

Project: Arapahoe County, CO (NAD 83)
 Site: Sec. 15-T4S-R64W (Bison Pad)
 Well: Bison 4-64 15-16-1BHZ (Restake 4)
 Wellbore: Wellbore #1
 Design: Rev C0



Bison Oil & Gas, L.L.C.

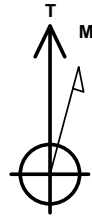


SECTION DETAILS

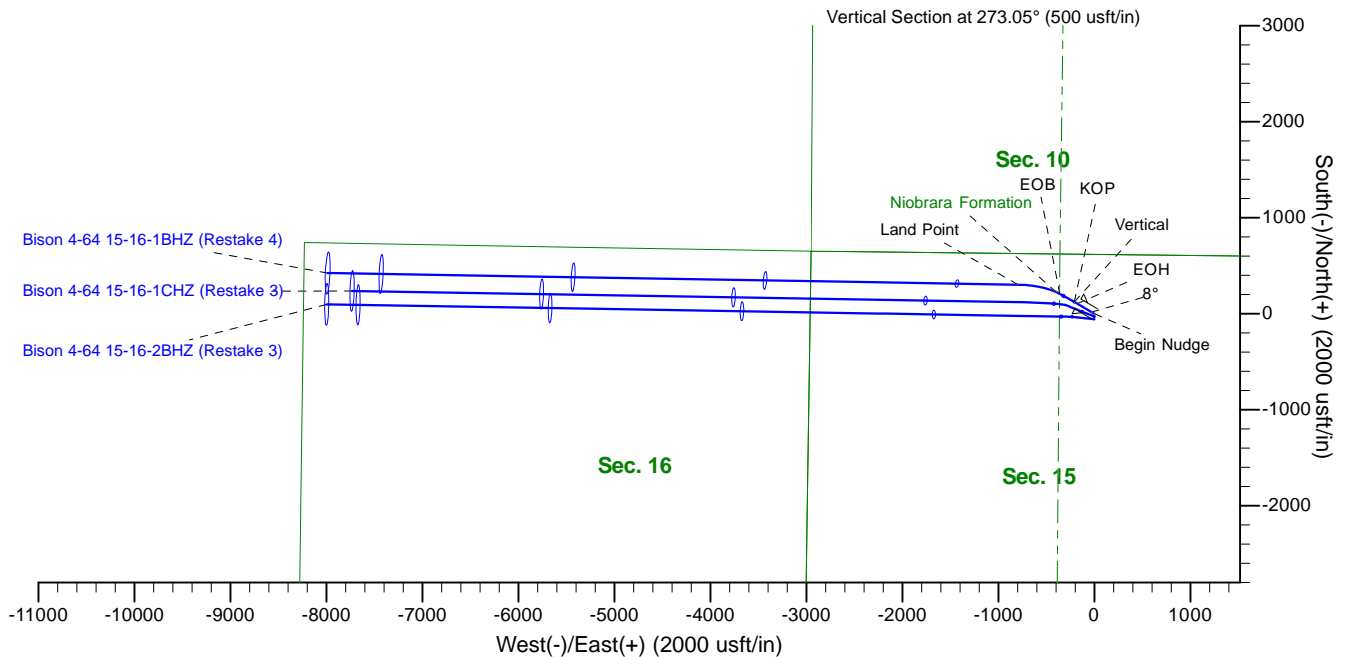
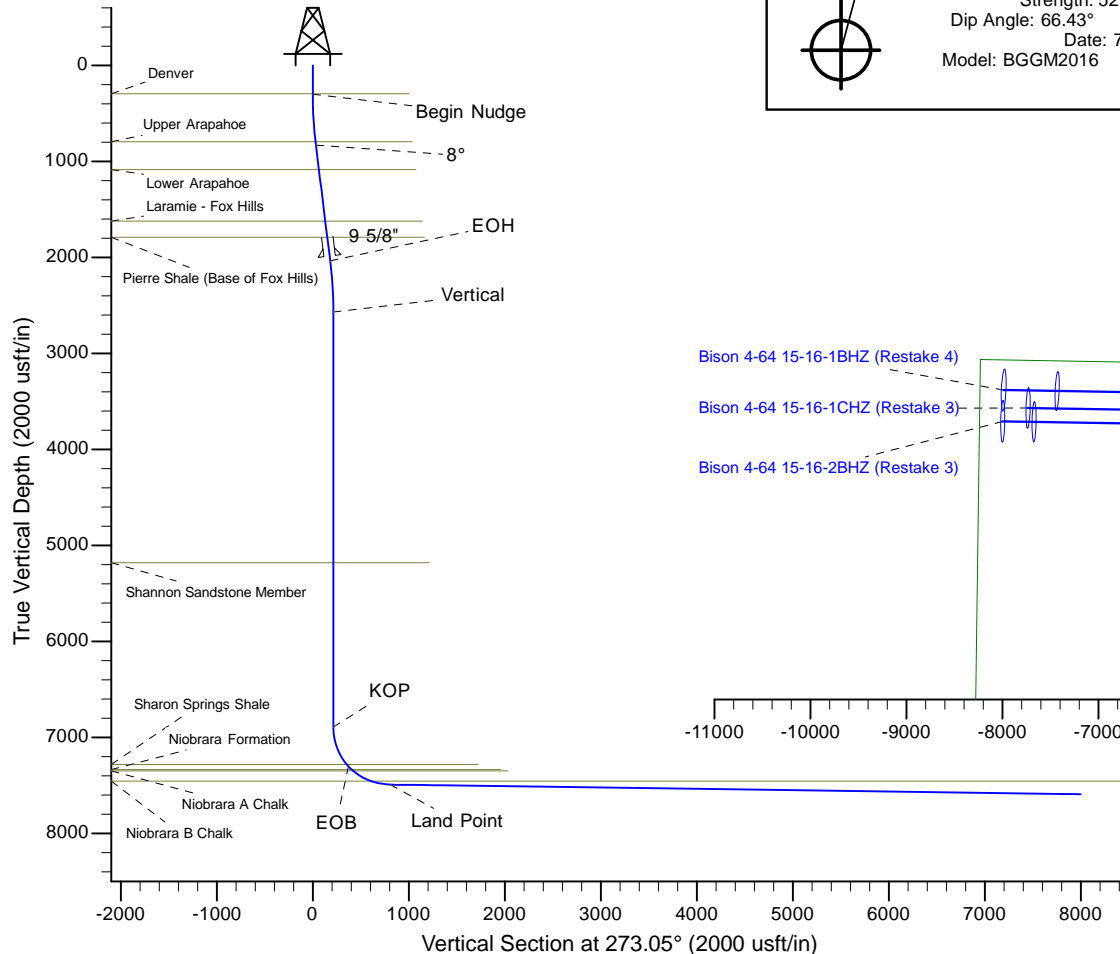
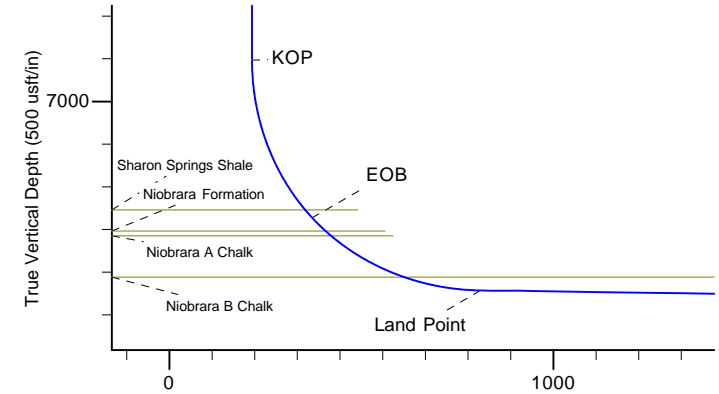
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	Begin Nudge
3	833.33	8.00	301.00	831.60	19.15	-31.86	1.50	301.00	32.84	8°
4	2050.00	8.00	301.00	2036.43	106.36	-177.01	0.00	0.00	182.41	EOH
5	2583.33	0.00	0.00	2568.03	125.50	-208.87	1.50	180.00	215.24	Vertical
6	6907.30	0.00	0.00	6892.00	125.50	-208.87	0.00	0.00	215.24	KOP
7	7365.04	45.79	298.62	7302.56	208.56	-361.05	10.00	298.62	371.62	EOB
8	7863.65	89.20	270.96	7492.00	304.47	-794.88	10.00	-37.38	809.94	Land Point
9	15056.77	89.20	270.96	7592.43	424.97	-7986.29	0.00	0.00	7997.59	BHL

