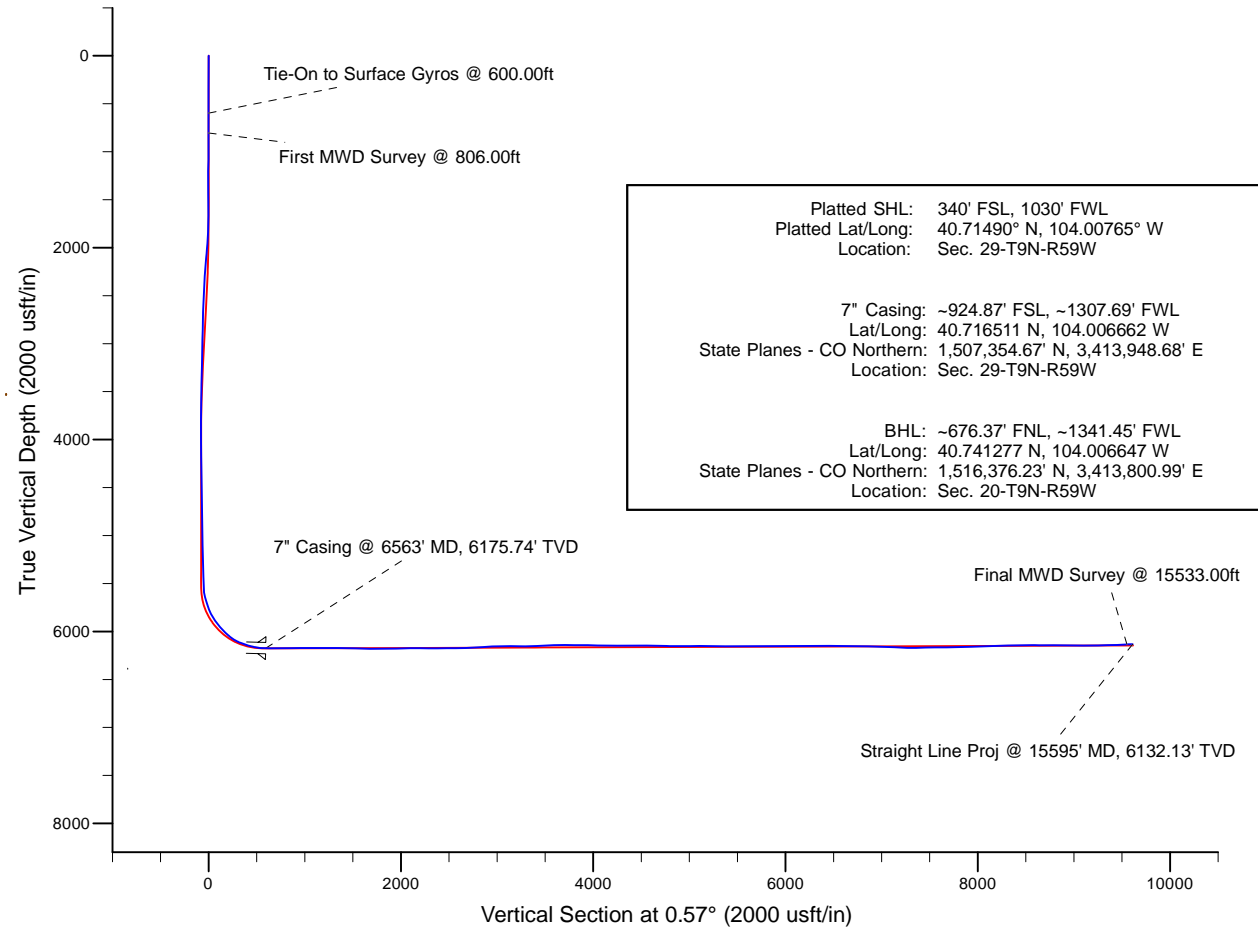
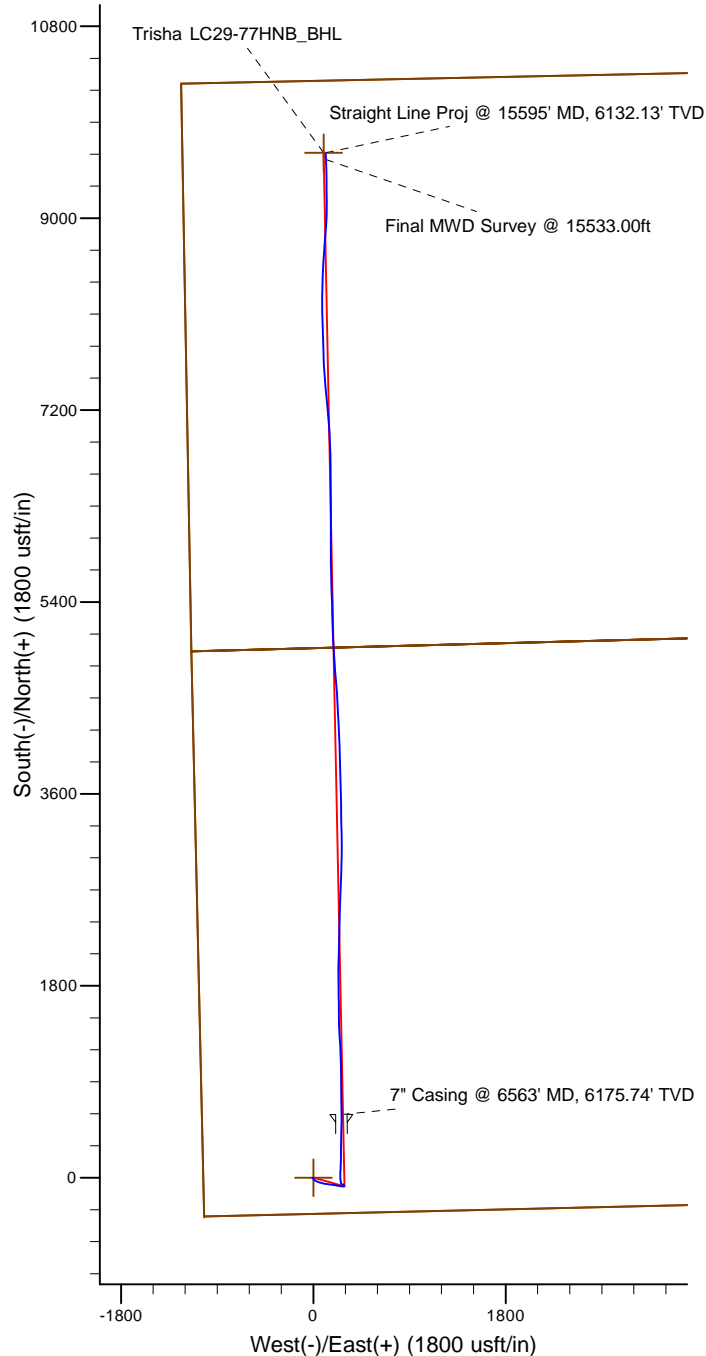


