

AXIS EXPLORATION

ARAPAHOE COUNTY

Sec 4-T4S-R65W

JAMASO 4-65 5-6-12

ORIGINAL WELLBORE

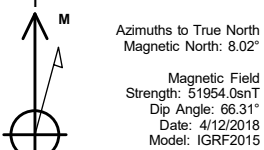
Plan: PROPOSAL 1

Standard Planning Report

18 October, 2018



Project: ARAPAHOE COUNTY
Site: Sec 4-T4S-R65W
Well: JAMASO 4-65 5-6-12
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL 1



WELL DETAILS: JAMASO 4-65 5-6-12										ANNOTATIONS									
	+N/-S	+E/-W	Northing	Easting	5585.00	Latitude	Longitude	Slot		MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation	
	0.00	0.00	1146771.36	3232352.96		39.733281°N	104.673842°W			100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	Start Build 2.00	
										1305.86	24.12	206.11	1270.56	-224.55	-110.04	152.22	250.06	Start 5161.41 hold at 1305.86 MD	
										6467.26	24.12	206.11	5981.44	-2118.35	-1038.09	1435.99	2359.03	Start Drop -2.00	
										7673.12	0.00	0.00	7152.00	-2342.90	-1148.13	1588.20	2609.10	Start 30.00 hold at 7673.12 MD	
										7703.12	0.00	0.00	7182.00	-2342.90	-1148.13	1588.20	2609.10	Start DLS 10.00 TFO 270.25	
										8603.19	90.00	270.25	7755.00	-2340.36	-1721.13	2149.41	3182.10	Start 9684.96 hold at 8603.19 MD	
										18288.14	90.00	270.25	7754.98	-2297.44	-11405.99	11635.07	12867.06	TD at 18288.14	
SECTION DETAILS										DESIGN TARGET DETAILS									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		JAMASO 4-65 5-6-12 - LP	7755.00	-2340.36	-1721.13	1144415.07	3230653.71	39.726856°N	104.679961°W	Point
2	100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00		- plan hits target center								
3	1305.86	24.12	206.11	1270.56	-224.55	-110.04	2.00	206.11	152.22		JAMASO 4-65 5-6-12 - PBHL	7755.00	-2297.74	-11405.99	1144367.46	3220968.87	39.726966°N	104.714393°W	Point
4	6467.26	24.12	206.11	5981.44	-2118.35	-1038.09	0.00	0.00	1435.99		- plan hits target center								
5	7673.12	0.00	0.00	7152.00	-2342.90	-1148.13	2.00	180.00	1588.20										
6	7703.12	0.00	0.00	7182.00	-2342.90	-1148.13	0.00	0.00	1588.20										
7	8603.19	90.00	270.25	7755.00	-2340.36	-1721.13	10.00	270.25	2149.41	JAMASO 4-65 5-6-12 -									
8	18288.14	90.00	270.25	7755.00	-2297.74	-11405.99	0.00	0.00	11635.13	JAMASO 4-65 5-6-12 -									

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
293.00	293.15	Denver
877.00	886.86	Upper Arapahoe
1165.00	1191.20	Lower Arapahoe
1718.00	1796.09	Laramie - Fox Hills
1970.00	2072.00	Shale (Base of Fox Hills)
5575.00	6021.85	Shannon Sandstone Member
7655.00	8259.53	Sharon Springs Shale
7720.00	8401.88	Niobrara Formation
7735.00	8451.35	Niobrara A Chalk
7745.00	8495.98	Niobrara A Landing Point

