



Anschutz Oil Company, LLC

Well Name: SAUTER 24-19-2H

Project Name:
Sec. 23-T8N-R66W, Weld County CO

Pad Name:
Sauter 23 B

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL 2205' FNL, 290' FEL Sec 23	0.00	0.00	0.00	1480050.86	3212005.35	40.6486200	-104.7360000
BHL 960' FNL, 600' FEL Sec 19	7568.00	1058.76	10458.11	1481199.68	3222453.97	40.6515200	-104.6983100
EP 960' FNL, 600' FWL Sec 24	7568.00	1238.71	899.02	1481297.27	3212893.66	40.6520200	-104.7327600

Geodetic Datum:

North American Datum 1983
US State Plane 1983, Colorado Northern Zone

Elevation:

Ground Elevation: 5053.00
WELL @ 5068.00usft (Original Well Elev)

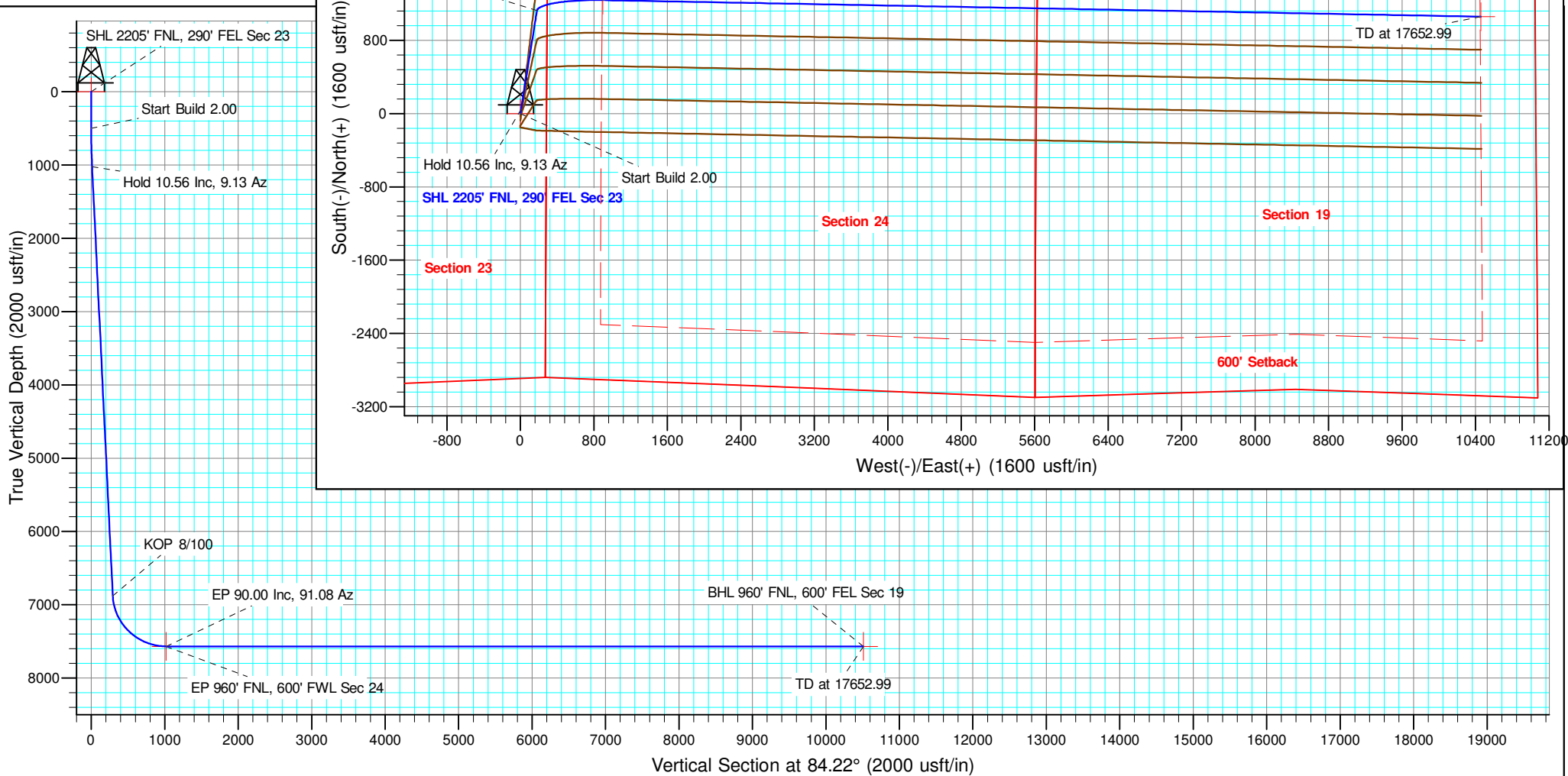
ANNOTATIONS

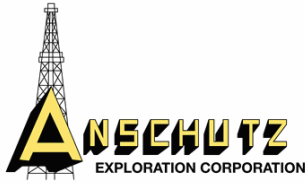
MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	Start Build 2.00
1027.84	10.56	9.13	1024.86	47.88	7.69	12.47	48.49	Hold 10.56 Inc, 9.13 Az
6985.58	10.56	9.13	6881.76	1125.58	180.80	293.25	1140.00	KOP 8/100
8092.21	90.00	91.08	7568.00	1238.71	899.02	1019.21	1883.94	EP 90.00 Inc, 91.08 Az
17652.99	90.00	91.08	7568.00	1058.76	10458.11	10511.57	11444.72	TD at 17652.99



Azimuths to True North
Magnetic North: 8.10°

Magnetic Field
Strength: 52396.4snT
Dip Angle: 67.03°
Date: 7/23/2018
Model: IGRF2015





Anschutz Oil Company, LLC

Sec. 23-T8N-R66W, Weld County CO

Sauter 23 B

SAUTER 24-19-2H

Wellbore #1

Plan: Design #1 01Nov18 amh

Standard Planning Report - Geographic

02 November, 2018



Microsoft
Planning Report - Geographic

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well SAUTER 24-19-2H
Company:	Anschutz Oil Company, LLC	TVD Reference:	WELL @ 5068.00usft (Original Well Elev)
Project:	Sec. 23-T8N-R66W, Weld County CO	MD Reference:	WELL @ 5068.00usft (Original Well Elev)
Site:	Sauter 23 B	North Reference:	True
Well:	SAUTER 24-19-2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 01Nov18 amh		

