

# **Apollo Operating, LLC**

**Steffes Multi Well Plan**

**Sec. 2, T3N R68W**

**Steffes 21-2D**

**Wellbore #1**

**Plan: Plan #1**

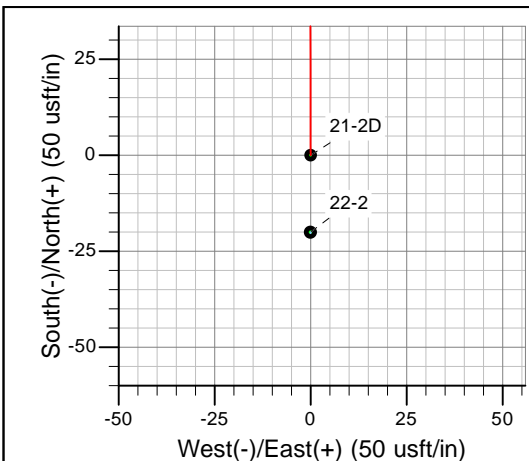
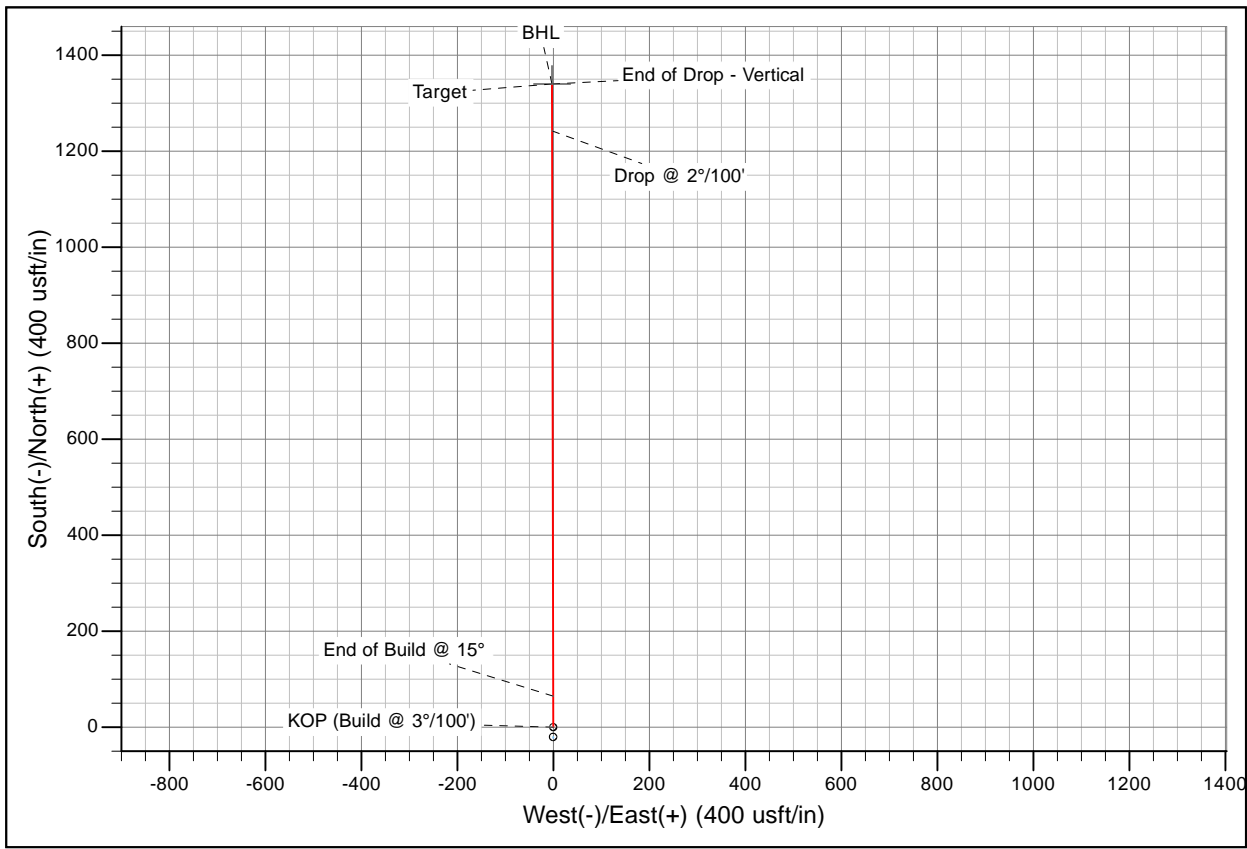
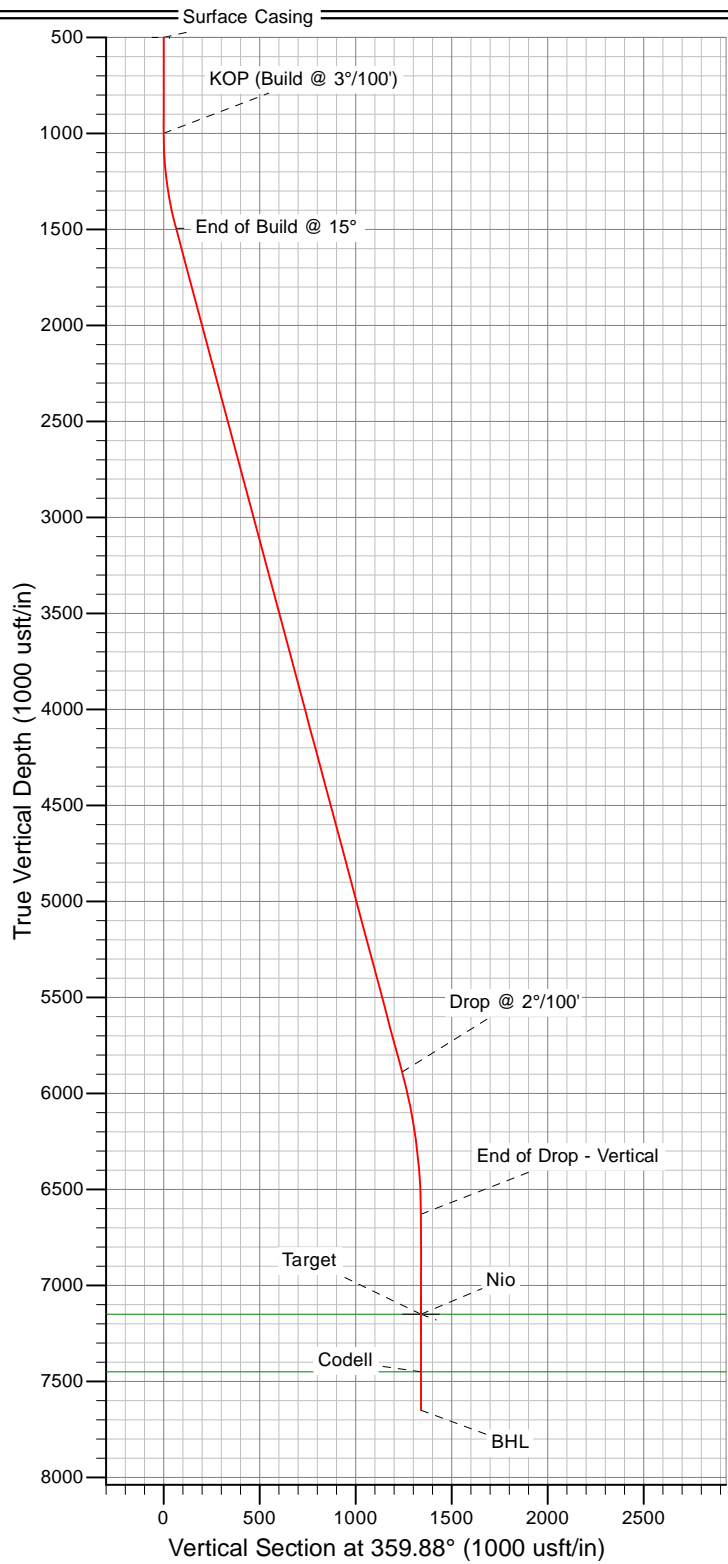
**16 May, 2011**