PROJECT DETAILS: ARAPAHOE COUNTY

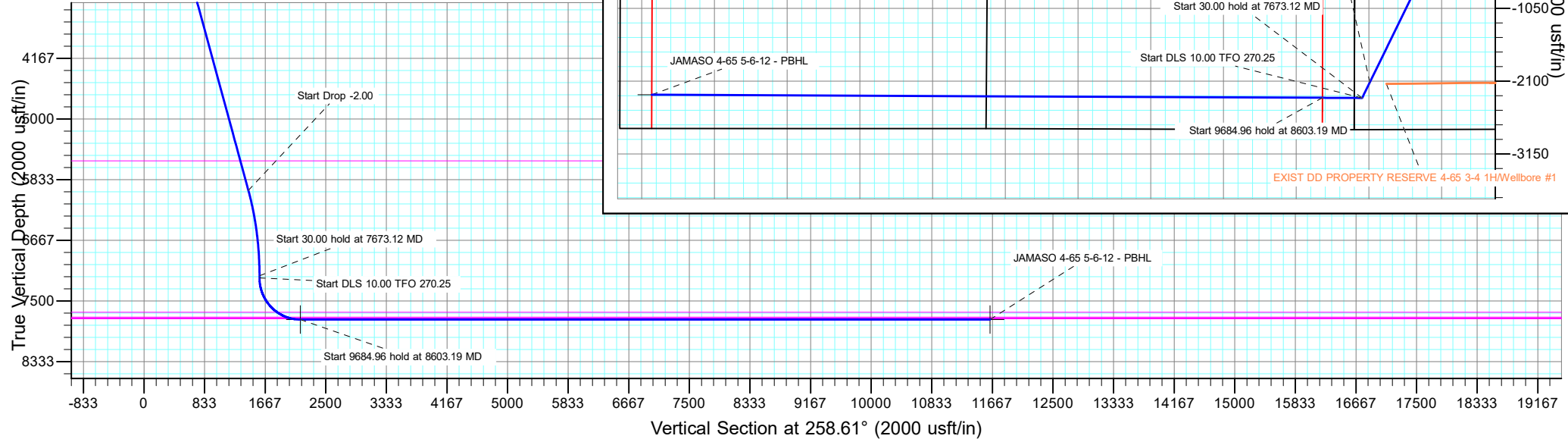
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone

System Datum: Mean Sea Level

SHL:
2449' FNL, 1256' FWL
Sec 4-T4S-R65W

LP:
460' FSL, 460' FEL
Sec 5-T4S-R65W

BHL:
485' FSL, 460' FWL
Sec 6-T4S-R65W



Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-12
Company:	AXIS EXPLORATION	TVD Reference:	KB 25' @ 5610.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-12	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Project	ARAPAHOE COUNTY		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Sec 4-T4S-R65W			
Site Position:		Northing:	1,149,213.35 usft	Latitude:	39.740017°N
From:	Lat/Long	Easting:	3,231,079.56 usft	Longitude:	104.678289°W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.53 °

Well	JAMASO 4-65 5-6-12					
Well Position	+N/-S	-2,453.68 usft	Northing:	1,146,771.36 usft	Latitude:	39.733281°N
	+E/-W	1,250.72 usft	Easting:	3,232,352.96 usft	Longitude:	104.673842°W
Position Uncertainty	0.00 usft		Wellhead Elevation:		Ground Level:	5,585.00 usft

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	4/12/2018	8.02	66.31	51,953.97697977

Design	PROPOSAL 1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	258.61

Plan Survey Tool Program	Date	10/18/2018		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	18,288.00	PROPOSAL 1 (ORIGINAL WELL	MWD OWSG
			OWSG MWD - Standard	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
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	
1,305.86	24.12	206.11	1,270.56	-224.55	-110.04	2.00	2.00	0.00	206.11	
6,467.26	24.12	206.11	5,981.44	-2,118.35	-1,038.09	0.00	0.00	0.00	0.00	
7,673.12	0.00	0.00	7,152.00	-2,342.90	-1,148.13	2.00	-2.00	0.00	180.00	
7,703.12	0.00	0.00	7,182.00	-2,342.90	-1,148.13	0.00	0.00	0.00	0.00	
8,603.19	90.00	270.25	7,755.00	-2,340.36	-1,721.13	10.00	10.00	-9.97	270.25	JAMASO 4-65 5-6-12
18,288.15	90.00	270.25	7,755.00	-2,297.74	-11,405.99	0.00	0.00	0.00	0.00	JAMASO 4-65 5-6-12