Project	Sec. 23-T8N-R66W, Weld County CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	Sauter 23 B			
Site Position:		Northing:	1,480,065.44 ft	Latitude: 40.6486600
From:	Lat/Long	Easting:	3,212,005.23 ft	Longitude: -104.7360000
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence: 0.49 °

Well	SAUTER 24-19-2H			
Well Position	+N/-S	0.00 usft	Northing:	1,480,050.86 ft
	+E/-W	0.00 usft	Easting:	3,212,005.35 ft
Position Uncertainty	0.00 usft		Wellhead Elevation:	
			Ground Level:	5,053.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/23/2018	8.10	67.03	52,396.43387204

Design	Design #1 01Nov18 amh			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	84.22

Plan Survey Tool Program	Date	11/2/2018		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	17,652.99 Design #1 01Nov18 amh (Wellbo	MWD	
			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	
1,027.84	10.56	9.13	1,024.86	47.88	7.69	2.00	2.00	0.00	9.13	
6,985.58	10.56	9.13	6,881.76	1,125.58	180.80	0.00	0.00	0.00	0.00	
8,092.21	90.00	91.08	7,568.00	1,238.71	899.02	8.00	7.18	7.41	82.09	EP 960' FNL, 600' FV
17,652.99	90.00	91.08	7,568.00	1,058.76	10,458.11	0.00	0.00	0.00	0.00	BHL 960' FNL, 600' FV



Microsoft
Planning Report - Geographic

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well SAUTER 24-19-2H
Company:	Anschutz Oil Company, LLC	TVD Reference:	WELL @ 5068.00usft (Original Well Elev)
Project:	Sec. 23-T8N-R66W, Weld County CO	MD Reference:	WELL @ 5068.00usft (Original Well Elev)
Site:	Sauter 23 B	North Reference:	True
Well:	SAUTER 24-19-2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 01Nov18 amh		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	1,480,050.86	3,212,005.35	40.6486200	-104.7360000	
100.00	0.00	0.00	100.00	0.00	0.00	1,480,050.86	3,212,005.35	40.6486200	-104.7360000	
200.00	0.00	0.00	200.00	0.00	0.00	1,480,050.86	3,212,005.35	40.6486200	-104.7360000	
300.00	0.00	0.00	300.00	0.00	0.00	1,480,050.86	3,212,005.35	40.6486200	-104.7360000	
400.00	0.00	0.00	400.00	0.00	0.00	1,480,050.86	3,212,005.35	40.6486200	-104.7360000	
500.00	0.00	0.00	500.00	0.00	0.00	1,480,050.86	3,212,005.35	40.6486200	-104.7360000	
Start Build 2.00										
600.00	2.00	9.13	599.98	1.72	0.28	1,480,052.59	3,212,005.61	40.6486247	-104.7359990	
700.00	4.00	9.13	699.84	6.89	1.11	1,480,057.76	3,212,006.40	40.6486389	-104.7359960	
800.00	6.00	9.13	799.45	15.50	2.49	1,480,066.38	3,212,007.71	40.6486625	-104.7359910	
900.00	8.00	9.13	898.70	27.53	4.42	1,480,078.43	3,212,009.54	40.6486956	-104.7359840	
1,000.00	10.00	9.13	997.47	42.97	6.90	1,480,093.89	3,212,011.88	40.6487380	-104.7359751	
1,027.84	10.56	9.13	1,024.86	47.88	7.69	1,480,098.80	3,212,012.63	40.6487514	-104.7359723	
Hold 10.56 Inc, 9.13 Az										
1,100.00	10.56	9.13	1,095.80	60.93	9.79	1,480,111.87	3,212,014.61	40.6487872	-104.7359647	
1,200.00	10.56	9.13	1,194.10	79.02	12.69	1,480,129.99	3,212,017.36	40.6488369	-104.7359542	
1,300.00	10.56	9.13	1,292.41	97.11	15.60	1,480,148.10	3,212,020.11	40.6488865	-104.7359438	
1,400.00	10.56	9.13	1,390.72	115.20	18.50	1,480,166.21	3,212,022.86	40.6489362	-104.7359333	
1,500.00	10.56	9.13	1,489.03	133.29	21.41	1,480,184.33	3,212,025.61	40.6489859	-104.7359228	