Project: Weld County, CO (NAD 83)  
Site: Sec. 29-T9N-R59W (LC29-13-A)  
Well: Trisha LC29-77HNB  
Wellbore: Plan A  
Design: Final Surveys

# Noble Energy

**HALLIBURTON**  
Sperry Drilling



## LEGEND

- Trisha LC29-77HNB, Plan A, Rev A0 - PROPOSAL V0
- Final Surveys

Platted SHL: 340' FSL, 1030' FWL  
Platted Lat/Long: 40.71490° N, 104.00765° W  
Location: Sec. 29-T9N-R59W

7" Casing: ~924.87' FSL, ~1307.69' FWL  
Lat/Long: 40.716511 N, 104.006662 W  
State Planes - CO Northern: 1,507,354.67' N, 3,413,948.68' E  
Location: Sec. 29-T9N-R59W

BHL: ~676.37' FNL, ~1341.45' FWL  
Lat/Long: 40.741277 N, 104.006647 W  
State Planes - CO Northern: 1,516,376.23' N, 3,413,800.99' E  
Location: Sec. 20-T9N-R59W

WELL DETAILS: Trisha LC29-77HNB

Ground Level: 4882.00  
RKB=24 @ 4906.00usft (H&P 273)

Created By: Fred Hartmann  
Created On: 05/02/2014

# Noble Energy

Weld County, CO (NAD 83)