WELL DETAILS: Bison 4-64 15-16-1BHZ (Restake 4)

+N/-S	+E/-W	Northing	Ground Level: Easting	5660.00 Latitude	Longitude
0.00	0.00	1684269.33	3271363.75	39.708166	-104.535475



Azimuths to True North
 Magnetic North: 8.29°
 Magnetic Field
 Strength: 52160.5snT
 Dip Angle: 66.43°
 Date: 7/18/2016
 Model: BGGM2016



Plan: Rev C0 (Bison 4-64 15-16-1BHZ (Restake 4)/Wellbore #1)

Created By: Kyle Rickey

Date: 16:29, July 29 2016

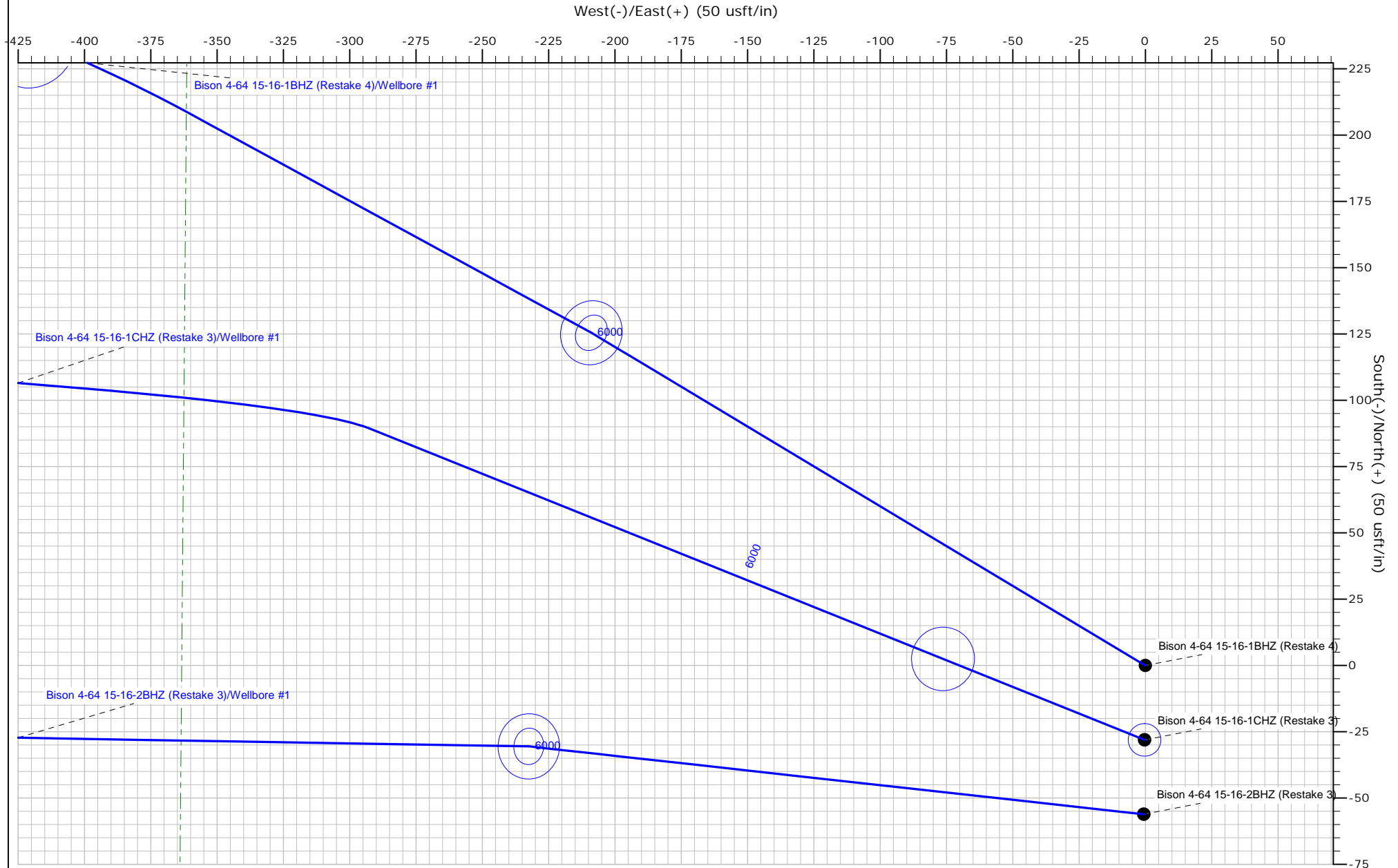
Checked: _____

Date: _____

Project: Arapahoe County, CO (NAD 83)
Site: Sec. 15-T4S-R64W (Bison Pad)
Well: Bison 4-64 15-16-1BHZ (Restake 4)
Wellbore: Wellbore #1
Design: Rev C0



Bison Oil & Gas, L.L.C.



GPL

Bison Oil & Gas, L.L.C.

Arapahoe County, CO (NAD 83) Sec. 15-T4S-R64W (Bison Pad)

API#

Bison 4-64 15-16-1BHZ (Restake 4)

Wellbore #1

Plan: Rev C0

Please review plan for SCC Application or Non-Mag Spacing.

Highlighted plan sections are within the Short Collar Correction (SCC) Instability Zone

Sperry Drilling Services

Combo Report

20 July, 2016

Well Coordinates: 39° 42' 29.40" N
104° 32' 07.71" W

North American Datum 1983
Colorado Central Zone
1,684,269.33 N
3,271,363.75 E

Ground Level: 5,660.00 usft

Geodetic Scale Factor Applied

Local Coordinate Origin:

Centered on Well Bison 4-64 15-16-1BHZ (Restake 4)

Viewing Datum:

RKB = 25' @ 5685.00usft (GPL)

TVDs to System:

N

North Reference:

