

Conoco Phillips Company

Arapahoe County, Colorado

Sec. 5-T4S-R65W

Parachute 4-65 5-6 3H

Plan B (Pilot)

Plan: Rev B0

Sperry Drilling Services

Proposal Report

25 August, 2014

Well Coordinates: 1,691,716.93 N, 3,230,656.30 E (39° 43' 46.95" N, 104° 40' 47.70" W)

Ground Level: 5,571.30 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 Parachute 4-65 5-6 3H

KB 24 ft @ 5595.30usft (H&P 280)

N

True

API - US Survey Feet - Custom

HALLIBURTON

Project: Arapahoe County, Colorado
Site: Sec. 5-T4S-R65W
Well: Parachute 4-65 5-6 3H
Wellbore: Plan B (Pilot)
Plan: Rev B0

Conoco Phillips Company

HALLIBURTON
Sperry Drilling

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2165.00	0.00	0.00	2165.00	0.00	0.00	0.00	0.00	0.00	
3	2898.33	11.00	180.15	2893.84	-70.18	-0.18	1.50	180.15	70.18	
4	6358.06	11.00	180.15	6290.00	-730.32	-1.91	0.00	0.00	730.33	
5	7091.40	0.00	0.00	7018.84	-800.50	-2.10	1.50	180.00	800.51	
6	8289.56	0.00	0.00	8217.00	-800.50	-2.10	0.00	0.00	800.51	Parachute 4-65 5-6 3H (Pilot)_Rev B0_BHL Tgt

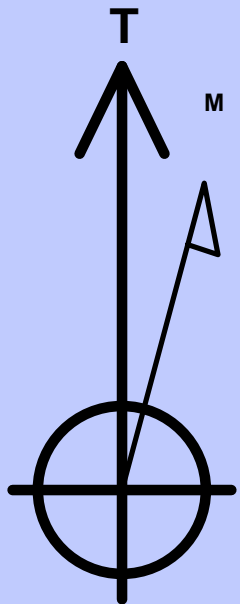
Plan: Rev B0 (Parachute 4-65 5-6 3H/Plan B (Pilot))

