



Extraction Oil & Gas

**Weld Co., Co
Sec.08-T07N-R66W
Thornton 10**

**Original Hole
Rev 0**

Anticollision Risk Report

21 June, 2014



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	17,254.82	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	496.00	251.76	250.07	149.632 CC, ES	
Thornton 1 - Original Hole - Rev 0	17,254.82	17,324.42	1,980.05	1,831.87	13.363 SF	
Thornton 11 - Original Hole - Rev 0	666.33	667.33	28.05	25.78	12.348 CC	
Thornton 11 - Original Hole - Rev 0	700.00	700.99	28.05	25.66	11.741 ES	
Thornton 11 - Original Hole - Rev 0	17,254.82	17,294.72	330.06	181.77	2.226 SF	
Thornton 12 - Original Hole - Rev 0	565.99	567.99	56.11	54.18	29.172 CC	
Thornton 12 - Original Hole - Rev 0	600.00	601.97	56.11	54.07	27.477 ES	
Thornton 12 - Original Hole - Rev 0	17,254.82	17,642.14	593.89	463.54	4.556 SF	
Thornton 2 - Original Hole - Rev 0	600.00	596.00	223.69	221.66	110.108 CC, ES	
Thornton 2 - Original Hole - Rev 0	17,254.82	17,273.45	1,649.98	1,501.84	11.138 SF	
Thornton 3 - Original Hole - Rev 0	700.00	696.00	196.01	193.63	82.334 CC, ES	
Thornton 3 - Original Hole - Rev 0	17,254.82	17,582.23	1,522.04	1,376.32	10.445 SF	
Thornton 4 - Original Hole - Rev 0	800.00	796.00	167.95	165.22	61.528 CC, ES	
Thornton 4 - Original Hole - Rev 0	17,254.82	17,242.86	1,319.92	1,171.79	8.911 SF	
Thornton 5 - Original Hole - Rev 0	800.00	797.00	139.90	137.17	51.220 CC, ES	
Thornton 5 - Original Hole - Rev 0	17,254.82	17,222.47	989.85	841.72	6.682 SF	
Thornton 6 - Original Hole - Rev 0	800.00	798.00	111.85	109.11	40.922 CC, ES	
Thornton 6 - Original Hole - Rev 0	17,254.82	17,547.64	889.12	748.27	6.312 SF	
Thornton 7 - Original Hole - Rev 0	800.00	798.00	83.79	81.06	30.658 CC, ES	
Thornton 7 - Original Hole - Rev 0	17,254.82	17,219.06	659.78	511.63	4.454 SF	
Thornton 8 - Original Hole - Rev 0	800.00	798.00	55.74	53.01	20.394 CC, ES	
Thornton 8 - Original Hole - Rev 0	17,254.82	17,230.36	329.71	181.53	2.225 SF	
Thornton 9 - Original Hole - Rev 0	800.00	799.00	28.05	25.32	10.257 CC, ES	
Thornton 9 - Original Hole - Rev 0	17,254.82	17,568.49	369.86	272.80	3.810 SF	



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Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	0.00	251.79						CC, ES	0
100.00	100.00	96.00	96.00	0.15	0.14	0.00	251.76	251.47	0.29	876.127				0
200.00	200.00	196.00	196.00	0.32	0.31	0.00	251.76	251.12	0.64	396.279				0
300.00	300.00	296.00	296.00	0.50	0.49	0.00	251.76	250.77	0.98	255.755				0
400.00	400.00	396.00	396.00	0.67	0.66	0.00	251.76	250.42	1.33	188.803				0
500.00	500.00	496.00	496.00	0.84	0.84	0.00	251.76	250.07	1.68	149.632				0
600.00	600.00	588.76	588.75	1.02	1.00	-0.12	253.13	251.11	2.02	125.371				0
700.00	700.00	681.04	680.92	1.19	1.16	-0.49	257.49	255.14	2.36	109.328				0
800.00	800.00	772.94	772.53	1.37	1.32	-1.08	264.85	262.16	2.69	98.398				0
900.00	899.98	864.19	863.21	1.54	1.49	134.01	276.42	273.40	3.03	91.340				0
1,000.00	999.84	954.34	952.44	1.72	1.65	133.53	293.34	289.98	3.36	87.349				0
1,100.00	1,099.45	1,043.03	1,039.79	1.90	1.82	133.25	315.49	311.80	3.69	85.578				0
1,197.49	1,196.22	1,127.75	1,122.73	2.07	1.99	133.11	341.99	337.99	4.00	85.427				0
1,200.00	1,198.70	1,129.90	1,124.84	2.07	1.99	133.12	342.73	338.72	4.01	85.436				0
1,300.00	1,297.74	1,217.42	1,209.97	2.26	2.16	133.39	373.69	369.34	4.35	85.974				0
1,400.00	1,396.78	1,312.25	1,302.01	2.44	2.35	133.59	405.42	400.73	4.70	86.339				0
1,500.00	1,495.82	1,407.07	1,394.06	2.62	2.55	133.76	437.16	432.11	5.05	86.635				0
1,600.00	1,594.86	1,501.89	1,486.10	2.80	2.74	133.91	468.90	463.50	5.40	86.878				0
1,700.00	1,693.90	1,596.71	1,578.14	2.99	2.94	134.04	500.65	494.90	5.75	87.079				0
1,800.00	1,792.94	1,691.53	1,670.19	3.17	3.13	134.16	532.39	526.29	6.10	87.249				0
1,900.00	1,891.97	1,786.36	1,762.23	3.36	3.33	134.26	564.14	557.68	6.46	87.393				0
2,000.00	1,991.01	1,881.18	1,854.27	3.55	3.53	134.35	595.89	589.08	6.81	87.517				0
2,100.00	2,090.05	1,976.00	1,946.32	3.73	3.73	134.44	627.64	620.47	7.16	87.624				0
2,200.00	2,189.09	2,070.82	2,038.36	3.92	3.93	134.51	659.39	651.87	7.52	87.717				0
2,300.00	2,288.13	2,165.65	2,130.41	4.11	4.13	134.58	691.14	683.27	7.87	87.799				0
2,400.00	2,387.17	2,260.47	2,222.45	4.29	4.33	134.64	722.89	714.67	8.23	87.871				0
2,500.00	2,486.21	2,355.29	2,314.49	4.48	4.53	134.70	754.65	746.06	8.58	87.935				0
2,600.00	2,585.25	2,450.11	2,406.54	4.67	4.73	134.75	786.40	777.46	8.94	87.992				0
2,700.00	2,684.29	2,544.93	2,498.58	4.85	4.93	134.80	818.15	808.86	9.29	88.043				0
2,800.00	2,783.33	2,639.76	2,590.62	5.04	5.14	134.84	849.91	840.26	9.65	88.089				0
2,900.00	2,882.36	2,734.58	2,682.67	5.23	5.34	134.88	881.66	871.66	10.00	88.131				0
3,000.00	2,981.40	2,829.40	2,774.71	5.42	5.54	134.92	913.42	903.06	10.36	88.169				0
3,100.00	3,080.44	2,924.22	2,866.76	5.60	5.74	134.95	945.18	934.46	10.72	88.203				0
3,200.00	3,179.48	3,019.05	2,958.80	5.79	5.94	134.99	976.93	965.86	11.07	88.234				0
3,300.00	3,278.52	3,113.87	3,050.84	5.98	6.15	135.02	1,008.69	997.26	11.43	88.263				0
3,400.00	3,377.56	3,208.69	3,142.89	6.17	6.35	135.05	1,040.45	1,028.66	11.78	88.290				0
3,500.00	3,476.60	3,303.51	3,234.93	6.36	6.55	135.08	1,072.20	1,060.06	12.14	88.314				0
3,600.00	3,575.64	3,398.33	3,326.97	6.55	6.75	135.10	1,103.96	1,091.46	12.50	88.337				0
3,700.00	3,674.68	3,493.16	3,419.02	6.73	6.96	135.13	1,135.72	1,122.87	12.85	88.357				0
3,800.00	3,773.71	3,587.98	3,511.06	6.92	7.16	135.15	1,167.48	1,154.27	13.21	88.377				0
3,900.00	3,872.75	3,682.80	3,603.10	7.11	7.36	135.17	1,199.23	1,185.67	13.57	88.395				0
4,000.00	3,971.79	3,777.62	3,695.15	7.30	7.57	135.19	1,230.99	1,217.07	13.92	88.411				0
4,100.00	4,070.83	3,872.45	3,787.19	7.49	7.77	135.21	1,262.75	1,248.47	14.28	88.427				0
4,200.00	4,169.87	3,967.27	3,879.24	7.67	7.97	135.23	1,294.51	1,279.87	14.64	88.442				0
4,300.00	4,268.91	4,062.09	3,971.28	7.86	8.18	135.25	1,326.27	1,311.27	14.99	88.455				0
4,400.00	4,367.95	4,156.91	4,063.32	8.05	8.38	135.27	1,358.03	1,342.68	15.35	88.468				0
4,500.00	4,466.99	4,251.73	4,155.37	8.24	8.58	135.28	1,389.79	1,374.08	15.71	88.480				0
4,600.00	4,566.03	4,346.56	4,247.41	8.43	8.79	135.30	1,421.54	1,405.48	16.06	88.492				0
4,700.00	4,665.07	4,441.38	4,339.45	8.62	8.99	135.31	1,453.30	1,436.88	16.42	88.502				0
4,800.00	4,764.10	4,536.20	4,431.50	8.81	9.19	135.33	1,485.06	1,468.28	16.78	88.513				0
4,900.00	4,863.14	4,631.02	4,523.54	8.99	9.40	135.34	1,516.82	1,499.69	17.13	88.522				0
5,000.00	4,962.18	4,725.84	4,615.58	9.18	9.60	135.35	1,548.58	1,531.09	17.49	88.531				0
5,100.00	5,061.22	4,820.67	4,707.63	9.37	9.80	135.37	1,580.34	1,562.49	17.85	88.540				0
5,200.00	5,160.26	4,915.49	4,799.67	9.56	10.01	135.38	1,612.10	1,593.89	18.21	88.548				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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	5,259.30	5,010.31	4,891.72	9.75	10.21	135.39	1,643.86	1,625.30	18.56	88.556	0					
5,400.00	5,358.34	5,105.13	4,983.76	9.94	10.41	135.40	1,675.62	1,656.70	18.92	88.563	0					
5,500.00	5,457.38	5,199.96	5,075.80	10.13	10.62	135.41	1,707.38	1,688.10	19.28	88.570	0					
5,600.00	5,556.42	5,294.78	5,167.85	10.32	10.82	135.42	1,739.14	1,719.50	19.63	88.577	0					
5,700.00	5,655.45	5,389.60	5,259.89	10.50	11.02	135.43	1,770.90	1,750.90	19.99	88.583	0					
5,800.00	5,754.49	5,484.42	5,351.93	10.69	11.23	135.44	1,802.66	1,782.31	20.35	88.589	0					
5,900.00	5,853.53	5,579.24	5,443.98	10.88	11.43	135.45	1,834.42	1,813.71	20.71	88.595	0					
6,000.00	5,952.57	5,674.07	5,536.02	11.07	11.64	135.46	1,866.17	1,845.11	21.06	88.601	0					
6,105.61	6,057.16	5,774.20	5,633.23	11.27	11.85	135.47	1,899.72	1,878.28	21.44	88.606	0					
6,200.00	6,150.85	5,864.05	5,720.44	11.44	12.04	135.87	1,928.64	1,906.81	21.83	88.353	0					
6,300.00	6,250.45	6,044.52	5,896.33	11.62	12.42	136.10	1,955.87	1,933.49	22.38	87.391	0					
6,400.00	6,350.30	6,311.72	6,160.47	11.79	12.91	136.18	1,973.38	1,950.32	23.06	85.569	0					
6,503.10	6,453.38	6,594.13	6,442.37	11.96	13.36	0.41	1,979.77	1,954.92	24.85	79.683	0					
6,603.10	6,553.38	6,701.14	6,549.38	12.13	13.52	0.41	1,979.78	1,954.60	25.18	78.631	0					
6,650.00	6,600.24	6,747.13	6,595.34	12.20	13.59	-89.60	1,979.77	1,955.54	24.24	81.686	0					