Sec. 29-T9N-R59W (LC29-13-A)

Trisha LC29-77HNB

Design: Final Surveys

## Sperry Drilling Services

### Final Survey Report

02 May, 2014

Well Coordinates: 1,506,763.13 N, 3,413,684.70 E (40° 42' 53.64" N, 104° 00' 27.54" W)

Ground Level: 4,882.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Trisha LC29-77HNB

RKB=24 @ 4906.00usft (H&P 273)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

**HALLIBURTON**

## Design Report for Trisha LC29-77HNB - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
350.00	0.40	91.20	350.00	-0.03	1.22	-0.01	0.11	0.11	0.00	91.20
600.00	0.20	88.90	599.99	-0.04	2.53	-0.01	0.08	-0.08	-0.92	-177.70
<b>Tie-On to Surface Gyros @ 600.00ft</b>										
806.00	1.23	263.58	805.98	-0.28	0.69	-0.27	0.69	0.50	84.80	175.42
<b>First MWD Survey @ 806.00ft</b>										
1,084.00	1.03	247.17	1,083.93	-1.58	-4.58	-1.62	0.14	-0.07	-5.90	-129.74
1,362.00	0.44	276.17	1,361.90	-2.43	-7.94	-2.51	0.24	-0.21	10.43	161.70
1,455.00	0.48	278.00	1,454.90	-2.34	-8.68	-2.43	0.05	0.04	1.97	21.08
1,734.00	0.47	284.87	1,733.89	-1.88	-10.94	-1.99	0.02	0.00	2.46	103.38
1,829.00	4.41	130.60	1,828.80	-4.16	-8.55	-4.25	5.09	4.15	-162.39	-156.68
1,924.00	6.79	132.24	1,923.34	-10.32	-1.61	-10.33	2.51	2.51	1.73	4.66
2,018.00	6.51	131.80	2,016.71	-17.60	6.47	-17.54	0.30	-0.30	-0.47	-169.90
2,113.00	8.41	130.87	2,110.90	-25.74	15.74	-25.58	2.00	2.00	-0.98	-4.10
2,208.00	10.45	113.81	2,204.63	-33.77	28.88	-33.48	3.62	2.15	-17.96	-62.50
2,303.00	11.57	106.11	2,297.89	-39.89	45.92	-39.43	1.94	1.18	-8.11	-56.53
2,398.00	11.16	105.95	2,391.03	-45.06	63.91	-44.42	0.43	-0.43	-0.17	-175.68
2,493.00	10.94	106.82	2,484.26	-50.19	81.38	-49.38	0.29	-0.23	0.92	143.27
2,587.00	9.93	106.59	2,576.71	-55.09	97.68	-54.11	1.08	-1.07	-0.24	-177.75
2,682.00	9.80	97.88	2,670.31	-58.54	113.54	-57.40	1.58	-0.14	-9.17	-99.26
2,777.00	9.75	96.11	2,763.93	-60.50	129.55	-59.20	0.32	-0.05	-1.86	-100.32
2,872.00	9.81	97.44	2,857.55	-62.40	145.57	-60.95	0.25	0.06	1.40	75.78
2,967.00	9.86	97.74	2,951.15	-64.55	161.66	-62.93	0.08	0.05	0.32	45.85
3,062.00	9.43	97.14	3,044.81	-66.61	177.44	-64.84	0.46	-0.45	-0.63	-167.14
3,157.00	9.24	98.29	3,138.55	-68.68	192.71	-66.75	0.28	-0.20	1.21	136.09
3,251.00	8.32	100.51	3,231.45	-71.01	206.87	-68.94	1.04	-0.98	2.36	160.87
3,346.00	8.10	100.37	3,325.48	-73.46	220.21	-71.26	0.23	-0.23	-0.15	-174.88