True

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 72

Report Version: Midcon Combo v1.11

HALLIBURTON

Plan Report for Bison 4-64 15-16-1BHZ (Restake 4) - Rev C0

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
0.00	0.00	0.00	0.00	0.00 N	0.00 E	1,684,269.33	3,271,363.75	0.00	0.00	
100.00	0.00	0.00	100.00	0.00 N	0.00 E	1,684,269.33	3,271,363.75	0.00	0.00	
200.00	0.00	0.00	200.00	0.00 N	0.00 E	1,684,269.33	3,271,363.75	0.00	0.00	
297.00	0.00	0.00	297.00	0.00 N	0.00 E	1,684,269.33	3,271,363.75	0.00	0.00	Denver
300.00	0.00	0.00	300.00	0.00 N	0.00 E	1,684,269.33	3,271,363.75	0.00	0.00	Begin Nudge
400.00	1.50	301.00	399.99	0.67 N	1.12 W	1,684,269.99	3,271,362.62	1.50	1.16	
500.00	3.00	301.00	499.91	2.70 N	4.49 W	1,684,271.98	3,271,359.24	1.50	4.62	
600.00	4.50	301.00	599.69	6.06 N	10.09 W	1,684,275.29	3,271,353.60	1.50	10.40	
700.00	6.00	301.00	699.27	10.78 N	17.94 W	1,684,279.92	3,271,345.70	1.50	18.48	
798.41	7.48	301.00	797.00	16.72 N	27.83 W	1,684,285.76	3,271,335.74	1.50	28.68	Upper Arapahoe
800.00	7.50	301.00	798.57	16.83 N	28.01 W	1,684,285.86	3,271,335.57	1.50	28.87	
833.33	8.00	301.00	831.60	19.15 N	31.86 W	1,684,288.14	3,271,331.69	1.50	32.84	8°
900.00	8.00	301.00	897.62	23.92 N	39.82 W	1,684,292.83	3,271,323.68	0.00	41.03	
1,000.00	8.00	301.00	996.65	31.09 N	51.75 W	1,684,299.87	3,271,311.68	0.00	53.33	
1,091.24	8.00	301.00	1,087.00	37.63 N	62.63 W	1,684,306.30	3,271,300.73	0.00	64.54	Lower Arapahoe
1,100.00	8.00	301.00	1,095.67	38.26 N	63.68 W	1,684,306.91	3,271,299.68	0.00	65.62	
1,200.00	8.00	301.00	1,194.70	45.43 N	75.61 W	1,684,313.95	3,271,287.67	0.00	77.91	
1,300.00	8.00	301.00	1,293.73	52.60 N	87.53 W	1,684,320.99	3,271,275.67	0.00	90.21	
1,400.00	8.00	301.00	1,392.75	59.76 N	99.46 W	1,684,328.03	3,271,263.66	0.00	102.50	
1,500.00	8.00	301.00	1,491.78	66.93 N	111.39 W	1,684,335.08	3,271,251.66	0.00	114.79	
1,600.00	8.00	301.00	1,590.81	74.10 N	123.32 W	1,684,342.12	3,271,239.65	0.00	127.09	
1,631.50	8.00	301.00	1,622.00	76.36 N	127.08 W	1,684,344.33	3,271,235.87	0.00	130.96	Laramie - Fox Hills
1,700.00	8.00	301.00	1,689.83	81.27 N	135.25 W	1,684,349.16	3,271,227.65	0.00	139.38	
1,800.00	8.00	301.00	1,788.86	88.44 N	147.18 W	1,684,356.20	3,271,215.64	0.00	151.67	
1,802.16	8.00	301.00	1,791.00	88.59 N	147.44 W	1,684,356.35	3,271,215.38	0.00	151.94	Pierre Shale (Base of Fox Hills)
1,900.00	8.00	301.00	1,887.89	95.60 N	159.11 W	1,684,363.24	3,271,203.64	0.00	163.97	
2,000.00	8.00	301.00	1,986.91	102.77 N	171.04 W	1,684,370.28	3,271,191.63	0.00	176.26	9 5/8"
2,050.00	8.00	301.00	2,036.43	106.36 N	177.01 W	1,684,373.80	3,271,185.63	0.00	182.41	EOH
2,100.00	7.25	301.00	2,085.99	109.77 N	182.69 W	1,684,377.16	3,271,179.91	1.50	188.27	
2,200.00	5.75	301.00	2,185.34	115.60 N	192.40 W	1,684,382.88	3,271,170.14	1.50	198.27	
2,300.00	4.25	301.00	2,284.96	120.09 N	199.87 W	1,684,387.29	3,271,162.62	1.50	205.97	
2,400.00	2.75	301.00	2,384.77	123.24 N	205.10 W	1,684,390.38	3,271,157.36	1.50	211.36	
2,500.00	1.25	301.00	2,484.70	125.03 N	208.09 W	1,684,392.15	3,271,154.35	1.50	214.44	
2,583.33	0.00	0.00	2,568.03	125.50 N	208.87 W	1,684,392.61	3,271,153.56	1.50	215.24	Vertical
2,600.00	0.00	0.00	2,584.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
2,700.00	0.00	0.00	2,684.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
2,800.00	0.00	0.00	2,784.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
2,900.00	0.00	0.00	2,884.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
3,000.00	0.00	0.00	2,984.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
3,100.00	0.00	0.00	3,084.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
3,200.00	0.00	0.00	3,184.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	

