

AXIS EXPLORATION

ARAPAHOE COUNTY

Sec 4-T4S-R65W

JAMASO 4-65 5-6-10

ORIGINAL WELLBORE

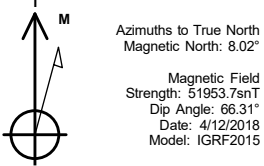
Plan: PROPOSAL 1

Standard Planning Report

12 April, 2018



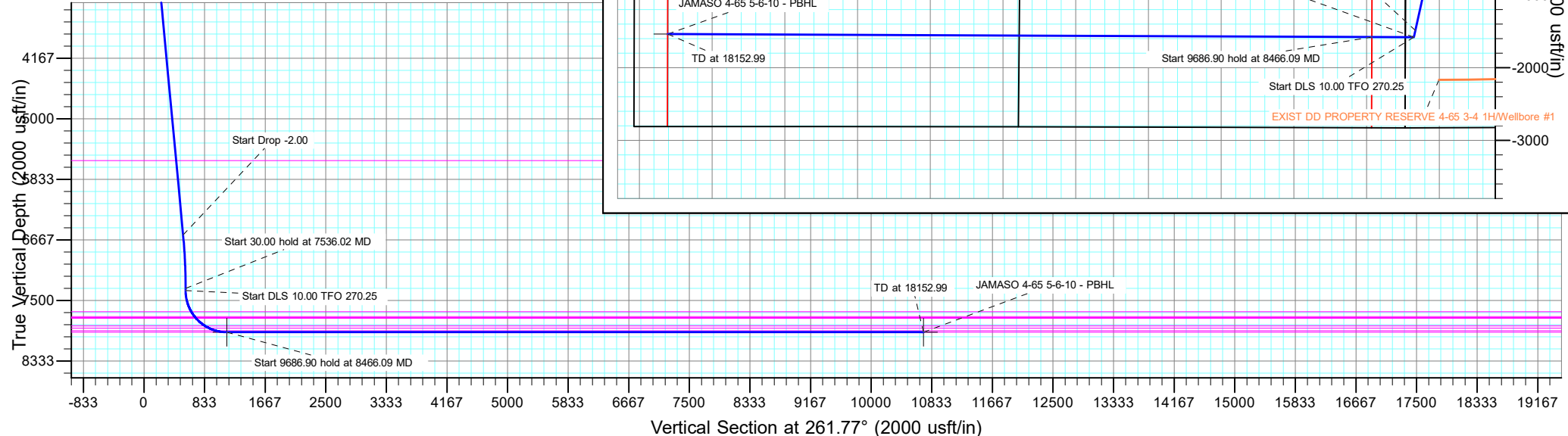
Project: ARAPAHOE COUNTY
Site: Sec 4-T4S-R65W
Well: JAMASO 4-65 5-6-10
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL 1



WELL DETAILS: JAMASO 4-65 5-6-10											ANNOTATIONS									

FORMATION TOP DETAILS		
TVDPATH	MDPATH	FORMATION
293.00	293.00	Denver
877.00	878.10	Upper Arapahoe
1165.00	1171.12	Lower Arapahoe
1718.00	1743.10	Laramie - Fox Hills
1970.00	2009.00	Shannon Sandstone Member
5575.00	5734.15	Sharon Springs Shale
7655.00	7872.41	Niobrara Formation
7720.00	7951.43	Niobrara A Chalk
7735.00	7970.87	Niobrara A Landing Point
7745.00	7984.15	Niobrara B Chalk
7849.00	8146.19	Niobrara B Landing Point
7879.00	8208.33	Niobrara C Chalk
7916.00	8314.24	Niobrara C Landing Point
7936.00	8466.09	Niobrara C 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: 2427' FNL, 463' FWL Sec 4-T4S-R65W		
LP: 1252' FSL, 460' FEL Sec 5-T4S-R65W		
BHL: 1277' FSL, 460' FWL Sec 6-T4S-R65W		



Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-10
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 5-6-10	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° 44' 24.061 N
From:	Lat/Long	Easting:	3,231,079.56 usft	Longitude:	104° 40' 41.840 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.53 °