1,600.00	10.56	9.13	1,587.33	151.37	24.32	1,480,202.44	3,212,028.36	40.6490355	-104.7359123	
1,700.00	10.56	9.13	1,685.64	169.46	27.22	1,480,220.55	3,212,031.11	40.6490852	-104.7359019	
1,800.00	10.56	9.13	1,783.95	187.55	30.13	1,480,238.67	3,212,033.86	40.6491348	-104.7358914	
1,900.00	10.56	9.13	1,882.26	205.64	33.03	1,480,256.78	3,212,036.61	40.6491845	-104.7358809	
2,000.00	10.56	9.13	1,980.56	223.73	35.94	1,480,274.89	3,212,039.36	40.6492341	-104.7358705	
2,100.00	10.56	9.13	2,078.87	241.82	38.84	1,480,293.01	3,212,042.11	40.6492838	-104.7358600	
2,200.00	10.56	9.13	2,177.18	259.91	41.75	1,480,311.12	3,212,044.86	40.6493334	-104.7358495	
2,300.00	10.56	9.13	2,275.49	278.00	44.65	1,480,329.24	3,212,047.61	40.6493831	-104.7358390	
2,400.00	10.56	9.13	2,373.79	296.09	47.56	1,480,347.35	3,212,050.36	40.6494327	-104.7358286	
2,500.00	10.56	9.13	2,472.10	314.18	50.47	1,480,365.46	3,212,053.11	40.6494824	-104.7358181	
2,600.00	10.56	9.13	2,570.41	332.27	53.37	1,480,383.58	3,212,055.86	40.6495320	-104.7358076	
2,700.00	10.56	9.13	2,668.72	350.35	56.28	1,480,401.69	3,212,058.61	40.6495817	-104.7357972	
2,800.00	10.56	9.13	2,767.02	368.44	59.18	1,480,419.80	3,212,061.36	40.6496313	-104.7357867	
2,900.00	10.56	9.13	2,865.33	386.53	62.09	1,480,437.92	3,212,064.11	40.6496810	-104.7357762	
3,000.00	10.56	9.13	2,963.64	404.62	64.99	1,480,456.03	3,212,066.86	40.6497306	-104.7357657	
3,100.00	10.56	9.13	3,061.94	422.71	67.90	1,480,474.14	3,212,069.61	40.6497803	-104.7357553	
3,200.00	10.56	9.13	3,160.25	440.80	70.81	1,480,492.26	3,212,072.36	40.6498299	-104.7357448	
3,300.00	10.56	9.13	3,258.56	458.89	73.71	1,480,510.37	3,212,075.11	40.6498796	-104.7357343	
3,400.00	10.56	9.13	3,356.87	476.98	76.62	1,480,528.48	3,212,077.86	40.6499292	-104.7357239	
3,500.00	10.56	9.13	3,455.17	495.07	79.52	1,480,546.60	3,212,080.61	40.6499789	-104.7357134	
3,600.00	10.56	9.13	3,553.48	513.16	82.43	1,480,564.71	3,212,083.35	40.6500285	-104.7357029	
3,700.00	10.56	9.13	3,651.79	531.25	85.33	1,480,582.82	3,212,086.10	40.6500782	-104.7356924	
3,800.00	10.56	9.13	3,750.10	549.33	88.24	1,480,600.94	3,212,088.85	40.6501278	-104.7356820	
3,900.00	10.56	9.13	3,848.40	567.42	91.14	1,480,619.05	3,212,091.60	40.6501775	-104.7356715	
4,000.00	10.56	9.13	3,946.71	585.51	94.05	1,480,637.16	3,212,094.35	40.6502271	-104.7356610	
4,100.00	10.56	9.13	4,045.02	603.60	96.96	1,480,655.28	3,212,097.10	40.6502768	-104.7356506	
4,200.00	10.56	9.13	4,143.33	621.69	99.86	1,480,673.39	3,212,099.85	40.6503264	-104.7356401	
4,300.00	10.56	9.13	4,241.63	639.78	102.77	1,480,691.50	3,212,102.60	40.6503761	-104.7356296	
4,400.00	10.56	9.13	4,339.94	657.87	105.67	1,480,709.62	3,212,105.35	40.6504257	-104.7356191	
4,500.00	10.56	9.13	4,438.25	675.96	108.58	1,480,727.73	3,212,108.10	40.6504754	-104.7356087	
4,600.00	10.56	9.13	4,536.56	694.05	111.48	1,480,745.84	3,212,110.85	40.6505250	-104.7355982	
4,700.00	10.56	9.13	4,634.86	712.14	114.39	1,480,763.96	3,212,113.60	40.6505747	-104.7355877	
4,800.00	10.56	9.13	4,733.17	730.23	117.30	1,480,782.07	3,212,116.35	40.6506244	-104.7355773	
4,900.00	10.56	9.13	4,831.48	748.31	120.20	1,480,800.19	3,212,119.10	40.6506740	-104.7355668	
5,000.00	10.56	9.13	4,929.79	766.40	123.11	1,480,818.30	3,212,121.85	40.6507237	-104.7355563	