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-12
Company:	AXIS EXPLORATION	TVD Reference:	KB 25' @ 5610.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-12	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
Start Build 2.00									
200.00	2.00	206.11	199.98	-1.57	-0.77	1.06	2.00	2.00	0.00
293.15	3.86	206.11	293.00	-5.84	-2.86	3.96	2.00	2.00	0.00
Denver									
300.00	4.00	206.11	299.84	-6.27	-3.07	4.25	2.00	2.00	0.00
400.00	6.00	206.11	399.45	-14.09	-6.91	9.55	2.00	2.00	0.00
500.00	8.00	206.11	498.70	-25.04	-12.27	16.97	2.00	2.00	0.00
600.00	10.00	206.11	597.47	-39.08	-19.15	26.49	2.00	2.00	0.00
700.00	12.00	206.11	695.62	-56.22	-27.55	38.11	2.00	2.00	0.00
800.00	14.00	206.11	793.06	-76.41	-37.45	51.80	2.00	2.00	0.00
886.86	15.74	206.11	877.00	-96.43	-47.25	65.37	2.00	2.00	0.00
Upper Arapahoe									
900.00	16.00	206.11	889.64	-99.65	-48.84	67.55	2.00	2.00	0.00
1,000.00	18.00	206.11	985.27	-125.91	-61.70	85.35	2.00	2.00	0.00
1,100.00	20.00	206.11	1,079.82	-155.14	-76.03	105.17	2.00	2.00	0.00
1,191.20	21.82	206.11	1,165.00	-184.37	-90.35	124.98	2.00	2.00	0.00
Lower Arapahoe									
1,200.00	22.00	206.11	1,173.17	-187.32	-91.80	126.98	2.00	2.00	0.00
1,305.86	24.12	206.11	1,270.56	-224.55	-110.04	152.22	2.00	2.00	0.00
Start 5161.41 hold at 1305.86 MD									
1,400.00	24.12	206.11	1,356.49	-259.09	-126.97	175.63	0.00	0.00	0.00
1,500.00	24.12	206.11	1,447.76	-295.78	-144.95	200.51	0.00	0.00	0.00
1,600.00	24.12	206.11	1,539.03	-332.48	-162.93	225.38	0.00	0.00	0.00
1,700.00	24.12	206.11	1,630.30	-369.17	-180.91	250.25	0.00	0.00	0.00
1,796.09	24.12	206.11	1,718.00	-404.42	-198.19	274.15	0.00	0.00	0.00
Laramie - Fox Hills									
1,800.00	24.12	206.11	1,721.57	-405.86	-198.89	275.12	0.00	0.00	0.00
1,900.00	24.12	206.11	1,812.84	-442.55	-216.87	300.00	0.00	0.00	0.00
2,000.00	24.12	206.11	1,904.12	-479.24	-234.85	324.87	0.00	0.00	0.00
2,072.19	24.12	206.11	1,970.00	-505.73	-247.83	342.82	0.00	0.00	0.00
Pierre Shale (Base of Fox Hills)									
2,100.00	24.12	206.11	1,995.39	-515.93	-252.83	349.74	0.00	0.00	0.00
2,200.00	24.12	206.11	2,086.66	-552.62	-270.81	374.61	0.00	0.00	0.00
2,300.00	24.12	206.11	2,177.93	-589.32	-288.79	399.48	0.00	0.00	0.00
2,400.00	24.12	206.11	2,269.20	-626.01	-306.77	424.36	0.00	0.00	0.00
2,500.00	24.12	206.11	2,360.47	-662.70	-324.75	449.23	0.00	0.00	0.00
2,600.00	24.12	206.11	2,451.74	-699.39	-342.73	474.10	0.00	0.00	0.00
2,700.00	24.12	206.11	2,543.01	-736.08	-360.71	498.97	0.00	0.00	0.00
2,800.00	24.12	206.11	2,634.28	-772.77	-378.70	523.85	0.00	0.00	0.00
2,900.00	24.12	206.11	2,725.56	-809.47	-396.68	548.72	0.00	0.00	0.00
3,000.00	24.12	206.11	2,816.83	-846.16	-414.66	573.59	0.00	0.00	0.00
3,100.00	24.12	206.11	2,908.10	-882.85	-432.64	598.46	0.00	0.00	0.00
3,200.00	24.12	206.11	2,999.37	-919.54	-450.62	623.34	0.00	0.00	0.00
3,300.00	24.12	206.11	3,090.64	-956.23	-468.60	648.21	0.00	0.00	0.00
3,400.00	24.12	206.11	3,181.91	-992.92	-486.58	673.08	0.00	0.00	0.00
3,500.00	24.12	206.11	3,273.18	-1,029.62	-504.56	697.95	0.00	0.00	0.00
3,600.00	24.12	206.11	3,364.45	-1,066.31	-522.54	722.83	0.00	0.00	0.00
3,700.00	24.12	206.11	3,455.73	-1,103.00	-540.52	747.70	0.00	0.00	0.00
3,800.00	24.12	206.11	3,547.00	-1,139.69	-558.50	772.57	0.00	0.00	0.00
3,900.00	24.12	206.11	3,638.27	-1,176.38	-576.48	797.44	0.00	0.00	0.00
4,000.00	24.12	206.11	3,729.54	-1,213.07	-594.46	822.32	0.00	0.00	0.00