Plan Report for Bison 4-64 15-16-1BHZ (Restake 4) - Rev C0

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
Depth (usft)	Inclination (°)	True Azimuth (°)	Depth (usft)	Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
3,300.00	0.00	0.00	3,284.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
3,400.00	0.00	0.00	3,384.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
3,500.00	0.00	0.00	3,484.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
3,600.00	0.00	0.00	3,584.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
3,700.00	0.00	0.00	3,684.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
3,800.00	0.00	0.00	3,784.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
3,900.00	0.00	0.00	3,884.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
4,000.00	0.00	0.00	3,984.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
4,100.00	0.00	0.00	4,084.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
4,200.00	0.00	0.00	4,184.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
4,300.00	0.00	0.00	4,284.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
4,400.00	0.00	0.00	4,384.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
4,500.00	0.00	0.00	4,484.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
4,600.00	0.00	0.00	4,584.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
4,700.00	0.00	0.00	4,684.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
4,800.00	0.00	0.00	4,784.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
4,900.00	0.00	0.00	4,884.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
5,000.00	0.00	0.00	4,984.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
5,100.00	0.00	0.00	5,084.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
5,197.30	0.00	0.00	5,182.00	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	Shannon Sandstone Member
5,200.00	0.00	0.00	5,184.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
5,300.00	0.00	0.00	5,284.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
5,400.00	0.00	0.00	5,384.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
5,500.00	0.00	0.00	5,484.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
5,600.00	0.00	0.00	5,584.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
5,700.00	0.00	0.00	5,684.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
5,800.00	0.00	0.00	5,784.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
5,900.00	0.00	0.00	5,884.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
6,000.00	0.00	0.00	5,984.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
6,100.00	0.00	0.00	6,084.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
6,200.00	0.00	0.00	6,184.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
6,300.00	0.00	0.00	6,284.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
6,400.00	0.00	0.00	6,384.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
6,500.00	0.00	0.00	6,484.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
6,600.00	0.00	0.00	6,584.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
6,700.00	0.00	0.00	6,684.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
6,800.00	0.00	0.00	6,784.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
6,900.00	0.00	0.00	6,884.70	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	
6,907.30	0.00	0.00	6,892.00	125.50 N	208.87 W	1,684,392.61	3,271,153.56	0.00	215.24	KOP
7,000.00	9.27	298.62	6,984.29	129.09 N	215.44 W	1,684,396.12	3,271,146.96	10.00	221.99	
7,100.00	19.27	298.62	7,081.08	140.88 N	237.05 W	1,684,407.69	3,271,125.22	10.00	244.21	