6,700.00	6,649.91	6,796.09	6,644.02	12.27	13.65	-89.62	1,979.77	1,955.38	24.39	81.183	0					
6,750.00	6,698.98	6,845.08	6,692.19	12.34	13.72	-89.63	1,979.77	1,955.24	24.53	80.713	0					
6,800.00	6,747.16	6,894.11	6,739.59	12.41	13.78	-89.65	1,979.76	1,955.10	24.66	80.271	0					
6,850.00	6,794.14	6,943.19	6,785.92	12.47	13.84	-89.67	1,979.76	1,954.97	24.79	79.853	0					
6,900.00	6,839.64	6,992.32	6,830.92	12.54	13.89	-89.69	1,979.76	1,954.84	24.92	79.454	0					
6,950.00	6,883.37	7,041.51	6,874.32	12.59	13.95	-89.71	1,979.75	1,954.71	25.04	79.070	0					
7,000.00	6,925.07	7,090.76	6,915.85	12.65	14.00	-89.73	1,979.75	1,954.59	25.16	78.693	0					
7,050.00	6,964.47	7,140.08	6,955.26	12.71	14.05	-89.76	1,979.74	1,954.46	25.28	78.317	0					
7,100.00	7,001.34	7,189.47	6,992.32	12.77	14.11	-89.79	1,979.74	1,954.34	25.40	77.935	0					
7,150.00	7,035.45	7,238.93	7,026.79	12.83	14.16	-89.82	1,979.74	1,954.20	25.53	77.541	0					
7,200.00	7,066.59	7,288.47	7,058.44	12.90	14.22	-89.85	1,979.73	1,954.06	25.67	77.128	0					
7,250.00	7,094.56	7,338.09	7,087.09	12.96	14.28	-89.88	1,979.73	1,953.92	25.82	76.689	0					
7,300.00	7,119.20	7,387.80	7,112.53	13.03	14.35	-89.91	1,979.73	1,953.75	25.97	76.219	0					
7,350.00	7,140.35	7,437.59	7,134.60	13.11	14.42	-89.94	1,979.73	1,953.58	26.15	75.714	0					
7,400.00	7,157.88	7,487.48	7,153.15	13.19	14.50	-89.98	1,979.73	1,953.39	26.34	75.170	0					
7,433.66	7,167.58	7,521.11	7,163.58	13.25	14.55	-90.00	1,979.73	1,953.25	26.47	74.779	0					
7,450.00	7,171.68	7,537.45	7,168.04	13.28	14.58	-90.01	1,979.73	1,953.18	26.54	74.587	0					
7,500.00	7,181.67	7,587.51	7,179.16	13.39	14.67	-90.04	1,979.73	1,952.96	26.77	73.965	0					
7,550.00	7,187.79	7,637.66	7,186.43	13.50	14.76	-90.08	1,979.73	1,952.72	27.01	73.306	0					
7,603.10	7,190.00	7,691.02	7,189.84	13.63	14.87	-90.11	1,979.73	1,952.45	27.28	72.570	0					
7,700.00	7,190.00	7,788.01	7,190.00	13.91	15.10	-90.12	1,979.73	1,951.90	27.83	71.147	0					
7,800.00	7,190.00	7,888.01	7,190.00	14.22	15.37	-90.12	1,979.73	1,951.28	28.45	69.596	0					
7,900.00	7,190.00	7,988.00	7,190.00	14.56	15.66	-90.12	1,979.73	1,950.61	29.12	67.984	0					
8,000.00	7,190.00	8,088.00	7,190.00	14.93	15.99	-90.12	1,979.73	1,949.88	29.85	66.331	0					
8,100.00	7,190.00	8,188.00	7,190.00	15.32	16.34	-90.12	1,979.73	1,949.11	30.62	64.656	0					
8,200.00	7,190.00	8,288.00	7,190.00	15.73	16.72	-90.12	1,979.73	1,948.29	31.44	62.975	0					
8,300.00	7,190.00	8,388.00	7,190.00	16.16	17.12	-90.12	1,979.73	1,947.44	32.29	61.302	0					
8,400.00	7,190.00	8,488.00	7,190.00	16.61	17.54	-90.12	1,979.73	1,946.54	33.19	59.648	0					
8,500.00	7,190.00	8,588.00	7,190.00	17.07	17.98	-90.12	1,979.73	1,945.61	34.12	58.022	0					
8,600.00	7,190.00	8,688.00	7,190.00	17.55	18.43	-90.12	1,979.73	1,944.65	35.08	56.432	0					
8,700.00	7,190.00	8,788.00	7,190.00	18.05	18.90	-90.12	1,979.73	1,943.66	36.07	54.881	0					
8,800.00	7,190.00	8,888.00	7,190.00	18.56	19.39	-90.12	1,979.73	1,942.64	37.09	53.375	0					
8,900.00	7,190.00	8,987.99	7,190.00	19.08	19.89	-90.12	1,979.73	1,941.60	38.13	51.916	0					
9,000.00	7,190.00	9,087.99	7,190.00	19.61	20.40	-90.12	1,979.74	1,940.54	39.20	50.505	0					
9,100.00	7,190.00	9,187.99	7,190.00	20.16	20.93	-90.12	1,979.74	1,939.45	40.29	49.143	0					
9,200.00	7,190.00	9,287.99	7,190.00	20.71	21.46	-90.12	1,979.74	1,938.35	41.39	47.830	0					
9,300.00	7,190.00	9,387.99	7,190.00	21.27	22.00	-90.12	1,979.74	1,937.22	42.51	46.566	0					
9,400.00	7,190.00	9,487.99	7,190.00	21.84	22.55	-90.12	1,979.74	1,936.08	43.65	45.350	0					
9,500.00	7,190.00	9,587.99	7,190.00	22.42	23.11	-90.12	1,979.74	1,934.93	44.81	44.181	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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		
9,600.00	7,190.00	9,687.99	7,190.00	23.00	23.68	-90.12	1,979.74	1,933.76	45.98	43.057	0		
9,700.00	7,190.00	9,787.99	7,190.00	23.59	24.26	-90.12	1,979.74	1,932.58	47.16	41.978	0		
9,800.00	7,190.00	9,887.99	7,190.00	24.19	24.84	-90.12	1,979.74	1,931.39	48.36	40.941	0		
9,900.00	7,190.00	9,987.98	7,190.00	24.79	25.43	-90.12	1,979.74	1,930.18	49.56	39.945	0		
10,000.00	7,190.00	10,087.98	7,190.00	25.40	26.02	-90.12	1,979.74	1,928.97	50.78	38.989	0		
10,100.00	7,190.00	10,187.98	7,190.00	26.01	26.62	-90.12	1,979.75	1,927.74	52.00	38.070	0		
10,200.00	7,190.00	10,287.98	7,190.00	26.63	27.22	-90.12	1,979.75	1,926.51	53.24	37.187	0		
10,300.00	7,190.00	10,387.98	7,190.00	27.25	27.83	-90.12	1,979.75	1,925.27	54.48	36.339	0		
10,400.00	7,190.00	10,487.98	7,190.00	27.88	28.44	-90.12	1,979.75	1,924.02	55.73	35.523	0		
10,500.00	7,190.00	10,587.98	7,190.00	28.51	29.06	-90.12	1,979.75	1,922.76	56.99	34.739	0		
10,600.00	7,190.00	10,687.98	7,190.00	29.14	29.68	-90.12	1,979.75	1,921.50	58.25	33.985	0		
10,700.00	7,190.00	10,787.98	7,190.00	29.77	30.31	-90.12	1,979.75	1,920.23	59.52	33.259	0		
10,800.00	7,190.00	10,887.97	7,190.00	30.41	30.93	-90.12	1,979.76	1,918.95	60.80	32.561	0		
10,900.00	7,190.00	10,987.97	7,190.00	31.05	31.57	-90.12	1,979.76	1,917.67	62.08	31.888	0		
11,000.00	7,190.00	11,087.97	7,190.00	31.70	32.20	-90.12	1,979.76	1,916.39	63.37	31.240	0		
11,100.00	7,190.00	11,187.97	7,190.00	32.34	32.84	-90.12	1,979.76	1,915.10	64.67	30.615	0		
11,200.00	7,190.00	11,287.97	7,190.00	32.99	33.48	-90.12	1,979.76	1,913.80	65.96	30.013	0		
11,300.00	7,190.00	11,387.97	7,190.00	33.64	34.12	-90.12	1,979.76	1,912.50	67.27	29.432	0		
11,400.00	7,190.00	11,487.97	7,190.00	34.30	34.76	-90.12	1,979.77	1,911.20	68.57	28.871	0		
11,500.00	7,190.00	11,587.97	7,190.00	34.95	35.41	-90.12	1,979.77	1,909.89	69.88	28.330	0		
11,600.00	7,190.00	11,687.97	7,190.00	35.61	36.06	-90.12	1,979.77	1,908.58	71.20	27.807	0		
11,700.00	7,190.00	11,787.97	7,190.00	36.27	36.71	-90.12	1,979.77	1,907.26	72.51	27.302	0		
11,800.00	7,190.00	11,887.96	7,190.00	36.93	37.36	-90.12	1,979.77	1,905.94	73.83	26.814	0		
11,900.00	7,190.00	11,987.96	7,190.00	37.59	38.02	-90.12	1,979.78	1,904.62	75.16	26.342	0		
12,000.00	7,190.00	12,087.96	7,190.00	38.25	38.67	-90.12	1,979.78	1,903.30	76.48	25.885	0		
12,100.00	7,190.00	12,187.96	7,190.00	38.91	39.33	-90.12	1,979.78	1,901.97	77.81	25.443	0		
12,200.00	7,190.00	12,287.96	7,190.00	39.58	39.99	-90.12	1,979.78	1,900.64	79.15	25.014	0		
12,300.00	7,190.00	12,387.96	7,190.00	40.25	40.65	-90.12	1,979.79	1,899.31	80.48	24.599	0		
12,400.00	7,190.00	12,487.96	7,190.00	40.92	41.31	-90.12	1,979.79	1,897.97	81.82	24.197	0		
12,500.00	7,190.00	12,587.96	7,190.00	41.59	41.98	-90.12	1,979.79	1,896.63	83.16	23.808	0		
12,600.00	7,190.00	12,687.96	7,190.00	42.26	42.64	-90.12	1,979.79	1,895.29	84.50	23.430	0		
12,700.00	7,190.00	12,787.96	7,190.00	42.93	43.31	-90.12	1,979.80	1,893.95	85.84	23.063	0		
12,800.00	7,190.00	12,887.95	7,190.00	43.60	43.97	-90.12	1,979.80	1,892.61	87.19	22.707	0		
12,900.00	7,190.00	12,987.95	7,190.00	44.28	44.64	-90.12	1,979.80	1,891.26	88.54	22.361	0		
13,000.00	7,190.00	13,087.95	7,190.00	44.95	45.31	-90.12	1,979.80	1,889.92	89.89	22.026	0		
13,100.00	7,190.00	13,187.95	7,190.00	45.63	45.98	-90.12	1,979.81	1,888.57	91.24	21.699	0		
13,200.00	7,190.00	13,287.95	7,190.00	46.30	46.65	-90.12	1,979.81	1,887.22	92.59	21.382	0		
13,300.00	7,190.00	13,387.95	7,190.00	46.98	47.33	-90.12	1,979.81	1,885.87	93.95	21.074	0		
13,400.00	7,190.00	13,487.95	7,190.00	47.66	48.00	-90.12	1,979.82	1,884.51	95.30	20.774	0		
13,500.00	7,190.00	13,587.95	7,190.00	48.34	48.67	-90.12	1,979.82	1,883.16	96.66	20.482	0		
13,600.00	7,190.00	13,687.95	7,190.00	49.01	49.35	-90.12	1,979.82	1,881.80	98.02	20.199	0		
13,700.00	7,190.00	13,787.95	7,190.00	49.69	50.02	-90.12	1,979.82	1,880.45	99.38	19.922	0		
13,800.00	7,190.00	13,887.94	7,190.00	50.38	50.70	-90.12	1,979.83	1,879.09	100.74	19.653	0		
13,900.00	7,190.00	13,987.94	7,190.00	51.06	51.38	-90.12	1,979.83	1,877.73	102.10	19.391	0		
14,000.00	7,190.00	14,087.94	7,190.00	51.74	52.06	-90.12	1,979.83	1,876.37	103.47	19.135	0		
14,100.00	7,190.00	14,187.94	7,190.00	52.42	52.73	-90.12	1,979.84	1,875.01	104.83	18.886	0		
14,200.00	7,190.00	14,287.94	7,190.00	53.10	53.41	-90.12	1,979.84	1,873.64	106.20	18.643	0		
14,300.00	7,190.00	14,387.94	7,190.00	53.79	54.09	-90.12	1,979.84	1,872.28	107.57	18.406	0		