Microsoft
Planning Report - Geographic

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well SAUTER 24-19-2H
Company:	Anschutz Oil Company, LLC	TVD Reference:	WELL @ 5068.00usft (Original Well Elev)
Project:	Sec. 23-T8N-R66W, Weld County CO	MD Reference:	WELL @ 5068.00usft (Original Well Elev)
Site:	Sauter 23 B	North Reference:	True
Well:	SAUTER 24-19-2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 01Nov18 amh		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude	
5,100.00	10.56	9.13	5,028.09	784.49	126.01	1,480,836.41	3,212,124.60	40.6507733	-104.7355458	
5,200.00	10.56	9.13	5,126.40	802.58	128.92	1,480,854.53	3,212,127.35	40.6508230	-104.7355354	
5,300.00	10.56	9.13	5,224.71	820.67	131.82	1,480,872.64	3,212,130.10	40.6508726	-104.7355249	
5,400.00	10.56	9.13	5,323.01	838.76	134.73	1,480,890.75	3,212,132.85	40.6509223	-104.7355144	
5,500.00	10.56	9.13	5,421.32	856.85	137.64	1,480,908.87	3,212,135.60	40.6509719	-104.7355040	
5,600.00	10.56	9.13	5,519.63	874.94	140.54	1,480,926.98	3,212,138.35	40.6510216	-104.7354935	
5,700.00	10.56	9.13	5,617.94	893.03	143.45	1,480,945.09	3,212,141.10	40.6510712	-104.7354830	
5,800.00	10.56	9.13	5,716.24	911.12	146.35	1,480,963.21	3,212,143.85	40.6511209	-104.7354725	
5,900.00	10.56	9.13	5,814.55	929.20	149.26	1,480,981.32	3,212,146.60	40.6511705	-104.7354621	
6,000.00	10.56	9.13	5,912.86	947.29	152.16	1,480,999.43	3,212,149.35	40.6512202	-104.7354516	
6,100.00	10.56	9.13	6,011.17	965.38	155.07	1,481,017.55	3,212,152.10	40.6512698	-104.7354411	
6,200.00	10.56	9.13	6,109.47	983.47	157.97	1,481,035.66	3,212,154.85	40.6513195	-104.7354307	
6,300.00	10.56	9.13	6,207.78	1,001.56	160.88	1,481,053.77	3,212,157.60	40.6513691	-104.7354202	
6,400.00	10.56	9.13	6,306.09	1,019.65	163.79	1,481,071.89	3,212,160.35	40.6514188	-104.7354097	
6,500.00	10.56	9.13	6,404.40	1,037.74	166.69	1,481,090.00	3,212,163.10	40.6514684	-104.7353992	
6,600.00	10.56	9.13	6,502.70	1,055.83	169.60	1,481,108.11	3,212,165.85	40.6515181	-104.7353888	
6,700.00	10.56	9.13	6,601.01	1,073.92	172.50	1,481,126.23	3,212,168.60	40.6515677	-104.7353783	
6,800.00	10.56	9.13	6,699.32	1,092.01	175.41	1,481,144.34	3,212,171.34	40.6516174	-104.7353678	
6,900.00	10.56	9.13	6,797.63	1,110.10	178.31	1,481,162.45	3,212,174.09	40.6516670	-104.7353573	
6,985.58	10.56	9.13	6,881.76	1,125.58	180.80	1,481,177.96	3,212,176.45	40.6517095	-104.7353484	
KOP 8/100										
7,000.00	10.78	15.25	6,895.93	1,128.18	181.36	1,481,180.57	3,212,176.99	40.6517167	-104.7353464	
7,100.00	14.86	47.03	6,993.53	1,145.97	193.23	1,481,198.46	3,212,188.70	40.6517655	-104.7353036	
7,200.00	21.27	62.78	7,088.61	1,163.04	218.78	1,481,215.74	3,212,214.10	40.6518124	-104.7352115	
7,300.00	28.46	71.18	7,179.31	1,179.05	257.52	1,481,232.09	3,212,252.71	40.6518563	-104.7350719	
7,400.00	35.98	76.35	7,263.86	1,193.69	308.70	1,481,247.17	3,212,303.76	40.6518965	-104.7348874	
7,500.00	43.65	79.92	7,340.63	1,206.68	371.33	1,481,260.70	3,212,366.27	40.6519321	-104.7346617	
7,600.00	51.40	82.61	7,408.12	1,217.76	444.18	1,481,272.41	3,212,439.02	40.6519626	-104.7343992	
7,700.00	59.20	84.76	7,465.00	1,226.73	525.83	1,481,282.07	3,212,520.59	40.6519872	-104.7341049	
7,800.00	67.03	86.59	7,510.19	1,233.39	614.70	1,481,289.51	3,212,609.40	40.6520054	-104.7337846	
7,900.00	74.88	88.22	7,542.79	1,237.63	709.05	1,481,294.56	3,212,703.72	40.6520171	-104.7334446	
8,000.00	82.75	89.73	7,562.17	1,239.36	807.06	1,481,297.14	3,212,801.70	40.6520218	-104.7330914	
8,092.21	90.00	91.08	7,568.00	1,238.71	899.02	1,481,297.27	3,212,893.67	40.6520200	-104.7327600	
EP 90.00 Inc, 91.08 Az										
8,100.00	90.00	91.08	7,568.00	1,238.56	906.81	1,481,297.19	3,212,901.46	40.6520196	-104.7327319	
8,200.00	90.00	91.08	7,568.00	1,236.68	1,006.79	1,481,296.17	3,213,001.45	40.6520144	-104.7323716	
8,300.00	90.00	91.08	7,568.00	1,234.80	1,106.77	1,481,295.15	3,213,101.45	40.6520093	-104.7320112	
8,400.00	90.00	91.08	7,568.00	1,232.92	1,206.76	1,481,294.13	3,213,201.44	40.6520041	-104.7316509	
8,500.00	90.00	91.08	7,568.00	1,231.03	1,306.74	1,481,293.11	3,213,301.44	40.6519989	-104.7312906	
8,600.00	90.00	91.08	7,568.00	1,229.15	1,406.72	1,481,292.09	3,213,401.43	40.6519937	-104.7309303	
8,700.00	90.00	91.08	7,568.00	1,227.27	1,506.70	1,481,291.07	3,213,501.43	40.6519885	-104.7305699	
8,800.00	90.00	91.08	7,568.00	1,225.39	1,606.68	1,481,290.05	3,213,601.42	40.6519833	-104.7302096	
8,900.00	90.00	91.08	7,568.00	1,223.51	1,706.67	1,481,289.03	3,213,701.42	40.6519782	-104.7298493	
9,000.00	90.00	91.08	7,568.00	1,221.62	1,806.65	1,481,288.01	3,213,801.41	40.6519730	-104.7294889	
9,100.00	90.00	91.08	7,568.00	1,219.74	1,906.63	1,481,286.99	3,213,901.41	40.6519678	-104.7291286	
9,200.00	90.00	91.08	7,568.00	1,217.86	2,006.61	1,481,285.97	3,214,001.40	40.6519626	-104.7287683	
9,300.00	90.00	91.08	7,568.00	1,215.98	2,106.60	1,481,284.95	3,214,101.40	40.6519574	-104.7284080	
9,400.00	90.00	91.08	7,568.00	1,214.09	2,206.58	1,481,283.92	3,214,201.39	40.6519522	-104.7280476	
9,500.00	90.00	91.08	7,568.00	1,212.21	2,306.56	1,481,282.90	3,214,301.39	40.6519470	-104.7276873	
9,600.00	90.00	91.08	7,568.00	1,210.33	2,406.54	1,481,281.88	3,214,401.38	40.6519418	-104.7273270	
9,700.00	90.00	91.08	7,568.00	1,208.45	2,506.52	1,481,280.86	3,214,501.38	40.6519366	-104.7269667	
9,800.00	90.00	91.08	7,568.00	1,206.57	2,606.51	1,481,279.84	3,214,601.37	40.6519314	-104.7266063	
9,900.00	90.00	91.08	7,568.00	1,204.68	2,706.49	1,481,278.82	3,214,701.37	40.6519263	-104.7262460	
10,000.00	90.00	91.08	7,568.00	1,202.80	2,806.47	1,481,277.80	3,214,801.36	40.6519211	-104.7258857	



