.16
11,066.0	91.70	184.73	6,682.5	-4,899.9	-162.5	4,902.6	1.62
11,156.0	91.50	183.35	6,680.0	-4,989.7	-168.8	4,992.5	1.55
11,245.0	89.70	181.74	6,679.1	-5,078.6	-172.7	5,081.5	2.71
11,335.0	90.30	181.29	6,679.1	-5,168.5	-175.1	5,171.5	0.83
11,425.0	90.90	180.09	6,678.1	-5,258.5	-176.2	5,261.5	1.49
11,514.0	89.10	180.63	6,678.1	-5,347.5	-176.8	5,350.4	2.11
11,604.0	89.90	180.81	6,678.9	-5,437.5	-177.9	5,440.4	0.91

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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)
11,693.0	90.90	180.10	6,678.3	-5,526.5	-178.6	5,529.4	1.38
11,800.0	91.40	178.82	6,676.2	-5,633.5	-177.6	5,636.2	1.28
11,862.0	91.40	178.82	6,674.6	-5,695.4	-176.3	5,698.1	0.00
Mahalo State AA09-75HNC BHL 30'FNL & 2495'FWL							

Checked By: _____ Approved By: _____ Date: _____