14,400.00	7,190.00	14,487.94	7,190.00	54.47	54.77	-90.12	1,979.85	1,870.91	108.93	18.175	0		
14,500.00	7,190.00	14,587.94	7,190.00	55.16	55.45	-90.12	1,979.85	1,869.55	110.30	17.949	0		
14,600.00	7,190.00	14,687.94	7,190.00	55.84	56.14	-90.12	1,979.85	1,868.18	111.67	17.729	0		
14,700.00	7,190.00	14,787.94	7,190.00	56.53	56.82	-90.12	1,979.86	1,866.81	113.04	17.514	0		
14,800.00	7,190.00	14,887.93	7,190.00	57.21	57.50	-90.12	1,979.86	1,865.45	114.42	17.304	0		
14,900.00	7,190.00	14,987.93	7,190.00	57.90	58.18	-90.12	1,979.87	1,864.08	115.79	17.099	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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				
15,000.00	7,190.00	15,087.93	7,190.00	58.59	58.87	-90.12	1,979.87	1,862.71	117.16	16.898	0					
15,100.00	7,190.00	15,187.93	7,190.00	59.27	59.55	-90.12	1,979.87	1,861.34	118.54	16.703	0					
15,200.00	7,190.00	15,287.93	7,190.00	59.96	60.24	-90.12	1,979.88	1,859.96	119.91	16.511	0					
15,300.00	7,190.00	15,387.93	7,190.00	60.65	60.92	-90.12	1,979.88	1,858.59	121.29	16.324	0					
15,400.00	7,190.00	15,487.93	7,190.00	61.34	61.61	-90.12	1,979.88	1,857.22	122.66	16.141	0					
15,500.00	7,190.00	15,587.93	7,190.00	62.02	62.29	-90.12	1,979.89	1,855.85	124.04	15.961	0					
15,600.00	7,190.00	15,687.93	7,190.00	62.71	62.98	-90.12	1,979.89	1,854.47	125.42	15.786	0					
15,700.00	7,190.00	15,787.93	7,190.00	63.40	63.66	-90.12	1,979.90	1,853.10	126.80	15.614	0					
15,800.00	7,190.00	15,887.92	7,190.00	64.09	64.35	-90.12	1,979.90	1,851.72	128.18	15.446	0					
15,900.00	7,190.00	15,987.92	7,190.00	64.78	65.04	-90.12	1,979.91	1,850.35	129.56	15.282	0					
16,000.00	7,190.00	16,087.92	7,190.00	65.47	65.73	-90.12	1,979.91	1,848.97	130.94	15.121	0					
16,100.00	7,190.00	16,187.92	7,190.00	66.16	66.41	-90.12	1,979.91	1,847.59	132.32	14.963	0					
16,200.00	7,190.00	16,287.92	7,190.00	66.85	67.10	-90.12	1,979.92	1,846.22	133.70	14.809	0					
16,300.00	7,190.00	16,387.92	7,190.00	67.54	67.79	-90.12	1,979.92	1,844.84	135.08	14.657	0					
16,400.00	7,190.00	16,487.92	7,190.00	68.24	68.48	-90.12	1,979.93	1,843.46	136.47	14.509	0					
16,500.00	7,190.00	16,587.92	7,190.00	68.93	69.17	-90.12	1,979.93	1,842.08	137.85	14.363	0					
16,600.00	7,190.00	16,687.92	7,190.00	69.62	69.86	-90.12	1,979.94	1,840.70	139.23	14.220	0					
16,700.00	7,190.00	16,787.92	7,190.00	70.31	70.55	-90.12	1,979.94	1,839.32	140.62	14.080	0					
16,800.00	7,190.00	16,887.91	7,190.00	71.00	71.24	-90.12	1,979.95	1,837.94	142.00	13.943	0					
16,900.00	7,190.00	16,987.91	7,190.00	71.70	71.93	-90.12	1,979.95	1,836.56	143.39	13.809	0					
17,000.00	7,190.00	17,087.91	7,190.00	72.39	72.62	-90.12	1,979.95	1,835.18	144.77	13.676	0					
17,100.00	7,190.00	17,187.91	7,190.00	73.08	73.31	-90.12	1,979.96	1,833.80	146.16	13.547	0					
17,200.00	7,190.00	17,287.91	7,190.00	73.77	74.00	-90.12	1,979.96	1,832.42	147.54	13.420	0					
17,221.82	7,190.00	17,309.73	7,190.00	73.93	74.15	-90.12	1,979.97	1,832.12	147.85	13.392	0					
17,254.82	7,190.00	17,324.42	7,190.00	74.15	74.25	-90.12	1,980.05	1,831.87	148.18	13.363	0	SF				



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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 11 - 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	-179.88	28.05					0	CC ES			
100.00	100.00	101.00	101.00	0.15	0.15	-179.88	28.05	27.76	0.29	95.109	0					
200.00	200.00	201.00	201.00	0.32	0.32	-179.88	28.05	27.41	0.64	43.560	0					
300.00	300.00	301.00	301.00	0.50	0.50	-179.88	28.05	27.06	0.99	28.249	0					
400.00	400.00	401.00	401.00	0.67	0.67	-179.88	28.05	26.71	1.34	20.902	0					
500.00	500.00	501.00	501.00	0.84	0.85	-179.88	28.05	26.36	1.69	16.588	0					
600.00	600.00	601.00	601.00	1.02	1.02	-179.88	28.05	26.01	2.04	13.750	0					
666.33	666.33	667.33	667.33	1.14	1.14	-179.88	28.05	25.78	2.27	12.348	0					
700.00	700.00	700.99	700.99	1.19	1.20	-179.88	28.05	25.66	2.39	11.741	0					
800.00	800.00	800.00	799.98	1.37	1.37	-178.10	29.57	26.83	2.74	10.804	0					
900.00	899.98	899.12	898.96	1.54	1.54	-39.79	32.84	29.75	3.08	10.647	0					
1,000.00	999.84	997.98	997.44	1.72	1.72	-38.74	36.52	33.09	3.43	10.645	0					
1,100.00	1,099.45	1,096.71	1,095.44	1.90	1.89	-38.79	40.57	36.80	3.78	10.741	0					
1,197.49	1,196.22	1,192.82	1,190.40	2.07	2.07	-39.61	44.88	40.76	4.12	10.899	0					
1,200.00	1,198.70	1,195.29	1,192.83	2.07	2.08	-39.64	45.00	40.87	4.13	10.904	0					
1,300.00	1,297.74	1,294.67	1,290.55	2.26	2.26	-40.17	50.53	46.05	4.48	11.267	0					
1,400.00	1,396.78	1,394.50	1,388.69	2.44	2.45	-40.50	56.24	51.39	4.85	11.607	0					
1,500.00	1,495.82	1,494.34	1,486.84	2.62	2.64	-40.78	61.95	56.75	5.21	11.898	0					
1,600.00	1,594.86	1,594.18	1,584.98	2.80	2.83	-41.00	67.67	62.10	5.57	12.149	0					
1,700.00	1,693.90	1,694.01	1,683.12	2.99	3.02	-41.19	73.38	67.45	5.93	12.369	0					
1,800.00	1,792.94	1,793.85	1,781.26	3.17	3.22	-41.36	79.09	72.80	6.30	12.561	0					
1,900.00	1,891.97	1,893.69	1,879.40	3.36	3.41	-41.50	84.81	78.15	6.66	12.732	0					
2,000.00	1,991.01	1,993.52	1,977.55	3.55	3.60	-41.62	90.52	83.50	7.03	12.884	0					
2,100.00	2,090.05	2,093.36	2,075.69	3.73	3.80	-41.73	96.24	88.85	7.39	13.021	0					
2,200.00	2,189.09	2,193.19	2,173.83	3.92	3.99	-41.83	101.96	94.20	7.76	13.144	0					
2,300.00	2,288.13	2,293.03	2,271.97	4.11	4.19	-41.91	107.67	99.55	8.12	13.256	0					
2,400.00	2,387.17	2,392.87	2,370.11	4.29	4.39	-41.99	113.39	104.90	8.49	13.357	0					
2,500.00	2,486.21	2,492.70	2,468.25	4.48	4.58	-42.06	119.11	110.25	8.86	13.450	0					
2,600.00	2,585.25	2,592.54	2,566.40	4.67	4.78	-42.13	124.82	115.60	9.22	13.535	0					
2,700.00	2,684.29	2,692.38	2,664.54	4.85	4.97	-42.18	130.54	120.95	9.59	13.614	0					
2,800.00	2,783.33	2,792.21	2,762.68	5.04	5.17	-42.24	136.26	126.30	9.96	13.686	0					
2,900.00	2,882.36	2,892.05	2,860.82	5.23	5.37	-42.29	141.97	131.65	10.32	13.753	0					
3,000.00	2,981.40	2,991.89	2,958.96	5.42	5.57	-42.33	147.69	137.00	10.69	13.816	0					
3,100.00	3,080.44	3,091.72	3,057.11	5.60	5.76	-42.37	153.41	142.35	11.06	13.874	0					
3,200.00	3,179.48	3,191.56	3,155.25	5.79	5.96	-42.41	159.13	147.70	11.43	13.928	0					
3,300.00	3,278.52	3,291.39	3,253.39	5.98	6.16	-42.45	164.85	153.05	11.79	13.979	0					
3,400.00	3,377.56	3,391.23	3,351.53	6.17	6.36	-42.48	170.56	158.40	12.16	14.026	0					
3,500.00	3,476.60	3,491.07	3,449.67	6.36	6.55	-42.51	176.28	163.75	12.53	14.071	0					
3,600.00	3,575.64	3,590.90	3,547.82	6.55	6.75	-42.54	182.00	169.10	12.90	14.113	0					
3,700.00	3,674.68	3,690.74	3,645.96	6.73	6.95	-42.57	187.72	174.45	13.26	14.153	0					
3,800.00	3,773.71	3,790.58	3,744.10	6.92	7.15	-42.60	193.43	179.80	13.63	14.190	0					
3,900.00	3,872.75	3,890.41	3,842.24	7.11	7.34	-42.62	199.15	185.15	14.00	14.225	0					
4,000.00	3,971.79	3,990.25	3,940.38	7.30	7.54	-42.65	204.87	190.50	14.37	14.259	0					
4,100.00	4,070.83	4,090.09	4,038.52	7.49	7.74	-42.67	210.59	195.85	14.74	14.291	0					
4,200.00	4,169.87	4,189.92	4,136.67	7.67	7.94	-42.69	216.31	201.20	15.10	14.321	0					
4,300.00	4,268.91	4,289.76	4,234.81	7.86	8.14	-42.71	222.03	206.55	15.47	14.350	0					
4,400.00	4,367.95	4,389.59	4,332.95	8.05	8.34	-42.73	227.74	211.90	15.84	14.377	0					
4,500.00	4,466.99	4,489.43	4,431.09	8.24	8.53	-42.74	233.46	217.25	16.21	14.403	0					
4,600.00	4,566.03	4,589.27	4,529.23	8.43	8.73	-42.76	239.18	222.60	16.58	14.428	0					
4,700.00	4,665.07	4,689.10	4,627.38	8.62	8.93	-42.78	244.90	227.95	16.95	14.452	0					
4,800.00	4,764.10	4,788.94	4,725.52	8.81	9.13	-42.79	250.62	233.30	17.31	14.475	0					
4,900.00	4,863.14	4,888.78	4,823.66	8.99	9.33	-42.81	256.33	238.65	17.68	14.497	0					
5,000.00	4,962.18	4,988.61	4,921.80	9.18	9.53	-42.82	262.05	244.00	18.05	14.518	0					
5,100.00	5,061.22	5,088.45	5,019.94	9.37	9.72	-42.84	267.77	249.35	18.42	14.538	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	5,160.26	5,188.29	5,118.09	9.56	9.92	-42.85	273.49	254.70	18.79	14.557	0		
5,300.00	5,259.30	5,288.12	5,216.23	9.75	10.12	-42.86	279.21	260.05	19.16	14.575	0		
5,400.00	5,358.34	5,387.96	5,314.37	9.94	10.32	-42.87	284.93	265.40	19.52	14.593	0		
5,500.00	5,457.38	5,487.79	5,412.51	10.13	10.52	-42.88	290.64	270.75	19.89	14.610	0		
5,600.00	5,556.42	5,587.63	5,510.65	10.32	10.72	-42.90	296.36	276.10	20.26	14.627	0		