## **Directional Planning Report**



# Apollo Operating, LLC

Site: Sec. 2, T3N R68W  
Well: Steffes 21-2D  
Wellbore: Wellbore #1  
Design: Plan #1



Azimuths to True North  
Magnetic North: 8.97°

Magnetic Field  
Strength: 53040.8snT  
Dip Angle: 66.90°  
Date: 5/16/2011  
Model: IGRF2010

total

Plan: Plan #1 (Steffes 21-2D/Wellbore #1)

Created By: Roopa Dattan Date: 15:31, May 16 2011

# Total Directional Services

## Directional Planning Report



<b>Database:</b>	Total	<b>Local Co-ordinate Reference:</b>	Well Steffes 21-2D
<b>Company:</b>	Apollo Operating, LLC	<b>TVD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
<b>Project:</b>	Steffes Multi Well Plan	<b>MD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
<b>Site:</b>	Sec. 2, T3N R68W	<b>North Reference:</b>	True
<b>Well:</b>	Steffes 21-2D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

<b>Project</b>	Steffes Multi Well Plan		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 Colorado - HARN		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		

<b>Site</b>	Sec. 2, T3N R68W		
<b>Site Position:</b>		<b>Northing:</b>	4,456,298.24 m
<b>From:</b>	Lat/Long	<b>Easting:</b>	502,321.56 m
<b>Position Uncertainty:</b>	0.00 <sub>usft</sub>	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	40° 15' 25.704 N
		<b>Longitude:</b>	104° 58' 21.720 W
		<b>Grid Convergence:</b>	0.02 °

<b>Well</b>	Steffes 21-2D		
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b> 4,456,298.24 m
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b> 502,321.56 m
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b> usft
			<b>Latitude:</b> 40° 15' 25.704 N
			<b>Longitude:</b> 104° 58' 21.720 W
			<b>Ground Level:</b> 4,998.00 usft

<b>Wellbore</b>	Wellbore #1		
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>
	IGRF2010	5/16/2011	8.97
			<b>Dip Angle (°)</b> 66.90
			<b>Field Strength (nT)</b> 53,041

<b>Design</b>	Plan #1		
<b>Audit Notes:</b>			
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b> 0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>
	0.00	0.00	0.00
			<b>Direction (°)</b> 359.88

# Total Directional Services

## Directional Planning Report



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<b>Company:</b>	Apollo Operating, LLC	<b>TVD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
<b>Project:</b>	Steffes Multi Well Plan	<b>MD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
<b>Site:</b>	Sec. 2, T3N R68W	<b>North Reference:</b>	True
<b>Well:</b>	Steffes 21-2D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	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	
1,500.00	15.00	359.88	1,494.31	65.08	-0.14	3.00	3.00	0.00	359.88	
6,049.15	15.00	359.88	5,888.45	1,242.48	-2.59	0.00	0.00	0.00	0.00	
6,799.15	0.00	0.00	6,629.91	1,340.10	-2.79	2.00	-2.00	0.00	180.00	
7,319.24	0.00	0.00	7,150.00	1,340.10	-2.79	0.00	0.00	0.00	0.00	Target
7,819.24	0.00	0.00	7,650.00	1,340.10	-2.79	0.00	0.00	0.00	0.00	

# Total Directional Services

## Directional Planning Report



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<b>Company:</b>	Apollo Operating, LLC	<b>TVD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
<b>Project:</b>	Steffes Multi Well Plan	<b>MD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
<b>Site:</b>	Sec. 2, T3N R68W	<b>North Reference:</b>	True
<b>Well:</b>	Steffes 21-2D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