Microsoft Planning Report - Geographic

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well SAUTER 24-19-2H
Company:	Anschutz Oil Company, LLC	TVD Reference:	WELL @ 5068.00usft (Original Well Elev)
Project:	Sec. 23-T8N-R66W, Weld County CO	MD Reference:	WELL @ 5068.00usft (Original Well Elev)
Site:	Sauter 23 B	North Reference:	True
Well:	SAUTER 24-19-2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 01Nov18 amh		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude	
10,100.00	90.00	91.08	7,568.00	1,200.92	2,906.45	1,481,276.78	3,214,901.36	40.6519159	-104.7255253	
10,200.00	90.00	91.08	7,568.00	1,199.04	3,006.44	1,481,275.76	3,215,001.35	40.6519107	-104.7251650	
10,300.00	90.00	91.08	7,568.00	1,197.15	3,106.42	1,481,274.74	3,215,101.35	40.6519055	-104.7248047	
10,400.00	90.00	91.08	7,568.00	1,195.27	3,206.40	1,481,273.72	3,215,201.34	40.6519003	-104.7244444	
10,500.00	90.00	91.08	7,568.00	1,193.39	3,306.38	1,481,272.70	3,215,301.34	40.6518951	-104.7240840	
10,600.00	90.00	91.08	7,568.00	1,191.51	3,406.37	1,481,271.68	3,215,401.33	40.6518899	-104.7237237	
10,700.00	90.00	91.08	7,568.00	1,189.63	3,506.35	1,481,270.65	3,215,501.33	40.6518846	-104.7233634	
10,800.00	90.00	91.08	7,568.00	1,187.74	3,606.33	1,481,269.63	3,215,601.32	40.6518794	-104.7230030	
10,900.00	90.00	91.08	7,568.00	1,185.86	3,706.31	1,481,268.61	3,215,701.32	40.6518742	-104.7226427	
11,000.00	90.00	91.08	7,568.00	1,183.98	3,806.29	1,481,267.59	3,215,801.31	40.6518690	-104.7222824	
11,100.00	90.00	91.08	7,568.00	1,182.10	3,906.28	1,481,266.57	3,215,901.31	40.6518638	-104.7219221	
11,200.00	90.00	91.08	7,568.00	1,180.21	4,006.26	1,481,265.55	3,216,001.30	40.6518586	-104.7215617	
11,300.00	90.00	91.08	7,568.00	1,178.33	4,106.24	1,481,264.53	3,216,101.30	40.6518534	-104.7212014	
11,400.00	90.00	91.08	7,568.00	1,176.45	4,206.22	1,481,263.51	3,216,201.29	40.6518482	-104.7208411	
11,500.00	90.00	91.08	7,568.00	1,174.57	4,306.21	1,481,262.49	3,216,301.29	40.6518430	-104.7204808	
11,600.00	90.00	91.08	7,568.00	1,172.69	4,406.19	1,481,261.47	3,216,401.28	40.6518378	-104.7201204	
11,700.00	90.00	91.08	7,568.00	1,170.80	4,506.17	1,481,260.45	3,216,501.28	40.6518325	-104.7197601	
11,800.00	90.00	91.08	7,568.00	1,168.92	4,606.15	1,481,259.43	3,216,601.27	40.6518273	-104.7193998	
11,900.00	90.00	91.08	7,568.00	1,167.04	4,706.14	1,481,258.41	3,216,701.27	40.6518221	-104.7190395	
12,000.00	90.00	91.08	7,568.00	1,165.16	4,806.12	1,481,257.39	3,216,801.26	40.6518169	-104.7186791	
12,100.00	90.00	91.08	7,568.00	1,163.27	4,906.10	1,481,256.36	3,216,901.26	40.6518117	-104.7183188	
12,200.00	90.00	91.08	7,568.00	1,161.39	5,006.08	1,481,255.34	3,217,001.25	40.6518064	-104.7179585	
12,300.00	90.00	91.08	7,568.00	1,159.51	5,106.06	1,481,254.32	3,217,101.25	40.6518012	-104.7175981	
12,400.00	90.00	91.08	7,568.00	1,157.63	5,206.05	1,481,253.30	3,217,201.24	40.6517960	-104.7172378	
12,500.00	90.00	91.08	7,568.00	1,155.75	5,306.03	1,481,252.28	3,217,301.24	40.6517908	-104.7168775	
12,600.00	90.00	91.08	7,568.00	1,153.86	5,406.01	1,481,251.26	3,217,401.23	40.6517855	-104.7165172	
12,700.00	90.00	91.08	7,568.00	1,151.98	5,505.99	1,481,250.24	3,217,501.23	40.6517803	-104.7161568	
12,800.00	90.00	91.08	7,568.00	1,150.10	5,605.98	1,481,249.22	3,217,601.22	40.6517751	-104.7157965	
12,900.00	90.00	91.08	7,568.00	1,148.22	5,705.96	1,481,248.20	3,217,701.22	40.6517699	-104.7154362	
13,000.00	90.00	91.08	7,568.00	1,146.33	5,805.94	1,481,247.18	3,217,801.21	40.6517646	-104.7150759	
13,100.00	90.00	91.08	7,568.00	1,144.45	5,905.92	1,481,246.16	3,217,901.21	40.6517594	-104.7147155	
13,200.00	90.00	91.08	7,568.00	1,142.57	6,005.90	1,481,245.14	3,218,001.20	40.6517542	-104.7143552	
13,300.00	90.00	91.08	7,568.00	1,140.69	6,105.89	1,481,244.12	3,218,101.20	40.6517489	-104.7139949	
13,400.00	90.00	91.08	7,568.00	1,138.81	6,205.87	1,481,243.10	3,218,201.19	40.6517437	-104.7136346	
13,500.00	90.00	91.08	7,568.00	1,136.92	6,305.85	1,481,242.07	3,218,301.19	40.6517385	-104.7132742	
13,600.00	90.00	91.08	7,568.00	1,135.04	6,405.83	1,481,241.05	3,218,401.18	40.6517332	-104.7129139	
13,700.00	90.00	91.08	7,568.00	1,133.16	6,505.82	1,481,240.03	3,218,501.18	40.6517280	-104.7125536	
13,800.00	90.00	91.08	7,568.00	1,131.28	6,605.80	1,481,239.01	3,218,601.17	40.6517227	-104.7121933	
13,900.00	90.00	91.08	7,568.00	1,129.39	6,705.78	1,481,237.99	3,218,701.17	40.6517175	-104.7118329	
14,000.00	90.00	91.08	7,568.00	1,127.51	6,805.76	1,481,236.97	3,218,801.16	40.6517123	-104.7114726	
14,100.00	90.00	91.08	7,568.00	1,125.63	6,905.75	1,481,235.95	3,218,901.16	40.6517070	-104.7111123	
14,200.00	90.00	91.08	7,568.00	1,123.75	7,005.73	1,481,234.93	3,219,001.15	40.6517018	-104.7107520	
14,300.00	90.00	91.08	7,568.00	1,121.87	7,105.71	1,481,233.91	3,219,101.15	40.6516965	-104.7103916	
14,400.00	90.00	91.08	7,568.00	1,119.98	7,205.69	1,481,232.89	3,219,201.14	40.6516913	-104.7100313	
14,500.00	90.00	91.08	7,568.00	1,118.10	7,305.67	1,481,231.87	3,219,301.14	40.6516860	-104.7096710	
14,600.00	90.00	91.08	7,568.00	1,116.22	7,405.66	1,481,230.85	3,219,401.13	40.6516808	-104.7093107	
14,700.00	90.00	91.08	7,568.00	1,114.34	7,505.64	1,481,229.83	3,219,501.13	40.6516755	-104.7089503	
14,800.00	90.00	91.08	7,568.00	1,112.45	7,605.62	1,481,228.80	3,219,601.12	40.6516703	-104.7085900	
14,900.00	90.00	91.08	7,568.00	1,110.57	7,705.60	1,481,227.78	3,219,701.12	40.6516650	-104.7082297	
15,000.00	90.00	91.08	7,568.00	1,108.69	7,805.59	1,481,226.76	3,219,801.11	40.6516598	-104.7078694	
15,100.00	90.00	91.08	7,568.00	1,106.81	7,905.57	1,481,225.74	3,219,901.11	40.6516545	-104.7075090	
15,200.00	90.00	91.08	7,568.00	1,104.93	8,005.55	1,481,224.72	3,220,001.10	40.6516493	-104.7071487	
15,300.00	90.00	91.08	7,568.00	1,103.04	8,105.53	1,481,223.70	3,220,101.10	40.6516440	-104.7067884	
15,400.00	90.00	91.08	7,568.00	1,101.16	8,205.52	1,481,222.68	3,220,201.09	40.6516388	-104.7064281	
15,500.00	90.00	91.08	7,568.00	1,099.28	8,305.50	1,481,221.66	3,220,301.09	40.6516335	-104.7060677	