5,700.00	5,655.45	5,687.47	5,608.79	10.50	10.91	-42.91	302.08	281.45	20.63	14.643	0		
5,800.00	5,754.49	5,787.30	5,706.94	10.69	11.11	-42.92	307.80	286.80	21.00	14.658	0		
5,900.00	5,853.53	5,887.14	5,805.08	10.88	11.31	-42.93	313.52	292.15	21.37	14.673	0		
6,000.00	5,952.57	5,986.98	5,903.22	11.07	11.51	-42.94	319.24	297.50	21.74	14.687	0		
6,105.61	6,057.16	6,101.08	6,015.63	11.27	11.73	-43.07	324.20	302.06	22.14	14.642	0		
6,200.00	6,150.85	6,205.62	6,119.20	11.44	11.92	-43.37	326.74	304.24	22.50	14.524	0		
6,300.00	6,250.45	6,316.44	6,229.49	11.62	12.12	-43.60	328.68	305.83	22.85	14.382	0		
6,400.00	6,350.30	6,427.32	6,340.18	11.79	12.30	-43.74	329.85	306.66	23.19	14.222	0		
6,503.10	6,453.38	6,541.55	6,454.38	11.96	12.49	-179.58	330.23	306.27	23.96	13.784	0		
6,603.10	6,553.38	6,641.56	6,554.38	12.13	12.65	-179.58	330.23	305.94	24.29	13.596	0		
6,650.00	6,600.24	6,688.64	6,601.42	12.20	12.72	90.41	330.23	306.22	24.01	13.755	0		
6,700.00	6,649.91	6,738.82	6,651.25	12.27	12.79	90.39	330.23	306.07	24.16	13.669	0		
6,750.00	6,698.98	6,788.99	6,700.48	12.34	12.86	90.37	330.23	305.93	24.30	13.588	0		
6,800.00	6,747.16	6,839.15	6,748.77	12.41	12.92	90.35	330.23	305.79	24.44	13.513	0		
6,850.00	6,794.14	6,889.31	6,795.85	12.47	12.98	90.32	330.23	305.66	24.57	13.441	0		
6,900.00	6,839.64	6,939.45	6,841.41	12.54	13.04	90.30	330.23	305.53	24.69	13.373	0		
6,950.00	6,883.37	6,989.58	6,885.18	12.59	13.10	90.27	330.23	305.41	24.82	13.307	0		
7,000.00	6,925.07	7,039.69	6,926.88	12.65	13.16	90.24	330.23	305.29	24.94	13.242	0		
7,050.00	6,964.47	7,089.79	6,966.25	12.71	13.21	90.21	330.23	305.17	25.06	13.177	0		
7,100.00	7,001.34	7,139.88	7,003.06	12.77	13.27	90.18	330.23	305.04	25.19	13.112	0		
7,150.00	7,035.45	7,189.95	7,037.08	12.83	13.33	90.14	330.22	304.91	25.32	13.044	0		
7,200.00	7,066.59	7,240.01	7,068.10	12.90	13.39	90.11	330.22	304.77	25.46	12.972	0		
7,250.00	7,094.56	7,290.05	7,095.92	12.96	13.46	90.07	330.22	304.62	25.61	12.896	0		
7,300.00	7,119.20	7,340.08	7,120.39	13.03	13.52	90.04	330.22	304.46	25.77	12.815	0		
7,350.00	7,140.35	7,390.08	7,141.36	13.11	13.60	90.00	330.22	304.28	25.94	12.728	0		
7,353.21	7,141.58	7,393.29	7,142.58	13.11	13.60	90.00	330.22	304.09	26.13	12.637	0		
7,400.00	7,157.88	7,440.08	7,158.69	13.19	13.68	89.97	330.22	304.09	26.14	12.634	0		
7,450.00	7,171.68	7,490.05	7,172.29	13.28	13.77	89.93	330.22	303.88	26.35	12.534	0		
7,500.00	7,181.67	7,540.01	7,182.08	13.39	13.86	89.90	330.22	303.65	26.57	12.427	0		
7,550.00	7,187.79	7,589.96	7,187.99	13.50	13.97	89.86	330.22	303.41	26.82	12.313	0		
7,603.10	7,190.00	7,642.98	7,190.00	13.63	14.09	89.83	330.22	303.13	27.10	12.188	0		
7,663.45	7,190.00	7,703.34	7,190.00	13.80	14.24	89.83	330.22	302.64	27.58	11.972	0		
7,700.00	7,190.00	7,739.89	7,190.00	13.91	14.34	89.83	330.22	302.58	27.65	11.944	0		
7,800.00	7,190.00	7,839.89	7,190.00	14.22	14.63	89.83	330.22	301.95	28.27	11.680	0		
7,900.00	7,190.00	7,939.89	7,190.00	14.56	14.96	89.83	330.22	301.27	28.95	11.406	0		
8,000.00	7,190.00	8,039.89	7,190.00	14.93	15.31	89.83	330.22	300.54	29.68	11.125	0		
8,100.00	7,190.00	8,139.89	7,190.00	15.32	15.69	89.83	330.22	299.76	30.46	10.841	0		
8,200.00	7,190.00	8,239.89	7,190.00	15.73	16.09	89.83	330.22	298.94	31.28	10.556	0		
8,300.00	7,190.00	8,339.89	7,190.00	16.16	16.51	89.83	330.22	298.08	32.14	10.273	0		
8,400.00	7,190.00	8,439.89	7,190.00	16.61	16.95	89.83	330.22	297.18	33.04	9.993	0		
8,500.00	7,190.00	8,539.89	7,190.00	17.07	17.41	89.83	330.22	296.24	33.98	9.718	0		
8,600.00	7,190.00	8,639.89	7,190.00	17.55	17.89	89.83	330.22	295.28	34.95	9.450	0		
8,700.00	7,190.00	8,739.89	7,190.00	18.05	18.37	89.83	330.22	294.28	35.94	9.188	0		
8,800.00	7,190.00	8,839.89	7,190.00	18.56	18.88	89.83	330.22	293.26	36.96	8.934	0		
8,900.00	7,190.00	8,939.89	7,190.00	19.08	19.39	89.83	330.22	292.21	38.01	8.688	0		
9,000.00	7,190.00	9,039.89	7,190.00	19.61	19.92	89.83	330.22	291.14	39.08	8.450	0		
9,100.00	7,190.00	9,139.89	7,190.00	20.16	20.45	89.83	330.22	290.05	40.17	8.221	0		
9,200.00	7,190.00	9,239.89	7,190.00	20.71	21.00	89.83	330.22	288.94	41.28	8.000	0		
9,300.00	7,190.00	9,339.89	7,190.00	21.27	21.55	89.83	330.22	287.81	42.41	7.787	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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		
9,400.00	7,190.00	9,439.89	7,190.00	21.84	22.12	89.83	330.22	286.67	43.55	7.583	0			
9,500.00	7,190.00	9,539.89	7,190.00	22.42	22.69	89.83	330.22	285.51	44.71	7.386	0			
9,600.00	7,190.00	9,639.89	7,190.00	23.00	23.27	89.83	330.22	284.34	45.88	7.197	0			
9,700.00	7,190.00	9,739.89	7,190.00	23.59	23.85	89.83	330.22	283.15	47.07	7.016	0			
9,800.00	7,190.00	9,839.89	7,190.00	24.19	24.44	89.83	330.22	281.95	48.26	6.842	0			
9,900.00	7,190.00	9,939.89	7,190.00	24.79	25.04	89.83	330.22	280.74	49.47	6.675	0			
10,000.00	7,190.00	10,039.89	7,190.00	25.40	25.64	89.83	330.21	279.53	50.69	6.515	0			
10,100.00	7,190.00	10,139.89	7,190.00	26.01	26.25	89.83	330.21	278.30	51.92	6.360	0			
10,200.00	7,190.00	10,239.89	7,190.00	26.63	26.86	89.83	330.21	277.06	53.15	6.212	0			
10,300.00	7,190.00	10,339.89	7,190.00	27.25	27.48	89.83	330.21	275.81	54.40	6.070	0			
10,400.00	7,190.00	10,439.89	7,190.00	27.88	28.10	89.83	330.21	274.56	55.65	5.934	0			
10,500.00	7,190.00	10,539.89	7,190.00	28.51	28.73	89.83	330.21	273.30	56.91	5.802	0			
10,600.00	7,190.00	10,639.89	7,190.00	29.14	29.35	89.83	330.21	272.03	58.18	5.676	0			
10,700.00	7,190.00	10,739.89	7,190.00	29.77	29.99	89.83	330.21	270.76	59.45	5.554	0			
10,800.00	7,190.00	10,839.89	7,190.00	30.41	30.62	89.83	330.21	269.48	60.73	5.437	0			
10,900.00	7,190.00	10,939.89	7,190.00	31.05	31.26	89.83	330.21	268.19	62.02	5.325	0			
11,000.00	7,190.00	11,039.89	7,190.00	31.70	31.90	89.83	330.20	266.90	63.31	5.216	0			
11,100.00	7,190.00	11,139.89	7,190.00	32.34	32.54	89.83	330.20	265.60	64.60	5.111	0			
11,200.00	7,190.00	11,239.89	7,190.00	32.99	33.19	89.83	330.20	264.30	65.90	5.011	0			
11,300.00	7,190.00	11,339.89	7,190.00	33.64	33.83	89.83	330.20	263.00	67.20	4.913	0			
11,400.00	7,190.00	11,439.89	7,190.00	34.30	34.48	89.83	330.20	261.69	68.51	4.820	0			
11,500.00	7,190.00	11,539.89	7,190.00	34.95	35.14	89.83	330.20	260.37	69.82	4.729	0			
11,600.00	7,190.00	11,639.89	7,190.00	35.61	35.79	89.83	330.20	259.06	71.14	4.642	0			
11,700.00	7,190.00	11,739.89	7,190.00	36.27	36.44	89.83	330.19	257.74	72.46	4.557	0			
11,800.00	7,190.00	11,839.89	7,190.00	36.93	37.10	89.83	330.19	256.41	73.78	4.475	0			
11,900.00	7,190.00	11,939.89	7,190.00	37.59	37.76	89.83	330.19	255.09	75.10	4.396	0			
12,000.00	7,190.00	12,039.89	7,190.00	38.25	38.42	89.83	330.19	253.76	76.43	4.320	0			
12,100.00	7,190.00	12,139.89	7,190.00	38.91	39.08	89.83	330.19	252.43	77.76	4.246	0			
12,200.00	7,190.00	12,239.89	7,190.00	39.58	39.75	89.83	330.19	251.09	79.10	4.175	0			
12,300.00	7,190.00	12,339.89	7,190.00	40.25	40.41	89.83	330.18	249.75	80.43	4.105	0			
12,400.00	7,190.00	12,439.89	7,190.00	40.92	41.08	89.83	330.18	248.41	81.77	4.038	0			
12,500.00	7,190.00	12,539.89	7,190.00	41.59	41.75	89.83	330.18	247.07	83.11	3.973	0			
12,600.00	7,190.00	12,639.89	7,190.00	42.26	42.42	89.83	330.18	245.73	84.45	3.910	0			
12,700.00	7,190.00	12,739.89	7,190.00	42.93	43.08	89.83	330.18	244.38	85.80	3.848	0			
12,800.00	7,190.00	12,839.89	7,190.00	43.60	43.76	89.83	330.18	243.03	87.15	3.789	0			
12,900.00	7,190.00	12,939.89	7,190.00	44.28	44.43	89.83	330.17	241.68	88.49	3.731	0			
13,000.00	7,190.00	13,039.89	7,190.00	44.95	45.10	89.83	330.17	240.33	89.84	3.675	0			
13,100.00	7,190.00	13,139.89	7,190.00	45.63	45.77	89.83	330.17	238.97	91.20	3.620	0			
13,200.00	7,190.00	13,239.89	7,190.00	46.30	46.45	89.83	330.17	237.62	92.55	3.567	0			
13,300.00	7,190.00	13,339.89	7,190.00	46.98	47.12	89.83	330.17	236.26	93.91	3.516	0			
13,400.00	7,190.00	13,439.89	7,190.00	47.66	47.80	89.83	330.16	234.90	95.26	3.466	0			
13,500.00	7,190.00	13,539.89	7,190.00	48.34	48.48	89.83	330.16	233.54	96.62	3.417	0			
13,600.00	7,190.00	13,639.89	7,190.00	49.01	49.15	89.83	330.16	232.18	97.98	3.370	0			
13,700.00	7,190.00	13,739.89	7,190.00	49.69	49.83	89.83	330.16	230.82	99.34	3.323	0			
13,800.00	7,190.00	13,839.89	7,190.00	50.38	50.51	89.83	330.15	229.45	100.70	3.278	0			