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-12
Company:	AXIS EXPLORATION	TVD Reference:	KB 25' @ 5610.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-12	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,100.00	24.12	206.11	3,820.81	-1,249.76	-612.44	847.19	0.00	0.00	0.00	
4,200.00	24.12	206.11	3,912.08	-1,286.46	-630.42	872.06	0.00	0.00	0.00	
4,300.00	24.12	206.11	4,003.35	-1,323.15	-648.40	896.93	0.00	0.00	0.00	
4,400.00	24.12	206.11	4,094.62	-1,359.84	-666.38	921.81	0.00	0.00	0.00	
4,500.00	24.12	206.11	4,185.89	-1,396.53	-684.37	946.68	0.00	0.00	0.00	
4,600.00	24.12	206.11	4,277.17	-1,433.22	-702.35	971.55	0.00	0.00	0.00	
4,700.00	24.12	206.11	4,368.44	-1,469.91	-720.33	996.42	0.00	0.00	0.00	
4,800.00	24.12	206.11	4,459.71	-1,506.61	-738.31	1,021.30	0.00	0.00	0.00	
4,900.00	24.12	206.11	4,550.98	-1,543.30	-756.29	1,046.17	0.00	0.00	0.00	
5,000.00	24.12	206.11	4,642.25	-1,579.99	-774.27	1,071.04	0.00	0.00	0.00	
5,100.00	24.12	206.11	4,733.52	-1,616.68	-792.25	1,095.91	0.00	0.00	0.00	
5,200.00	24.12	206.11	4,824.79	-1,653.37	-810.23	1,120.79	0.00	0.00	0.00	
5,300.00	24.12	206.11	4,916.06	-1,690.06	-828.21	1,145.66	0.00	0.00	0.00	
5,400.00	24.12	206.11	5,007.33	-1,726.76	-846.19	1,170.53	0.00	0.00	0.00	
5,500.00	24.12	206.11	5,098.61	-1,763.45	-864.17	1,195.40	0.00	0.00	0.00	
5,600.00	24.12	206.11	5,189.88	-1,800.14	-882.15	1,220.28	0.00	0.00	0.00	
5,700.00	24.12	206.11	5,281.15	-1,836.83	-900.13	1,245.15	0.00	0.00	0.00	
5,800.00	24.12	206.11	5,372.42	-1,873.52	-918.11	1,270.02	0.00	0.00	0.00	
5,900.00	24.12	206.11	5,463.69	-1,910.21	-936.09	1,294.89	0.00	0.00	0.00	
6,000.00	24.12	206.11	5,554.96	-1,946.90	-954.07	1,319.77	0.00	0.00	0.00	
6,021.95	24.12	206.11	5,575.00	-1,954.96	-958.02	1,325.23	0.00	0.00	0.00	
Shannon Sandstone Member										
6,100.00	24.12	206.11	5,646.23	-1,983.60	-972.05	1,344.64	0.00	0.00	0.00	
6,200.00	24.12	206.11	5,737.50	-2,020.29	-990.04	1,369.51	0.00	0.00	0.00	
6,300.00	24.12	206.11	5,828.78	-2,056.98	-1,008.02	1,394.38	0.00	0.00	0.00	
6,400.00	24.12	206.11	5,920.05	-2,093.67	-1,026.00	1,419.26	0.00	0.00	0.00	
6,467.26	24.12	206.11	5,981.44	-2,118.35	-1,038.09	1,435.99	0.00	0.00	0.00	
Start Drop -2.00										
6,500.00	23.46	206.11	6,011.39	-2,130.21	-1,043.90	1,444.02	2.00	-2.00	0.00	
6,600.00	21.46	206.11	6,103.80	-2,164.52	-1,060.71	1,467.28	2.00	-2.00	0.00	
6,700.00	19.46	206.11	6,197.49	-2,195.91	-1,076.10	1,488.56	2.00	-2.00	0.00	
6,800.00	17.46	206.11	6,292.34	-2,224.34	-1,090.03	1,507.84	2.00	-2.00	0.00	
6,900.00	15.46	206.11	6,388.23	-2,249.79	-1,102.50	1,525.09	2.00	-2.00	0.00	
7,000.00	13.46	206.11	6,485.06	-2,272.22	-1,113.49	1,540.29	2.00	-2.00	0.00	
7,100.00	11.46	206.11	6,582.70	-2,291.59	-1,122.99	1,553.42	2.00	-2.00	0.00	
7,200.00	9.46	206.11	6,681.03	-2,307.90	-1,130.98	1,564.48	2.00	-2.00	0.00	
7,300.00	7.46	206.11	6,779.94	-2,321.11	-1,137.45	1,573.43	2.00	-2.00	0.00	
7,400.00	5.46	206.11	6,879.29	-2,331.22	-1,142.41	1,580.28	2.00	-2.00	0.00	
7,500.00	3.46	206.11	6,978.99	-2,338.20	-1,145.83	1,585.02	2.00	-2.00	0.00	
7,600.00	1.46	206.11	7,078.89	-2,342.06	-1,147.72	1,587.63	2.00	-2.00	0.00	
7,673.12	0.00	0.00	7,152.00	-2,342.90	-1,148.13	1,588.20	2.00	-2.00	210.47	
Start 30.00 hold at 7673.12 MD										
7,703.12	0.00	0.00	7,182.00	-2,342.90	-1,148.13	1,588.20	0.00	0.00	0.00	
Start DLS 10.00 TFO 270.25										
7,750.00	4.69	270.25	7,228.83	-2,342.89	-1,150.05	1,590.08	10.00	10.00	0.00	
7,800.00	9.69	270.25	7,278.42	-2,342.86	-1,156.30	1,596.20	10.00	10.00	0.00	
7,850.00	14.69	270.25	7,327.28	-2,342.82	-1,166.85	1,606.54	10.00	10.00	0.00	
7,900.00	19.69	270.25	7,375.03	-2,342.75	-1,181.62	1,621.01	10.00	10.00	0.00	
7,950.00	24.69	270.25	7,421.31	-2,342.67	-1,200.50	1,639.49	10.00	10.00	0.00	
8,000.00	29.69	270.25	7,465.78	-2,342.57	-1,223.33	1,661.86	10.00	10.00	0.00	
8,050.00	34.69	270.25	7,508.08	-2,342.45	-1,249.96	1,687.94	10.00	10.00	0.00	
8,100.00	39.69	270.25	7,547.90	-2,342.31	-1,280.17	1,717.52	10.00	10.00	0.00	
8,150.00	44.68	270.25	7,584.94	-2,342.17	-1,313.73	1,750.40	10.00	10.00	0.00	

