

Noble Energy

Weld County, CO (NAD 83)

Sec. 2-T9N-R58W (Sharpe State 2 /Davis State (PAD)

Tripucka State LD02-75-1BHN

Original Wellbore

Design: Original Wellbore

API# 65-123-39875

Sperry Drilling Services

Final Survey Report

13 January, 2015

Well Coordinates: 1,529,543.21 N, 3,462,827.67 E (40° 46' 30.04" N, 103° 49' 43.90" W)

Ground Level: 4,676.00 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 Tripucka State LD02-75-1BHN

KB @ 4706.00usft (HP 321)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Project: Weld County, CO (NAD 83)
Site: Sec. 2-T9N-R58W (Sharpe State 2 /Davis State (PAD))
Well: Tripucka State LD02-75-1BHN
Wellbore: Original Wellbore
Design: Original Wellbore

Noble Energy

HALLIBURTON
Sperry Drilling

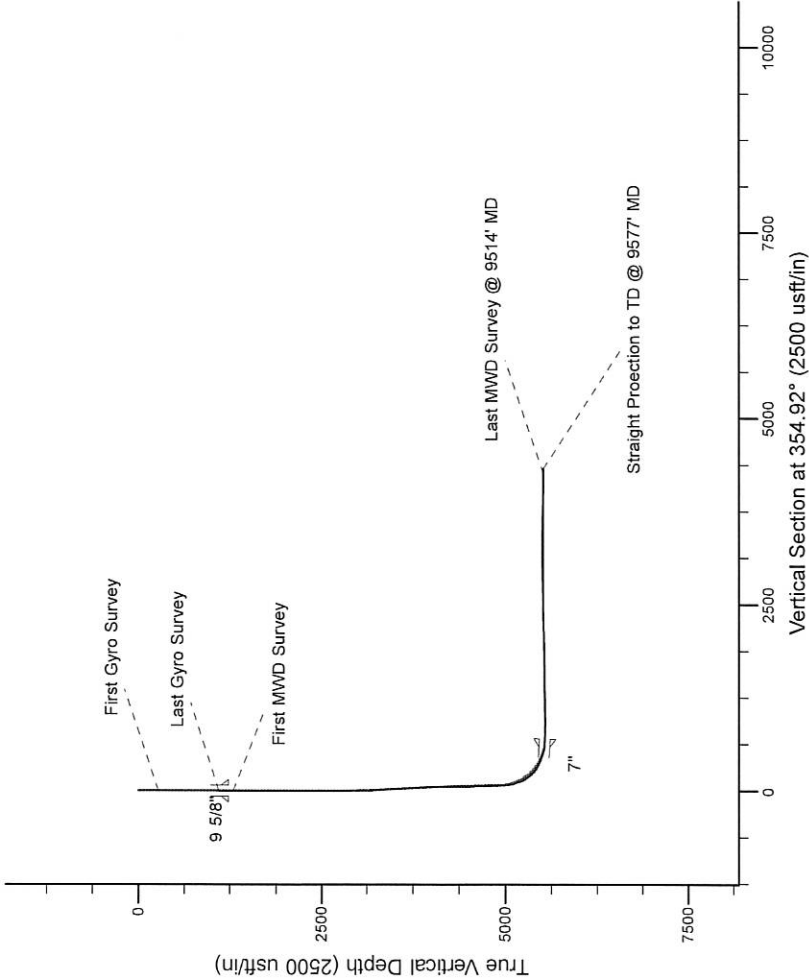
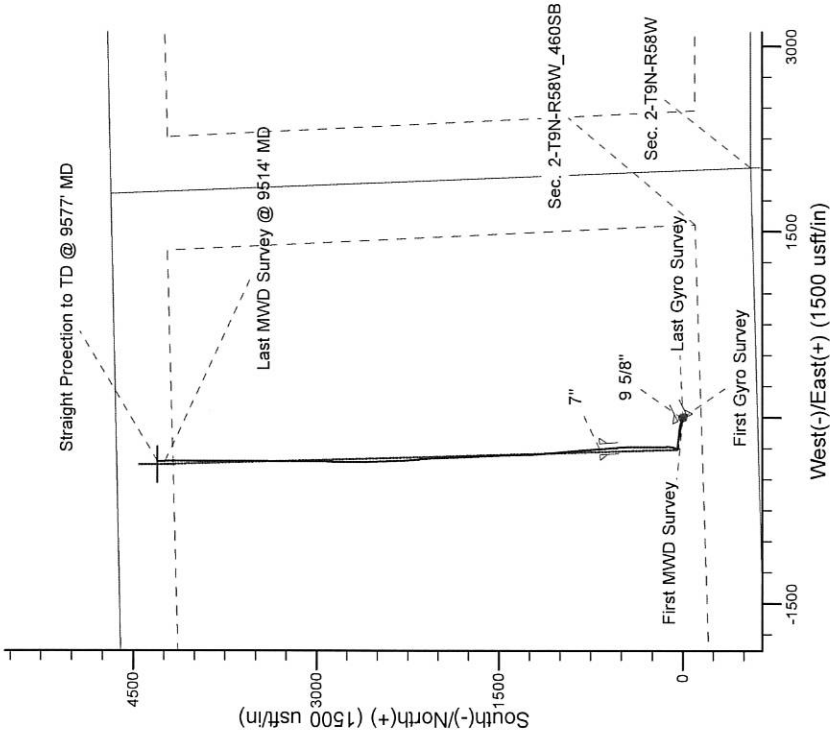
LEGEND