13,900.00	7,190.00	13,939.89	7,190.00	51.06	51.19	89.83	330.15	228.08	102.07	3.235	0			
14,000.00	7,190.00	14,039.89	7,190.00	51.74	51.87	89.83	330.15	226.72	103.43	3.192	0			
14,100.00	7,190.00	14,139.90	7,190.00	52.42	52.55	89.83	330.15	225.35	104.80	3.150	0			
14,200.00	7,190.00	14,239.90	7,190.00	53.10	53.24	89.83	330.15	223.98	106.17	3.110	0			
14,300.00	7,190.00	14,339.90	7,190.00	53.79	53.92	89.83	330.14	222.61	107.53	3.070	0			
14,400.00	7,190.00	14,439.90	7,190.00	54.47	54.60	89.83	330.14	221.24	108.90	3.032	0			
14,500.00	7,190.00	14,539.90	7,190.00	55.16	55.28	89.83	330.14	219.87	110.27	2.994	0			
14,600.00	7,190.00	14,639.90	7,190.00	55.84	55.97	89.83	330.14	218.49	111.64	2.957	0			
14,700.00	7,190.00	14,739.90	7,190.00	56.53	56.65	89.83	330.13	217.12	113.01	2.921	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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 11 - 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				
14,800.00	7,190.00	14,839.90	7,190.00	57.21	57.34	89.83	330.13	215.74	114.39	2.886	0					
14,900.00	7,190.00	14,939.90	7,190.00	57.90	58.02	89.83	330.13	214.37	115.76	2.852	0					
15,000.00	7,190.00	15,039.90	7,190.00	58.59	58.71	89.83	330.12	212.99	117.13	2.818	0					
15,100.00	7,190.00	15,139.90	7,190.00	59.27	59.39	89.83	330.12	211.61	118.51	2.786	0					
15,200.00	7,190.00	15,239.90	7,190.00	59.96	60.08	89.83	330.12	210.23	119.89	2.754	0					
15,300.00	7,190.00	15,339.90	7,190.00	60.65	60.77	89.83	330.12	208.85	121.26	2.722	0					
15,400.00	7,190.00	15,439.90	7,190.00	61.34	61.45	89.83	330.11	207.48	122.64	2.692	0					
15,500.00	7,190.00	15,539.90	7,190.00	62.02	62.14	89.83	330.11	206.09	124.02	2.662	0					
15,600.00	7,190.00	15,639.90	7,190.00	62.71	62.83	89.83	330.11	204.71	125.39	2.633	0					
15,700.00	7,190.00	15,739.90	7,190.00	63.40	63.52	89.83	330.11	203.33	126.77	2.604	0					
15,800.00	7,190.00	15,839.90	7,190.00	64.09	64.21	89.83	330.10	201.95	128.15	2.576	0					
15,900.00	7,190.00	15,939.90	7,190.00	64.78	64.89	89.83	330.10	200.56	129.53	2.548	0					
16,000.00	7,190.00	16,039.90	7,190.00	65.47	65.58	89.83	330.10	199.18	130.91	2.521	0					
16,100.00	7,190.00	16,139.90	7,190.00	66.16	66.27	89.83	330.09	197.80	132.30	2.495	0					
16,200.00	7,190.00	16,239.90	7,190.00	66.85	66.96	89.83	330.09	196.41	133.68	2.469	0					
16,300.00	7,190.00	16,339.90	7,190.00	67.54	67.65	89.83	330.09	195.03	135.06	2.444	0					
16,400.00	7,190.00	16,439.90	7,190.00	68.24	68.34	89.83	330.08	193.64	136.44	2.419	0					
16,500.00	7,190.00	16,539.90	7,190.00	68.93	69.03	89.83	330.08	192.25	137.83	2.395	0					
16,600.00	7,190.00	16,639.90	7,190.00	69.62	69.72	89.83	330.08	190.87	139.21	2.371	0					
16,700.00	7,190.00	16,739.90	7,190.00	70.31	70.42	89.83	330.07	189.48	140.60	2.348	0					
16,800.00	7,190.00	16,839.90	7,190.00	71.00	71.11	89.83	330.07	188.09	141.98	2.325	0					
16,900.00	7,190.00	16,939.90	7,190.00	71.70	71.80	89.83	330.07	186.70	143.37	2.302	0					
17,000.00	7,190.00	17,039.90	7,190.00	72.39	72.49	89.83	330.06	185.31	144.75	2.280	0					
17,100.00	7,190.00	17,139.90	7,190.00	73.08	73.18	89.83	330.06	183.92	146.14	2.259	0					
17,200.00	7,190.00	17,239.90	7,190.00	73.77	73.88	89.83	330.06	182.53	147.52	2.237	0					
17,218.68	7,190.00	17,258.58	7,190.00	73.90	74.00	89.83	330.06	182.13	147.93	2.231	0					
17,254.82	7,190.00	17,294.72	7,190.00	74.15	74.25	89.83	330.06	181.77	148.28	2.226	0	SF				



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	2.00	2.00	0.00	0.00	-179.88	56.11						
100.00	100.00	102.00	102.00	0.15	0.15	-179.88	56.11	55.81	0.30	189.100	0		
200.00	200.00	202.00	202.00	0.32	0.32	-179.88	56.11	55.46	0.65	86.884	0		
300.00	300.00	302.00	302.00	0.50	0.50	-179.88	56.11	55.11	0.99	56.398	0		
400.00	400.00	402.00	402.00	0.67	0.67	-179.88	56.11	54.76	1.34	41.749	0		
500.00	500.00	502.00	502.00	0.84	0.85	-179.88	56.11	54.41	1.69	33.141	0		
565.99	565.99	567.99	567.99	0.96	0.96	-179.88	56.11	54.18	1.92	29.172	0		
600.00	600.00	601.97	601.97	1.02	1.02	-179.88	56.11	54.07	2.04	27.477	0		CC
700.00	700.00	700.00	699.98	1.19	1.19	-179.06	57.69	55.30	2.39	24.158	0		ES
800.00	800.00	798.25	798.09	1.37	1.37	-176.92	62.37	59.63	2.74	22.798	0		
900.00	899.98	895.96	895.43	1.54	1.54	-39.01	68.91	65.83	3.08	22.377	0		
1,000.00	999.84	993.42	992.19	1.72	1.72	-37.90	75.94	72.51	3.43	22.171	0		
1,100.00	1,099.45	1,090.64	1,088.24	1.90	1.89	-37.56	83.37	79.60	3.77	22.109	0		
1,197.49	1,196.22	1,186.20	1,182.16	2.07	2.07	-37.84	90.78	86.67	4.11	22.082	0		
1,200.00	1,198.70	1,188.70	1,184.62	2.07	2.08	-37.86	90.95	86.83	4.12	22.075	0		
1,300.00	1,297.74	1,288.46	1,282.54	2.26	2.27	-38.67	97.81	93.33	4.48	21.836	0		
1,400.00	1,396.78	1,388.21	1,380.47	2.44	2.46	-39.37	104.70	99.86	4.84	21.628	0		
1,500.00	1,495.82	1,487.97	1,478.39	2.62	2.65	-39.98	111.59	106.39	5.20	21.446	0		
1,600.00	1,594.86	1,587.72	1,576.32	2.80	2.85	-40.52	118.50	112.93	5.57	21.287	0		
1,700.00	1,693.90	1,687.48	1,674.24	2.99	3.04	-41.01	125.42	119.49	5.93	21.145	0		
1,800.00	1,792.94	1,787.23	1,772.17	3.17	3.24	-41.44	132.34	126.05	6.30	21.019	0		
1,900.00	1,891.97	1,886.99	1,870.09	3.36	3.43	-41.83	139.27	132.61	6.66	20.906	0		
2,000.00	1,991.01	1,986.74	1,968.01	3.55	3.63	-42.18	146.21	139.18	7.03	20.804	0		
2,100.00	2,090.05	2,086.50	2,065.94	3.73	3.83	-42.50	153.15	145.76	7.39	20.711	0		
2,200.00	2,189.09	2,186.25	2,163.86	3.92	4.03	-42.79	160.10	152.34	7.76	20.627	0		
2,300.00	2,288.13	2,286.01	2,261.79	4.11	4.22	-43.06	167.05	158.92	8.13	20.549	0		
2,400.00	2,387.17	2,385.76	2,359.71	4.29	4.42	-43.30	174.00	165.51	8.50	20.478	0		
2,500.00	2,486.21	2,485.52	2,457.64	4.48	4.62	-43.53	180.96	172.10	8.86	20.413	0		
2,600.00	2,585.25	2,585.28	2,555.56	4.67	4.82	-43.74	187.92	178.69	9.23	20.352	0		
2,700.00	2,684.29	2,685.03	2,653.49	4.85	5.02	-43.94	194.88	185.28	9.60	20.296	0		
2,800.00	2,783.33	2,784.79	2,751.41	5.04	5.22	-44.12	201.85	191.87	9.97	20.244	0		
2,900.00	2,882.36	2,884.54	2,849.33	5.23	5.41	-44.29	208.81	198.47	10.34	20.196	0		
3,000.00	2,981.40	2,984.30	2,947.26	5.42	5.61	-44.45	215.78	205.07	10.71	20.150	0		
3,100.00	3,080.44	3,084.05	3,045.18	5.60	5.81	-44.60	222.75	211.67	11.08	20.107	0		
3,200.00	3,179.48	3,183.81	3,143.11	5.79	6.01	-44.74	229.72	218.27	11.45	20.068	0		
3,300.00	3,278.52	3,283.56	3,241.03	5.98	6.21	-44.87	236.69	224.87	11.82	20.030	0		
3,400.00	3,377.56	3,383.32	3,338.96	6.17	6.41	-44.99	243.66	231.48	12.19	19.995	0		
3,500.00	3,476.60	3,483.07	3,436.88	6.36	6.61	-45.11	250.64	238.08	12.56	19.961	0		
3,600.00	3,575.64	3,582.83	3,534.81	6.55	6.81	-45.22	257.61	244.68	12.93	19.930	0		
3,700.00	3,674.68	3,682.58	3,632.73	6.73	7.01	-45.33	264.59	251.29	13.30	19.900	0		
3,800.00	3,773.71	3,782.34	3,730.65	6.92	7.21	-45.43	271.56	257.90	13.67	19.871	0		
3,900.00	3,872.75	3,882.09	3,828.58	7.11	7.41	-45.52	278.54	264.50	14.04	19.844	0		
4,000.00	3,971.79	3,981.85	3,926.50	7.30	7.61	-45.61	285.52	271.11	14.41	19.819	0		
4,100.00	4,070.83	4,081.60	4,024.43	7.49	7.81	-45.70	292.50	277.72	14.78	19.794	0		
4,200.00	4,169.87	4,181.36	4,122.35	7.67	8.01	-45.78	299.48	284.33	15.15	19.771	0		
4,300.00	4,268.91	4,281.11	4,220.28	7.86	8.21	-45.86	306.46	290.94	15.52	19.749	0		
4,400.00	4,367.95	4,380.87	4,318.20	8.05	8.41	-45.93	313.44	297.55	15.89	19.728	0		
4,500.00	4,466.99	4,480.63	4,416.13	8.24	8.61	-46.00	320.42	304.16	16.26	19.708	0		
4,600.00	4,566.03	4,580.38	4,514.05	8.43	8.81	-46.07	327.40	310.77	16.63	19.688	0		
4,700.00	4,665.07	4,680.14	4,611.97	8.62	9.01	-46.14	334.38	317.38	17.00	19.670	0		
4,800.00	4,764.10	4,779.89	4,709.90	8.81	9.21	-46.20	341.36	323.99	17.37	19.652	0		
4,900.00	4,863.14	4,879.65	4,807.82	8.99	9.41	-46.26	348.35	330.61	17.74	19.635	0		
5,000.00	4,962.18	4,979.40	4,905.75	9.18	9.61	-46.32	355.33	337.22	18.11	19.619	0		
5,100.00	5,061.22	5,079.16	5,003.67	9.37	9.81	-46.37	362.31	343.83	18.48	19.603	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	5,160.26	5,178.91	5,101.60	9.56	10.01	-46.43	369.30	350.44	18.85	19.588	0				
5,300.00	5,259.30	5,278.67	5,199.52	9.75	10.21	-46.48	376.28	357.06	19.22	19.573	0				
5,400.00	5,358.34	5,378.42	5,297.45	9.94	10.41	-46.53	383.27	363.67	19.60	19.559	0				
5,500.00	5,457.38	5,478.18	5,395.37	10.13	10.61	-46.58	390.25	370.28	19.97	19.546	0				
