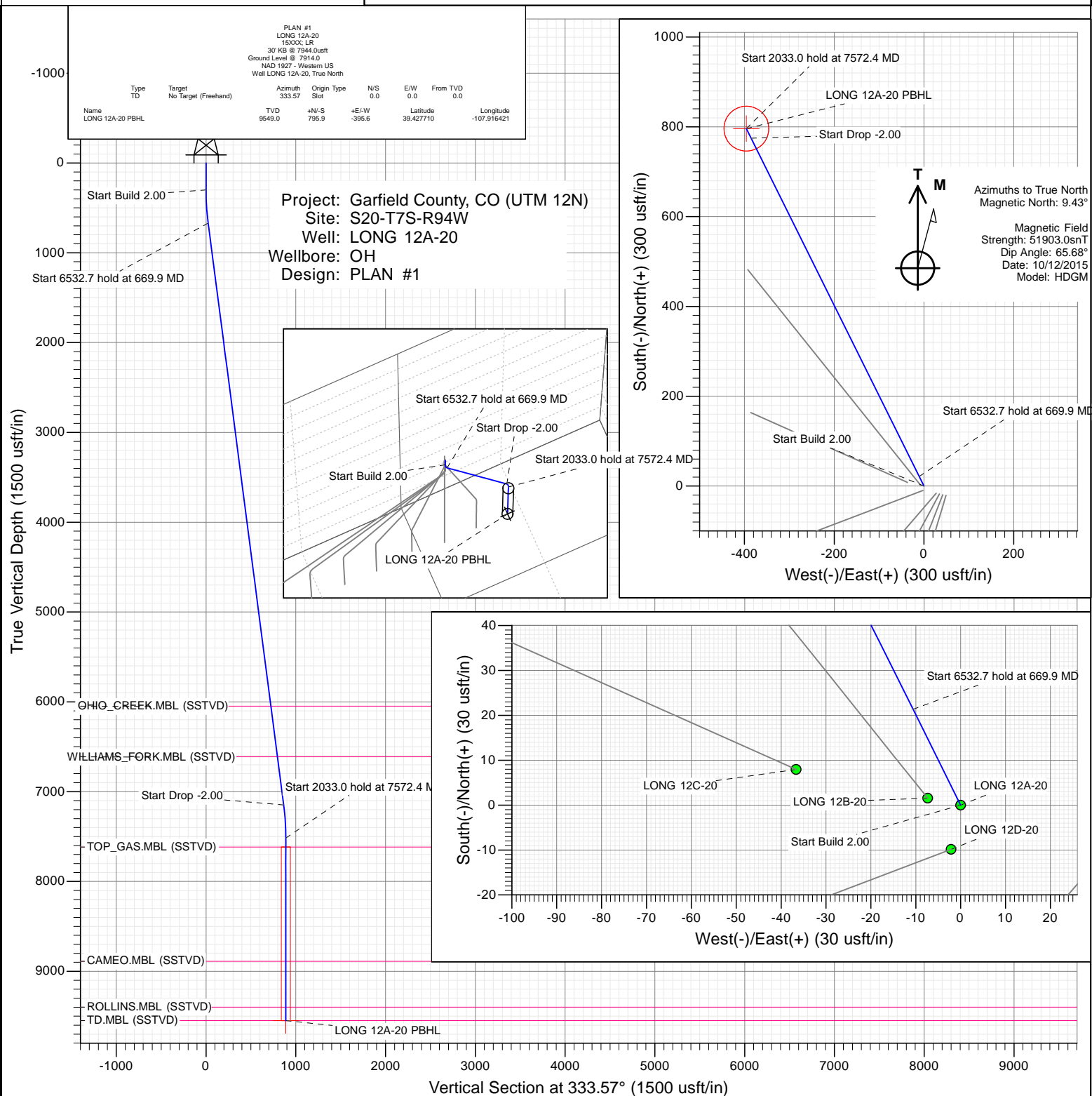




# SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0	
3	669.9	7.40	333.57	668.9	21.4	-10.6	2.00	333.57	23.8	
4	7202.5	7.40	333.57	7147.1	774.5	-385.0	0.00	0.00	865.0	
5	7572.4	0.00	0.00	7516.0	795.9	-395.6	2.00	180.00	888.8	
6	9605.4	0.00	0.00	9549.0	795.9	-395.6	0.00	0.00	888.8	LONG 12A-20 PBHL