Well	JAMASO 4-65 5-6-10					
Well Position	+N/-S	-2,428.58 usft	Northing:	1,146,789.12 usft	Latitude:	39° 44' 0.060 N
	+E/-W	458.15 usft	Easting:	3,231,560.20 usft	Longitude:	104° 40' 35.976 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	51,953.71547712

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	261.77

Plan Survey Tool Program	Date	4/12/2018		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	18,153.00	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	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,244.60	14.89	192.48	1,236.24	-93.95	-20.79	2.00	2.00	0.00	192.48	
6,791.42	14.89	192.48	6,596.76	-1,485.80	-328.76	0.00	0.00	0.00	0.00	
7,536.02	0.00	0.00	7,333.00	-1,579.75	-349.55	2.00	-2.00	0.00	180.00	
7,566.02	0.00	0.00	7,363.00	-1,579.75	-349.55	0.00	0.00	0.00	0.00	
8,466.09	90.00	270.25	7,936.00	-1,577.26	-922.55	10.00	10.00	-9.97	270.25	JAMASO 4-65 5-6-10
18,153.00	90.00	270.25	7,936.00	-1,534.95	-10,609.37	0.00	0.00	0.00	0.00	JAMASO 4-65 5-6-10

Planning Report

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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 5-6-10	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
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
293.00	0.00	0.00	293.00	0.00	0.00	0.00	0.00	0.00	0.00
Denver									
300.00	0.00	0.00	300.00	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
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
600.00	2.00	192.48	599.98	-1.70	-0.38	0.62	2.00	2.00	0.00
700.00	4.00	192.48	699.84	-6.81	-1.51	2.47	2.00	2.00	0.00
800.00	6.00	192.48	799.45	-15.32	-3.39	5.55	2.00	2.00	0.00
878.10	7.56	192.48	877.00	-24.33	-5.38	8.81	2.00	2.00	0.00
Upper Arapahoe									
900.00	8.00	192.48	898.70	-27.22	-6.02	9.86	2.00	2.00	0.00
1,000.00	10.00	192.48	997.47	-42.49	-9.40	15.39	2.00	2.00	0.00
1,100.00	12.00	192.48	1,095.62	-61.12	-13.52	22.14	2.00	2.00	0.00
1,171.12	13.42	192.48	1,165.00	-76.40	-16.91	27.67	2.00	2.00	0.00
Lower Arapahoe									
1,200.00	14.00	192.48	1,193.06	-83.09	-18.38	30.09	2.00	2.00	0.00
1,244.60	14.89	192.48	1,236.24	-93.95	-20.79	34.03	2.00	2.00	0.00
Start 5546.82 hold at 1244.60 MD									
1,300.00	14.89	192.48	1,289.78	-107.85	-23.86	39.06	0.00	0.00	0.00
1,400.00	14.89	192.48	1,386.43	-132.94	-29.42	48.15	0.00	0.00	0.00
1,500.00	14.89	192.48	1,483.07	-158.04	-34.97	57.24	0.00	0.00	0.00
1,600.00	14.89	192.48	1,579.71	-183.13	-40.52	66.33	0.00	0.00	0.00
1,700.00	14.89	192.48	1,676.35	-208.22	-46.07	75.41	0.00	0.00	0.00
1,743.10	14.89	192.48	1,718.00	-219.04	-48.47	79.33	0.00	0.00	0.00
Laramie - Fox Hills									
1,800.00	14.89	192.48	1,772.99	-233.32	-51.63	84.50	0.00	0.00	0.00
1,900.00	14.89	192.48	1,869.63	-258.41	-57.18	93.59	0.00	0.00	0.00
2,000.00	14.89	192.48	1,966.27	-283.50	-62.73	102.68	0.00	0.00	0.00
2,003.86	14.89	192.48	1,970.00	-284.47	-62.94	103.03	0.00	0.00	0.00
Pierre Shale (Base of Fox Hills)									
2,100.00	14.89	192.48	2,062.91	-308.59	-68.28	111.77	0.00	0.00	0.00
2,200.00	14.89	192.48	2,159.55	-333.69	-73.83	120.85	0.00	0.00	0.00
2,300.00	14.89	192.48	2,256.20	-358.78	-79.39	129.94	0.00	0.00	0.00
2,400.00	14.89	192.48	2,352.84	-383.87	-84.94	139.03	0.00	0.00	0.00
2,500.00	14.89	192.48	2,449.48	-408.96	-90.49	148.12	0.00	0.00	0.00
2,600.00	14.89	192.48	2,546.12	-434.06	-96.04	157.21	0.00	0.00	0.00
2,700.00	14.89	192.48	2,642.76	-459.15	-101.60	166.29	0.00	0.00	0.00
2,800.00	14.89	192.48	2,739.40	-484.24	-107.15	175.38	0.00	0.00	0.00
2,900.00	14.89	192.48	2,836.04	-509.34	-112.70	184.47	0.00	0.00	0.00
3,000.00	14.89	192.48	2,932.68	-534.43	-118.25	193.56	0.00	0.00	0.00
3,100.00	14.89	192.48	3,029.33	-559.52	-123.80	202.65	0.00	0.00	0.00
3,200.00	14.89	192.48	3,125.97	-584.61	-129.36	211.73	0.00	0.00	0.00
3,300.00	14.89	192.48	3,222.61	-609.71	-134.91	220.82	0.00	0.00	0.00
3,400.00	14.89	192.48	3,319.25	-634.80	-140.46	229.91	0.00	0.00	0.00
3,500.00	14.89	192.48	3,415.89	-659.89	-146.01	239.00	0.00	0.00	0.00
3,600.00	14.89	192.48	3,512.53	-684.99	-151.57	248.09	0.00	0.00	0.00
3,700.00	14.89	192.48	3,609.17	-710.08	-157.12	257.17	0.00	0.00	0.00
3,800.00	14.89	192.48	3,705.81	-735.17	-162.67	266.26	0.00	0.00	0.00
3,900.00	14.89	192.48	3,802.46	-760.26	-168.22	275.35	0.00	0.00	0.00

