



Well Name: Murdock 24-34 (Vert.)

Surface Location: Murdock 34SW-BL Pad Sec.34-T5N-R68W
North American Datum 1983 US State Plane 1983 Colorado Northern Zone

+N/-S
0.0

+E/-W
0.0

Northing
1371256.55

Easting
3140770.09

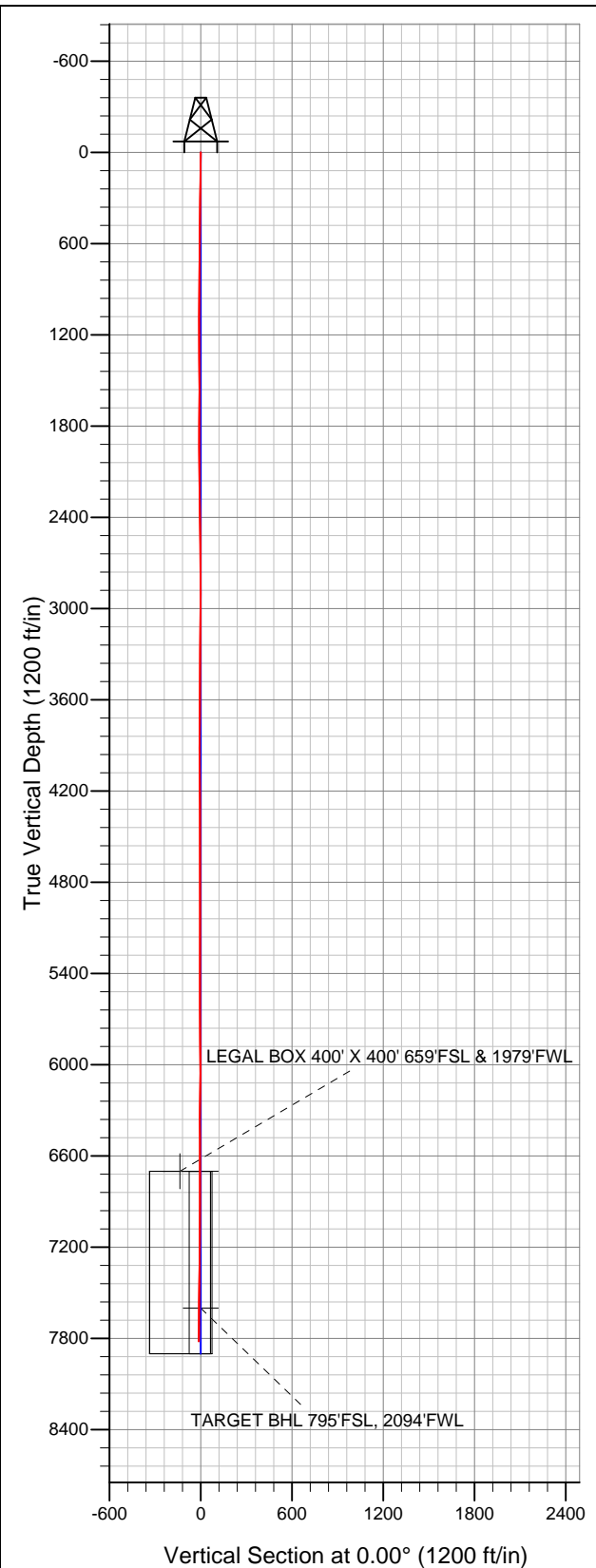
Latitude
40.351400

Longitude
-104.994920

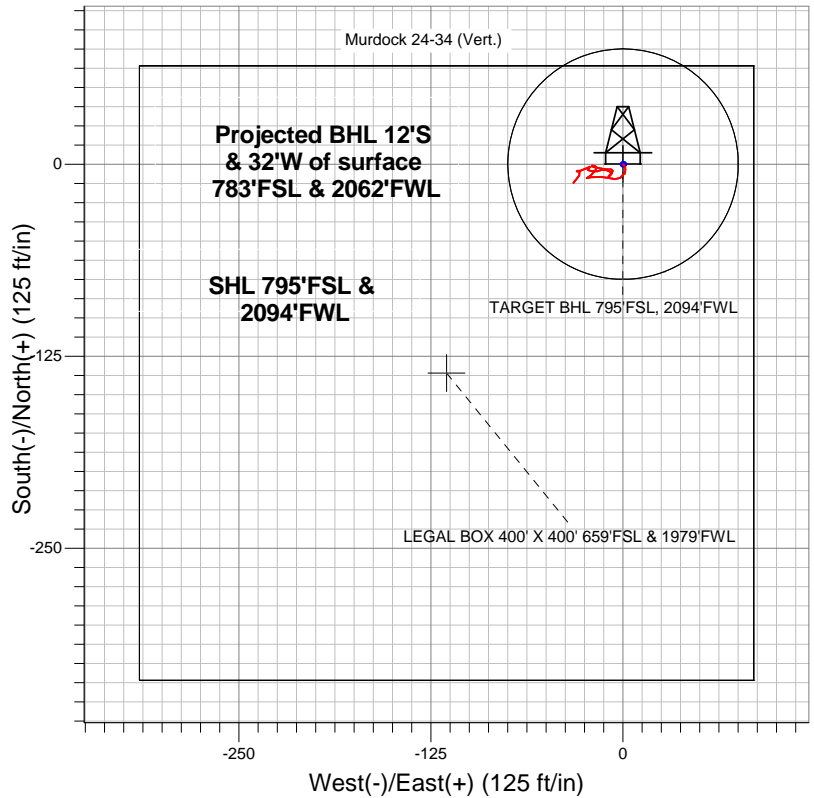
Slot

Original Well Elev

WELL @ 5070.0ft (Original Well Elev)



