



Extraction Oil & Gas

**Weld Co., Co
Sec.08-T07N-R66W
Thornton 4**

**Original Hole
Rev 0**

Anticollision Risk Report

21 June, 2014



Schlumberger
Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Reference	Rev 0		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations Interval 1.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 25,000.00usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Risk Settings	
Vertical Depth for Analysis:	usft (Below TVD Reference Datum)
Level of Acceptable Risk (1 in):	
Minimum Separation:	0 usft

Survey Tool Program	Date	6/21/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	17,242.86	Rev 0 (Original Hole)	Pathfinder	Pathfinder MWD

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						
Sec.08-T07N-R66W						
Thornton 1 - Original Hole - Rev 0	500.00	500.00	83.80	82.11	49.604 CC, ES	
Thornton 1 - Original Hole - Rev 0	17,242.86	17,324.42	660.14	512.06	4.458 SF	
Thornton 10 - Original Hole - Rev 0	765.28	769.28	167.95	165.33	64.044 CC	
Thornton 10 - Original Hole - Rev 0	800.00	803.84	167.95	165.21	61.222 ES	
Thornton 10 - Original Hole - Rev 0	17,242.86	17,245.55	1,319.88	1,171.82	8.914 SF	
Thornton 11 - Original Hole - Rev 0	664.91	669.91	196.01	193.73	86.200 CC	
Thornton 11 - Original Hole - Rev 0	700.00	704.73	196.01	193.61	81.811 ES	
Thornton 11 - Original Hole - Rev 0	17,242.86	17,282.31	1,649.91	1,501.82	11.141 SF	
Thornton 12 - Original Hole - Rev 0	564.54	570.54	224.06	222.13	116.380 CC	
Thornton 12 - Original Hole - Rev 0	600.00	605.61	224.06	222.02	109.388 ES	
Thornton 12 - Original Hole - Rev 0	17,242.86	17,633.60	1,843.67	1,697.00	12.570 SF	
Thornton 2 - Original Hole - Rev 0	600.00	600.00	55.74	53.70	27.342 CC, ES	
Thornton 2 - Original Hole - Rev 0	17,242.86	17,273.45	330.07	182.03	2.230 SF	
Thornton 3 - Original Hole - Rev 0	700.00	700.00	28.05	25.67	11.750 CC, ES	
Thornton 3 - Original Hole - Rev 0	17,242.86	17,582.23	368.97	273.44	3.862 SF	
Thornton 5 - Original Hole - Rev 0	800.00	801.00	28.05	25.31	10.242 CC, ES	
Thornton 5 - Original Hole - Rev 0	17,242.86	17,218.82	330.05	182.05	2.230 SF	
Thornton 6 - Original Hole - Rev 0	800.00	802.00	56.10	53.36	20.475 CC, ES	
Thornton 6 - Original Hole - Rev 0	17,242.86	17,543.03	593.88	462.48	4.520 SF	
Thornton 7 - Original Hole - Rev 0	800.00	802.00	84.16	81.42	30.713 CC, ES	
Thornton 7 - Original Hole - Rev 0	17,242.86	17,214.24	660.12	512.12	4.460 SF	
Thornton 8 - Original Hole - Rev 0	800.00	802.00	112.21	109.47	40.951 CC, ES	
Thornton 8 - Original Hole - Rev 0	17,242.86	17,220.82	990.16	842.15	6.690 SF	
Thornton 9 - Original Hole - Rev 0	800.00	803.00	139.90	137.16	51.023 CC, ES	
Thornton 9 - Original Hole - Rev 0	17,242.86	17,559.62	1,200.24	1,055.92	8.316 SF	

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



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Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision		
0.00	0.00	0.00	0.00	0.00	0.00	0.12	83.80						CC, ES	
100.00	100.00	100.00	100.00	0.15	0.15	0.12	83.80	83.51	0.29	285.811	0			
200.00	200.00	200.00	200.00	0.32	0.32	0.12	83.80	83.16	0.64	130.479	0			
300.00	300.00	300.00	300.00	0.50	0.50	0.12	83.80	82.81	0.99	84.536	0			
400.00	400.00	400.00	400.00	0.67	0.67	0.12	83.80	82.46	1.34	62.521	0			
500.00	500.00	500.00	500.00	0.84	0.84	0.12	83.80	82.11	1.69	49.604	0			
600.00	600.00	597.33	597.31	1.02	1.01	-0.30	85.38	83.34	2.03	41.970	0			
700.00	700.00	694.44	694.29	1.19	1.19	-1.49	90.11	87.73	2.38	37.866	0			
800.00	800.00	791.11	790.61	1.37	1.36	-3.21	98.06	95.34	2.73	35.965	0			
900.00	899.98	887.31	886.13	1.54	1.53	33.93	107.85	104.78	3.07	35.152	0			
1,000.00	999.84	983.17	980.88	1.72	1.71	33.02	117.97	114.56	3.41	34.574	0			
1,100.00	1,099.45	1,078.69	1,074.77	1.90	1.89	32.65	128.38	124.62	3.76	34.176	0			
1,200.00	1,198.70	1,173.87	1,167.67	2.07	2.08	32.69	139.04	134.93	4.10	33.900	0			
1,237.30	1,235.60	1,209.95	1,202.71	2.14	2.15	32.80	143.04	138.81	4.23	33.805	0			
1,300.00	1,297.57	1,272.30	1,263.24	2.26	2.27	33.11	149.56	145.11	4.46	33.550	0			
1,400.00	1,396.41	1,371.75	1,359.78	2.44	2.48	33.55	159.98	155.16	4.82	33.186	0			
1,500.00	1,495.25	1,471.20	1,456.31	2.62	2.68	33.94	170.40	165.22	5.18	32.868	0			
1,600.00	1,594.09	1,570.65	1,552.84	2.81	2.88	34.28	180.83	175.28	5.55	32.586	0			
1,700.00	1,692.92	1,670.10	1,649.38	3.00	3.09	34.59	191.27	185.35	5.92	32.333	0			
1,800.00	1,791.76	1,769.55	1,745.91	3.18	3.30	34.87	201.71	195.42	6.28	32.107	0			
1,900.00	1,890.60	1,869.00	1,842.45	3.37	3.51	35.11	212.15	205.50	6.65	31.904	0			
2,000.00	1,989.44	1,968.45	1,938.98	3.56	3.71	35.34	222.60	215.58	7.02	31.719	0			
2,100.00	2,088.27	2,067.90	2,035.52	3.75	3.92	35.54	233.05	225.66	7.39	31.552	0			
2,200.00	2,187.11	2,167.34	2,132.05	3.94	4.13	35.73	243.50	235.75	7.76	31.399	0			
2,300.00	2,285.95	2,266.79	2,228.59	4.13	4.34	35.90	253.96	245.84	8.12	31.259	0			
2,400.00	2,384.78	2,366.24	2,325.12	4.31	4.56	36.06	264.42	255.93	8.49	31.130	0			
2,500.00	2,483.62	2,465.69	2,421.66	4.50	4.77	36.21	274.88	266.02	8.86	31.011	0			
2,600.00	2,582.46	2,565.14	2,518.19	4.69	4.98	36.34	285.34	276.11	9.23	30.901	0			
2,700.00	2,681.30	2,664.59	2,614.73	4.88	5.19	36.47	295.80	286.20	9.60	30.799	0			
2,800.00	2,780.13	2,764.04	2,711.26	5.07	5.40	36.58	306.27	296.29	9.97	30.704	0			
2,900.00	2,878.97	2,863.49	2,807.80	5.26	5.61	36.69	316.73	306.39	10.35	30.616	0			
3,000.00	2,977.81	2,962.94	2,904.33	5.45	5.82	36.80	327.20	316.49	10.72	30.533	0			
3,100.00	3,076.64	3,062.39	3,000.87	5.64	6.04	36.89	337.67	326.58	11.09	30.455	0			
3,200.00	3,175.48	3,161.84	3,097.40	5.84	6.25	36.98	348.14	336.68	11.46	30.382	0			
3,300.00	3,274.32	3,261.28	3,193.94	6.03	6.46	37.07	358.61	346.78	11.83	30.314	0			
3,400.00	3,373.16	3,360.73	3,290.47	6.22	6.67	37.15	369.08	356.88	12.20	30.249	0			
3,500.00	3,471.99	3,460.18	3,387.01	6.41	6.89	37.22	379.55	366.98	12.57	30.188	0			
3,600.00	3,570.83	3,559.63	3,483.54	6.60	7.10	37.29	390.02	377.08	12.94	30.130	0			
3,700.00	3,669.67	3,659.08	3,580.08	6.79	7.31	37.36	400.49	387.18	13.32	30.076	0			
3,800.00	3,768.51	3,758.53	3,676.61	6.98	7.53	37.43	410.96	397.28	13.69	30.024	0			
3,900.00	3,867.34	3,857.98	3,773.15	7.17	7.74	37.49	421.44	407.38	14.06	29.975	0			
4,000.00	3,966.18	3,957.43	3,869.68	7.36	7.95	37.55	431.91	417.48	14.43	29.928	0			
4,100.00	4,065.02	4,056.88	3,966.22	7.55	8.16	37.60	442.39	427.58	14.80	29.883	0			
4,200.00	4,163.85	4,156.33	4,062.75	7.74	8.38	37.65	452.86	437.68	15.18	29.841	0			
4,300.00	4,262.69	4,255.77	4,159.29	7.94	8.59	37.71	463.33	447.79	15.55	29.800	0			
4,400.00	4,361.53	4,355.22	4,255.82	8.13	8.80	37.75	473.81	457.89	15.92	29.762	0			
4,500.00	4,460.37	4,454.67	4,352.36	8.32	9.02	37.80	484.29	467.99	16.29	29.724	0			
4,600.00	4,559.20	4,554.12	4,448.89	8.51	9.23	37.84	494.76	478.10	16.66	29.689	0			
4,700.00	4,658.04	4,653.57	4,545.43	8.70	9.44	37.89	505.24	488.20	17.04	29.655	0			
4,800.00	4,756.88	4,753.02	4,641.96	8.89	9.66	37.93	515.71	498.30	17.41	29.623	0			
4,900.00	4,855.71	4,852.47	4,738.50	9.08	9.87	37.97	526.19	508.41	17.78	29.591	0			
5,000.00	4,954.55	4,951.92	4,835.03	9.27	10.08	38.00	536.67	518.51	18.15	29.561	0			
5,100.00	5,053.39	5,051.37	4,931.57	9.47	10.30	38.04	547.14	528.62	18.53	29.532	0			
5,200.00	5,152.23	5,150.82	5,028.10	9.66	10.51	38.07	557.62	538.72	18.90	29.505	0			

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



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PATHFINDER
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Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 1 - Original Hole - Rev 0		Offset Site Error:		0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:		0.00 usft		
Reference		Offset		Semi Major Axis			Distance						Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision					
5,300.00	5,251.06	5,250.27	5,124.64	9.85	10.73	38.11	568.10	548.83	19.27	29.478	0						
5,400.00	5,349.90	5,349.71	5,221.17	10.04	10.94	38.14	578.57	558.93	19.64	29.452	0						
5,500.00	5,448.74	5,449.16	5,317.71	10.23	11.15	38.17	589.05	569.04	20.02	29.427	0						
5,600.00	5,547.58	5,548.61	5,414.24	10.42	11.37	38.20	599.53	579.14	20.39	29.403	0						
5,700.00	5,646.41	5,648.06	5,510.78	10.61	11.58	38.23	610.01	589.25	20.76	29.380	0						
5,800.00	5,745.25	5,747.51	5,607.31	10.81	11.79	38.26	620.49	599.35	21.14	29.358	0						
5,900.00	5,844.09	5,846.96	5,703.85	11.00	12.01	38.29	630.97	609.46	21.51	29.336	0						
6,000.00	5,942.92	5,955.93	5,809.72	11.19	12.24	38.33	641.17	619.27	21.90	29.281	0						
6,075.73	6,017.78	6,051.26	5,902.94	11.33	12.43	38.46	646.83	624.61	22.22	29.116	0						
6,100.00	6,041.78	6,081.87	5,933.02	11.38	12.49	38.53	648.23	625.92	22.31	29.050	0						
6,200.00	6,140.97	6,208.23	6,057.74	11.56	12.73	38.79	653.18	630.47	22.71	28.766	0						
6,300.00	6,240.54	6,334.86	6,183.51	11.74	12.95	38.98	656.78	633.70	23.08	28.461	0						
6,400.00	6,340.38	6,461.68	6,309.98	11.91	13.16	39.09	659.01	635.59	23.42	28.133	0						
6,500.00	6,440.35	6,588.60	6,436.84	12.08	13.35	39.14	659.88	636.13	23.75	27.781	0						
6,513.03	6,453.38	6,605.14	6,453.38	12.10	13.38	0.40	659.89	634.89	25.00	26.392	0						
6,600.00	6,540.35	6,692.11	6,540.35	12.24	13.51	0.40	659.89	634.61	25.28	26.101	0						
6,613.03	6,553.38	6,705.14	6,553.38	12.26	13.53	0.40	659.89	634.57	25.32	26.058	0						
6,650.00	6,590.33	6,741.84	6,590.06	12.32	13.58	-89.60	659.89	635.64	24.25	27.213	0						
6,700.00	6,640.08	6,791.49	6,639.46	12.39	13.65	-89.61	659.89	635.49	24.40	27.043	0						
6,750.00	6,689.29	6,841.13	6,688.34	12.46	13.71	-89.61	659.89	635.34	24.55	26.883	0						
6,800.00	6,737.67	6,890.79	6,736.41	12.53	13.77	-89.62	659.89	635.20	24.68	26.734	0						
6,850.00	6,784.91	6,940.45	6,783.37	12.60	13.83	-89.63	659.89	635.07	24.81	26.592	0						
6,900.00	6,830.73	6,990.12	6,828.94	12.66	13.89	-89.64	659.89	634.95	24.94	26.458	0						
6,950.00	6,874.83	7,039.80	6,872.84	12.72	13.94	-89.66	659.89	634.82	25.06	26.329	0						
7,000.00	6,916.95	7,089.50	6,914.81	12.78	14.00	-89.67	659.88	634.70	25.18	26.202	0						
7,050.00	6,956.84	7,139.21	6,954.59	12.83	14.05	-89.69	659.88	634.58	25.31	26.077	0						
7,100.00	6,994.23	7,188.94	6,991.94	12.89	14.11	-89.71	659.88	634.45	25.43	25.949	0						
7,150.00	7,028.90	7,238.69	7,026.63	12.95	14.16	-89.73	659.88	634.32	25.56	25.818	0						
7,200.00	7,060.65	7,288.46	7,058.44	13.02	14.22	-89.76	659.88	634.18	25.70	25.681	0						
7,250.00	7,089.26	7,338.26	7,087.18	13.08	14.28	-89.78	659.88	634.04	25.84	25.536	0						
7,300.00	7,114.58	7,388.07	7,112.66	13.15	14.35	-89.81	659.88	633.88	26.00	25.380	0						
7,350.00	7,136.43	7,437.91	7,134.73	13.23	14.42	-89.84	659.88	633.70	26.17	25.213	0						
7,400.00	7,154.69	7,487.78	7,153.25	13.31	14.50	-89.87	659.88	633.52	26.36	25.034	0						
7,450.00	7,169.24	7,537.67	7,168.10	13.40	14.58	-89.90	659.88	633.31	26.56	24.841	0						
7,500.00	7,179.99	7,587.59	7,179.18	13.50	14.67	-89.93	659.87	633.09	26.79	24.636	0						
7,550.00	7,186.88	7,637.54	7,186.41	13.61	14.76	-89.96	659.87	632.85	27.02	24.418	0						
7,600.00	7,189.87	7,687.52	7,189.76	13.73	14.87	-89.99	659.87	632.60	27.28	24.190	0						
7,613.03	7,190.00	7,700.55	7,189.98	13.76	14.90	-90.00	659.87	632.53	27.35	24.129	0						
7,642.81	7,190.00	7,730.32	7,190.00	13.84	14.96	-90.00	659.87	632.36	27.52	23.982	0						
7,700.00	7,190.00	7,787.52	7,190.00	14.00	15.10	-90.00	659.87	632.04	27.84	23.703	0						
7,800.00	7,190.00	7,887.52	7,190.00	14.31	15.36	-90.00	659.87	631.42	28.46	23.188	0						
7,900.00	7,190.00	7,987.51	7,190.00	14.64	15.66	-90.00	659.87	630.74	29.13	22.652	0						
8,000.00	7,190.00	8,087.51	7,190.00	15.00	15.99	-90.00	659.87	630.02	29.85	22.103	0						
8,100.00	7,190.00	8,187.51	7,190.00	15.39	16.34	-90.00	659.87	629.25	30.63	21.546	0						
8,200.00	7,190.00	8,287.51	7,190.00	15.80	16.71	-90.00	659.88	628.43	31.44	20.987	0						
8,300.00	7,190.00	8,387.51	7,190.00	16.23	17.11	-90.00	659.88	627.58	32.30	20.430	0						
8,400.00	7,190.00	8,487.51	7,190.00	16.67	17.53	-90.00	659.88	626.68	33.19	19.880	0						
8,500.00	7,190.00	8,587.51	7,190.00	17.14	17.97	-90.00	659.88	625.75	34.12	19.339	0						
8,600.00	7,190.00	8,687.51	7,190.00	17.61	18.43	-90.00	659.88	624.79	35.08	18.809	0						
8,700.00	7,190.00	8,787.51	7,190.00	18.11	18.90	-90.00	659.88	623.80	36.07	18.293	0						
8,800.00	7,190.00	8,887.51	7,190.00	18.62	19.39	-90.00	659.88	622.79	37.09	17.792	0						
8,900.00	7,190.00	8,987.51	7,190.00	19.13	19.89	-90.00	659.88	621.75	38.13	17.305	0						
9,000.00	7,190.00	9,087.51	7,190.00	19.67	20.40	-90.00	659.88	620.68	39.20	16.835	0						
9,100.00	7,190.00	9,187.51	7,190.00	20.21	20.92	-90.00	659.88	619.60	40.28	16.382	0						

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 1 - Original Hole - Rev 0		Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder													Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
9,200.00	7,190.00	9,287.51	7,190.00	20.76	21.46	-90.00	659.88	618.49	41.39	15.944	0					
9,300.00	7,190.00	9,387.51	7,190.00	21.32	22.00	-90.00	659.88	617.37	42.51	15.523	0					
9,400.00	7,190.00	9,487.51	7,190.00	21.88	22.55	-90.00	659.88	616.23	43.65	15.118	0					
9,500.00	7,190.00	9,587.51	7,190.00	22.46	23.11	-90.00	659.88	615.08	44.80	14.729	0					
9,600.00	7,190.00	9,687.51	7,190.00	23.04	23.68	-90.00	659.88	613.91	45.97	14.354	0					
9,700.00	7,190.00	9,787.51	7,190.00	23.63	24.25	-90.00	659.89	612.73	47.15	13.994	0					
9,800.00	7,190.00	9,887.51	7,190.00	24.23	24.84	-90.00	659.89	611.54	48.35	13.649	0					
9,900.00	7,190.00	9,987.51	7,190.00	24.83	25.42	-90.00	659.89	610.34	49.55	13.317	0					
10,000.00	7,190.00	10,087.51	7,190.00	25.44	26.02	-90.00	659.89	609.12	50.77	12.998	0					
10,100.00	7,190.00	10,187.51	7,190.00	26.05	26.62	-90.00	659.89	607.90	51.99	12.692	0					
10,200.00	7,190.00	10,287.51	7,190.00	26.66	27.22	-90.00	659.89	606.66	53.23	12.398	0					
10,300.00	7,190.00	10,387.51	7,190.00	27.28	27.83	-90.00	659.89	605.42	54.47	12.115	0					
10,400.00	7,190.00	10,487.51	7,190.00	27.91	28.44	-90.00	659.89	604.17	55.72	11.843	0					
10,500.00	7,190.00	10,587.51	7,190.00	28.53	29.06	-90.00	659.90	602.92	56.98	11.582	0					
10,600.00	7,190.00	10,687.51	7,190.00	29.16	29.68	-90.00	659.90	601.66	58.24	11.330	0					
10,700.00	7,190.00	10,787.51	7,190.00	29.80	30.30	-90.00	659.90	600.39	59.51	11.089	0					
10,800.00	7,190.00	10,887.51	7,190.00	30.44	30.93	-90.00	659.90	599.11	60.79	10.856	0					
10,900.00	7,190.00	10,987.51	7,190.00	31.08	31.56	-90.00	659.90	597.83	62.07	10.631	0					
11,000.00	7,190.00	11,087.50	7,190.00	31.72	32.20	-90.00	659.90	596.54	63.36	10.415	0					
11,100.00	7,190.00	11,187.50	7,190.00	32.36	32.83	-90.00	659.91	595.25	64.65	10.207	0					
11,200.00	7,190.00	11,287.50	7,190.00	33.01	33.47	-90.00	659.91	593.96	65.95	10.006	0					
11,300.00	7,190.00	11,387.50	7,190.00	33.66	34.11	-90.00	659.91	592.66	67.25	9.813	0					
11,400.00	7,190.00	11,487.50	7,190.00	34.31	34.76	-90.00	659.91	591.35	68.56	9.626	0					
11,500.00	7,190.00	11,587.50	7,190.00	34.97	35.41	-90.00	659.91	590.05	69.87	9.445	0					
11,600.00	7,190.00	11,687.50	7,190.00	35.62	36.05	-90.00	659.91	588.73	71.18	9.271	0					
11,700.00	7,190.00	11,787.50	7,190.00	36.28	36.71	-90.00	659.92	587.42	72.50	9.103	0					
11,800.00	7,190.00	11,887.50	7,190.00	36.94	37.36	-90.00	659.92	586.10	73.82	8.940	0					
11,900.00	7,190.00	11,987.50	7,190.00	37.60	38.01	-90.00	659.92	584.78	75.14	8.782	0					
12,000.00	7,190.00	12,087.50	7,190.00	38.26	38.67	-90.00	659.92	583.46	76.47	8.630	0					
12,100.00	7,190.00	12,187.50	7,190.00	38.93	39.33	-90.00	659.93	582.13	77.80	8.483	0					
12,200.00	7,190.00	12,287.50	7,190.00	39.59	39.99	-90.00	659.93	580.80	79.13	8.340	0					
12,300.00	7,190.00	12,387.50	7,190.00	40.26	40.65	-90.00	659.93	579.47	80.46	8.202	0					
12,400.00	7,190.00	12,487.50	7,190.00	40.93	41.31	-90.00	659.93	578.13	81.80	8.068	0					
12,500.00	7,190.00	12,587.50	7,190.00	41.60	41.97	-90.00	659.93	576.79	83.14	7.938	0					
12,600.00	7,190.00	12,687.50	7,190.00	42.27	42.64	-90.00	659.94	575.46	84.48	7.812	0					
12,700.00	7,190.00	12,787.50	7,190.00	42.94	43.30	-90.00	659.94	574.11	85.83	7.689	0					
12,800.00	7,190.00	12,887.50	7,190.00	43.61	43.97	-90.00	659.94	572.77	87.17	7.571	0					
12,900.00	7,190.00	12,987.50	7,190.00	44.28	44.64	-90.00	659.95	571.43	88.52	7.455	0					
13,000.00	7,190.00	13,087.50	7,190.00	44.96	45.31	-90.00	659.95	570.08	89.87	7.343	0					
13,100.00	7,190.00	13,187.50	7,190.00	45.63	45.98	-90.00	659.95	568.73	91.22	7.235	0					
13,200.00	7,190.00	13,287.50	7,190.00	46.31	46.65	-90.00	659.95	567.38	92.57	7.129	0					
13,300.00	7,190.00	13,387.50	7,190.00	46.99	47.32	-90.00	659.96	566.03	93.93	7.026	0					
13,400.00	7,190.00	13,487.50	7,190.00	47.66	48.00	-90.00	659.96	564.68	95.28	6.926	0					
13,500.00	7,190.00	13,587.50	7,190.00	48.34	48.67	-90.00	659.96	563.32	96.64	6.829	0					
13,600.00	7,190.00	13,687.50	7,190.00	49.02	49.35	-90.00	659.97	561.97	98.00	6.734	0					
13,700.00	7,190.00	13,787.50	7,190.00	49.70	50.02	-90.00	659.97	560.61	99.36	6.642	0					
13,800.00	7,190.00	13,887.50	7,190.00	50.38	50.70	-90.00	659.97	559.25	100.72	6.552	0					
13,900.00	7,190.00	13,987.50	7,190.00	51.06	51.37	-90.00	659.97	557.89	102.08	6.465	0					
14,000.00	7,190.00	14,087.49	7,190.00	51.74	52.05	-90.00	659.98	556.53	103.45	6.380	0					
14,100.00	7,190.00	14,187.49	7,190.00	52.42	52.73	-90.00	659.98	555.17	104.81	6.297	0					
14,200.00	7,190.00	14,287.49	7,190.00	53.11	53.41	-90.00	659.98	553.81	106.18	6.216	0					
14,300.00	7,190.00	14,387.49	7,190.00	53.79	54.09	-90.00	659.99	552.44	107.55	6.137	0					
14,400.00	7,190.00	14,487.49	7,190.00	54.47	54.77	-90.00	659.99	551.08	108.91	6.060	0					
14,500.00	7,190.00	14,587.49	7,190.00	55.16	55.45	-90.00	659.99	549.71	110.28	5.985	0					

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



Schlumberger
Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
14,600.00	7,190.00	14,687.49	7,190.00	55.84	56.13	-90.00	660.00	548.35	111.65	5.911	0		
14,700.00	7,190.00	14,787.49	7,190.00	56.53	56.81	-90.00	660.00	546.98	113.02	5.839	0		
14,800.00	7,190.00	14,887.49	7,190.00	57.21	57.50	-90.00	660.01	545.61	114.40	5.769	0		
14,900.00	7,190.00	14,987.49	7,190.00	57.90	58.18	-90.00	660.01	544.24	115.77	5.701	0		
15,000.00	7,190.00	15,087.49	7,190.00	58.59	58.86	-90.00	660.01	542.87	117.14	5.634	0		
15,100.00	7,190.00	15,187.49	7,190.00	59.27	59.55	-90.00	660.02	541.50	118.52	5.569	0		
15,200.00	7,190.00	15,287.49	7,190.00	59.96	60.23	-90.00	660.02	540.13	119.89	5.505	0		
15,300.00	7,190.00	15,387.49	7,190.00	60.65	60.92	-90.00	660.02	538.76	121.27	5.443	0		
15,400.00	7,190.00	15,487.49	7,190.00	61.34	61.60	-90.00	660.03	537.38	122.64	5.382	0		
15,500.00	7,190.00	15,587.49	7,190.00	62.02	62.29	-90.00	660.03	536.01	124.02	5.322	0		
15,600.00	7,190.00	15,687.49	7,190.00	62.71	62.97	-90.00	660.04	534.64	125.40	5.263	0		
15,700.00	7,190.00	15,787.49	7,190.00	63.40	63.66	-90.00	660.04	533.26	126.78	5.206	0		
15,800.00	7,190.00	15,887.49	7,190.00	64.09	64.35	-90.00	660.04	531.89	128.16	5.150	0		
15,900.00	7,190.00	15,987.49	7,190.00	64.78	65.04	-90.00	660.05	530.51	129.54	5.095	0		
16,000.00	7,190.00	16,087.49	7,190.00	65.47	65.72	-90.00	660.05	529.14	130.92	5.042	0		
16,100.00	7,190.00	16,187.49	7,190.00	66.16	66.41	-90.00	660.06	527.76	132.30	4.989	0		
16,200.00	7,190.00	16,287.49	7,190.00	66.85	67.10	-90.00	660.06	526.38	133.68	4.938	0		
16,300.00	7,190.00	16,387.49	7,190.00	67.54	67.79	-90.00	660.07	525.00	135.06	4.887	0		
16,400.00	7,190.00	16,487.49	7,190.00	68.23	68.48	-90.00	660.07	523.63	136.44	4.838	0		
16,500.00	7,190.00	16,587.49	7,190.00	68.92	69.17	-90.00	660.08	522.25	137.83	4.789	0		
16,600.00	7,190.00	16,687.49	7,190.00	69.62	69.86	-90.00	660.08	520.87	139.21	4.742	0		
16,700.00	7,190.00	16,787.49	7,190.00	70.31	70.55	-90.00	660.08	519.49	140.59	4.695	0		
16,800.00	7,190.00	16,887.49	7,190.00	71.00	71.24	-90.00	660.09	518.11	141.98	4.649	0		
16,900.00	7,190.00	16,987.49	7,190.00	71.69	71.93	-90.00	660.09	516.73	143.36	4.604	0		
17,000.00	7,190.00	17,087.48	7,190.00	72.38	72.62	-90.00	660.10	515.35	144.75	4.560	0		
17,100.00	7,190.00	17,187.48	7,190.00	73.08	73.31	-90.00	660.10	513.97	146.14	4.517	0		
17,200.00	7,190.00	17,287.48	7,190.00	73.77	74.00	-90.00	660.11	512.59	147.52	4.475	0		
17,220.59	7,190.00	17,308.07	7,190.00	73.91	74.14	-90.00	660.11	512.30	147.81	4.466	0		
17,242.86	7,190.00	17,324.42	7,190.00	74.07	74.25	-90.00	660.14	512.06	148.07	4.458	0		SF



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision		
0.00	0.00	4.00	4.00	0.00	0.01	179.93	167.95				0			
100.00	100.00	104.00	104.00	0.15	0.15	179.93	167.95	167.65	0.30	559.473	0			
200.00	200.00	204.00	204.00	0.32	0.33	179.93	167.95	167.30	0.65	258.681	0			
300.00	300.00	304.00	304.00	0.50	0.50	179.93	167.95	166.95	1.00	168.233	0			
400.00	400.00	404.00	404.00	0.67	0.68	179.93	167.95	166.60	1.35	124.650	0			
500.00	500.00	504.00	504.00	0.84	0.85	179.93	167.95	166.26	1.70	99.002	0			
600.00	600.00	604.00	604.00	1.02	1.03	179.93	167.95	165.91	2.05	82.107	0			
700.00	700.00	704.00	704.00	1.19	1.20	179.93	167.95	165.56	2.39	70.138	0			
765.28	765.28	769.28	769.28	1.31	1.31	179.93	167.95	165.33	2.62	64.044	0			
800.00	800.00	803.84	803.84	1.37	1.38	179.93	167.95	165.21	2.74	61.222	0			
900.00	899.98	900.00	899.98	1.54	1.54	-141.24	170.61	167.53	3.09	55.302	0			
1,000.00	999.84	995.27	995.11	1.72	1.71	-141.05	178.38	174.95	3.42	52.094	0			
1,100.00	1,099.45	1,090.04	1,089.55	1.90	1.88	-140.77	191.22	187.46	3.76	50.832	0			
1,200.00	1,198.70	1,183.72	1,182.58	2.07	2.05	-140.43	209.07	204.97	4.10	51.024	0			
1,237.30	1,235.60	1,219.45	1,217.96	2.14	2.11	-140.30	216.93	212.71	4.22	51.359	0			
1,300.00	1,297.57	1,280.66	1,278.59	2.26	2.22	-140.32	230.51	226.06	4.44	51.870	0			
1,400.00	1,396.41	1,378.29	1,375.28	2.44	2.40	-140.35	252.16	247.36	4.80	52.575	0			
1,500.00	1,495.25	1,475.92	1,471.97	2.62	2.58	-140.37	273.80	268.65	5.15	53.170	0			
1,600.00	1,594.09	1,573.55	1,568.66	2.81	2.76	-140.39	295.45	289.95	5.50	53.679	0			
1,700.00	1,692.92	1,671.18	1,665.35	3.00	2.94	-140.41	317.10	311.24	5.86	54.120	0			
1,800.00	1,791.76	1,768.80	1,762.04	3.18	3.12	-140.43	338.75	332.54	6.22	54.504	0			
1,900.00	1,890.60	1,866.43	1,858.73	3.37	3.30	-140.44	360.40	353.83	6.57	54.843	0			
2,000.00	1,989.44	1,964.06	1,955.42	3.56	3.48	-140.45	382.05	375.12	6.93	55.143	0			
2,100.00	2,088.27	2,061.69	2,052.11	3.75	3.66	-140.46	403.70	396.41	7.29	55.411	0			
2,200.00	2,187.11	2,159.32	2,148.80	3.94	3.84	-140.47	425.35	417.70	7.64	55.651	0			
2,300.00	2,285.95	2,256.95	2,245.49	4.13	4.02	-140.48	447.00	438.99	8.00	55.868	0			
2,400.00	2,384.78	2,354.58	2,342.18	4.31	4.21	-140.49	468.64	460.29	8.36	56.065	0			
2,500.00	2,483.62	2,452.20	2,438.87	4.50	4.39	-140.49	490.29	481.58	8.72	56.244	0			
2,600.00	2,582.46	2,549.83	2,535.56	4.69	4.57	-140.50	511.94	502.87	9.08	56.408	0			
2,700.00	2,681.30	2,647.46	2,632.25	4.88	4.76	-140.51	533.59	524.16	9.43	56.558	0			
2,800.00	2,780.13	2,745.09	2,728.94	5.07	4.94	-140.51	555.24	545.45	9.79	56.697	0			
2,900.00	2,878.97	2,842.72	2,825.63	5.26	5.12	-140.52	576.89	566.74	10.15	56.824	0			
3,000.00	2,977.81	2,940.35	2,922.32	5.45	5.31	-140.52	598.54	588.03	10.51	56.943	0			
3,100.00	3,076.64	3,037.98	3,019.01	5.64	5.49	-140.53	620.19	609.32	10.87	57.053	0			
3,200.00	3,175.48	3,135.60	3,115.70	5.84	5.67	-140.53	641.84	630.61	11.23	57.156	0			
3,300.00	3,274.32	3,233.23	3,212.39	6.03	5.86	-140.53	663.48	651.90	11.59	57.251	0			
3,400.00	3,373.16	3,330.86	3,309.08	6.22	6.04	-140.54	685.13	673.19	11.95	57.341	0			
3,500.00	3,471.99	3,428.49	3,405.77	6.41	6.22	-140.54	706.78	694.48	12.31	57.425	0			
3,600.00	3,570.83	3,526.12	3,502.46	6.60	6.41	-140.54	728.43	715.76	12.67	57.504	0			
3,700.00	3,669.67	3,623.75	3,599.15	6.79	6.59	-140.55	750.08	737.05	13.03	57.578	0			
3,800.00	3,768.51	3,721.37	3,695.84	6.98	6.77	-140.55	771.73	758.34	13.39	57.648	0			
3,900.00	3,867.34	3,819.00	3,792.53	7.17	6.96	-140.55	793.38	779.63	13.75	57.715	0			
4,000.00	3,966.18	3,916.63	3,889.22	7.36	7.14	-140.56	815.03	800.92	14.11	57.777	0			
4,100.00	4,065.02	4,014.26	3,985.91	7.55	7.33	-140.56	836.68	822.21	14.47	57.837	0			
4,200.00	4,163.85	4,111.89	4,082.60	7.74	7.51	-140.56	858.33	843.50	14.83	57.893	0			
4,300.00	4,262.69	4,209.52	4,179.29	7.94	7.69	-140.56	879.97	864.79	15.19	57.946	0			
4,400.00	4,361.53	4,307.15	4,275.98	8.13	7.88	-140.56	901.62	886.08	15.55	57.997	0			
4,500.00	4,460.37	4,404.77	4,372.67	8.32	8.06	-140.57	923.27	907.37	15.91	58.046	0			
4,600.00	4,559.20	4,502.40	4,469.36	8.51	8.24	-140.57	944.92	928.66	16.27	58.092	0			
4,700.00	4,658.04	4,600.03	4,566.05	8.70	8.43	-140.57	966.57	949.94	16.63	58.136	0			
4,800.00	4,756.88	4,697.66	4,662.74	8.89	8.61	-140.57	988.22	971.23	16.99	58.178	0			
4,900.00	4,855.71	4,795.29	4,759.43	9.08	8.80	-140.57	1,009.87	992.52	17.35	58.218	0			
5,000.00	4,954.55	4,892.92	4,856.12	9.27	8.98	-140.57	1,031.52	1,013.81	17.71	58.257	0			
5,100.00	5,053.39	4,990.54	4,952.81	9.47	9.17	-140.58	1,053.17	1,035.10	18.07	58.294	0			