Created By: Kansa B. Becker Date: 12:37, August 25 2014

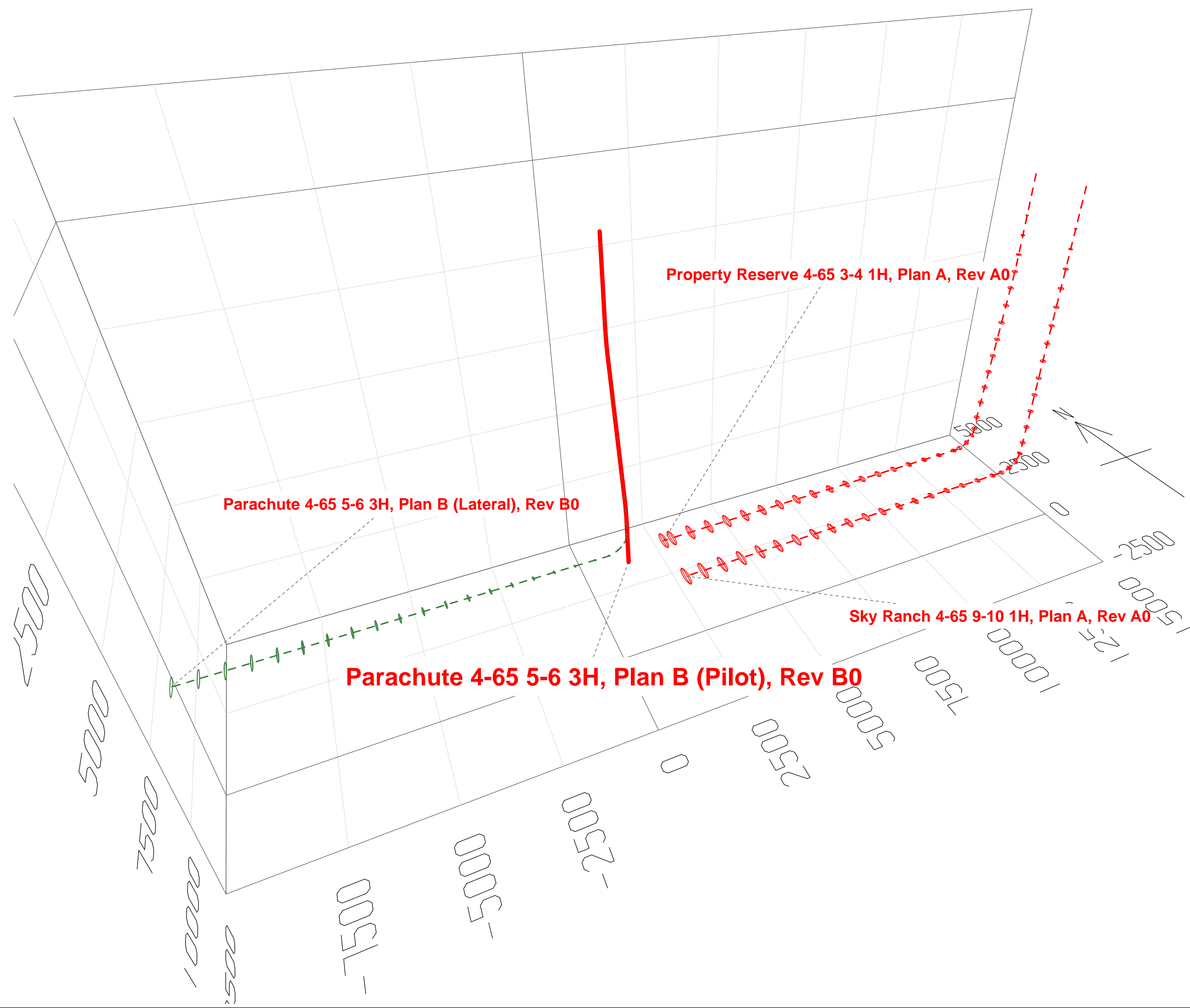