- Tripucka State LD02-75-1BHN, Original Wellbore, Rev C0 V0
- Original Wellbore

Platted SHL: 615' FSL, 1991' FEL
Platted Lat/Long: 40.77501° N, 103.82886° W
Location: Sec. 2-T9N-R58W

~7" Casing: 1326' FSL, 2200' FEL
Lat/Long: 40.776875° N, 103.829734° W
State Planes - CO Northern: 1530217.92° N, 3462572.88° E
Location: Sec. 2-T9N-R58W

Platted BHL: 330' FNL, 2200' FEL
Lat/Long: 40.78685° N, 103.82995° W
State Planes - CO Northern: 1533850.52° N, 3462444.59° E
Location: Sec. 2-T9N-R58W



WELL DETAILS: Tripucka State LD02-75-1BHN

Ground Level: 4676.00
KB @ 4706.00usft (HP 321)

Created By: Amanda Marchand
Created On: 1/13/2015

Design Report for Tripucka State LD02-75-1BHN - Original Wellbore

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
273.00	0.30	253.72	273.00	-0.20	-0.69	-0.14	0.11
First Gyro Survey							
546.00	0.60	291.22	545.99	0.12	-2.70	0.36	0.15
830.00	1.40	251.42	829.95	-0.45	-7.38	0.20	0.36
1,099.00	0.70	42.82	1,098.93	-0.29	-9.38	0.54	0.76
Last Gyro Survey							
1,298.00	0.72	233.71	1,297.92	-0.14	-9.56	0.71	0.71
First MWD Survey							
1,482.00	0.49	219.84	1,481.91	-1.43	-11.00	-0.45	0.15
1,574.00	0.97	134.61	1,573.90	-2.28	-10.69	-1.32	1.14
1,666.00	0.93	141.02	1,665.89	-3.41	-9.67	-2.54	0.12
1,757.00	0.55	119.59	1,756.88	-4.20	-8.82	-3.40	0.51
1,850.00	0.46	114.56	1,849.88	-4.57	-8.10	-3.84	0.11
1,941.00	0.39	89.95	1,940.88	-4.72	-7.45	-4.04	0.21
2,033.00	0.16	127.74	2,032.88	-4.80	-7.04	-4.16	0.31
2,217.00	0.33	59.11	2,216.88	-4.69	-6.38	-4.10	0.17
2,402.00	0.36	81.16	2,401.87	-4.32	-5.35	-3.83	0.07
2,494.00	0.41	68.48	2,493.87	-4.16	-4.76	-3.72	0.11
2,586.00	0.33	48.92	2,585.87	-3.86	-4.25	-3.47	0.16
2,677.00	0.15	12.62	2,676.87	-3.57	-4.03	-3.20	0.25
2,772.00	0.17	81.94	2,771.87	-3.43	-3.86	-3.08	0.19
2,867.00	0.95	340.94	2,866.86	-2.67	-3.98	-2.31	1.05
2,962.00	1.66	290.82	2,961.84	-1.44	-5.52	-0.94	1.35
3,056.00	2.60	288.07	3,055.77	-0.29	-8.82	0.49	1.01
3,151.00	5.29	291.00	3,150.54	1.95	-14.96	3.27	2.84
3,245.00	6.92	301.16	3,244.01	6.43	-23.85	8.52	2.07
3,340.00	8.29	294.89	3,338.17	12.28	-34.96	15.32	1.68
3,435.00	10.76	289.42	3,431.86	18.11	-49.54	22.42	2.77
3,529.00	11.62	281.43	3,524.07	22.90	-67.10	28.76	1.88
3,623.00	10.60	278.07	3,616.31	25.99	-84.94	33.41	1.28
3,718.00	8.13	275.98	3,710.04	27.92	-100.27	36.69	2.62
3,812.00	9.57	276.74	3,802.92	29.53	-114.64	39.57	1.54
3,907.00	10.90	278.13	3,896.40	31.72	-131.38	43.24	1.42
4,001.00	10.51	275.23	3,988.77	33.76	-148.71	46.80	0.71
4,096.00	10.87	275.31	4,082.12	35.38	-166.26	49.97	0.38
4,191.00	10.62	277.79	4,175.45	37.40	-183.85	53.54	0.55
4,285.00	9.79	274.10	4,267.97	39.14	-200.41	56.74	1.12
4,380.00	8.08	261.77	4,361.82	38.76	-215.07	57.66	2.69
4,475.00	7.45	263.12	4,455.95	37.07	-227.80	57.11	0.69
4,569.00	6.67	272.68	4,549.24	36.60	-239.30	57.65	1.50
4,664.00	5.63	288.04	4,643.70	38.30	-249.24	60.23	2.04
4,759.00	3.63	316.96	4,738.39	41.94	-255.73	64.43	3.17
4,853.00	1.52	341.80	4,832.30	45.30	-258.15	67.99	2.49
4,948.00	3.30	60.63	4,927.23	47.84	-256.16	70.34	3.53
5,043.00	6.98	35.53	5,021.84	53.88	-250.42	75.85	4.45
5,137.00	14.14	16.50	5,114.21	69.56	-243.83	90.89	8.37
5,232.00	22.26	4.45	5,204.42	98.68	-239.13	119.48	9.38
5,326.00	32.57	358.07	5,287.76	141.85	-238.60	162.43	11.39
5,421.00	43.71	359.14	5,362.37	200.41	-239.95	220.88	11.75