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-12
Company:	AXIS EXPLORATION	TVD Reference:	KB 25' @ 5610.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-12	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,200.00	49.68	270.25	7,618.91	-2,342.00	-1,350.40	1,786.31	10.00	10.00	0.00
8,250.00	54.68	270.25	7,649.55	-2,341.83	-1,389.89	1,824.99	10.00	10.00	0.00
8,259.53	55.64	270.25	7,655.00	-2,341.79	-1,397.71	1,832.65	10.00	10.00	0.00
Sharon Springs Shale									
8,300.00	59.68	270.25	7,676.64	-2,341.64	-1,431.89	1,866.13	10.00	10.00	0.00
8,350.00	64.68	270.25	7,699.97	-2,341.45	-1,476.10	1,909.43	10.00	10.00	0.00
8,400.00	69.68	270.25	7,719.35	-2,341.24	-1,522.17	1,954.55	10.00	10.00	0.00
8,401.88	69.87	270.25	7,720.00	-2,341.23	-1,523.93	1,956.28	10.00	10.00	0.00
Niobrara Formation									
8,450.00	74.68	270.25	7,734.65	-2,341.03	-1,569.76	2,001.16	10.00	10.00	0.00
8,451.35	74.82	270.25	7,735.00	-2,341.03	-1,571.06	2,002.43	10.00	10.00	0.00
Niobrara A Chalk									
8,495.98	79.28	270.25	7,745.00	-2,340.83	-1,614.54	2,045.02	10.00	10.00	0.00
Niobrara A Landing Point									
8,500.00	79.68	270.25	7,745.73	-2,340.82	-1,618.50	2,048.89	10.00	10.00	0.00
8,550.00	84.68	270.25	7,752.53	-2,340.60	-1,668.02	2,097.39	10.00	10.00	0.00
8,603.19	90.00	270.25	7,755.00	-2,340.36	-1,721.13	2,149.41	10.00	10.00	0.00
Start 9684.96 hold at 8603.19 MD									
8,700.00	90.00	270.25	7,755.00	-2,339.93	-1,817.94	2,244.23	0.00	0.00	0.00
8,800.00	90.00	270.25	7,755.00	-2,339.49	-1,917.94	2,342.18	0.00	0.00	0.00
8,900.00	90.00	270.25	7,755.00	-2,339.04	-2,017.94	2,440.12	0.00	0.00	0.00
9,000.00	90.00	270.25	7,755.00	-2,338.60	-2,117.94	2,538.06	0.00	0.00	0.00
9,100.00	90.00	270.25	7,755.00	-2,338.16	-2,217.93	2,636.00	0.00	0.00	0.00
9,200.00	90.00	270.25	7,755.00	-2,337.72	-2,317.93	2,733.94	0.00	0.00	0.00
9,300.00	90.00	270.25	7,755.00	-2,337.27	-2,417.93	2,831.89	0.00	0.00	0.00
9,400.00	90.00	270.25	7,755.00	-2,336.83	-2,517.93	2,929.83	0.00	0.00	0.00
9,500.00	90.00	270.25	7,755.00	-2,336.39	-2,617.93	3,027.77	0.00	0.00	0.00
9,600.00	90.00	270.25	7,755.00	-2,335.94	-2,717.93	3,125.71	0.00	0.00	0.00
9,700.00	90.00	270.25	7,755.00	-2,335.50	-2,817.93	3,223.65	0.00	0.00	0.00
9,800.00	90.00	270.25	7,755.00	-2,335.06	-2,917.93	3,321.60	0.00	0.00	0.00
9,900.00	90.00	270.25	7,755.00	-2,334.61	-3,017.93	3,419.54	0.00	0.00	0.00
10,000.00	90.00	270.25	7,755.00	-2,334.17	-3,117.93	3,517.48	0.00	0.00	0.00
10,100.00	90.00	270.25	7,755.00	-2,333.73	-3,217.92	3,615.42	0.00	0.00	0.00
10,200.00	90.00	270.25	7,755.00	-2,333.28	-3,317.92	3,713.37	0.00	0.00	0.00
10,300.00	90.00	270.25	7,755.00	-2,332.84	-3,417.92	3,811.31	0.00	0.00	0.00
10,400.00	90.00	270.25	7,755.00	-2,332.40	-3,517.92	3,909.25	0.00	0.00	0.00
10,500.00	90.00	270.25	7,755.00	-2,331.95	-3,617.92	4,007.19	0.00	0.00	0.00
10,600.00	90.00	270.25	7,755.00	-2,331.51	-3,717.92	4,105.13	0.00	0.00	0.00
10,700.00	90.00	270.25	7,755.00	-2,331.07	-3,817.92	4,203.08	0.00	0.00	0.00
10,800.00	90.00	270.25	7,755.00	-2,330.62	-3,917.92	4,301.02	0.00	0.00	0.00
10,900.00	90.00	270.25	7,754.99	-2,330.18	-4,017.92	4,398.96	0.00	0.00	0.00
11,000.00	90.00	270.25	7,754.99	-2,329.74	-4,117.92	4,496.90	0.00	0.00	0.00
11,100.00	90.00	270.25	7,754.99	-2,329.29	-4,217.91	4,594.84	0.00	0.00	0.00
11,200.00	90.00	270.25	7,754.99	-2,328.85	-4,317.91	4,692.79	0.00	0.00	0.00
11,300.00	90.00	270.25	7,754.99	-2,328.41	-4,417.91	4,790.73	0.00	0.00	0.00
11,400.00	90.00	270.25	7,754.99	-2,327.96	-4,517.91	4,888.67	0.00	0.00	0.00
11,500.00	90.00	270.25	7,754.99	-2,327.52	-4,617.91	4,986.61	0.00	0.00	0.00
11,600.00	90.00	270.25	7,754.99	-2,327.08	-4,717.91	5,084.56	0.00	0.00	0.00
11,700.00	90.00	270.25	7,754.99	-2,326.64	-4,817.91	5,182.50	0.00	0.00	0.00
11,800.00	90.00	270.25	7,754.99	-2,326.19	-4,917.91	5,280.44	0.00	0.00	0.00
11,900.00	90.00	270.25	7,754.99	-2,325.75	-5,017.91	5,378.38	0.00	0.00	0.00
12,000.00	90.00	270.25	7,754.99	-2,325.31	-5,117.91	5,476.32	0.00	0.00	0.00
12,100.00	90.00	270.25	7,754.99	-2,324.86	-5,217.90	5,574.27	0.00	0.00	0.00
12,200.00	90.00	270.25	7,754.99	-2,324.42	-5,317.90	5,672.21	0.00	0.00	0.00