Plan Report for Bison 4-64 15-16-1BHZ (Restake 4) - Rev C0

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
Northings	Easting	Northings	Easting							
7,200.00	29.28	298.62	7,172.12	160.55 N	273.10 W	1,684,426.97	3,271,088.97	10.00	281.24	
7,300.00	39.28	298.62	7,254.65	187.50 N	322.47 W	1,684,453.40	3,271,039.31	10.00	331.98	
7,336.30	42.91	298.62	7,282.00	198.93 N	343.41 W	1,684,464.60	3,271,018.25	10.00	353.50	Sharon Springs Shale
7,365.04	45.79	298.62	7,302.56	208.56 N	361.05 W	1,684,474.04	3,271,000.52	10.00	371.62	EOB
7,400.00	48.60	295.80	7,326.31	220.27 N	383.85 W	1,684,485.51	3,270,977.59	10.00	395.02	
7,416.39	49.94	294.55	7,337.00	225.55 N	395.09 W	1,684,490.67	3,270,966.29	10.00	406.52	Niobrara Formation
7,436.95	51.64	293.06	7,350.00	231.98 N	409.67 W	1,684,496.94	3,270,951.65	10.00	421.42	Niobrara A Chalk
7,500.00	56.97	288.89	7,386.78	250.24 N	457.47 W	1,684,514.69	3,270,903.66	10.00	470.12	
7,600.00	65.65	283.21	7,434.78	274.28 N	541.69 W	1,684,537.84	3,270,819.19	10.00	555.50	
7,660.10	70.96	280.18	7,457.00	285.57 N	596.34 W	1,684,548.55	3,270,764.42	10.00	610.68	Niobrara B Chalk
7,700.00	74.51	278.27	7,468.84	291.67 N	633.95 W	1,684,554.25	3,270,726.75	10.00	648.55	
7,800.00	83.47	273.74	7,487.93	301.87 N	731.45 W	1,684,563.41	3,270,629.15	10.00	746.46	
7,863.65	89.20	270.96	7,492.00	304.47 N	794.88 W	1,684,565.34	3,270,565.69	10.00	809.94	Land Point
7,900.00	89.20	270.96	7,492.51	305.08 N	831.22 W	1,684,565.56	3,270,529.35	0.00	846.26	
8,000.00	89.20	270.96	7,493.90	306.75 N	931.20 W	1,684,566.18	3,270,429.36	0.00	946.19	
8,100.00	89.20	270.96	7,495.30	308.43 N	1,031.17 W	1,684,566.79	3,270,329.37	0.00	1,046.11	
8,200.00	89.20	270.96	7,496.70	310.10 N	1,131.15 W	1,684,567.41	3,270,229.38	0.00	1,146.03	
8,300.00	89.20	270.96	7,498.09	311.78 N	1,231.13 W	1,684,568.02	3,270,129.40	0.00	1,245.96	
8,400.00	89.20	270.96	7,499.49	313.46 N	1,331.10 W	1,684,568.63	3,270,029.41	0.00	1,345.88	
8,500.00	89.20	270.96	7,500.88	315.13 N	1,431.08 W	1,684,569.25	3,269,929.42	0.00	1,445.81	
8,600.00	89.20	270.96	7,502.28	316.81 N	1,531.06 W	1,684,569.86	3,269,829.43	0.00	1,545.73	
8,700.00	89.20	270.96	7,503.68	318.48 N	1,631.03 W	1,684,570.47	3,269,729.44	0.00	1,645.65	
8,800.00	89.20	270.96	7,505.07	320.16 N	1,731.01 W	1,684,571.09	3,269,629.46	0.00	1,745.58	
8,900.00	89.20	270.96	7,506.47	321.83 N	1,830.98 W	1,684,571.70	3,269,529.47	0.00	1,845.50	
9,000.00	89.20	270.96	7,507.87	323.51 N	1,930.96 W	1,684,572.32	3,269,429.48	0.00	1,945.43	
9,100.00	89.20	270.96	7,509.26	325.18 N	2,030.94 W	1,684,572.93	3,269,329.49	0.00	2,045.35	
9,200.00	89.20	270.96	7,510.66	326.86 N	2,130.91 W	1,684,573.54	3,269,229.51	0.00	2,145.27	
9,300.00	89.20	270.96	7,512.05	328.53 N	2,230.89 W	1,684,574.16	3,269,129.52	0.00	2,245.20	
9,400.00	89.20	270.96	7,513.45	330.21 N	2,330.87 W	1,684,574.77	3,269,029.53	0.00	2,345.12	
9,500.00	89.20	270.96	7,514.85	331.88 N	2,430.84 W	1,684,575.38	3,268,929.54	0.00	2,445.04	
9,600.00	89.20	270.96	7,516.24	333.56 N	2,530.82 W	1,684,576.00	3,268,829.56	0.00	2,544.97	
9,700.00	89.20	270.96	7,517.64	335.23 N	2,630.79 W	1,684,576.61	3,268,729.57	0.00	2,644.89	
9,800.00	89.20	270.96	7,519.04	336.91 N	2,730.77 W	1,684,577.23	3,268,629.58	0.00	2,744.82	
9,900.00	89.20	270.96	7,520.43	338.58 N	2,830.75 W	1,684,577.84	3,268,529.59	0.00	2,844.74	
10,000.00	89.20	270.96	7,521.83	340.26 N	2,930.72 W	1,684,578.45	3,268,429.61	0.00	2,944.66	
10,100.00	89.20	270.96	7,523.22	341.94 N	3,030.70 W	1,684,579.07	3,268,329.62	0.00	3,044.59	
10,200.00	89.20	270.96	7,524.62	343.61 N	3,130.68 W	1,684,579.68	3,268,229.63	0.00	3,144.51	
10,300.00	89.20	270.96	7,526.02	345.29 N	3,230.65 W	1,684,580.29	3,268,129.64	0.00	3,244.44	
10,400.00	89.20	270.96	7,527.41	346.96 N	3,330.63 W	1,684,580.91	3,268,029.66	0.00	3,344.36	
10,500.00	89.20	270.96	7,528.81	348.64 N	3,430.60 W	1,684,581.52	3,267,929.67	0.00	3,444.28	
10,600.00	89.20	270.96	7,530.21	350.31 N	3,530.58 W	1,684,582.14	3,267,829.68	0.00	3,544.21	