Design Report for Tripucka State LD02-75-1BHN - Original Wellbore

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
5,516.00	57.51	0.53	5,422.51	273.65	-240.08	293.84	14.57
5,611.00	65.15	1.51	5,468.05	356.92	-238.57	376.65	8.09
5,659.00	68.88	359.56	5,486.79	401.10	-238.17	420.62	8.62
5,706.00	70.10	357.74	5,503.26	445.11	-239.21	464.55	4.46
5,754.00	74.82	356.61	5,517.72	490.80	-241.47	510.27	10.09
5,801.00	80.90	355.48	5,527.60	536.62	-244.64	556.18	13.15
5,849.00	85.77	355.40	5,533.17	584.13	-248.43	603.84	10.15
5,895.00	86.36	356.16	5,536.33	629.90	-251.81	649.73	2.09
6,012.00	86.86	356.30	5,543.25	746.44	-259.49	766.49	0.44
6,103.00	89.54	355.23	5,546.11	837.14	-266.20	857.43	3.17
6,198.00	90.49	353.57	5,546.08	931.68	-275.47	952.42	2.01
6,293.00	91.42	353.86	5,544.50	1,026.09	-285.87	1,047.39	1.03
6,388.00	92.31	356.62	5,541.41	1,120.71	-293.75	1,142.32	3.05
6,483.00	91.54	357.97	5,538.22	1,215.54	-298.23	1,237.18	1.64
6,577.00	91.23	357.65	5,535.94	1,309.45	-301.82	1,331.04	0.47
6,672.00	90.71	357.63	5,534.34	1,404.35	-305.73	1,425.92	0.55
6,767.00	90.80	359.27	5,533.08	1,499.31	-308.30	1,520.72	1.73
6,862.00	89.66	356.96	5,532.70	1,594.25	-311.43	1,615.57	2.71
6,957.00	88.95	355.34	5,533.85	1,689.02	-317.80	1,710.53	1.86
7,052.00	91.11	358.71	5,533.80	1,783.87	-322.73	1,805.45	4.21
7,146.00	91.45	359.08	5,531.70	1,877.83	-324.55	1,899.20	0.53
7,241.00	91.88	357.66	5,528.94	1,972.75	-327.25	1,993.99	1.56
7,336.00	92.28	356.52	5,525.50	2,067.57	-332.07	2,088.85	1.27
7,431.00	91.51	353.50	5,522.35	2,162.14	-340.33	2,183.79	3.28
7,526.00	92.00	356.62	5,519.44	2,256.73	-348.50	2,278.73	3.32
7,620.00	92.13	358.25	5,516.06	2,350.57	-352.71	2,372.58	1.74
7,715.00	91.39	359.29	5,513.14	2,445.51	-354.74	2,467.32	1.34
7,810.00	88.40	357.11	5,513.31	2,540.44	-357.73	2,562.14	3.89
7,904.00	88.30	357.27	5,516.02	2,634.29	-362.33	2,656.03	0.20
7,999.00	91.85	1.38	5,515.90	2,729.25	-363.45	2,750.71	5.72
8,094.00	93.95	1.50	5,511.09	2,824.09	-361.07	2,844.97	2.21
8,189.00	93.30	1.54	5,505.08	2,918.87	-358.55	2,939.15	0.69
8,284.00	91.23	0.77	5,501.33	3,013.77	-356.64	3,033.51	2.32
8,378.00	89.11	0.43	5,501.05	3,107.76	-355.66	3,127.04	2.28
8,473.00	89.08	0.09	5,502.55	3,202.74	-355.22	3,221.62	0.36
8,568.00	89.38	0.19	5,503.83	3,297.73	-354.99	3,316.22	0.33
8,663.00	89.63	0.30	5,504.65	3,392.73	-354.59	3,410.80	0.29
8,757.00	89.85	2.20	5,505.07	3,486.70	-352.54	3,504.22	2.03
8,852.00	87.35	358.22	5,507.40	3,581.65	-352.19	3,598.76	4.95
8,946.00	88.43	0.34	5,510.86	3,675.57	-353.37	3,692.42	2.53
9,041.00	88.89	1.27	5,513.08	3,770.53	-352.03	3,786.89	1.09
9,136.00	88.55	359.58	5,515.20	3,865.50	-351.33	3,881.43	1.81
9,231.00	88.58	358.99	5,517.58	3,960.46	-352.51	3,976.12	0.62
9,325.00	89.82	359.59	5,518.89	4,054.45	-353.68	4,069.84	1.47
9,420.00	89.54	359.47	5,519.42	4,149.44	-354.46	4,164.53	0.32
9,514.00	88.92	358.26	5,520.69	4,243.41	-356.32	4,258.29	1.45
Last MWD Survey @ 9514' MD							
9,577.00	88.92	358.26	5,521.87	4,306.37	-358.23	4,321.18	0.00
Straight Projection to TD @ 9577' MD							