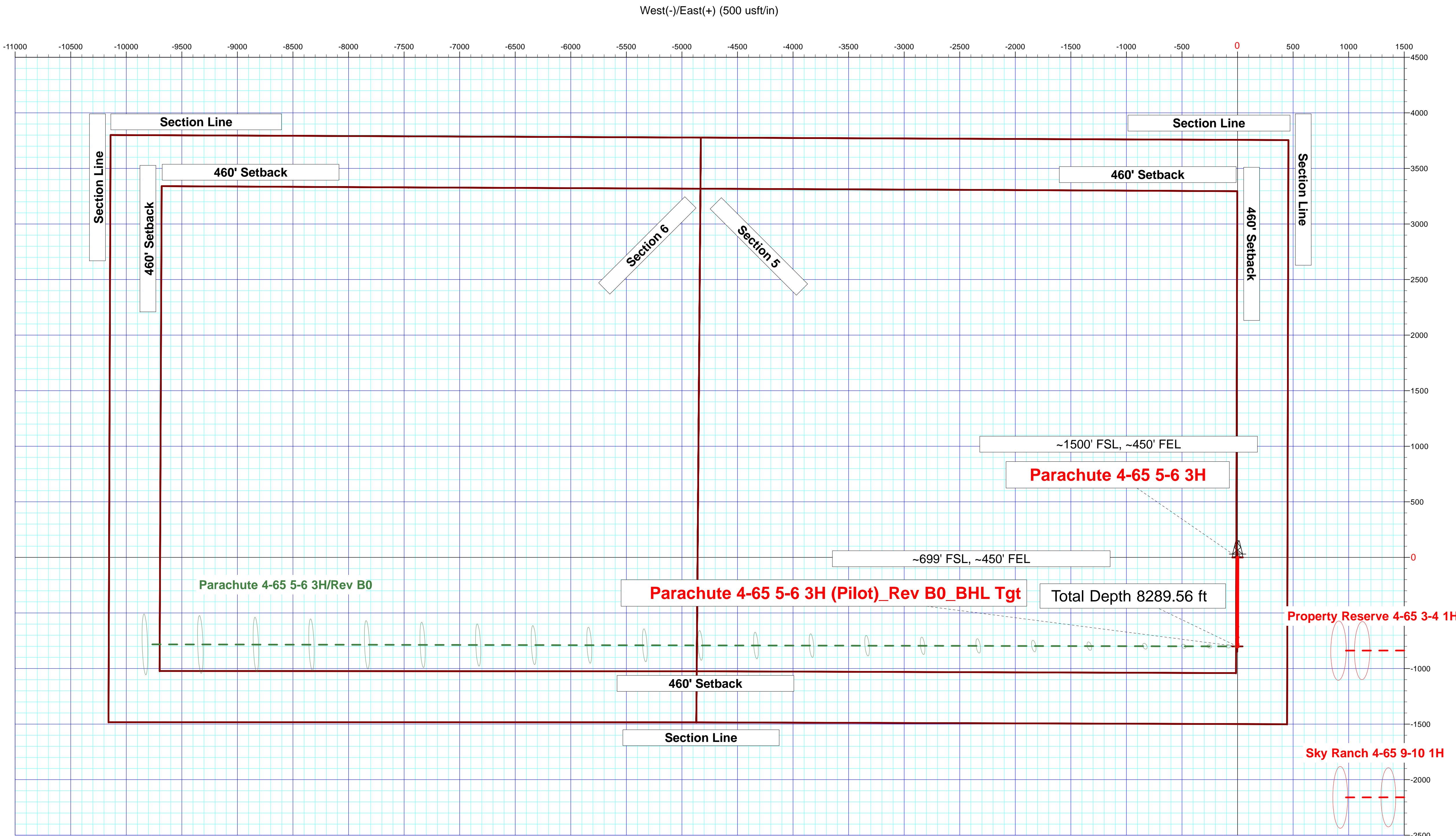
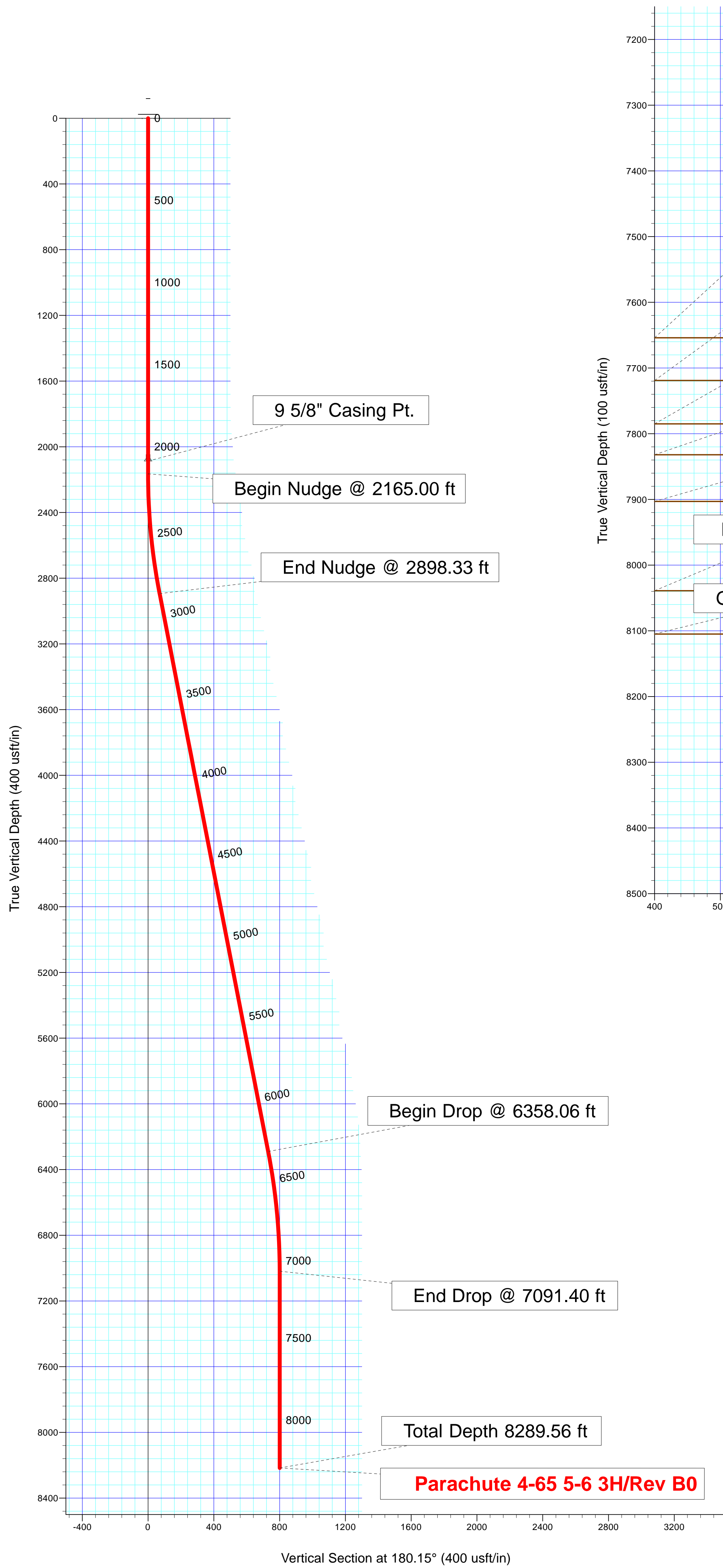
Checked: _____ Date: _____