5,600.00	5,556.42	5,577.93	5,493.29	10.32	10.81	-46.62	397.24	376.90	20.34	19.533	0				
5,700.00	5,655.45	5,677.69	5,591.22	10.50	11.01	-46.67	404.22	383.51	20.71	19.520	0				
5,800.00	5,754.49	5,777.44	5,689.14	10.69	11.21	-46.71	411.21	390.13	21.08	19.508	0				
5,900.00	5,853.53	5,877.20	5,787.07	10.88	11.41	-46.75	418.19	396.74	21.45	19.496	0				
6,000.00	5,952.57	5,976.95	5,884.99	11.07	11.61	-46.79	425.18	403.36	21.82	19.485	0				
6,105.61	6,057.16	6,082.30	5,988.41	11.27	11.82	-46.83	432.56	410.34	22.21	19.473	0				
6,200.00	6,150.85	6,176.38	6,080.75	11.44	12.01	-46.83	440.21	417.66	22.55	19.524	0				
6,300.00	6,250.45	6,275.77	6,178.32	11.62	12.21	-46.55	450.65	427.76	22.88	19.695	0				
6,400.00	6,350.30	6,381.17	6,281.86	11.79	12.42	-45.99	463.24	440.04	23.20	19.964	0				
6,503.10	6,453.38	6,500.32	6,399.57	11.96	12.65	178.97	475.85	451.76	24.09	19.751	0				
6,603.10	6,553.38	6,616.86	6,515.34	12.13	12.85	179.73	485.85	461.36	24.49	19.841	0				
6,650.00	6,600.24	6,671.73	6,570.01	12.20	12.95	89.91	489.32	465.27	24.06	20.341	0				
6,700.00	6,649.91	6,729.98	6,628.15	12.27	13.05	90.62	492.22	468.00	24.22	20.325	0				
6,750.00	6,698.98	6,787.71	6,685.82	12.34	13.14	91.83	494.44	470.08	24.36	20.295	0				
6,800.00	6,747.16	6,844.65	6,742.74	12.41	13.23	93.49	496.21	471.72	24.49	20.260	0				
6,850.00	6,794.14	6,898.05	6,796.14	12.47	13.31	95.44	497.89	473.28	24.60	20.236	0				
6,900.00	6,839.64	6,943.55	6,841.64	12.54	13.39	97.36	500.43	475.73	24.70	20.259	0				
6,950.00	6,883.37	6,987.63	6,885.72	12.59	13.46	99.42	504.47	479.68	24.79	20.354	0				
7,000.00	6,925.07	7,039.35	6,937.38	12.65	13.53	101.90	509.98	485.13	24.85	20.526	0				
7,050.00	6,964.47	7,093.87	6,991.43	12.71	13.61	104.36	516.65	491.77	24.88	20.762	0				
7,100.00	7,001.34	7,151.61	7,047.81	12.77	13.69	106.79	524.35	499.45	24.89	21.064	0				
7,150.00	7,035.45	7,213.04	7,106.30	12.83	13.76	109.19	532.87	508.01	24.87	21.430	0				
7,200.00	7,066.59	7,278.66	7,166.48	12.90	13.84	111.55	541.99	517.19	24.80	21.857	0				
7,250.00	7,094.56	7,349.02	7,227.64	12.96	13.92	113.83	551.41	526.72	24.69	22.336	0				
7,300.00	7,119.20	7,424.59	7,288.63	13.03	14.01	116.02	560.78	536.25	24.53	22.859	0				
7,350.00	7,140.35	7,505.76	7,347.77	13.11	14.10	118.06	569.74	545.39	24.35	23.398	0				
7,400.00	7,157.88	7,592.69	7,402.73	13.19	14.21	119.88	577.85	553.70	24.16	23.922	0				
7,450.00	7,171.68	7,685.19	7,450.57	13.28	14.33	121.42	584.71	560.73	23.98	24.384	0				
7,500.00	7,181.67	7,782.56	7,487.99	13.39	14.48	122.58	589.89	566.03	23.86	24.725	0				
7,550.00	7,187.79	7,883.56	7,511.89	13.50	14.66	123.30	593.08	569.24	23.84	24.881	0				
7,603.10	7,190.00	7,988.94	7,520.00	13.63	14.89	123.51	594.04	570.08	23.96	24.795	0				
7,700.00	7,190.00	8,085.85	7,520.00	13.91	15.12	123.51	594.04	569.54	24.50	24.246	0				
7,800.00	7,190.00	8,185.85	7,520.00	14.22	15.41	123.52	594.04	568.93	25.11	23.662	0				
7,900.00	7,190.00	8,285.85	7,520.00	14.56	15.72	123.52	594.03	568.28	25.75	23.066	0				
8,000.00	7,190.00	8,385.85	7,520.00	14.93	16.06	123.52	594.03	567.59	26.44	22.464	0				
8,100.00	7,190.00	8,485.85	7,520.00	15.32	16.42	123.52	594.03	566.86	27.17	21.863	0				
8,200.00	7,190.00	8,585.85	7,520.00	15.73	16.81	123.52	594.03	566.10	27.93	21.267	0				
8,300.00	7,190.00	8,685.85	7,520.00	16.16	17.22	123.52	594.03	565.31	28.73	20.679	0				
8,400.00	7,190.00	8,785.85	7,520.00	16.61	17.65	123.52	594.03	564.48	29.55	20.103	0				
8,500.00	7,190.00	8,885.85	7,520.00	17.07	18.09	123.52	594.03	563.63	30.40	19.541	0				
8,600.00	7,190.00	8,985.85	7,520.00	17.55	18.56	123.52	594.03	562.76	31.27	18.994	0				
8,700.00	7,190.00	9,085.85	7,520.00	18.05	19.03	123.52	594.03	561.86	32.17	18.464	0				
8,800.00	7,190.00	9,185.85	7,520.00	18.56	19.52	123.52	594.03	560.94	33.09	17.952	0				
8,900.00	7,190.00	9,285.85	7,520.00	19.08	20.03	123.52	594.03	560.00	34.03	17.457	0				
9,000.00	7,190.00	9,385.85	7,520.00	19.61	20.54	123.52	594.03	559.05	34.98	16.981	0				
9,100.00	7,190.00	9,485.85	7,520.00	20.16	21.07	123.52	594.03	558.07	35.95	16.522	0				
9,200.00	7,190.00	9,585.85	7,520.00	20.71	21.60	123.52	594.03	557.09	36.94	16.080	0				
9,300.00	7,190.00	9,685.85	7,520.00	21.27	22.15	123.52	594.03	556.09	37.94	15.656	0				
9,400.00	7,190.00	9,785.85	7,520.00	21.84	22.70	123.52	594.03	555.07	38.95	15.249	0				
9,500.00	7,190.00	9,885.85	7,520.00	22.42	23.27	123.52	594.03	554.05	39.98	14.858	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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		
9,600.00	7,190.00	9,985.85	7,520.00	23.00	23.83	123.52	594.03	553.01	41.02	14.483	0		
9,700.00	7,190.00	10,085.85	7,520.00	23.59	24.41	123.52	594.03	551.96	42.06	14.123	0		
9,800.00	7,190.00	10,185.85	7,520.00	24.19	24.99	123.52	594.03	550.91	43.12	13.777	0		
9,900.00	7,190.00	10,285.85	7,520.00	24.79	25.58	123.52	594.02	549.84	44.18	13.445	0		
10,000.00	7,190.00	10,385.85	7,520.00	25.40	26.18	123.52	594.02	548.77	45.25	13.127	0		
10,100.00	7,190.00	10,485.85	7,520.00	26.01	26.78	123.52	594.02	547.69	46.33	12.821	0		
10,200.00	7,190.00	10,585.85	7,520.00	26.63	27.38	123.52	594.02	546.60	47.42	12.527	0		
10,300.00	7,190.00	10,685.85	7,520.00	27.25	27.99	123.52	594.02	545.51	48.51	12.245	0		
10,400.00	7,190.00	10,785.85	7,520.00	27.88	28.61	123.52	594.02	544.41	49.61	11.974	0		
10,500.00	7,190.00	10,885.85	7,520.00	28.51	29.22	123.52	594.02	543.31	50.72	11.713	0		
10,600.00	7,190.00	10,985.85	7,520.00	29.14	29.84	123.52	594.02	542.20	51.83	11.462	0		
10,700.00	7,190.00	11,085.85	7,520.00	29.77	30.47	123.52	594.02	541.08	52.94	11.221	0		
10,800.00	7,190.00	11,185.85	7,520.00	30.41	31.10	123.52	594.02	539.96	54.06	10.988	0		
10,900.00	7,190.00	11,285.85	7,520.00	31.05	31.73	123.52	594.02	538.84	55.18	10.764	0		
11,000.00	7,190.00	11,385.85	7,520.00	31.70	32.36	123.52	594.02	537.71	56.31	10.549	0		
11,100.00	7,190.00	11,485.85	7,520.00	32.34	33.00	123.52	594.02	536.57	57.44	10.341	0		
11,200.00	7,190.00	11,585.85	7,520.00	32.99	33.64	123.52	594.02	535.44	58.58	10.140	0		
11,300.00	7,190.00	11,685.85	7,520.00	33.64	34.28	123.52	594.02	534.30	59.72	9.947	0		
11,400.00	7,190.00	11,785.85	7,520.00	34.30	34.93	123.52	594.02	533.15	60.86	9.760	0		
11,500.00	7,190.00	11,885.85	7,520.00	34.95	35.58	123.52	594.02	532.01	62.01	9.580	0		
11,600.00	7,190.00	11,985.85	7,520.00	35.61	36.22	123.52	594.02	530.86	63.16	9.405	0		
11,700.00	7,190.00	12,085.85	7,520.00	36.27	36.88	123.52	594.02	529.71	64.31	9.237	0		
11,800.00	7,190.00	12,185.85	7,520.00	36.93	37.53	123.52	594.01	528.55	65.46	9.074	0		
11,900.00	7,190.00	12,285.85	7,520.00	37.59	38.18	123.52	594.01	527.40	66.62	8.917	0		
12,000.00	7,190.00	12,385.85	7,520.00	38.25	38.84	123.52	594.01	526.24	67.78	8.764	0		
12,100.00	7,190.00	12,485.85	7,520.00	38.91	39.50	123.52	594.01	525.07	68.94	8.616	0		
12,200.00	7,190.00	12,585.85	7,520.00	39.58	40.16	123.52	594.01	523.91	70.10	8.473	0		
12,300.00	7,190.00	12,685.85	7,520.00	40.25	40.82	123.52	594.01	522.74	71.27	8.335	0		
12,400.00	7,190.00	12,785.85	7,520.00	40.92	41.48	123.52	594.01	521.58	72.43	8.201	0		
12,500.00	7,190.00	12,885.85	7,520.00	41.59	42.15	123.52	594.01	520.41	73.60	8.070	0		
12,600.00	7,190.00	12,985.85	7,520.00	42.26	42.81	123.52	594.01	519.24	74.77	7.944	0		
12,700.00	7,190.00	13,085.85	7,520.00	42.93	43.48	123.52	594.01	518.06	75.95	7.821	0		
12,800.00	7,190.00	13,185.85	7,520.00	43.60	44.14	123.52	594.01	516.89	77.12	7.702	0		
12,900.00	7,190.00	13,285.85	7,520.00	44.28	44.81	123.52	594.01	515.71	78.30	7.587	0		
13,000.00	7,190.00	13,385.85	7,520.00	44.95	45.48	123.52	594.01	514.54	79.47	7.474	0		
13,100.00	7,190.00	13,485.85	7,520.00	45.63	46.15	123.52	594.01	513.36	80.65	7.365	0		
13,200.00	7,190.00	13,585.85	7,520.00	46.30	46.82	123.52	594.01	512.18	81.83	7.259	0		
13,300.00	7,190.00	13,685.85	7,520.00	46.98	47.50	123.52	594.01	510.99	83.01	7.156	0		
13,400.00	7,190.00	13,785.85	7,520.00	47.66	48.17	123.52	594.01	509.81	84.19	7.055	0		
13,500.00	7,190.00	13,885.85	7,520.00	48.34	48.84	123.52	594.01	508.63	85.38	6.957	0		
13,600.00	7,190.00	13,985.85	7,520.00	49.01	49.52	123.52	594.01	507.44	86.56	6.862	0		
13,700.00	7,190.00	14,085.85	7,520.00	49.69	50.20	123.52	594.01	506.26	87.75	6.769	0		