Design Report for Tripucka State LD02-75-1BHN - Original Wellbore

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
273.00	273.00	-0.20	-0.69	First Gyro Survey
1,099.00	1,098.93	-0.29	-9.38	Last Gyro Survey
1,298.00	1,297.92	-0.14	-9.56	First MWD Survey
9,514.00	5,520.69	4,243.41	-356.32	Last MWD Survey @ 9514' MD
9,577.00	5,521.87	4,306.37	-358.23	Straight Projection to TD @ 9577' MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Tripucka State LD02-75-1BHN_BHL	354.92	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
273.00	1,099.00	Gyro Surveys	Flexi-Shot
1,298.00	5,895.00	Intermediate Surveys	MWD
6,012.00	9,577.00	Production Surveys	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,233.00	1,232.92	9 5/8"	9-5/8	13-3/4
5,940.00	5,539.11	7"	7	8-3/4

Wellbore Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Tripucka State LD02-7	0.00	0.00	5,515.00	4,307.32	-383.08	1,533,850.52	3,462,444.59	40.786850	-103.829950
- actual wellpath misses target center by 25.80usft at 9577.00usft MD (5521.87 TVD, 4306.37 N, -358.23 E)									
- Point									
Tripucka State LD02-7	0.00	0.00	5,541.04	703.32	-280.60	1,530,246.52	3,462,547.07	40.776954	-103.829825
- actual wellpath misses target center by 23.87usft at 5970.30usft MD (5540.90 TVD, 704.89 N, -256.78 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	2.10 °/100usft	Maximum Dogleg over Survey:	14.57 °/100usft at 5,516.00 usft
Net Tortousity applicable to Plans:	0.93 °/100usft	Directional Difficulty Index:	6.200

Audit Info

**North Reference Sheet for Sec. 2-T9N-R58W (Sharpe State 2 /Davis State (PAD) -
Tripucka State LD02-75-1BHN - Original Wellbore**

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

Vertical Depths are relative to KB @ 4706.00usft (HP 321). Northing and Easting are relative to Tripucka State LD02-75-1BHN

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 -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99999866

Grid Coordinates of Well: 1,529,543.21 usft N, 3,462,827.67 usft E

Geographical Coordinates of Well: 40° 46' 30.04" N, 103° 49' 43.90" W

Grid Convergence at Surface is: 1.08°

Based upon Minimum Curvature type calculations, at a Measured Depth of 9,577.00usft
the Bottom Hole Displacement is 4,321.25usft in the Direction of 355.24° (Grid).

Magnetic Convergence at surface is: -6.92° (15 December 2014, , BGGM2014)