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder												Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
5,200.00	5,152.23	5,088.17	5,049.50	9.66	9.35	-140.58	1,074.82	1,056.39	18.43	58.329	0		
5,300.00	5,251.06	5,185.80	5,146.19	9.85	9.53	-140.58	1,096.46	1,077.68	18.79	58.363	0		
5,400.00	5,349.90	5,283.43	5,242.88	10.04	9.72	-140.58	1,118.11	1,098.97	19.15	58.396	0		
5,500.00	5,448.74	5,381.06	5,339.57	10.23	9.90	-140.58	1,139.76	1,120.26	19.51	58.427	0		
5,600.00	5,547.58	5,478.69	5,436.26	10.42	10.09	-140.58	1,161.41	1,141.54	19.87	58.458	0		
5,700.00	5,646.41	5,576.32	5,532.95	10.61	10.27	-140.58	1,183.06	1,162.83	20.23	58.487	0		
5,800.00	5,745.25	5,673.94	5,629.64	10.81	10.45	-140.58	1,204.71	1,184.12	20.59	58.515	0		
5,900.00	5,844.09	5,771.57	5,726.33	11.00	10.64	-140.59	1,226.36	1,205.41	20.95	58.542	0		
6,000.00	5,942.92	5,869.20	5,823.02	11.19	10.82	-140.59	1,248.01	1,226.70	21.31	58.568	0		
6,075.73	6,017.78	5,943.14	5,896.24	11.33	10.96	-140.59	1,264.40	1,242.82	21.58	58.587	0		
6,100.00	6,041.78	5,966.85	5,919.72	11.38	11.01	-140.65	1,269.58	1,247.90	21.68	58.565	0		
6,200.00	6,140.97	6,064.87	6,016.81	11.56	11.19	-140.83	1,289.27	1,267.20	22.07	58.425	0		
6,300.00	6,240.54	6,191.58	6,142.46	11.74	11.43	-140.86	1,305.67	1,283.18	22.49	58.045	0		
6,400.00	6,340.38	6,339.98	6,290.34	11.91	11.69	-140.85	1,316.05	1,293.11	22.94	57.367	0		
6,500.00	6,440.35	6,489.58	6,439.85	12.08	11.94	-140.85	1,319.98	1,296.61	23.37	56.485	0		
6,513.03	6,453.38	6,507.11	6,457.38	12.10	11.97	-179.59	1,320.02	1,296.45	23.57	56.006	0		
6,600.00	6,540.35	6,594.08	6,544.35	12.24	12.11	-179.59	1,320.02	1,296.15	23.86	55.321	0		
6,613.03	6,553.38	6,607.17	6,557.44	12.26	12.13	-179.59	1,320.02	1,296.11	23.91	55.219	0		
6,650.00	6,590.33	6,644.69	6,594.93	12.32	12.19	90.40	1,320.01	1,296.14	23.88	55.282	0		
6,700.00	6,640.08	6,695.40	6,645.35	12.39	12.27	90.38	1,320.01	1,295.98	24.03	54.927	0		
6,750.00	6,689.29	6,746.08	6,695.15	12.46	12.34	90.36	1,320.01	1,295.83	24.18	54.596	0		
6,800.00	6,737.67	6,796.72	6,744.02	12.53	12.41	90.34	1,320.01	1,295.69	24.32	54.285	0		
6,850.00	6,784.91	6,847.32	6,791.65	12.60	12.47	90.32	1,320.00	1,295.55	24.45	53.992	0		
6,900.00	6,830.73	6,897.88	6,837.72	12.66	12.53	90.29	1,320.00	1,295.42	24.57	53.714	0		
6,950.00	6,874.83	6,948.38	6,881.97	12.72	12.59	90.26	1,320.00	1,295.30	24.70	53.446	0		
7,000.00	6,916.95	6,998.83	6,924.10	12.78	12.65	90.23	1,319.99	1,295.17	24.82	53.183	0		
7,050.00	6,956.84	7,049.23	6,963.87	12.83	12.71	90.20	1,319.99	1,295.05	24.94	52.922	0		
7,100.00	6,994.23	7,099.56	7,001.02	12.89	12.77	90.17	1,319.99	1,294.92	25.07	52.658	0		
7,150.00	7,028.90	7,149.84	7,035.34	12.95	12.83	90.14	1,319.99	1,294.79	25.20	52.385	0		
7,200.00	7,060.65	7,200.06	7,066.62	13.02	12.90	90.11	1,319.98	1,294.65	25.34	52.098	0		
7,250.00	7,089.26	7,250.21	7,094.67	13.08	12.96	90.07	1,319.98	1,294.50	25.49	51.794	0		
7,300.00	7,114.58	7,300.31	7,119.33	13.15	13.03	90.04	1,319.98	1,294.34	25.65	51.469	0		
7,350.00	7,136.43	7,350.33	7,140.47	13.23	13.11	90.00	1,319.98	1,294.16	25.82	51.120	0		
7,352.87	7,137.57	7,353.20	7,141.57	13.23	13.11	90.00	1,319.98	1,294.01	25.97	50.829	0		
7,400.00	7,154.69	7,400.30	7,157.97	13.31	13.19	89.97	1,319.98	1,293.97	26.01	50.744	0		
7,450.00	7,169.24	7,450.20	7,171.72	13.40	13.28	89.93	1,319.98	1,293.76	26.22	50.342	0		
7,500.00	7,179.99	7,500.00	7,181.67	13.50	13.39	89.90	1,319.98	1,293.54	26.45	49.914	0		
7,550.00	7,186.88	7,549.82	7,187.77	13.61	13.50	89.86	1,319.99	1,293.30	26.69	49.460	0		
7,600.00	7,189.87	7,599.54	7,189.99	13.73	13.63	89.83	1,319.99	1,293.04	26.95	48.985	0		
7,613.03	7,190.00	7,612.56	7,190.00	13.76	13.66	89.83	1,319.99	1,292.97	27.02	48.856	0		
7,700.00	7,190.00	7,699.52	7,190.00	14.00	13.91	89.83	1,319.99	1,292.48	27.51	47.978	0		
7,800.00	7,190.00	7,799.52	7,190.00	14.31	14.22	89.83	1,319.99	1,291.85	28.14	46.913	0		
7,900.00	7,190.00	7,899.52	7,190.00	14.64	14.56	89.83	1,319.99	1,291.17	28.82	45.806	0		
8,000.00	7,190.00	7,999.52	7,190.00	15.00	14.93	89.83	1,319.99	1,290.44	29.55	44.672	0		
8,100.00	7,190.00	8,099.52	7,190.00	15.39	15.31	89.83	1,319.99	1,289.66	30.33	43.525	0		
8,200.00	7,190.00	8,199.52	7,190.00	15.80	15.72	89.83	1,319.99	1,288.84	31.15	42.375	0		
8,300.00	7,190.00	8,299.52	7,190.00	16.23	16.16	89.83	1,319.99	1,287.97	32.01	41.231	0		
8,400.00	7,190.00	8,399.52	7,190.00	16.67	16.60	89.83	1,319.99	1,287.07	32.92	40.102	0		
8,500.00	7,190.00	8,499.52	7,190.00	17.14	17.07	89.83	1,319.99	1,286.14	33.85	38.993	0		
8,600.00	7,190.00	8,599.52	7,190.00	17.61	17.55	89.83	1,319.99	1,285.17	34.82	37.910	0		
8,700.00	7,190.00	8,699.52	7,190.00	18.11	18.05	89.83	1,319.99	1,284.17	35.82	36.855	0		
8,800.00	7,190.00	8,799.52	7,190.00	18.62	18.56	89.83	1,319.99	1,283.15	36.84	35.831	0		
8,900.00	7,190.00	8,899.52	7,190.00	19.13	19.08	89.83	1,319.99	1,282.10	37.89	34.840	0		
9,000.00	7,190.00	8,999.52	7,190.00	19.67	19.61	89.83	1,319.99	1,281.03	38.96	33.882	0		

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



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
9,100.00	7,190.00	9,099.52	7,190.00	20.21	20.15	89.83	1,319.99	1,279.94	40.05	32.958	0		
9,200.00	7,190.00	9,199.52	7,190.00	20.76	20.71	89.83	1,319.99	1,278.83	41.16	32.069	0		
9,300.00	7,190.00	9,299.52	7,190.00	21.32	21.27	89.83	1,319.99	1,277.70	42.29	31.213	0		
9,400.00	7,190.00	9,399.52	7,190.00	21.88	21.84	89.83	1,319.99	1,276.55	43.43	30.391	0		
9,500.00	7,190.00	9,499.52	7,190.00	22.46	22.42	89.83	1,319.99	1,275.39	44.59	29.600	0		
9,600.00	7,190.00	9,599.52	7,190.00	23.04	23.00	89.83	1,319.99	1,274.22	45.77	28.841	0		
9,700.00	7,190.00	9,699.52	7,190.00	23.63	23.59	89.83	1,319.99	1,273.03	46.95	28.113	0		
9,800.00	7,190.00	9,799.52	7,190.00	24.23	24.19	89.83	1,319.99	1,271.84	48.15	27.413	0		
9,900.00	7,190.00	9,899.52	7,190.00	24.83	24.79	89.83	1,319.99	1,270.63	49.36	26.741	0		
10,000.00	7,190.00	9,999.52	7,190.00	25.44	25.40	89.83	1,319.99	1,269.41	50.58	26.097	0		
10,100.00	7,190.00	10,099.52	7,190.00	26.05	26.01	89.83	1,319.99	1,268.18	51.81	25.477	0		
10,200.00	7,190.00	10,199.52	7,190.00	26.66	26.63	89.83	1,319.99	1,266.94	53.05	24.883	0		
10,300.00	7,190.00	10,299.52	7,190.00	27.28	27.25	89.83	1,319.99	1,265.69	54.29	24.312	0		
10,400.00	7,190.00	10,399.52	7,190.00	27.91	27.87	89.83	1,319.99	1,264.44	55.55	23.763	0		
10,500.00	7,190.00	10,499.52	7,190.00	28.53	28.50	89.83	1,319.99	1,263.18	56.81	23.236	0		
10,600.00	7,190.00	10,599.52	7,190.00	29.16	29.13	89.83	1,319.99	1,261.91	58.08	22.728	0		
10,700.00	7,190.00	10,699.52	7,190.00	29.80	29.77	89.83	1,319.99	1,260.64	59.35	22.240	0		
10,800.00	7,190.00	10,799.52	7,190.00	30.44	30.41	89.83	1,319.99	1,259.36	60.63	21.771	0		
10,900.00	7,190.00	10,899.52	7,190.00	31.08	31.05	89.83	1,319.99	1,258.07	61.92	21.319	0		
11,000.00	7,190.00	10,999.52	7,190.00	31.72	31.69	89.83	1,319.99	1,256.78	63.21	20.884	0		
11,100.00	7,190.00	11,099.52	7,190.00	32.36	32.34	89.83	1,319.99	1,255.49	64.50	20.464	0		
11,200.00	7,190.00	11,199.52	7,190.00	33.01	32.99	89.83	1,319.99	1,254.19	65.80	20.060	0		
11,300.00	7,190.00	11,299.52	7,190.00	33.66	33.64	89.83	1,319.99	1,252.88	67.11	19.670	0		
11,400.00	7,190.00	11,399.52	7,190.00	34.31	34.29	89.83	1,319.99	1,251.57	68.42	19.294	0		
11,500.00	7,190.00	11,499.52	7,190.00	34.97	34.95	89.83	1,319.99	1,250.26	69.73	18.931	0		
11,600.00	7,190.00	11,599.52	7,190.00	35.62	35.60	89.83	1,319.99	1,248.94	71.04	18.580	0		
11,700.00	7,190.00	11,699.52	7,190.00	36.28	36.26	89.83	1,319.99	1,247.63	72.36	18.241	0		
11,800.00	7,190.00	11,799.52	7,190.00	36.94	36.92	89.83	1,319.99	1,246.30	73.69	17.914	0		
11,900.00	7,190.00	11,899.52	7,190.00	37.60	37.58	89.83	1,319.99	1,244.98	75.01	17.597	0		
12,000.00	7,190.00	11,999.52	7,190.00	38.26	38.25	89.83	1,319.99	1,243.65	76.34	17.291	0		
12,100.00	7,190.00	12,099.52	7,190.00	38.93	38.91	89.83	1,319.99	1,242.32	77.67	16.995	0		
12,200.00	7,190.00	12,199.52	7,190.00	39.59	39.58	89.83	1,319.99	1,240.98	79.01	16.708	0		
12,300.00	7,190.00	12,299.52	7,190.00	40.26	40.24	89.83	1,319.99	1,239.65	80.34	16.430	0		
12,400.00	7,190.00	12,399.52	7,190.00	40.93	40.91	89.83	1,319.99	1,238.31	81.68	16.160	0		
12,500.00	7,190.00	12,499.52	7,190.00	41.60	41.58	89.83	1,319.99	1,236.97	83.02	15.899	0		
12,600.00	7,190.00	12,599.52	7,190.00	42.27	42.25	89.83	1,319.99	1,235.62	84.36	15.646	0		
12,700.00	7,190.00	12,699.52	7,190.00	42.94	42.93	89.83	1,319.99	1,234.28	85.71	15.401	0		
12,800.00	7,190.00	12,799.52	7,190.00	43.61	43.60	89.83	1,319.99	1,232.93	87.06	15.162	0		
12,900.00	7,190.00	12,899.52	7,190.00	44.28	44.27	89.83	1,319.99	1,231.58	88.41	14.931	0		
13,000.00	7,190.00	12,999.52	7,190.00	44.96	44.95	89.83	1,319.99	1,230.23	89.76	14.706	0		
13,100.00	7,190.00	13,099.52	7,190.00	45.63	45.62	89.83	1,319.99	1,228.88	91.11	14.488	0		
13,200.00	7,190.00	13,199.52	7,190.00	46.31	46.30	89.83	1,319.99	1,227.52	92.46	14.276	0		
13,300.00	7,190.00	13,299.52	7,190.00	46.99	46.98	89.83	1,319.99	1,226.17	93.82	14.069	0		
13,400.00	7,190.00	13,399.52	7,190.00	47.66	47.65	89.83	1,319.99	1,224.81	95.18	13.869	0		
13,500.00	7,190.00	13,499.52	7,190.00	48.34	48.33	89.83	1,319.99	1,223.45	96.54	13.673	0		
13,600.00	7,190.00	13,599.52	7,190.00	49.02	49.01	89.83	1,319.99	1,222.09	97.90	13.484	0		
13,700.00	7,190.00	13,699.52	7,190.00	49.70	49.69	89.83	1,319.99	1,220.73	99.26	13.299	0		
13,800.00	7,190.00	13,799.52	7,190.00	50.38	50.37	89.83	1,319.99	1,219.37	100.62	13.118	0		
13,900.00	7,190.00	13,899.52	7,190.00	51.06	51.05	89.83	1,319.99	1,218.00	101.98	12.943	0		
14,000.00	7,190.00	13,999.52	7,190.00	51.74	51.74	89.83	1,319.99	1,216.64	103.35	12.772	0		
14,100.00	7,190.00	14,099.52	7,190.00	52.42	52.42	89.83	1,319.99	1,215.27	104.72	12.605	0		
14,200.00	7,190.00	14,199.52	7,190.00	53.11	53.10	89.83	1,319.99	1,213.91	106.08	12.443	0		
14,300.00	7,190.00	14,299.52	7,190.00	53.79	53.78	89.83	1,319.99	1,212.54	107.45	12.285	0		
14,400.00	7,190.00	14,399.52	7,190.00	54.47	54.47	89.83	1,319.99	1,211.17	108.82	12.130	0		

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



Schlumberger
Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
14,500.00	7,190.00	14,499.52	7,190.00	55.16	55.15	89.83	1,319.99	1,209.80	110.19	11.979	0		
14,600.00	7,190.00	14,599.52	7,190.00	55.84	55.84	89.83	1,319.99	1,208.43	111.56	11.832	0		
14,700.00	7,190.00	14,699.52	7,190.00	56.53	56.52	89.83	1,319.99	1,207.05	112.93	11.688	0		
14,800.00	7,190.00	14,799.52	7,190.00	57.21	57.21	89.83	1,319.99	1,205.68	114.31	11.548	0		
14,900.00	7,190.00	14,899.52	7,190.00	57.90	57.90	89.83	1,319.99	1,204.31	115.68	11.411	0		
15,000.00	7,190.00	14,999.52	7,190.00	58.59	58.58	89.83	1,319.99	1,202.93	117.05	11.277	0		
15,100.00	7,190.00	15,099.52	7,190.00	59.27	59.27	89.83	1,319.99	1,201.56	118.43	11.146	0		
15,200.00	7,190.00	15,199.52	7,190.00	59.96	59.96	89.83	1,319.99	1,200.18	119.81	11.018	0		
15,300.00	7,190.00	15,299.52	7,190.00	60.65	60.64	89.83	1,319.99	1,198.81	121.18	10.893	0		
15,400.00	7,190.00	15,399.52	7,190.00	61.34	61.33	89.83	1,319.99	1,197.43	122.56	10.770	0		
15,500.00	7,190.00	15,499.52	7,190.00	62.02	62.02	89.83	1,319.99	1,196.05	123.94	10.650	0		
15,600.00	7,190.00	15,599.52	7,190.00	62.71	62.71	89.83	1,319.99	1,194.67	125.32	10.533	0		
15,700.00	7,190.00	15,699.52	7,190.00	63.40	63.40	89.83	1,319.99	1,193.29	126.70	10.419	0		
15,800.00	7,190.00	15,799.52	7,190.00	64.09	64.09	89.83	1,319.99	1,191.91	128.08	10.306	0		
15,900.00	7,190.00	15,899.52	7,190.00	64.78	64.78	89.83	1,319.99	1,190.53	129.46	10.196	0		
16,000.00	7,190.00	15,999.52	7,190.00	65.47	65.47	89.83	1,319.99	1,189.15	130.84	10.089	0		
16,100.00	7,190.00	16,099.52	7,190.00	66.16	66.16	89.83	1,319.99	1,187.77	132.22	9.983	0		
16,200.00	7,190.00	16,199.52	7,190.00	66.85	66.85	89.83	1,319.99	1,186.39	133.60	9.880	0		
16,300.00	7,190.00	16,299.52	7,190.00	67.54	67.54	89.83	1,319.99	1,185.00	134.98	9.779	0		
16,400.00	7,190.00	16,399.52	7,190.00	68.23	68.23	89.83	1,319.99	1,183.62	136.37	9.680	0		
16,500.00	7,190.00	16,499.52	7,190.00	68.92	68.92	89.83	1,319.99	1,182.24	137.75	9.582	0		
16,600.00	7,190.00	16,599.52	7,190.00	69.62	69.62	89.83	1,319.99	1,180.85	139.13	9.487	0		
16,700.00	7,190.00	16,699.52	7,190.00	70.31	70.31	89.83	1,319.99	1,179.47	140.52	9.394	0		
16,800.00	7,190.00	16,799.52	7,190.00	71.00	71.00	89.83	1,319.99	1,178.08	141.90	9.302	0		
16,900.00	7,190.00	16,899.52	7,190.00	71.69	71.69	89.83	1,319.99	1,176.70	143.29	9.212	0		
17,000.00	7,190.00	16,999.52	7,190.00	72.38	72.38	89.83	1,319.99	1,175.31	144.68	9.124	0		
17,100.00	7,190.00	17,099.52	7,190.00	73.08	73.08	89.83	1,319.99	1,173.93	146.06	9.037	0		
17,200.00	7,190.00	17,199.52	7,190.00	73.77	73.77	89.83	1,319.99	1,172.54	147.45	8.952	0		
17,242.86	7,190.00	17,245.55	7,190.00	74.07	74.09	89.83	1,319.88	1,171.82	148.07	8.914	0	SF	



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision		
0.00	0.00	5.00	5.00	0.00	0.01	179.96	196.01						CC ES	
100.00	100.00	105.00	105.00	0.15	0.16	179.96	196.01	195.70	0.30	649.149	0			
200.00	200.00	205.00	205.00	0.32	0.33	179.96	196.01	195.35	0.65	301.080	0			
300.00	300.00	305.00	305.00	0.50	0.50	179.96	196.01	195.01	1.00	195.991	0			
400.00	400.00	405.00	405.00	0.67	0.68	179.96	196.01	194.66	1.35	145.282	0			
500.00	500.00	505.00	505.00	0.84	0.85	179.96	196.01	194.31	1.70	115.419	0			
600.00	600.00	605.00	605.00	1.02	1.03	179.96	196.01	193.96	2.05	95.740	0			
664.91	664.91	669.91	669.91	1.13	1.14	179.96	196.01	193.73	2.27	86.200	0			
700.00	700.00	704.73	704.73	1.19	1.20	179.96	196.01	193.61	2.40	81.811	0			
800.00	800.00	800.00	799.98	1.37	1.37	-179.77	197.55	194.82	2.74	72.186	0			
900.00	899.98	893.39	893.24	1.54	1.53	-140.55	203.26	200.19	3.07	66.127	0			
1,000.00	999.84	986.91	986.43	1.72	1.70	-140.15	214.46	211.05	3.41	62.889	0			
1,100.00	1,099.45	1,079.35	1,078.24	1.90	1.86	-139.85	231.07	227.33	3.74	61.720	0			
1,200.00	1,198.70	1,170.32	1,168.21	2.07	2.03	-139.63	253.00	248.92	4.07	62.089	0			
1,237.30	1,235.60	1,203.80	1,201.20	2.14	2.09	-139.56	262.51	258.32	4.20	62.542	0			
1,300.00	1,297.57	1,262.19	1,258.62	2.26	2.20	-139.62	279.46	275.05	4.41	63.326	0			
1,400.00	1,396.41	1,358.42	1,353.22	2.44	2.38	-139.70	306.65	301.89	4.76	64.376	0			
1,500.00	1,495.25	1,454.65	1,447.82	2.62	2.56	-139.77	333.85	328.73	5.12	65.268	0			
1,600.00	1,594.09	1,550.88	1,542.42	2.81	2.75	-139.82	361.04	355.57	5.47	66.033	0			
1,700.00	1,692.92	1,647.11	1,637.01	3.00	2.93	-139.87	388.23	382.41	5.82	66.696	0			
1,800.00	1,791.76	1,743.34	1,731.61	3.18	3.12	-139.91	415.42	409.25	6.17	67.276	0			
1,900.00	1,890.60	1,839.58	1,826.21	3.37	3.30	-139.94	442.62	436.09	6.53	67.788	0			
2,000.00	1,989.44	1,935.81	1,920.81	3.56	3.49	-139.98	469.81	462.92	6.88	68.242	0			
2,100.00	2,088.27	2,032.04	2,015.41	3.75	3.68	-140.00	497.00	489.76	7.24	68.648	0			
2,200.00	2,187.11	2,128.27	2,110.01	3.94	3.87	-140.03	524.19	516.60	7.60	69.012	0			
2,300.00	2,285.95	2,224.50	2,204.60	4.13	4.06	-140.05	551.39	543.44	7.95	69.342	0			
2,400.00	2,384.78	2,320.73	2,299.20	4.31	4.24	-140.07	578.58	570.27	8.31	69.641	0			
2,500.00	2,483.62	2,416.96	2,393.80	4.50	4.43	-140.09	605.77	597.11	8.66	69.914	0			
2,600.00	2,582.46	2,513.20	2,488.40	4.69	4.62	-140.11	632.97	623.94	9.02	70.163	0			
2,700.00	2,681.30	2,609.43	2,583.00	4.88	4.81	-140.12	660.16	650.78	9.38	70.392	0			
2,800.00	2,780.13	2,705.66	2,677.59	5.07	5.00	-140.14	687.35	677.62	9.74	70.604	0			
2,900.00	2,878.97	2,801.89	2,772.19	5.26	5.19	-140.15	714.55	704.45	10.09	70.799	0			
3,000.00	2,977.81	2,898.12	2,866.79	5.45	5.38	-140.16	741.74	731.29	10.45	70.980	0			
3,100.00	3,076.64	2,994.35	2,961.39	5.64	5.57	-140.18	768.93	758.13	10.81	71.148	0			
3,200.00	3,175.48	3,090.58	3,055.99	5.84	5.76	-140.19	796.13	784.96	11.17	71.305	0			
3,300.00	3,274.32	3,186.82	3,150.59	6.03	5.95	-140.20	823.32	811.80	11.52	71.452	0			
3,400.00	3,373.16	3,283.05	3,245.18	6.22	6.14	-140.21	850.51	838.63	11.88	71.589	0			
3,500.00	3,471.99	3,379.28	3,339.78	6.41	6.33	-140.22	877.71	865.47	12.24	71.718	0			
3,600.00	3,570.83	3,475.51	3,434.38	6.60	6.52	-140.22	904.90	892.30	12.60	71.839	0			
3,700.00	3,669.67	3,571.74	3,528.98	6.79	6.71	-140.23	932.09	919.14	12.95	71.953	0			
3,800.00	3,768.51	3,667.97	3,623.58	6.98	6.90	-140.24	959.29	945.97	13.31	72.061	0			
3,900.00	3,867.34	3,764.21	3,718.17	7.17	7.09	-140.25	986.48	972.81	13.67	72.162	0			
4,000.00	3,966.18	3,860.44	3,812.77	7.36	7.29	-140.25	1,013.67	999.65	14.03	72.259	0			
4,100.00	4,065.02	3,956.67	3,907.37	7.55	7.48	-140.26	1,040.87	1,026.48	14.39	72.350	0			
4,200.00	4,163.85	4,052.90	4,001.97	7.74	7.67	-140.26	1,068.06	1,053.32	14.74	72.436	0			
4,300.00	4,262.69	4,149.13	4,096.57	7.94	7.86	-140.27	1,095.25	1,080.15	15.10	72.518	0			
4,400.00	4,361.53	4,245.36	4,191.17	8.13	8.05	-140.28	1,122.45	1,106.99	15.46	72.597	0			
4,500.00	4,460.37	4,341.59	4,285.76	8.32	8.24	-140.28	1,149.64	1,133.82	15.82	72.671	0			
4,600.00	4,559.20	4,437.83	4,380.36	8.51	8.43	-140.29	1,176.84	1,160.66	16.18	72.742	0			
4,700.00	4,658.04	4,534.06	4,474.96	8.70	8.62	-140.29	1,204.03	1,187.49	16.54	72.810	0			
4,800.00	4,756.88	4,630.29	4,569.56	8.89	8.81	-140.29	1,231.22	1,214.33	16.90	72.875	0			
4,900.00	4,855.71	4,726.52	4,664.16	9.08	9.00	-140.30	1,258.42	1,241.16	17.25	72.937	0			
5,000.00	4,954.55	4,822.75	4,758.75	9.27	9.20	-140.30	1,285.61	1,268.00	17.61	72.996	0			
5,100.00	5,053.39	4,918.98	4,853.35	9.47	9.39	-140.31	1,312.80	1,294.83	17.97	73.053	0			

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



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder												Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor		
5,200.00	5,152.23	5,015.21	4,947.95	9.66	9.58	-140.31	1,340.00	1,321.67	18.33	73.108	0		
5,300.00	5,251.06	5,111.45	5,042.55	9.85	9.77	-140.31	1,367.19	1,348.50	18.69	73.160	0		
5,400.00	5,349.90	5,207.68	5,137.15	10.04	9.96	-140.32	1,394.38	1,375.34	19.05	73.211	0		
5,500.00	5,448.74	5,303.91	5,231.75	10.23	10.15	-140.32	1,421.58	1,402.17	19.40	73.259	0		
5,600.00	5,547.58	5,400.14	5,326.34	10.42	10.34	-140.32	1,448.77	1,429.01	19.76	73.306	0		
5,700.00	5,646.41	5,496.37	5,420.94	10.61	10.53	-140.33	1,475.97	1,455.84	20.12	73.351	0		
5,800.00	5,745.25	5,592.60	5,515.54	10.81	10.73	-140.33	1,503.16	1,482.68	20.48	73.394	0		
5,900.00	5,844.09	5,688.83	5,610.14	11.00	10.92	-140.33	1,530.35	1,509.51	20.84	73.436	0		
6,000.00	5,942.92	5,785.07	5,704.74	11.19	11.11	-140.34	1,557.55	1,536.35	21.20	73.476	0		
6,075.73	6,017.78	5,857.95	5,776.38	11.33	11.25	-140.34	1,578.14	1,556.67	21.47	73.506	0		
6,100.00	6,041.78	5,881.32	5,799.36	11.38	11.30	-140.42	1,584.66	1,563.10	21.57	73.473	0		
6,200.00	6,140.97	5,978.06	5,894.45	11.56	11.49	-140.70	1,609.93	1,587.96	21.96	73.297	0		
6,300.00	6,240.54	6,135.24	6,049.42	11.74	11.79	-140.80	1,631.41	1,608.96	22.45	72.656	0		
6,400.00	6,340.38	6,328.63	6,241.64	11.91	12.14	-140.83	1,644.98	1,621.99	22.99	71.552	0		
6,500.00	6,440.35	6,524.76	6,437.58	12.08	12.46	-140.85	1,650.08	1,626.57	23.51	70.198	0		
6,513.03	6,453.38	6,545.55	6,458.38	12.10	12.49	-179.59	1,650.12	1,626.01	24.11	68.454	0		
6,600.00	6,540.35	6,632.52	6,545.35	12.24	12.63	-179.59	1,650.12	1,625.73	24.39	67.650	0		
6,613.03	6,553.38	6,645.65	6,558.48	12.26	12.65	-179.59	1,650.12	1,625.68	24.44	67.531	0		
6,650.00	6,590.33	6,683.31	6,596.10	12.32	12.71	90.40	1,650.12	1,626.10	24.02	68.695	0		
6,700.00	6,640.08	6,734.21	6,646.70	12.39	12.78	90.38	1,650.11	1,625.94	24.17	68.258	0		
6,750.00	6,689.29	6,785.07	6,696.65	12.46	12.85	90.36	1,650.11	1,625.79	24.32	67.849	0		
6,800.00	6,737.67	6,835.87	6,745.65	12.53	12.92	90.34	1,650.11	1,625.65	24.46	67.466	0		
6,850.00	6,784.91	6,886.63	6,793.37	12.60	12.98	90.32	1,650.10	1,625.51	24.59	67.105	0		
6,900.00	6,830.73	6,937.33	6,839.52	12.66	13.04	90.29	1,650.10	1,625.38	24.72	66.761	0		
6,950.00	6,874.83	6,987.96	6,883.80	12.72	13.10	90.27	1,650.09	1,625.25	24.84	66.430	0		
7,000.00	6,916.95	7,038.53	6,925.93	12.78	13.16	90.24	1,650.09	1,625.13	24.96	66.106	0		
7,050.00	6,956.84	7,089.02	6,965.67	12.83	13.21	90.21	1,650.09	1,625.00	25.08	65.783	0		
7,100.00	6,994.23	7,139.45	7,002.75	12.89	13.27	90.17	1,650.08	1,624.87	25.21	65.456	0		
7,150.00	7,028.90	7,189.79	7,036.98	12.95	13.33	90.14	1,650.08	1,624.74	25.34	65.118	0		
7,200.00	7,060.65	7,240.07	7,068.13	13.02	13.39	90.11	1,650.08	1,624.60	25.48	64.764	0		
7,250.00	7,089.26	7,290.26	7,096.03	13.08	13.46	90.07	1,650.08	1,624.45	25.63	64.388	0		
7,300.00	7,114.58	7,340.37	7,120.53	13.15	13.53	90.04	1,650.08	1,624.29	25.79	63.986	0		
7,350.00	7,136.43	7,390.41	7,141.48	13.23	13.60	90.00	1,650.08	1,624.11	25.96	63.554	0		
7,352.87	7,137.58	7,393.28	7,142.58	13.23	13.60	90.00	1,650.08	1,623.97	26.10	63.220	0		
7,400.00	7,154.69	7,440.36	7,158.78	13.31	13.68	89.97	1,650.08	1,623.92	26.15	63.090	0		
7,450.00	7,169.24	7,490.24	7,172.34	13.40	13.77	89.93	1,650.08	1,623.71	26.36	62.593	0		
7,500.00	7,179.99	7,540.04	7,182.08	13.50	13.86	89.90	1,650.08	1,623.49	26.59	62.064	0		
7,550.00	7,186.88	7,589.76	7,187.97	13.61	13.97	89.86	1,650.08	1,623.25	26.83	61.505	0		
7,600.00	7,189.87	7,639.41	7,190.00	13.73	14.08	89.83	1,650.08	1,623.00	27.09	60.920	0		
7,613.03	7,190.00	7,652.43	7,190.00	13.76	14.11	89.83	1,650.08	1,622.93	27.16	60.761	0		
7,700.00	7,190.00	7,739.40	7,190.00	14.00	14.34	89.83	1,650.08	1,622.43	27.65	59.670	0		
7,800.00	7,190.00	7,839.40	7,190.00	14.31	14.63	89.83	1,650.08	1,621.81	28.28	58.356	0		
7,900.00	7,190.00	7,939.40	7,190.00	14.64	14.96	89.83	1,650.08	1,621.13	28.95	56.990	0		
8,000.00	7,190.00	8,039.40	7,190.00	15.00	15.31	89.83	1,650.08	1,620.40	29.68	55.590	0		
8,100.00	7,190.00	8,139.40	7,190.00	15.39	15.69	89.83	1,650.08	1,619.62	30.46	54.173	0		
8,200.00	7,190.00	8,239.40	7,190.00	15.80	16.09	89.83	1,650.08	1,618.80	31.28	52.752	0		
8,300.00	7,190.00	8,339.40	7,190.00	16.23	16.51	89.83	1,650.08	1,617.94	32.14	51.338	0		
8,400.00	7,190.00	8,439.40	7,190.00	16.67	16.95	89.83	1,650.08	1,617.04	33.04	49.942	0		
8,500.00	7,190.00	8,539.40	7,190.00	17.14	17.41	89.83	1,650.08	1,616.11	33.97	48.570	0		
8,600.00	7,190.00	8,639.40	7,190.00	17.61	17.88	89.83	1,650.08	1,615.14	34.94	47.228	0		
8,700.00	7,190.00	8,739.40	7,190.00	18.11	18.37	89.83	1,650.08	1,614.15	35.93	45.921	0		
8,800.00	7,190.00	8,839.40	7,190.00	18.62	18.87	89.83	1,650.08	1,613.13	36.95	44.652	0		
8,900.00	7,190.00	8,939.40	7,190.00	19.13	19.39	89.83	1,650.08	1,612.08	38.00	43.423	0		
9,000.00	7,190.00	9,039.40	7,190.00	19.67	19.91	89.83	1,650.08	1,611.01	39.07	42.236	0		

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
9,100.00	7,190.00	9,139.41	7,190.00	20.21	20.45	89.83	1,650.08	1,609.92	40.16	41.090	0		
9,200.00	7,190.00	9,239.41	7,190.00	20.76	21.00	89.83	1,650.08	1,608.81	41.27	39.986	0		
9,300.00	7,190.00	9,339.41	7,190.00	21.32	21.55	89.83	1,650.08	1,607.69	42.39	38.923	0		
9,400.00	7,190.00	9,439.41	7,190.00	21.88	22.11	89.83	1,650.08	1,606.54	43.54	37.902	0		
9,500.00	7,190.00	9,539.41	7,190.00	22.46	22.69	89.83	1,650.08	1,605.38	44.69	36.920	0		
9,600.00	7,190.00	9,639.41	7,190.00	23.04	23.26	89.83	1,650.08	1,604.21	45.87	35.977	0		
9,700.00	7,190.00	9,739.41	7,190.00	23.63	23.85	89.83	1,650.08	1,603.03	47.05	35.071	0		
9,800.00	7,190.00	9,839.41	7,190.00	24.23	24.44	89.83	1,650.07	1,601.83	48.25	34.201	0		
9,900.00	7,190.00	9,939.41	7,190.00	24.83	25.04	89.83	1,650.07	1,600.62	49.45	33.366	0		
10,000.00	7,190.00	10,039.41	7,190.00	25.44	25.64	89.83	1,650.07	1,599.40	50.67	32.564	0		
10,100.00	7,190.00	10,139.41	7,190.00	26.05	26.25	89.83	1,650.07	1,598.17	51.90	31.794	0		
10,200.00	7,190.00	10,239.41	7,190.00	26.66	26.86	89.83	1,650.07	1,596.93	53.14	31.054	0		
10,300.00	7,190.00	10,339.41	7,190.00	27.28	27.48	89.83	1,650.07	1,595.69	54.38	30.343	0		
10,400.00	7,190.00	10,439.41	7,190.00	27.91	28.10	89.83	1,650.07	1,594.44	55.63	29.660	0		
10,500.00	7,190.00	10,539.41	7,190.00	28.53	28.72	89.83	1,650.07	1,593.17	56.89	29.003	0		
10,600.00	7,190.00	10,639.41	7,190.00	29.16	29.35	89.83	1,650.07	1,591.91	58.16	28.371	0		
10,700.00	7,190.00	10,739.42	7,190.00	29.80	29.98	89.83	1,650.07	1,590.63	59.43	27.764	0		
10,800.00	7,190.00	10,839.42	7,190.00	30.44	30.62	89.83	1,650.06	1,589.35	60.71	27.179	0		
10,900.00	7,190.00	10,939.42	7,190.00	31.08	31.25	89.83	1,650.06	1,588.07	62.00	26.616	0		
11,000.00	7,190.00	11,039.42	7,190.00	31.72	31.89	89.83	1,650.06	1,586.78	63.28	26.074	0		
11,100.00	7,190.00	11,139.42	7,190.00	32.36	32.54	89.83	1,650.06	1,585.48	64.58	25.551	0		
11,200.00	7,190.00	11,239.42	7,190.00	33.01	33.18	89.83	1,650.06	1,584.18	65.88	25.047	0		
11,300.00	7,190.00	11,339.42	7,190.00	33.66	33.83	89.83	1,650.06	1,582.88	67.18	24.561	0		
11,400.00	7,190.00	11,439.42	7,190.00	34.31	34.48	89.83	1,650.06	1,581.57	68.49	24.092	0		
11,500.00	7,190.00	11,539.42	7,190.00	34.97	35.13	89.83	1,650.06	1,580.25	69.80	23.639	0		
11,600.00	7,190.00	11,639.42	7,190.00	35.62	35.79	89.83	1,650.05	1,578.94	71.12	23.202	0		
11,700.00	7,190.00	11,739.42	7,190.00	36.28	36.44	89.83	1,650.05	1,577.62	72.43	22.780	0		
11,800.00	7,190.00	11,839.42	7,190.00	36.94	37.10	89.83	1,650.05	1,576.29	73.76	22.372	0		
11,900.00	7,190.00	11,939.42	7,190.00	37.60	37.76	89.83	1,650.05	1,574.97	75.08	21.977	0		
12,000.00	7,190.00	12,039.42	7,190.00	38.26	38.42	89.83	1,650.05	1,573.64	76.41	21.595	0		
12,100.00	7,190.00	12,139.42	7,190.00	38.93	39.08	89.83	1,650.05	1,572.31	77.74	21.225	0		
12,200.00	7,190.00	12,239.42	7,190.00	39.59	39.74	89.83	1,650.04	1,570.97	79.07	20.867	0		
12,300.00	7,190.00	12,339.42	7,190.00	40.26	40.41	89.83	1,650.04	1,569.63	80.41	20.521	0		
12,400.00	7,190.00	12,439.43	7,190.00	40.93	41.08	89.83	1,650.04	1,568.29	81.75	20.185	0		
12,500.00	7,190.00	12,539.43	7,190.00	41.60	41.74	89.83	1,650.04	1,566.95	83.09	19.859	0		
12,600.00	7,190.00	12,639.43	7,190.00	42.27	42.41	89.83	1,650.04	1,565.61	84.43	19.543	0		
12,700.00	7,190.00	12,739.43	7,190.00	42.94	43.08	89.83	1,650.04	1,564.26	85.77	19.237	0		
12,800.00	7,190.00	12,839.43	7,190.00	43.61	43.75	89.83	1,650.03	1,562.91	87.12	18.940	0		
12,900.00	7,190.00	12,939.43	7,190.00	44.28	44.42	89.83	1,650.03	1,561.56	88.47	18.651	0		
13,000.00	7,190.00	13,039.43	7,190.00	44.96	45.10	89.83	1,650.03	1,560.21	89.82	18.370	0		
13,100.00	7,190.00	13,139.43	7,190.00	45.63	45.77	89.83	1,650.03	1,558.86	91.17	18.098	0		
13,200.00	7,190.00	13,239.43	7,190.00	46.31	46.45	89.83	1,650.03	1,557.50	92.53	17.833	0		
13,300.00	7,190.00	13,339.43	7,190.00	46.99	47.12	89.83	1,650.02	1,556.14	93.88	17.576	0		
13,400.00	7,190.00	13,439.43	7,190.00	47.66	47.80	89.83	1,650.02	1,554.78	95.24	17.325	0		
13,500.00	7,190.00	13,539.43	7,190.00	48.34	48.47	89.83	1,650.02	1,553.42	96.60	17.082	0		
13,600.00	7,190.00	13,639.43	7,190.00	49.02	49.15	89.83	1,650.02	1,552.06	97.96	16.844	0		
13,700.00	7,190.00	13,739.43	7,190.00	49.70	49.83	89.83	1,650.02	1,550.70	99.32	16.614	0		
13,800.00	7,190.00	13,839.43	7,190.00	50.38	50.51	89.83	1,650.01	1,549.33	100.68	16.389	0		
13,900.00	7,190.00	13,939.43	7,190.00	51.06	51.19	89.83	1,650.01	1,547.97	102.04	16.170	0		
14,000.00	7,190.00	14,039.44	7,190.00	51.74	51.87	89.83	1,650.01	1,546.60	103.41	15.956	0		
14,100.00	7,190.00	14,139.44	7,190.00	52.42	52.55	89.83	1,650.01	1,545.23	104.77	15.748	0		
14,200.00	7,190.00	14,239.44	7,190.00	53.11	53.23	89.83	1,650.00	1,543.86	106.14	15.546	0		
14,300.00	7,190.00	14,339.44	7,190.00	53.79	53.91	89.83	1,650.00	1,542.49	107.51	15.348	0		
14,400.00	7,190.00	14,439.44	7,190.00	54.47	54.60	89.83	1,650.00	1,541.12	108.88	15.155	0		