Planned Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	TVD (usft)	Sub Sea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Dogleg Rate (°/100usft)	Comment/Formation
0.00	0.00	0.00	0.00	5,019.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	4,919.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	4,819.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	4,719.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	4,619.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	4,519.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	4,419.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	4,319.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	4,219.00	0.00	0.00	0.00	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	4,119.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,000.00	0.00	0.00	1,000.00	4,019.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP (Build @ 3°/100')
1,100.00	3.00	359.88	1,099.95	3,919.05	2.62	-0.01	2.62	3.00	0.00	3.00	
1,200.00	6.00	359.88	1,199.63	3,819.37	10.46	-0.02	10.46	3.00	0.00	3.00	
1,300.00	9.00	359.88	1,298.77	3,720.23	23.51	-0.05	23.51	3.00	0.00	3.00	
1,400.00	12.00	359.88	1,397.08	3,621.92	41.73	-0.09	41.74	3.00	0.00	3.00	
1,500.00	15.00	359.88	1,494.31	3,524.69	65.08	-0.14	65.08	3.00	0.00	3.00	End of Build @ 15°
1,600.00	15.00	359.88	1,590.90	3,428.10	90.96	-0.19	90.96	0.00	0.00	0.00	
1,700.00	15.00	359.88	1,687.49	3,331.51	116.84	-0.24	116.84	0.00	0.00	0.00	
1,800.00	15.00	359.88	1,784.09	3,234.91	142.72	-0.30	142.72	0.00	0.00	0.00	
1,900.00	15.00	359.88	1,880.68	3,138.32	168.60	-0.35	168.60	0.00	0.00	0.00	
2,000.00	15.00	359.88	1,977.27	3,041.73	194.49	-0.40	194.49	0.00	0.00	0.00	
2,100.00	15.00	359.88	2,073.86	2,945.14	220.37	-0.46	220.37	0.00	0.00	0.00	
2,200.00	15.00	359.88	2,170.46	2,848.54	246.25	-0.51	246.25	0.00	0.00	0.00	

# Total Directional Services

## Directional Planning Report



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<b>Company:</b>	Apollo Operating, LLC	<b>TVD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
<b>Project:</b>	Steffes Multi Well Plan	<b>MD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
<b>Site:</b>	Sec. 2, T3N R68W	<b>North Reference:</b>	True
<b>Well:</b>	Steffes 21-2D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

Planned Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	TVD (usft)	Sub Sea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Dogleg Rate (°/100usft)	Comment/Formation
2,300.00	15.00	359.88	2,267.05	2,751.95	272.13	-0.57	272.13	0.00	0.00	0.00	
2,400.00	15.00	359.88	2,363.64	2,655.36	298.01	-0.62	298.01	0.00	0.00	0.00	
2,500.00	15.00	359.88	2,460.23	2,558.77	323.90	-0.67	323.90	0.00	0.00	0.00	
2,600.00	15.00	359.88	2,556.83	2,462.17	349.78	-0.73	349.78	0.00	0.00	0.00	
2,700.00	15.00	359.88	2,653.42	2,365.58	375.66	-0.78	375.66	0.00	0.00	0.00	
2,800.00	15.00	359.88	2,750.01	2,268.99	401.54	-0.84	401.54	0.00	0.00	0.00	
2,900.00	15.00	359.88	2,846.60	2,172.40	427.42	-0.89	427.42	0.00	0.00	0.00	
3,000.00	15.00	359.88	2,943.20	2,075.80	453.30	-0.94	453.31	0.00	0.00	0.00	
3,100.00	15.00	359.88	3,039.79	1,979.21	479.19	-1.00	479.19	0.00	0.00	0.00	
3,200.00	15.00	359.88	3,136.38	1,882.62	505.07	-1.05	505.07	0.00	0.00	0.00	
3,300.00	15.00	359.88	3,232.97	1,786.03	530.95	-1.11	530.95	0.00	0.00	0.00	
3,400.00	15.00	359.88	3,329.57	1,689.43	556.83	-1.16	556.83	0.00	0.00	0.00	
3,500.00	15.00	359.88	3,426.16	1,592.84	582.71	-1.21	582.71	0.00	0.00	0.00	
3,600.00	15.00	359.88	3,522.75	1,496.25	608.60	-1.27	608.60	0.00	0.00	0.00	
3,700.00	15.00	359.88	3,619.34	1,399.66	634.48	-1.32	634.48	0.00	0.00	0.00	
3,800.00	15.00	359.88	3,715.94	1,303.06	660.36	-1.37	660.36	0.00	0.00	0.00	
3,900.00	15.00	359.88	3,812.53	1,206.47	686.24	-1.43	686.24	0.00	0.00	0.00	
4,000.00	15.00	359.88	3,909.12	1,109.88	712.12	-1.48	712.12	0.00	0.00	0.00	
4,100.00	15.00	359.88	4,005.72	1,013.28	738.00	-1.54	738.01	0.00	0.00	0.00	
4,200.00	15.00	359.88	4,102.31	916.69	763.89	-1.59	763.89	0.00	0.00	0.00	
4,300.00	15.00	359.88	4,198.90	820.10	789.77	-1.64	789.77	0.00	0.00	0.00	
4,400.00	15.00	359.88	4,295.49	723.51	815.65	-1.70	815.65	0.00	0.00	0.00	
4,500.00	15.00	359.88	4,392.09	626.91	841.53	-1.75	841.53	0.00	0.00	0.00	
4,600.00	15.00	359.88	4,488.68	530.32	867.41	-1.81	867.42	0.00	0.00	0.00	

