

KGH Operating

Rio Blanco, Colorado

Sec. 14-T1S-R104W

Meagher 14-2H

Plan B Rev 0

Plan: Rev B0 Proposal (Actual)

Sperry Drilling Services

Proposal Report

06 November, 2013

Well Coordinates: 1,249,736.27 N, 2,009,176.03 E (39° 57' 52.84" N, 109° 02' 08.96" W)

Ground Level: 6,530.00 ft

Local Coordinate Origin:

Centered on Well Meagher 14-2H

Viewing Datum:

KB-20' @ 6550.00ft (Unknown Rig)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Project: Rio Blanco, Colorado
 Site: Sec. 14-T1S-R104W
 Well: Meagher 14-2H
 Wellbore: Plan B Rev 0
 Design: Rev B0 Proposal (Actual)

KGH Operating

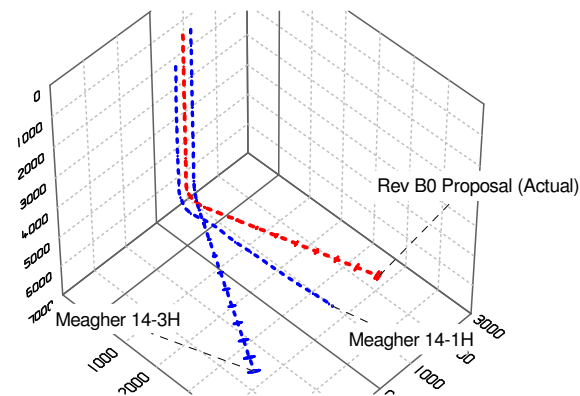
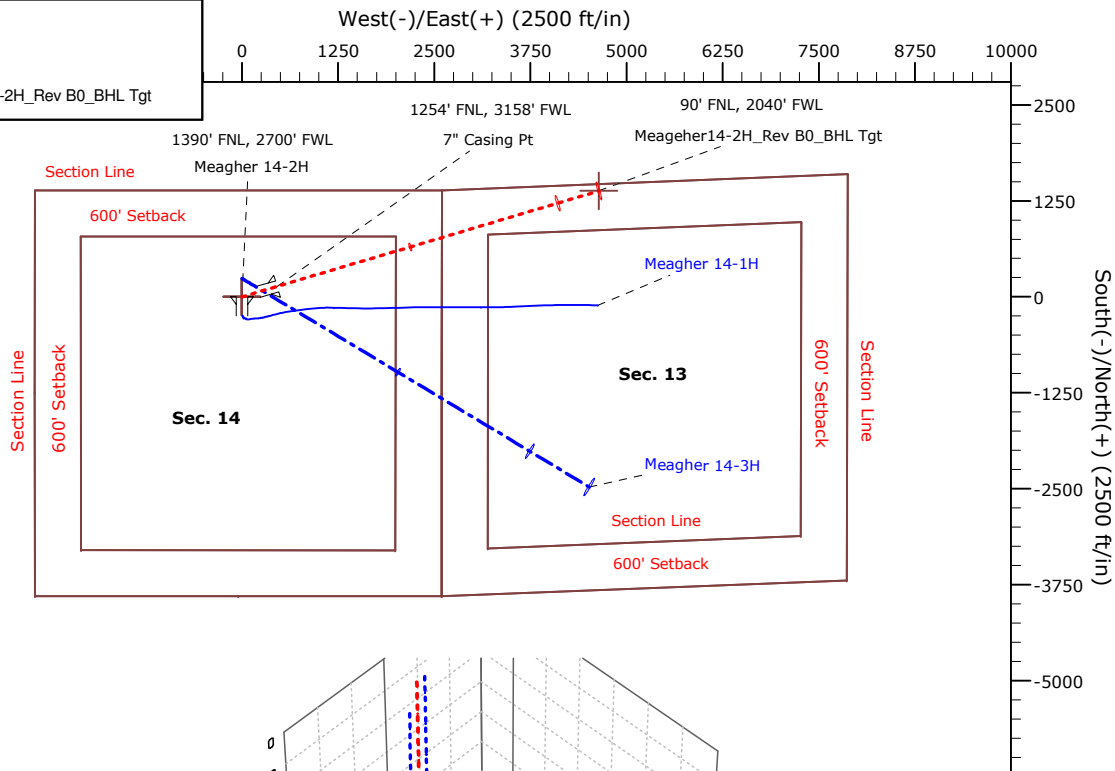
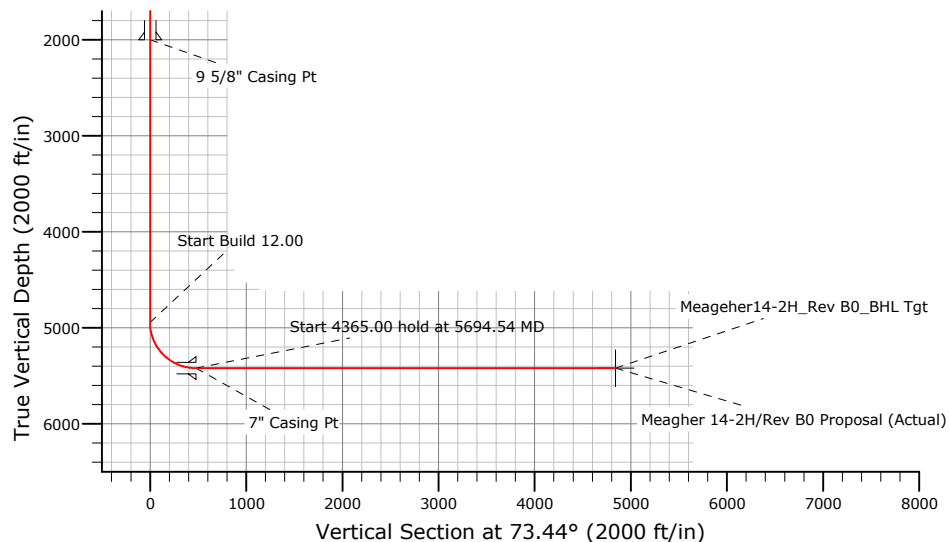
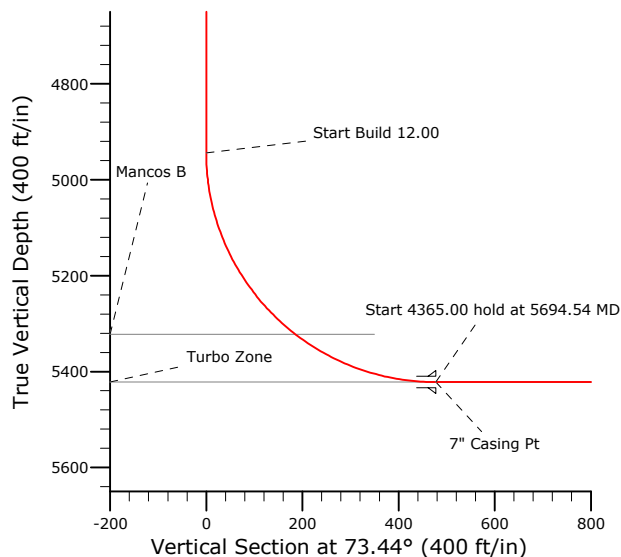
HALLIBURTON
 Sperry Drilling

WELL DETAILS: Meagher 14-2H

Ground Level: Northing: Easting: Latitude: Longitude:

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	4944.54	0.00	0.00	4944.54	0.00	0.00	0.00	0.00	0.00	
3	5694.54	90.00	73.44	5422.00	136.08	457.66	12.00	73.44	477.46	
4	10059.54	90.00	73.44	5422.00	1380.12	4641.63	0.00	0.00	4842.47	Meageher14-2H_Rev B0_BHL Tgt



Plan: Rev B0 Proposal (Meagher 14-2H)