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



Schlumberger
Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
14,500.00	7,190.00	14,539.44	7,190.00	55.16	55.28	89.83	1,650.00	1,539.75	110.25	14.966	0		
14,600.00	7,190.00	14,639.44	7,190.00	55.84	55.96	89.83	1,649.99	1,538.38	111.62	14.783	0		
14,700.00	7,190.00	14,739.44	7,190.00	56.53	56.65	89.83	1,649.99	1,537.00	112.99	14.603	0		
14,800.00	7,190.00	14,839.44	7,190.00	57.21	57.33	89.83	1,649.99	1,535.63	114.36	14.428	0		
14,900.00	7,190.00	14,939.44	7,190.00	57.90	58.02	89.83	1,649.99	1,534.25	115.73	14.257	0		
15,000.00	7,190.00	15,039.44	7,190.00	58.59	58.70	89.83	1,649.98	1,532.87	117.11	14.089	0		
15,100.00	7,190.00	15,139.44	7,190.00	59.27	59.39	89.83	1,649.98	1,531.50	118.48	13.926	0		
15,200.00	7,190.00	15,239.44	7,190.00	59.96	60.08	89.83	1,649.98	1,530.12	119.86	13.766	0		
15,300.00	7,190.00	15,339.44	7,190.00	60.65	60.76	89.83	1,649.97	1,528.74	121.24	13.610	0		
15,400.00	7,190.00	15,439.44	7,190.00	61.34	61.45	89.83	1,649.97	1,527.36	122.61	13.457	0		
15,500.00	7,190.00	15,539.44	7,190.00	62.02	62.14	89.83	1,649.97	1,525.98	123.99	13.307	0		
15,600.00	7,190.00	15,639.44	7,190.00	62.71	62.83	89.83	1,649.97	1,524.60	125.37	13.161	0		
15,700.00	7,190.00	15,739.45	7,190.00	63.40	63.51	89.83	1,649.96	1,523.22	126.75	13.018	0		
15,800.00	7,190.00	15,839.45	7,190.00	64.09	64.20	89.83	1,649.96	1,521.83	128.13	12.878	0		
15,900.00	7,190.00	15,939.45	7,190.00	64.78	64.89	89.83	1,649.96	1,520.45	129.51	12.740	0		
16,000.00	7,190.00	16,039.45	7,190.00	65.47	65.58	89.83	1,649.95	1,519.07	130.89	12.606	0		
16,100.00	7,190.00	16,139.45	7,190.00	66.16	66.27	89.83	1,649.95	1,517.68	132.27	12.474	0		
16,200.00	7,190.00	16,239.45	7,190.00	66.85	66.96	89.83	1,649.95	1,516.30	133.65	12.345	0		
16,300.00	7,190.00	16,339.45	7,190.00	67.54	67.65	89.83	1,649.94	1,514.91	135.03	12.219	0		
16,400.00	7,190.00	16,439.45	7,190.00	68.23	68.34	89.83	1,649.94	1,513.52	136.42	12.095	0		
16,500.00	7,190.00	16,539.45	7,190.00	68.92	69.03	89.83	1,649.94	1,512.14	137.80	11.973	0		
16,600.00	7,190.00	16,639.45	7,190.00	69.62	69.72	89.83	1,649.94	1,510.75	139.18	11.854	0		
16,700.00	7,190.00	16,739.45	7,190.00	70.31	70.41	89.83	1,649.93	1,509.36	140.57	11.738	0		
16,800.00	7,190.00	16,839.45	7,190.00	71.00	71.10	89.83	1,649.93	1,507.98	141.95	11.623	0		
16,900.00	7,190.00	16,939.45	7,190.00	71.69	71.80	89.83	1,649.93	1,506.59	143.34	11.511	0		
17,000.00	7,190.00	17,039.45	7,190.00	72.38	72.49	89.83	1,649.92	1,505.20	144.72	11.400	0		
17,100.00	7,190.00	17,139.45	7,190.00	73.08	73.18	89.83	1,649.92	1,503.81	146.11	11.292	0		
17,200.00	7,190.00	17,239.45	7,190.00	73.77	73.87	89.83	1,649.91	1,502.42	147.50	11.186	0		
17,242.86	7,190.00	17,282.31	7,190.00	74.07	74.17	89.83	1,649.91	1,501.82	148.09	11.141	0	SF	



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 12 - Original Hole - Rev 0		Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder													Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis			Distance						Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
0.00	0.00	6.00	6.00	0.00	0.01	179.98	224.06									
100.00	100.00	106.00	106.00	0.15	0.16	179.98	224.06	223.76	0.30	737.794	0					
200.00	200.00	206.00	206.00	0.32	0.33	179.98	224.06	223.41	0.65	343.252	0					
300.00	300.00	306.00	306.00	0.50	0.51	179.98	224.06	223.06	1.00	223.652	0					
400.00	400.00	406.00	406.00	0.67	0.68	179.98	224.06	222.71	1.35	165.861	0					
500.00	500.00	506.00	506.00	0.84	0.86	179.98	224.06	222.36	1.70	131.803	0					
564.54	564.54	570.54	570.54	0.96	0.97	179.98	224.06	222.13	1.93	116.380	0					
600.00	600.00	605.61	605.61	1.02	1.03	179.98	224.06	222.02	2.05	109.388	0		CC			
700.00	700.00	700.00	699.98	1.19	1.19	-179.81	225.68	223.29	2.39	94.518	0		ES			
800.00	800.00	792.42	792.27	1.37	1.36	-179.26	230.19	227.46	2.72	84.505	0					
900.00	899.98	885.22	884.75	1.54	1.52	-139.80	238.94	235.88	3.06	78.079	0					
1,000.00	999.84	977.11	976.03	1.72	1.69	-139.24	253.23	249.84	3.39	74.606	0					
1,100.00	1,099.45	1,067.68	1,065.61	1.90	1.85	-138.82	272.95	269.22	3.73	73.268	0					
1,200.00	1,198.70	1,157.19	1,153.69	2.07	2.02	-138.52	297.96	293.90	4.05	73.498	0					
1,237.30	1,235.60	1,193.01	1,188.84	2.14	2.09	-138.46	308.36	304.18	4.18	73.760	0					
1,300.00	1,297.57	1,253.13	1,247.86	2.26	2.20	-138.65	326.14	321.74	4.40	74.134	0					
1,400.00	1,396.41	1,349.01	1,341.98	2.44	2.38	-138.91	354.50	349.75	4.75	74.634	0					
1,500.00	1,495.25	1,444.89	1,436.11	2.62	2.57	-139.13	382.87	377.76	5.10	75.050	0					
1,600.00	1,594.09	1,540.77	1,530.23	2.81	2.76	-139.32	411.24	405.78	5.45	75.402	0					
1,700.00	1,692.92	1,636.65	1,624.35	3.00	2.94	-139.48	439.61	433.81	5.81	75.703	0					
1,800.00	1,791.76	1,732.54	1,718.47	3.18	3.13	-139.63	467.99	461.83	6.16	75.963	0					
1,900.00	1,890.60	1,828.42	1,812.60	3.37	3.32	-139.76	496.38	489.86	6.52	76.189	0					
2,000.00	1,989.44	1,924.30	1,906.72	3.56	3.51	-139.87	524.76	517.89	6.87	76.387	0					
2,100.00	2,088.27	2,020.18	2,000.84	3.75	3.70	-139.98	553.14	545.92	7.22	76.563	0					
2,200.00	2,187.11	2,116.07	2,094.96	3.94	3.89	-140.07	581.53	573.95	7.58	76.719	0					
2,300.00	2,285.95	2,211.95	2,189.09	4.13	4.08	-140.15	609.92	601.98	7.94	76.860	0					
2,400.00	2,384.78	2,307.83	2,283.21	4.31	4.27	-140.23	638.31	630.02	8.29	76.986	0					
2,500.00	2,483.62	2,403.71	2,377.33	4.50	4.46	-140.30	666.70	658.05	8.65	77.100	0					
2,600.00	2,582.46	2,499.60	2,471.45	4.69	4.65	-140.36	695.09	686.09	9.00	77.203	0					
2,700.00	2,681.30	2,595.48	2,565.58	4.88	4.84	-140.42	723.48	714.12	9.36	77.298	0					
2,800.00	2,780.13	2,691.36	2,659.70	5.07	5.03	-140.48	751.87	742.16	9.72	77.384	0					
2,900.00	2,878.97	2,787.24	2,753.82	5.26	5.22	-140.53	780.27	770.19	10.07	77.464	0					
3,000.00	2,977.81	2,883.12	2,847.94	5.45	5.41	-140.58	808.66	798.23	10.43	77.537	0					
3,100.00	3,076.64	2,979.01	2,942.07	5.64	5.60	-140.62	837.05	826.27	10.79	77.605	0					
3,200.00	3,175.48	3,074.89	3,036.19	5.84	5.79	-140.66	865.45	854.30	11.14	77.668	0					
3,300.00	3,274.32	3,170.77	3,130.31	6.03	5.99	-140.70	893.84	882.34	11.50	77.727	0					
3,400.00	3,373.16	3,266.65	3,224.43	6.22	6.18	-140.74	922.24	910.38	11.86	77.781	0					
3,500.00	3,471.99	3,362.54	3,318.56	6.41	6.37	-140.77	950.63	938.42	12.21	77.832	0					
3,600.00	3,570.83	3,458.42	3,412.68	6.60	6.56	-140.80	979.03	966.46	12.57	77.880	0					
3,700.00	3,669.67	3,554.30	3,506.80	6.79	6.75	-140.83	1,007.42	994.50	12.93	77.924	0					
3,800.00	3,768.51	3,650.18	3,600.92	6.98	6.94	-140.86	1,035.82	1,022.54	13.29	77.966	0					
3,900.00	3,867.34	3,746.07	3,695.05	7.17	7.14	-140.89	1,064.22	1,050.57	13.64	78.006	0					
4,000.00	3,966.18	3,841.95	3,789.17	7.36	7.33	-140.92	1,092.61	1,078.61	14.00	78.043	0					
4,100.00	4,065.02	3,937.83	3,883.29	7.55	7.52	-140.94	1,121.01	1,106.65	14.36	78.078	0					
4,200.00	4,163.85	4,033.71	3,977.41	7.74	7.71	-140.96	1,149.41	1,134.69	14.71	78.112	0					
4,300.00	4,262.69	4,129.59	4,071.54	7.94	7.90	-140.98	1,177.80	1,162.73	15.07	78.143	0					
4,400.00	4,361.53	4,225.48	4,165.66	8.13	8.10	-141.01	1,206.20	1,190.77	15.43	78.173	0					
4,500.00	4,460.37	4,321.36	4,259.78	8.32	8.29	-141.03	1,234.60	1,218.81	15.79	78.202	0					
4,600.00	4,559.20	4,417.24	4,353.90	8.51	8.48	-141.05	1,263.00	1,246.85	16.14	78.229	0					
4,700.00	4,658.04	4,513.12	4,448.03	8.70	8.67	-141.06	1,291.39	1,274.89	16.50	78.255	0					
4,800.00	4,756.88	4,609.01	4,542.15	8.89	8.87	-141.08	1,319.79	1,302.93	16.86	78.279	0					
4,900.00	4,855.71	4,704.89	4,636.27	9.08	9.06	-141.10	1,348.19	1,330.97	17.22	78.303	0					
5,000.00	4,954.55	4,800.77	4,730.39	9.27	9.25	-141.11	1,376.59	1,359.01	17.58	78.325	0					
5,100.00	5,053.39	4,896.65	4,824.52	9.47	9.44	-141.13	1,404.99	1,387.05	17.93	78.347	0					

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 12 - Original Hole - Rev 0	Offset Site Error:	0.00 usft
Survey Program:													0-Pathfinder	Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision			
5,200.00	5,152.23	4,992.54	4,918.64	9.66	9.64	-141.14	1,433.38	1,415.09	18.29	78.367	0				
5,300.00	5,251.06	5,088.42	5,012.76	9.85	9.83	-141.16	1,461.78	1,443.13	18.65	78.387	0				
5,400.00	5,349.90	5,184.30	5,106.89	10.04	10.02	-141.17	1,490.18	1,471.18	19.01	78.406	0				
5,500.00	5,448.74	5,280.18	5,201.01	10.23	10.21	-141.19	1,518.58	1,499.22	19.36	78.424	0				
5,600.00	5,547.58	5,376.06	5,295.13	10.42	10.41	-141.20	1,546.98	1,527.26	19.72	78.441	0				
5,700.00	5,646.41	5,471.95	5,389.25	10.61	10.60	-141.21	1,575.38	1,555.30	20.08	78.458	0				
5,800.00	5,745.25	5,567.83	5,483.38	10.81	10.79	-141.22	1,603.78	1,583.34	20.44	78.474	0				
5,900.00	5,844.09	5,663.71	5,577.50	11.00	10.98	-141.23	1,632.17	1,611.38	20.79	78.489	0				
6,000.00	5,942.92	5,759.59	5,671.62	11.19	11.18	-141.24	1,660.57	1,639.42	21.15	78.504	0				
6,075.73	6,017.78	5,832.21	5,742.90	11.33	11.32	-141.25	1,682.08	1,660.66	21.42	78.515	0				
6,100.00	6,041.78	5,855.50	5,765.77	11.38	11.37	-141.34	1,688.90	1,667.37	21.52	78.470	0				
6,200.00	6,140.97	5,951.92	5,860.42	11.56	11.56	-141.64	1,715.35	1,693.42	21.92	78.248	0				
6,300.00	6,240.54	6,048.98	5,955.70	11.74	11.76	-141.82	1,739.15	1,716.84	22.31	77.957	0				
6,400.00	6,340.38	6,146.56	6,051.48	11.91	11.95	-141.90	1,760.29	1,737.61	22.68	77.601	0				
6,500.00	6,440.35	6,244.53	6,147.65	12.08	12.15	-141.88	1,778.77	1,755.73	23.05	77.182	0				
6,513.03	6,453.38	6,257.32	6,160.21	12.10	12.17	179.39	1,780.98	1,757.18	23.80	74.825	0				
6,600.00	6,540.35	6,351.49	6,252.66	12.24	12.36	179.67	1,795.59	1,771.46	24.13	74.406	0				
6,613.03	6,553.38	6,380.22	6,280.92	12.26	12.42	179.75	1,797.67	1,773.46	24.21	74.254	0				
6,650.00	6,590.33	6,462.03	6,361.66	12.32	12.57	89.55	1,802.93	1,779.24	23.69	76.104	0				
6,700.00	6,640.08	6,573.00	6,471.71	12.39	12.78	89.59	1,808.59	1,784.62	23.97	75.463	0				
6,750.00	6,689.29	6,683.81	6,582.07	12.46	12.97	89.99	1,812.59	1,788.34	24.24	74.769	0				
6,800.00	6,737.67	6,793.91	6,692.02	12.53	13.15	90.73	1,815.01	1,790.49	24.52	74.026	0				
6,850.00	6,784.91	6,892.82	6,790.91	12.60	13.31	91.67	1,816.01	1,791.24	24.78	73.289	0				
6,900.00	6,830.73	6,938.64	6,836.73	12.66	13.38	92.18	1,816.75	1,791.79	24.96	72.794	0				
6,950.00	6,874.83	6,982.74	6,880.83	12.72	13.45	92.73	1,817.89	1,792.75	25.14	72.301	0				
7,000.00	6,916.95	7,034.64	6,932.68	12.78	13.53	93.42	1,819.47	1,794.12	25.35	71.780	0				
7,050.00	6,956.84	7,089.87	6,987.48	12.83	13.60	94.12	1,821.38	1,795.82	25.56	71.257	0				
7,100.00	6,994.23	7,148.35	7,044.67	12.89	13.68	94.82	1,823.58	1,797.80	25.78	70.740	0				
7,150.00	7,028.90	7,210.57	7,103.99	12.95	13.76	95.54	1,826.04	1,800.05	25.99	70.246	0				
7,200.00	7,060.65	7,277.01	7,165.00	13.02	13.84	96.25	1,828.69	1,802.49	26.21	69.782	0				
7,250.00	7,089.26	7,348.16	7,226.92	13.08	13.92	96.96	1,831.45	1,805.04	26.41	69.357	0				
7,300.00	7,114.58	7,424.48	7,288.55	13.15	14.01	97.66	1,834.21	1,807.63	26.58	68.997	0				
7,350.00	7,136.43	7,506.28	7,348.13	13.23	14.10	98.33	1,836.87	1,810.13	26.74	68.694	0				
7,400.00	7,154.69	7,593.64	7,403.28	13.31	14.21	98.94	1,839.27	1,812.41	26.87	68.457	0				
7,450.00	7,169.24	7,686.26	7,451.05	13.40	14.33	99.45	1,841.29	1,814.32	26.97	68.263	0				
7,500.00	7,179.99	7,783.37	7,488.25	13.50	14.48	99.85	1,842.79	1,815.72	27.07	68.073	0				
7,550.00	7,186.88	7,883.68	7,511.91	13.61	14.66	100.08	1,843.66	1,816.48	27.18	67.830	0				
7,600.00	7,189.87	7,985.36	7,520.00	13.73	14.88	100.12	1,843.84	1,816.47	27.37	67.363	0				
7,613.03	7,190.00	7,998.40	7,520.00	13.76	14.91	100.12	1,843.82	1,816.37	27.44	67.193	0				
7,700.00	7,190.00	8,085.36	7,520.00	14.00	15.12	100.12	1,843.81	1,815.88	27.93	66.011	0				
7,800.00	7,190.00	8,185.36	7,520.00	14.31	15.40	100.12	1,843.81	1,815.27	28.55	64.587	0				
7,900.00	7,190.00	8,285.36	7,520.00	14.64	15.72	100.12	1,843.81	1,814.60	29.22	63.108	0				
8,000.00	7,190.00	8,385.36	7,520.00	15.00	16.06	100.12	1,843.81	1,813.88	29.94	61.593	0				
8,100.00	7,190.00	8,485.36	7,520.00	15.39	16.42	100.12	1,843.81	1,813.11	30.70	60.059	0				
8,200.00	7,190.00	8,585.36	7,520.00	15.80	16.81	100.12	1,843.81	1,812.30	31.51	58.520	0				
8,300.00	7,190.00	8,685.36	7,520.00	16.23	17.22	100.12	1,843.81	1,811.46	32.35	56.988	0				
8,400.00	7,190.00	8,785.36	7,520.00	16.67	17.65	100.12	1,843.81	1,810.57	33.24	55.473	0				
8,500.00	7,190.00	8,885.36	7,520.00	17.14	18.09	100.12	1,843.81	1,809.65	34.16	53.983	0				
8,600.00	7,190.00	8,985.36	7,520.00	17.61	18.55	100.12	1,843.81	1,808.71	35.10	52.525	0				
8,700.00	7,190.00	9,085.36	7,520.00	18.11	19.03	100.12	1,843.81	1,807.73	36.08	51.103	0				
8,800.00	7,190.00	9,185.36	7,520.00	18.62	19.52	100.12	1,843.81	1,806.72	37.08	49.720	0				
8,900.00	7,190.00	9,285.36	7,520.00	19.13	20.02	100.12	1,843.81	1,805.70	38.11	48.379	0				
9,000.00	7,190.00	9,385.36	7,520.00	19.67	20.54	100.12	1,843.81	1,804.65	39.16	47.082	0				
9,100.00	7,190.00	9,485.36	7,520.00	20.21	21.07	100.12	1,843.81	1,803.57	40.23	45.830	0				

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



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder												Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
9,200.00	7,190.00	9,585.36	7,520.00	20.76	21.60	100.12	1,843.81	1,802.48	41.32	44.621	0		
9,300.00	7,190.00	9,685.36	7,520.00	21.32	22.15	100.12	1,843.81	1,801.38	42.43	43.457	0		
9,400.00	7,190.00	9,785.36	7,520.00	21.88	22.70	100.12	1,843.80	1,800.25	43.55	42.336	0		
9,500.00	7,190.00	9,885.36	7,520.00	22.46	23.26	100.12	1,843.80	1,799.11	44.69	41.258	0		
9,600.00	7,190.00	9,985.36	7,520.00	23.04	23.83	100.12	1,843.80	1,797.96	45.84	40.221	0		
9,700.00	7,190.00	10,085.36	7,520.00	23.63	24.41	100.12	1,843.80	1,796.80	47.01	39.224	0		
9,800.00	7,190.00	10,185.36	7,520.00	24.23	24.99	100.12	1,843.80	1,795.62	48.18	38.266	0		
9,900.00	7,190.00	10,285.36	7,520.00	24.83	25.58	100.12	1,843.80	1,794.43	49.37	37.346	0		
10,000.00	7,190.00	10,385.36	7,520.00	25.44	26.18	100.12	1,843.80	1,793.23	50.57	36.461	0		
10,100.00	7,190.00	10,485.36	7,520.00	26.05	26.78	100.12	1,843.80	1,792.02	51.78	35.610	0		
10,200.00	7,190.00	10,585.36	7,520.00	26.66	27.38	100.12	1,843.80	1,790.81	52.99	34.793	0		
10,300.00	7,190.00	10,685.36	7,520.00	27.28	27.99	100.12	1,843.80	1,789.58	54.22	34.007	0		
10,400.00	7,190.00	10,785.36	7,520.00	27.91	28.60	100.12	1,843.80	1,788.35	55.45	33.250	0		
10,500.00	7,190.00	10,885.36	7,520.00	28.53	29.22	100.12	1,843.80	1,787.11	56.69	32.523	0		
10,600.00	7,190.00	10,985.36	7,520.00	29.16	29.84	100.12	1,843.80	1,785.86	57.94	31.823	0		
10,700.00	7,190.00	11,085.36	7,520.00	29.80	30.47	100.12	1,843.80	1,784.60	59.19	31.150	0		
10,800.00	7,190.00	11,185.36	7,520.00	30.44	31.10	100.12	1,843.80	1,783.35	60.45	30.501	0		
10,900.00	7,190.00	11,285.36	7,520.00	31.08	31.73	100.12	1,843.80	1,782.08	61.72	29.876	0		
11,000.00	7,190.00	11,385.36	7,520.00	31.72	32.36	100.12	1,843.79	1,780.81	62.99	29.273	0		
11,100.00	7,190.00	11,485.36	7,520.00	32.36	33.00	100.12	1,843.79	1,779.53	64.26	28.692	0		
11,200.00	7,190.00	11,585.36	7,520.00	33.01	33.64	100.12	1,843.79	1,778.25	65.54	28.132	0		
11,300.00	7,190.00	11,685.36	7,520.00	33.66	34.28	100.12	1,843.79	1,776.97	66.82	27.592	0		
11,400.00	7,190.00	11,785.36	7,520.00	34.31	34.93	100.12	1,843.79	1,775.68	68.11	27.070	0		
11,500.00	7,190.00	11,885.36	7,520.00	34.97	35.57	100.12	1,843.79	1,774.39	69.40	26.566	0		
11,600.00	7,190.00	11,985.36	7,520.00	35.62	36.22	100.12	1,843.79	1,773.09	70.70	26.079	0		
11,700.00	7,190.00	12,085.36	7,520.00	36.28	36.87	100.12	1,843.79	1,771.79	72.00	25.608	0		
11,800.00	7,190.00	12,185.36	7,520.00	36.94	37.53	100.12	1,843.79	1,770.49	73.30	25.153	0		
11,900.00	7,190.00	12,285.36	7,520.00	37.60	38.18	100.12	1,843.79	1,769.18	74.61	24.713	0		
12,000.00	7,190.00	12,385.36	7,520.00	38.26	38.84	100.12	1,843.79	1,767.87	75.92	24.287	0		
12,100.00	7,190.00	12,485.36	7,520.00	38.93	39.50	100.12	1,843.79	1,766.56	77.23	23.875	0		
12,200.00	7,190.00	12,585.36	7,520.00	39.59	40.15	100.12	1,843.79	1,765.25	78.54	23.475	0		
12,300.00	7,190.00	12,685.36	7,520.00	40.26	40.82	100.12	1,843.79	1,763.93	79.86	23.088	0		
12,400.00	7,190.00	12,785.36	7,520.00	40.93	41.48	100.12	1,843.79	1,762.61	81.18	22.713	0		
12,500.00	7,190.00	12,885.36	7,520.00	41.60	42.14	100.12	1,843.79	1,761.29	82.50	22.349	0		
12,600.00	7,190.00	12,985.36	7,520.00	42.27	42.81	100.12	1,843.78	1,759.96	83.82	21.996	0		
12,700.00	7,190.00	13,085.36	7,520.00	42.94	43.47	100.12	1,843.78	1,758.64	85.15	21.654	0		
12,800.00	7,190.00	13,185.36	7,520.00	43.61	44.14	100.12	1,843.78	1,757.31	86.48	21.321	0		
12,900.00	7,190.00	13,285.36	7,520.00	44.28	44.81	100.12	1,843.78	1,755.98	87.81	20.998	0		
13,000.00	7,190.00	13,385.36	7,520.00	44.96	45.48	100.12	1,843.78	1,754.64	89.14	20.685	0		
13,100.00	7,190.00	13,485.36	7,520.00	45.63	46.15	100.12	1,843.78	1,753.31	90.47	20.380	0		
13,200.00	7,190.00	13,585.36	7,520.00	46.31	46.82	100.12	1,843.78	1,751.97	91.81	20.083	0		
13,300.00	7,190.00	13,685.36	7,520.00	46.99	47.49	100.12	1,843.78	1,750.64	93.14	19.795	0		
13,400.00	7,190.00	13,785.36	7,520.00	47.66	48.17	100.12	1,843.78	1,749.30	94.48	19.515	0		
13,500.00	7,190.00	13,885.36	7,520.00	48.34	48.84	100.12	1,843.78	1,747.96	95.82	19.242	0		
13,600.00	7,190.00	13,985.36	7,520.00	49.02	49.52	100.12	1,843.78	1,746.62	97.16	18.976	0		
13,700.00	7,190.00	14,085.36	7,520.00	49.70	50.19	100.12	1,843.78	1,745.27	98.50	18.718	0		
13,800.00	7,190.00	14,185.36	7,520.00	50.38	50.87	100.12	1,843.78	1,743.93	99.85	18.466	0		
13,900.00	7,190.00	14,285.36	7,520.00	51.06	51.55	100.12	1,843.78	1,742.58	101.19	18.220	0		
14,000.00	7,190.00	14,385.36	7,520.00	51.74	52.22	100.12	1,843.78	1,741.24	102.54	17.981	0		
14,100.00	7,190.00	14,485.36	7,520.00	52.42	52.90	100.12	1,843.78	1,739.89	103.89	17.748	0		
14,200.00	7,190.00	14,585.36	7,520.00	53.11	53.58	100.12	1,843.78	1,738.54	105.23	17.521	0		
14,300.00	7,190.00	14,685.36	7,520.00	53.79	54.26	100.12	1,843.77	1,737.19	106.58	17.299	0		
14,400.00	7,190.00	14,785.36	7,520.00	54.47	54.94	100.12	1,843.77	1,735.84	107.93	17.082	0		
14,500.00	7,190.00	14,885.36	7,520.00	55.16	55.62	100.12	1,843.77	1,734.49	109.29	16.871	0		

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



Schlumberger
Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
14,600.00	7,190.00	14,985.36	7,520.00	55.84	56.30	100.12	1,843.77	1,733.14	110.64	16.665	0		
14,700.00	7,190.00	15,085.36	7,520.00	56.53	56.99	100.12	1,843.77	1,731.78	111.99	16.464	0		
14,800.00	7,190.00	15,185.36	7,520.00	57.21	57.67	100.12	1,843.77	1,730.43	113.35	16.267	0		
14,900.00	7,190.00	15,285.36	7,520.00	57.90	58.35	100.12	1,843.77	1,729.07	114.70	16.075	0		
15,000.00	7,190.00	15,385.36	7,520.00	58.59	59.04	100.12	1,843.77	1,727.71	116.06	15.887	0		
15,100.00	7,190.00	15,485.36	7,520.00	59.27	59.72	100.12	1,843.77	1,726.36	117.41	15.703	0		
15,200.00	7,190.00	15,585.36	7,520.00	59.96	60.41	100.12	1,843.77	1,725.00	118.77	15.524	0		
15,300.00	7,190.00	15,685.36	7,520.00	60.65	61.09	100.12	1,843.77	1,723.64	120.13	15.348	0		
15,400.00	7,190.00	15,785.36	7,520.00	61.34	61.78	100.12	1,843.77	1,722.28	121.49	15.177	0		
15,500.00	7,190.00	15,885.36	7,520.00	62.02	62.46	100.12	1,843.77	1,720.92	122.85	15.009	0		
15,600.00	7,190.00	15,985.36	7,520.00	62.71	63.15	100.12	1,843.77	1,719.56	124.21	14.844	0		
15,700.00	7,190.00	16,085.36	7,520.00	63.40	63.83	100.12	1,843.77	1,718.20	125.57	14.684	0		
15,800.00	7,190.00	16,185.36	7,520.00	64.09	64.52	100.12	1,843.77	1,716.84	126.93	14.526	0		
15,900.00	7,190.00	16,285.36	7,520.00	64.78	65.21	100.12	1,843.76	1,715.47	128.29	14.372	0		
16,000.00	7,190.00	16,385.36	7,520.00	65.47	65.90	100.12	1,843.76	1,714.11	129.65	14.221	0		
16,100.00	7,190.00	16,485.36	7,520.00	66.16	66.58	100.12	1,843.76	1,712.75	131.02	14.073	0		
16,200.00	7,190.00	16,585.36	7,520.00	66.85	67.27	100.12	1,843.76	1,711.38	132.38	13.928	0		
16,300.00	7,190.00	16,685.36	7,520.00	67.54	67.96	100.12	1,843.76	1,710.02	133.74	13.786	0		
16,400.00	7,190.00	16,785.36	7,520.00	68.23	68.65	100.12	1,843.76	1,708.65	135.11	13.646	0		
16,500.00	7,190.00	16,885.36	7,520.00	68.92	69.34	100.12	1,843.76	1,707.29	136.47	13.510	0		
16,600.00	7,190.00	16,985.36	7,520.00	69.62	70.03	100.12	1,843.76	1,705.92	137.84	13.376	0		
16,700.00	7,190.00	17,085.36	7,520.00	70.31	70.72	100.12	1,843.76	1,704.55	139.21	13.245	0		
16,800.00	7,190.00	17,185.36	7,520.00	71.00	71.41	100.12	1,843.76	1,703.19	140.57	13.116	0		
16,900.00	7,190.00	17,285.36	7,520.00	71.69	72.10	100.12	1,843.76	1,701.82	141.94	12.990	0		
17,000.00	7,190.00	17,385.36	7,520.00	72.38	72.79	100.12	1,843.76	1,700.45	143.31	12.866	0		
17,100.00	7,190.00	17,485.36	7,520.00	73.08	73.48	100.12	1,843.76	1,699.08	144.68	12.744	0		
17,200.00	7,190.00	17,585.36	7,520.00	73.77	74.17	100.12	1,843.76	1,697.71	146.04	12.625	0		
17,242.86	7,190.00	17,633.60	7,520.00	74.07	74.50	100.12	1,843.67	1,697.00	146.67	12.570	0	SF	