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-12
Company:	AXIS EXPLORATION	TVD Reference:	KB 25' @ 5610.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-12	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
12,300.00	90.00	270.25	7,754.99	-2,323.98	-5,417.90	5,770.15	0.00	0.00	0.00
12,400.00	90.00	270.25	7,754.99	-2,323.53	-5,517.90	5,868.09	0.00	0.00	0.00
12,500.00	90.00	270.25	7,754.99	-2,323.09	-5,617.90	5,966.03	0.00	0.00	0.00
12,600.00	90.00	270.25	7,754.99	-2,322.65	-5,717.90	6,063.98	0.00	0.00	0.00
12,700.00	90.00	270.25	7,754.99	-2,322.20	-5,817.90	6,161.92	0.00	0.00	0.00
12,800.00	90.00	270.25	7,754.99	-2,321.76	-5,917.90	6,259.86	0.00	0.00	0.00
12,900.00	90.00	270.25	7,754.99	-2,321.32	-6,017.90	6,357.80	0.00	0.00	0.00
13,000.00	90.00	270.25	7,754.99	-2,320.87	-6,117.90	6,455.75	0.00	0.00	0.00
13,100.00	90.00	270.25	7,754.99	-2,320.43	-6,217.90	6,553.69	0.00	0.00	0.00
13,200.00	90.00	270.25	7,754.99	-2,319.99	-6,317.89	6,651.63	0.00	0.00	0.00
13,300.00	90.00	270.25	7,754.99	-2,319.54	-6,417.89	6,749.57	0.00	0.00	0.00
13,400.00	90.00	270.25	7,754.99	-2,319.10	-6,517.89	6,847.51	0.00	0.00	0.00
13,500.00	90.00	270.25	7,754.99	-2,318.66	-6,617.89	6,945.46	0.00	0.00	0.00
13,600.00	90.00	270.25	7,754.99	-2,318.21	-6,717.89	7,043.40	0.00	0.00	0.00
13,700.00	90.00	270.25	7,754.99	-2,317.77	-6,817.89	7,141.34	0.00	0.00	0.00
13,800.00	90.00	270.25	7,754.99	-2,317.33	-6,917.89	7,239.28	0.00	0.00	0.00
13,900.00	90.00	270.25	7,754.99	-2,316.88	-7,017.89	7,337.22	0.00	0.00	0.00
14,000.00	90.00	270.25	7,754.99	-2,316.44	-7,117.89	7,435.17	0.00	0.00	0.00
14,100.00	90.00	270.25	7,754.99	-2,316.00	-7,217.89	7,533.11	0.00	0.00	0.00
14,200.00	90.00	270.25	7,754.99	-2,315.55	-7,317.88	7,631.05	0.00	0.00	0.00
14,300.00	90.00	270.25	7,754.99	-2,315.11	-7,417.88	7,728.99	0.00	0.00	0.00
14,400.00	90.00	270.25	7,754.99	-2,314.67	-7,517.88	7,826.94	0.00	0.00	0.00
14,500.00	90.00	270.25	7,754.99	-2,314.23	-7,617.88	7,924.88	0.00	0.00	0.00
14,600.00	90.00	270.25	7,754.99	-2,313.78	-7,717.88	8,022.82	0.00	0.00	0.00
14,700.00	90.00	270.25	7,754.99	-2,313.34	-7,817.88	8,120.76	0.00	0.00	0.00
14,800.00	90.00	270.25	7,754.99	-2,312.90	-7,917.88	8,218.70	0.00	0.00	0.00