Created By: Tatiana Gomez Date: 11/6/2013
 Checked: _____ Date: _____
 Reviewed: _____ Date: _____
 Approved: _____ Date: _____

Plan Report for Meagher 14-2H - Rev B0 Proposal (Actual)

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	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
1,500.00	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
1,900.00	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
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
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,306.00	0.00	0.00	3,306.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Main Coal Zone										
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,912.00	0.00	0.00	3,912.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lower Sego										
3,953.00	0.00	0.00	3,953.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Buck Tongue										
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,175.00	0.00	0.00	4,175.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Castlegate										
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Plan Report for Meagher 14-2H - Rev B0 Proposal (Actual)

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,944.54	0.00	0.00	4,944.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kickoff at 4944.54ft										
5,000.00	6.66	73.44	4,999.88	0.92	3.08	3.22	12.00	12.00	0.00	73.44
5,100.00	18.66	73.44	5,097.27	7.15	24.05	25.09	12.00	12.00	0.00	0.00
5,200.00	30.66	73.44	5,187.98	19.02	63.96	66.73	12.00	12.00	0.00	0.00
5,300.00	42.66	73.44	5,268.06	36.00	121.08	126.32	12.00	12.00	0.00	0.00
5,350.00	48.66	73.44	5,302.99	46.19	155.34	162.06	12.00	12.00	0.00	0.00
Build Rate = 12.00°/100ft										
5,381.00	52.38	73.44	5,322.70	53.01	178.27	185.98	12.00	12.00	0.00	0.00
Mancos B										
5,400.00	54.66	73.44	5,334.00	57.36	192.91	201.26	12.00	12.00	0.00	0.00
5,500.00	66.66	73.44	5,382.92	82.16	276.31	288.27	12.00	12.00	0.00	0.00
5,600.00	78.66	73.44	5,412.67	109.31	367.64	383.55	12.00	12.00	0.00	0.00
5,694.54	90.00	73.44	5,422.00	136.08	457.67	477.47	12.00	12.00	0.00	0.00
End Build at 5694.54ft - Turbo Zone - 7" Casing Pt										
5,700.00	90.00	73.44	5,422.00	137.64	462.90	482.93	0.00	0.00	0.00	0.00
5,800.00	90.00	73.44	5,422.00	166.14	558.75	582.93	0.00	0.00	0.00	0.00
5,900.00	90.00	73.44	5,422.00	194.64	654.61	682.93	0.00	0.00	0.00	0.00
6,000.00	90.00	73.44	5,422.00	223.14	750.46	782.93	0.00	0.00	0.00	0.00
6,100.00	90.00	73.44	5,422.00	251.64	846.31	882.93	0.00	0.00	0.00	0.00
6,200.00	90.00	73.44	5,422.00	280.14	942.16	982.93	0.00	0.00	0.00	0.00
6,300.00	90.00	73.44	5,422.00	308.64	1,038.02	1,082.93	0.00	0.00	0.00	0.00
6,400.00	90.00	73.44	5,422.00	337.14	1,133.87	1,182.93	0.00	0.00	0.00	0.00