Plan Report for Bison 4-64 15-16-1BHZ (Restake 4) - Rev C0

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
10,700.00	89.20	270.96	7,531.60	351.99 N	3,630.56 W	1,684,582.75	3,267,729.69	0.00	3,644.13	
10,800.00	89.20	270.96	7,533.00	353.66 N	3,730.53 W	1,684,583.36	3,267,629.71	0.00	3,744.06	
10,900.00	89.20	270.96	7,534.39	355.34 N	3,830.51 W	1,684,583.98	3,267,529.72	0.00	3,843.98	
11,000.00	89.20	270.96	7,535.79	357.01 N	3,930.48 W	1,684,584.59	3,267,429.73	0.00	3,943.90	
11,100.00	89.20	270.96	7,537.19	358.69 N	4,030.46 W	1,684,585.20	3,267,329.74	0.00	4,043.83	
11,200.00	89.20	270.96	7,538.58	360.36 N	4,130.44 W	1,684,585.82	3,267,229.76	0.00	4,143.75	
11,300.00	89.20	270.96	7,539.98	362.04 N	4,230.41 W	1,684,586.43	3,267,129.77	0.00	4,243.68	
11,400.00	89.20	270.96	7,541.38	363.71 N	4,330.39 W	1,684,587.05	3,267,029.78	0.00	4,343.60	
11,500.00	89.20	270.96	7,542.77	365.39 N	4,430.37 W	1,684,587.66	3,266,929.79	0.00	4,443.52	
11,600.00	89.20	270.96	7,544.17	367.06 N	4,530.34 W	1,684,588.27	3,266,829.81	0.00	4,543.45	
11,700.00	89.20	270.96	7,545.56	368.74 N	4,630.32 W	1,684,588.89	3,266,729.82	0.00	4,643.37	
11,800.00	89.20	270.96	7,546.96	370.41 N	4,730.29 W	1,684,589.50	3,266,629.83	0.00	4,743.30	
11,900.00	89.20	270.96	7,548.36	372.09 N	4,830.27 W	1,684,590.11	3,266,529.84	0.00	4,843.22	
12,000.00	89.20	270.96	7,549.75	373.77 N	4,930.25 W	1,684,590.73	3,266,429.86	0.00	4,943.14	
12,100.00	89.20	270.96	7,551.15	375.44 N	5,030.22 W	1,684,591.34	3,266,329.87	0.00	5,043.07	
12,200.00	89.20	270.96	7,552.54	377.12 N	5,130.20 W	1,684,591.96	3,266,229.88	0.00	5,142.99	
12,300.00	89.20	270.96	7,553.94	378.79 N	5,230.18 W	1,684,592.57	3,266,129.89	0.00	5,242.92	
12,400.00	89.20	270.96	7,555.34	380.47 N	5,330.15 W	1,684,593.18	3,266,029.90	0.00	5,342.84	
12,500.00	89.20	270.96	7,556.73	382.14 N	5,430.13 W	1,684,593.80	3,265,929.92	0.00	5,442.76	
12,600.00	89.20	270.96	7,558.13	383.82 N	5,530.10 W	1,684,594.41	3,265,829.93	0.00	5,542.69	
12,700.00	89.20	270.96	7,559.53	385.49 N	5,630.08 W	1,684,595.02	3,265,729.94	0.00	5,642.61	
12,800.00	89.20	270.96	7,560.92	387.17 N	5,730.06 W	1,684,595.64	3,265,629.95	0.00	5,742.54	
12,900.00	89.20	270.96	7,562.32	388.84 N	5,830.03 W	1,684,596.25	3,265,529.97	0.00	5,842.46	
13,000.00	89.20	270.96	7,563.71	390.52 N	5,930.01 W	1,684,596.87	3,265,429.98	0.00	5,942.38	
13,100.00	89.20	270.96	7,565.11	392.19 N	6,029.99 W	1,684,597.48	3,265,329.99	0.00	6,042.31	
13,200.00	89.20	270.96	7,566.51	393.87 N	6,129.96 W	1,684,598.09	3,265,230.00	0.00	6,142.23	
13,300.00	89.20	270.96	7,567.90	395.54 N	6,229.94 W	1,684,598.71	3,265,130.02	0.00	6,242.16	
13,400.00	89.20	270.96	7,569.30	397.22 N	6,329.91 W	1,684,599.32	3,265,030.03	0.00	6,342.08	
13,500.00	89.20	270.96	7,570.70	398.89 N	6,429.89 W	1,684,599.93	3,264,930.04	0.00	6,442.00	
13,600.00	89.20	270.96	7,572.09	400.57 N	6,529.87 W	1,684,600.55	3,264,830.05	0.00	6,541.93	
13,700.00	89.20	270.96	7,573.49	402.24 N	6,629.84 W	1,684,601.16	3,264,730.07	0.00	6,641.85	
13,800.00	89.20	270.96	7,574.88	403.92 N	6,729.82 W	1,684,601.78	3,264,630.08	0.00	6,741.77	
13,900.00	89.20	270.96	7,576.28	405.60 N	6,829.80 W	1,684,602.39	3,264,530.09	0.00	6,841.70	
14,000.00	89.20	270.96	7,577.68	407.27 N	6,929.77 W	1,684,603.00	3,264,430.10	0.00	6,941.62	
14,100.00	89.20	270.96	7,579.07	408.95 N	7,029.75 W	1,684,603.62	3,264,330.12	0.00	7,041.55	
14,200.00	89.20	270.96	7,580.47	410.62 N	7,129.72 W	1,684,604.23	3,264,230.13	0.00	7,141.47	
14,300.00	89.20	270.96	7,581.87	412.30 N	7,229.70 W	1,684,604.84	3,264,130.14	0.00	7,241.39	
14,400.00	89.20	270.96	7,583.26	413.97 N	7,329.68 W	1,684,605.46	3,264,030.15	0.00	7,341.32	
14,500.00	89.20	270.96	7,584.66	415.65 N	7,429.65 W	1,684,606.07	3,263,930.17	0.00	7,441.24	
14,600.00	89.20	270.96	7,586.05	417.32 N	7,529.63 W	1,684,606.68	3,263,830.18	0.00	7,541.17	
14,700.00	89.20	270.96	7,587.45	419.00 N	7,629.61 W	1,684,607.30	3,263,730.19	0.00	7,641.09	