# Total Directional Services

## Directional Planning Report



<b>Database:</b>	Total	<b>Local Co-ordinate Reference:</b>	Well Steffes 21-2D
<b>Company:</b>	Apollo Operating, LLC	<b>TVD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
<b>Project:</b>	Steffes Multi Well Plan	<b>MD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
<b>Site:</b>	Sec. 2, T3N R68W	<b>North Reference:</b>	True
<b>Well:</b>	Steffes 21-2D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

Planned Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	TVD (usft)	Sub Sea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Dogleg Rate (°/100usft)	Comment/Formation
4,700.00	15.00	359.88	4,585.27	433.73	893.30	-1.86	893.30	0.00	0.00	0.00	
4,800.00	15.00	359.88	4,681.86	337.14	919.18	-1.91	919.18	0.00	0.00	0.00	
4,900.00	15.00	359.88	4,778.46	240.54	945.06	-1.97	945.06	0.00	0.00	0.00	
5,000.00	15.00	359.88	4,875.05	143.95	970.94	-2.02	970.94	0.00	0.00	0.00	
5,100.00	15.00	359.88	4,971.64	47.36	996.82	-2.08	996.83	0.00	0.00	0.00	
5,200.00	15.00	359.88	5,068.23	-49.23	1,022.71	-2.13	1,022.71	0.00	0.00	0.00	
5,300.00	15.00	359.88	5,164.83	-145.83	1,048.59	-2.18	1,048.59	0.00	0.00	0.00	
5,400.00	15.00	359.88	5,261.42	-242.42	1,074.47	-2.24	1,074.47	0.00	0.00	0.00	
5,500.00	15.00	359.88	5,358.01	-339.01	1,100.35	-2.29	1,100.35	0.00	0.00	0.00	
5,600.00	15.00	359.88	5,454.60	-435.60	1,126.23	-2.34	1,126.23	0.00	0.00	0.00	
5,700.00	15.00	359.88	5,551.20	-532.20	1,152.11	-2.40	1,152.12	0.00	0.00	0.00	
5,800.00	15.00	359.88	5,647.79	-628.79	1,178.00	-2.45	1,178.00	0.00	0.00	0.00	
5,900.00	15.00	359.88	5,744.38	-725.38	1,203.88	-2.51	1,203.88	0.00	0.00	0.00	
6,000.00	15.00	359.88	5,840.97	-821.97	1,229.76	-2.56	1,229.76	0.00	0.00	0.00	
6,049.15	15.00	359.88	5,888.45	-869.45	1,242.48	-2.59	1,242.48	0.00	0.00	0.00	Drop @ 2°/100'
6,100.00	13.98	359.88	5,937.68	-918.68	1,255.21	-2.61	1,255.21	-2.00	0.00	2.00	
6,200.00	11.98	359.88	6,035.12	-1,016.12	1,277.67	-2.66	1,277.67	-2.00	0.00	2.00	
6,300.00	9.98	359.88	6,133.28	-1,114.28	1,296.72	-2.70	1,296.72	-2.00	0.00	2.00	
6,400.00	7.98	359.88	6,232.05	-1,213.05	1,312.33	-2.73	1,312.34	-2.00	0.00	2.00	
6,500.00	5.98	359.88	6,331.30	-1,312.30	1,324.49	-2.76	1,324.49	-2.00	0.00	2.00	
6,600.00	3.98	359.88	6,430.92	-1,411.92	1,333.18	-2.78	1,333.18	-2.00	0.00	2.00	
6,700.00	1.98	359.88	6,530.78	-1,511.78	1,338.38	-2.79	1,338.38	-2.00	0.00	2.00	
6,799.15	0.00	359.88	6,629.91	-1,610.91	1,340.10	-2.79	1,340.10	-2.00	0.00	2.00	End of Drop - Vertical
6,800.00	0.00	0.00	6,630.76	-1,611.76	1,340.10	-2.79	1,340.10	-0.01	0.00	0.01	