3,441.00	8.17	100.19	3,419.52	-75.86	233.44	-73.53	0.08	0.07	-0.19	-20.08
3,536.00	8.73	98.28	3,513.49	-78.10	247.21	-75.63	0.66	0.59	-2.01	-27.57
3,631.00	6.89	96.32	3,607.60	-79.76	260.01	-77.16	1.96	-1.94	-2.06	-172.73
3,726.00	6.73	92.51	3,701.93	-80.63	271.24	-77.92	0.50	-0.17	-4.01	-111.39
3,821.00	4.48	102.11	3,796.48	-81.66	280.43	-78.85	2.56	-2.37	10.11	162.11
3,916.00	1.43	81.87	3,891.34	-82.27	285.23	-79.42	3.34	-3.21	-21.31	-171.04
4,011.00	1.00	59.21	3,986.32	-81.67	287.12	-78.81	0.67	-0.45	-23.85	-142.78
4,200.00	0.78	26.51	4,175.30	-79.68	289.11	-76.79	0.29	-0.12	-17.30	-129.19
4,295.00	0.88	347.18	4,270.29	-78.39	289.23	-75.50	0.60	0.11	-41.40	-100.09
4,390.00	0.86	334.44	4,365.28	-77.03	288.76	-74.15	0.20	-0.02	-13.41	-102.25
4,485.00	0.85	333.56	4,460.27	-75.76	288.14	-72.88	0.02	-0.01	-0.93	-127.73
4,580.00	0.97	344.01	4,555.25	-74.36	287.61	-71.48	0.22	0.13	11.00	59.43
4,674.00	1.28	320.02	4,649.24	-72.79	286.71	-69.92	0.59	0.33	-25.52	-69.03
4,864.00	2.07	305.83	4,839.15	-69.15	282.57	-66.33	0.47	0.42	-7.47	-34.91
4,959.00	2.31	298.94	4,934.09	-67.22	279.50	-64.43	0.37	0.25	-7.25	-51.13
5,054.00	2.46	297.94	5,029.00	-65.34	276.02	-62.58	0.16	0.16	-1.05	-16.01
5,148.00	2.38	303.83	5,122.92	-63.31	272.62	-60.58	0.28	-0.09	6.27	110.76
5,243.00	2.28	303.09	5,217.84	-61.18	269.40	-58.49	0.11	-0.11	-0.78	-163.63
5,433.00	2.04	301.32	5,407.71	-57.36	263.34	-54.73	0.13	-0.13	-0.93	-165.35
5,527.00	1.70	307.78	5,501.66	-55.63	260.81	-53.03	0.43	-0.36	6.87	151.40
5,574.00	3.25	333.47	5,548.61	-54.01	259.67	-51.42	3.98	3.30	54.66	48.89
5,621.00	9.62	347.86	5,595.29	-48.98	258.24	-46.40	13.88	13.55	30.62	21.45
5,668.00	15.45	350.80	5,641.15	-38.95	256.42	-36.39	12.47	12.40	6.26	7.69
5,716.00	17.34	353.52	5,687.20	-25.53	254.59	-22.99	4.25	3.94	5.67	23.42
5,763.00	17.60	358.38	5,732.04	-11.47	253.59	-8.93	3.15	0.55	10.34	82.22
5,811.00	21.47	358.23	5,777.26	4.57	253.12	7.10	8.06	8.06	-0.31	-0.81
5,858.00	27.65	0.23	5,819.99	24.10	252.90	26.62	13.27	13.15	4.26	8.58
5,906.00	32.23	0.71	5,861.58	48.05	253.10	50.57	9.55	9.54	1.00	3.20
5,953.00	35.98	1.84	5,900.49	74.39	253.70	76.91	8.09	7.98	2.40	10.06
6,001.00	39.63	1.99	5,938.40	103.79	254.68	106.32	7.61	7.60	0.31	1.50
6,048.00	42.31	3.11	5,973.89	134.57	256.06	137.12	5.91	5.70	2.38	15.75