Planning Report

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Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-10	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)
4,000.00	14.89	192.48	3,899.10	-785.36	-173.78	284.44	0.00	0.00	0.00
4,100.00	14.89	192.48	3,995.74	-810.45	-179.33	293.53	0.00	0.00	0.00
4,200.00	14.89	192.48	4,092.38	-835.54	-184.88	302.61	0.00	0.00	0.00
4,300.00	14.89	192.48	4,189.02	-860.63	-190.43	311.70	0.00	0.00	0.00
4,400.00	14.89	192.48	4,285.66	-885.73	-195.98	320.79	0.00	0.00	0.00
4,500.00	14.89	192.48	4,382.30	-910.82	-201.54	329.88	0.00	0.00	0.00
4,600.00	14.89	192.48	4,478.94	-935.91	-207.09	338.97	0.00	0.00	0.00
4,700.00	14.89	192.48	4,575.59	-961.01	-212.64	348.05	0.00	0.00	0.00
4,800.00	14.89	192.48	4,672.23	-986.10	-218.19	357.14	0.00	0.00	0.00
4,900.00	14.89	192.48	4,768.87	-1,011.19	-223.75	366.23	0.00	0.00	0.00
5,000.00	14.89	192.48	4,865.51	-1,036.28	-229.30	375.32	0.00	0.00	0.00
5,100.00	14.89	192.48	4,962.15	-1,061.38	-234.85	384.41	0.00	0.00	0.00
5,200.00	14.89	192.48	5,058.79	-1,086.47	-240.40	393.49	0.00	0.00	0.00
5,300.00	14.89	192.48	5,155.43	-1,111.56	-245.95	402.58	0.00	0.00	0.00
5,400.00	14.89	192.48	5,252.07	-1,136.65	-251.51	411.67	0.00	0.00	0.00
5,500.00	14.89	192.48	5,348.72	-1,161.75	-257.06	420.76	0.00	0.00	0.00
5,600.00	14.89	192.48	5,445.36	-1,186.84	-262.61	429.85	0.00	0.00	0.00
5,700.00	14.89	192.48	5,542.00	-1,211.93	-268.16	438.93	0.00	0.00	0.00
5,734.15	14.89	192.48	5,575.00	-1,220.50	-270.06	442.04	0.00	0.00	0.00
Shannon Sandstone Member									
5,800.00	14.89	192.48	5,638.64	-1,237.03	-273.72	448.02	0.00	0.00	0.00
5,900.00	14.89	192.48	5,735.28	-1,262.12	-279.27	457.11	0.00	0.00	0.00
6,000.00	14.89	192.48	5,831.92	-1,287.21	-284.82	466.20	0.00	0.00	0.00
6,100.00	14.89	192.48	5,928.56	-1,312.30	-290.37	475.29	0.00	0.00	0.00
6,200.00	14.89	192.48	6,025.20	-1,337.40	-295.92	484.37	0.00	0.00	0.00
6,300.00	14.89	192.48	6,121.85	-1,362.49	-301.48	493.46	0.00	0.00	0.00
6,400.00	14.89	192.48	6,218.49	-1,387.58	-307.03	502.55	0.00	0.00	0.00
6,500.00	14.89	192.48	6,315.13	-1,412.68	-312.58	511.64	0.00	0.00	0.00
6,600.00	14.89	192.48	6,411.77	-1,437.77	-318.13	520.73	0.00	0.00	0.00
6,700.00	14.89	192.48	6,508.41	-1,462.86	-323.69	529.81	0.00	0.00	0.00
6,791.42	14.89	192.48	6,596.76	-1,485.80	-328.76	538.12	0.00	0.00	0.00
Start Drop -2.00									
6,800.00	14.72	192.48	6,605.05	-1,487.94	-329.24	538.90	2.00	-2.00	0.00
6,900.00	12.72	192.48	6,702.20	-1,511.10	-334.36	547.28	2.00	-2.00	0.00
7,000.00	10.72	192.48	6,800.11	-1,530.93	-338.75	554.47	2.00	-2.00	0.00
7,100.00	8.72	192.48	6,898.67	-1,547.42	-342.40	560.44	2.00	-2.00	0.00
7,200.00	6.72	192.48	6,997.75	-1,560.53	-345.30	565.19	2.00	-2.00	0.00
7,300.00	4.72	192.48	7,097.25	-1,570.26	-347.45	568.71	2.00	-2.00	0.00
7,400.00	2.72	192.48	7,197.04	-1,576.60	-348.85	571.01	2.00	-2.00	0.00
7,500.00	0.72	192.48	7,296.99	-1,579.53	-349.50	572.07	2.00	-2.00	0.00
7,536.02	0.00	0.00	7,333.00	-1,579.75	-349.55	572.15	2.00	-2.00	0.00
Start 30.00 hold at 7536.02 MD									
7,566.02	0.00	0.00	7,363.00	-1,579.75	-349.55	572.15	0.00	0.00	0.00
Start DLS 10.00 TFO 270.25									
7,600.00	3.40	270.25	7,396.96	-1,579.75	-350.56	573.15	10.00	10.00	0.00
7,650.00	8.40	270.25	7,446.68	-1,579.72	-355.69	578.23	10.00	10.00	0.00
7,700.00	13.40	270.25	7,495.77	-1,579.68	-365.14	587.57	10.00	10.00	0.00
7,750.00	18.40	270.25	7,543.84	-1,579.62	-378.83	601.11	10.00	10.00	0.00
7,800.00	23.40	270.25	7,590.54	-1,579.54	-396.66	618.75	10.00	10.00	0.00
7,850.00	28.40	270.25	7,635.50	-1,579.45	-418.49	640.34	10.00	10.00	0.00
7,872.41	30.64	270.25	7,655.00	-1,579.40	-429.53	651.26	10.00	10.00	0.00
Sharon Springs Shale									
7,900.00	33.40	270.25	7,678.39	-1,579.34	-444.16	665.72	10.00	10.00	0.00
7,950.00	38.40	270.25	7,718.88	-1,579.21	-473.46	694.71	10.00	10.00	0.00