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16")
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16")
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance								Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision		
0.00	0.00	0.00	0.00	0.00	0.00	0.13	55.74						0	
100.00	100.00	100.00	100.00	0.15	0.15	0.13	55.74	55.45	0.29	190.095	0		0	
200.00	200.00	200.00	200.00	0.32	0.32	0.13	55.74	55.10	0.64	86.782	0		0	
300.00	300.00	300.00	300.00	0.50	0.50	0.13	55.74	54.75	0.99	56.225	0		0	
400.00	400.00	400.00	400.00	0.67	0.67	0.13	55.74	54.40	1.34	41.583	0		0	
500.00	500.00	500.00	500.00	0.84	0.84	0.13	55.74	54.05	1.69	32.992	0		0	
600.00	600.00	600.00	600.00	1.02	1.02	0.13	55.74	53.70	2.04	27.342	0		0	CC, ES
700.00	700.00	698.29	698.27	1.19	1.19	-0.70	57.24	54.86	2.38	24.001	0		0	
800.00	800.00	796.35	796.20	1.37	1.36	-2.92	61.82	59.08	2.73	22.624	0		0	
900.00	899.98	894.10	893.59	1.54	1.54	33.48	68.14	65.06	3.08	22.141	0		0	
1,000.00	999.84	991.63	990.41	1.72	1.71	31.96	74.75	71.32	3.42	21.834	0		0	
1,100.00	1,099.45	1,088.93	1,086.56	1.90	1.89	31.06	81.57	77.80	3.77	21.642	0		0	
1,200.00	1,198.70	1,187.05	1,183.00	2.07	2.08	30.71	88.34	84.23	4.12	21.462	0		0	
1,237.30	1,235.60	1,224.29	1,219.56	2.14	2.15	30.82	90.33	86.08	4.25	21.269	0		0	
1,300.00	1,297.57	1,286.92	1,281.04	2.26	2.27	31.16	93.33	88.85	4.47	20.867	0		0	
1,400.00	1,396.41	1,386.80	1,379.09	2.44	2.46	31.67	98.11	93.28	4.83	20.300	0		0	
1,500.00	1,495.25	1,486.68	1,477.14	2.62	2.65	32.12	102.90	97.71	5.19	19.809	0		0	
1,600.00	1,594.09	1,586.56	1,575.19	2.81	2.84	32.54	107.70	102.14	5.56	19.379	0		0	
1,700.00	1,692.92	1,686.45	1,673.24	3.00	3.04	32.92	112.50	106.58	5.92	19.001	0		0	
1,800.00	1,791.76	1,786.33	1,771.29	3.18	3.24	33.27	117.31	111.02	6.28	18.665	0		0	
1,900.00	1,890.60	1,886.21	1,869.34	3.37	3.43	33.59	122.12	115.47	6.65	18.365	0		0	
2,000.00	1,989.44	1,986.09	1,967.39	3.56	3.63	33.89	126.93	119.92	7.01	18.095	0		0	
2,100.00	2,088.27	2,085.97	2,065.44	3.75	3.83	34.16	131.75	124.37	7.38	17.851	0		0	
2,200.00	2,187.11	2,185.86	2,163.49	3.94	4.02	34.42	136.57	128.82	7.75	17.629	0		0	
2,300.00	2,285.95	2,285.74	2,261.54	4.13	4.22	34.66	141.39	133.28	8.11	17.426	0		0	
2,400.00	2,384.78	2,385.62	2,359.59	4.31	4.42	34.88	146.22	137.74	8.48	17.241	0		0	
2,500.00	2,483.62	2,485.50	2,457.64	4.50	4.62	35.09	151.04	142.20	8.85	17.071	0		0	
2,600.00	2,582.46	2,585.38	2,555.69	4.69	4.82	35.29	155.87	146.66	9.22	16.914	0		0	
2,700.00	2,681.30	2,685.27	2,653.74	4.88	5.02	35.47	160.70	151.12	9.58	16.768	0		0	
2,800.00	2,780.13	2,785.15	2,751.80	5.07	5.22	35.64	165.54	155.58	9.95	16.634	0		0	
2,900.00	2,878.97	2,885.03	2,849.85	5.26	5.41	35.81	170.37	160.05	10.32	16.508	0		0	
3,000.00	2,977.81	2,984.91	2,947.90	5.45	5.61	35.96	175.20	164.52	10.69	16.392	0		0	
3,100.00	3,076.64	3,084.79	3,045.95	5.64	5.81	36.11	180.04	168.98	11.06	16.282	0		0	
3,200.00	3,175.48	3,184.68	3,144.00	5.84	6.01	36.25	184.88	173.45	11.43	16.180	0		0	
3,300.00	3,274.32	3,284.56	3,242.05	6.03	6.21	36.38	189.72	177.92	11.80	16.084	0		0	
3,400.00	3,373.16	3,384.44	3,340.10	6.22	6.41	36.50	194.55	182.39	12.16	15.994	0		0	
3,500.00	3,471.99	3,484.32	3,438.15	6.41	6.61	36.62	199.39	186.86	12.53	15.909	0		0	
3,600.00	3,570.83	3,584.20	3,536.20	6.60	6.81	36.74	204.24	191.33	12.90	15.829	0		0	
3,700.00	3,669.67	3,684.09	3,634.25	6.79	7.01	36.84	209.08	195.81	13.27	15.753	0		0	
3,800.00	3,768.51	3,783.97	3,732.30	6.98	7.21	36.95	213.92	200.28	13.64	15.681	0		0	
3,900.00	3,867.34	3,883.85	3,830.35	7.17	7.41	37.05	218.76	204.75	14.01	15.613	0		0	
4,000.00	3,966.18	3,983.73	3,928.40	7.36	7.61	37.14	223.61	209.23	14.38	15.549	0		0	
4,100.00	4,065.02	4,083.61	4,026.45	7.55	7.81	37.23	228.45	213.70	14.75	15.487	0		0	
4,200.00	4,163.85	4,183.50	4,124.50	7.74	8.01	37.32	233.30	218.17	15.12	15.429	0		0	
4,300.00	4,262.69	4,283.38	4,222.55	7.94	8.21	37.40	238.14	222.65	15.49	15.373	0		0	
4,400.00	4,361.53	4,383.26	4,320.60	8.13	8.41	37.48	242.99	227.13	15.86	15.320	0		0	
4,500.00	4,460.37	4,483.14	4,418.66	8.32	8.61	37.56	247.83	231.60	16.23	15.269	0		0	
4,600.00	4,559.20	4,583.02	4,516.71	8.51	8.81	37.63	252.68	236.08	16.60	15.221	0		0	
4,700.00	4,658.04	4,682.91	4,614.76	8.70	9.01	37.70	257.53	240.55	16.97	15.174	0		0	
4,800.00	4,756.88	4,782.79	4,712.81	8.89	9.21	37.77	262.37	245.03	17.34	15.130	0		0	
4,900.00	4,855.71	4,882.67	4,810.86	9.08	9.41	37.83	267.22	249.51	17.71	15.087	0		0	
5,000.00	4,954.55	4,982.55	4,908.91	9.27	9.61	37.90	272.07	253.99	18.08	15.046	0		0	
5,100.00	5,053.39	5,082.43	5,006.96	9.47	9.82	37.96	276.92	258.46	18.45	15.007	0		0	
5,200.00	5,152.23	5,182.32	5,105.01	9.66	10.02	38.02	281.77	262.94	18.82	14.969	0		0	

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



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risk Separation Factor	Probability of Collision		
5,300.00	5,251.06	5,282.20	5,203.06	9.85	10.22	38.07	286.61	267.42	19.19	14.933	0			
5,400.00	5,349.90	5,382.08	5,301.11	10.04	10.42	38.13	291.46	271.90	19.56	14.898	0			
5,500.00	5,448.74	5,481.96	5,399.16	10.23	10.62	38.18	296.31	276.38	19.93	14.865	0			
5,600.00	5,547.58	5,581.84	5,497.21	10.42	10.82	38.24	301.16	280.86	20.30	14.832	0			
5,700.00	5,646.41	5,681.73	5,595.26	10.61	11.02	38.29	306.01	285.34	20.68	14.801	0			
5,800.00	5,745.25	5,781.61	5,693.31	10.81	11.22	38.33	310.86	289.82	21.05	14.771	0			
5,900.00	5,844.09	5,881.49	5,791.36	11.00	11.42	38.38	315.71	294.30	21.42	14.741	0			
6,000.00	5,942.92	5,981.37	5,889.41	11.19	11.62	38.43	320.56	298.78	21.79	14.713	0			
6,075.73	6,017.78	6,063.32	5,969.99	11.33	11.78	38.52	323.68	301.60	22.08	14.660	0			
6,100.00	6,041.78	6,090.24	5,996.54	11.38	11.83	38.59	324.37	302.19	22.17	14.629	0			
6,200.00	6,140.97	6,201.22	6,106.42	11.56	12.04	38.84	326.79	304.24	22.55	14.493	0			
6,300.00	6,240.54	6,312.29	6,216.90	11.74	12.23	39.01	328.55	305.64	22.90	14.346	0			
6,400.00	6,340.38	6,423.40	6,327.79	11.91	12.42	39.12	329.64	306.40	23.23	14.188	0			
6,500.00	6,440.35	6,534.55	6,438.89	12.08	12.60	39.16	330.06	306.51	23.55	14.016	0			
6,513.03	6,453.38	6,549.03	6,453.38	12.10	12.62	0.42	330.07	305.83	24.23	13.620	0			
6,600.00	6,540.35	6,636.00	6,540.35	12.24	12.76	0.42	330.07	305.55	24.52	13.461	0			
6,613.03	6,553.38	6,649.03	6,553.38	12.26	12.78	0.42	330.07	305.51	24.56	13.438	0			
6,650.00	6,590.33	6,685.86	6,590.19	12.32	12.83	-89.58	330.07	306.02	24.04	13.727	0			
6,700.00	6,640.08	6,735.67	6,639.75	12.39	12.90	-89.58	330.07	305.87	24.20	13.640	0			
6,750.00	6,689.29	6,785.48	6,688.79	12.46	12.97	-89.59	330.07	305.72	24.34	13.559	0			
6,800.00	6,737.67	6,835.30	6,737.00	12.53	13.04	-89.60	330.07	305.59	24.48	13.482	0			
6,850.00	6,784.91	6,885.12	6,784.09	12.60	13.10	-89.61	330.07	305.45	24.61	13.410	0			
6,900.00	6,830.73	6,934.95	6,829.78	12.66	13.16	-89.62	330.07	305.33	24.74	13.342	0			
6,950.00	6,874.83	6,984.78	6,873.77	12.72	13.22	-89.64	330.07	305.20	24.86	13.276	0			
7,000.00	6,916.95	7,034.62	6,915.82	12.78	13.27	-89.65	330.06	305.08	24.98	13.211	0			
7,050.00	6,956.84	7,084.46	6,955.65	12.83	13.33	-89.67	330.06	304.96	25.11	13.147	0			
7,100.00	6,994.23	7,134.32	6,993.02	12.89	13.39	-89.70	330.06	304.83	25.23	13.082	0			
7,150.00	7,028.90	7,184.19	7,027.70	12.95	13.45	-89.72	330.06	304.70	25.36	13.015	0			
7,200.00	7,060.65	7,234.07	7,059.48	13.02	13.51	-89.74	330.06	304.57	25.50	12.945	0			
7,250.00	7,089.26	7,283.96	7,088.16	13.08	13.57	-89.77	330.06	304.42	25.64	12.871	0			
7,300.00	7,114.58	7,333.86	7,113.56	13.15	13.64	-89.80	330.06	304.26	25.80	12.792	0			
7,350.00	7,136.43	7,383.78	7,135.53	13.23	13.71	-89.83	330.06	304.08	25.98	12.706	0			
7,400.00	7,154.69	7,433.71	7,153.93	13.31	13.79	-89.86	330.06	303.89	26.16	12.615	0			
7,450.00	7,169.24	7,483.65	7,168.64	13.40	13.88	-89.89	330.06	303.69	26.37	12.516	0			
7,500.00	7,179.99	7,533.61	7,179.56	13.50	13.97	-89.92	330.06	303.47	26.59	12.411	0			
7,550.00	7,186.88	7,583.58	7,186.64	13.61	14.07	-89.96	330.06	303.23	26.83	12.300	0			
7,600.00	7,189.87	7,633.57	7,189.81	13.73	14.18	-89.99	330.06	302.97	27.09	12.184	0			
7,613.03	7,190.00	7,646.60	7,190.00	13.76	14.22	-90.00	330.06	302.90	27.16	12.153	0			
7,642.43	7,190.00	7,676.00	7,190.00	13.84	14.29	-90.00	330.06	302.74	27.32	12.080	0			
7,700.00	7,190.00	7,733.57	7,190.00	14.00	14.44	-90.00	330.06	302.40	27.65	11.935	0			
7,800.00	7,190.00	7,833.57	7,190.00	14.31	14.72	-90.00	330.06	301.78	28.28	11.673	0			
7,857.74	7,190.00	7,891.30	7,190.00	14.50	14.90	-90.00	330.06	301.40	28.66	11.516	0			
7,900.00	7,190.00	7,933.57	7,190.00	14.64	15.04	-90.00	330.06	301.11	28.95	11.400	0			
8,000.00	7,190.00	8,033.57	7,190.00	15.00	15.39	-90.00	330.06	300.38	29.68	11.121	0			
8,100.00	7,190.00	8,133.57	7,190.00	15.39	15.76	-90.00	330.06	299.60	30.45	10.838	0			
8,200.00	7,190.00	8,233.57	7,190.00	15.80	16.16	-90.00	330.06	298.78	31.27	10.554	0			
8,300.00	7,190.00	8,333.57	7,190.00	16.23	16.58	-90.00	330.06	297.92	32.13	10.271	0			
8,400.00	7,190.00	8,433.57	7,190.00	16.67	17.01	-90.00	330.06	297.03	33.03	9.992	0			
8,500.00	7,190.00	8,533.57	7,190.00	17.14	17.47	-90.00	330.06	296.09	33.96	9.718	0			
8,600.00	7,190.00	8,633.57	7,190.00	17.61	17.94	-90.00	330.06	295.13	34.93	9.450	0			
8,700.00	7,190.00	8,733.57	7,190.00	18.11	18.42	-90.00	330.06	294.14	35.92	9.188	0			
8,800.00	7,190.00	8,833.57	7,190.00	18.62	18.92	-90.00	330.06	293.12	36.94	8.935	0			
8,900.00	7,190.00	8,933.57	7,190.00	19.13	19.44	-90.00	330.06	292.07	37.99	8.689	0			
9,000.00	7,190.00	9,033.57	7,190.00	19.67	19.96	-90.00	330.06	291.00	39.05	8.451	0			

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 2 - Original Hole - Rev 0		Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder													Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
9,100.00	7,190.00	9,133.57	7,190.00	20.21	20.49	-90.00	330.06	289.92	40.14	8.222	0					
9,200.00	7,190.00	9,233.57	7,190.00	20.76	21.04	-90.00	330.06	288.81	41.25	8.001	0					
9,300.00	7,190.00	9,333.57	7,190.00	21.32	21.59	-90.00	330.06	287.68	42.38	7.789	0					
9,400.00	7,190.00	9,433.57	7,190.00	21.88	22.15	-90.00	330.06	286.54	43.52	7.584	0					
9,500.00	7,190.00	9,533.57	7,190.00	22.46	22.72	-90.00	330.06	285.38	44.68	7.388	0					
9,600.00	7,190.00	9,633.57	7,190.00	23.04	23.30	-90.00	330.06	284.21	45.85	7.199	0					
9,700.00	7,190.00	9,733.57	7,190.00	23.63	23.88	-90.00	330.06	283.03	47.03	7.018	0					
9,800.00	7,190.00	9,833.57	7,190.00	24.23	24.47	-90.00	330.06	281.83	48.23	6.844	0					
9,900.00	7,190.00	9,933.57	7,190.00	24.83	25.07	-90.00	330.06	280.62	49.44	6.677	0					
10,000.00	7,190.00	10,033.57	7,190.00	25.44	25.67	-90.00	330.06	279.41	50.65	6.516	0					
10,100.00	7,190.00	10,133.57	7,190.00	26.05	26.27	-90.00	330.06	278.18	51.88	6.362	0					
10,200.00	7,190.00	10,233.57	7,190.00	26.66	26.89	-90.00	330.06	276.94	53.12	6.214	0					
10,300.00	7,190.00	10,333.57	7,190.00	27.28	27.50	-90.00	330.06	275.70	54.36	6.072	0					
10,400.00	7,190.00	10,433.57	7,190.00	27.91	28.12	-90.00	330.06	274.45	55.61	5.935	0					
10,500.00	7,190.00	10,533.57	7,190.00	28.53	28.74	-90.00	330.06	273.19	56.87	5.803	0					
10,600.00	7,190.00	10,633.57	7,190.00	29.16	29.37	-90.00	330.06	271.92	58.14	5.677	0					
10,700.00	7,190.00	10,733.57	7,190.00	29.80	30.00	-90.00	330.06	270.65	59.41	5.556	0					
10,800.00	7,190.00	10,833.57	7,190.00	30.44	30.63	-90.00	330.06	269.37	60.69	5.438	0					
10,900.00	7,190.00	10,933.57	7,190.00	31.08	31.27	-90.00	330.06	268.08	61.97	5.326	0					
11,000.00	7,190.00	11,033.57	7,190.00	31.72	31.91	-90.00	330.06	266.80	63.26	5.217	0					
11,100.00	7,190.00	11,133.57	7,190.00	32.36	32.55	-90.00	330.06	265.50	64.56	5.113	0					
11,200.00	7,190.00	11,233.57	7,190.00	33.01	33.20	-90.00	330.06	264.20	65.86	5.012	0					
11,300.00	7,190.00	11,333.57	7,190.00	33.66	33.84	-90.00	330.06	262.90	67.16	4.915	0					
11,400.00	7,190.00	11,433.57	7,190.00	34.31	34.49	-90.00	330.06	261.59	68.47	4.821	0					
11,500.00	7,190.00	11,533.57	7,190.00	34.97	35.14	-90.00	330.06	260.28	69.78	4.730	0					
11,600.00	7,190.00	11,633.57	7,190.00	35.62	35.80	-90.00	330.06	258.97	71.09	4.643	0					
11,700.00	7,190.00	11,733.57	7,190.00	36.28	36.45	-90.00	330.06	257.65	72.41	4.558	0					
11,800.00	7,190.00	11,833.57	7,190.00	36.94	37.11	-90.00	330.06	256.33	73.73	4.476	0					
11,900.00	7,190.00	11,933.57	7,190.00	37.60	37.77	-90.00	330.06	255.00	75.06	4.397	0					
12,000.00	7,190.00	12,033.57	7,190.00	38.26	38.43	-90.00	330.06	253.67	76.39	4.321	0					
12,100.00	7,190.00	12,133.57	7,190.00	38.93	39.09	-90.00	330.06	252.34	77.72	4.247	0					
12,200.00	7,190.00	12,233.57	7,190.00	39.59	39.75	-90.00	330.06	251.01	79.05	4.175	0					
12,300.00	7,190.00	12,333.57	7,190.00	40.26	40.42	-90.00	330.06	249.67	80.38	4.106	0					
12,400.00	7,190.00	12,433.57	7,190.00	40.93	41.08	-90.00	330.06	248.34	81.72	4.039	0					
12,500.00	7,190.00	12,533.57	7,190.00	41.60	41.75	-90.00	330.06	247.00	83.06	3.974	0					
12,600.00	7,190.00	12,633.57	7,190.00	42.27	42.42	-90.00	330.06	245.65	84.41	3.910	0					
12,700.00	7,190.00	12,733.57	7,190.00	42.94	43.08	-90.00	330.06	244.31	85.75	3.849	0					
12,800.00	7,190.00	12,833.57	7,190.00	43.61	43.76	-90.00	330.06	242.96	87.10	3.790	0					
12,900.00	7,190.00	12,933.57	7,190.00	44.28	44.43	-90.00	330.06	241.61	88.44	3.732	0					
13,000.00	7,190.00	13,033.57	7,190.00	44.96	45.10	-90.00	330.06	240.26	89.80	3.676	0					
13,100.00	7,190.00	13,133.57	7,190.00	45.63	45.77	-90.00	330.06	238.91	91.15	3.621	0					
13,200.00	7,190.00	13,233.57	7,190.00	46.31	46.45	-90.00	330.06	237.56	92.50	3.568	0					
13,300.00	7,190.00	13,333.57	7,190.00	46.99	47.12	-90.00	330.06	236.20	93.86	3.517	0					
13,366.67	7,190.00	13,400.24	7,190.00	47.44	47.57	-90.00	330.06	235.30	94.76	3.483	0					
13,400.00	7,190.00	13,433.57	7,190.00	47.66	47.80	-90.00	330.06	234.85	95.21	3.467	0					
13,500.00	7,190.00	13,533.57	7,190.00	48.34	48.47	-90.00	330.06	233.49	96.57	3.418	0					
13,600.00	7,190.00	13,633.57	7,190.00	49.02	49.15	-90.00	330.06	232.13	97.93	3.370	0					
13,700.00	7,190.00	13,733.57	7,190.00	49.70	49.83	-90.00	330.06	230.77	99.29	3.324	0					
13,800.00	7,190.00	13,833.57	7,190.00	50.38	50.51	-90.00	330.06	229.41	100.65	3.279	0					
13,900.00	7,190.00	13,933.57	7,190.00	51.06	51.19	-90.00	330.06	228.04	102.02	3.235	0					
14,000.00	7,190.00	14,033.57	7,190.00	51.74	51.87	-90.00	330.06	226.68	103.38	3.193	0					
14,066.67	7,190.00	14,100.24	7,190.00	52.20	52.32	-90.00	330.06	225.77	104.29	3.165	0					
14,100.00	7,190.00	14,133.57	7,190.00	52.42	52.55	-90.00	330.06	225.31	104.75	3.151	0					
14,200.00	7,190.00	14,233.57	7,190.00	53.11	53.23	-90.00	330.06	223.95	106.11	3.110	0					

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



Schlumberger
Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 2 - Original Hole - Rev 0		Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft		
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
14,300.00	7,190.00	14,333.57	7,190.00	53.79	53.91	-90.00	330.06	222.58	107.48	3.071	0					
14,400.00	7,190.00	14,433.57	7,190.00	54.47	54.59	-90.00	330.06	221.21	108.85	3.032	0					
14,500.00	7,190.00	14,533.57	7,190.00	55.16	55.28	-90.00	330.06	219.84	110.22	2.995	0					
14,600.00	7,190.00	14,633.57	7,190.00	55.84	55.96	-90.00	330.06	218.47	111.59	2.958	0					
14,700.00	7,190.00	14,733.57	7,190.00	56.53	56.64	-90.00	330.06	217.10	112.96	2.922	0					
14,800.00	7,190.00	14,833.57	7,190.00	57.21	57.33	-90.00	330.06	215.72	114.33	2.887	0					
14,900.00	7,190.00	14,933.57	7,190.00	57.90	58.01	-90.00	330.06	214.35	115.71	2.853	0					
15,000.00	7,190.00	15,033.57	7,190.00	58.59	58.70	-90.00	330.06	212.98	117.08	2.819	0					
15,100.00	7,190.00	15,133.57	7,190.00	59.27	59.38	-90.00	330.06	211.60	118.46	2.786	0					
15,200.00	7,190.00	15,233.57	7,190.00	59.96	60.07	-90.00	330.06	210.23	119.83	2.754	0					
15,300.00	7,190.00	15,333.57	7,190.00	60.65	60.76	-90.00	330.06	208.85	121.21	2.723	0					
15,400.00	7,190.00	15,433.57	7,190.00	61.34	61.44	-90.00	330.06	207.47	122.59	2.692	0					
15,500.00	7,190.00	15,533.57	7,190.00	62.02	62.13	-90.00	330.06	206.10	123.96	2.663	0					
15,600.00	7,190.00	15,633.57	7,190.00	62.71	62.82	-90.00	330.06	204.72	125.34	2.633	0					
15,700.00	7,190.00	15,733.57	7,190.00	63.40	63.51	-90.00	330.06	203.34	126.72	2.605	0					
15,800.00	7,190.00	15,833.57	7,190.00	64.09	64.19	-90.00	330.06	201.96	128.10	2.577	0					
15,900.00	7,190.00	15,933.57	7,190.00	64.78	64.88	-90.00	330.06	200.58	129.48	2.549	0					
16,000.00	7,190.00	16,033.57	7,190.00	65.47	65.57	-90.00	330.06	199.20	130.86	2.522	0					
16,100.00	7,190.00	16,133.57	7,190.00	66.16	66.26	-90.00	330.06	197.82	132.24	2.496	0					
16,200.00	7,190.00	16,233.57	7,190.00	66.85	66.95	-90.00	330.06	196.43	133.62	2.470	0					
16,300.00	7,190.00	16,333.57	7,190.00	67.54	67.64	-90.00	330.06	195.05	135.01	2.445	0					
16,400.00	7,190.00	16,433.57	7,190.00	68.23	68.33	-90.00	330.06	193.67	136.39	2.420	0					
16,500.00	7,190.00	16,533.57	7,190.00	68.92	69.02	-90.00	330.06	192.29	137.77	2.396	0					
16,600.00	7,190.00	16,633.57	7,190.00	69.62	69.71	-90.00	330.06	190.90	139.16	2.372	0					
16,700.00	7,190.00	16,733.57	7,190.00	70.31	70.40	-90.00	330.06	189.52	140.54	2.348	0					
16,800.00	7,190.00	16,833.57	7,190.00	71.00	71.09	-90.00	330.06	188.13	141.93	2.326	0					
16,900.00	7,190.00	16,933.57	7,190.00	71.69	71.79	-90.00	330.06	186.75	143.31	2.303	0					
17,000.00	7,190.00	17,033.57	7,190.00	72.38	72.48	-90.00	330.06	185.36	144.70	2.281	0					
17,100.00	7,190.00	17,133.57	7,190.00	73.08	73.17	-90.00	330.06	183.98	146.08	2.259	0					
17,200.00	7,190.00	17,233.58	7,190.00	73.77	73.86	-90.00	330.06	182.59	147.47	2.238	0					
17,232.68	7,190.00	17,266.27	7,190.00	74.00	74.09	-90.00	330.06	182.13	147.92	2.231	0					
17,242.86	7,190.00	17,273.45	7,190.00	74.07	74.14	-90.00	330.07	182.03	148.04	2.230	0	SF				



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision		
0.00	0.00	0.00	0.00	0.00	0.00	0.12	28.05							
100.00	100.00	100.00	100.00	0.15	0.15	0.12	28.05	27.76	0.29	95.675	0			
200.00	200.00	200.00	200.00	0.32	0.32	0.12	28.05	27.41	0.64	43.678	0			
300.00	300.00	300.00	300.00	0.50	0.50	0.12	28.05	27.06	0.99	28.298	0			
400.00	400.00	400.00	400.00	0.67	0.67	0.12	28.05	26.71	1.34	20.929	0			
500.00	500.00	500.00	500.00	0.84	0.84	0.12	28.05	26.36	1.69	16.605	0			
600.00	600.00	600.00	600.00	1.02	1.02	0.12	28.05	26.01	2.04	13.762	0			
700.00	700.00	700.00	700.00	1.19	1.19	0.12	28.05	25.67	2.39	11.750	0			
800.00	800.00	799.15	799.13	1.37	1.37	-1.71	29.51	26.78	2.74	10.789	0		CC, ES	
900.00	899.98	898.16	898.00	1.54	1.54	34.09	32.58	29.50	3.08	10.569	0			
1,000.00	999.84	997.05	996.52	1.72	1.72	32.14	35.85	32.42	3.43	10.455	0			
1,100.00	1,099.45	1,095.83	1,094.57	1.90	1.89	30.96	39.27	35.50	3.78	10.402	0			
1,200.00	1,198.70	1,194.94	1,192.51	2.07	2.07	30.49	42.64	38.52	4.12	10.344	0			
1,237.30	1,235.60	1,232.23	1,229.32	2.14	2.14	30.78	43.38	39.13	4.25	10.202	0			
1,300.00	1,297.57	1,294.92	1,291.20	2.26	2.26	31.52	44.28	39.81	4.48	9.891	0			
1,400.00	1,396.41	1,394.91	1,389.90	2.44	2.44	32.65	45.73	40.90	4.84	9.456	0			
1,500.00	1,495.25	1,494.89	1,488.59	2.62	2.63	33.71	47.20	42.00	5.20	9.081	0			
1,600.00	1,594.09	1,594.88	1,587.29	2.81	2.82	34.71	48.68	43.12	5.56	8.755	0			
1,700.00	1,692.92	1,694.86	1,685.98	3.00	3.01	35.64	50.18	44.25	5.92	8.471	0			
1,800.00	1,791.76	1,794.85	1,784.67	3.18	3.20	36.52	51.68	45.40	6.29	8.219	0			
1,900.00	1,890.60	1,894.84	1,883.37	3.37	3.39	37.35	53.20	46.55	6.65	7.996	0			
2,000.00	1,989.44	1,994.82	1,982.06	3.56	3.58	38.14	54.73	47.71	7.02	7.797	0			
2,100.00	2,088.27	2,094.81	2,080.75	3.75	3.77	38.88	56.27	48.89	7.39	7.618	0			
2,200.00	2,187.11	2,194.79	2,179.45	3.94	3.96	39.58	57.82	50.07	7.75	7.456	0			
2,300.00	2,285.95	2,294.78	2,278.14	4.13	4.15	40.25	59.38	51.26	8.12	7.310	0			
2,400.00	2,384.78	2,394.76	2,376.83	4.31	4.34	40.88	60.94	52.45	8.49	7.176	0			
2,500.00	2,483.62	2,494.75	2,475.53	4.50	4.53	41.48	62.52	53.65	8.86	7.054	0			
2,600.00	2,582.46	2,594.73	2,574.22	4.69	4.73	42.05	64.09	54.86	9.23	6.942	0			
2,700.00	2,681.30	2,694.72	2,672.91	4.88	4.92	42.59	65.68	56.08	9.60	6.839	0			
2,800.00	2,780.13	2,794.71	2,771.61	5.07	5.11	43.11	67.27	57.29	9.97	6.744	0			
2,900.00	2,878.97	2,894.69	2,870.30	5.26	5.30	43.60	68.86	58.52	10.35	6.656	0			
3,000.00	2,977.81	2,994.68	2,968.99	5.45	5.49	44.07	70.46	59.75	10.72	6.575	0			
3,100.00	3,076.64	3,094.66	3,067.69	5.64	5.69	44.52	72.07	60.98	11.09	6.498	0			
3,200.00	3,175.48	3,194.65	3,166.38	5.84	5.88	44.95	73.68	62.21	11.46	6.428	0			
3,300.00	3,274.32	3,294.63	3,265.08	6.03	6.07	45.36	75.29	63.45	11.84	6.361	0			
3,400.00	3,373.16	3,394.62	3,363.77	6.22	6.26	45.76	76.90	64.70	12.21	6.299	0			
3,500.00	3,471.99	3,494.60	3,462.46	6.41	6.46	46.14	78.52	65.94	12.58	6.241	0			
3,600.00	3,570.83	3,594.59	3,561.16	6.60	6.65	46.50	80.15	67.19	12.96	6.186	0			
3,700.00	3,669.67	3,694.58	3,659.85	6.79	6.84	46.85	81.77	68.44	13.33	6.135	0			
3,800.00	3,768.51	3,794.56	3,758.54	6.98	7.04	47.18	83.40	69.70	13.70	6.086	0			
3,900.00	3,867.34	3,894.55	3,857.24	7.17	7.23	47.51	85.04	70.96	14.08	6.040	0			
4,000.00	3,966.18	3,994.53	3,955.93	7.36	7.42	47.82	86.67	72.22	14.45	5.996	0			
4,100.00	4,065.02	4,094.52	4,054.62	7.55	7.61	48.11	88.31	73.48	14.83	5.955	0			
4,200.00	4,163.85	4,194.50	4,153.32	7.74	7.81	48.40	89.95	74.74	15.20	5.916	0			
4,300.00	4,262.69	4,294.49	4,252.01	7.94	8.00	48.68	91.59	76.01	15.58	5.879	0			
4,400.00	4,361.53	4,394.48	4,350.70	8.13	8.19	48.95	93.23	77.28	15.95	5.844	0			
4,500.00	4,460.37	4,494.46	4,449.40	8.32	8.39	49.21	94.88	78.55	16.33	5.810	0			
4,600.00	4,559.20	4,594.45	4,548.09	8.51	8.58	49.45	96.52	79.82	16.71	5.778	0			
4,700.00	4,658.04	4,694.43	4,646.78	8.70	8.77	49.70	98.17	81.09	17.08	5.747	0			
4,800.00	4,756.88	4,794.42	4,745.48	8.89	8.97	49.93	99.82	82.37	17.46	5.718	0			
4,900.00	4,855.71	4,894.40	4,844.17	9.08	9.16	50.15	101.48	83.64	17.83	5.690	0			
5,000.00	4,954.55	4,994.39	4,942.87	9.27	9.35	50.37	103.13	84.92	18.21	5.663	0			
5,100.00	5,053.39	5,094.37	5,041.56	9.47	9.55	50.58	104.79	86.20	18.59	5.638	0			
5,200.00	5,152.23	5,194.36	5,140.25	9.66	9.74	50.79	106.44	87.48	18.96	5.613	0			

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 3 - Original Hole - Rev 0		Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder													Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
5,300.00	5,251.06	5,294.35	5,238.95	9.85	9.93	50.99	108.10	88.76	19.34	5.590	0					
5,400.00	5,349.90	5,394.33	5,337.64	10.04	10.13	51.18	109.76	90.04	19.72	5.567	0					
5,500.00	5,448.74	5,494.32	5,436.33	10.23	10.32	51.37	111.42	91.33	20.09	5.545	0					
5,600.00	5,547.58	5,594.30	5,535.03	10.42	10.51	51.55	113.08	92.61	20.47	5.524	0					
5,700.00	5,646.41	5,694.29	5,633.72	10.61	10.71	51.72	114.74	93.90	20.85	5.504	0					
5,800.00	5,745.25	5,794.27	5,732.41	10.81	10.90	51.90	116.41	95.18	21.22	5.485	0					
5,900.00	5,844.09	5,894.26	5,831.11	11.00	11.09	52.06	118.07	96.47	21.60	5.466	0					
6,000.00	5,942.92	5,994.24	5,929.80	11.19	11.29	52.22	119.74	97.76	21.98	5.448	0					
6,075.73	6,017.78	6,069.97	6,004.54	11.33	11.43	52.34	121.00	98.74	22.26	5.435	0					
6,100.00	6,041.78	6,094.23	6,028.49	11.38	11.48	52.35	121.47	99.11	22.35	5.434	0					
6,200.00	6,140.97	6,194.16	6,127.13	11.56	11.67	51.61	124.73	102.03	22.70	5.494	0					
6,300.00	6,240.54	6,293.91	6,225.59	11.74	11.86	49.75	130.24	107.23	23.01	5.659	0					
6,400.00	6,340.38	6,393.36	6,323.75	11.91	12.06	47.02	138.25	114.96	23.29	5.936	0					
6,500.00	6,440.35	6,496.56	6,425.89	12.08	12.25	43.99	147.67	124.13	23.54	6.272	0					
6,513.03	6,453.38	6,510.04	6,439.28	12.10	12.27	4.88	148.90	125.11	23.79	6.260	0					
6,600.00	6,540.35	6,600.38	6,529.12	12.24	12.44	2.73	156.16	132.02	24.14	6.468	0					
6,613.03	6,553.38	6,613.97	6,542.66	12.26	12.46	2.48	157.08	132.88	24.20	6.492	0					
6,650.00	6,590.33	6,652.50	6,581.07	12.32	12.53	-88.34	159.38	135.40	23.98	6.647	0					
6,700.00	6,640.08	6,704.42	6,632.89	12.39	12.61	-90.54	161.91	137.82	24.09	6.721	0					
6,750.00	6,689.29	6,755.90	6,684.32	12.46	12.70	-93.91	164.15	140.00	24.15	6.797	0					
6,800.00	6,737.67	6,806.71	6,735.11	12.53	12.78	-98.28	166.72	142.56	24.16	6.900	0					
6,850.00	6,784.91	6,856.51	6,784.91	12.60	12.86	-103.45	170.39	146.28	24.11	7.068	0					
6,900.00	6,830.73	6,902.32	6,830.73	12.66	12.94	-108.79	176.43	152.45	23.98	7.358	0					
6,950.00	6,874.83	6,946.43	6,874.83	12.72	13.01	-114.19	186.05	162.30	23.75	7.833	0					
7,000.00	6,916.95	6,995.73	6,924.10	12.78	13.09	-120.09	199.30	175.91	23.39	8.520	0					
7,050.00	6,956.84	7,049.01	6,977.07	12.83	13.17	-125.57	214.82	191.89	22.93	9.368	0					
7,100.00	6,994.23	7,105.36	7,032.37	12.89	13.24	-130.45	231.94	209.55	22.38	10.361	0					
7,150.00	7,028.90	7,165.23	7,089.83	12.95	13.32	-134.76	250.07	228.29	21.78	11.483	0					
7,200.00	7,060.65	7,229.13	7,149.13	13.02	13.40	-138.55	268.64	247.51	21.13	12.711	0					
7,250.00	7,089.26	7,297.59	7,209.69	13.08	13.49	-141.87	287.12	266.63	20.48	14.018	0					
7,300.00	7,114.58	7,371.15	7,270.53	13.15	13.57	-144.76	304.96	285.10	19.86	15.356	0					
7,350.00	7,136.43	7,450.25	7,330.19	13.23	13.67	-147.23	321.64	302.34	19.30	16.666	0					
7,400.00	7,154.69	7,535.19	7,386.54	13.31	13.77	-149.31	336.59	317.74	18.84	17.863	0					
7,450.00	7,169.24	7,625.94	7,436.85	13.40	13.90	-150.97	349.26	330.74	18.53	18.852	0					
7,500.00	7,179.99	7,722.01	7,477.85	13.50	14.04	-152.22	359.14	340.76	18.39	19.534	0					
7,550.00	7,186.88	7,822.37	7,506.24	13.61	14.22	-153.04	365.76	347.32	18.44	19.838	0					
7,600.00	7,189.87	7,925.39	7,519.31	13.73	14.44	-153.41	368.79	350.10	18.69	19.728	0					
7,613.03	7,190.00	7,952.44	7,519.99	13.76	14.51	-153.43	368.96	350.17	18.79	19.634	0					
7,700.00	7,190.00	8,040.72	7,520.00	14.00	14.73	-153.43	368.97	349.64	19.32	19.094	0					
7,800.00	7,190.00	8,140.72	7,520.00	14.31	15.03	-153.43	368.97	349.02	19.95	18.499	0					
7,900.00	7,190.00	8,240.72	7,520.00	14.64	15.35	-153.43	368.97	348.38	20.58	17.926	0					
8,000.00	7,190.00	8,340.72	7,520.00	15.00	15.70	-153.43	368.97	347.73	21.23	17.376	0					
8,100.00	7,190.00	8,440.72	7,520.00	15.39	16.08	-153.43	368.97	347.07	21.90	16.848	0					
8,200.00	7,190.00	8,540.72	7,520.00	15.80	16.47	-153.43	368.97	346.39	22.58	16.343	0					
8,300.00	7,190.00	8,640.72	7,520.00	16.23	16.89	-153.43	368.97	345.70	23.26	15.860	0					
8,400.00	7,190.00	8,740.72	7,520.00	16.67	17.33	-153.43	368.97	345.00	23.96	15.398	0					
8,500.00	7,190.00	8,840.72	7,520.00	17.14	17.78	-153.43	368.97	344.30	24.67	14.956	0					
8,600.00	7,190.00	8,940.72	7,520.00	17.61	18.25	-153.43	368.97	343.58	25.38	14.535	0					
8,700.00	7,190.00	9,040.72	7,520.00	18.11	18.73	-153.43	368.97	342.86	26.11	14.132	0					
8,800.00	7,190.00	9,140.72	7,520.00	18.62	19.23	-153.43	368.97	342.13	26.84	13.748	0					
8,900.00	7,190.00	9,240.72	7,520.00	19.13	19.74	-153.43	368.97	341.39	27.58	13.380	0					
9,000.00	7,190.00	9,340.72	7,520.00	19.67	20.26	-153.43	368.97	340.65	28.32	13.029	0					
9,100.00	7,190.00	9,440.72	7,520.00	20.21	20.79	-153.43	368.97	339.90	29.07	12.694	0					
9,200.00	7,190.00	9,540.72	7,520.00	20.76	21.33	-153.43	368.97	339.15	29.82	12.373	0					