14,900.00	90.00	270.25	7,754.99	-2,312.45	-8,017.88	8,316.65	0.00	0.00	0.00
15,000.00	90.00	270.25	7,754.99	-2,312.01	-8,117.88	8,414.59	0.00	0.00	0.00
15,100.00	90.00	270.25	7,754.99	-2,311.57	-8,217.88	8,512.53	0.00	0.00	0.00
15,200.00	90.00	270.25	7,754.99	-2,311.12	-8,317.87	8,610.47	0.00	0.00	0.00
15,300.00	90.00	270.25	7,754.98	-2,310.68	-8,417.87	8,708.41	0.00	0.00	0.00
15,400.00	90.00	270.25	7,754.98	-2,310.24	-8,517.87	8,806.36	0.00	0.00	0.00
15,500.00	90.00	270.25	7,754.98	-2,309.79	-8,617.87	8,904.30	0.00	0.00	0.00
15,600.00	90.00	270.25	7,754.98	-2,309.35	-8,717.87	9,002.24	0.00	0.00	0.00
15,700.00	90.00	270.25	7,754.98	-2,308.91	-8,817.87	9,100.18	0.00	0.00	0.00
15,800.00	90.00	270.25	7,754.98	-2,308.46	-8,917.87	9,198.13	0.00	0.00	0.00
15,900.00	90.00	270.25	7,754.98	-2,308.02	-9,017.87	9,296.07	0.00	0.00	0.00
16,000.00	90.00	270.25	7,754.98	-2,307.58	-9,117.87	9,394.01	0.00	0.00	0.00
16,100.00	90.00	270.25	7,754.98	-2,307.13	-9,217.87	9,491.95	0.00	0.00	0.00
16,200.00	90.00	270.25	7,754.98	-2,306.69	-9,317.86	9,589.89	0.00	0.00	0.00
16,300.00	90.00	270.25	7,754.98	-2,306.25	-9,417.86	9,687.84	0.00	0.00	0.00
16,400.00	90.00	270.25	7,754.98	-2,305.80	-9,517.86	9,785.78	0.00	0.00	0.00
16,500.00	90.00	270.25	7,754.98	-2,305.36	-9,617.86	9,883.72	0.00	0.00	0.00
16,600.00	90.00	270.25	7,754.98	-2,304.92	-9,717.86	9,981.66	0.00	0.00	0.00
16,700.00	90.00	270.25	7,754.98	-2,304.47	-9,817.86	10,079.60	0.00	0.00	0.00
16,800.00	90.00	270.25	7,754.98	-2,304.03	-9,917.86	10,177.55	0.00	0.00	0.00
16,900.00	90.00	270.25	7,754.98	-2,303.59	-10,017.86	10,275.49	0.00	0.00	0.00
17,000.00	90.00	270.25	7,754.98	-2,303.14	-10,117.86	10,373.43	0.00	0.00	0.00
17,100.00	90.00	270.25	7,754.98	-2,302.70	-10,217.86	10,471.37	0.00	0.00	0.00
17,200.00	90.00	270.25	7,754.98	-2,302.26	-10,317.85	10,569.32	0.00	0.00	0.00
17,300.00	90.00	270.25	7,754.98	-2,301.82	-10,417.85	10,667.26	0.00	0.00	0.00
17,400.00	90.00	270.25	7,754.98	-2,301.37	-10,517.85	10,765.20	0.00	0.00	0.00
17,500.00	90.00	270.25	7,754.98	-2,300.93	-10,617.85	10,863.14	0.00	0.00	0.00
17,600.00	90.00	270.25	7,754.98	-2,300.49	-10,717.85	10,961.08	0.00	0.00	0.00