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-10
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 5-6-10	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)
7,951.43	38.54	270.25	7,720.00	-1,579.21	-474.35	695.59	10.00	10.00	0.00
Niobrara Formation									
7,970.87	40.48	270.25	7,735.00	-1,579.15	-486.72	707.82	10.00	10.00	0.00
Niobrara A Chalk									
7,984.15	41.81	270.25	7,745.00	-1,579.12	-495.46	716.46	10.00	10.00	0.00
Niobrara A Landing Point									
8,000.00	43.40	270.25	7,756.67	-1,579.07	-506.19	727.08	10.00	10.00	0.00
8,050.00	48.39	270.25	7,791.45	-1,578.91	-542.08	762.57	10.00	10.00	0.00
8,100.00	53.39	270.25	7,822.98	-1,578.74	-580.87	800.94	10.00	10.00	0.00
8,146.19	58.01	270.25	7,849.00	-1,578.58	-619.01	838.67	10.00	10.00	0.00
Niobrara B Chalk									
8,150.00	58.39	270.25	7,851.01	-1,578.56	-622.25	841.87	10.00	10.00	0.00
8,200.00	63.39	270.25	7,875.32	-1,578.37	-665.92	885.07	10.00	10.00	0.00
8,208.33	64.23	270.25	7,879.00	-1,578.34	-673.40	892.46	10.00	10.00	0.00
Niobrara B Landing Point									
8,250.00	68.39	270.25	7,895.74	-1,578.17	-711.55	930.19	10.00	10.00	0.00
8,300.00	73.39	270.25	7,912.10	-1,577.97	-758.78	976.91	10.00	10.00	0.00
8,314.25	74.82	270.25	7,916.00	-1,577.91	-772.48	990.46	10.00	10.00	0.00
Niobrara C Chalk									
8,350.00	78.39	270.25	7,924.28	-1,577.76	-807.26	1,024.85	10.00	10.00	0.00
8,400.00	83.39	270.25	7,932.19	-1,577.54	-856.61	1,073.67	10.00	10.00	0.00
8,450.00	88.39	270.25	7,935.77	-1,577.33	-906.46	1,122.98	10.00	10.00	0.00
8,466.09	90.00	270.25	7,936.00	-1,577.26	-922.55	1,138.89	10.00	10.00	0.00
Start 9686.90 hold at 8466.09 MD - Niobrara C Landing Point									
8,500.00	90.00	270.25	7,936.00	-1,577.11	-956.46	1,172.43	0.00	0.00	0.00
8,600.00	90.00	270.25	7,936.00	-1,576.67	-1,056.46	1,271.34	0.00	0.00	0.00
8,700.00	90.00	270.25	7,936.00	-1,576.24	-1,156.46	1,370.24	0.00	0.00	0.00
8,800.00	90.00	270.25	7,935.99	-1,575.80	-1,256.46	1,469.15	0.00	0.00	0.00
8,900.00	90.00	270.25	7,935.99	-1,575.37	-1,356.46	1,568.05	0.00	0.00	0.00
9,000.00	90.00	270.25	7,935.99	-1,574.93	-1,456.46	1,666.96	0.00	0.00	0.00
9,100.00	90.00	270.25	7,935.99	-1,574.50	-1,556.46	1,765.87	0.00	0.00	0.00
9,200.00	90.00	270.25	7,935.99	-1,574.06	-1,656.46	1,864.77	0.00	0.00	0.00
9,300.00	90.00	270.25	7,935.99	-1,573.63	-1,756.45	1,963.68	0.00	0.00	0.00
9,400.00	90.00	270.25	7,935.98	-1,573.19	-1,856.45	2,062.59	0.00	0.00	0.00
9,500.00	90.00	270.25	7,935.98	-1,572.76	-1,956.45	2,161.49	0.00	0.00	0.00
9,600.00	90.00	270.25	7,935.98	-1,572.32	-2,056.45	2,260.40	0.00	0.00	0.00
9,700.00	90.00	270.25	7,935.98	-1,571.89	-2,156.45	2,359.30	0.00	0.00	0.00
9,800.00	90.00	270.25	7,935.98	-1,571.45	-2,256.45	2,458.21	0.00	0.00	0.00
9,900.00	90.00	270.25	7,935.97	-1,571.02	-2,356.45	2,557.12	0.00	0.00	0.00
10,000.00	90.00	270.25	7,935.97	-1,570.58	-2,456.45	2,656.02	0.00	0.00	0.00
10,100.00	90.00	270.25	7,935.97	-1,570.15	-2,556.45	2,754.93	0.00	0.00	0.00
10,200.00	90.00	270.25	7,935.97	-1,569.71	-2,656.45	2,853.84	0.00	0.00	0.00
10,300.00	90.00	270.25	7,935.97	-1,569.28	-2,756.44	2,952.74	0.00	0.00	0.00
10,400.00	90.00	270.25	7,935.97	-1,568.84	-2,856.44	3,051.65	0.00	0.00	0.00
10,500.00	90.00	270.25	7,935.96	-1,568.40	-2,956.44	3,150.55	0.00	0.00	0.00
10,600.00	90.00	270.25	7,935.96	-1,567.97	-3,056.44	3,249.46	0.00	0.00	0.00
10,700.00	90.00	270.25	7,935.96	-1,567.53	-3,156.44	3,348.37	0.00	0.00	0.00
10,800.00	90.00	270.25	7,935.96	-1,567.10	-3,256.44	3,447.27	0.00	0.00	0.00
10,900.00	90.00	270.25	7,935.96	-1,566.66	-3,356.44	3,546.18	0.00	0.00	0.00
11,000.00	90.00	270.25	7,935.95	-1,566.23	-3,456.44	3,645.09	0.00	0.00	0.00
11,100.00	90.00	270.25	7,935.95	-1,565.79	-3,556.44	3,743.99	0.00	0.00	0.00
11,200.00	90.00	270.25	7,935.95	-1,565.36	-3,656.44	3,842.90	0.00	0.00	0.00
11,300.00	90.00	270.25	7,935.95	-1,564.92	-3,756.44	3,941.81	0.00	0.00	0.00