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 3 - Original Hole - Rev 0		Offset Site Error:		0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:		0.00 usft		
Reference		Offset		Semi Major Axis		Distance							Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision					
9,300.00	7,190.00	9,640.72	7,520.00	21.32	21.88	-153.43	368.97	338.39	30.58	12.066	0						
9,400.00	7,190.00	9,740.72	7,520.00	21.88	22.44	-153.43	368.97	337.63	31.34	11.773	0						
9,500.00	7,190.00	9,840.72	7,520.00	22.46	23.00	-153.43	368.97	336.86	32.11	11.492	0						
9,600.00	7,190.00	9,940.72	7,520.00	23.04	23.58	-153.43	368.97	336.09	32.88	11.222	0						
9,700.00	7,190.00	10,040.72	7,520.00	23.63	24.16	-153.43	368.97	335.31	33.65	10.964	0						
9,800.00	7,190.00	10,140.72	7,520.00	24.23	24.75	-153.43	368.97	334.54	34.43	10.717	0						
9,900.00	7,190.00	10,240.72	7,520.00	24.83	25.34	-153.43	368.97	333.76	35.21	10.479	0						
10,000.00	7,190.00	10,340.72	7,520.00	25.44	25.94	-153.43	368.97	332.97	35.99	10.251	0						
10,100.00	7,190.00	10,440.72	7,520.00	26.05	26.54	-153.43	368.97	332.19	36.78	10.032	0						
10,200.00	7,190.00	10,540.72	7,520.00	26.66	27.15	-153.43	368.97	331.40	37.57	9.821	0						
10,300.00	7,190.00	10,640.72	7,520.00	27.28	27.76	-153.43	368.97	330.61	38.36	9.619	0						
10,400.00	7,190.00	10,740.72	7,520.00	27.91	28.38	-153.43	368.97	329.81	39.15	9.424	0						
10,500.00	7,190.00	10,840.72	7,520.00	28.53	29.00	-153.43	368.97	329.02	39.95	9.236	0						
10,600.00	7,190.00	10,940.72	7,520.00	29.16	29.63	-153.43	368.97	328.22	40.74	9.056	0						
10,700.00	7,190.00	11,040.72	7,520.00	29.80	30.25	-153.43	368.97	327.42	41.54	8.881	0						
10,800.00	7,190.00	11,140.72	7,520.00	30.44	30.89	-153.43	368.97	326.62	42.34	8.713	0						
10,900.00	7,190.00	11,240.72	7,520.00	31.08	31.52	-153.43	368.97	325.82	43.15	8.551	0						
11,000.00	7,190.00	11,340.72	7,520.00	31.72	32.16	-153.43	368.97	325.02	43.95	8.395	0						
11,100.00	7,190.00	11,440.72	7,520.00	32.36	32.80	-153.43	368.97	324.21	44.76	8.244	0						
11,200.00	7,190.00	11,540.72	7,520.00	33.01	33.44	-153.43	368.97	323.40	45.56	8.098	0						
11,300.00	7,190.00	11,640.72	7,520.00	33.66	34.08	-153.43	368.97	322.59	46.37	7.957	0						
11,400.00	7,190.00	11,740.72	7,520.00	34.31	34.73	-153.43	368.97	321.78	47.18	7.820	0						
11,500.00	7,190.00	11,840.72	7,520.00	34.97	35.38	-153.43	368.97	320.97	47.99	7.688	0						
11,600.00	7,190.00	11,940.72	7,520.00	35.62	36.03	-153.43	368.97	320.16	48.80	7.560	0						
11,700.00	7,190.00	12,040.72	7,520.00	36.28	36.69	-153.43	368.97	319.35	49.62	7.436	0						
11,800.00	7,190.00	12,140.72	7,520.00	36.94	37.34	-153.43	368.97	318.54	50.43	7.316	0						
11,900.00	7,190.00	12,240.72	7,520.00	37.60	38.00	-153.43	368.97	317.72	51.25	7.200	0						
12,000.00	7,190.00	12,340.72	7,520.00	38.26	38.66	-153.43	368.97	316.90	52.06	7.087	0						
12,100.00	7,190.00	12,440.72	7,520.00	38.93	39.32	-153.43	368.97	316.09	52.88	6.978	0						
12,200.00	7,190.00	12,540.72	7,520.00	39.59	39.98	-153.43	368.97	315.27	53.70	6.871	0						
12,300.00	7,190.00	12,640.72	7,520.00	40.26	40.64	-153.43	368.97	314.45	54.51	6.768	0						
12,400.00	7,190.00	12,740.72	7,520.00	40.93	41.31	-153.43	368.97	313.63	55.33	6.668	0						
12,500.00	7,190.00	12,840.72	7,520.00	41.60	41.97	-153.43	368.97	312.81	56.15	6.571	0						
12,600.00	7,190.00	12,940.72	7,520.00	42.27	42.64	-153.43	368.97	311.99	56.97	6.476	0						
12,700.00	7,190.00	13,040.72	7,520.00	42.94	43.31	-153.43	368.97	311.17	57.80	6.384	0						
12,800.00	7,190.00	13,140.72	7,520.00	43.61	43.98	-153.43	368.97	310.35	58.62	6.294	0						
12,900.00	7,190.00	13,240.72	7,520.00	44.28	44.65	-153.43	368.97	309.53	59.44	6.207	0						
13,000.00	7,190.00	13,340.72	7,520.00	44.96	45.32	-153.43	368.97	308.70	60.26	6.122	0						
13,100.00	7,190.00	13,440.72	7,520.00	45.63	45.99	-153.43	368.97	307.88	61.09	6.040	0						
13,200.00	7,190.00	13,540.72	7,520.00	46.31	46.66	-153.43	368.97	307.05	61.91	5.959	0						
13,300.00	7,190.00	13,640.72	7,520.00	46.99	47.34	-153.43	368.97	306.23	62.74	5.881	0						
13,400.00	7,190.00	13,740.72	7,520.00	47.66	48.01	-153.43	368.97	305.40	63.56	5.805	0						
13,500.00	7,190.00	13,840.72	7,520.00	48.34	48.69	-153.43	368.97	304.58	64.39	5.730	0						
13,600.00	7,190.00	13,940.72	7,520.00	49.02	49.36	-153.43	368.97	303.75	65.22	5.658	0						
13,700.00	7,190.00	14,040.72	7,520.00	49.70	50.04	-153.43	368.97	302.92	66.04	5.587	0						
13,800.00	7,190.00	14,140.72	7,520.00	50.38	50.72	-153.43	368.97	302.10	66.87	5.518	0						
13,900.00	7,190.00	14,240.72	7,520.00	51.06	51.40	-153.43	368.97	301.27	67.70	5.450	0						
14,000.00	7,190.00	14,340.72	7,520.00	51.74	52.08	-153.43	368.97	300.44	68.53	5.384	0						
14,100.00	7,190.00	14,440.72	7,520.00	52.42	52.76	-153.43	368.97	299.61	69.35	5.320	0						
14,200.00	7,190.00	14,540.72	7,520.00	53.11	53.44	-153.43	368.97	298.78	70.18	5.257	0						
14,300.00	7,190.00	14,640.72	7,520.00	53.79	54.12	-153.43	368.97	297.95	71.01	5.196	0						
14,400.00	7,190.00	14,740.72	7,520.00	54.47	54.80	-153.43	368.97	297.12	71.84	5.136	0						
14,500.00	7,190.00	14,840.72	7,520.00	55.16	55.48	-153.43	368.97	296.29	72.67	5.077	0						
14,600.00	7,190.00	14,940.72	7,520.00	55.84	56.16	-153.43	368.97	295.46	73.50	5.020	0						

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



Schlumberger
Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 3 - Original Hole - Rev 0		Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft		
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
14,700.00	7,190.00	15,040.72	7,520.00	56.53	56.85	-153.43	368.97	294.63	74.33	4.964	0					
14,800.00	7,190.00	15,140.72	7,520.00	57.21	57.53	-153.43	368.97	293.80	75.16	4.909	0					
14,900.00	7,190.00	15,240.72	7,520.00	57.90	58.21	-153.43	368.97	292.97	75.99	4.855	0					
15,000.00	7,190.00	15,340.72	7,520.00	58.59	58.90	-153.43	368.97	292.14	76.83	4.803	0					
15,100.00	7,190.00	15,440.72	7,520.00	59.27	59.58	-153.43	368.97	291.31	77.66	4.751	0					
15,200.00	7,190.00	15,540.72	7,520.00	59.96	60.27	-153.43	368.97	290.48	78.49	4.701	0					
15,300.00	7,190.00	15,640.72	7,520.00	60.65	60.96	-153.43	368.97	289.64	79.32	4.652	0					
15,400.00	7,190.00	15,740.72	7,520.00	61.34	61.64	-153.43	368.97	288.81	80.15	4.603	0					
15,500.00	7,190.00	15,840.72	7,520.00	62.02	62.33	-153.43	368.97	287.98	80.99	4.556	0					
15,600.00	7,190.00	15,940.72	7,520.00	62.71	63.02	-153.43	368.97	287.15	81.82	4.509	0					
15,700.00	7,190.00	16,040.72	7,520.00	63.40	63.70	-153.43	368.97	286.31	82.65	4.464	0					
15,800.00	7,190.00	16,140.72	7,520.00	64.09	64.39	-153.43	368.97	285.48	83.49	4.419	0					
15,839.40	7,190.00	16,180.13	7,520.00	64.36	64.66	-153.43	368.97	285.15	83.82	4.402	0					
15,900.00	7,190.00	16,240.72	7,520.00	64.78	65.08	-153.43	368.97	284.65	84.32	4.376	0					
16,000.00	7,190.00	16,340.72	7,520.00	65.47	65.77	-153.43	368.97	283.81	85.15	4.333	0					
16,100.00	7,190.00	16,440.72	7,520.00	66.16	66.46	-153.43	368.97	282.98	85.99	4.291	0					
16,200.00	7,190.00	16,540.72	7,520.00	66.85	67.14	-153.43	368.97	282.14	86.82	4.250	0					
16,300.00	7,190.00	16,640.72	7,520.00	67.54	67.83	-153.43	368.97	281.31	87.66	4.209	0					
16,400.00	7,190.00	16,740.72	7,520.00	68.23	68.52	-153.43	368.97	280.47	88.49	4.169	0					
16,500.00	7,190.00	16,840.72	7,520.00	68.92	69.21	-153.43	368.97	279.64	89.33	4.131	0					
16,600.00	7,190.00	16,940.72	7,520.00	69.62	69.90	-153.43	368.97	278.80	90.16	4.092	0					
16,700.00	7,190.00	17,040.72	7,520.00	70.31	70.59	-153.43	368.97	277.97	91.00	4.055	0					
16,800.00	7,190.00	17,140.72	7,520.00	71.00	71.29	-153.43	368.97	277.13	91.83	4.018	0					
16,900.00	7,190.00	17,240.72	7,520.00	71.69	71.98	-153.43	368.97	276.30	92.67	3.982	0					
17,000.00	7,190.00	17,340.72	7,520.00	72.38	72.67	-153.43	368.97	275.46	93.50	3.946	0					
17,100.00	7,190.00	17,440.72	7,520.00	73.08	73.36	-153.43	368.97	274.63	94.34	3.911	0					
17,200.00	7,190.00	17,540.73	7,520.00	73.77	74.05	-153.43	368.97	273.79	95.18	3.877	0					
17,233.34	7,190.00	17,574.07	7,520.00	74.00	74.28	-153.43	368.96	273.51	95.45	3.865	0					
17,242.86	7,190.00	17,582.23	7,520.00	74.07	74.34	-153.43	368.97	273.44	95.53	3.862	0	SF				



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 5 - Original Hole - Rev 0		Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder														Offset Well Error: 0.00 usft		
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
0.00	0.00	1.00	1.00	0.00	0.00	179.55	28.05					0	CC, ES			
100.00	100.00	101.00	101.00	0.15	0.15	179.55	28.05	27.75	0.29	95.091	0					
200.00	200.00	201.00	201.00	0.32	0.32	179.55	28.05	27.40	0.64	43.551	0					
300.00	300.00	301.00	301.00	0.50	0.50	179.55	28.05	27.06	0.99	28.243	0					
400.00	400.00	401.00	401.00	0.67	0.67	179.55	28.05	26.71	1.34	20.898	0					
500.00	500.00	501.00	501.00	0.84	0.85	179.55	28.05	26.36	1.69	16.585	0					
600.00	600.00	601.00	601.00	1.02	1.02	179.55	28.05	26.01	2.04	13.747	0					
700.00	700.00	701.00	701.00	1.19	1.20	179.55	28.05	25.66	2.39	11.739	0					
800.00	800.00	801.00	801.00	1.37	1.37	179.55	28.05	25.31	2.74	10.242	0					
900.00	899.98	900.99	900.99	1.54	1.54	-143.80	29.44	26.35	3.09	9.536	0					
1,000.00	999.84	1,001.57	1,001.55	1.72	1.72	-146.64	32.67	29.24	3.44	9.511	0					
1,100.00	1,099.45	1,102.25	1,102.08	1.90	1.90	-147.58	36.69	32.91	3.78	9.702	0					
1,200.00	1,198.70	1,203.00	1,202.44	2.07	2.07	-147.11	41.45	37.32	4.13	10.039	0					
1,237.30	1,235.60	1,240.47	1,239.67	2.14	2.14	-146.70	43.44	39.18	4.26	10.199	0					
1,300.00	1,297.57	1,303.07	1,301.86	2.26	2.25	-146.24	47.01	42.52	4.48	10.488	0					
1,400.00	1,396.41	1,402.90	1,401.04	2.44	2.43	-145.63	52.71	47.87	4.84	10.892	0					
1,500.00	1,495.25	1,502.74	1,500.23	2.62	2.61	-145.14	58.41	53.22	5.20	11.239	0					
1,600.00	1,594.09	1,602.57	1,599.42	2.81	2.79	-144.73	64.12	58.57	5.56	11.539	0					
1,700.00	1,692.92	1,702.41	1,698.60	3.00	2.97	-144.40	69.83	63.92	5.92	11.802	0					
1,800.00	1,791.76	1,802.25	1,797.79	3.18	3.15	-144.11	75.55	69.27	6.28	12.034	0					
1,900.00	1,890.60	1,902.08	1,896.97	3.37	3.33	-143.87	81.26	74.62	6.64	12.240	0					
2,000.00	1,989.44	2,001.92	1,996.16	3.56	3.52	-143.65	86.98	79.98	7.00	12.424	0					
2,100.00	2,088.27	2,101.75	2,095.34	3.75	3.70	-143.47	92.70	85.33	7.36	12.589	0					
2,200.00	2,187.11	2,201.59	2,194.53	3.94	3.88	-143.30	98.42	90.69	7.73	12.738	0					
2,300.00	2,285.95	2,301.43	2,293.71	4.13	4.06	-143.15	104.14	96.05	8.09	12.873	0					
2,400.00	2,384.78	2,401.26	2,392.90	4.31	4.24	-143.02	109.86	101.40	8.45	12.997	0					
2,500.00	2,483.62	2,501.10	2,492.08	4.50	4.43	-142.90	115.58	106.76	8.82	13.110	0					
2,600.00	2,582.46	2,600.93	2,591.27	4.69	4.61	-142.80	121.30	112.12	9.18	13.214	0					
2,700.00	2,681.30	2,700.77	2,690.45	4.88	4.79	-142.70	127.02	117.48	9.54	13.309	0					
2,800.00	2,780.13	2,800.60	2,789.64	5.07	4.98	-142.61	132.74	122.83	9.91	13.398	0					
2,900.00	2,878.97	2,900.44	2,888.82	5.26	5.16	-142.53	138.46	128.19	10.27	13.480	0					
3,000.00	2,977.81	3,000.28	2,988.01	5.45	5.34	-142.45	144.19	133.55	10.64	13.556	0					
3,100.00	3,076.64	3,100.11	3,087.19	5.64	5.53	-142.38	149.91	138.91	11.00	13.627	0					
3,200.00	3,175.48	3,199.95	3,186.38	5.84	5.71	-142.32	155.63	144.27	11.37	13.694	0					
3,300.00	3,274.32	3,299.78	3,285.56	6.03	5.89	-142.26	161.35	149.62	11.73	13.756	0					
3,400.00	3,373.16	3,399.62	3,384.75	6.22	6.08	-142.20	167.08	154.98	12.09	13.814	0					
3,500.00	3,471.99	3,499.46	3,483.93	6.41	6.26	-142.15	172.80	160.34	12.46	13.869	0					
3,600.00	3,570.83	3,599.29	3,583.12	6.60	6.44	-142.10	178.52	165.70	12.82	13.920	0					
3,700.00	3,669.67	3,699.13	3,682.30	6.79	6.63	-142.05	184.25	171.06	13.19	13.969	0					
3,800.00	3,768.51	3,798.96	3,781.49	6.98	6.81	-142.01	189.97	176.42	13.55	14.015	0					
3,900.00	3,867.34	3,898.80	3,880.67	7.17	6.99	-141.97	195.69	181.77	13.92	14.059	0					
4,000.00	3,966.18	3,998.64	3,979.86	7.36	7.18	-141.93	201.42	187.13	14.29	14.100	0					
4,100.00	4,065.02	4,098.47	4,079.04	7.55	7.36	-141.90	207.14	192.49	14.65	14.139	0					
4,200.00	4,163.85	4,198.31	4,178.23	7.74	7.54	-141.86	212.87	197.85	15.02	14.176	0					
4,300.00	4,262.69	4,298.14	4,277.41	7.94	7.73	-141.83	218.59	203.21	15.38	14.212	0					
4,400.00	4,361.53	4,397.98	4,376.60	8.13	7.91	-141.80	224.31	208.57	15.75	14.245	0					
4,500.00	4,460.37	4,497.82	4,475.78	8.32	8.10	-141.77	230.04	213.93	16.11	14.278	0					
4,600.00	4,559.20	4,597.65	4,574.97	8.51	8.28	-141.74	235.76	219.28	16.48	14.308	0					
4,700.00	4,658.04	4,697.49	4,674.15	8.70	8.46	-141.71	241.49	224.64	16.84	14.338	0					
4,800.00	4,756.88	4,797.32	4,773.34	8.89	8.65	-141.69	247.21	230.00	17.21	14.366	0					
4,900.00	4,855.71	4,897.16	4,872.52	9.08	8.83	-141.67	252.93	235.36	17.57	14.393	0					
5,000.00	4,954.55	4,997.00	4,971.71	9.27	9.01	-141.64	258.66	240.72	17.94	14.419	0					
5,100.00	5,053.39	5,096.83	5,070.89	9.47	9.20	-141.62	264.38	246.08	18.30	14.443	0					
5,200.00	5,152.23	5,196.67	5,170.08	9.66	9.38	-141.60	270.11	251.44	18.67	14.467	0					

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



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Sec.08-T07N-R66W - Thornton 5 - Original Hole - Rev 0		Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder												Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis		Distance							Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision			
5,300.00	5,251.06	5,296.50	5,269.26	9.85	9.57	-141.58	275.83	256.80	19.04	14.490	0				
5,400.00	5,349.90	5,396.34	5,368.45	10.04	9.75	-141.56	281.56	262.15	19.40	14.512	0				
5,500.00	5,448.74	5,496.18	5,467.63	10.23	9.93	-141.54	287.28	267.51	19.77	14.533	0				
5,600.00	5,547.58	5,596.01	5,566.82	10.42	10.12	-141.52	293.01	272.87	20.13	14.553	0				
5,700.00	5,646.41	5,695.85	5,666.00	10.61	10.30	-141.51	298.73	278.23	20.50	14.573	0				
5,800.00	5,745.25	5,795.68	5,765.19	10.81	10.49	-141.49	304.45	283.59	20.86	14.592	0				
5,900.00	5,844.09	5,895.52	5,864.37	11.00	10.67	-141.47	310.18	288.95	21.23	14.610	0				
6,000.00	5,942.92	5,995.36	5,963.56	11.19	10.85	-141.46	315.90	294.31	21.60	14.628	0				
6,075.73	6,017.78	6,070.97	6,038.68	11.33	10.99	-141.45	320.24	298.37	21.87	14.641	0				
6,100.00	6,041.78	6,095.20	6,062.75	11.38	11.04	-141.45	321.55	299.58	21.97	14.639	0				
6,200.00	6,140.97	6,193.06	6,159.99	11.56	11.22	-141.23	325.36	303.03	22.34	14.567	0				
6,300.00	6,240.54	6,287.23	6,253.81	11.74	11.38	-141.02	327.87	305.19	22.68	14.456	0				
6,400.00	6,340.38	6,381.42	6,347.86	11.91	11.55	-140.89	329.44	306.43	23.01	14.320	0				
6,500.00	6,440.35	6,475.62	6,442.04	12.08	11.71	-140.84	330.06	306.74	23.31	14.158	0				
6,513.03	6,453.38	6,487.96	6,454.38	12.10	11.73	-179.58	330.07	306.74	23.32	14.151	0				
6,600.00	6,540.35	6,574.93	6,541.35	12.24	11.87	-179.58	330.07	306.45	23.62	13.974	0				
6,613.03	6,553.38	6,587.96	6,554.38	12.26	11.90	-179.58	330.07	306.40	23.66	13.948	0				
6,650.00	6,590.33	6,625.07	6,591.47	12.32	11.95	90.41	330.07	306.26	23.81	13.863	0				
6,700.00	6,640.08	6,675.25	6,641.39	12.39	12.03	90.39	330.07	306.10	23.96	13.773	0				
6,750.00	6,689.29	6,725.43	6,690.76	12.46	12.10	90.38	330.06	305.95	24.11	13.690	0				
6,800.00	6,737.67	6,775.59	6,739.27	12.53	12.17	90.35	330.06	305.82	24.25	13.612	0				
6,850.00	6,784.91	6,825.75	6,786.61	12.60	12.24	90.33	330.06	305.68	24.38	13.538	0				
6,900.00	6,830.73	6,875.89	6,832.50	12.66	12.30	90.30	330.06	305.56	24.51	13.468	0				
6,950.00	6,874.83	6,926.02	6,876.64	12.72	12.36	90.28	330.06	305.43	24.63	13.401	0				
7,000.00	6,916.95	6,976.14	6,918.77	12.78	12.42	90.25	330.06	305.31	24.75	13.335	0				
7,050.00	6,956.84	7,026.25	6,958.63	12.83	12.48	90.22	330.06	305.19	24.87	13.270	0				
7,100.00	6,994.23	7,076.34	6,995.96	12.89	12.54	90.18	330.06	305.06	25.00	13.203	0				
7,150.00	7,028.90	7,126.41	7,030.55	12.95	12.61	90.15	330.06	304.93	25.13	13.135	0				
7,200.00	7,060.65	7,176.47	7,062.18	13.02	12.67	90.12	330.06	304.79	25.27	13.063	0				
7,250.00	7,089.26	7,226.52	7,090.66	13.08	12.74	90.08	330.06	304.64	25.41	12.987	0				
7,300.00	7,114.58	7,276.55	7,115.81	13.15	12.81	90.05	330.06	304.48	25.57	12.906	0				
7,350.00	7,136.43	7,326.56	7,137.48	13.23	12.89	90.01	330.06	304.31	25.75	12.819	0				
7,400.00	7,154.69	7,376.55	7,155.54	13.31	12.97	89.97	330.06	304.12	25.94	12.725	0				
7,421.41	7,161.38	7,397.96	7,162.15	13.35	13.01	89.96	330.06	303.93	26.13	12.632	0				
7,450.00	7,169.24	7,426.53	7,169.89	13.40	13.07	89.94	330.06	303.91	26.15	12.624	0				
7,500.00	7,179.99	7,476.50	7,180.44	13.50	13.18	89.90	330.06	303.69	26.37	12.516	0				
7,550.00	7,186.88	7,526.44	7,187.13	13.61	13.31	89.87	330.06	303.44	26.61	12.403	0				
7,600.00	7,189.87	7,576.38	7,189.91	13.73	13.44	89.83	330.06	303.19	26.87	12.284	0				
7,613.03	7,190.00	7,589.39	7,190.00	13.76	13.47	89.83	330.06	303.12	26.94	12.252	0				
7,700.00	7,190.00	7,676.36	7,190.00	14.00	13.73	89.83	330.06	302.62	27.44	12.030	0				
7,800.00	7,190.00	7,776.36	7,190.00	14.31	14.05	89.83	330.06	301.99	28.06	11.762	0				
7,900.00	7,190.00	7,876.36	7,190.00	14.64	14.39	89.83	330.06	301.31	28.74	11.483	0				
8,000.00	7,190.00	7,976.36	7,190.00	15.00	14.76	89.83	330.06	300.58	29.47	11.198	0				
8,100.00	7,190.00	8,076.36	7,190.00	15.39	15.15	89.83	330.06	299.80	30.25	10.910	0				
8,200.00	7,190.00	8,176.36	7,190.00	15.80	15.56	89.83	330.05	298.98	31.08	10.621	0				
8,300.00	7,190.00	8,276.36	7,190.00	16.23	15.99	89.83	330.05	298.11	31.94	10.333	0				
8,400.00	7,190.00	8,376.36	7,190.00	16.67	16.44	89.83	330.05	297.21	32.84	10.049	0				
8,500.00	7,190.00	8,476.36	7,190.00	17.14	16.91	89.83	330.05	296.27	33.78	9.771	0				
8,600.00	7,190.00	8,576.36	7,190.00	17.61	17.39	89.83	330.05	295.31	34.75	9.499	0				
8,700.00	7,190.00	8,676.36	7,190.00	18.11	17.89	89.83	330.05	294.31	35.75	9.234	0				
8,800.00	7,190.00	8,776.36	7,190.00	18.62	18.40	89.83	330.05	293.28	36.77	8.976	0				
8,900.00	7,190.00	8,876.36	7,190.00	19.13	18.93	89.83	330.05	292.23	37.82	8.727	0				
9,000.00	7,190.00	8,976.36	7,190.00	19.67	19.46	89.83	330.05	291.16	38.89	8.487	0				
9,100.00	7,190.00	9,076.36	7,190.00	20.21	20.01	89.83	330.05	290.07	39.98	8.255	0				

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
9,200.00	7,190.00	9,176.36	7,190.00	20.76	20.57	89.83	330.05	288.96	41.09	8.032	0		
9,300.00	7,190.00	9,276.36	7,190.00	21.32	21.13	89.83	330.05	287.83	42.22	7.817	0		
9,400.00	7,190.00	9,376.36	7,190.00	21.88	21.70	89.83	330.05	286.68	43.37	7.610	0		
9,500.00	7,190.00	9,476.36	7,190.00	22.46	22.28	89.83	330.05	285.52	44.53	7.412	0		
9,600.00	7,190.00	9,576.36	7,190.00	23.04	22.87	89.83	330.05	284.35	45.70	7.222	0		
9,700.00	7,190.00	9,676.36	7,190.00	23.63	23.46	89.83	330.05	283.16	46.89	7.039	0		
9,800.00	7,190.00	9,776.36	7,190.00	24.23	24.06	89.83	330.05	281.96	48.09	6.863	0		
9,900.00	7,190.00	9,876.36	7,190.00	24.83	24.67	89.83	330.05	280.75	49.30	6.695	0		
10,000.00	7,190.00	9,976.36	7,190.00	25.44	25.28	89.83	330.05	279.53	50.52	6.533	0		
10,100.00	7,190.00	10,076.36	7,190.00	26.05	25.89	89.83	330.05	278.30	51.75	6.378	0		
10,200.00	7,190.00	10,176.36	7,190.00	26.66	26.51	89.83	330.05	277.06	52.99	6.229	0		
10,300.00	7,190.00	10,276.36	7,190.00	27.28	27.13	89.83	330.05	275.81	54.23	6.086	0		
10,400.00	7,190.00	10,376.36	7,190.00	27.91	27.76	89.83	330.05	274.56	55.49	5.948	0		
10,500.00	7,190.00	10,476.36	7,190.00	28.53	28.39	89.83	330.05	273.30	56.75	5.816	0		
10,600.00	7,190.00	10,576.36	7,190.00	29.16	29.02	89.83	330.05	272.03	58.02	5.689	0		
10,700.00	7,190.00	10,676.36	7,190.00	29.80	29.66	89.83	330.05	270.75	59.29	5.566	0		
10,800.00	7,190.00	10,776.36	7,190.00	30.44	30.30	89.83	330.05	269.47	60.57	5.449	0		
10,900.00	7,190.00	10,876.36	7,190.00	31.08	30.94	89.83	330.05	268.19	61.86	5.335	0		
11,000.00	7,190.00	10,976.36	7,190.00	31.72	31.59	89.83	330.05	266.90	63.15	5.226	0		
11,100.00	7,190.00	11,076.36	7,190.00	32.36	32.24	89.83	330.05	265.60	64.45	5.121	0		
11,200.00	7,190.00	11,176.36	7,190.00	33.01	32.89	89.83	330.05	264.30	65.75	5.020	0		
11,300.00	7,190.00	11,276.36	7,190.00	33.66	33.54	89.83	330.05	262.99	67.05	4.922	0		
11,400.00	7,190.00	11,376.36	7,190.00	34.31	34.19	89.83	330.04	261.68	68.36	4.828	0		
11,500.00	7,190.00	11,476.36	7,190.00	34.97	34.85	89.83	330.04	260.37	69.67	4.737	0		
11,600.00	7,190.00	11,576.36	7,190.00	35.62	35.51	89.83	330.04	259.06	70.99	4.649	0		
11,700.00	7,190.00	11,676.36	7,190.00	36.28	36.17	89.83	330.04	257.74	72.31	4.564	0		
11,800.00	7,190.00	11,776.36	7,190.00	36.94	36.83	89.83	330.04	256.41	73.63	4.482	0		
11,900.00	7,190.00	11,876.36	7,190.00	37.60	37.49	89.83	330.04	255.09	74.96	4.403	0		
12,000.00	7,190.00	11,976.36	7,190.00	38.26	38.15	89.83	330.04	253.76	76.29	4.326	0		
12,100.00	7,190.00	12,076.36	7,190.00	38.93	38.82	89.83	330.04	252.42	77.62	4.252	0		
12,200.00	7,190.00	12,176.36	7,190.00	39.59	39.49	89.83	330.04	251.09	78.95	4.180	0		
12,300.00	7,190.00	12,276.36	7,190.00	40.26	40.15	89.83	330.04	249.75	80.29	4.111	0		
12,400.00	7,190.00	12,376.36	7,190.00	40.93	40.82	89.83	330.04	248.41	81.63	4.043	0		
12,500.00	7,190.00	12,476.36	7,190.00	41.60	41.49	89.83	330.04	247.07	82.97	3.978	0		
12,600.00	7,190.00	12,576.36	7,190.00	42.27	42.17	89.83	330.04	245.73	84.31	3.914	0		
12,700.00	7,190.00	12,676.36	7,190.00	42.94	42.84	89.83	330.04	244.38	85.66	3.853	0		
12,800.00	7,190.00	12,776.36	7,190.00	43.61	43.51	89.83	330.04	243.03	87.01	3.793	0		
12,900.00	7,190.00	12,876.36	7,190.00	44.28	44.19	89.83	330.04	241.68	88.36	3.735	0		
13,000.00	7,190.00	12,976.36	7,190.00	44.96	44.86	89.83	330.04	240.33	89.71	3.679	0		
13,100.00	7,190.00	13,076.36	7,190.00	45.63	45.54	89.83	330.04	238.98	91.06	3.624	0		
13,200.00	7,190.00	13,176.36	7,190.00	46.31	46.22	89.83	330.04	237.62	92.41	3.571	0		
13,300.00	7,190.00	13,276.36	7,190.00	46.99	46.89	89.83	330.04	236.27	93.77	3.520	0		
13,400.00	7,190.00	13,376.36	7,190.00	47.66	47.57	89.83	330.04	234.91	95.13	3.469	0		
13,500.00	7,190.00	13,476.36	7,190.00	48.34	48.25	89.83	330.04	233.55	96.49	3.421	0		
13,600.00	7,190.00	13,576.36	7,190.00	49.02	48.93	89.83	330.04	232.19	97.85	3.373	0		
13,700.00	7,190.00	13,676.36	7,190.00	49.70	49.61	89.83	330.04	230.83	99.21	3.327	0		
13,800.00	7,190.00	13,776.36	7,190.00	50.38	50.29	89.83	330.04	229.47	100.57	3.282	0		
13,900.00	7,190.00	13,876.36	7,190.00	51.06	50.98	89.83	330.04	228.10	101.94	3.238	0		
14,000.00	7,190.00	13,976.36	7,190.00	51.74	51.66	89.83	330.04	226.74	103.30	3.195	0		
14,100.00	7,190.00	14,076.36	7,190.00	52.42	52.34	89.83	330.04	225.37	104.67	3.153	0		
14,200.00	7,190.00	14,176.36	7,190.00	53.11	53.02	89.83	330.04	224.00	106.04	3.113	0		
14,300.00	7,190.00	14,276.36	7,190.00	53.79	53.71	89.83	330.04	222.63	107.40	3.073	0		
14,400.00	7,190.00	14,376.36	7,190.00	54.47	54.39	89.83	330.04	221.26	108.77	3.034	0		
14,500.00	7,190.00	14,476.36	7,190.00	55.16	55.08	89.83	330.04	219.89	110.14	2.996	0		

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



Schlumberger
Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 5 - Original Hole - Rev 0		Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft		
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
14,600.00	7,190.00	14,576.36	7,190.00	55.84	55.76	89.83	330.03	218.52	111.51	2.960	0					
14,700.00	7,190.00	14,676.36	7,190.00	56.53	56.45	89.83	330.03	217.15	112.89	2.924	0					
14,800.00	7,190.00	14,776.36	7,190.00	57.21	57.14	89.83	330.03	215.77	114.26	2.888	0					
14,900.00	7,190.00	14,876.36	7,190.00	57.90	57.82	89.83	330.03	214.40	115.63	2.854	0					
15,000.00	7,190.00	14,976.36	7,190.00	58.59	58.51	89.83	330.03	213.03	117.01	2.821	0					
15,100.00	7,190.00	15,076.36	7,190.00	59.27	59.20	89.83	330.03	211.65	118.38	2.788	0					
15,200.00	7,190.00	15,176.36	7,190.00	59.96	59.89	89.83	330.03	210.27	119.76	2.756	0					
15,300.00	7,190.00	15,276.36	7,190.00	60.65	60.57	89.83	330.03	208.90	121.14	2.724	0					
15,400.00	7,190.00	15,376.36	7,190.00	61.34	61.26	89.83	330.03	207.52	122.51	2.694	0					
15,500.00	7,190.00	15,476.36	7,190.00	62.02	61.95	89.83	330.03	206.14	123.89	2.664	0					
15,600.00	7,190.00	15,576.36	7,190.00	62.71	62.64	89.83	330.03	204.76	125.27	2.635	0					
15,700.00	7,190.00	15,676.36	7,190.00	63.40	63.33	89.83	330.03	203.38	126.65	2.606	0					
15,800.00	7,190.00	15,776.36	7,190.00	64.09	64.02	89.83	330.03	202.00	128.03	2.578	0					
15,900.00	7,190.00	15,876.36	7,190.00	64.78	64.71	89.83	330.03	200.62	129.41	2.550	0					
16,000.00	7,190.00	15,976.36	7,190.00	65.47	65.40	89.83	330.03	199.24	130.79	2.523	0					
16,100.00	7,190.00	16,076.36	7,190.00	66.16	66.09	89.83	330.03	197.86	132.17	2.497	0					
16,200.00	7,190.00	16,176.36	7,190.00	66.85	66.78	89.83	330.03	196.47	133.56	2.471	0					
16,300.00	7,190.00	16,276.36	7,190.00	67.54	67.47	89.83	330.03	195.09	134.94	2.446	0					
16,400.00	7,190.00	16,376.36	7,190.00	68.23	68.17	89.83	330.03	193.71	136.32	2.421	0					
16,500.00	7,190.00	16,476.36	7,190.00	68.92	68.86	89.83	330.03	192.32	137.71	2.397	0					
16,600.00	7,190.00	16,576.36	7,190.00	69.62	69.55	89.83	330.03	190.94	139.09	2.373	0					
16,700.00	7,190.00	16,676.36	7,190.00	70.31	70.24	89.83	330.03	189.55	140.48	2.349	0					
16,800.00	7,190.00	16,776.36	7,190.00	71.00	70.93	89.83	330.03	188.17	141.86	2.326	0					
16,900.00	7,190.00	16,876.36	7,190.00	71.69	71.63	89.83	330.03	186.78	143.25	2.304	0					
17,000.00	7,190.00	16,976.36	7,190.00	72.38	72.32	89.83	330.03	185.40	144.63	2.282	0					
17,100.00	7,190.00	17,076.36	7,190.00	73.08	73.01	89.83	330.03	184.01	146.02	2.260	0					
17,200.00	7,190.00	17,176.36	7,190.00	73.77	73.71	89.83	330.03	182.62	147.41	2.239	0					
17,205.21	7,190.00	17,181.57	7,190.00	73.81	73.74	89.83	330.03	182.40	147.63	2.236	0					
17,242.86	7,190.00	17,218.82	7,190.00	74.07	74.00	89.83	330.05	182.05	148.00	2.230	0	SF				