CATHEDRAL

## WELL DETAILS: LONG 12A-20

Ground Level:	7914.0
+N/-S	0.0
+E/-W	0.0
Northing	14331773.30
Easting	2511668.90
Latitude	39.425526
Longitude	-107.915021



## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LONG 12A-20
<b>Company:</b>	Caerus Oil & Gas	<b>TVD Reference:</b>	30' KB @ 7944.0usft
<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>MD Reference:</b>	30' KB @ 7944.0usft
<b>Site:</b>	S20-T7S-R94W	<b>North Reference:</b>	True
<b>Well:</b>	LONG 12A-20	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

<b>Project</b>	Garfield County, CO (UTM 12N)		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 - Western US		
<b>Map Zone:</b>	Zone 12N (114 W to 108 W)		

Site		S20-T7S-R94W			
Site Position:		Northing:	14,331,773.30 usft	Latitude:	39.425526
From:	Map	Easting:	2,511,668.90 usft	Longitude:	-107.915021
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.96 °

Well	LONG 12A-20					
Well Position	+N/-S	0.0 usft	Northing:	14,331,773.30 usft	Latitude:	39.425526
	+E/-W	0.0 usft	Easting:	2,511,668.90 usft	Longitude:	-107.915021
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,914.0 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b> (°)	<b>Dip Angle</b> (°)	<b>Field Strength</b> (nT)
	HDGM	10/12/2015	9.43	65.68	51,903

<b>Design</b>	PLAN #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b> (usft)	<b>+N/-S</b> (usft)	<b>+E/-W</b> (usft)	<b>Direction</b> (°)
	0.0	0.0	0.0	333.57

<b>Plan Sections</b>										
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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
669.9	7.40	333.57	668.9	21.4	-10.6	2.00	2.00	0.00	333.57	
7,202.5	7.40	333.57	7,147.1	774.5	-385.0	0.00	0.00	0.00	0.00	
7,572.4	0.00	0.00	7,516.0	795.9	-395.6	2.00	-2.00	0.00	180.00	
9,605.4	0.00	0.00	9,549.0	795.9	-395.6	0.00	0.00	0.00	0.00	LONG 12A-20 PBHL

# Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LONG 12A-20
<b>Company:</b>	Caerus Oil & Gas	<b>TVD Reference:</b>	30' KB @ 7944.0usft
<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>MD Reference:</b>	30' KB @ 7944.0usft
<b>Site:</b>	S20-T7S-R94W	<b>North Reference:</b>	True
<b>Well:</b>	LONG 12A-20	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	Start Build 2.00
400.0	2.00	333.57	400.0	1.6	-0.8	1.7	2.00	2.00	
500.0	4.00	333.57	499.8	6.2	-3.1	7.0	2.00	2.00	
600.0	6.00	333.57	599.5	14.1	-7.0	15.7	2.00	2.00	
669.9	7.40	333.57	668.9	21.4	-10.6	23.8	2.00	2.00	Start 6532.7 hold at 669.9 MD
700.0	7.40	333.57	698.7	24.8	-12.3	27.7	0.00	0.00	
800.0	7.40	333.57	797.9	36.4	-18.1	40.6	0.00	0.00	
900.0	7.40	333.57	897.1	47.9	-23.8	53.5	0.00	0.00	
1,000.0	7.40	333.57	996.2	59.4	-29.5	66.3	0.00	0.00	
1,100.0	7.40	333.57	1,095.4	70.9	-35.3	79.2	0.00	0.00	
1,200.0	7.40	333.57	1,194.6	82.5	-41.0	92.1	0.00	0.00	
1,300.0	7.40	333.57	1,293.7	94.0	-46.7	105.0	0.00	0.00	
1,400.0	7.40	333.57	1,392.9	105.5	-52.5	117.9	0.00	0.00	
1,500.0	7.40	333.57	1,492.1	117.1	-58.2	130.7	0.00	0.00	
1,600.0	7.40	333.57	1,591.2	128.6	-63.9	143.6	0.00	0.00	
1,700.0	7.40	333.57	1,690.4	140.1	-69.6	156.5	0.00	0.00	
1,800.0	7.40	333.57	1,789.6	151.7	-75.4	169.4	0.00	0.00	
1,900.0	7.40	333.57	1,888.7	163.2	-81.1	182.2	0.00	0.00	
2,000.0	7.40	333.57	1,987.9	174.7	-86.8	195.1	0.00	0.00	
2,100.0	7.40	333.57	2,087.1	186.2	-92.6	208.0	0.00	0.00	
2,200.0	7.40	333.57	2,186.2	197.8	-98.3	220.9	0.00	0.00	
2,300.0	7.40	333.57	2,285.4	209.3	-104.0	233.7	0.00	0.00	
2,400.0	7.40	333.57	2,384.6	220.8	-109.8	246.6	0.00	0.00	
2,500.0	7.40	333.57	2,483.7	232.4	-115.5	259.5	0.00	0.00	
2,600.0	7.40	333.57	2,582.9	243.9	-121.2	272.4	0.00	0.00	
2,700.0	7.40	333.57	2,682.1	255.4	-127.0	285.2	0.00	0.00	
2,800.0	7.40	333.57	2,781.2	266.9	-132.7	298.1	0.00	0.00	
2,900.0	7.40	333.57	2,880.4	278.5	-138.4	311.0	0.00	0.00	
3,000.0	7.40	333.57	2,979.6	290.0	-144.1	323.9	0.00	0.00	
3,100.0	7.40	333.57	3,078.7	301.5	-149.9	336.7	0.00	0.00	
3,200.0	7.40	333.57	3,177.9	313.1	-155.6	349.6	0.00	0.00	
3,300.0	7.40	333.57	3,277.1	324.6	-161.3	362.5	0.00	0.00	
3,400.0	7.40	333.57	3,376.2	336.1	-167.1	375.4	0.00	0.00	
3,500.0	7.40	333.57	3,475.4	347.7	-172.8	388.2	0.00	0.00	
3,600.0	7.40	333.57	3,574.6	359.2	-178.5	401.1	0.00	0.00	
3,700.0	7.40	333.57	3,673.8	370.7	-184.3	414.0	0.00	0.00	
3,800.0	7.40	333.57	3,772.9	382.2	-190.0	426.9	0.00	0.00	
3,900.0	7.40	333.57	3,872.1	393.8	-195.7	439.7	0.00	0.00	
4,000.0	7.40	333.57	3,971.3	405.3	-201.5	452.6	0.00	0.00	
4,100.0	7.40	333.57	4,070.4	416.8	-207.2	465.5	0.00	0.00	
4,200.0	7.40	333.57	4,169.6	428.4	-212.9	478.4	0.00	0.00	
4,300.0	7.40	333.57	4,268.8	439.9	-218.7	491.2	0.00	0.00	
4,400.0	7.40	333.57	4,367.9	451.4	-224.4	504.1	0.00	0.00	
4,500.0	7.40	333.57	4,467.1	463.0	-230.1	517.0	0.00	0.00	
4,600.0	7.40	333.57	4,566.3	474.5	-235.8	529.9	0.00	0.00	
4,700.0	7.40	333.57	4,665.4	486.0	-241.6	542.7	0.00	0.00	
4,800.0	7.40	333.57	4,764.6	497.5	-247.3	555.6	0.00	0.00	
4,900.0	7.40	333.57	4,863.8	509.1	-253.0	568.5	0.00	0.00	
5,000.0	7.40	333.57	4,962.9	520.6	-258.8	581.4	0.00	0.00	

# Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LONG 12A-20
<b>Company:</b>	Caerus Oil & Gas	<b>TVD Reference:</b>	30' KB @ 7944.0usft
<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>MD Reference:</b>	30' KB @ 7944.0usft
<b>Site:</b>	S20-T7S-R94W	<b>North Reference:</b>	True
<b>Well:</b>	LONG 12A-20	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
5,100.0	7.40	333.57	5,062.1	532.1	-264.5	594.2	0.00	0.00	
5,200.0	7.40	333.57	5,161.3	543.7	-270.2	607.1	0.00	0.00	
5,300.0	7.40	333.57	5,260.4	555.2	-276.0	620.0	0.00	0.00	
5,400.0	7.40	333.57	5,359.6	566.7	-281.7	632.9	0.00	0.00	
5,500.0	7.40	333.57	5,458.8	578.2	-287.4	645.7	0.00	0.00	
5,600.0	7.40	333.57	5,557.9	589.8	-293.2	658.6	0.00	0.00	
5,700.0	7.40	333.57	5,657.1	601.3	-298.9	671.5	0.00	0.00	
5,800.0	7.40	333.57	5,756.3	612.8	-304.6	684.4	0.00	0.00	
5,900.0	7.40	333.57	5,855.4	624.4	-310.3	697.2	0.00	0.00	
6,000.0	7.40	333.57	5,954.6	635.9	-316.1	710.1	0.00	0.00	
6,093.2	7.40	333.57	6,047.0	646.6	-321.4	722.1	0.00	0.00	OHIO_CREEK.MBL (SSTVD)
6,100.0	7.40	333.57	6,053.8	647.4	-321.8	723.0	0.00	0.00	
6,200.0	7.40	333.57	6,152.9	659.0	-327.5	735.9	0.00	0.00	
6,300.0	7.40	333.57	6,252.1	670.5	-333.3	748.7	0.00	0.00	
6,400.0	7.40	333.57	6,351.3	682.0	-339.0	761.6	0.00	0.00	
6,500.0	7.40	333.57	6,450.4	693.5	-344.7	774.5	0.00	0.00	
6,600.0	7.40	333.57	6,549.6	705.1	-350.5	787.4	0.00	0.00	
6,662.9	7.40	333.57	6,612.0	712.3	-354.1	795.5	0.00	0.00	WILLIAMS_FORK.MBL (SSTVD)
6,700.0	7.40	333.57	6,648.8	716.6	-356.2	800.2	0.00	0.00	
6,800.0	7.40	333.57	6,747.9	728.1	-361.9	813.1	0.00	0.00	
6,900.0	7.40	333.57	6,847.1	739.7	-367.7	826.0	0.00	0.00	
7,000.0	7.40	333.57	6,946.3	751.2	-373.4	838.9	0.00	0.00	
7,100.0	7.40	333.57	7,045.5	762.7	-379.1	851.7	0.00	0.00	
7,200.0	7.40	333.57	7,144.6	774.3	-384.8	864.6	0.00	0.00	
7,202.5	7.40	333.57	7,147.1	774.5	-385.0	865.0	0.00	0.00	Start Drop -2.00
7,300.0	5.45	333.57	7,244.0	784.3	-389.8	875.9	2.00	-2.00	
7,400.0	3.45	333.57	7,343.7	791.3	-393.3	883.6	2.00	-2.00	
7,500.0	1.45	333.57	7,443.6	795.1	-395.2	887.9	2.00	-2.00	
7,572.4	0.00	0.00	7,516.0	795.9	-395.6	888.8	2.00	-2.00	Start 2033.0 hold at 7572.4 MD
7,600.0	0.00	0.00	7,543.6	795.9	-395.6	888.8	0.00	0.00	
7,672.4	0.00	0.00	7,616.0	795.9	-395.6	888.8	0.00	0.00	TOP_GAS.MBL (SSTVD)
7,700.0	0.00	0.00	7,643.6	795.9	-395.6	888.8	0.00	0.00	
7,800.0	0.00	0.00	7,743.6	795.9	-395.6	888.8	0.00	0.00	
7,900.0	0.00	0.00	7,843.6	795.9	-395.6	888.8	0.00	0.00	
8,000.0	0.00	0.00	7,943.6	795.9	-395.6	888.8	0.00	0.00	
8,100.0	0.00	0.00	8,043.6	795.9	-395.6	888.8	0.00	0.00	
8,200.0	0.00	0.00	8,143.6	795.9	-395.6	888.8	0.00	0.00	
8,300.0	0.00	0.00	8,243.6	795.9	-395.6	888.8	0.00	0.00	
8,400.0	0.00	0.00	8,343.6	795.9	-395.6	888.8	0.00	0.00	
8,500.0	0.00	0.00	8,443.6	795.9	-395.6	888.8	0.00	0.00	
8,600.0	0.00	0.00	8,543.6	795.9	-395.6	888.8	0.00	0.00	
8,700.0	0.00	0.00	8,643.6	795.9	-395.6	888.8	0.00	0.00	
8,800.0	0.00	0.00	8,743.6	795.9	-395.6	888.8	0.00	0.00	
8,900.0	0.00	0.00	8,843.6	795.9	-395.6	888.8	0.00	0.00	
8,945.4	0.00	0.00	8,889.0	795.9	-395.6	888.8	0.00	0.00	CAMEO.MBL (SSTVD)
9,000.0	0.00	0.00	8,943.6	795.9	-395.6	888.8	0.00	0.00	
9,100.0	0.00	0.00	9,043.6	795.9	-395.6	888.8	0.00	0.00	
9,200.0	0.00	0.00	9,143.6	795.9	-395.6	888.8	0.00	0.00	
9,300.0	0.00	0.00	9,243.6	795.9	-395.6	888.8	0.00	0.00	
9,400.0	0.00	0.00	9,343.6	795.9	-395.6	888.8	0.00	0.00	
9,455.4	0.00	0.00	9,399.0	795.9	-395.6	888.8	0.00	0.00	ROLLINS.MBL (SSTVD)
9,500.0	0.00	0.00	9,443.6	795.9	-395.6	888.8	0.00	0.00	