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-10
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 5-6-10	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)	
11,400.00	90.00	270.25	7,935.95	-1,564.49	-3,856.43	4,040.71	0.00	0.00	0.00	
11,500.00	90.00	270.25	7,935.95	-1,564.05	-3,956.43	4,139.62	0.00	0.00	0.00	
11,600.00	90.00	270.25	7,935.94	-1,563.62	-4,056.43	4,238.52	0.00	0.00	0.00	
11,700.00	90.00	270.25	7,935.94	-1,563.18	-4,156.43	4,337.43	0.00	0.00	0.00	
11,800.00	90.00	270.25	7,935.94	-1,562.75	-4,256.43	4,436.34	0.00	0.00	0.00	
11,900.00	90.00	270.25	7,935.94	-1,562.31	-4,356.43	4,535.24	0.00	0.00	0.00	
12,000.00	90.00	270.25	7,935.94	-1,561.88	-4,456.43	4,634.15	0.00	0.00	0.00	
12,100.00	90.00	270.25	7,935.93	-1,561.44	-4,556.43	4,733.06	0.00	0.00	0.00	
12,200.00	90.00	270.25	7,935.93	-1,561.01	-4,656.43	4,831.96	0.00	0.00	0.00	
12,300.00	90.00	270.25	7,935.93	-1,560.57	-4,756.43	4,930.87	0.00	0.00	0.00	
12,400.00	90.00	270.25	7,935.93	-1,560.14	-4,856.43	5,029.77	0.00	0.00	0.00	
12,500.00	90.00	270.25	7,935.93	-1,559.70	-4,956.42	5,128.68	0.00	0.00	0.00	
12,600.00	90.00	270.25	7,935.93	-1,559.27	-5,056.42	5,227.59	0.00	0.00	0.00	
12,700.00	90.00	270.25	7,935.92	-1,558.83	-5,156.42	5,326.49	0.00	0.00	0.00	
12,800.00	90.00	270.25	7,935.92	-1,558.40	-5,256.42	5,425.40	0.00	0.00	0.00	
12,900.00	90.00	270.25	7,935.92	-1,557.96	-5,356.42	5,524.31	0.00	0.00	0.00	
13,000.00	90.00	270.25	7,935.92	-1,557.52	-5,456.42	5,623.21	0.00	0.00	0.00	
13,100.00	90.00	270.25	7,935.92	-1,557.09	-5,556.42	5,722.12	0.00	0.00	0.00	
13,200.00	90.00	270.25	7,935.91	-1,556.65	-5,656.42	5,821.03	0.00	0.00	0.00	
13,300.00	90.00	270.25	7,935.91	-1,556.22	-5,756.42	5,919.93	0.00	0.00	0.00	
13,400.00	90.00	270.25	7,935.91	-1,555.78	-5,856.42	6,018.84	0.00	0.00	0.00	
13,500.00	90.00	270.25	7,935.91	-1,555.35	-5,956.41	6,117.74	0.00	0.00	0.00	
13,600.00	90.00	270.25	7,935.91	-1,554.91	-6,056.41	6,216.65	0.00	0.00	0.00	
13,700.00	90.00	270.25	7,935.91	-1,554.48	-6,156.41	6,315.56	0.00	0.00	0.00	
13,800.00	90.00	270.25	7,935.90	-1,554.04	-6,256.41	6,414.46	0.00	0.00	0.00	
13,900.00	90.00	270.25	7,935.90	-1,553.61	-6,356.41	6,513.37	0.00	0.00	0.00	