6,500.00	90.00	73.44	5,422.00	365.64	1,229.72	1,282.93	0.00	0.00	0.00	0.00
6,600.00	90.00	73.44	5,422.00	394.14	1,325.57	1,382.93	0.00	0.00	0.00	0.00
6,700.00	90.00	73.44	5,422.00	422.64	1,421.43	1,482.93	0.00	0.00	0.00	0.00
6,800.00	90.00	73.44	5,422.00	451.14	1,517.28	1,582.93	0.00	0.00	0.00	0.00
6,900.00	90.00	73.44	5,422.00	479.64	1,613.13	1,682.93	0.00	0.00	0.00	0.00
7,000.00	90.00	73.44	5,422.00	508.14	1,708.98	1,782.93	0.00	0.00	0.00	0.00
7,100.00	90.00	73.44	5,422.00	536.64	1,804.84	1,882.93	0.00	0.00	0.00	0.00
7,200.00	90.00	73.44	5,422.00	565.14	1,900.69	1,982.93	0.00	0.00	0.00	0.00
7,300.00	90.00	73.44	5,422.00	593.64	1,996.54	2,082.93	0.00	0.00	0.00	0.00
7,400.00	90.00	73.44	5,422.00	622.14	2,092.40	2,182.93	0.00	0.00	0.00	0.00
7,500.00	90.00	73.44	5,422.00	650.65	2,188.25	2,282.93	0.00	0.00	0.00	0.00
7,600.00	90.00	73.44	5,422.00	679.15	2,284.10	2,382.93	0.00	0.00	0.00	0.00
7,700.00	90.00	73.44	5,422.00	707.65	2,379.95	2,482.93	0.00	0.00	0.00	0.00
7,800.00	90.00	73.44	5,422.00	736.15	2,475.81	2,582.93	0.00	0.00	0.00	0.00
7,820.00	90.00	73.44	5,422.00	741.85	2,494.98	2,602.93	0.00	0.00	0.00	0.00
Hold Angle 90.00° INC & 73.44° AZI										
7,900.00	90.00	73.44	5,422.00	764.65	2,571.66	2,682.93	0.00	0.00	0.00	0.00
8,000.00	90.00	73.44	5,422.00	793.15	2,667.51	2,782.93	0.00	0.00	0.00	0.00
8,100.00	90.00	73.44	5,422.00	821.65	2,763.36	2,882.93	0.00	0.00	0.00	0.00
8,200.00	90.00	73.44	5,422.00	850.15	2,859.22	2,982.93	0.00	0.00	0.00	0.00
8,300.00	90.00	73.44	5,422.00	878.65	2,955.07	3,082.93	0.00	0.00	0.00	0.00
8,400.00	90.00	73.44	5,422.00	907.15	3,050.92	3,182.93	0.00	0.00	0.00	0.00
8,500.00	90.00	73.44	5,422.00	935.65	3,146.77	3,282.93	0.00	0.00	0.00	0.00
8,600.00	90.00	73.44	5,422.00	964.15	3,242.63	3,382.93	0.00	0.00	0.00	0.00
8,700.00	90.00	73.44	5,422.00	992.65	3,338.48	3,482.93	0.00	0.00	0.00	0.00
8,800.00	90.00	73.44	5,422.00	1,021.15	3,434.33	3,582.93	0.00	0.00	0.00	0.00
8,900.00	90.00	73.44	5,422.00	1,049.65	3,530.18	3,682.93	0.00	0.00	0.00	0.00
9,000.00	90.00	73.44	5,422.00	1,078.15	3,626.04	3,782.93	0.00	0.00	0.00	0.00
9,100.00	90.00	73.44	5,422.00	1,106.65	3,721.89	3,882.93	0.00	0.00	0.00	0.00
9,200.00	90.00	73.44	5,422.00	1,135.15	3,817.74	3,982.93	0.00	0.00	0.00	0.00
9,300.00	90.00	73.44	5,422.00	1,163.65	3,913.60	4,082.93	0.00	0.00	0.00	0.00
9,400.00	90.00	73.44	5,422.00	1,192.15	4,009.45	4,182.93	0.00	0.00	0.00	0.00
9,500.00	90.00	73.44	5,422.00	1,220.65	4,105.30	4,282.93	0.00	0.00	0.00	0.00
9,600.00	90.00	73.44	5,422.00	1,249.15	4,201.15	4,382.93	0.00	0.00	0.00	0.00
9,700.00	90.00	73.44	5,422.00	1,277.65	4,297.01	4,482.93	0.00	0.00	0.00	0.00

Plan Report for Meagher 14-2H - Rev B0 Proposal (Actual)