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 6 - Original Hole - Rev 0		Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder														Offset Well Error: 0.00 usft		
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
0.00	0.00	2.00	2.00	0.00	0.00	179.84	56.10					0	CC, ES			
100.00	100.00	102.00	102.00	0.15	0.15	179.84	56.10	55.81	0.30	189.093	0					
200.00	200.00	202.00	202.00	0.32	0.32	179.84	56.10	55.46	0.65	86.880	0					
300.00	300.00	302.00	302.00	0.50	0.50	179.84	56.10	55.11	0.99	56.396	0					
400.00	400.00	402.00	402.00	0.67	0.67	179.84	56.10	54.76	1.34	41.748	0					
500.00	500.00	502.00	502.00	0.84	0.85	179.84	56.10	54.41	1.69	33.140	0					
600.00	600.00	602.00	602.00	1.02	1.02	179.84	56.10	54.06	2.04	27.475	0					
700.00	700.00	702.00	702.00	1.19	1.20	179.84	56.10	53.71	2.39	23.464	0					
800.00	800.00	802.00	802.00	1.37	1.37	179.84	56.10	53.36	2.74	20.475	0					
900.00	899.98	901.98	901.98	1.54	1.55	-142.49	57.48	54.39	3.09	18.610	0					
1,000.00	999.84	1,001.85	1,001.85	1.72	1.72	-145.40	61.71	58.28	3.44	17.962	0					
1,100.00	1,099.45	1,102.59	1,102.57	1.90	1.90	-148.13	68.22	64.44	3.78	18.033	0					
1,200.00	1,198.70	1,203.45	1,203.28	2.07	2.07	-149.33	76.17	72.04	4.13	18.446	0					
1,237.30	1,235.60	1,241.09	1,240.81	2.14	2.14	-149.47	79.48	75.22	4.26	18.666	0					
1,300.00	1,297.57	1,304.08	1,303.52	2.26	2.25	-149.27	84.91	80.43	4.48	18.951	0					
1,400.00	1,396.41	1,403.72	1,402.69	2.44	2.43	-148.78	93.39	88.55	4.84	19.312	0					
1,500.00	1,495.25	1,503.36	1,501.85	2.62	2.60	-148.36	101.87	96.68	5.19	19.620	0					
1,600.00	1,594.09	1,603.00	1,601.01	2.81	2.78	-148.01	110.35	104.80	5.55	19.887	0					
1,700.00	1,692.92	1,702.63	1,700.17	3.00	2.96	-147.72	118.84	112.93	5.91	20.119	0					
1,800.00	1,791.76	1,802.27	1,799.33	3.18	3.14	-147.46	127.33	121.07	6.27	20.323	0					
1,900.00	1,890.60	1,901.91	1,898.50	3.37	3.32	-147.23	135.83	129.20	6.62	20.504	0					
2,000.00	1,989.44	2,001.54	1,997.66	3.56	3.50	-147.03	144.32	137.34	6.98	20.665	0					
2,100.00	2,088.27	2,101.18	2,096.82	3.75	3.68	-146.85	152.82	145.48	7.34	20.809	0					
2,200.00	2,187.11	2,200.82	2,195.98	3.94	3.86	-146.69	161.32	153.61	7.70	20.939	0					
2,300.00	2,285.95	2,300.46	2,295.15	4.13	4.03	-146.55	169.82	161.75	8.06	21.057	0					
2,400.00	2,384.78	2,400.09	2,394.31	4.31	4.21	-146.42	178.32	169.89	8.43	21.164	0					
2,500.00	2,483.62	2,499.73	2,493.47	4.50	4.39	-146.30	186.82	178.03	8.79	21.262	0					
2,600.00	2,582.46	2,599.37	2,592.63	4.69	4.57	-146.20	195.32	186.17	9.15	21.352	0					
2,700.00	2,681.30	2,699.01	2,691.80	4.88	4.75	-146.10	203.83	194.32	9.51	21.434	0					
2,800.00	2,780.13	2,798.64	2,790.96	5.07	4.93	-146.01	212.33	202.46	9.87	21.511	0					
2,900.00	2,878.97	2,898.28	2,890.12	5.26	5.11	-145.92	220.83	210.60	10.23	21.581	0					
3,000.00	2,977.81	2,997.92	2,989.28	5.45	5.30	-145.85	229.34	218.74	10.59	21.647	0					
3,100.00	3,076.64	3,097.55	3,088.45	5.64	5.48	-145.77	237.84	226.89	10.96	21.708	0					
3,200.00	3,175.48	3,197.19	3,187.61	5.84	5.66	-145.71	246.35	235.03	11.32	21.765	0					
3,300.00	3,274.32	3,296.83	3,286.77	6.03	5.84	-145.64	254.85	243.17	11.68	21.818	0					
3,400.00	3,373.16	3,396.47	3,385.93	6.22	6.02	-145.59	263.36	251.31	12.04	21.868	0					
3,500.00	3,471.99	3,496.10	3,485.09	6.41	6.20	-145.53	271.86	259.46	12.41	21.915	0					
3,600.00	3,570.83	3,595.74	3,584.26	6.60	6.38	-145.48	280.37	267.60	12.77	21.959	0					
3,700.00	3,669.67	3,695.38	3,683.42	6.79	6.56	-145.43	288.88	275.75	13.13	22.000	0					
3,800.00	3,768.51	3,795.02	3,782.58	6.98	6.74	-145.39	297.38	283.89	13.49	22.039	0					
3,900.00	3,867.34	3,894.65	3,881.74	7.17	6.92	-145.34	305.89	292.03	13.86	22.077	0					
4,000.00	3,966.18	3,994.29	3,980.91	7.36	7.10	-145.30	314.40	300.18	14.22	22.112	0					
4,100.00	4,065.02	4,093.93	4,080.07	7.55	7.28	-145.26	322.90	308.32	14.58	22.145	0					
4,200.00	4,163.85	4,193.56	4,179.23	7.74	7.46	-145.23	331.41	316.47	14.94	22.177	0					
4,300.00	4,262.69	4,293.20	4,278.39	7.94	7.64	-145.19	339.92	324.61	15.31	22.207	0					
4,400.00	4,361.53	4,392.84	4,377.56	8.13	7.82	-145.16	348.43	332.76	15.67	22.235	0					
4,500.00	4,460.37	4,492.48	4,476.72	8.32	8.00	-145.13	356.93	340.90	16.03	22.263	0					
4,600.00	4,559.20	4,592.11	4,575.88	8.51	8.19	-145.10	365.44	349.05	16.40	22.289	0					
4,700.00	4,658.04	4,691.75	4,675.04	8.70	8.37	-145.07	373.95	357.19	16.76	22.314	0					
4,800.00	4,756.88	4,791.39	4,774.21	8.89	8.55	-145.04	382.46	365.33	17.12	22.337	0					
4,900.00	4,855.71	4,891.03	4,873.37	9.08	8.73	-145.02	390.96	373.48	17.48	22.360	0					
5,000.00	4,954.55	4,990.66	4,972.53	9.27	8.91	-144.99	399.47	381.62	17.85	22.382	0					
5,100.00	5,053.39	5,090.30	5,071.69	9.47	9.09	-144.97	407.98	389.77	18.21	22.403	0					
5,200.00	5,152.23	5,189.94	5,170.85	9.66	9.27	-144.94	416.49	397.91	18.57	22.423	0					

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



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance								Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision		
5,300.00	5,251.06	5,289.57	5,270.02	9.85	9.45	-144.92	425.00	406.06	18.94	22.442	0			
5,400.00	5,349.90	5,389.21	5,369.18	10.04	9.63	-144.90	433.50	414.20	19.30	22.461	0			
5,500.00	5,448.74	5,488.85	5,468.34	10.23	9.81	-144.88	442.01	422.35	19.66	22.479	0			
5,600.00	5,547.58	5,588.49	5,567.50	10.42	9.99	-144.86	450.52	430.49	20.03	22.496	0			
5,700.00	5,646.41	5,688.12	5,666.67	10.61	10.18	-144.84	459.03	438.64	20.39	22.512	0			
5,800.00	5,745.25	5,787.76	5,765.83	10.81	10.36	-144.82	467.54	446.79	20.75	22.528	0			
5,900.00	5,844.09	5,887.40	5,864.99	11.00	10.54	-144.80	476.05	454.93	21.12	22.544	0			
6,000.00	5,942.92	5,987.03	5,964.15	11.19	10.72	-144.79	484.56	463.08	21.48	22.559	0			
6,075.73	6,017.78	6,062.49	6,039.25	11.33	10.86	-144.78	491.00	469.24	21.76	22.569	0			
6,100.00	6,041.78	6,086.68	6,063.32	11.38	10.90	-144.79	492.98	471.13	21.85	22.564	0			
6,200.00	6,140.97	6,186.46	6,162.62	11.56	11.08	-144.67	499.38	477.16	22.22	22.472	0			
6,300.00	6,240.54	6,286.32	6,262.01	11.74	11.26	-144.30	502.95	480.37	22.58	22.270	0			
6,400.00	6,340.38	6,386.15	6,361.37	11.91	11.44	-143.67	503.73	480.80	22.94	21.963	0			
6,500.00	6,440.35	6,485.83	6,460.57	12.08	11.62	-142.77	501.79	478.51	23.28	21.559	0			
6,513.03	6,453.38	6,498.81	6,473.48	12.10	11.65	178.63	501.34	478.06	23.28	21.534	0			
6,600.00	6,540.35	6,582.10	6,556.42	12.24	11.80	179.45	498.45	474.88	23.56	21.155	0			
6,613.03	6,553.38	6,594.33	6,568.62	12.26	11.82	179.55	498.09	474.49	23.60	21.102	0			
6,650.00	6,590.33	6,629.01	6,603.21	12.32	11.88	90.00	497.19	473.39	23.80	20.889	0			
6,700.00	6,640.08	6,675.67	6,649.81	12.39	11.96	90.88	496.29	472.31	23.98	20.696	0			
6,750.00	6,689.29	6,721.94	6,696.04	12.46	12.04	92.04	495.88	471.72	24.16	20.521	0			
6,757.22	6,696.34	6,728.58	6,702.68	12.47	12.05	92.23	495.88	471.67	24.21	20.484	0			
6,800.00	6,737.67	6,767.66	6,741.75	12.53	12.12	93.46	496.16	471.80	24.36	20.371	0			
6,850.00	6,784.91	6,812.82	6,786.91	12.60	12.20	95.08	497.35	472.80	24.55	20.256	0			
6,900.00	6,830.73	6,858.64	6,832.73	12.66	12.27	96.97	499.65	474.89	24.76	20.181	0			
6,950.00	6,874.83	6,902.74	6,876.83	12.72	12.35	98.99	503.35	478.40	24.96	20.168	0			
7,000.00	6,916.95	6,952.86	6,926.92	12.78	12.43	101.41	508.62	483.46	25.15	20.220	0			
7,050.00	6,956.84	7,006.79	6,980.50	12.83	12.51	103.88	515.07	489.75	25.33	20.337	0			
7,100.00	6,994.23	7,063.85	7,036.43	12.89	12.60	106.32	522.58	497.12	25.46	20.523	0			
7,150.00	7,028.90	7,124.51	7,094.52	12.95	12.68	108.73	530.96	505.40	25.56	20.774	0			
7,200.00	7,060.65	7,189.26	7,154.41	13.02	12.76	111.09	539.99	514.38	25.61	21.089	0			
7,250.00	7,089.26	7,258.63	7,215.45	13.08	12.85	113.39	549.37	523.77	25.60	21.459	0			
7,300.00	7,114.58	7,333.12	7,276.59	13.15	12.94	115.60	558.79	533.24	25.55	21.874	0			
7,350.00	7,136.43	7,413.16	7,336.26	13.23	13.04	117.68	567.86	542.41	25.45	22.312	0			
7,400.00	7,154.69	7,498.95	7,392.27	13.31	13.16	119.55	576.18	550.84	25.34	22.742	0			
7,450.00	7,169.24	7,590.37	7,441.77	13.40	13.29	121.15	583.32	558.09	25.23	23.123	0			
7,500.00	7,179.99	7,686.86	7,481.53	13.50	13.45	122.39	588.87	563.70	25.16	23.402	0			
7,550.00	7,186.88	7,787.26	7,508.34	13.61	13.67	123.20	592.47	567.29	25.19	23.523	0			
7,600.00	7,189.87	7,889.92	7,519.71	13.73	13.92	123.52	593.89	568.56	25.33	23.446	0			
7,613.03	7,190.00	7,912.93	7,520.00	13.76	13.99	123.52	593.90	568.49	25.40	23.380	0			
7,700.00	7,190.00	7,999.90	7,520.00	14.00	14.23	123.52	593.90	567.99	25.91	22.925	0			
7,800.00	7,190.00	8,099.90	7,520.00	14.31	14.54	123.52	593.90	567.37	26.53	22.389	0			
7,900.00	7,190.00	8,199.90	7,520.00	14.64	14.88	123.52	593.90	566.71	27.19	21.844	0			
8,000.00	7,190.00	8,299.90	7,520.00	15.00	15.24	123.52	593.90	566.01	27.89	21.297	0			
8,036.06	7,190.00	8,335.96	7,520.00	15.14	15.38	123.52	593.90	565.52	28.37	20.931	0			
8,100.00	7,190.00	8,399.90	7,520.00	15.39	15.63	123.52	593.90	565.27	28.62	20.750	0			
8,200.00	7,190.00	8,499.90	7,520.00	15.80	16.03	123.52	593.90	564.51	29.39	20.208	0			
8,300.00	7,190.00	8,599.90	7,520.00	16.23	16.46	123.52	593.90	563.71	30.19	19.675	0			
8,400.00	7,190.00	8,699.90	7,520.00	16.67	16.90	123.52	593.90	562.89	31.01	19.151	0			
8,500.00	7,190.00	8,799.90	7,520.00	17.14	17.36	123.52	593.90	562.03	31.86	18.640	0			
8,600.00	7,190.00	8,899.90	7,520.00	17.61	17.84	123.52	593.90	561.16	32.74	18.142	0			
8,700.00	7,190.00	8,999.90	7,520.00	18.11	18.33	123.52	593.90	560.26	33.63	17.659	0			
8,724.29	7,190.00	9,024.19	7,520.00	18.23	18.46	123.52	593.90	559.78	34.12	17.406	0			
8,800.00	7,190.00	9,099.90	7,520.00	18.62	18.84	123.52	593.90	559.35	34.55	17.190	0			
8,900.00	7,190.00	9,199.90	7,520.00	19.13	19.36	123.52	593.90	558.41	35.48	16.737	0			

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder												Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
9,000.00	7,190.00	9,299.90	7,520.00	19.67	19.89	123.52	593.90	557.46	36.43	16.300	0		
9,100.00	7,190.00	9,399.90	7,520.00	20.21	20.43	123.52	593.90	556.49	37.40	15.879	0		
9,200.00	7,190.00	9,499.90	7,520.00	20.76	20.97	123.52	593.90	555.51	38.38	15.472	0		
9,300.00	7,190.00	9,599.90	7,520.00	21.32	21.53	123.52	593.90	554.52	39.38	15.081	0		
9,400.00	7,190.00	9,699.90	7,520.00	21.88	22.10	123.52	593.90	553.51	40.39	14.705	0		
9,437.45	7,190.00	9,737.35	7,520.00	22.10	22.31	123.52	593.90	552.91	40.99	14.489	0		
9,500.00	7,190.00	9,799.90	7,520.00	22.46	22.67	123.52	593.90	552.49	41.41	14.342	0		
9,600.00	7,190.00	9,899.90	7,520.00	23.04	23.26	123.52	593.90	551.46	42.44	13.994	0		
9,700.00	7,190.00	9,999.90	7,520.00	23.63	23.84	123.52	593.90	550.42	43.48	13.659	0		
9,800.00	7,190.00	10,099.90	7,520.00	24.23	24.44	123.52	593.90	549.37	44.53	13.337	0		
9,900.00	7,190.00	10,199.90	7,520.00	24.83	25.04	123.52	593.90	548.31	45.59	13.027	0		
10,000.00	7,190.00	10,299.90	7,520.00	25.44	25.64	123.52	593.90	547.24	46.65	12.730	0		
10,100.00	7,190.00	10,399.90	7,520.00	26.05	26.25	123.52	593.90	546.17	47.73	12.443	0		
10,200.00	7,190.00	10,499.90	7,520.00	26.66	26.87	123.52	593.90	545.09	48.81	12.167	0		
10,237.96	7,190.00	10,537.86	7,520.00	26.90	27.10	123.52	593.90	544.46	49.44	12.013	0		
10,300.00	7,190.00	10,599.90	7,520.00	27.28	27.48	123.52	593.90	544.00	49.90	11.902	0		
10,400.00	7,190.00	10,699.90	7,520.00	27.91	28.11	123.52	593.90	542.90	50.99	11.647	0		
10,500.00	7,190.00	10,799.90	7,520.00	28.53	28.73	123.52	593.90	541.80	52.09	11.401	0		
10,600.00	7,190.00	10,899.90	7,520.00	29.16	29.36	123.52	593.90	540.70	53.20	11.164	0		
10,700.00	7,190.00	10,999.90	7,520.00	29.80	30.00	123.52	593.90	539.59	54.31	10.936	0		
10,800.00	7,190.00	11,099.90	7,520.00	30.44	30.63	123.52	593.90	538.47	55.42	10.716	0		
10,900.00	7,190.00	11,199.90	7,520.00	31.08	31.27	123.52	593.90	537.35	56.54	10.504	0		
10,918.96	7,190.00	11,218.86	7,520.00	31.20	31.39	123.52	593.90	536.86	57.04	10.412	0		
11,000.00	7,190.00	11,299.90	7,520.00	31.72	31.91	123.52	593.90	536.23	57.66	10.299	0		
11,100.00	7,190.00	11,399.90	7,520.00	32.36	32.56	123.52	593.90	535.10	58.79	10.102	0		
11,200.00	7,190.00	11,499.90	7,520.00	33.01	33.21	123.52	593.90	533.97	59.92	9.911	0		
11,300.00	7,190.00	11,599.90	7,520.00	33.66	33.85	123.52	593.90	532.84	61.06	9.727	0		
11,400.00	7,190.00	11,699.90	7,520.00	34.31	34.51	123.52	593.90	531.70	62.20	9.549	0		
11,500.00	7,190.00	11,799.90	7,520.00	34.97	35.16	123.52	593.90	530.56	63.34	9.377	0		
11,600.00	7,190.00	11,899.90	7,520.00	35.62	35.81	123.52	593.90	529.41	64.48	9.210	0		
11,635.13	7,190.00	11,935.03	7,520.00	35.85	36.05	123.52	593.90	528.78	65.11	9.121	0		
11,700.00	7,190.00	11,999.90	7,520.00	36.28	36.47	123.52	593.90	528.27	65.63	9.049	0		
11,800.00	7,190.00	12,099.90	7,520.00	36.94	37.13	123.52	593.90	527.12	66.78	8.893	0		
11,900.00	7,190.00	12,199.90	7,520.00	37.60	37.79	123.52	593.90	525.96	67.93	8.742	0		
12,000.00	7,190.00	12,299.90	7,520.00	38.26	38.45	123.52	593.90	524.81	69.09	8.596	0		
12,100.00	7,190.00	12,399.90	7,520.00	38.93	39.12	123.52	593.90	523.65	70.25	8.455	0		
12,200.00	7,190.00	12,499.90	7,520.00	39.59	39.78	123.52	593.90	522.49	71.41	8.317	0		
12,300.00	7,190.00	12,599.90	7,520.00	40.26	40.45	123.52	593.90	521.33	72.57	8.184	0		
12,335.13	7,190.00	12,635.03	7,520.00	40.49	40.68	123.52	593.90	520.69	73.20	8.113	0		
12,400.00	7,190.00	12,699.90	7,520.00	40.93	41.11	123.52	593.90	520.17	73.73	8.055	0		
12,500.00	7,190.00	12,799.90	7,520.00	41.60	41.78	123.52	593.90	519.00	74.90	7.930	0		
12,600.00	7,190.00	12,899.90	7,520.00	42.27	42.45	123.52	593.90	517.83	76.06	7.808	0		
12,700.00	7,190.00	12,999.90	7,520.00	42.94	43.12	123.52	593.90	516.66	77.23	7.690	0		
12,800.00	7,190.00	13,099.90	7,520.00	43.61	43.79	123.52	593.90	515.49	78.40	7.575	0		
12,900.00	7,190.00	13,199.90	7,520.00	44.28	44.47	123.52	593.90	514.32	79.58	7.463	0		
13,000.00	7,190.00	13,299.90	7,520.00	44.96	45.14	123.52	593.90	513.15	80.75	7.355	0		
13,017.54	7,190.00	13,317.44	7,520.00	45.08	45.26	123.52	593.90	512.65	81.25	7.310	0		
13,100.00	7,190.00	13,399.90	7,520.00	45.63	45.81	123.52	593.90	511.97	81.92	7.249	0		
13,200.00	7,190.00	13,499.90	7,520.00	46.31	46.49	123.52	593.90	510.79	83.10	7.147	0		
13,300.00	7,190.00	13,599.90	7,520.00	46.99	47.17	123.52	593.90	509.62	84.28	7.047	0		
13,400.00	7,190.00	13,699.90	7,520.00	47.66	47.84	123.52	593.90	508.44	85.46	6.949	0		
13,500.00	7,190.00	13,799.90	7,520.00	48.34	48.52	123.52	593.90	507.26	86.64	6.855	0		
13,600.00	7,190.00	13,899.90	7,520.00	49.02	49.20	123.52	593.90	506.08	87.82	6.763	0		
13,700.00	7,190.00	13,999.90	7,520.00	49.70	49.88	123.52	593.90	504.89	89.00	6.673	0		

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 6 - Original Hole - Rev 0		Offset Site Error:		0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:		0.00 usft		
Reference		Offset		Semi Major Axis		Distance							Warning				
Measured Depth	Vertical	Measured	Vertical	Reference	Offset	Highside	Between	Between	Minimum	Separation	Risked	Probability					
Depth (usft)	Depth (usft)	Depth (usft)	Depth (usft)			Toolface (°)	Centres (usft)	Ellipses (usft)	Separation (usft)	Factor	Separation Factor	of Collision					
13,735.13	7,190.00	14,035.03	7,520.00	49.94	50.12	123.52	593.90	504.25	89.65	6.625	0						
13,800.00	7,190.00	14,099.90	7,520.00	50.38	50.56	123.52	593.90	503.71	90.19	6.585	0						
13,900.00	7,190.00	14,199.90	7,520.00	51.06	51.24	123.52	593.90	502.52	91.37	6.500	0						
14,000.00	7,190.00	14,299.90	7,520.00	51.74	51.92	123.52	593.90	501.34	92.56	6.416	0						
14,100.00	7,190.00	14,399.90	7,520.00	52.42	52.60	123.52	593.90	500.15	93.75	6.335	0						
14,200.00	7,190.00	14,499.90	7,520.00	53.11	53.28	123.52	593.90	498.96	94.93	6.256	0						
14,300.00	7,190.00	14,599.90	7,520.00	53.79	53.97	123.52	593.90	497.77	96.12	6.179	0						
14,400.00	7,190.00	14,699.90	7,520.00	54.47	54.65	123.52	593.90	496.58	97.31	6.103	0						
14,500.00	7,190.00	14,799.90	7,520.00	55.16	55.33	123.52	593.90	495.39	98.50	6.029	0						
14,535.13	7,190.00	14,835.03	7,520.00	55.40	55.57	123.52	593.90	494.75	99.15	5.990	0						
14,600.00	7,190.00	14,899.90	7,520.00	55.84	56.02	123.52	593.90	494.20	99.69	5.957	0						
14,700.00	7,190.00	14,999.90	7,520.00	56.53	56.70	123.52	593.90	493.01	100.89	5.887	0						
14,800.00	7,190.00	15,099.90	7,520.00	57.21	57.39	123.52	593.90	491.82	102.08	5.818	0						
14,900.00	7,190.00	15,199.90	7,520.00	57.90	58.07	123.52	593.90	490.62	103.27	5.751	0						
15,000.00	7,190.00	15,299.90	7,520.00	58.59	58.76	123.52	593.90	489.43	104.47	5.685	0						
15,100.00	7,190.00	15,399.90	7,520.00	59.27	59.45	123.52	593.90	488.24	105.66	5.621	0						
15,200.00	7,190.00	15,499.90	7,520.00	59.96	60.13	123.52	593.90	487.04	106.86	5.558	0						
15,222.54	7,190.00	15,522.44	7,520.00	60.11	60.29	123.52	593.90	486.50	107.40	5.530	0						
15,300.00	7,190.00	15,599.90	7,520.00	60.65	60.82	123.52	593.90	485.84	108.05	5.496	0						
15,400.00	7,190.00	15,699.90	7,520.00	61.34	61.51	123.52	593.90	484.65	109.25	5.436	0						
15,500.00	7,190.00	15,799.90	7,520.00	62.02	62.20	123.52	593.90	483.45	110.45	5.377	0						
15,600.00	7,190.00	15,899.90	7,520.00	62.71	62.88	123.52	593.90	482.25	111.64	5.320	0						
15,700.00	7,190.00	15,999.90	7,520.00	63.40	63.57	123.52	593.90	481.05	112.84	5.263	0						
15,800.00	7,190.00	16,099.90	7,520.00	64.09	64.26	123.52	593.90	479.85	114.04	5.208	0						
15,900.00	7,190.00	16,199.90	7,520.00	64.78	64.95	123.52	593.90	478.65	115.24	5.153	0						
16,000.00	7,190.00	16,299.90	7,520.00	65.47	65.64	123.52	593.90	477.45	116.44	5.100	0						
16,100.00	7,190.00	16,399.90	7,520.00	66.16	66.33	123.52	593.90	476.25	117.64	5.048	0						
16,200.00	7,190.00	16,499.90	7,520.00	66.85	67.02	123.52	593.90	475.05	118.84	4.997	0						
16,300.00	7,190.00	16,599.90	7,520.00	67.54	67.71	123.52	593.90	473.85	120.04	4.947	0						
16,400.00	7,190.00	16,699.90	7,520.00	68.23	68.40	123.52	593.90	472.65	121.25	4.898	0						
16,500.00	7,190.00	16,799.90	7,520.00	68.92	69.09	123.52	593.90	471.45	122.45	4.850	0						
16,600.00	7,190.00	16,899.90	7,520.00	69.62	69.78	123.52	593.90	470.25	123.65	4.803	0						
16,700.00	7,190.00	16,999.90	7,520.00	70.31	70.48	123.52	593.90	469.04	124.85	4.757	0						
16,800.00	7,190.00	17,099.90	7,520.00	71.00	71.17	123.52	593.90	467.84	126.06	4.711	0						
16,900.00	7,190.00	17,199.90	7,520.00	71.69	71.86	123.52	593.90	466.63	127.26	4.667	0						
17,000.00	7,190.00	17,299.90	7,520.00	72.38	72.55	123.52	593.90	465.43	128.47	4.623	0						
17,100.00	7,190.00	17,399.90	7,520.00	73.08	73.24	123.52	593.90	464.23	129.67	4.580	0						
17,200.00	7,190.00	17,499.90	7,520.00	73.77	73.94	123.52	593.90	463.02	130.88	4.538	0						
17,242.86	7,190.00	17,543.03	7,520.00	74.07	74.24	123.53	593.88	462.48	131.39	4.520	0	SF					



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision		
0.00	0.00	2.00	2.00	0.00	0.00	179.93	84.16						0	
100.00	100.00	102.00	102.00	0.15	0.15	179.93	84.16	83.86	0.30	283.642	0		0	
200.00	200.00	202.00	202.00	0.32	0.32	179.93	84.16	83.51	0.65	130.322	0		0	
300.00	300.00	302.00	302.00	0.50	0.50	179.93	84.16	83.16	0.99	84.595	0		0	
400.00	400.00	402.00	402.00	0.67	0.67	179.93	84.16	82.81	1.34	62.622	0		0	
500.00	500.00	502.00	502.00	0.84	0.85	179.93	84.16	82.47	1.69	49.710	0		0	
600.00	600.00	602.00	602.00	1.02	1.02	179.93	84.16	82.12	2.04	41.213	0		0	
700.00	700.00	702.00	702.00	1.19	1.20	179.93	84.16	81.77	2.39	35.196	0		0	
800.00	800.00	802.00	802.00	1.37	1.37	179.93	84.16	81.42	2.74	30.713	0		0	CC, ES
900.00	899.98	901.98	901.98	1.54	1.55	-142.04	85.53	82.44	3.09	27.691	0		0	
1,000.00	999.84	1,001.84	1,001.84	1.72	1.72	-144.05	89.71	86.28	3.44	26.109	0		0	
1,100.00	1,099.45	1,101.46	1,101.46	1.90	1.89	-146.99	96.91	93.13	3.78	25.625	0		0	
1,200.00	1,198.70	1,201.65	1,201.63	2.07	2.07	-149.53	106.90	102.77	4.13	25.904	0		0	
1,237.30	1,235.60	1,239.03	1,238.98	2.14	2.13	-150.13	111.22	106.96	4.25	26.140	0		0	
1,300.00	1,297.57	1,301.94	1,301.78	2.26	2.24	-150.69	118.57	114.10	4.48	26.488	0		0	
1,400.00	1,396.41	1,402.29	1,401.73	2.44	2.42	-150.24	129.58	124.74	4.83	26.823	0		0	
1,500.00	1,495.25	1,501.69	1,500.64	2.62	2.60	-149.37	140.28	135.09	5.19	27.052	0		0	
1,600.00	1,594.09	1,601.10	1,599.54	2.81	2.77	-148.63	151.01	145.47	5.54	27.251	0		0	
1,700.00	1,692.92	1,700.50	1,698.45	3.00	2.95	-147.98	161.76	155.86	5.90	27.425	0		0	
1,800.00	1,791.76	1,799.91	1,797.36	3.18	3.13	-147.41	172.53	166.27	6.26	27.578	0		0	
1,900.00	1,890.60	1,899.31	1,896.26	3.37	3.31	-146.91	183.32	176.70	6.61	27.714	0		0	
2,000.00	1,989.44	1,998.72	1,995.17	3.56	3.49	-146.47	194.11	187.14	6.97	27.835	0		0	
2,100.00	2,088.27	2,098.12	2,094.08	3.75	3.66	-146.07	204.92	197.59	7.33	27.943	0		0	
2,200.00	2,187.11	2,197.53	2,192.98	3.94	3.84	-145.72	215.74	208.04	7.69	28.041	0		0	
2,300.00	2,285.95	2,296.93	2,291.89	4.13	4.02	-145.39	226.56	218.51	8.05	28.130	0		0	
2,400.00	2,384.78	2,396.34	2,390.80	4.31	4.20	-145.10	237.39	228.97	8.42	28.210	0		0	
2,500.00	2,483.62	2,495.74	2,489.70	4.50	4.38	-144.83	248.22	239.45	8.78	28.282	0		0	
2,600.00	2,582.46	2,595.15	2,588.61	4.69	4.56	-144.58	259.07	249.93	9.14	28.349	0		0	
2,700.00	2,681.30	2,694.55	2,687.52	4.88	4.74	-144.36	269.91	260.41	9.50	28.410	0		0	
2,800.00	2,780.13	2,793.96	2,786.42	5.07	4.92	-144.15	280.76	270.90	9.86	28.467	0		0	
2,900.00	2,878.97	2,893.36	2,885.33	5.26	5.10	-143.96	291.61	281.39	10.23	28.519	0		0	
3,000.00	2,977.81	2,992.76	2,984.24	5.45	5.28	-143.78	302.47	291.88	10.59	28.567	0		0	
3,100.00	3,076.64	3,092.17	3,083.14	5.64	5.46	-143.61	313.32	302.37	10.95	28.612	0		0	
3,200.00	3,175.48	3,191.57	3,182.05	5.84	5.64	-143.46	324.18	312.87	11.31	28.655	0		0	
3,300.00	3,274.32	3,290.98	3,280.95	6.03	5.82	-143.31	335.05	323.37	11.68	28.694	0		0	
3,400.00	3,373.16	3,390.38	3,379.86	6.22	6.00	-143.17	345.91	333.87	12.04	28.731	0		0	
3,500.00	3,471.99	3,489.79	3,478.77	6.41	6.18	-143.05	356.78	344.37	12.40	28.765	0		0	
3,600.00	3,570.83	3,589.19	3,577.67	6.60	6.36	-142.93	367.65	354.88	12.77	28.798	0		0	
3,700.00	3,669.67	3,688.60	3,676.58	6.79	6.54	-142.81	378.51	365.38	13.13	28.828	0		0	
3,800.00	3,768.51	3,788.00	3,775.49	6.98	6.72	-142.70	389.39	375.89	13.49	28.857	0		0	
3,900.00	3,867.34	3,887.41	3,874.39	7.17	6.90	-142.60	400.26	386.40	13.86	28.885	0		0	
4,000.00	3,966.18	3,986.81	3,973.30	7.36	7.08	-142.51	411.13	396.91	14.22	28.910	0		0	
4,100.00	4,065.02	4,086.22	4,072.21	7.55	7.26	-142.42	422.01	407.42	14.58	28.935	0		0	
4,200.00	4,163.85	4,185.62	4,171.11	7.74	7.44	-142.33	432.88	417.93	14.95	28.958	0		0	
4,300.00	4,262.69	4,285.03	4,270.02	7.94	7.63	-142.25	443.76	428.44	15.31	28.980	0		0	
4,400.00	4,361.53	4,384.43	4,368.93	8.13	7.81	-142.17	454.63	438.96	15.68	29.001	0		0	
4,500.00	4,460.37	4,483.84	4,467.83	8.32	7.99	-142.09	465.51	449.47	16.04	29.021	0		0	
4,600.00	4,559.20	4,583.24	4,566.74	8.51	8.17	-142.02	476.39	459.99	16.40	29.040	0		0	
4,700.00	4,658.04	4,682.65	4,665.65	8.70	8.35	-141.96	487.27	470.50	16.77	29.059	0		0	
4,800.00	4,756.88	4,782.05	4,764.55	8.89	8.53	-141.89	498.15	481.02	17.13	29.076	0		0	
4,900.00	4,855.71	4,881.46	4,863.46	9.08	8.71	-141.83	509.03	491.53	17.50	29.093	0		0	
5,000.00	4,954.55	4,980.86	4,962.37	9.27	8.89	-141.77	519.91	502.05	17.86	29.109	0		0	
5,100.00	5,053.39	5,080.27	5,061.27	9.47	9.07	-141.71	530.79	512.57	18.23	29.124	0		0	
5,200.00	5,152.23	5,179.67	5,160.18	9.66	9.25	-141.66	541.68	523.09	18.59	29.139	0		0	

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 7 - Original Hole - Rev 0		Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder													Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
5,300.00	5,251.06	5,279.08	5,259.08	9.85	9.43	-141.60	552.56	533.61	18.95	29.153	0					
5,400.00	5,349.90	5,378.48	5,357.99	10.04	9.61	-141.55	563.44	544.12	19.32	29.166	0					
5,500.00	5,448.74	5,477.88	5,456.90	10.23	9.79	-141.50	574.33	554.64	19.68	29.179	0					
5,600.00	5,547.58	5,577.29	5,555.80	10.42	9.98	-141.46	585.21	565.16	20.05	29.192	0					
5,700.00	5,646.41	5,676.69	5,654.71	10.61	10.16	-141.41	596.09	575.68	20.41	29.204	0					
5,800.00	5,745.25	5,776.10	5,753.62	10.81	10.34	-141.37	606.98	586.20	20.78	29.216	0					
5,900.00	5,844.09	5,875.50	5,852.52	11.00	10.52	-141.33	617.86	596.72	21.14	29.227	0					
6,000.00	5,942.92	5,974.91	5,951.43	11.19	10.70	-141.29	628.75	607.24	21.50	29.238	0					
6,075.73	6,017.78	6,050.19	6,026.34	11.33	10.84	-141.26	636.99	615.21	21.78	29.246	0					
6,100.00	6,041.78	6,074.32	6,050.34	11.38	10.88	-141.27	639.56	617.68	21.87	29.237	0					
6,200.00	6,140.97	6,173.90	6,149.43	11.56	11.06	-141.20	648.43	626.18	22.25	29.138	0					
6,300.00	6,240.54	6,271.88	6,247.02	11.74	11.24	-141.02	654.72	632.11	22.61	28.952	0					
6,400.00	6,340.38	6,369.69	6,344.68	11.91	11.41	-140.90	658.63	635.67	22.95	28.693	0					
6,500.00	6,440.35	6,467.62	6,442.57	12.08	11.57	-140.86	660.14	636.87	23.28	28.361	0					
6,513.03	6,453.38	6,480.42	6,455.38	12.10	11.60	-179.60	660.16	636.97	23.19	28.467	0					
6,600.00	6,540.35	6,567.39	6,542.35	12.24	11.74	-179.60	660.16	636.68	23.49	28.107	0					
6,613.03	6,553.38	6,580.44	6,555.39	12.26	11.77	-179.60	660.16	636.63	23.53	28.054	0					
6,650.00	6,590.33	6,617.67	6,592.60	12.32	11.83	90.39	660.16	636.39	23.78	27.765	0					
6,700.00	6,640.08	6,668.01	6,642.67	12.39	11.90	90.37	660.16	636.23	23.93	27.586	0					
6,750.00	6,689.29	6,718.34	6,692.17	12.46	11.98	90.35	660.16	636.08	24.08	27.418	0					
6,800.00	6,737.67	6,768.65	6,740.79	12.53	12.05	90.33	660.16	635.94	24.22	27.262	0					
6,850.00	6,784.91	6,818.94	6,788.22	12.60	12.11	90.31	660.16	635.81	24.35	27.114	0					
6,900.00	6,830.73	6,869.21	6,834.16	12.66	12.18	90.28	660.16	635.68	24.47	26.974	0					
6,950.00	6,874.83	6,919.45	6,878.33	12.72	12.24	90.25	660.15	635.56	24.60	26.838	0					
7,000.00	6,916.95	6,969.67	6,920.46	12.78	12.30	90.23	660.15	635.43	24.72	26.706	0					
7,050.00	6,956.84	7,019.86	6,960.28	12.83	12.36	90.20	660.15	635.31	24.84	26.575	0					
7,100.00	6,994.23	7,070.02	6,997.56	12.89	12.42	90.17	660.15	635.18	24.97	26.442	0					
7,150.00	7,028.90	7,120.15	7,032.06	12.95	12.49	90.13	660.15	635.05	25.10	26.304	0					
7,200.00	7,060.65	7,170.26	7,063.57	13.02	12.56	90.10	660.15	634.91	25.23	26.160	0					
7,250.00	7,089.26	7,220.33	7,091.92	13.08	12.63	90.07	660.15	634.77	25.38	26.007	0					
7,300.00	7,114.58	7,270.38	7,116.91	13.15	12.71	90.03	660.15	634.60	25.54	25.844	0					
7,348.47	7,135.81	7,318.86	7,137.81	13.23	12.80	90.00	660.15	634.44	25.71	25.674	0					
7,350.00	7,136.43	7,320.39	7,138.42	13.23	12.80	90.00	660.15	634.43	25.72	25.668	0					
7,400.00	7,154.69	7,370.37	7,156.30	13.31	12.89	89.96	660.15	634.24	25.91	25.479	0					
7,450.00	7,169.24	7,420.32	7,170.47	13.40	13.00	89.93	660.15	634.03	26.12	25.277	0					
7,500.00	7,179.99	7,470.24	7,180.83	13.50	13.11	89.90	660.15	633.81	26.34	25.061	0					
7,550.00	7,186.88	7,520.14	7,187.33	13.61	13.23	89.87	660.15	633.57	26.58	24.833	0					
7,600.00	7,189.87	7,570.00	7,189.94	13.73	13.36	89.83	660.15	633.31	26.84	24.595	0					
7,613.03	7,190.00	7,583.00	7,190.00	13.76	13.40	89.83	660.15	633.24	26.91	24.531	0					
7,700.00	7,190.00	7,669.97	7,190.00	14.00	13.65	89.83	660.15	632.74	27.41	24.084	0					
7,800.00	7,190.00	7,769.97	7,190.00	14.31	13.96	89.83	660.15	632.12	28.04	23.547	0					
7,900.00	7,190.00	7,869.97	7,190.00	14.64	14.31	89.83	660.15	631.44	28.72	22.989	0					
8,000.00	7,190.00	7,969.97	7,190.00	15.00	14.67	89.83	660.15	630.70	29.45	22.417	0					
8,100.00	7,190.00	8,069.97	7,190.00	15.39	15.06	89.83	660.15	629.92	30.23	21.839	0					
8,200.00	7,190.00	8,169.97	7,190.00	15.80	15.48	89.83	660.15	629.10	31.05	21.259	0					
8,300.00	7,190.00	8,269.97	7,190.00	16.23	15.91	89.83	660.15	628.23	31.92	20.683	0					
8,400.00	7,190.00	8,369.97	7,190.00	16.67	16.36	89.83	660.15	627.33	32.82	20.114	0					
8,500.00	7,190.00	8,469.97	7,190.00	17.14	16.83	89.83	660.15	626.39	33.76	19.556	0					
8,600.00	7,190.00	8,569.97	7,190.00	17.61	17.32	89.83	660.15	625.43	34.73	19.010	0					
8,700.00	7,190.00	8,669.97	7,190.00	18.11	17.82	89.83	660.15	624.43	35.72	18.479	0					
8,800.00	7,190.00	8,769.97	7,190.00	18.62	18.33	89.83	660.15	623.40	36.75	17.964	0					
8,900.00	7,190.00	8,869.97	7,190.00	19.13	18.86	89.83	660.15	622.35	37.80	17.465	0					
9,000.00	7,190.00	8,969.97	7,190.00	19.67	19.39	89.83	660.15	621.28	38.87	16.984	0					
9,100.00	7,190.00	9,069.97	7,190.00	20.21	19.94	89.83	660.15	620.19	39.96	16.519	0					