14,000.00	90.00	270.25	7,935.90	-1,553.17	-6,456.41	6,612.28	0.00	0.00	0.00	
14,100.00	90.00	270.25	7,935.90	-1,552.74	-6,556.41	6,711.18	0.00	0.00	0.00	
14,200.00	90.00	270.25	7,935.90	-1,552.30	-6,656.41	6,810.09	0.00	0.00	0.00	
14,300.00	90.00	270.25	7,935.89	-1,551.87	-6,756.41	6,908.99	0.00	0.00	0.00	
14,400.00	90.00	270.25	7,935.89	-1,551.43	-6,856.41	7,007.90	0.00	0.00	0.00	
14,500.00	90.00	270.25	7,935.89	-1,551.00	-6,956.41	7,106.81	0.00	0.00	0.00	
14,600.00	90.00	270.25	7,935.89	-1,550.56	-7,056.40	7,205.71	0.00	0.00	0.00	
14,700.00	90.00	270.25	7,935.89	-1,550.13	-7,156.40	7,304.62	0.00	0.00	0.00	
14,800.00	90.00	270.25	7,935.89	-1,549.69	-7,256.40	7,403.53	0.00	0.00	0.00	
14,900.00	90.00	270.25	7,935.88	-1,549.26	-7,356.40	7,502.43	0.00	0.00	0.00	
15,000.00	90.00	270.25	7,935.88	-1,548.82	-7,456.40	7,601.34	0.00	0.00	0.00	
15,100.00	90.00	270.25	7,935.88	-1,548.39	-7,556.40	7,700.24	0.00	0.00	0.00	
15,200.00	90.00	270.25	7,935.88	-1,547.95	-7,656.40	7,799.15	0.00	0.00	0.00	
15,300.00	90.00	270.25	7,935.88	-1,547.52	-7,756.40	7,898.06	0.00	0.00	0.00	
15,400.00	90.00	270.25	7,935.87	-1,547.08	-7,856.40	7,996.96	0.00	0.00	0.00	
15,500.00	90.00	270.25	7,935.87	-1,546.64	-7,956.40	8,095.87	0.00	0.00	0.00	
15,600.00	90.00	270.25	7,935.87	-1,546.21	-8,056.39	8,194.78	0.00	0.00	0.00	
15,700.00	90.00	270.25	7,935.87	-1,545.77	-8,156.39	8,293.68	0.00	0.00	0.00	
15,800.00	90.00	270.25	7,935.87	-1,545.34	-8,256.39	8,392.59	0.00	0.00	0.00	
15,900.00	90.00	270.25	7,935.87	-1,544.90	-8,356.39	8,491.50	0.00	0.00	0.00	
16,000.00	90.00	270.25	7,935.86	-1,544.47	-8,456.39	8,590.40	0.00	0.00	0.00	
16,100.00	90.00	270.25	7,935.86	-1,544.03	-8,556.39	8,689.31	0.00	0.00	0.00	
16,200.00	90.00	270.25	7,935.86	-1,543.60	-8,656.39	8,788.21	0.00	0.00	0.00	
16,300.00	90.00	270.25	7,935.86	-1,543.16	-8,756.39	8,887.12	0.00	0.00	0.00	
16,400.00	90.00	270.25	7,935.86	-1,542.73	-8,856.39	8,986.03	0.00	0.00	0.00	
16,500.00	90.00	270.25	7,935.85	-1,542.29	-8,956.39	9,084.93	0.00	0.00	0.00	
16,600.00	90.00	270.25	7,935.85	-1,541.86	-9,056.39	9,183.84	0.00	0.00	0.00	
16,700.00	90.00	270.25	7,935.85	-1,541.42	-9,156.38	9,282.75	0.00	0.00	0.00	