Plan Report for Bison 4-64 15-16-1BHZ (Restake 4) - Rev C0

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
14,800.00	89.20	270.96	7,588.85	420.67 N	7,729.58 W	1,684,607.91	3,263,630.20	0.00	7,741.01	
14,900.00	89.20	270.96	7,590.24	422.35 N	7,829.56 W	1,684,608.53	3,263,530.22	0.00	7,840.94	
15,000.00	89.20	270.96	7,591.64	424.02 N	7,929.53 W	1,684,609.14	3,263,430.23	0.00	7,940.86	
15,056.77	89.20	270.96	7,592.43	424.97 N	7,986.29 W	1,684,609.49	3,263,373.46	0.00	7,997.59	BHL

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
300.00	300.00	0.00	0.00	Begin Nudge
833.33	831.60	19.15	-31.86	8°
2,050.00	2,036.43	106.36	-177.01	EOH
2,583.33	2,568.03	125.50	-208.87	Vertical
6,907.30	6,892.00	125.50	-208.87	KOP
7,365.04	7,302.56	208.56	-361.05	EOB
7,863.65	7,492.00	304.47	-794.88	Land Point
15,056.77	7,592.43	424.97	-7,986.29	BHL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
Target	Bison 4-64 15-16-1BHZ (Restake 4) BHL	273.05	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	15,056.61	Rev C0	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,000.00	1,986.91	9 5/8"	9-5/8	12-1/4

Plan Report for Bison 4-64 15-16-1BHZ (Restake 4) - Rev C0

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	TVDSS (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
297.00	297.00	-5,388.00	Denver		0.00	
798.41	797.00	-4,888.00	Upper Arapahoe		0.00	
1,091.24	1,087.00	-4,598.00	Lower Arapahoe		0.00	
1,631.50	1,622.00	-4,063.00	Laramie - Fox Hills		0.00	
1,802.16	1,791.00	-3,894.00	Pierre Shale (Base of Fox Hills)		0.00	
5,197.30	5,182.00	-503.00	Shannon Sandstone Member		0.00	
7,336.30	7,282.00	1,597.00	Sharon Springs Shale		0.00	
7,416.39	7,337.00	1,652.00	Niobrara Formation		0.00	
7,436.95	7,350.00	1,665.00	Niobrara A Chalk		0.00	
7,660.10	7,457.00	1,772.00	Niobrara B Chalk		0.00	

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Bison 4-64 15-16-1BHZ (Restake 4) BHL ()	0.00	0.00	0.00	425.05	-7,986.29	1,684,609.57	3,263,373.47	39.709330	-104.563861
- plan misses target center by 7591.69usft at 14950.76usft MD (7590.95 TVD, 423.20 N, -7880.31 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	0.23 °/100usft	Maximum Dogleg over Survey:	1.50 °/100usft at 833.33 usft
Net Tortousity applicable to Plans:	0.23 °/100usft	Directional Difficulty Index:	6.451

Audit Info

North Reference Sheet for Sec. 15-T4S-R64W (Bison Pad) - Bison 4-64 15-16-1BHZ (Restake 4) - Wellbore #1

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

Vertical Depths are relative to RKB = 25' @ 5685.00usft (GPL). Northing and Easting are relative to Bison 4-64 15-16-1BHZ (Restake 4)

Coordinate System is US State Plane 1983, Colorado Central 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:39.750000°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99999199

Grid Coordinates of Well: 1,684,269.33 usft N, 3,271,363.75 usft E

Geographical Coordinates of Well: 39° 42' 29.40" N, 104° 32' 07.71" W

Grid Convergence at Surface is: 0.61°

Based upon Minimum Curvature type calculations, at a Measured Depth of 15,056.77usft
the Bottom Hole Displacement is 7,997.59usft in the Direction of 273.05° (True).

Magnetic Convergence at surface is: -7.68° (18 July 2016, , BGGM2016)