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
9,200.00	7,190.00	9,169.97	7,190.00	20.76	20.50	89.83	660.15	619.08	41.07	16.072	0		
9,300.00	7,190.00	9,269.97	7,190.00	21.32	21.06	89.83	660.15	617.95	42.20	15.642	0		
9,400.00	7,190.00	9,369.97	7,190.00	21.88	21.64	89.83	660.15	616.80	43.35	15.228	0		
9,500.00	7,190.00	9,469.97	7,190.00	22.46	22.22	89.83	660.15	615.64	44.51	14.831	0		
9,600.00	7,190.00	9,569.97	7,190.00	23.04	22.81	89.83	660.15	614.47	45.69	14.450	0		
9,700.00	7,190.00	9,669.97	7,190.00	23.63	23.40	89.83	660.15	613.28	46.87	14.084	0		
9,800.00	7,190.00	9,769.97	7,190.00	24.23	24.00	89.83	660.15	612.08	48.07	13.733	0		
9,900.00	7,190.00	9,869.97	7,190.00	24.83	24.61	89.83	660.15	610.87	49.28	13.395	0		
10,000.00	7,190.00	9,969.97	7,190.00	25.44	25.22	89.83	660.15	609.65	50.50	13.072	0		
10,100.00	7,190.00	10,069.97	7,190.00	26.05	25.83	89.83	660.15	608.42	51.73	12.761	0		
10,200.00	7,190.00	10,169.97	7,190.00	26.66	26.45	89.83	660.15	607.18	52.97	12.462	0		
10,300.00	7,190.00	10,269.97	7,190.00	27.28	27.08	89.83	660.15	605.93	54.22	12.176	0		
10,400.00	7,190.00	10,369.97	7,190.00	27.91	27.71	89.83	660.15	604.68	55.47	11.900	0		
10,500.00	7,190.00	10,469.97	7,190.00	28.53	28.34	89.83	660.15	603.42	56.74	11.636	0		
10,600.00	7,190.00	10,569.97	7,190.00	29.16	28.97	89.83	660.15	602.15	58.00	11.381	0		
10,700.00	7,190.00	10,669.97	7,190.00	29.80	29.61	89.83	660.15	600.87	59.28	11.136	0		
10,800.00	7,190.00	10,769.97	7,190.00	30.44	30.25	89.83	660.15	599.59	60.56	10.901	0		
10,900.00	7,190.00	10,869.97	7,190.00	31.08	30.90	89.83	660.15	598.31	61.85	10.674	0		
11,000.00	7,190.00	10,969.97	7,190.00	31.72	31.54	89.83	660.15	597.01	63.14	10.456	0		
11,100.00	7,190.00	11,069.97	7,190.00	32.36	32.19	89.83	660.15	595.72	64.43	10.246	0		
11,200.00	7,190.00	11,169.97	7,190.00	33.01	32.84	89.83	660.15	594.42	65.73	10.043	0		
11,300.00	7,190.00	11,269.97	7,190.00	33.66	33.49	89.83	660.15	593.11	67.04	9.847	0		
11,400.00	7,190.00	11,369.97	7,190.00	34.31	34.15	89.83	660.15	591.80	68.35	9.659	0		
11,500.00	7,190.00	11,469.97	7,190.00	34.97	34.81	89.83	660.15	590.49	69.66	9.477	0		
11,600.00	7,190.00	11,569.97	7,190.00	35.62	35.46	89.83	660.15	589.17	70.98	9.301	0		
11,700.00	7,190.00	11,669.97	7,190.00	36.28	36.12	89.83	660.15	587.85	72.30	9.131	0		
11,800.00	7,190.00	11,769.97	7,190.00	36.94	36.79	89.83	660.15	586.53	73.62	8.967	0		
11,900.00	7,190.00	11,869.97	7,190.00	37.60	37.45	89.83	660.15	585.20	74.95	8.808	0		
12,000.00	7,190.00	11,969.97	7,190.00	38.26	38.11	89.83	660.15	583.88	76.28	8.655	0		
12,100.00	7,190.00	12,069.97	7,190.00	38.93	38.78	89.83	660.15	582.54	77.61	8.506	0		
12,200.00	7,190.00	12,169.97	7,190.00	39.59	39.45	89.83	660.15	581.21	78.94	8.362	0		
12,300.00	7,190.00	12,269.97	7,190.00	40.26	40.12	89.83	660.15	579.87	80.28	8.223	0		
12,400.00	7,190.00	12,369.97	7,190.00	40.93	40.79	89.83	660.15	578.53	81.62	8.088	0		
12,500.00	7,190.00	12,469.97	7,190.00	41.60	41.46	89.83	660.15	577.19	82.96	7.957	0		
12,600.00	7,190.00	12,569.97	7,190.00	42.27	42.13	89.83	660.15	575.85	84.30	7.831	0		
12,700.00	7,190.00	12,669.97	7,190.00	42.94	42.80	89.83	660.15	574.50	85.65	7.708	0		
12,800.00	7,190.00	12,769.97	7,190.00	43.61	43.48	89.83	660.15	573.15	87.00	7.588	0		
12,900.00	7,190.00	12,869.97	7,190.00	44.28	44.15	89.83	660.15	571.80	88.35	7.472	0		
13,000.00	7,190.00	12,969.97	7,190.00	44.96	44.83	89.83	660.15	570.45	89.70	7.360	0		
13,100.00	7,190.00	13,069.97	7,190.00	45.63	45.51	89.83	660.15	569.10	91.05	7.250	0		
13,200.00	7,190.00	13,169.97	7,190.00	46.31	46.18	89.83	660.15	567.75	92.41	7.144	0		
13,300.00	7,190.00	13,269.97	7,190.00	46.99	46.86	89.83	660.15	566.39	93.76	7.041	0		
13,400.00	7,190.00	13,369.97	7,190.00	47.66	47.54	89.83	660.15	565.03	95.12	6.940	0		
13,500.00	7,190.00	13,469.97	7,190.00	48.34	48.22	89.83	660.15	563.67	96.48	6.842	0		
13,600.00	7,190.00	13,569.97	7,190.00	49.02	48.90	89.83	660.15	562.31	97.84	6.747	0		
13,700.00	7,190.00	13,669.97	7,190.00	49.70	49.58	89.83	660.15	560.95	99.20	6.655	0		
13,800.00	7,190.00	13,769.97	7,190.00	50.38	50.26	89.83	660.15	559.59	100.56	6.565	0		
13,900.00	7,190.00	13,869.97	7,190.00	51.06	50.95	89.83	660.15	558.22	101.93	6.477	0		
14,000.00	7,190.00	13,969.97	7,190.00	51.74	51.63	89.83	660.15	556.86	103.29	6.391	0		
14,100.00	7,190.00	14,069.97	7,190.00	52.42	52.31	89.83	660.15	555.49	104.66	6.308	0		
14,200.00	7,190.00	14,169.97	7,190.00	53.11	53.00	89.83	660.15	554.12	106.03	6.226	0		
14,300.00	7,190.00	14,269.97	7,190.00	53.79	53.68	89.83	660.15	552.76	107.40	6.147	0		
14,400.00	7,190.00	14,369.97	7,190.00	54.47	54.37	89.83	660.15	551.39	108.76	6.070	0		
14,500.00	7,190.00	14,469.97	7,190.00	55.16	55.05	89.83	660.15	550.02	110.14	5.994	0		

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



Schlumberger
Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 7 - Original Hole - Rev 0		Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft		
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
14,600.00	7,190.00	14,569.97	7,190.00	55.84	55.74	89.83	660.15	548.64	111.51	5.920	0					
14,700.00	7,190.00	14,669.97	7,190.00	56.53	56.42	89.83	660.15	547.27	112.88	5.848	0					
14,800.00	7,190.00	14,769.97	7,190.00	57.21	57.11	89.83	660.15	545.90	114.25	5.778	0					
14,900.00	7,190.00	14,869.97	7,190.00	57.90	57.80	89.83	660.15	544.53	115.63	5.709	0					
15,000.00	7,190.00	14,969.97	7,190.00	58.59	58.48	89.83	660.15	543.15	117.00	5.642	0					
15,100.00	7,190.00	15,069.97	7,190.00	59.27	59.17	89.83	660.15	541.78	118.38	5.577	0					
15,200.00	7,190.00	15,169.97	7,190.00	59.96	59.86	89.83	660.15	540.40	119.75	5.513	0					
15,300.00	7,190.00	15,269.97	7,190.00	60.65	60.55	89.83	660.15	539.02	121.13	5.450	0					
15,400.00	7,190.00	15,369.97	7,190.00	61.34	61.24	89.83	660.15	537.64	122.51	5.389	0					
15,500.00	7,190.00	15,469.97	7,190.00	62.02	61.93	89.83	660.15	536.27	123.89	5.329	0					
15,600.00	7,190.00	15,569.97	7,190.00	62.71	62.62	89.83	660.15	534.89	125.26	5.270	0					
15,700.00	7,190.00	15,669.97	7,190.00	63.40	63.31	89.83	660.15	533.51	126.64	5.213	0					
15,800.00	7,190.00	15,769.97	7,190.00	64.09	64.00	89.83	660.15	532.13	128.02	5.156	0					
15,900.00	7,190.00	15,869.97	7,190.00	64.78	64.69	89.83	660.15	530.75	129.40	5.101	0					
16,000.00	7,190.00	15,969.97	7,190.00	65.47	65.38	89.83	660.15	529.37	130.79	5.048	0					
16,100.00	7,190.00	16,069.97	7,190.00	66.16	66.07	89.83	660.15	527.98	132.17	4.995	0					
16,200.00	7,190.00	16,169.97	7,190.00	66.85	66.76	89.83	660.15	526.60	133.55	4.943	0					
16,300.00	7,190.00	16,269.97	7,190.00	67.54	67.45	89.83	660.15	525.22	134.93	4.892	0					
16,400.00	7,190.00	16,369.97	7,190.00	68.23	68.14	89.83	660.15	523.84	136.32	4.843	0					
16,500.00	7,190.00	16,469.97	7,190.00	68.92	68.84	89.83	660.15	522.45	137.70	4.794	0					
16,600.00	7,190.00	16,569.97	7,190.00	69.62	69.53	89.83	660.15	521.07	139.08	4.746	0					
16,700.00	7,190.00	16,669.97	7,190.00	70.31	70.22	89.83	660.15	519.68	140.47	4.700	0					
16,800.00	7,190.00	16,769.97	7,190.00	71.00	70.91	89.83	660.15	518.30	141.85	4.654	0					
16,900.00	7,190.00	16,869.97	7,190.00	71.69	71.61	89.83	660.15	516.91	143.24	4.609	0					
17,000.00	7,190.00	16,969.97	7,190.00	72.38	72.30	89.83	660.15	515.53	144.63	4.565	0					
17,100.00	7,190.00	17,069.97	7,190.00	73.08	72.99	89.83	660.15	514.14	146.01	4.521	0					
17,200.00	7,190.00	17,169.97	7,190.00	73.77	73.69	89.83	660.15	512.75	147.40	4.479	0					
17,242.86	7,190.00	17,214.24	7,190.00	74.07	73.99	89.83	660.12	512.12	148.00	4.460	0	SF				



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 8 - Original Hole - Rev 0		Offset Site Error:		0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:		0.00 usft		
Reference		Offset		Semi Major Axis		Distance							Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision					
0.00	0.00	2.00	2.00	0.00	0.00	179.98	112.21					0	CC, ES				
100.00	100.00	102.00	102.00	0.15	0.15	179.98	112.21	111.91	0.30	378.191	0						
200.00	200.00	202.00	202.00	0.32	0.32	179.98	112.21	111.57	0.65	173.764	0						
300.00	300.00	302.00	302.00	0.50	0.50	179.98	112.21	111.22	0.99	112.794	0						
400.00	400.00	402.00	402.00	0.67	0.67	179.98	112.21	110.87	1.34	83.497	0						
500.00	500.00	502.00	502.00	0.84	0.85	179.98	112.21	110.52	1.69	66.281	0						
600.00	600.00	602.00	602.00	1.02	1.02	179.98	112.21	110.17	2.04	54.951	0						
700.00	700.00	702.00	702.00	1.19	1.20	179.98	112.21	109.82	2.39	46.929	0						
800.00	800.00	802.00	802.00	1.37	1.37	179.98	112.21	109.47	2.74	40.951	0						
900.00	899.98	901.98	901.98	1.54	1.55	-141.82	113.58	110.49	3.09	36.772	0						
1,000.00	999.84	1,001.81	1,001.81	1.72	1.72	-143.34	117.74	114.30	3.44	34.265	0						
1,100.00	1,099.45	1,100.00	1,099.98	1.90	1.89	-144.86	125.51	121.73	3.78	33.208	0						
1,200.00	1,198.70	1,197.37	1,197.22	2.07	2.06	-145.64	137.49	133.37	4.12	33.369	0						
1,237.30	1,235.60	1,233.61	1,233.35	2.14	2.13	-145.76	143.01	138.77	4.25	33.676	0						
1,300.00	1,297.57	1,294.36	1,293.84	2.26	2.23	-145.76	153.02	148.55	4.46	34.271	0						
1,400.00	1,396.41	1,392.54	1,391.44	2.44	2.41	-145.22	169.60	164.78	4.82	35.210	0						
1,500.00	1,495.25	1,491.14	1,489.44	2.62	2.58	-144.75	186.23	181.06	5.17	36.016	0						
1,600.00	1,594.09	1,589.74	1,587.44	2.81	2.76	-144.36	202.86	197.33	5.53	36.713	0						
1,700.00	1,692.92	1,688.34	1,685.44	3.00	2.94	-144.02	219.50	213.62	5.88	37.321	0						
1,800.00	1,791.76	1,786.94	1,783.44	3.18	3.12	-143.74	236.15	229.91	6.24	37.856	0						
1,900.00	1,890.60	1,885.53	1,881.45	3.37	3.29	-143.49	252.81	246.21	6.60	38.331	0						
2,000.00	1,989.44	1,984.13	1,979.45	3.56	3.47	-143.27	269.46	262.51	6.95	38.754	0						
2,100.00	2,088.27	2,082.73	2,077.45	3.75	3.65	-143.08	286.13	278.81	7.31	39.133	0						
2,200.00	2,187.11	2,181.33	2,175.45	3.94	3.83	-142.91	302.79	295.12	7.67	39.476	0						
2,300.00	2,285.95	2,279.93	2,273.45	4.13	4.01	-142.76	319.46	311.43	8.03	39.787	0						
2,400.00	2,384.78	2,378.52	2,371.45	4.31	4.19	-142.62	336.12	327.74	8.39	40.069	0						
2,500.00	2,483.62	2,477.12	2,469.45	4.50	4.37	-142.49	352.79	344.05	8.75	40.328	0						
2,600.00	2,582.46	2,575.72	2,567.45	4.69	4.55	-142.38	369.47	360.36	9.11	40.565	0						
2,700.00	2,681.30	2,674.32	2,665.45	4.88	4.73	-142.28	386.14	376.67	9.47	40.783	0						
2,800.00	2,780.13	2,772.92	2,763.45	5.07	4.91	-142.18	402.81	392.98	9.83	40.985	0						
2,900.00	2,878.97	2,871.51	2,861.45	5.26	5.09	-142.09	419.49	409.30	10.19	41.171	0						
3,000.00	2,977.81	2,970.11	2,959.45	5.45	5.27	-142.01	436.16	425.61	10.55	41.345	0						
3,100.00	3,076.64	3,068.71	3,057.46	5.64	5.45	-141.94	452.84	441.93	10.91	41.506	0						
3,200.00	3,175.48	3,167.31	3,155.46	5.84	5.63	-141.87	469.52	458.25	11.27	41.657	0						
3,300.00	3,274.32	3,265.91	3,253.46	6.03	5.81	-141.80	486.20	474.56	11.63	41.798	0						
3,400.00	3,373.16	3,364.50	3,351.46	6.22	5.99	-141.74	502.87	490.88	11.99	41.930	0						
3,500.00	3,471.99	3,463.10	3,449.46	6.41	6.17	-141.68	519.55	507.20	12.35	42.055	0						
3,600.00	3,570.83	3,561.70	3,547.46	6.60	6.35	-141.63	536.23	523.52	12.72	42.172	0						
3,700.00	3,669.67	3,660.30	3,645.46	6.79	6.53	-141.58	552.91	539.84	13.08	42.282	0						
3,800.00	3,768.51	3,758.90	3,743.46	6.98	6.71	-141.53	569.59	556.15	13.44	42.386	0						
3,900.00	3,867.34	3,857.49	3,841.46	7.17	6.89	-141.49	586.27	572.47	13.80	42.485	0						
4,000.00	3,966.18	3,956.09	3,939.46	7.36	7.07	-141.45	602.95	588.79	14.16	42.578	0						
4,100.00	4,065.02	4,054.69	4,037.46	7.55	7.25	-141.41	619.64	605.11	14.52	42.667	0						
4,200.00	4,163.85	4,153.29	4,135.47	7.74	7.43	-141.37	636.32	621.43	14.88	42.751	0						
4,300.00	4,262.69	4,251.89	4,233.47	7.94	7.61	-141.33	653.00	637.75	15.25	42.831	0						
4,400.00	4,361.53	4,350.48	4,331.47	8.13	7.79	-141.30	669.68	654.07	15.61	42.908	0						
4,500.00	4,460.37	4,449.08	4,429.47	8.32	7.97	-141.27	686.36	670.39	15.97	42.980	0						
4,600.00	4,559.20	4,547.68	4,527.47	8.51	8.15	-141.24	703.05	686.71	16.33	43.050	0						
4,700.00	4,658.04	4,646.28	4,625.47	8.70	8.34	-141.21	719.73	703.04	16.69	43.116	0						
4,800.00	4,756.88	4,744.88	4,723.47	8.89	8.52	-141.18	736.41	719.36	17.05	43.180	0						
4,900.00	4,855.71	4,843.47	4,821.47	9.08	8.70	-141.15	753.09	735.68	17.42	43.240	0						
5,000.00	4,954.55	4,942.07	4,919.47	9.27	8.88	-141.13	769.78	752.00	17.78	43.299	0						
5,100.00	5,053.39	5,040.67	5,017.47	9.47	9.06	-141.10	786.46	768.32	18.14	43.354	0						
5,200.00	5,152.23	5,139.27	5,115.47	9.66	9.24	-141.08	803.14	784.64	18.50	43.408	0						

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 8 - Original Hole - Rev 0		Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder													Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
5,300.00	5,251.06	5,237.87	5,213.48	9.85	9.42	-141.06	819.83	800.96	18.86	43.460	0					
5,400.00	5,349.90	5,336.46	5,311.48	10.04	9.60	-141.04	836.51	817.29	19.23	43.509	0					
5,500.00	5,448.74	5,435.06	5,409.48	10.23	9.78	-141.02	853.20	833.61	19.59	43.557	0					
5,600.00	5,547.58	5,533.66	5,507.48	10.42	9.96	-141.00	869.88	849.93	19.95	43.603	0					
5,700.00	5,646.41	5,632.26	5,605.48	10.61	10.14	-140.98	886.56	866.25	20.31	43.647	0					
5,800.00	5,745.25	5,730.86	5,703.48	10.81	10.32	-140.96	903.25	882.57	20.67	43.689	0					
5,900.00	5,844.09	5,829.45	5,801.48	11.00	10.51	-140.94	919.93	898.90	21.04	43.731	0					
6,000.00	5,942.92	5,928.05	5,899.48	11.19	10.69	-140.92	936.62	915.22	21.40	43.770	0					
6,075.73	6,017.78	6,002.72	5,973.70	11.33	10.82	-140.91	949.25	927.58	21.67	43.799	0					
6,100.00	6,041.78	6,026.66	5,997.49	11.38	10.87	-140.95	953.22	931.45	21.77	43.789	0					
6,200.00	6,140.97	6,125.55	6,095.79	11.56	11.05	-141.03	967.92	945.76	22.15	43.690	0					
6,300.00	6,240.54	6,234.87	6,204.52	11.74	11.25	-140.95	979.65	957.10	22.54	43.456	0					
6,400.00	6,340.38	6,352.68	6,322.07	11.91	11.45	-140.88	987.03	964.10	22.93	43.049	0					
6,500.00	6,440.35	6,470.98	6,440.32	12.08	11.65	-140.86	989.87	966.58	23.29	42.494	0					
6,513.03	6,453.38	6,486.04	6,455.38	12.10	11.68	-179.59	989.91	966.63	23.28	42.527	0					
6,600.00	6,540.35	6,573.01	6,542.35	12.24	11.83	-179.59	989.91	966.33	23.57	41.994	0					
6,613.03	6,553.38	6,586.07	6,555.40	12.26	11.85	-179.59	989.91	966.29	23.62	41.916	0					
6,650.00	6,590.33	6,623.44	6,592.75	12.32	11.91	90.40	989.91	966.11	23.80	41.593	0					
6,700.00	6,640.08	6,673.98	6,643.02	12.39	11.99	90.39	989.90	965.95	23.95	41.325	0					
6,750.00	6,689.29	6,724.50	6,692.70	12.46	12.06	90.37	989.90	965.80	24.10	41.074	0					
6,800.00	6,737.67	6,774.99	6,741.48	12.53	12.13	90.35	989.90	965.66	24.24	40.840	0					
6,850.00	6,784.91	6,825.46	6,789.06	12.60	12.19	90.33	989.90	965.53	24.37	40.618	0					
6,900.00	6,830.73	6,875.91	6,835.13	12.66	12.26	90.31	989.90	965.40	24.50	40.408	0					
6,950.00	6,874.83	6,926.32	6,879.40	12.72	12.32	90.29	989.89	965.27	24.62	40.205	0					
7,000.00	6,916.95	6,976.70	6,921.61	12.78	12.38	90.27	989.89	965.15	24.74	40.007	0					
7,050.00	6,956.84	7,027.04	6,961.48	12.83	12.44	90.24	989.89	965.02	24.87	39.810	0					
7,100.00	6,994.23	7,077.34	6,998.78	12.89	12.50	90.21	989.89	964.90	24.99	39.610	0					
7,150.00	7,028.90	7,127.61	7,033.27	12.95	12.57	90.18	989.89	964.77	25.12	39.404	0					
7,200.00	7,060.65	7,177.83	7,064.74	13.02	12.63	90.15	989.89	964.63	25.26	39.188	0					
7,250.00	7,089.26	7,228.01	7,093.01	13.08	12.70	90.12	989.88	964.48	25.41	38.959	0					
7,300.00	7,114.58	7,278.15	7,117.91	13.15	12.77	90.09	989.88	964.31	25.57	38.713	0					
7,350.00	7,136.43	7,328.25	7,139.30	13.23	12.85	90.05	989.88	964.14	25.74	38.450	0					
7,400.00	7,154.69	7,378.29	7,157.04	13.31	12.93	90.02	989.88	963.95	25.94	38.167	0					
7,432.47	7,164.56	7,410.77	7,166.56	13.37	13.00	90.00	989.88	963.78	26.10	37.928	0					
7,450.00	7,169.24	7,428.30	7,171.04	13.40	13.04	89.99	989.88	963.74	26.14	37.863	0					
7,500.00	7,179.99	7,478.26	7,181.23	13.50	13.16	89.96	989.88	963.51	26.37	37.540	0					
7,550.00	7,186.88	7,528.17	7,187.55	13.61	13.28	89.92	989.88	963.27	26.61	37.198	0					
7,600.00	7,189.87	7,578.04	7,189.97	13.73	13.41	89.89	989.88	963.01	26.87	36.840	0					
7,613.03	7,190.00	7,591.05	7,190.00	13.76	13.45	89.88	989.88	962.94	26.94	36.745	0					
7,700.00	7,190.00	7,678.02	7,190.00	14.00	13.71	89.88	989.88	962.45	27.44	36.077	0					
7,800.00	7,190.00	7,778.02	7,190.00	14.31	14.02	89.88	989.88	961.82	28.06	35.273	0					
7,900.00	7,190.00	7,878.02	7,190.00	14.64	14.36	89.88	989.88	961.14	28.74	34.438	0					
8,000.00	7,190.00	7,978.02	7,190.00	15.00	14.73	89.88	989.88	960.41	29.48	33.583	0					
8,100.00	7,190.00	8,078.02	7,190.00	15.39	15.12	89.88	989.88	959.63	30.26	32.717	0					
8,200.00	7,190.00	8,178.02	7,190.00	15.80	15.54	89.88	989.88	958.81	31.08	31.850	0					
8,300.00	7,190.00	8,278.02	7,190.00	16.23	15.97	89.88	989.89	957.94	31.94	30.988	0					
8,400.00	7,190.00	8,378.02	7,190.00	16.67	16.42	89.88	989.89	957.04	32.85	30.136	0					
8,500.00	7,190.00	8,478.02	7,190.00	17.14	16.89	89.88	989.89	956.10	33.78	29.301	0					
8,600.00	7,190.00	8,578.02	7,190.00	17.61	17.37	89.88	989.89	955.13	34.75	28.484	0					
8,700.00	7,190.00	8,678.02	7,190.00	18.11	17.87	89.88	989.89	954.14	35.75	27.689	0					
8,800.00	7,190.00	8,778.01	7,190.00	18.62	18.39	89.88	989.89	953.11	36.77	26.918	0					
8,900.00	7,190.00	8,878.01	7,190.00	19.13	18.91	89.88	989.89	952.07	37.82	26.171	0					
9,000.00	7,190.00	8,978.01	7,190.00	19.67	19.45	89.88	989.89	950.99	38.90	25.450	0					
9,100.00	7,190.00	9,078.01	7,190.00	20.21	19.99	89.88	989.89	949.90	39.99	24.755	0					

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



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder												Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
9,200.00	7,190.00	9,178.01	7,190.00	20.76	20.55	89.88	989.89	948.79	41.10	24.085	0		
9,300.00	7,190.00	9,278.01	7,190.00	21.32	21.11	89.88	989.89	947.66	42.23	23.441	0		
9,400.00	7,190.00	9,378.01	7,190.00	21.88	21.69	89.88	989.89	946.52	43.37	22.822	0		
9,500.00	7,190.00	9,478.01	7,190.00	22.46	22.27	89.88	989.89	945.36	44.53	22.227	0		
9,600.00	7,190.00	9,578.01	7,190.00	23.04	22.86	89.88	989.90	944.19	45.71	21.656	0		
9,700.00	7,190.00	9,678.01	7,190.00	23.63	23.45	89.88	989.90	943.00	46.90	21.108	0		
9,800.00	7,190.00	9,778.01	7,190.00	24.23	24.05	89.88	989.90	941.80	48.10	20.582	0		
9,900.00	7,190.00	9,878.01	7,190.00	24.83	24.65	89.88	989.90	940.59	49.31	20.077	0		
10,000.00	7,190.00	9,978.01	7,190.00	25.44	25.26	89.88	989.90	939.37	50.53	19.592	0		
10,100.00	7,190.00	10,078.01	7,190.00	26.05	25.88	89.88	989.90	938.15	51.76	19.126	0		
10,200.00	7,190.00	10,178.01	7,190.00	26.66	26.50	89.88	989.90	936.91	52.99	18.679	0		
10,300.00	7,190.00	10,278.01	7,190.00	27.28	27.12	89.88	989.91	935.66	54.24	18.250	0		
10,400.00	7,190.00	10,378.01	7,190.00	27.91	27.75	89.88	989.91	934.41	55.50	17.837	0		
10,500.00	7,190.00	10,478.00	7,190.00	28.53	28.38	89.88	989.91	933.15	56.76	17.441	0		
10,600.00	7,190.00	10,578.00	7,190.00	29.16	29.01	89.88	989.91	931.88	58.03	17.060	0		
10,700.00	7,190.00	10,678.00	7,190.00	29.80	29.65	89.88	989.91	930.61	59.30	16.693	0		
10,800.00	7,190.00	10,778.00	7,190.00	30.44	30.29	89.88	989.91	929.33	60.58	16.340	0		
10,900.00	7,190.00	10,878.00	7,190.00	31.08	30.93	89.88	989.92	928.05	61.87	16.001	0		
11,000.00	7,190.00	10,978.00	7,190.00	31.72	31.58	89.88	989.92	926.76	63.16	15.674	0		
11,100.00	7,190.00	11,078.00	7,190.00	32.36	32.23	89.88	989.92	925.47	64.45	15.359	0		
11,200.00	7,190.00	11,178.00	7,190.00	33.01	32.88	89.88	989.92	924.17	65.75	15.055	0		
11,300.00	7,190.00	11,278.00	7,190.00	33.66	33.53	89.88	989.92	922.87	67.06	14.762	0		
11,400.00	7,190.00	11,378.00	7,190.00	34.31	34.19	89.88	989.93	921.56	68.37	14.479	0		
11,500.00	7,190.00	11,478.00	7,190.00	34.97	34.84	89.88	989.93	920.25	69.68	14.207	0		
11,600.00	7,190.00	11,578.00	7,190.00	35.62	35.50	89.88	989.93	918.93	71.00	13.943	0		
11,700.00	7,190.00	11,678.00	7,190.00	36.28	36.16	89.88	989.93	917.62	72.32	13.689	0		
11,800.00	7,190.00	11,778.00	7,190.00	36.94	36.82	89.88	989.94	916.30	73.64	13.443	0		
11,900.00	7,190.00	11,878.00	7,190.00	37.60	37.48	89.88	989.94	914.97	74.97	13.205	0		
12,000.00	7,190.00	11,978.00	7,190.00	38.26	38.15	89.88	989.94	913.65	76.30	12.975	0		
12,100.00	7,190.00	12,078.00	7,190.00	38.93	38.81	89.88	989.94	912.32	77.63	12.753	0		
12,200.00	7,190.00	12,177.99	7,190.00	39.59	39.48	89.88	989.95	910.99	78.96	12.537	0		
12,300.00	7,190.00	12,277.99	7,190.00	40.26	40.15	89.88	989.95	909.65	80.30	12.328	0		
12,400.00	7,190.00	12,377.99	7,190.00	40.93	40.82	89.88	989.95	908.31	81.64	12.126	0		
12,500.00	7,190.00	12,477.99	7,190.00	41.60	41.49	89.88	989.96	906.98	82.98	11.930	0		
12,600.00	7,190.00	12,577.99	7,190.00	42.27	42.16	89.88	989.96	905.64	84.32	11.740	0		
12,700.00	7,190.00	12,677.99	7,190.00	42.94	42.84	89.88	989.96	904.29	85.67	11.556	0		
12,800.00	7,190.00	12,777.99	7,190.00	43.61	43.51	89.88	989.96	902.95	87.02	11.377	0		
12,900.00	7,190.00	12,877.99	7,190.00	44.28	44.18	89.88	989.97	901.60	88.37	11.203	0		
13,000.00	7,190.00	12,977.99	7,190.00	44.96	44.86	89.88	989.97	900.25	89.72	11.034	0		
13,100.00	7,190.00	13,077.99	7,190.00	45.63	45.54	89.88	989.97	898.90	91.07	10.871	0		
13,200.00	7,190.00	13,177.99	7,190.00	46.31	46.21	89.88	989.98	897.55	92.42	10.711	0		
13,300.00	7,190.00	13,277.99	7,190.00	46.99	46.89	89.88	989.98	896.20	93.78	10.556	0		
13,400.00	7,190.00	13,377.99	7,190.00	47.66	47.57	89.88	989.98	894.85	95.14	10.406	0		
13,500.00	7,190.00	13,477.99	7,190.00	48.34	48.25	89.88	989.99	893.49	96.50	10.259	0		
13,600.00	7,190.00	13,577.99	7,190.00	49.02	48.93	89.88	989.99	892.13	97.86	10.117	0		
13,700.00	7,190.00	13,677.99	7,190.00	49.70	49.61	89.88	989.99	890.78	99.22	9.978	0		
13,800.00	7,190.00	13,777.99	7,190.00	50.38	50.29	89.88	990.00	889.42	100.58	9.843	0		
13,900.00	7,190.00	13,877.98	7,190.00	51.06	50.97	89.88	990.00	888.06	101.95	9.711	0		
14,000.00	7,190.00	13,977.98	7,190.00	51.74	51.66	89.88	990.01	886.70	103.31	9.583	0		
14,100.00	7,190.00	14,077.98	7,190.00	52.42	52.34	89.88	990.01	885.33	104.68	9.458	0		
14,200.00	7,190.00	14,177.98	7,190.00	53.11	53.02	89.88	990.01	883.97	106.04	9.336	0		
14,300.00	7,190.00	14,277.98	7,190.00	53.79	53.71	89.88	990.02	882.60	107.41	9.217	0		
14,400.00	7,190.00	14,377.98	7,190.00	54.47	54.39	89.88	990.02	881.24	108.78	9.101	0		
14,500.00	7,190.00	14,477.98	7,190.00	55.16	55.08	89.88	990.03	879.87	110.15	8.988	0		