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-10
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 5-6-10	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)	
16,800.00	90.00	270.25	7,935.85	-1,540.99	-9,256.38	9,381.65	0.00	0.00	0.00	
16,900.00	90.00	270.25	7,935.85	-1,540.55	-9,356.38	9,480.56	0.00	0.00	0.00	
17,000.00	90.00	270.25	7,935.85	-1,540.12	-9,456.38	9,579.46	0.00	0.00	0.00	
17,100.00	90.00	270.25	7,935.84	-1,539.68	-9,556.38	9,678.37	0.00	0.00	0.00	
17,200.00	90.00	270.25	7,935.84	-1,539.25	-9,656.38	9,777.28	0.00	0.00	0.00	
17,300.00	90.00	270.25	7,935.84	-1,538.81	-9,756.38	9,876.18	0.00	0.00	0.00	
17,400.00	90.00	270.25	7,935.84	-1,538.38	-9,856.38	9,975.09	0.00	0.00	0.00	
17,500.00	90.00	270.25	7,935.84	-1,537.94	-9,956.38	10,074.00	0.00	0.00	0.00	
17,600.00	90.00	270.25	7,935.83	-1,537.51	-10,056.38	10,172.90	0.00	0.00	0.00	
17,700.00	90.00	270.25	7,935.83	-1,537.07	-10,156.38	10,271.81	0.00	0.00	0.00	
17,800.00	90.00	270.25	7,935.83	-1,536.64	-10,256.37	10,370.72	0.00	0.00	0.00	
17,900.00	90.00	270.25	7,935.83	-1,536.20	-10,356.37	10,469.62	0.00	0.00	0.00	
18,000.00	90.00	270.25	7,935.83	-1,535.76	-10,456.37	10,568.53	0.00	0.00	0.00	
18,100.00	90.00	270.25	7,935.83	-1,535.33	-10,556.37	10,667.43	0.00	0.00	0.00	
18,153.00	90.00	270.25	7,936.00	-1,534.95	-10,609.37	10,719.83	0.00	0.00	0.00	
TD at 18152.99										