Microsoft

Planning Report - Geographic

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Well SAUTER 24-19-2H
Company:	Anschutz Oil Company, LLC	TVD Reference:	WELL @ 5068.00usft (Original Well Elev)
Project:	Sec. 23-T8N-R66W, Weld County CO	MD Reference:	WELL @ 5068.00usft (Original Well Elev)
Site:	Sauter 23 B	North Reference:	True
Well:	SAUTER 24-19-2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 01Nov18 amh		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
15,600.00	90.00	91.08	7,568.00	1,097.40	8,405.48	1,481,220.64	3,220,401.08	40.6516282	-104.7057074
15,700.00	90.00	91.08	7,568.00	1,095.51	8,505.46	1,481,219.62	3,220,501.08	40.6516230	-104.7053471
15,800.00	90.00	91.08	7,568.00	1,093.63	8,605.44	1,481,218.60	3,220,601.07	40.6516177	-104.7049868
15,900.00	90.00	91.08	7,568.00	1,091.75	8,705.43	1,481,217.58	3,220,701.07	40.6516125	-104.7046264
16,000.00	90.00	91.08	7,568.00	1,089.87	8,805.41	1,481,216.56	3,220,801.06	40.6516072	-104.7042661
16,100.00	90.00	91.08	7,568.00	1,087.99	8,905.39	1,481,215.54	3,220,901.06	40.6516019	-104.7039058
16,200.00	90.00	91.08	7,568.00	1,086.10	9,005.37	1,481,214.51	3,221,001.05	40.6515967	-104.7035455
16,300.00	90.00	91.08	7,568.00	1,084.22	9,105.36	1,481,213.49	3,221,101.05	40.6515914	-104.7031851
16,400.00	90.00	91.08	7,568.00	1,082.34	9,205.34	1,481,212.47	3,221,201.04	40.6515861	-104.7028248
16,500.00	90.00	91.08	7,568.00	1,080.46	9,305.32	1,481,211.45	3,221,301.04	40.6515809	-104.7024645
16,600.00	90.00	91.08	7,568.00	1,078.57	9,405.30	1,481,210.43	3,221,401.03	40.6515756	-104.7021042
16,700.00	90.00	91.08	7,568.00	1,076.69	9,505.28	1,481,209.41	3,221,501.03	40.6515703	-104.7017438
16,800.00	90.00	91.08	7,568.00	1,074.81	9,605.27	1,481,208.39	3,221,601.02	40.6515650	-104.7013835
16,900.00	90.00	91.08	7,568.00	1,072.93	9,705.25	1,481,207.37	3,221,701.02	40.6515598	-104.7010232
17,000.00	90.00	91.08	7,568.00	1,071.05	9,805.23	1,481,206.35	3,221,801.01	40.6515545	-104.7006629
17,100.00	90.00	91.08	7,568.00	1,069.16	9,905.21	1,481,205.33	3,221,901.01	40.6515492	-104.7003025
17,200.00	90.00	91.08	7,568.00	1,067.28	10,005.20	1,481,204.31	3,222,001.00	40.6515439	-104.6999422
17,300.00	90.00	91.08	7,568.00	1,065.40	10,105.18	1,481,203.29	3,222,101.00	40.6515387	-104.6995819
17,400.00	90.00	91.08	7,568.00	1,063.52	10,205.16	1,481,202.27	3,222,200.99	40.6515334	-104.6992216
17,500.00	90.00	91.08	7,568.00	1,061.64	10,305.14	1,481,201.25	3,222,300.99	40.6515281	-104.6988612
17,600.00	90.00	91.08	7,568.00	1,059.75	10,405.13	1,481,200.22	3,222,400.98	40.6515228	-104.6985009
17,652.99	90.00	91.08	7,568.00	1,058.76	10,458.11	1,481,199.68	3,222,453.97	40.6515200	-104.6983100
TD at 17652.99									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
SHL 2205' FNL, 290' FE	0.00	0.00	0.00	0.00	0.00	1,480,050.86	3,212,005.35	40.6486200	-104.7360000
- plan hits target center									
- Point									
EP 960' FNL, 600' FWL	0.00	0.00	7,568.00	1,238.71	899.02	1,481,297.27	3,212,893.67	40.6520200	-104.7327600
- plan hits target center									
- Point									
BHL 960' FNL, 600' FEL	0.00	0.00	7,568.00	1,058.76	10,458.11	1,481,199.68	3,222,453.97	40.6515200	-104.6983100
- plan hits target center									
- Point									