13,800.00	7,190.00	14,185.85	7,520.00	50.38	50.87	123.52	594.00	505.07	88.93	6.679	0		
13,900.00	7,190.00	14,285.85	7,520.00	51.06	51.55	123.52	594.00	503.88	90.12	6.591	0		
14,000.00	7,190.00	14,385.85	7,520.00	51.74	52.23	123.52	594.00	502.69	91.31	6.505	0		
14,100.00	7,190.00	14,485.85	7,520.00	52.42	52.91	123.52	594.00	501.50	92.50	6.422	0		
14,200.00	7,190.00	14,585.85	7,520.00	53.10	53.58	123.52	594.00	500.31	93.69	6.340	0		
14,300.00	7,190.00	14,685.85	7,520.00	53.79	54.26	123.52	594.00	499.12	94.88	6.260	0		
14,400.00	7,190.00	14,785.85	7,520.00	54.47	54.95	123.52	594.00	497.93	96.07	6.183	0		
14,500.00	7,190.00	14,885.85	7,520.00	55.16	55.63	123.52	594.00	496.74	97.27	6.107	0		
14,600.00	7,190.00	14,985.85	7,520.00	55.84	56.31	123.52	594.00	495.54	98.46	6.033	0		
14,700.00	7,190.00	15,085.85	7,520.00	56.53	56.99	123.52	594.00	494.35	99.65	5.961	0		
14,800.00	7,190.00	15,185.85	7,520.00	57.21	57.67	123.52	594.00	493.15	100.85	5.890	0		
14,900.00	7,190.00	15,285.85	7,520.00	57.90	58.36	123.52	594.00	491.96	102.04	5.821	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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					
15,000.00	7,190.00	15,385.85	7,520.00	58.59	59.04	123.52	594.00	490.76	103.24	5.754	0						
15,100.00	7,190.00	15,485.85	7,520.00	59.27	59.72	123.52	594.00	489.56	104.44	5.688	0						
15,200.00	7,190.00	15,585.85	7,520.00	59.96	60.41	123.52	594.00	488.36	105.63	5.623	0						
15,300.00	7,190.00	15,685.85	7,520.00	60.65	61.09	123.52	594.00	487.16	106.83	5.560	0						
15,400.00	7,190.00	15,785.85	7,520.00	61.34	61.78	123.52	594.00	485.97	108.03	5.498	0						
15,500.00	7,190.00	15,885.85	7,520.00	62.02	62.46	123.52	594.00	484.77	109.23	5.438	0						
15,600.00	7,190.00	15,985.85	7,520.00	62.71	63.15	123.52	594.00	483.57	110.43	5.379	0						
15,700.00	7,190.00	16,085.85	7,520.00	63.40	63.84	123.52	593.99	482.36	111.63	5.321	0						
15,800.00	7,190.00	16,185.85	7,520.00	64.09	64.52	123.52	593.99	481.16	112.83	5.264	0						
15,900.00	7,190.00	16,285.85	7,520.00	64.78	65.21	123.52	593.99	479.96	114.03	5.209	0						
16,000.00	7,190.00	16,385.85	7,520.00	65.47	65.90	123.52	593.99	478.76	115.23	5.155	0						
16,100.00	7,190.00	16,485.85	7,520.00	66.16	66.59	123.52	593.99	477.56	116.44	5.101	0						
16,200.00	7,190.00	16,585.85	7,520.00	66.85	67.28	123.52	593.99	476.35	117.64	5.049	0						
16,300.00	7,190.00	16,685.85	7,520.00	67.54	67.96	123.52	593.99	475.15	118.84	4.998	0						
16,400.00	7,190.00	16,785.85	7,520.00	68.24	68.65	123.52	593.99	473.95	120.04	4.948	0						
16,500.00	7,190.00	16,885.85	7,520.00	68.93	69.34	123.52	593.99	472.74	121.25	4.899	0						
16,600.00	7,190.00	16,985.85	7,520.00	69.62	70.03	123.52	593.99	471.54	122.45	4.851	0						
16,700.00	7,190.00	17,085.85	7,520.00	70.31	70.72	123.52	593.99	470.33	123.66	4.804	0						
16,800.00	7,190.00	17,185.85	7,520.00	71.00	71.41	123.52	593.99	469.13	124.86	4.757	0						
16,900.00	7,190.00	17,285.85	7,520.00	71.70	72.10	123.52	593.99	467.92	126.07	4.712	0						
17,000.00	7,190.00	17,385.85	7,520.00	72.39	72.79	123.52	593.99	466.71	127.27	4.667	0						
17,100.00	7,190.00	17,485.85	7,520.00	73.08	73.48	123.52	593.99	465.51	128.48	4.623	0						
17,200.00	7,190.00	17,585.85	7,520.00	73.77	74.17	123.52	593.99	464.30	129.69	4.580	0						
17,254.82	7,190.00	17,642.14	7,520.00	74.15	74.56	123.52	593.89	463.54	130.35	4.556	0	SF					



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	-0.02	223.73						CC, ES	
100.00	100.00	96.00	96.00	0.15	0.14	-0.02	223.69	223.40	0.29	778.457	0			
200.00	200.00	196.00	196.00	0.32	0.31	-0.02	223.69	223.06	0.64	352.102	0			
300.00	300.00	296.00	296.00	0.50	0.49	-0.02	223.69	222.71	0.98	227.243	0			
400.00	400.00	396.00	396.00	0.67	0.66	-0.02	223.69	222.36	1.33	167.756	0			
500.00	500.00	496.00	496.00	0.84	0.84	-0.02	223.69	222.01	1.68	132.952	0			
600.00	600.00	596.00	596.00	1.02	1.01	-0.02	223.69	221.66	2.03	110.108	0			
700.00	700.00	689.83	689.82	1.19	1.18	-0.19	225.01	222.64	2.37	94.941	0			
800.00	800.00	783.22	783.10	1.37	1.34	-0.73	229.19	226.49	2.71	84.636	0			
900.00	899.98	876.16	875.73	1.54	1.50	134.37	237.49	234.45	3.05	77.976	0			
1,000.00	999.84	968.25	967.24	1.72	1.67	133.86	251.08	247.70	3.38	74.263	0			
1,100.00	1,099.45	1,059.13	1,057.17	1.90	1.84	133.52	269.86	266.14	3.71	72.671	0			
1,197.49	1,196.22	1,146.21	1,142.91	2.07	2.00	133.32	293.06	289.02	4.03	72.653	0			
1,200.00	1,198.70	1,149.44	1,146.08	2.07	2.00	133.33	293.72	289.67	4.04	72.633	0			
1,300.00	1,297.74	1,244.81	1,239.69	2.26	2.19	133.56	320.05	315.66	4.39	72.872	0			
1,400.00	1,396.78	1,341.27	1,334.39	2.44	2.37	133.76	346.38	341.64	4.74	73.029	0			
1,500.00	1,495.82	1,437.73	1,429.08	2.62	2.56	133.93	372.73	367.63	5.10	73.149	0			
1,600.00	1,594.86	1,534.19	1,523.78	2.80	2.74	134.08	399.07	393.62	5.45	73.242	0			
1,700.00	1,693.90	1,630.66	1,618.47	2.99	2.93	134.21	425.41	419.61	5.80	73.315	0			
1,800.00	1,792.94	1,727.12	1,713.17	3.17	3.12	134.33	451.76	445.60	6.16	73.373	0			
1,900.00	1,891.97	1,823.58	1,807.86	3.36	3.31	134.43	478.11	471.60	6.51	73.420	0			
2,000.00	1,991.01	1,920.05	1,902.55	3.55	3.50	134.52	504.46	497.59	6.87	73.457	0			
2,100.00	2,090.05	2,016.51	1,997.25	3.73	3.69	134.60	530.81	523.59	7.22	73.487	0			
2,200.00	2,189.09	2,112.97	2,091.94	3.92	3.88	134.68	557.16	549.58	7.58	73.511	0			
2,300.00	2,288.13	2,209.44	2,186.64	4.11	4.07	134.74	583.51	575.58	7.94	73.531	0			
2,400.00	2,387.17	2,305.90	2,281.33	4.29	4.26	134.81	609.87	601.57	8.29	73.547	0			
2,500.00	2,486.21	2,402.36	2,376.03	4.48	4.45	134.86	636.22	627.57	8.65	73.560	0			
2,600.00	2,585.25	2,498.82	2,470.72	4.67	4.65	134.92	662.58	653.57	9.01	73.570	0			
2,700.00	2,684.29	2,595.29	2,565.42	4.85	4.84	134.96	688.93	679.57	9.36	73.579	0			
2,800.00	2,783.33	2,691.75	2,660.11	5.04	5.03	135.01	715.29	705.57	9.72	73.586	0			
2,900.00	2,882.36	2,788.21	2,754.80	5.23	5.22	135.05	741.64	731.56	10.08	73.591	0			
3,000.00	2,981.40	2,884.68	2,849.50	5.42	5.41	135.09	768.00	757.56	10.44	73.596	0			
3,100.00	3,080.44	2,981.14	2,944.19	5.60	5.61	135.13	794.35	783.56	10.79	73.599	0			
3,200.00	3,179.48	3,077.60	3,038.89	5.79	5.80	135.16	820.71	809.56	11.15	73.602	0			
3,300.00	3,278.52	3,174.07	3,133.58	5.98	5.99	135.19	847.07	835.56	11.51	73.604	0			
3,400.00	3,377.56	3,270.53	3,228.28	6.17	6.18	135.22	873.42	861.56	11.87	73.605	0			
3,500.00	3,476.60	3,366.99	3,322.97	6.36	6.38	135.25	899.78	887.56	12.22	73.606	0			
3,600.00	3,575.64	3,463.46	3,417.66	6.55	6.57	135.28	926.14	913.56	12.58	73.606	0			
3,700.00	3,674.68	3,559.92	3,512.36	6.73	6.76	135.30	952.50	939.56	12.94	73.606	0			
3,800.00	3,773.71	3,656.38	3,607.05	6.92	6.96	135.32	978.85	965.56	13.30	73.606	0			
3,900.00	3,872.75	3,752.84	3,701.75	7.11	7.15	135.35	1,005.21	991.56	13.66	73.606	0			
4,000.00	3,971.79	3,849.31	3,796.44	7.30	7.34	135.37	1,031.57	1,017.56	14.01	73.605	0			
4,100.00	4,070.83	3,945.77	3,891.14	7.49	7.54	135.39	1,057.93	1,043.56	14.37	73.604	0			
4,200.00	4,169.87	4,042.23	3,985.83	7.67	7.73	135.41	1,084.29	1,069.56	14.73	73.603	0			
4,300.00	4,268.91	4,138.70	4,080.53	7.86	7.92	135.43	1,110.65	1,095.56	15.09	73.602	0			
4,400.00	4,367.95	4,235.16	4,175.22	8.05	8.12	135.44	1,137.00	1,121.56	15.45	73.601	0			
4,500.00	4,466.99	4,331.62	4,269.91	8.24	8.31	135.46	1,163.36	1,147.56	15.81	73.600	0			
4,600.00	4,566.03	4,428.09	4,364.61	8.43	8.50	135.48	1,189.72	1,173.56	16.17	73.598	0			
4,700.00	4,665.07	4,524.55	4,459.30	8.62	8.70	135.49	1,216.08	1,199.56	16.52	73.597	0			
4,800.00	4,764.10	4,621.01	4,554.00	8.81	8.89	135.51	1,242.44	1,225.56	16.88	73.596	0			
4,900.00	4,863.14	4,717.47	4,648.69	8.99	9.08	135.52	1,268.80	1,251.56	17.24	73.594	0			
5,000.00	4,962.18	4,813.94	4,743.39	9.18	9.28	135.53	1,295.16	1,277.56	17.60	73.593	0			
5,100.00	5,061.22	4,910.40	4,838.08	9.37	9.47	135.55	1,321.52	1,303.56	17.96	73.591	0			
5,200.00	5,160.26	5,006.86	4,932.77	9.56	9.66	135.56	1,347.87	1,329.56	18.32	73.589	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	5,259.30	5,103.33	5,027.47	9.75	9.86	135.57	1,374.23	1,355.56	18.67	73.588	0		
5,400.00	5,358.34	5,199.79	5,122.16	9.94	10.05	135.58	1,400.59	1,381.56	19.03	73.586	0		
5,500.00	5,457.38	5,296.25	5,216.86	10.13	10.24	135.59	1,426.95	1,407.56	19.39	73.585	0		