Reviewed: _____ Date: _____

Approved: _____ Date: _____



Azimuths to True North
Magnetic Field
Magnetic North: 8.40°
Strength: 52302.9snT
Dip Angle: 66.40°
Date: 11/24/2014
Model: BGGM2014



Plan Report for Parachute 4-65 5-6 3H - Rev B0

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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,401.00	0.00	0.00	1,401.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills										
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,887.00	0.00	0.00	1,887.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierre Shale										
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,087.00	0.00	0.00	2,087.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface Casing - 9 5/8" Casing Pt.										
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,165.00	0.00	0.00	2,165.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 2165.00 ft										
2,200.00	0.53	180.15	2,200.00	-0.16	0.00	0.16	1.50	1.50	0.00	180.15
2,300.00	2.03	180.15	2,299.97	-2.39	-0.01	2.39	1.50	1.50	0.00	0.00
2,400.00	3.53	180.15	2,399.85	-7.23	-0.02	7.23	1.50	1.50	0.00	0.00
2,500.00	5.03	180.15	2,499.57	-14.68	-0.04	14.68	1.50	1.50	0.00	0.00
2,600.00	6.53	180.15	2,599.06	-24.74	-0.06	24.74	1.50	1.50	0.00	0.00
2,700.00	8.03	180.15	2,698.25	-37.41	-0.10	37.41	1.50	1.50	0.00	0.00
2,800.00	9.53	180.15	2,797.08	-52.66	-0.14	52.66	1.50	1.50	0.00	0.00
2,898.33	11.00	180.15	2,893.84	-70.18	-0.18	70.18	1.50	1.50	0.00	0.00
End Nudge @ 2898.33 ft										
2,900.00	11.00	180.15	2,895.47	-70.50	-0.18	70.50	0.00	0.00	0.00	0.00
3,000.00	11.00	180.15	2,993.64	-89.58	-0.23	89.58	0.00	0.00	0.00	0.00
3,100.00	11.00	180.15	3,091.80	-108.66	-0.28	108.66	0.00	0.00	0.00	0.00
3,200.00	11.00	180.15	3,189.96	-127.74	-0.33	127.74	0.00	0.00	0.00	0.00
3,300.00	11.00	180.15	3,288.12	-146.82	-0.38	146.82	0.00	0.00	0.00	0.00
3,400.00	11.00	180.15	3,386.29	-165.90	-0.43	165.90	0.00	0.00	0.00	0.00
3,500.00	11.00	180.15	3,484.45	-184.98	-0.48	184.98	0.00	0.00	0.00	0.00
3,600.00	11.00	180.15	3,582.61	-204.06	-0.53	204.06	0.00	0.00	0.00	0.00
3,700.00	11.00	180.15	3,680.77	-223.14	-0.58	223.14	0.00	0.00	0.00	0.00
3,800.00	11.00	180.15	3,778.94	-242.22	-0.63	242.23	0.00	0.00	0.00	0.00
3,900.00	11.00	180.15	3,877.10	-261.31	-0.68	261.31	0.00	0.00	0.00	0.00
4,000.00	11.00	180.15	3,975.26	-280.39	-0.73	280.39	0.00	0.00	0.00	0.00
4,100.00	11.00	180.15	4,073.43	-299.47	-0.78	299.47	0.00	0.00	0.00	0.00
4,200.00	11.00	180.15	4,171.59	-318.55	-0.83	318.55	0.00	0.00	0.00	0.00
4,300.00	11.00	180.15	4,269.75	-337.63	-0.88	337.63	0.00	0.00	0.00	0.00
4,400.00	11.00	180.15	4,367.91	-356.71	-0.93	356.71	0.00	0.00	0.00	0.00
4,500.00	11.00	180.15	4,466.08	-375.79	-0.98	375.79	0.00	0.00	0.00	0.00
4,600.00	11.00	180.15	4,564.24	-394.87	-1.03	394.87	0.00	0.00	0.00	0.00
4,700.00	11.00	180.15	4,662.40	-413.95	-1.08	413.95	0.00	0.00	0.00	0.00