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LONG 12A-20
<b>Company:</b>	Caerus Oil & Gas	<b>TVD Reference:</b>	30' KB @ 7944.0usft
<b>Project:</b>	Garfield County, CO (UTM 12N)	<b>MD Reference:</b>	30' KB @ 7944.0usft
<b>Site:</b>	S20-T7S-R94W	<b>North Reference:</b>	True
<b>Well:</b>	LONG 12A-20	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #1		

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
9,600.0	0.00	0.00	9,543.6	795.9	-395.6	888.8	0.00	0.00	
9,605.4	0.00	0.00	9,549.0	795.9	-395.6	888.8	0.00	0.00	TD at 9605.4 - TD.MBL (SSTVD)

### Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LONG 12A-20 PBHL - plan hits target center - Circle (radius 50.0)	0.00	0.00	9,549.0	795.9	-395.6	14,332,555.20	2,511,246.30	39.427710	-107.916421

### Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,093.2	6,047.0	OHIO_CREEK.MBL (SSTVD)		0.00	
6,662.9	6,612.0	WILLIAMS_FORK.MBL (SSTVD)		0.00	
7,672.4	7,616.0	TOP_GAS.MBL (SSTVD)		0.00	
8,945.4	8,889.0	CAMEO.MBL (SSTVD)		0.00	
9,455.4	9,399.0	ROLLINS.MBL (SSTVD)		0.00	
9,605.4	9,549.0	TD.MBL (SSTVD)		0.00	

### Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
300.0	300.0	0.0	0.0	Start Build 2.00
669.9	668.9	21.4	-10.6	Start 6532.7 hold at 669.9 MD
7,202.5	7,147.1	774.5	-385.0	Start Drop -2.00
7,572.4	7,516.0	795.9	-395.6	Start 2033.0 hold at 7572.4 MD
9,605.4	9,549.0	795.9	-395.6	TD at 9605.4