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
1,027.84	1,024.86	47.88	7.69	Hold 10.56 Inc, 9.13 Az
6,985.58	6,881.76	1,125.58	180.80	KOP 8/100
8,092.21	7,568.00	1,238.71	899.02	EP 90.00 Inc, 91.08 Az
17,652.99	7,568.00	1,058.76	10,458.11	TD at 17652.99



Anschutz Oil Company, LLC

Sec. 23-T8N-R66W, Weld County CO

Sauter 23 B

SAUTER 24-19-2H

Wellbore #1

Design #1 01Nov18 amh

Anticollision Summary Report

02 November, 2018



Microsoft
Anticollision Summary Report

Company:	Anschutz Oil Company, LLC	Local Co-ordinate Reference:	Well SAUTER 24-19-2H
Project:	Sec. 23-T8N-R66W, Weld County CO	TVD Reference:	WELL @ 5068.00usft (Original Well Elev)
Reference Site:	Sauter 23 B	MD Reference:	WELL @ 5068.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	SAUTER 24-19-2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.14 Single User Db
Reference Design:	Design #1 01Nov18 amh	Offset TVD Reference:	Offset Datum

Reference	Design #1 01Nov18 amh		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	11/2/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	17,652.99	Design #1 01Nov18 amh (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sauter 23 B						
Sauter 24-19-1H - Wellbore #1 - Design #1 01Nov18 am	2,210.27	2,226.59	1.31	-13.37	0.089	Level 1, CC, SF
Sauter 24-19-1H - Wellbore #1 - Design #1 01Nov18 am	17,652.99	17,645.23	368.36	-196.54	0.652	Level 1, ES
SAUTER 24-19-3H - Wellbore #1 - Design #1 01Nov18 a	500.00	500.00	14.57	12.58	7.326	CC
SAUTER 24-19-3H - Wellbore #1 - Design #1 01Nov18 a	17,652.99	17,506.26	371.62	-189.77	0.662	Level 1, ES, SF
SAUTER 24-19-4H - Wellbore #1 - Design #1 01Nov18 a	500.00	500.00	29.15	27.16	14.654	CC
SAUTER 24-19-4H - Wellbore #1 - Design #1 01Nov18 a	700.00	701.93	29.41	26.52	10.164	ES
SAUTER 24-19-4H - Wellbore #1 - Design #1 01Nov18 a	17,652.99	17,554.53	721.11	142.41	1.246	Level 2, SF
SAUTER 24-19-5H - Wellbore #1 - Design #1 01Nov18 a	500.00	500.00	47.36	45.37	23.810	CC
SAUTER 24-19-5H - Wellbore #1 - Design #1 01Nov18 a	600.00	601.25	47.77	45.33	19.581	ES
SAUTER 24-19-5H - Wellbore #1 - Design #1 01Nov18 a	17,652.99	17,441.16	1,085.45	509.03	1.883	SF
SAUTER 24-19-6H - Wellbore #1 - Design #1 01Nov18 a	500.00	500.00	61.93	59.95	31.136	CC, ES
SAUTER 24-19-6H - Wellbore #1 - Design #1 01Nov18 a	17,652.99	17,524.50	1,442.27	863.77	2.493	SF