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-12
Company:	AXIS EXPLORATION	TVD Reference:	KB 25' @ 5610.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-12	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
17,700.00	90.00	270.25	7,754.98	-2,300.04	-10,817.85	11,059.03	0.00	0.00	0.00
17,800.00	90.00	270.25	7,754.98	-2,299.60	-10,917.85	11,156.97	0.00	0.00	0.00
17,900.00	90.00	270.25	7,754.98	-2,299.16	-11,017.85	11,254.91	0.00	0.00	0.00
18,000.00	90.00	270.25	7,754.98	-2,298.71	-11,117.85	11,352.85	0.00	0.00	0.00
18,100.00	90.00	270.25	7,754.98	-2,298.27	-11,217.85	11,450.79	0.00	0.00	0.00
18,200.00	90.00	270.25	7,754.98	-2,297.83	-11,317.85	11,548.74	0.00	0.00	0.00
18,288.15	90.00	270.25	7,754.98	-2,297.44	-11,405.99	11,635.07	0.00	0.00	0.00
TD at 18288.14									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
JAMASO 4-65 5-6-12 - F	0.00	0.00	7,755.00	-2,297.74	-11,405.99	1,144,367.45	3,220,968.88	39.726966°N	104.714393°W
- plan misses target center by 0.31usft at 18288.14usft MD (7754.98 TVD, -2297.44 N, -11405.99 E)									
- Point									
JAMASO 4-65 5-6-12 - L	0.00	0.00	7,755.00	-2,340.36	-1,721.13	1,144,415.07	3,230,653.72	39.726856°N	104.679961°W
- plan hits target center									
- Point									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
293.15	293.00	Denver				
886.86	877.00	Upper Arapahoe				
1,191.20	1,165.00	Lower Arapahoe				
1,796.09	1,718.00	Laramie - Fox Hills				
2,072.19	1,970.00	Pierre Shale (Base of Fox Hills)				
6,021.95	5,575.00	Shannon Sandstone Member				
8,259.53	7,655.00	Sharon Springs Shale				
8,401.88	7,720.00	Niobrara Formation				
8,451.35	7,735.00	Niobrara A Chalk				
8,495.98	7,745.00	Niobrara A Landing Point				

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
100.00	100.00	0.00	0.00	Start Build 2.00
1,305.86	1,270.56	-224.55	-110.04	Start 5161.41 hold at 1305.86 MD
6,467.26	5,981.44	-2,118.35	-1,038.09	Start Drop -2.00
7,673.12	7,152.00	-2,342.90	-1,148.13	Start 30.00 hold at 7673.12 MD
7,703.12	7,182.00	-2,342.90	-1,148.13	Start DLS 10.00 TFO 270.25
8,603.19	7,755.00	-2,340.36	-1,721.13	Start 9684.96 hold at 8603.19 MD
18,288.15	7,754.98	-2,297.44	-11,405.99	TD at 18288.14