Plan Report for Parachute 4-65 5-6 3H - Rev B0

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 (°)
4,800.00	11.00	180.15	4,760.56	-433.03	-1.13	433.03	0.00	0.00	0.00	0.00
4,900.00	11.00	180.15	4,858.73	-452.11	-1.18	452.11	0.00	0.00	0.00	0.00
5,000.00	11.00	180.15	4,956.89	-471.19	-1.23	471.20	0.00	0.00	0.00	0.00
5,100.00	11.00	180.15	5,055.05	-490.28	-1.28	490.28	0.00	0.00	0.00	0.00
5,200.00	11.00	180.15	5,153.22	-509.36	-1.33	509.36	0.00	0.00	0.00	0.00
5,300.00	11.00	180.15	5,251.38	-528.44	-1.38	528.44	0.00	0.00	0.00	0.00
5,400.00	11.00	180.15	5,349.54	-547.52	-1.43	547.52	0.00	0.00	0.00	0.00
5,500.00	11.00	180.15	5,447.70	-566.60	-1.48	566.60	0.00	0.00	0.00	0.00
5,600.00	11.00	180.15	5,545.87	-585.68	-1.53	585.68	0.00	0.00	0.00	0.00
5,700.00	11.00	180.15	5,644.03	-604.76	-1.58	604.76	0.00	0.00	0.00	0.00
5,800.00	11.00	180.15	5,742.19	-623.84	-1.63	623.84	0.00	0.00	0.00	0.00
5,900.00	11.00	180.15	5,840.35	-642.92	-1.68	642.92	0.00	0.00	0.00	0.00
6,000.00	11.00	180.15	5,938.52	-662.00	-1.73	662.00	0.00	0.00	0.00	0.00
6,100.00	11.00	180.15	6,036.68	-681.08	-1.78	681.09	0.00	0.00	0.00	0.00
6,200.00	11.00	180.15	6,134.84	-700.16	-1.83	700.17	0.00	0.00	0.00	0.00
6,300.00	11.00	180.15	6,233.01	-719.25	-1.88	719.25	0.00	0.00	0.00	0.00
6,358.06	11.00	180.15	6,290.00	-730.32	-1.91	730.33	0.00	0.00	0.00	0.00
Begin Drop @ 6358.06 ft										
6,400.00	10.37	180.15	6,331.21	-738.10	-1.93	738.10	1.50	-1.50	0.00	180.00
6,500.00	8.87	180.15	6,429.80	-754.81	-1.98	754.81	1.50	-1.50	0.00	180.00
6,600.00	7.37	180.15	6,528.80	-768.94	-2.01	768.94	1.50	-1.50	0.00	180.00
6,700.00	5.87	180.15	6,628.13	-780.47	-2.04	780.47	1.50	-1.50	0.00	180.00
6,800.00	4.37	180.15	6,727.72	-789.39	-2.07	789.40	1.50	-1.50	0.00	180.00
6,900.00	2.87	180.15	6,827.52	-795.71	-2.08	795.71	1.50	-1.50	0.00	180.00
7,000.00	1.37	180.15	6,927.45	-799.41	-2.09	799.41	1.50	-1.50	0.00	180.00
7,091.40	0.00	0.00	7,018.84	-800.50	-2.10	800.51	1.50	-1.50	196.78	180.00
End Drop @ 7091.40 ft										
7,100.00	0.00	0.00	7,027.44	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,127.44	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,227.44	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,327.44	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,427.44	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,527.44	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,627.44	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
7,726.56	0.00	0.00	7,654.00	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
Sharon Springs										
7,791.56	0.00	0.00	7,719.00	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
Niobrara										
7,800.00	0.00	0.00	7,727.44	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
7,857.56	0.00	0.00	7,785.00	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
Niobrara B										
7,900.00	0.00	0.00	7,827.44	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
7,904.56	0.00	0.00	7,832.00	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
Niobrara C										
7,975.56	0.00	0.00	7,903.00	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
Niobrara D										
8,000.00	0.00	0.00	7,927.44	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
8,100.00	0.00	0.00	8,027.44	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
8,111.56	0.00	0.00	8,039.00	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
Fort Hays Limestone										
8,177.56	0.00	0.00	8,105.00	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
Greenhorn Limestone										
8,200.00	0.00	0.00	8,127.44	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
8,289.56	0.00	0.00	8,217.00	-800.50	-2.10	800.51	0.00	0.00	0.00	0.00
Total Depth 8289.56 ft										