Apollo Operating, LLC.



LEGEND

- Murdock 24-34 (Vert.), Wellbore #1, Plan #1 (6-19-12) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
7820'MD & 7819'TVD @ -12.33'VS
0.80 deg Inc 209.10 deg AZ

Project: SEC.34-T5N-68W
Site: Murdock 34SW-BL Pad Sec.34-T5N-R68W
Well: Murdock 24-34 (Vert.)
Plan: Wellbore #1



Directional

Apollo Operating, LLC.

SEC.34-T5N-68W

Murdock 34SW-BL Pad Sec.34-T5N-R68W

Murdock 24-34 (Vert.)

Wellbore #1

Survey: Survey #1

Standard Survey Report

05 November, 2012

Company:	Apollo Operating, LLC.	Local Co-ordinate Reference:	Well Murdock 24-34 (Vert.)
Project:	SEC.34-T5N-68W	TVD Reference:	WELL @ 5070.0ft (Original Well Elev)
Site:	Murdock 34SW-BL Pad Sec.34-T5N-R68W	MD Reference:	WELL @ 5070.0ft (Original Well Elev)
Well:	Murdock 24-34 (Vert.)	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.34-T5N-68W		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Murdock 34SW-BL Pad Sec.34-T5N-R68W		
Site Position:		Northing:	1,371,227.26ft
From:	Lat/Long	Easting:	3,140,742.39ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40.351320
		Longitude:	-104.995020
		Grid Convergence:	0.33 °

Well	Murdock 24-34 (Vert.)		
Well Position	+N/-S	0.0 ft	Northing:
	+E/-W	0.0 ft	Easting:
Position Uncertainty		0.0 ft	Wellhead Elevation:
			Latitude:
			Longitude:
			Ground Level:

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/22/2012	8.85	66.94	52,972

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	7,600.0	0.0	0.0	0.00	

Survey Program	Date	11/5/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
79.0	7,820.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey										
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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
79.0	0.90	137.20	79.0	-0.5	0.4	-0.5	1.14	1.14	0.00	
197.0	0.90	165.10	197.0	-2.0	1.3	-2.0	0.37	0.00	23.64	
313.0	0.50	190.30	313.0	-3.4	1.4	-3.4	0.43	-0.34	21.72	
441.0	0.90	178.80	441.0	-5.0	1.4	-5.0	0.33	0.31	-8.98	
568.0	0.40	229.30	568.0	-6.3	1.0	-6.2	0.56	-0.39	39.76	
607.0	0.50	278.00	607.0	-6.3	0.8	-6.3	0.98	0.26	124.87	
712.0	0.60	210.80	712.0	-6.7	0.0	-6.7	0.59	0.10	-64.00	
925.0	0.90	226.30	924.9	-8.8	-1.7	-8.8	0.17	0.14	7.28	
1,139.0	1.10	275.90	1,138.9	-9.8	-5.0	-9.8	0.40	0.09	23.18	
1,352.0	1.20	282.50	1,351.9	-9.1	-9.2	-9.1	0.08	0.05	3.10	
1,566.0	1.60	275.30	1,565.8	-8.3	-14.4	-8.3	0.20	0.19	-3.36	
1,780.0	1.90	260.90	1,779.7	-8.6	-20.9	-8.6	0.25	0.14	-6.73	