## Design Report for Trisha LC29-77HNB - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
6,096.00	45.48	1.85	6,008.47	167.81	257.49	170.37	6.85	6.60	-2.62	-15.86
6,142.00	49.01	359.91	6,039.70	201.58	257.99	204.14	8.27	7.67	-4.22	-22.64
6,190.00	53.73	0.36	6,069.66	239.06	258.09	241.63	9.86	9.83	0.94	4.40
6,237.00	61.02	0.88	6,094.98	278.62	258.52	281.18	15.54	15.51	1.11	3.58
6,285.00	67.56	1.35	6,115.79	321.83	259.37	324.41	13.65	13.62	0.98	3.81
6,332.00	70.12	1.29	6,132.75	365.65	260.38	368.23	5.45	5.45	-0.13	-1.26
6,380.00	74.14	0.98	6,147.48	411.32	261.28	413.90	8.40	8.37	-0.65	-4.25
6,427.00	77.80	0.81	6,158.87	456.90	261.99	459.49	7.80	7.79	-0.36	-2.60
6,475.00	79.77	1.61	6,168.21	503.97	262.99	506.57	4.42	4.10	1.67	21.80
6,521.00	86.08	0.54	6,173.87	549.59	263.84	552.19	13.91	13.72	-2.33	-9.62
6,563.00	88.82	359.84	6,175.74	591.54	263.98	594.15	6.72	6.52	-1.66	-14.32
<b>7" Casing @ 6563' MD, 6175.74' TVD</b>										
6,583.00	90.12	359.51	6,175.93	611.54	263.87	614.14	6.72	6.52	-1.66	-14.28
6,646.00	89.69	358.46	6,176.03	674.53	262.75	677.12	1.80	-0.68	-1.67	-112.27
6,741.00	90.65	359.13	6,175.75	769.51	260.75	772.07	1.23	1.01	0.71	34.91
6,836.00	90.74	359.75	6,174.60	864.50	259.82	867.04	0.66	0.09	0.65	81.74
6,931.00	90.06	359.29	6,173.93	959.49	259.03	962.03	0.86	-0.72	-0.48	-145.92
7,026.00	90.09	358.73	6,173.81	1,054.47	257.39	1,056.99	0.59	0.03	-0.59	-86.93
7,120.00	90.43	358.43	6,173.38	1,148.44	255.06	1,150.93	0.48	0.36	-0.32	-41.42
7,215.00	90.15	357.72	6,172.90	1,243.39	251.87	1,245.84	0.80	-0.29	-0.75	-111.52
7,310.00	88.98	354.93	6,173.62	1,338.18	245.78	1,340.57	3.18	-1.23	-2.94	-112.76
7,405.00	89.11	358.45	6,175.21	1,432.99	240.30	1,435.32	3.71	0.14	3.71	87.91
7,500.00	88.58	359.52	6,177.12	1,527.96	238.61	1,530.26	1.26	-0.56	1.13	116.37
7,595.00	88.89	359.72	6,179.22	1,622.93	237.98	1,625.23	0.39	0.33	0.21	32.82
7,690.00	88.28	359.10	6,181.57	1,717.90	237.01	1,720.18	0.92	-0.64	-0.65	-134.55
7,784.00	91.02	359.45	6,182.14	1,811.88	235.82	1,814.14	2.94	2.91	0.37	7.28
7,880.00	93.21	359.19	6,178.60	1,907.80	234.68	1,910.05	2.30	2.28	-0.27	-6.76
8,070.00	89.35	2.64	6,174.35	2,097.66	237.71	2,099.93	2.72	-2.03	1.82	138.16
8,164.00	89.14	1.11	6,175.59	2,191.60	240.79	2,193.90	1.64	-0.22	-1.63	-97.83
8,259.00	88.77	0.97	6,177.32	2,286.57	242.51	2,288.88	0.42	-0.39	-0.15	-159.28