# Total Directional Services

## Directional Planning Report



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<b>Company:</b>	Apollo Operating, LLC	<b>TVD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
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<b>Well:</b>	Steffes 21-2D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

Planned Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	TVD (usft)	Sub Sea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Dogleg Rate (°/100usft)	Comment/Formation
6,900.00	0.00	0.00	6,730.76	-1,711.76	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	
7,000.00	0.00	0.00	6,830.76	-1,811.76	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	
7,100.00	0.00	0.00	6,930.76	-1,911.76	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	
7,200.00	0.00	0.00	7,030.76	-2,011.76	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	
7,300.00	0.00	0.00	7,130.76	-2,111.76	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	
7,319.24	0.00	0.00	7,150.00	-2,131.00	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	Target - Nio
7,400.00	0.00	0.00	7,230.76	-2,211.76	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	
7,500.00	0.00	0.00	7,330.76	-2,311.76	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	
7,600.00	0.00	0.00	7,430.76	-2,411.76	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	
7,619.24	0.00	0.00	7,450.00	-2,431.00	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	Codell
7,700.00	0.00	0.00	7,530.76	-2,511.76	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,630.76	-2,611.76	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	
7,819.24	0.00	0.00	7,650.00	-2,631.00	1,340.10	-2.79	1,340.10	0.00	0.00	0.00	BHL

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
500.00	500.00	Surface Casing	0	0	



# Total Directional Services

## Directional Planning Report



<b>Database:</b>	Total	<b>Local Co-ordinate Reference:</b>	Well Steffes 21-2D
<b>Company:</b>	Apollo Operating, LLC	<b>TVD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
<b>Project:</b>	Steffes Multi Well Plan	<b>MD Reference:</b>	Est. KB @ 5019.00usft (Original Well Elev)
<b>Site:</b>	Sec. 2, T3N R68W	<b>North Reference:</b>	True
<b>Well:</b>	Steffes 21-2D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1		

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,319.24	7,150.00	Nio		0.00	
7,619.24	7,450.00	Codell		0.00	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,000.00	1,000.00	0.00	0.00	KOP (Build @ 3°/100')	
1,500.00	1,494.31	65.08	-0.14	End of Build @ 15°	
6,049.15	5,888.45	1,242.48	-2.59	Drop @ 2°/100'	
6,799.15	6,629.91	1,340.10	-2.79	End of Drop - Vertical	
7,319.24	7,150.00	1,340.10	-2.79	Target	
7,819.24	7,650.00	1,340.10	-2.79	BHL	