Company:	Apollo Operating, LLC.	Local Co-ordinate Reference:	Well Murdock 24-34 (Vert.)
Project:	SEC.34-T5N-68W	TVD Reference:	WELL @ 5070.0ft (Original Well Elev)
Site:	Murdock 34SW-BL Pad Sec.34-T5N-R68W	MD Reference:	WELL @ 5070.0ft (Original Well Elev)
Well:	Murdock 24-34 (Vert.)	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
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)
1,994.0	0.40	82.20	1,993.7	-9.1	-23.6	-9.1	1.07	-0.70	-83.50
2,207.0	1.30	48.90	2,206.6	-7.4	-21.1	-7.4	0.46	0.42	-15.63
2,421.0	1.10	32.90	2,420.6	-4.1	-18.1	-4.1	0.18	-0.09	-7.48
2,635.0	0.80	315.80	2,634.6	-1.3	-18.0	-1.3	0.56	-0.14	-36.03
2,849.0	0.70	238.80	2,848.6	-0.9	-20.2	-0.9	0.44	-0.05	-35.98
3,062.0	1.40	97.80	3,061.5	-1.9	-18.7	-1.9	0.94	0.33	-66.20
3,276.0	1.50	107.30	3,275.5	-3.1	-13.5	-3.1	0.12	0.05	4.44
3,490.0	0.90	110.10	3,489.4	-4.5	-9.2	-4.5	0.28	-0.28	1.31
3,704.0	0.40	161.40	3,703.4	-5.8	-7.4	-5.8	0.34	-0.23	23.97
3,917.0	1.10	231.70	3,916.4	-7.8	-8.8	-7.8	0.49	0.33	33.00
4,131.0	1.40	42.20	4,130.4	-7.1	-8.6	-7.1	1.16	0.14	79.67
4,345.0	0.40	15.50	4,344.3	-4.4	-6.7	-4.4	0.49	-0.47	-12.48
4,559.0	0.70	282.50	4,558.3	-3.4	-7.7	-3.4	0.39	0.14	-43.46
4,773.0	1.20	265.10	4,772.3	-3.3	-11.3	-3.3	0.27	0.23	-8.13
4,987.0	0.40	249.10	4,986.3	-3.8	-14.2	-3.8	0.38	-0.37	-7.48
5,201.0	1.10	252.80	5,200.3	-4.7	-16.8	-4.7	0.33	0.33	1.73
5,415.0	1.00	294.80	5,414.2	-4.5	-20.5	-4.5	0.35	-0.05	19.63
5,629.0	0.40	261.30	5,628.2	-3.8	-22.9	-3.8	0.33	-0.28	-15.65
5,843.0	1.10	47.70	5,842.2	-2.6	-22.2	-2.6	0.68	0.33	68.41
6,057.0	1.20	242.30	6,056.2	-2.2	-22.6	-2.2	1.07	0.05	-77.29
6,271.0	1.60	251.10	6,270.1	-4.2	-27.4	-4.2	0.21	0.19	4.11
6,485.0	0.30	3.90	6,484.1	-4.6	-30.2	-4.6	0.81	-0.61	52.71
6,699.0	0.40	109.60	6,698.1	-4.3	-29.5	-4.3	0.26	0.05	49.39
6,700.6	0.40	109.49	6,699.7	-4.3	-29.5	-4.3	0.18	-0.18	-6.60
LEGAL BOX 400' X 400' 659'FSL & 1979'FWL									
6,701.0	0.40	109.49	6,700.1	-4.3	-29.5	-4.3	0.00	0.00	0.00
TARGET CIRCLE 795'FSL & 2094'FWL									
6,913.0	0.10	31.20	6,912.1	-4.4	-28.7	-4.4	0.18	-0.14	-36.93
7,127.0	0.50	162.50	7,126.1	-5.2	-28.3	-5.2	0.27	0.19	61.36
7,341.0	0.80	202.20	7,340.1	-7.4	-28.6	-7.4	0.24	0.14	18.55
7,555.0	0.70	232.20	7,554.1	-9.6	-30.2	-9.6	0.19	-0.05	14.02
7,600.6	0.71	226.95	7,599.6	-10.0	-30.6	-10.0	0.14	0.02	-11.52
TARGET BHL 795'FSL, 2094'FWL									
7,775.0	0.80	209.10	7,774.0	-11.8	-32.0	-11.8	0.14	0.05	-10.23
7,820.0	0.80	209.10	7,819.0	-12.3	-32.3	-12.3	0.00	0.00	0.00

Wellbore Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
LEGAL BOX 400' X 400' 659'FSL & 1979'FWL	0.00	0.00	6,700.0	-136.0	-115.0	1,371,119.90	3,140,655.88	40.351027	-104.995333
- survey misses target center by 157.0ft at 6700.6ft MD (6699.7 TVD, -4.3 N, -29.5 E)									
- Rectangle (sides W400.0 H400.0 D1,200.0)									
TARGET CIRCLE 795'FSL & 2094'FWL	0.00	0.00	6,700.0	0.0	0.0	1,371,256.56	3,140,770.09	40.351400	-104.994920
- survey misses target center by 29.8ft at 6701.0ft MD (6700.1 TVD, -4.3 N, -29.5 E)									
- Circle (radius 75.0)									
TARGET BHL 795'FSL & 2094'FWL	0.00	0.00	7,600.0	0.0	0.0	1,371,256.56	3,140,770.09	40.351400	-104.994920
- survey misses target center by 32.2ft at 7600.6ft MD (7599.6 TVD, -10.0 N, -30.6 E)									
- Point									

Company:	Apollo Operating, LLC.	Local Co-ordinate Reference:	Well Murdock 24-34 (Vert.)
Project:	SEC.34-T5N-68W	TVD Reference:	WELL @ 5070.0ft (Original Well Elev)
Site:	Murdock 34SW-BL Pad Sec.34-T5N-R68W	MD Reference:	WELL @ 5070.0ft (Original Well Elev)
Well:	Murdock 24-34 (Vert.)	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------