8,354.00	91.02	2.40	6,177.50	2,381.52	245.31	2,383.85	2.81	2.37	1.51	32.44
8,449.00	90.93	1.47	6,175.88	2,476.45	248.51	2,478.81	0.98	-0.09	-0.98	-95.52
8,543.00	90.80	0.88	6,174.46	2,570.42	250.44	2,572.79	0.64	-0.14	-0.63	-102.42
8,638.00	92.00	1.87	6,172.14	2,665.36	252.72	2,667.75	1.64	1.26	1.04	39.50
8,733.00	92.62	2.15	6,168.31	2,760.23	256.05	2,762.64	0.72	0.65	0.29	24.28
8,828.00	93.95	2.58	6,162.87	2,854.99	259.96	2,857.44	1.47	1.40	0.45	17.88
8,922.00	92.53	1.59	6,157.56	2,948.77	263.38	2,951.25	1.84	-1.51	-1.05	-145.13
9,017.00	91.08	0.33	6,154.56	3,043.71	264.97	3,046.20	2.02	-1.53	-1.33	-139.00
9,112.00	89.66	359.84	6,153.95	3,138.70	265.11	3,141.19	1.58	-1.49	-0.52	-160.96
9,207.00	89.35	357.28	6,154.77	3,233.66	262.72	3,236.12	2.71	-0.33	-2.69	-96.91
9,302.00	91.17	0.44	6,154.34	3,328.62	260.83	3,331.06	3.84	1.92	3.33	60.06
9,396.00	92.44	359.24	6,151.38	3,422.57	260.57	3,425.00	1.86	1.35	-1.28	-43.35
9,491.00	92.53	358.92	6,147.26	3,517.47	259.04	3,519.88	0.35	0.09	-0.34	-74.27
9,586.00	92.00	358.64	6,143.50	3,612.38	257.02	3,614.76	0.63	-0.56	-0.29	-152.17
9,681.00	89.88	358.64	6,141.95	3,707.33	254.77	3,709.69	2.23	-2.23	0.00	180.00
9,775.00	89.57	357.67	6,142.40	3,801.28	251.74	3,803.60	1.08	-0.33	-1.03	-107.73
9,870.00	89.48	358.86	6,143.19	3,896.23	248.87	3,898.52	1.26	-0.09	1.25	94.33
9,965.00	88.12	358.26	6,145.17	3,991.18	246.48	3,993.44	1.56	-1.43	-0.63	-156.20
10,060.00	88.61	357.95	6,147.89	4,086.09	243.34	4,088.31	0.61	0.52	-0.33	-32.31
10,152.00	89.23	357.46	6,149.62	4,178.00	239.66	4,180.18	0.86	0.67	-0.53	-38.32
10,245.00	90.15	356.84	6,150.12	4,270.88	235.03	4,273.01	1.19	0.99	-0.67	-33.98
10,338.00	91.67	357.10	6,148.65	4,363.73	230.12	4,365.81	1.66	1.63	0.28	9.70
10,431.00	90.46	356.83	6,146.92	4,456.59	225.19	4,458.61	1.33	-1.30	-0.29	-167.42
10,524.00	88.06	356.97	6,148.12	4,549.43	220.17	4,551.40	2.59	-2.58	0.15	176.66
10,616.00	88.80	355.76	6,150.64	4,641.21	214.34	4,643.12	1.54	0.80	-1.32	-58.56
10,708.00	89.97	354.21	6,151.63	4,732.85	206.29	4,734.67	2.11	1.27	-1.68	-52.96
10,801.00	88.83	355.99	6,152.60	4,825.50	198.35	4,827.24	2.27	-1.23	1.91	122.65
10,893.00	89.57	356.51	6,153.88	4,917.29	192.33	4,918.97	0.98	0.80	0.57	35.10
10,986.00	91.54	356.71	6,152.98	5,010.12	186.84	5,011.74	2.13	2.12	0.22	5.80
11,079.00	89.88	358.09	6,151.83	5,103.01	182.62	5,104.58	2.32	-1.78	1.48	140.25