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Toolface Azimuth (°)
9,800.00	90.00	73.44	5,422.00	1,306.16	4,392.86	4,582.93	0.00	0.00	0.00	0.00
9,900.00	90.00	73.44	5,422.00	1,334.66	4,488.71	4,682.93	0.00	0.00	0.00	0.00
10,000.00	90.00	73.44	5,422.00	1,363.16	4,584.56	4,782.93	0.00	0.00	0.00	0.00
10,059.54	90.00	73.44	5,422.00	1,380.12	4,641.63	4,842.47	0.00	0.00	0.00	0.00
Meagher14-2H_Rev B0_BHL Tgt										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,944.54	4,944.54	0.00	0.00	Kickoff at 4944.54ft
5,350.00	5,302.99	46.19	155.34	Build Rate = 12.00°/100ft
5,694.54	5,422.00	136.08	457.67	End Build at 5694.54ft
7,820.00	5,422.00	741.85	2,494.98	Hold Angle 90.00° INC & 73.44° AZI
10,059.54	5,422.00	1,380.13	4,641.63	Total Depth = 10059.54ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Meagher14-2H_Rev B0_BHL Tgt	73.44	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	2,000.00	Rev B0 Proposal (Actual)	NS-GYRO-MS
2,000.00	5,694.54	Rev B0 Proposal (Actual)	MWD
5,694.54	10,059.54	Rev B0 Proposal (Actual)	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
5,694.54	5,422.00	7" Casing Pt	7	8-3/4
2,000.00	2,000.00	9 5/8" Casing Pt	9-5/8	12-1/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,306.00	3,306.00	Main Coal Zone		0.00	
3,912.00	3,912.00	Lower Sego		0.00	
3,953.00	3,953.00	Buck Tongue		0.00	
4,175.00	4,175.00	Castlegate		0.00	
5,381.00	5,322.70	Mancos B		0.00	
5,694.54	5,422.00	Turbo Zone		0.00	

Plan Report for Meagher 14-2H - Rev B0 Proposal (Actual)

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Meageher14-2H_Section Lines_Sec.14	0.00	0.02	0.00	Polygon
Meageher14-2H_Setbacks_Sec.14	0.00	0.02	0.00	Polygon
Meageher14-2H_Section Lines_Sec.13	0.00	0.02	0.00	Polygon
Meageher14-2H_Rev B0_BHL Tgt	5,422.00	1,380.12	4,641.63	Point
Meageher14-2H_Setbacks_Sec.13	0.00	0.02	0.00	Polygon

North Reference Sheet for Sec. 14-T1S-R104W - Meagher 14-2H - Plan B Rev 0

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

Vertical Depths are relative to KB-20' @ 6550.00ft (Unknown Rig). Northing and Easting are relative to Meagher 14-2H

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° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99996924

Grid Coordinates of Well: 1,249,736.27 ft N, 2,009,176.03 ft E

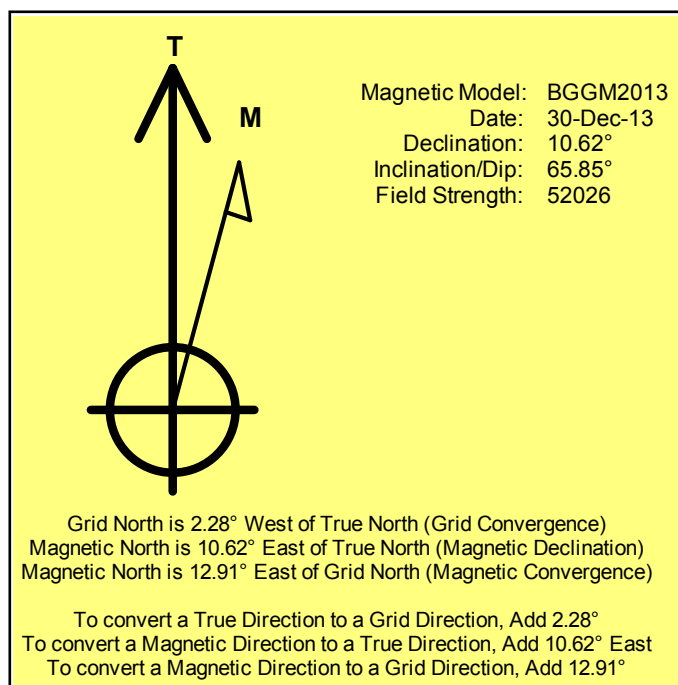
Geographical Coordinates of Well: 39° 57' 52.84" N, 109° 02' 08.96" W

Grid Convergence at Surface is: -2.28°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,059.54ft

the Bottom Hole Displacement is 4,842.47ft in the Direction of 73.44° (True).