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



Schlumberger
Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision		
14,600.00	7,190.00	14,577.98	7,190.00	55.84	55.76	89.88	990.03	878.51	111.52	8.877	0			
14,700.00	7,190.00	14,677.98	7,190.00	56.53	56.45	89.88	990.03	877.14	112.90	8.769	0			
14,800.00	7,190.00	14,777.98	7,190.00	57.21	57.14	89.88	990.04	875.77	114.27	8.664	0			
14,900.00	7,190.00	14,877.98	7,190.00	57.90	57.82	89.88	990.04	874.40	115.64	8.561	0			
15,000.00	7,190.00	14,977.98	7,190.00	58.59	58.51	89.88	990.05	873.03	117.02	8.461	0			
15,100.00	7,190.00	15,077.98	7,190.00	59.27	59.20	89.88	990.05	871.66	118.39	8.362	0			
15,200.00	7,190.00	15,177.98	7,190.00	59.96	59.89	89.88	990.06	870.29	119.77	8.266	0			
15,300.00	7,190.00	15,277.98	7,190.00	60.65	60.57	89.88	990.06	868.91	121.15	8.172	0			
15,400.00	7,190.00	15,377.98	7,190.00	61.34	61.26	89.88	990.07	867.54	122.52	8.081	0			
15,500.00	7,190.00	15,477.98	7,190.00	62.02	61.95	89.88	990.07	866.17	123.90	7.991	0			
15,600.00	7,190.00	15,577.97	7,190.00	62.71	62.64	89.88	990.07	864.79	125.28	7.903	0			
15,700.00	7,190.00	15,677.97	7,190.00	63.40	63.33	89.88	990.08	863.42	126.66	7.817	0			
15,800.00	7,190.00	15,777.97	7,190.00	64.09	64.02	89.88	990.08	862.04	128.04	7.733	0			
15,900.00	7,190.00	15,877.97	7,190.00	64.78	64.71	89.88	990.09	860.67	129.42	7.650	0			
16,000.00	7,190.00	15,977.97	7,190.00	65.47	65.40	89.88	990.09	859.29	130.80	7.569	0			
16,100.00	7,190.00	16,077.97	7,190.00	66.16	66.09	89.88	990.10	857.92	132.18	7.490	0			
16,200.00	7,190.00	16,177.97	7,190.00	66.85	66.78	89.88	990.10	856.54	133.57	7.413	0			
16,300.00	7,190.00	16,277.97	7,190.00	67.54	67.48	89.88	990.11	855.16	134.95	7.337	0			
16,400.00	7,190.00	16,377.97	7,190.00	68.23	68.17	89.88	990.12	853.78	136.33	7.263	0			
16,500.00	7,190.00	16,477.97	7,190.00	68.92	68.86	89.88	990.12	852.40	137.72	7.190	0			
16,600.00	7,190.00	16,577.97	7,190.00	69.62	69.55	89.88	990.13	851.03	139.10	7.118	0			
16,700.00	7,190.00	16,677.97	7,190.00	70.31	70.24	89.88	990.13	849.65	140.49	7.048	0			
16,800.00	7,190.00	16,777.97	7,190.00	71.00	70.94	89.88	990.14	848.27	141.87	6.979	0			
16,900.00	7,190.00	16,877.97	7,190.00	71.69	71.63	89.88	990.14	846.89	143.26	6.912	0			
17,000.00	7,190.00	16,977.97	7,190.00	72.38	72.32	89.88	990.15	845.51	144.64	6.846	0			
17,100.00	7,190.00	17,077.97	7,190.00	73.08	73.02	89.88	990.15	844.12	146.03	6.781	0			
17,200.00	7,190.00	17,177.97	7,190.00	73.77	73.71	89.88	990.16	842.74	147.42	6.717	0			
17,242.86	7,190.00	17,220.82	7,190.00	74.07	74.01	89.88	990.16	842.15	148.01	6.690	0		SF	



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error: 0.00 usft	
Survey Program: 0-Pathfinder												Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor		
0.00	0.00	3.00	3.00	0.00	0.00	-179.99	139.90					0	
100.00	100.00	103.00	103.00	0.15	0.15	-179.99	139.90	139.60	0.30	468.755	0		
200.00	200.00	203.00	203.00	0.32	0.33	-179.99	139.90	139.25	0.65	216.057	0		
300.00	300.00	303.00	303.00	0.50	0.50	-179.99	139.90	138.90	1.00	140.380	0		
400.00	400.00	403.00	403.00	0.67	0.68	-179.99	139.90	138.56	1.35	103.965	0		
500.00	500.00	503.00	503.00	0.84	0.85	-179.99	139.90	138.21	1.69	82.551	0		
600.00	600.00	603.00	603.00	1.02	1.02	-179.99	139.90	137.86	2.04	68.452	0		
700.00	700.00	703.00	703.00	1.19	1.20	-179.99	139.90	137.51	2.39	58.466	0		
800.00	800.00	803.00	803.00	1.37	1.37	-179.99	139.90	137.16	2.74	51.023	0		CC, ES
900.00	899.98	902.89	902.89	1.54	1.55	-141.68	141.27	138.18	3.09	45.713	0		
1,000.00	999.84	1,000.00	999.98	1.72	1.72	-142.30	146.46	143.03	3.43	42.666	0		
1,100.00	1,099.45	1,096.35	1,096.19	1.90	1.89	-142.60	156.41	152.64	3.77	41.457	0		
1,200.00	1,198.70	1,192.07	1,191.57	2.07	2.06	-142.58	171.06	166.95	4.11	41.607	0		
1,237.30	1,235.60	1,227.52	1,226.80	2.14	2.12	-142.51	177.72	173.48	4.24	41.944	0		
1,300.00	1,297.57	1,289.03	1,287.91	2.26	2.23	-142.49	189.47	185.02	4.46	42.508	0		
1,400.00	1,396.41	1,387.26	1,385.49	2.44	2.40	-142.47	208.22	203.41	4.81	43.289	0		
1,500.00	1,495.25	1,485.48	1,483.07	2.62	2.58	-142.45	226.97	221.81	5.16	43.953	0		
1,600.00	1,594.09	1,583.71	1,580.64	2.81	2.76	-142.44	245.72	240.20	5.52	44.525	0		
1,700.00	1,692.92	1,681.94	1,678.22	3.00	2.94	-142.43	264.47	258.60	5.87	45.022	0		
1,800.00	1,791.76	1,780.16	1,775.80	3.18	3.11	-142.42	283.22	276.99	6.23	45.458	0		
1,900.00	1,890.60	1,878.39	1,873.38	3.37	3.29	-142.41	301.97	295.38	6.59	45.843	0		
2,000.00	1,989.44	1,976.62	1,970.95	3.56	3.47	-142.40	320.72	313.77	6.94	46.186	0		
2,100.00	2,088.27	2,074.84	2,068.53	3.75	3.65	-142.39	339.47	332.17	7.30	46.493	0		
2,200.00	2,187.11	2,173.07	2,166.11	3.94	3.83	-142.38	358.22	350.56	7.66	46.769	0		
2,300.00	2,285.95	2,271.30	2,263.68	4.13	4.01	-142.38	376.97	368.95	8.02	47.019	0		
2,400.00	2,384.78	2,369.52	2,361.26	4.31	4.19	-142.37	395.72	387.34	8.38	47.246	0		
2,500.00	2,483.62	2,467.75	2,458.84	4.50	4.37	-142.37	414.47	405.73	8.73	47.453	0		
2,600.00	2,582.46	2,565.98	2,556.42	4.69	4.55	-142.36	433.22	424.12	9.09	47.643	0		
2,700.00	2,681.30	2,664.20	2,653.99	4.88	4.73	-142.36	451.96	442.51	9.45	47.818	0		
2,800.00	2,780.13	2,762.43	2,751.57	5.07	4.91	-142.35	470.71	460.90	9.81	47.979	0		
2,900.00	2,878.97	2,860.66	2,849.15	5.26	5.09	-142.35	489.46	479.29	10.17	48.128	0		
3,000.00	2,977.81	2,958.88	2,946.72	5.45	5.27	-142.35	508.21	497.68	10.53	48.267	0		
3,100.00	3,076.64	3,057.11	3,044.30	5.64	5.45	-142.34	526.96	516.07	10.89	48.396	0		
3,200.00	3,175.48	3,155.34	3,141.88	5.84	5.63	-142.34	545.71	534.46	11.25	48.516	0		
3,300.00	3,274.32	3,253.56	3,239.46	6.03	5.81	-142.34	564.46	552.85	11.61	48.628	0		
3,400.00	3,373.16	3,351.79	3,337.03	6.22	5.99	-142.34	583.21	571.24	11.97	48.733	0		
3,500.00	3,471.99	3,450.02	3,434.61	6.41	6.17	-142.33	601.96	589.63	12.33	48.832	0		
3,600.00	3,570.83	3,548.24	3,532.19	6.60	6.35	-142.33	620.71	608.02	12.69	48.925	0		
3,700.00	3,669.67	3,646.47	3,629.76	6.79	6.53	-142.33	639.46	626.41	13.05	49.013	0		
3,800.00	3,768.51	3,744.70	3,727.34	6.98	6.71	-142.33	658.21	644.80	13.41	49.096	0		
3,900.00	3,867.34	3,842.92	3,824.92	7.17	6.89	-142.33	676.96	663.19	13.77	49.174	0		
4,000.00	3,966.18	3,941.15	3,922.50	7.36	7.07	-142.32	695.71	681.58	14.13	49.248	0		
4,100.00	4,065.02	4,039.38	4,020.07	7.55	7.25	-142.32	714.46	699.97	14.49	49.318	0		
4,200.00	4,163.85	4,137.60	4,117.65	7.74	7.44	-142.32	733.21	718.36	14.85	49.385	0		
4,300.00	4,262.69	4,235.83	4,215.23	7.94	7.62	-142.32	751.96	736.75	15.21	49.448	0		
4,400.00	4,361.53	4,334.06	4,312.81	8.13	7.80	-142.32	770.71	755.14	15.57	49.509	0		
4,500.00	4,460.37	4,432.28	4,410.38	8.32	7.98	-142.32	789.45	773.53	15.93	49.566	0		
4,600.00	4,559.20	4,530.51	4,507.96	8.51	8.16	-142.31	808.20	791.92	16.29	49.621	0		
4,700.00	4,658.04	4,628.73	4,605.54	8.70	8.34	-142.31	826.95	810.31	16.65	49.673	0		
4,800.00	4,756.88	4,726.96	4,703.11	8.89	8.52	-142.31	845.70	828.70	17.01	49.724	0		
4,900.00	4,855.71	4,825.19	4,800.69	9.08	8.70	-142.31	864.45	847.08	17.37	49.772	0		
5,000.00	4,954.55	4,923.41	4,898.27	9.27	8.88	-142.31	883.20	865.47	17.73	49.817	0		
5,100.00	5,053.39	5,021.64	4,995.85	9.47	9.06	-142.31	901.95	883.86	18.09	49.862	0		
5,200.00	5,152.23	5,119.87	5,093.42	9.66	9.24	-142.31	920.70	902.25	18.45	49.904	0		

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



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 9 - Original Hole - Rev 0		Offset Site Error:		0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:		0.00 usft		
Reference		Offset		Semi Major Axis		Distance							Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision					
5,300.00	5,251.06	5,218.09	5,191.00	9.85	9.43	-142.31	939.45	920.64	18.81	49.944	0						
5,400.00	5,349.90	5,316.32	5,288.58	10.04	9.61	-142.31	958.20	939.03	19.17	49.983	0						
5,500.00	5,448.74	5,414.55	5,386.15	10.23	9.79	-142.31	976.95	957.42	19.53	50.021	0						
5,600.00	5,547.58	5,512.77	5,483.73	10.42	9.97	-142.30	995.70	975.81	19.89	50.057	0						
5,700.00	5,646.41	5,611.00	5,581.31	10.61	10.15	-142.30	1,014.45	994.20	20.25	50.092	0						
5,800.00	5,745.25	5,709.23	5,678.89	10.81	10.33	-142.30	1,033.20	1,012.59	20.61	50.125	0						
5,900.00	5,844.09	5,807.45	5,776.46	11.00	10.51	-142.30	1,051.95	1,030.97	20.97	50.158	0						
6,000.00	5,942.92	5,905.68	5,874.04	11.19	10.69	-142.30	1,070.70	1,049.36	21.33	50.189	0						
6,075.73	6,017.78	5,980.07	5,947.94	11.33	10.83	-142.30	1,084.90	1,063.29	21.61	50.212	0						
6,100.00	6,041.78	6,003.92	5,971.63	11.38	10.87	-142.35	1,089.37	1,067.66	21.70	50.196	0						
6,200.00	6,140.97	6,102.49	6,069.55	11.56	11.06	-142.48	1,106.10	1,084.01	22.09	50.079	0						
6,300.00	6,240.54	6,201.44	6,167.84	11.74	11.24	-142.46	1,120.10	1,097.64	22.46	49.872	0						
6,400.00	6,340.38	6,300.62	6,266.37	11.91	11.42	-142.30	1,131.37	1,108.55	22.82	49.580	0						
6,500.00	6,440.35	6,399.94	6,365.03	12.08	11.60	-142.01	1,139.94	1,116.78	23.17	49.208	0						
6,513.03	6,453.38	6,412.89	6,377.89	12.10	11.63	179.30	1,140.86	1,117.62	23.25	49.075	0						
6,600.00	6,540.35	6,502.24	6,466.66	12.24	11.79	179.71	1,146.86	1,123.31	23.55	48.697	0						
6,613.03	6,553.38	6,519.34	6,483.66	12.26	11.82	179.79	1,147.71	1,124.11	23.60	48.627	0						
6,650.00	6,590.33	6,567.84	6,531.93	12.32	11.91	89.85	1,149.87	1,126.15	23.72	48.476	0						
6,700.00	6,640.08	6,633.19	6,597.10	12.39	12.03	90.15	1,152.21	1,128.29	23.92	48.172	0						
6,750.00	6,689.29	6,698.10	6,661.90	12.46	12.14	90.69	1,153.96	1,129.84	24.12	47.843	0						
6,800.00	6,737.67	6,762.34	6,726.11	12.53	12.25	91.45	1,155.21	1,130.88	24.32	47.491	0						
6,850.00	6,784.91	6,824.14	6,787.91	12.60	12.35	92.39	1,156.09	1,131.56	24.53	47.125	0						
6,900.00	6,830.73	6,869.96	6,833.73	12.66	12.43	93.20	1,157.16	1,132.44	24.72	46.812	0						
6,950.00	6,874.83	6,914.06	6,877.83	12.72	12.50	94.08	1,158.86	1,133.95	24.91	46.518	0						
7,000.00	6,916.95	6,964.80	6,928.53	12.78	12.58	95.14	1,161.25	1,136.13	25.12	46.226	0						
7,050.00	6,956.84	7,019.31	6,982.67	12.83	12.67	96.24	1,164.17	1,138.84	25.33	45.952	0						
7,100.00	6,994.23	7,077.01	7,039.18	12.89	12.75	97.35	1,167.58	1,142.04	25.55	45.701	0						
7,150.00	7,028.90	7,138.39	7,097.88	12.95	12.83	98.46	1,171.41	1,145.65	25.76	45.479	0						
7,200.00	7,060.65	7,203.94	7,158.35	13.02	12.92	99.58	1,175.56	1,149.60	25.95	45.292	0						
7,250.00	7,089.26	7,274.18	7,219.90	13.08	13.00	100.69	1,179.90	1,153.77	26.13	45.151	0						
7,300.00	7,114.58	7,349.60	7,281.41	13.15	13.09	101.79	1,184.28	1,158.00	26.29	45.049	0						
7,350.00	7,136.43	7,430.57	7,341.22	13.23	13.19	102.83	1,188.53	1,162.11	26.41	44.997	0						
7,400.00	7,154.69	7,517.26	7,397.03	13.31	13.31	103.80	1,192.42	1,165.91	26.51	44.976	0						
7,450.00	7,169.24	7,609.47	7,445.94	13.40	13.43	104.63	1,195.74	1,169.15	26.59	44.966	0						
7,500.00	7,179.99	7,706.52	7,484.67	13.50	13.59	105.28	1,198.28	1,171.62	26.67	44.933	0						
7,550.00	7,186.88	7,807.18	7,510.10	13.61	13.79	105.68	1,199.86	1,173.10	26.77	44.827	0						
7,600.00	7,189.87	7,909.74	7,519.92	13.73	14.04	105.81	1,200.36	1,173.44	26.92	44.591	0						
7,613.03	7,190.00	7,927.84	7,520.00	13.76	14.09	105.81	1,200.33	1,173.33	27.00	44.450	0						
7,613.03	7,190.00	7,927.84	7,520.00	13.76	14.09	105.81	1,200.33	1,173.33	27.00	44.450	0						
7,700.00	7,190.00	8,014.81	7,520.00	14.00	14.34	105.81	1,200.33	1,172.83	27.50	43.649	0						
7,800.00	7,190.00	8,114.81	7,520.00	14.31	14.65	105.81	1,200.33	1,172.21	28.12	42.688	0						
7,900.00	7,190.00	8,214.81	7,520.00	14.64	14.99	105.81	1,200.33	1,171.54	28.79	41.693	0						
8,000.00	7,190.00	8,314.81	7,520.00	15.00	15.35	105.81	1,200.33	1,170.82	29.51	40.678	0						
8,100.00	7,190.00	8,414.81	7,520.00	15.39	15.74	105.81	1,200.33	1,170.06	30.27	39.652	0						
8,200.00	7,190.00	8,514.81	7,520.00	15.80	16.14	105.81	1,200.33	1,169.26	31.08	38.626	0						
8,300.00	7,190.00	8,614.81	7,520.00	16.23	16.57	105.81	1,200.33	1,168.41	31.92	37.606	0						
8,400.00	7,190.00	8,714.81	7,520.00	16.67	17.01	105.81	1,200.33	1,167.54	32.80	36.600	0						
8,500.00	7,190.00	8,814.81	7,520.00	17.14	17.47	105.81	1,200.33	1,166.63	33.71	35.611	0						
8,600.00	7,190.00	8,914.81	7,520.00	17.61	17.95	105.81	1,200.33	1,165.69	34.65	34.645	0						
8,700.00	7,190.00	9,014.81	7,520.00	18.11	18.44	105.81	1,200.33	1,164.72	35.61	33.704	0						
8,800.00	7,190.00	9,114.81	7,520.00	18.62	18.94	105.81	1,200.33	1,163.73	36.61	32.790	0						
8,900.00	7,190.00	9,214.81	7,520.00	19.13	19.46	105.81	1,200.33	1,162.71	37.62	31.904	0						
9,000.00	7,190.00	9,314.81	7,520.00	19.67	19.98	105.81	1,200.33	1,161.67	38.66	31.048	0						
9,100.00	7,190.00	9,414.81	7,520.00	20.21	20.52	105.81	1,200.33	1,160.62	39.72	30.222	0						

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



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision	
9,200.00	7,190.00	9,514.81	7,520.00	20.76	21.07	105.81	1,200.33	1,159.54	40.79	29.425	0		
9,300.00	7,190.00	9,614.81	7,520.00	21.32	21.62	105.81	1,200.33	1,158.45	41.89	28.657	0		
9,400.00	7,190.00	9,714.81	7,520.00	21.88	22.19	105.81	1,200.33	1,157.34	42.99	27.919	0		
9,500.00	7,190.00	9,814.81	7,520.00	22.46	22.76	105.81	1,200.33	1,156.22	44.12	27.208	0		
9,600.00	7,190.00	9,914.81	7,520.00	23.04	23.34	105.81	1,200.33	1,155.08	45.25	26.525	0		
9,700.00	7,190.00	10,014.81	7,520.00	23.63	23.93	105.81	1,200.33	1,153.93	46.40	25.869	0		
9,800.00	7,190.00	10,114.81	7,520.00	24.23	24.52	105.81	1,200.33	1,152.77	47.56	25.238	0		
9,900.00	7,190.00	10,214.81	7,520.00	24.83	25.12	105.81	1,200.33	1,151.60	48.73	24.632	0		
10,000.00	7,190.00	10,314.81	7,520.00	25.44	25.72	105.81	1,200.33	1,150.42	49.91	24.050	0		
10,100.00	7,190.00	10,414.81	7,520.00	26.05	26.33	105.81	1,200.33	1,149.23	51.10	23.490	0		
10,200.00	7,190.00	10,514.81	7,520.00	26.66	26.94	105.81	1,200.33	1,148.04	52.30	22.952	0		
10,300.00	7,190.00	10,614.81	7,520.00	27.28	27.56	105.81	1,200.33	1,146.83	53.50	22.435	0		
10,400.00	7,190.00	10,714.81	7,520.00	27.91	28.18	105.81	1,200.33	1,145.62	54.72	21.937	0		
10,500.00	7,190.00	10,814.81	7,520.00	28.53	28.81	105.81	1,200.33	1,144.40	55.94	21.459	0		
10,600.00	7,190.00	10,914.81	7,520.00	29.16	29.44	105.81	1,200.33	1,143.17	57.16	20.998	0		
10,700.00	7,190.00	11,014.81	7,520.00	29.80	30.07	105.81	1,200.33	1,141.94	58.40	20.555	0		
10,800.00	7,190.00	11,114.81	7,520.00	30.44	30.71	105.81	1,200.33	1,140.70	59.63	20.128	0		
10,900.00	7,190.00	11,214.81	7,520.00	31.08	31.34	105.81	1,200.33	1,139.46	60.88	19.717	0		
11,000.00	7,190.00	11,314.81	7,520.00	31.72	31.98	105.81	1,200.33	1,138.21	62.13	19.320	0		
11,100.00	7,190.00	11,414.81	7,520.00	32.36	32.63	105.81	1,200.33	1,136.95	63.38	18.938	0		
11,200.00	7,190.00	11,514.81	7,520.00	33.01	33.27	105.81	1,200.33	1,135.69	64.64	18.569	0		
11,300.00	7,190.00	11,614.81	7,520.00	33.66	33.92	105.81	1,200.33	1,134.43	65.90	18.214	0		
11,400.00	7,190.00	11,714.81	7,520.00	34.31	34.57	105.81	1,200.33	1,133.17	67.17	17.870	0		
11,500.00	7,190.00	11,814.81	7,520.00	34.97	35.22	105.81	1,200.33	1,131.90	68.44	17.539	0		
11,600.00	7,190.00	11,914.81	7,520.00	35.62	35.88	105.81	1,200.33	1,130.62	69.71	17.218	0		
11,700.00	7,190.00	12,014.81	7,520.00	36.28	36.54	105.81	1,200.34	1,129.34	70.99	16.908	0		
11,800.00	7,190.00	12,114.81	7,520.00	36.94	37.19	105.81	1,200.34	1,128.06	72.27	16.609	0		
11,900.00	7,190.00	12,214.81	7,520.00	37.60	37.85	105.81	1,200.34	1,126.78	73.56	16.319	0		
12,000.00	7,190.00	12,314.81	7,520.00	38.26	38.51	105.81	1,200.34	1,125.49	74.84	16.038	0		
12,100.00	7,190.00	12,414.81	7,520.00	38.93	39.18	105.81	1,200.34	1,124.20	76.13	15.767	0		
12,200.00	7,190.00	12,514.81	7,520.00	39.59	39.84	105.81	1,200.34	1,122.91	77.42	15.504	0		
12,300.00	7,190.00	12,614.81	7,520.00	40.26	40.51	105.81	1,200.34	1,121.62	78.72	15.249	0		
12,400.00	7,190.00	12,714.81	7,520.00	40.93	41.17	105.81	1,200.34	1,120.32	80.01	15.002	0		
12,500.00	7,190.00	12,814.81	7,520.00	41.60	41.84	105.81	1,200.34	1,119.02	81.31	14.762	0		
12,600.00	7,190.00	12,914.81	7,520.00	42.27	42.51	105.81	1,200.34	1,117.72	82.61	14.530	0		
12,700.00	7,190.00	13,014.81	7,520.00	42.94	43.18	105.81	1,200.34	1,116.42	83.92	14.304	0		
12,800.00	7,190.00	13,114.81	7,520.00	43.61	43.85	105.81	1,200.34	1,115.12	85.22	14.085	0		
12,900.00	7,190.00	13,214.81	7,520.00	44.28	44.52	105.81	1,200.34	1,113.81	86.53	13.872	0		
13,000.00	7,190.00	13,314.81	7,520.00	44.96	45.19	105.81	1,200.34	1,112.50	87.84	13.666	0		
13,100.00	7,190.00	13,414.81	7,520.00	45.63	45.87	105.81	1,200.34	1,111.19	89.15	13.465	0		
13,200.00	7,190.00	13,514.81	7,520.00	46.31	46.54	105.81	1,200.34	1,109.88	90.46	13.270	0		
13,300.00	7,190.00	13,614.81	7,520.00	46.99	47.22	105.81	1,200.34	1,108.57	91.77	13.080	0		
13,400.00	7,190.00	13,714.81	7,520.00	47.66	47.90	105.81	1,200.34	1,107.25	93.09	12.895	0		
13,500.00	7,190.00	13,814.81	7,520.00	48.34	48.57	105.81	1,200.34	1,105.93	94.40	12.715	0		
13,600.00	7,190.00	13,914.81	7,520.00	49.02	49.25	105.81	1,200.34	1,104.62	95.72	12.540	0		
13,700.00	7,190.00	14,014.81	7,520.00	49.70	49.93	105.81	1,200.34	1,103.30	97.04	12.370	0		
13,800.00	7,190.00	14,114.81	7,520.00	50.38	50.61	105.81	1,200.34	1,101.98	98.36	12.204	0		
13,900.00	7,190.00	14,214.81	7,520.00	51.06	51.29	105.81	1,200.34	1,100.66	99.68	12.042	0		
14,000.00	7,190.00	14,314.81	7,520.00	51.74	51.97	105.81	1,200.34	1,099.33	101.00	11.884	0		
14,100.00	7,190.00	14,414.81	7,520.00	52.42	52.65	105.81	1,200.34	1,098.01	102.33	11.731	0		
14,200.00	7,190.00	14,514.81	7,520.00	53.11	53.33	105.81	1,200.34	1,096.69	103.65	11.581	0		
14,300.00	7,190.00	14,614.81	7,520.00	53.79	54.02	105.81	1,200.34	1,095.36	104.98	11.434	0		
14,400.00	7,190.00	14,714.81	7,520.00	54.47	54.70	105.81	1,200.34	1,094.03	106.30	11.292	0		
14,500.00	7,190.00	14,814.81	7,520.00	55.16	55.38	105.81	1,200.34	1,092.71	107.63	11.152	0		

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



Schlumberger
Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Sec.08-T07N-R66W - Thornton 9 - Original Hole - Rev 0		Offset Site Error:	0.00 usft
Survey Program: 0-Pathfinder													Offset Well Error:	0.00 usft		
Reference		Offset		Semi Major Axis		Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Risked Separation Factor	Probability of Collision				
14,600.00	7,190.00	14,914.81	7,520.00	55.84	56.07	105.81	1,200.34	1,091.38	108.96	11.016	0					
14,700.00	7,190.00	15,014.81	7,520.00	56.53	56.75	105.81	1,200.34	1,090.05	110.29	10.884	0					
14,800.00	7,190.00	15,114.81	7,520.00	57.21	57.44	105.81	1,200.34	1,088.72	111.62	10.754	0					
14,900.00	7,190.00	15,214.81	7,520.00	57.90	58.12	105.81	1,200.34	1,087.39	112.95	10.627	0					
15,000.00	7,190.00	15,314.81	7,520.00	58.59	58.81	105.81	1,200.34	1,086.06	114.28	10.503	0					
15,100.00	7,190.00	15,414.81	7,520.00	59.27	59.49	105.81	1,200.34	1,084.72	115.61	10.382	0					
15,200.00	7,190.00	15,514.81	7,520.00	59.96	60.18	105.81	1,200.34	1,083.39	116.95	10.264	0					
15,300.00	7,190.00	15,614.81	7,520.00	60.65	60.87	105.81	1,200.34	1,082.06	118.28	10.148	0					
15,400.00	7,190.00	15,714.81	7,520.00	61.34	61.55	105.81	1,200.34	1,080.72	119.62	10.035	0					
15,500.00	7,190.00	15,814.81	7,520.00	62.02	62.24	105.81	1,200.34	1,079.39	120.95	9.924	0					
15,600.00	7,190.00	15,914.81	7,520.00	62.71	62.93	105.81	1,200.34	1,078.05	122.29	9.816	0					
15,700.00	7,190.00	16,014.81	7,520.00	63.40	63.62	105.81	1,200.34	1,076.71	123.63	9.710	0					
15,800.00	7,190.00	16,114.81	7,520.00	64.09	64.31	105.81	1,200.34	1,075.38	124.96	9.606	0					
15,900.00	7,190.00	16,214.81	7,520.00	64.78	65.00	105.81	1,200.34	1,074.04	126.30	9.504	0					
16,000.00	7,190.00	16,314.81	7,520.00	65.47	65.68	105.81	1,200.34	1,072.70	127.64	9.404	0					
16,100.00	7,190.00	16,414.81	7,520.00	66.16	66.37	105.81	1,200.34	1,071.36	128.98	9.307	0					
16,200.00	7,190.00	16,514.81	7,520.00	66.85	67.06	105.81	1,200.34	1,070.02	130.32	9.211	0					
16,300.00	7,190.00	16,614.81	7,520.00	67.54	67.75	105.81	1,200.34	1,068.68	131.66	9.117	0					
16,400.00	7,190.00	16,714.81	7,520.00	68.23	68.44	105.81	1,200.34	1,067.34	133.00	9.025	0					
16,500.00	7,190.00	16,814.81	7,520.00	68.92	69.14	105.81	1,200.34	1,066.00	134.34	8.935	0					
16,600.00	7,190.00	16,914.81	7,520.00	69.62	69.83	105.81	1,200.34	1,064.66	135.68	8.847	0					
16,700.00	7,190.00	17,014.81	7,520.00	70.31	70.52	105.81	1,200.34	1,063.32	137.02	8.760	0					
16,800.00	7,190.00	17,114.81	7,520.00	71.00	71.21	105.81	1,200.34	1,061.97	138.37	8.675	0					
16,900.00	7,190.00	17,214.81	7,520.00	71.69	71.90	105.81	1,200.34	1,060.63	139.71	8.592	0					
17,000.00	7,190.00	17,314.81	7,520.00	72.38	72.59	105.81	1,200.34	1,059.29	141.05	8.510	0					
17,100.00	7,190.00	17,414.81	7,520.00	73.08	73.29	105.81	1,200.34	1,057.94	142.40	8.430	0					
17,200.00	7,190.00	17,516.76	7,520.00	73.77	73.99	105.81	1,200.31	1,056.56	143.75	8.350	0					
17,242.86	7,190.00	17,559.62	7,520.00	74.07	74.29	105.81	1,200.24	1,055.92	144.33	8.316	0	SF				

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 5049.00usft (Xtreme 7 - 16')

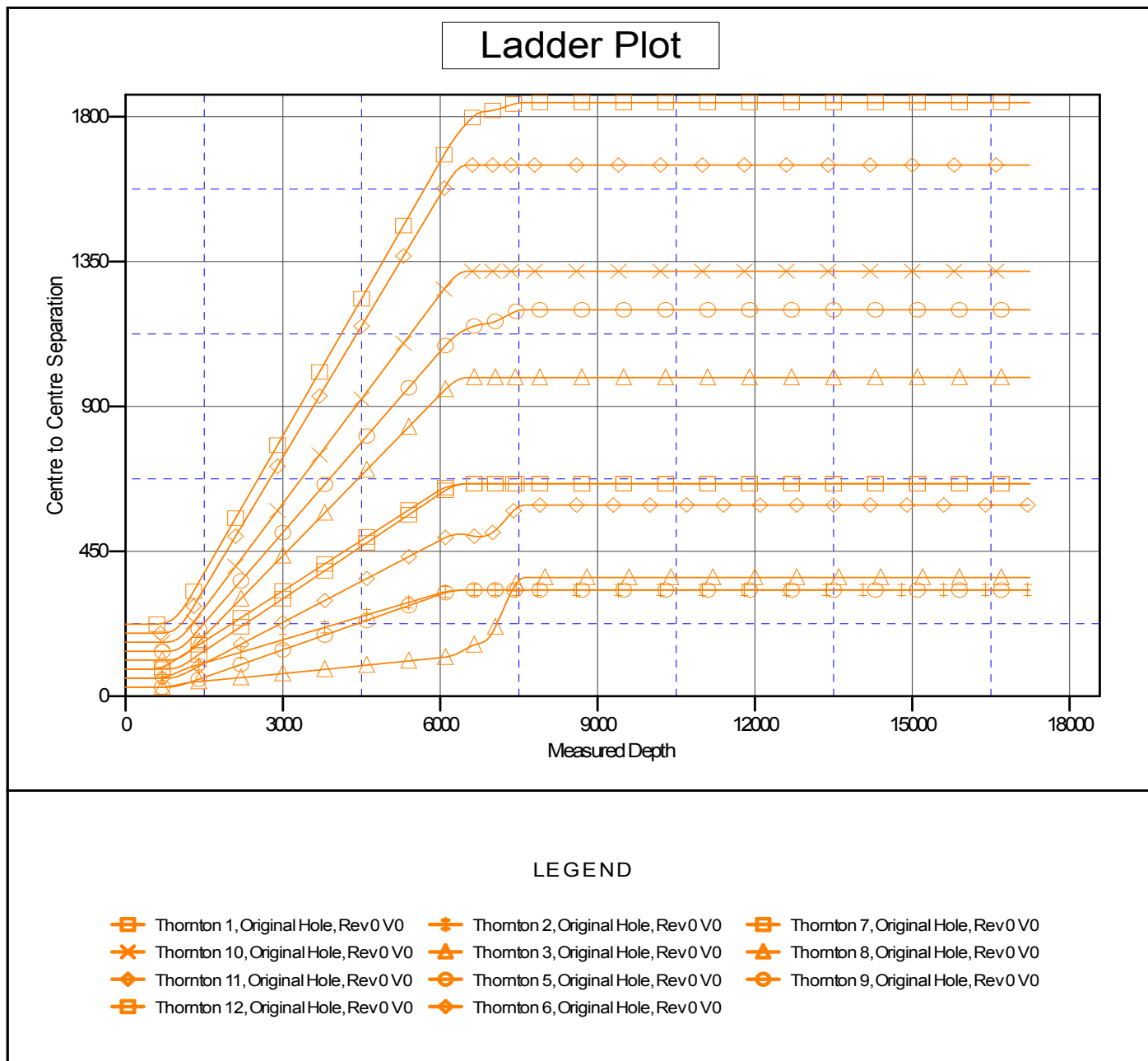
Offset Depths are relative to Offset Datum

Central Meridian is 105° 30' 0.000 W °

Coordinates are relative to: Thornton 4

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.45°



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 4
Project:	Weld Co., Co	TVD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5049.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 4	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00	Output errors are at	2.00 sigma
Reference Wellbore	Original Hole	Database:	EDM 5000.1 Single User Db
Reference Design:	Rev 0	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 5049.00usft (Xtreme 7 - 16')

Offset Depths are relative to Offset Datum

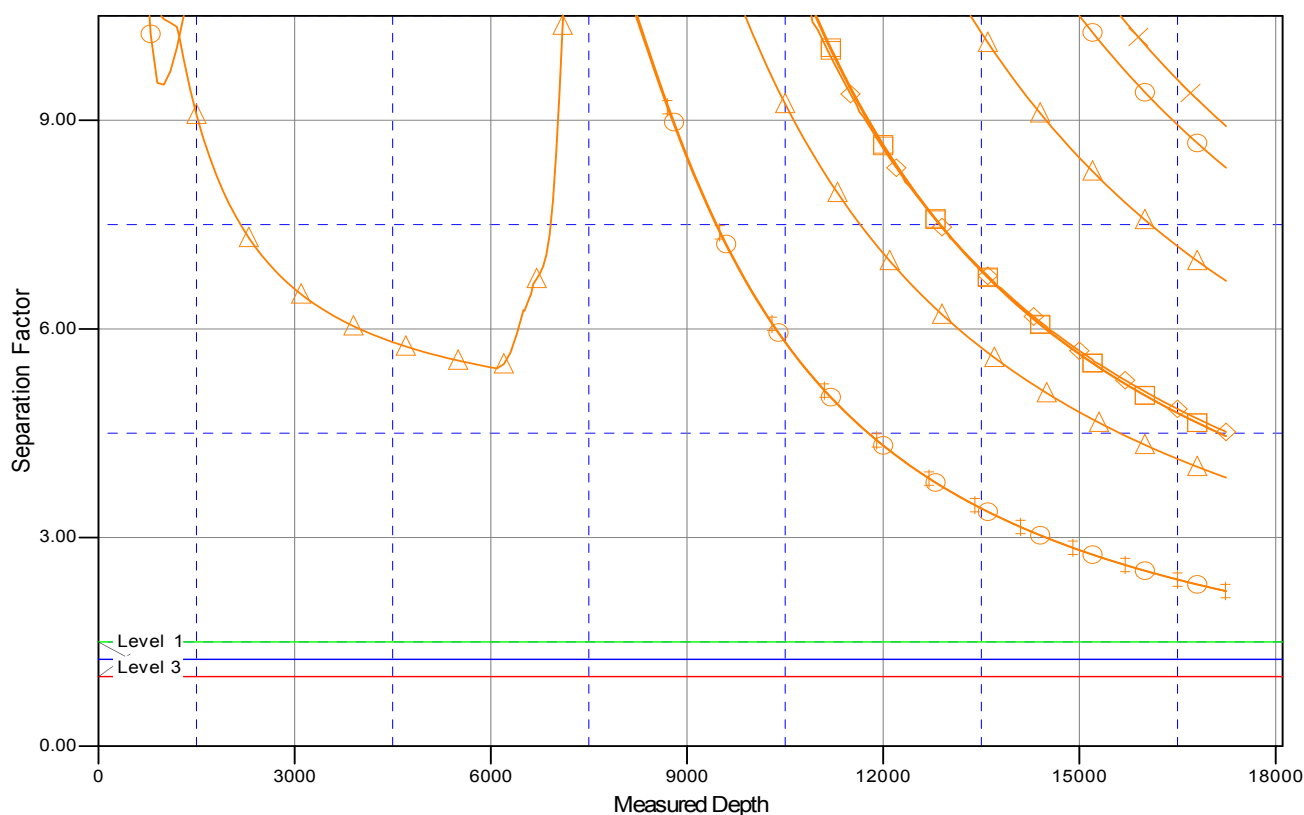
Central Meridian is 105° 30' 0.000 W °

Coordinates are relative to: Thornton 4

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.45°

Separation Factor Plot



LEGEND

- | | | |
|-------------------------------------|------------------------------------|------------------------------------|
| Thornton 1, Original Hole, Rev0 V0 | Thornton 2, Original Hole, Rev0 V0 | Thornton 7, Original Hole, Rev0 V0 |
| Thornton 10, Original Hole, Rev0 V0 | Thornton 3, Original Hole, Rev0 V0 | Thornton 8, Original Hole, Rev0 V0 |
| Thornton 11, Original Hole, Rev0 V0 | Thornton 5, Original Hole, Rev0 V0 | Thornton 9, Original Hole, Rev0 V0 |
| Thornton 12, Original Hole, Rev0 V0 | Thornton 6, Original Hole, Rev0 V0 | |