## Design Report for Trisha LC29-77HNB - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
11,172.00	90.77	358.45	6,151.30	5,195.97	179.81	5,197.50	1.03	0.96	0.39	22.02
11,264.00	89.48	358.75	6,151.10	5,287.94	177.56	5,289.45	1.44	-1.40	0.33	166.91
11,357.00	88.43	358.32	6,152.80	5,380.89	175.18	5,382.37	1.22	-1.13	-0.46	-157.74
11,450.00	88.02	357.68	6,155.68	5,473.79	171.94	5,475.23	0.82	-0.44	-0.69	-122.67
11,543.00	89.51	358.18	6,157.68	5,566.70	168.58	5,568.11	1.69	1.60	0.54	18.55
11,636.00	92.10	358.38	6,156.38	5,659.65	165.79	5,661.02	2.79	2.78	0.22	4.41
11,729.00	91.20	359.96	6,153.70	5,752.59	164.45	5,753.95	1.95	-0.97	1.70	119.65
11,822.00	89.54	0.72	6,153.10	5,845.59	165.00	5,846.94	1.96	-1.78	0.82	155.40
11,916.00	89.94	359.91	6,153.53	5,939.58	165.51	5,940.94	0.96	0.43	-0.86	-63.72
12,011.00	91.29	359.66	6,152.51	6,034.57	165.16	6,035.92	1.45	1.42	-0.26	-10.49
12,106.00	89.72	359.06	6,151.67	6,129.56	164.10	6,130.89	1.77	-1.65	-0.63	-159.08
12,201.00	90.96	359.38	6,151.11	6,224.55	162.80	6,225.86	1.35	1.31	0.34	14.47
12,296.00	89.29	0.53	6,150.90	6,319.54	162.73	6,320.85	2.13	-1.76	1.21	145.44
12,390.00	89.11	359.38	6,152.21	6,413.53	162.66	6,414.84	1.24	-0.19	-1.22	-98.90
12,485.00	90.59	359.90	6,152.46	6,508.53	162.06	6,509.82	1.65	1.56	0.55	19.36
12,580.00	90.09	359.76	6,151.90	6,603.52	161.78	6,604.81	0.55	-0.53	-0.15	-164.36
12,675.00	90.99	359.40	6,151.00	6,698.52	161.08	6,699.79	1.02	0.95	-0.38	-21.80
12,770.00	87.87	358.31	6,151.95	6,793.48	159.18	6,794.73	3.48	-3.28	-1.15	-160.75
12,865.00	87.41	357.08	6,155.86	6,888.32	155.36	6,889.53	1.38	-0.48	-1.29	-110.55
12,960.00	86.57	356.74	6,160.85	6,983.05	150.25	6,984.20	0.95	-0.88	-0.36	-158.00
13,054.00	87.72	355.81	6,165.53	7,076.73	144.15	7,077.82	1.57	1.22	-0.99	-38.95
13,150.00	88.80	355.40	6,168.44	7,172.40	136.80	7,173.41	1.20	1.12	-0.43	-20.79
13,244.00	89.00	354.54	6,170.25	7,266.02	128.56	7,266.95	0.94	0.21	-0.91	-76.91
13,339.00	90.52	354.18	6,170.65	7,360.56	119.22	7,361.38	1.64	1.60	-0.38	-13.33
13,434.00	92.04	355.43	6,168.52	7,455.14	110.62	7,455.88	2.07	1.60	1.32	39.41
13,529.00	90.22	355.38	6,166.65	7,549.81	103.01	7,550.47	1.92	-1.92	-0.05	-178.43
13,624.00	91.73	357.27	6,165.03	7,644.60	96.93	7,645.19	2.55	1.59	1.99	51.36
13,718.00	90.65	359.15	6,163.08	7,738.53	93.99	7,739.08	2.31	-1.15	2.00	119.86
13,813.00	90.09	358.44	6,162.47	7,833.50	91.99	7,834.03	0.95	-0.59	-0.75	-128.26
13,908.00	91.70	358.57	6,160.98	7,928.46	89.51	7,928.95	1.70	1.69	0.14	4.61
14,002.00	92.62	357.34	6,157.44	8,022.33	86.16	8,022.79	1.63	0.98	-1.31	-53.16
14,097.00	91.26	358.67	6,154.22	8,117.21	82.86	8,117.63	2.00	-1.43	1.40	135.63
14,192.00	91.63	1.08	6,151.83	8,212.17	82.65	8,212.59	2.57	0.39	2.54	81.24
14,287.00	92.81	0.88	6,148.15	8,307.09	84.27	8,307.51	1.26	1.24	-0.21	-9.61
14,382.00	91.97	1.41	6,144.19	8,401.98	86.17	8,402.42	1.05	-0.88	0.56	147.76
14,477.00	90.92	2.24	6,141.79	8,496.90	89.20	8,497.37	1.41	-1.11	0.87	141.67
14,572.00	87.93	3.74	6,142.74	8,591.75	94.15	8,592.27	3.52	-3.15	1.58	153.36
14,667.00	89.54	4.25	6,144.84	8,686.50	100.77	8,687.07	1.78	1.69	0.54	17.58
14,761.00	89.85	4.25	6,145.34	8,780.24	107.73	8,780.88	0.33	0.33	0.00	0.00
14,855.00	89.81	3.61	6,145.62	8,874.02	114.18	8,874.71	0.68	-0.04	-0.68	-93.58
14,950.00	89.63	4.77	6,146.09	8,968.76	121.12	8,969.52	1.24	-0.19	1.22	98.82
15,045.00	88.49	359.53	6,147.64	9,063.64	124.68	9,064.44	5.64	-1.20	-5.52	-102.31
15,140.00	90.31	359.71	6,148.64	9,158.63	124.05	9,159.41	1.93	1.92	0.19	5.65
15,235.00	92.75	359.46	6,146.10	9,253.59	123.36	9,254.36	2.58	2.57	-0.26	-5.85
15,330.00	91.27	359.33	6,142.77	9,348.52	122.36	9,349.28	1.56	-1.56	-0.14	-174.98
15,425.00	91.42	359.10	6,140.54	9,443.49	121.06	9,444.23	0.29	0.16	-0.24	-56.88
15,520.00	93.18	358.23	6,136.73	9,538.38	118.85	9,539.09	2.07	1.85	-0.92	-26.27
15,533.00	93.55	358.03	6,135.97	9,551.35	118.42	9,552.06	3.23	2.85	-1.54	-28.35
<b>Final MWD Survey @ 15533.00ft</b>										
15,595.00	93.55	358.03	6,132.13	9,613.20	116.30	9,613.88	0.00	0.00	0.00	0.00
<b>Straight Line Proj @ 15595' MD, 6132.13' TVD</b>										