Magnetic Convergence at surface is: -12.91° (30 December 2013, , BGGM2013)



KGH Operating

Rio Blanco, Colorado

Sec. 14-T1S-R104W

Meagher 14-2H

Plan B Rev 0

Rev B0 Proposal (Actual)

Sperry Drilling Services

Clearance Summary Anticollision Report

06 November, 2013

Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)

Reference Design: Sec. 14-T1S-R104W - Meagher 14-2H - Plan B Rev 0 - Rev B0 Proposal (Actual)

Well Coordinates: 1,249,736.27 N, 2,009,176.03 E (39° 57' 52.84" N, 109° 02' 08.96" W)

Datum Height: KB-20' @ 6550.00ft (Unknown Rig)

Scan Range: 0.00 to 10,059.54 ft. Measured Depth.

Scan Radius is 9,999.98 ft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Anticollision Report for Meagher 14-2H - Rev B0 Proposal (Actual)

Closest Approach 3D Proximity Scan on Current Survey Data (Highside Reference)

Reference Design: Sec. 14-T1S-R104W - Meagher 14-2H - Plan B Rev 0 - Rev B0 Proposal (Actual)

Scan Range: 0.00 to 10,059.54 ft. Measured Depth.

Scan Radius is 9,999.98 ft . Clearance Factor cutoff is Unlimited. Max Ellipse Separation is Unlimited

Site Name	Measured Depth (ft)	Minimum Distance (ft)	@Measured Depth (ft)	Ellipse Separation (ft)	@Measured Depth ft	Clearance Factor	Summary Based on Minimum
Comparison Well Name - Wellbore Name - Design							
Sec. 14-T1S-R104W							
Meagher 14-1H - Plan A Rev 0 - Actual Survey	819.40	241.45	819.40	239.43	823.66	119.766	Ellipse Separation
Meagher 14-1H - Plan A Rev 0 - Actual Survey	10,000.00	1,489.60	10,000.00	1,372.14	9,638.00	12.681	Clearance Factor
Meagher 14-3H - Plan B Rev 0 - Rev B0 Proposal (Act	5,475.00	34.17	5,475.00	19.40	5,516.38	2.313	Clearance Factor
Meagher 14-3H - Plan B Rev 0 - Rev B0 Proposal (Act	5,499.41	29.47	5,499.41	17.18	5,535.30	2.397	Ellipse Separation

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	2,000.00	Rev B0 Proposal (Actual)	NS-GYRO-MS
2,000.00	5,694.54	Rev B0 Proposal (Actual)	MWD
5,694.54	10,059.54	Rev B0 Proposal (Actual)	MWD

Ellipse error terms are correlated across survey tool tie-on points.

Calculated ellipses incorporate surface errors.

Separation is the actual distance between ellipsoids.

Distance Between centres is the straight line distance between wellbore centres.

Clearance Factor = Distance Between Profiles / (Distance Between Profiles - Ellipse Separation).

All station coordinates were calculated using the Minimum Curvature method.