Plan Report for Parachute 4-65 5-6 3H - Rev B0

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,165.00	2,165.00	0.00	0.00	Begin Nudge @ 2165.00 ft
2,898.33	2,893.84	-70.18	-0.18	End Nudge @ 2898.33 ft
6,358.06	6,290.00	-730.32	-1.91	Begin Drop @ 6358.06 ft
7,091.40	7,018.84	-800.50	-2.10	End Drop @ 7091.40 ft
8,289.56	8,217.00	-800.50	-2.10	Total Depth 8289.56 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
Target	Parachute 4-65 5-6 3H (Pilot)_Rev B0_BHL Tgt	180.15	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	2,087.00	Rev B0	NS-GYRO-MS
2,087.00	8,289.56	Rev B0	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,087.00	2,087.00	9 5/8" Casing Pt.	9-5/8	13-1/2

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,401.00	1,401.00	Fox Hills			
1,887.00	1,887.00	Pierre Shale			
2,087.00	2,087.00	Surface Casing			
7,726.56	7,654.00	Sharon Springs			
7,791.56	7,719.00	Niobrara			
7,857.56	7,785.00	Niobrara B			
7,904.56	7,832.00	Niobrara C			
7,975.56	7,903.00	Niobrara D			
8,111.56	8,039.00	Fort Hays Limestone			
8,177.56	8,105.00	Greenhorn Limestone			

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Parachute 4-65 5-6 3H_SB	0.00	0.00	0.00	Polygon
Parachute 4-65 5-6 3H_SL	0.00	0.00	0.00	Polygon
Parachute 4-65 5-6 3H (Pilot)_Rev B0_BHL Tgt	8,217.00	-800.50	-2.10	Point

Plan Report for Parachute 4-65 5-6 3H - Rev B0

Directional Difficulty Index

Average Dogleg over Survey:	0.26 °/100usft	Maximum Dogleg over Survey:	2.00 °/100usft at 2,697.50 usft
Net Tortosity applicable to Plans:	0.26 °/100usft	Directional Difficulty Index:	4.656

Audit Info

**North Reference Sheet for Sec. 5-T4S-R65W - Parachute 4-65 5-6 3H - Plan B
 (Pilot)**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference .
 Vertical Depths are relative to KB 24 ft @ 5595.30usft (H&P 280). Northing and Easting are relative to Parachute 4-65 5-6 3H
 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 -105.50°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:39° 45' 0.000 N°
 False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99999605

Grid Coordinates of Well: 1,691,716.93 usft N, 3,230,656.30 usft E
 Geographical Coordinates of Well: 39° 43' 46.95" N, 104° 40' 47.70" W
 Grid Convergence at Surface is: 0.52°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,289.56usft
 the Bottom Hole Displacement is 800.51usft in the Direction of 180.15° (True).
 Magnetic Convergence at surface is: -7.89° (24 November 2014, , BGGM2014)