## Design Report for Trisha LC29-77HNB - Final Surveys

### Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
600.00	599.99	-0.04	2.53	Tie-On to Surface Gyros @ 600.00ft
806.00	805.98	-0.28	0.69	First MWD Survey @ 806.00ft
15,533.00	6,135.97	9,551.35	118.42	Final MWD Survey @ 15533.00ft
15,595.00	6,132.13	9,613.20	116.30	Straight Line Proj @ 15595' MD, 6132.13' TVD

### Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Trisha LC29-77HNB_BHL	0.57	Slot	0.00	0.00	0.00

### Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
350.00	600.00	Surface Gyro	Flexi-Shot
806.00	6,521.00	MWD Surveys - Intermediate	MWD+IFR1+MS_WY
6,583.00	15,533.00	MWD Surveys - Production	MWD+IFR1+MS_WY

### Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
6,563.00	6,175.74	7" Casing @ 6563' MD, 6175.74' TVD	7	8-3/4

### *Targets associated with this wellbore*

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Trisha LC29-77HNB_600	0.00	0.00	0.00	Polygon
Trisha LC29-77HNB_SHL	0.00	0.00	0.00	Point
Trisha LC29-77HNB_SL	0.00	0.00	0.00	Polygon
Trisha LC29-77HNB_KOP 35ft	5,538.92	-80.01	289.97	Circle
Trisha LC29-77HNB_BHL	6,146.44	9,614.09	95.93	Point
Trisha LC29-77HNB_Lateral	6,180.00	0.00	0.00	Polygon

**Design Report for Trisha LC29-77HNB - Final Surveys**

**Directional Difficulty Index**

Average Dogleg over Survey:	1.77 °/100usft	Maximum Dogleg over Survey:	15.54 °/100usft at 6,237.00 usft
Net Tortosity applicable to Plans:	1.05 °/100usft	Directional Difficulty Index:	6.846

**Audit Info**

**North Reference Sheet for Sec. 29-T9N-R59W (LC29-13-A) - Trisha LC29-77HNB -**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to RKB=24 @ 4906.00usft (H&P 273). Northing and Easting are relative to Trisha LC29-77HNB

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.50°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99998961

Grid Coordinates of Well: 1,506,763.13 usft N, 3,413,684.70 usft E

Geographical Coordinates of Well: 40° 42' 53.64" N, 104° 00' 27.54" W

Grid Convergence at Surface is: 0.96°

Based upon Minimum Curvature type calculations, at a Measured Depth of 15,595.00usft  
the Bottom Hole Displacement is 9,613.90usft in the Direction of 0.69° (Grid).

Magnetic Convergence at surface is: -7.17° ( 6 April 2014, , BGGM2013)