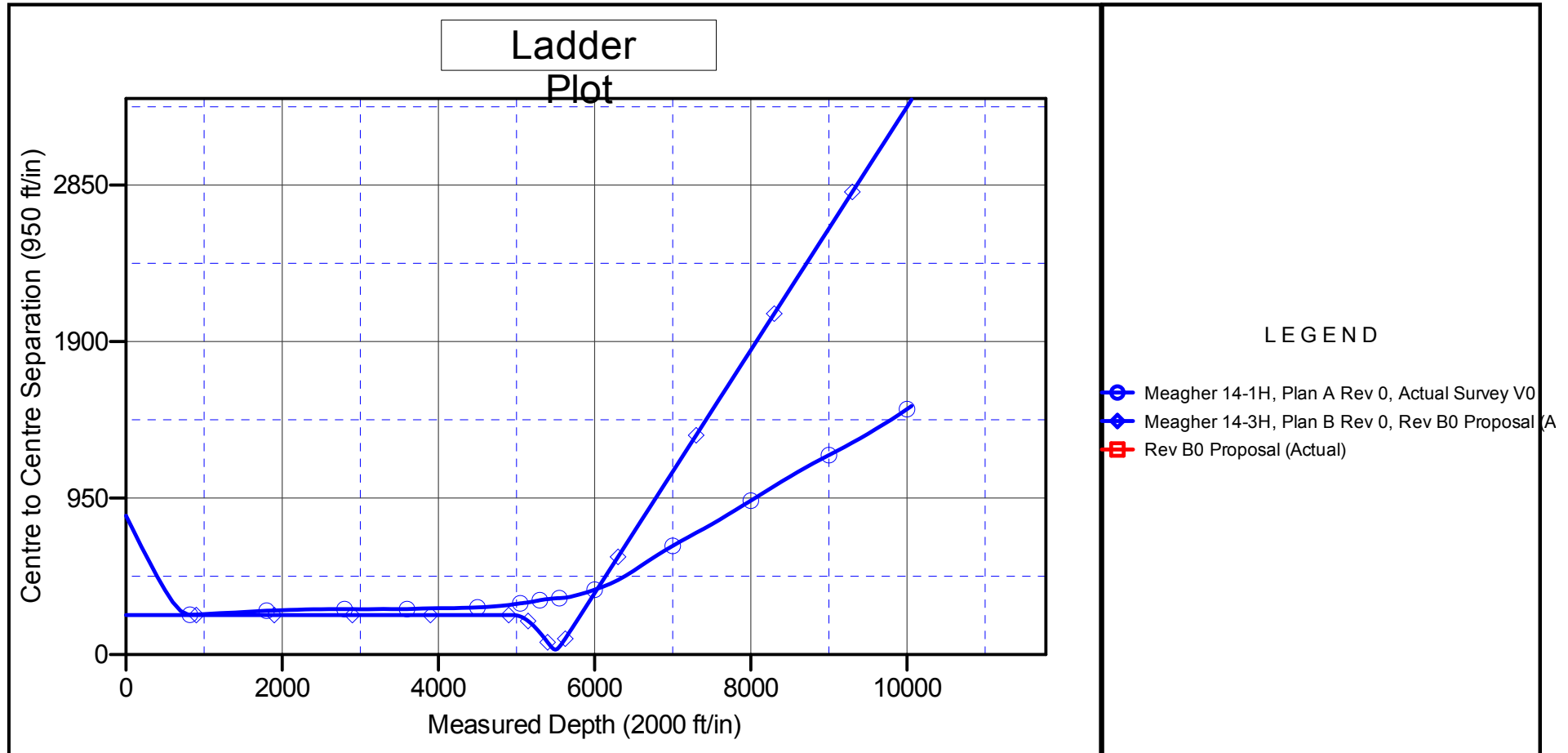
Anticollision Report for Meagher 14-2H - Rev B0 Proposal (Actual)

Direction and Coordinates are relative to True North Reference.

Vertical Depths are relative to KB-20' @ 6550.00ft (Unknown Rig). Northing and Easting are relative to Meagher 14-2H.

Coordinate System is US State Plane 1983, Colorado Northern Zone.

Central Meridian is -105.00°, Grid Convergence at Surface is: -2.28°.



Anticollision Report for Meagher 14-2H - Rev B0 Proposal (Actual)

Clearance Factor Plot: Measured Depth versus Separation(Clearance) Factor