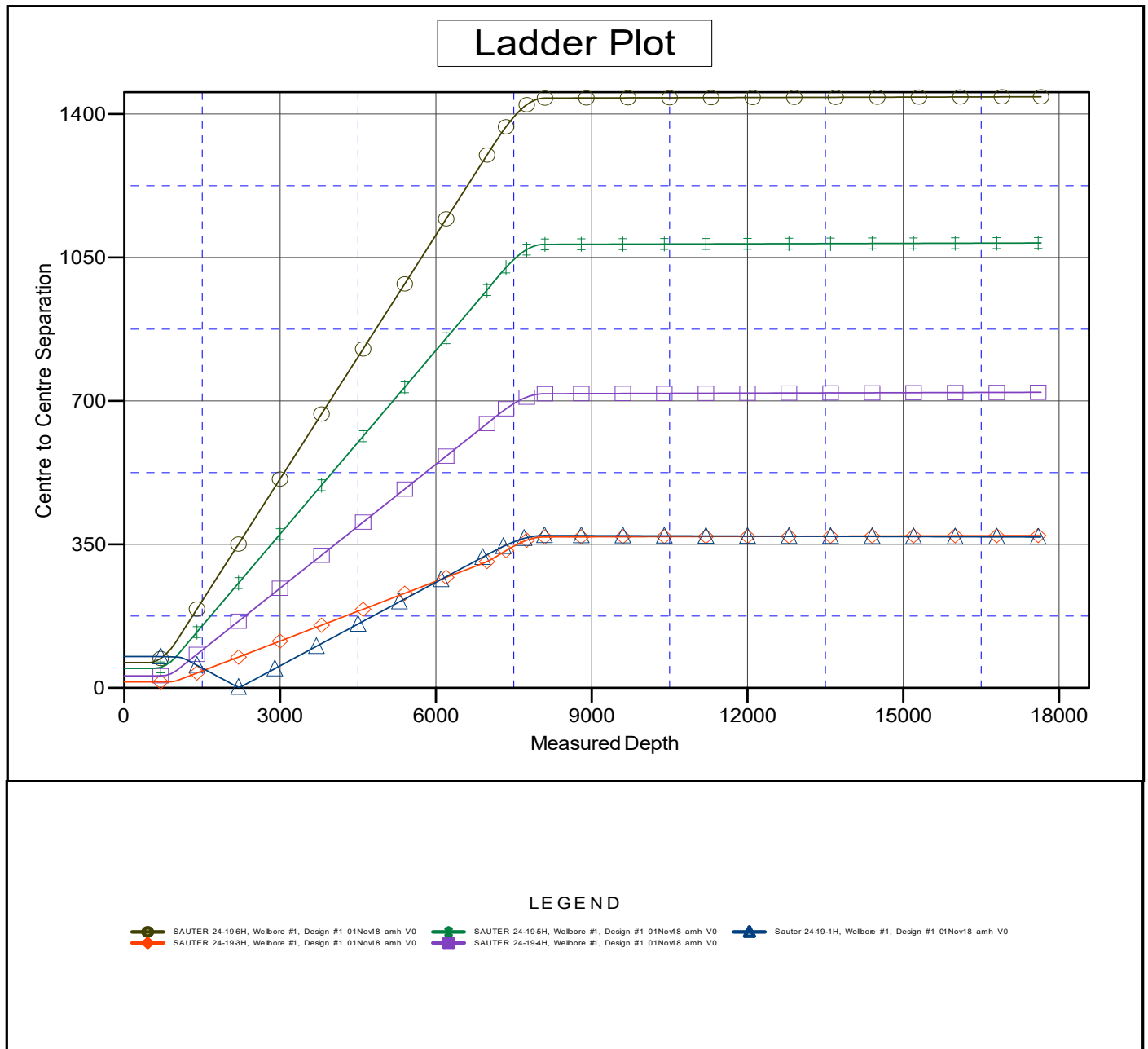
Microsoft

Anticollision Summary Report

Company:	Anschutz Oil Company, LLC	Local Co-ordinate Reference:	Well SAUTER 24-19-2H
Project:	Sec. 23-T8N-R66W, Weld County CO	TVD Reference:	WELL @ 5068.00usft (Original Well Elev)
Reference Site:	Sauter 23 B	MD Reference:	WELL @ 5068.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	SAUTER 24-19-2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.14 Single User Db
Reference Design:	Design #1 01Nov18 amh	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 5068.00usft (Original Well E
Offset Depths are relative to Offset Datum
Central Meridian is -105.5000000

Coordinates are relative to: SAUTER 24-19-2H
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.49°



CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Microsoft

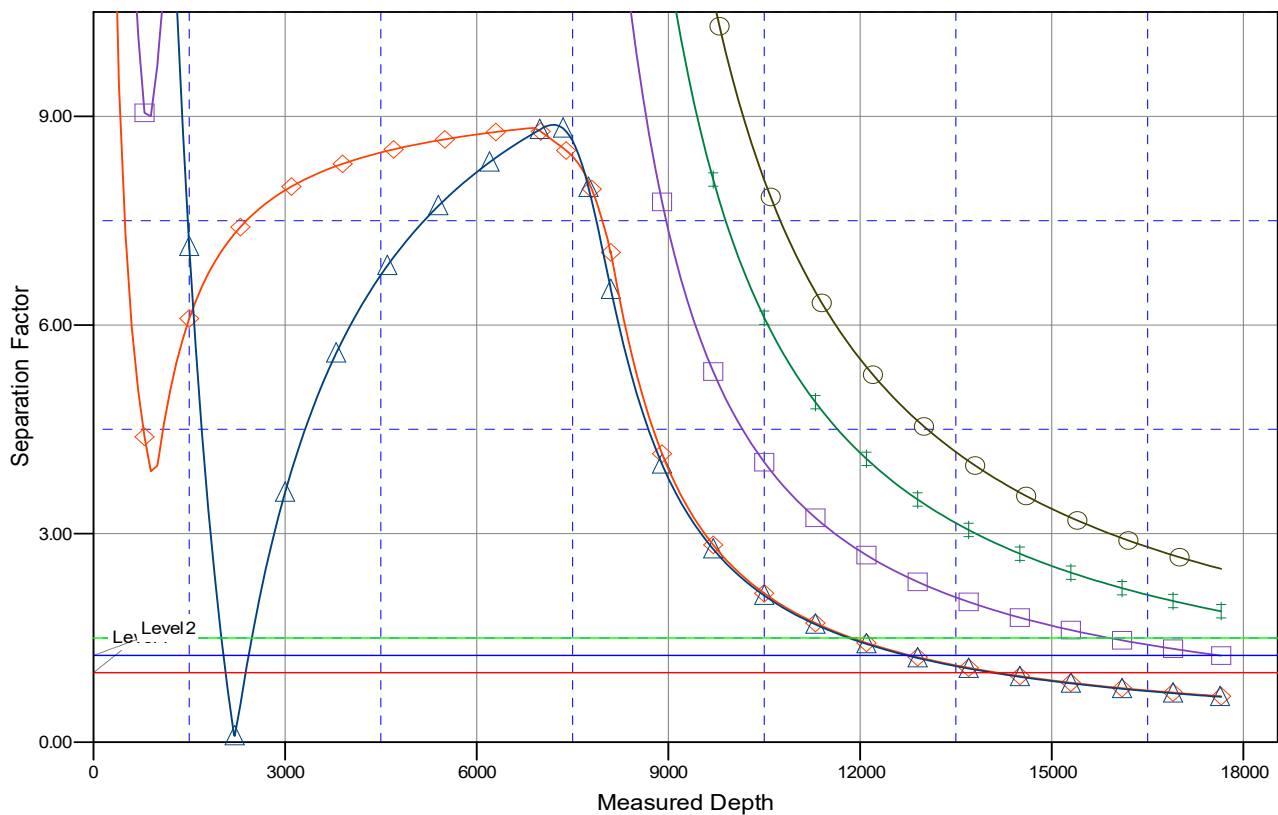
Anticollision Summary Report

Company:	Anschutz Oil Company, LLC	Local Co-ordinate Reference:	Well SAUTER 24-19-2H
Project:	Sec. 23-T8N-R66W, Weld County CO	TVD Reference:	WELL @ 5068.00usft (Original Well Elev)
Reference Site:	Sauter 23 B	MD Reference:	WELL @ 5068.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	SAUTER 24-19-2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.14 Single User Db
Reference Design:	Design #1 01Nov18 amh	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 5068.00usft (Original Well E
Offset Depths are relative to Offset Datum
Central Meridian is -105.5000000

Coordinates are relative to: SAUTER 24-19-2H
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.49°

Separation Factor Plot



LEGEND

SAUTER 24-19-2H, Wellbore #1, Design #1 01Nov18 amh V0
SAUTER 24-19-3H, Wellbore #1, Design #1 01Nov18 amh V0
SAUTER 24-19-4H, Wellbore #1, Design #1 01Nov18 amh V0
SAUTER 24-19-1H, Wellbore #1, Design #1 01Nov18 amh V0