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 5-6-10 - F	0.00	0.00	7,936.00	-1,534.95	-10,609.37	1,145,155.73	3,220,965.55	39° 43' 44.868 N	104° 42' 51.768 W
- plan hits target center									
- Point									
JAMASO 4-65 5-6-10 - L	0.00	0.00	7,936.00	-1,577.26	-922.55	1,145,203.36	3,230,652.33	39° 43' 44.472 N	104° 40' 47.784 W
- plan hits target center									
- Point									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
293.00	293.00	Denver				
878.10	877.00	Upper Arapahoe				
1,171.12	1,165.00	Lower Arapahoe				
1,743.10	1,718.00	Laramie - Fox Hills				
2,003.86	1,970.00	Pierre Shale (Base of Fox Hills)				
5,734.15	5,575.00	Shannon Sandstone Member				
7,872.41	7,655.00	Sharon Springs Shale				
7,951.43	7,720.00	Niobrara Formation				
7,970.87	7,735.00	Niobrara A Chalk				
7,984.15	7,745.00	Niobrara A Landing Point				
8,146.19	7,849.00	Niobrara B Chalk				
8,208.33	7,879.00	Niobrara B Landing Point				
8,314.25	7,916.00	Niobrara C Chalk				
8,466.09	7,936.00	Niobrara C Landing Point				

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-10
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 5-6-10	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.00	500.00	0.00	0.00	Start Build 2.00
1,244.60	1,236.24	-93.95	-20.79	Start 5546.82 hold at 1244.60 MD
6,791.42	6,596.76	-1,485.80	-328.76	Start Drop -2.00
7,536.02	7,333.00	-1,579.75	-349.55	Start 30.00 hold at 7536.02 MD
7,566.02	7,363.00	-1,579.75	-349.55	Start DLS 10.00 TFO 270.25
8,466.09	7,936.00	-1,577.26	-922.55	Start 9686.90 hold at 8466.09 MD
18,153.00	7,936.00	-1,534.95	-10,609.37	TD at 18152.99