5,600.00	5,556.42	5,392.72	5,311.55	10.32	10.44	135.60	1,453.31	1,433.56	19.75	73.583	0		
5,700.00	5,655.45	5,489.18	5,406.25	10.50	10.63	135.61	1,479.67	1,459.56	20.11	73.581	0		
5,800.00	5,754.49	5,585.64	5,500.94	10.69	10.83	135.62	1,506.03	1,485.56	20.47	73.580	0		
5,900.00	5,853.53	5,682.11	5,595.63	10.88	11.02	135.63	1,532.39	1,511.56	20.83	73.578	0		
6,000.00	5,952.57	5,778.57	5,690.33	11.07	11.21	135.64	1,558.75	1,537.56	21.19	73.577	0		
6,105.61	6,057.16	5,880.44	5,790.33	11.27	11.42	135.65	1,586.59	1,565.02	21.56	73.575	0		
6,200.00	6,150.85	5,971.77	5,879.99	11.44	11.60	135.96	1,610.39	1,588.45	21.94	73.388	0		
6,300.00	6,250.45	6,137.38	6,043.14	11.62	11.92	136.12	1,631.79	1,609.34	22.45	72.675	0		
6,400.00	6,350.30	6,334.71	6,239.26	11.79	12.27	136.19	1,645.13	1,622.13	23.00	71.534	0		
6,503.10	6,453.38	6,541.01	6,445.36	11.96	12.61	0.41	1,649.95	1,625.87	24.08	68.517	0		
6,603.10	6,553.38	6,645.03	6,549.38	12.13	12.77	0.41	1,649.95	1,625.54	24.42	67.574	0		
6,650.00	6,600.24	6,691.16	6,595.48	12.20	12.84	-89.60	1,649.95	1,625.92	24.03	68.657	0		
6,700.00	6,649.91	6,740.28	6,644.32	12.27	12.91	-89.61	1,649.95	1,625.77	24.18	68.229	0		
6,750.00	6,698.98	6,789.44	6,692.65	12.34	12.98	-89.63	1,649.95	1,625.62	24.33	67.829	0		
6,800.00	6,747.16	6,838.63	6,740.18	12.41	13.04	-89.65	1,649.94	1,625.48	24.46	67.453	0		
6,850.00	6,794.14	6,887.86	6,786.65	12.47	13.10	-89.67	1,649.94	1,625.35	24.59	67.098	0		
6,900.00	6,839.64	6,937.15	6,831.76	12.54	13.16	-89.69	1,649.93	1,625.22	24.71	66.759	0		
6,950.00	6,883.37	6,986.48	6,875.25	12.59	13.22	-89.72	1,649.93	1,625.09	24.84	66.431	0		
7,000.00	6,925.07	7,035.87	6,916.85	12.65	13.27	-89.74	1,649.93	1,624.97	24.96	66.111	0		
7,050.00	6,964.47	7,085.32	6,956.31	12.71	13.33	-89.77	1,649.92	1,624.85	25.08	65.791	0		
7,100.00	7,001.34	7,134.84	6,993.39	12.77	13.39	-89.80	1,649.92	1,624.72	25.20	65.467	0		
7,150.00	7,035.45	7,184.42	7,027.85	12.83	13.45	-89.83	1,649.92	1,624.59	25.33	65.131	0		
7,200.00	7,066.59	7,234.07	7,059.48	12.90	13.51	-89.86	1,649.92	1,624.45	25.47	64.780	0		
7,250.00	7,094.56	7,283.79	7,088.07	12.96	13.57	-89.90	1,649.91	1,624.30	25.62	64.406	0		
7,300.00	7,119.20	7,333.59	7,113.43	13.03	13.64	-89.93	1,649.91	1,624.13	25.78	64.006	0		
7,350.00	7,140.35	7,383.46	7,135.40	13.11	13.71	-89.96	1,649.91	1,623.96	25.95	63.576	0		
7,400.00	7,157.88	7,433.40	7,153.83	13.19	13.79	-90.00	1,649.91	1,623.77	26.14	63.113	0		
7,402.55	7,158.67	7,435.96	7,154.67	13.20	13.80	-90.00	1,649.91	1,623.76	26.15	63.089	0		
7,450.00	7,171.68	7,483.43	7,168.58	13.28	13.88	-90.03	1,649.91	1,623.56	26.35	62.617	0		
7,500.00	7,181.67	7,533.53	7,179.55	13.39	13.97	-90.07	1,649.91	1,623.34	26.57	62.087	0		
7,550.00	7,187.79	7,583.71	7,186.65	13.50	14.07	-90.10	1,649.91	1,623.10	26.82	61.527	0		
7,603.10	7,190.00	7,637.08	7,189.89	13.63	14.19	-90.14	1,649.92	1,622.82	27.09	60.901	0		
7,700.00	7,190.00	7,734.06	7,190.00	13.91	14.44	-90.14	1,649.92	1,622.27	27.64	59.689	0		
7,800.00	7,190.00	7,834.06	7,190.00	14.22	14.72	-90.14	1,649.92	1,621.65	28.26	58.374	0		
7,900.00	7,190.00	7,934.06	7,190.00	14.56	15.04	-90.14	1,649.92	1,620.97	28.94	57.007	0		
8,000.00	7,190.00	8,034.06	7,190.00	14.93	15.39	-90.14	1,649.92	1,620.24	29.67	55.606	0		
8,100.00	7,190.00	8,134.06	7,190.00	15.32	15.76	-90.14	1,649.92	1,619.47	30.45	54.187	0		
8,200.00	7,190.00	8,234.06	7,190.00	15.73	16.16	-90.14	1,649.92	1,618.65	31.27	52.765	0		
8,300.00	7,190.00	8,334.06	7,190.00	16.16	16.58	-90.14	1,649.92	1,617.78	32.13	51.350	0		
8,400.00	7,190.00	8,434.06	7,190.00	16.61	17.02	-90.14	1,649.92	1,616.89	33.03	49.952	0		
8,500.00	7,190.00	8,534.06	7,190.00	17.07	17.47	-90.14	1,649.92	1,615.95	33.96	48.579	0		
8,600.00	7,190.00	8,634.06	7,190.00	17.55	17.94	-90.14	1,649.92	1,614.99	34.93	47.237	0		
8,700.00	7,190.00	8,734.06	7,190.00	18.05	18.43	-90.14	1,649.92	1,613.99	35.92	45.929	0		
8,800.00	7,190.00	8,834.06	7,190.00	18.56	18.93	-90.14	1,649.92	1,612.97	36.94	44.660	0		
8,900.00	7,190.00	8,934.06	7,190.00	19.08	19.44	-90.14	1,649.92	1,611.93	37.99	43.430	0		
9,000.00	7,190.00	9,034.06	7,190.00	19.61	19.96	-90.14	1,649.92	1,610.86	39.06	42.242	0		
9,100.00	7,190.00	9,134.06	7,190.00	20.16	20.50	-90.14	1,649.92	1,609.77	40.15	41.095	0		
9,200.00	7,190.00	9,234.06	7,190.00	20.71	21.04	-90.14	1,649.92	1,608.66	41.26	39.991	0		
9,300.00	7,190.00	9,334.06	7,190.00	21.27	21.59	-90.14	1,649.92	1,607.53	42.38	38.928	0		
9,400.00	7,190.00	9,434.06	7,190.00	21.84	22.15	-90.14	1,649.92	1,606.39	43.53	37.906	0		
9,500.00	7,190.00	9,534.06	7,190.00	22.42	22.72	-90.14	1,649.92	1,605.23	44.68	36.924	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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		
9,600.00	7,190.00	9,634.06	7,190.00	23.00	23.30	-90.14	1,649.92	1,604.06	45.86	35.980	0		
9,700.00	7,190.00	9,734.06	7,190.00	23.59	23.88	-90.14	1,649.92	1,602.87	47.04	35.074	0		
9,800.00	7,190.00	9,834.06	7,190.00	24.19	24.47	-90.14	1,649.92	1,601.68	48.24	34.204	0		
9,900.00	7,190.00	9,934.06	7,190.00	24.79	25.07	-90.14	1,649.92	1,600.47	49.45	33.368	0		
10,000.00	7,190.00	10,034.06	7,190.00	25.40	25.67	-90.14	1,649.92	1,599.25	50.66	32.566	0		
10,100.00	7,190.00	10,134.06	7,190.00	26.01	26.28	-90.14	1,649.92	1,598.02	51.89	31.795	0		
10,200.00	7,190.00	10,234.06	7,190.00	26.63	26.89	-90.14	1,649.92	1,596.79	53.13	31.055	0		
10,300.00	7,190.00	10,334.06	7,190.00	27.25	27.50	-90.14	1,649.92	1,595.54	54.37	30.344	0		
10,400.00	7,190.00	10,434.06	7,190.00	27.88	28.12	-90.14	1,649.92	1,594.29	55.63	29.661	0		
10,500.00	7,190.00	10,534.06	7,190.00	28.51	28.75	-90.14	1,649.92	1,593.03	56.89	29.004	0		
10,600.00	7,190.00	10,634.06	7,190.00	29.14	29.37	-90.14	1,649.92	1,591.76	58.15	28.373	0		
10,700.00	7,190.00	10,734.06	7,190.00	29.77	30.00	-90.14	1,649.92	1,590.49	59.42	27.765	0		
10,800.00	7,190.00	10,834.06	7,190.00	30.41	30.64	-90.14	1,649.92	1,589.21	60.70	27.180	0		
10,900.00	7,190.00	10,934.06	7,190.00	31.05	31.27	-90.14	1,649.92	1,587.93	61.99	26.617	0		
11,000.00	7,190.00	11,034.06	7,190.00	31.70	31.91	-90.14	1,649.92	1,586.64	63.28	26.074	0		
11,100.00	7,190.00	11,134.06	7,190.00	32.34	32.56	-90.14	1,649.92	1,585.34	64.57	25.551	0		
11,200.00	7,190.00	11,234.06	7,190.00	32.99	33.20	-90.14	1,649.92	1,584.04	65.87	25.048	0		
11,300.00	7,190.00	11,334.06	7,190.00	33.64	33.85	-90.14	1,649.92	1,582.74	67.17	24.562	0		
11,400.00	7,190.00	11,434.06	7,190.00	34.30	34.50	-90.14	1,649.92	1,581.43	68.48	24.093	0		
11,500.00	7,190.00	11,534.06	7,190.00	34.95	35.15	-90.14	1,649.92	1,580.12	69.79	23.640	0		
11,600.00	7,190.00	11,634.06	7,190.00	35.61	35.80	-90.14	1,649.92	1,578.81	71.11	23.203	0		
11,700.00	7,190.00	11,734.06	7,190.00	36.27	36.45	-90.14	1,649.92	1,577.49	72.43	22.780	0		
11,800.00	7,190.00	11,834.06	7,190.00	36.93	37.11	-90.14	1,649.92	1,576.17	73.75	22.372	0		
11,900.00	7,190.00	11,934.06	7,190.00	37.59	37.77	-90.14	1,649.92	1,574.84	75.07	21.977	0		
12,000.00	7,190.00	12,034.06	7,190.00	38.25	38.43	-90.14	1,649.92	1,573.51	76.40	21.595	0		
12,100.00	7,190.00	12,134.06	7,190.00	38.91	39.09	-90.14	1,649.92	1,572.18	77.73	21.225	0		
12,200.00	7,190.00	12,234.06	7,190.00	39.58	39.75	-90.14	1,649.92	1,570.85	79.07	20.868	0		
12,300.00	7,190.00	12,334.06	7,190.00	40.25	40.42	-90.14	1,649.92	1,569.51	80.40	20.521	0		
12,400.00	7,190.00	12,434.06	7,190.00	40.92	41.08	-90.14	1,649.92	1,568.18	81.74	20.185	0		
12,500.00	7,190.00	12,534.06	7,190.00	41.59	41.75	-90.14	1,649.92	1,566.83	83.08	19.859	0		
12,600.00	7,190.00	12,634.06	7,190.00	42.26	42.42	-90.14	1,649.92	1,565.49	84.42	19.543	0		
12,700.00	7,190.00	12,734.06	7,190.00	42.93	43.09	-90.14	1,649.92	1,564.15	85.77	19.237	0		
12,800.00	7,190.00	12,834.06	7,190.00	43.60	43.76	-90.14	1,649.92	1,562.80	87.12	18.940	0		
12,900.00	7,190.00	12,934.06	7,190.00	44.28	44.43	-90.14	1,649.92	1,561.45	88.46	18.651	0		
13,000.00	7,190.00	13,034.06	7,190.00	44.95	45.10	-90.14	1,649.92	1,560.10	89.81	18.370	0		
13,100.00	7,190.00	13,134.06	7,190.00	45.63	45.78	-90.14	1,649.92	1,558.75	91.17	18.098	0		
13,200.00	7,190.00	13,234.06	7,190.00	46.30	46.45	-90.14	1,649.92	1,557.40	92.52	17.833	0		
13,300.00	7,190.00	13,334.06	7,190.00	46.98	47.12	-90.14	1,649.92	1,556.04	93.88	17.576	0		
13,400.00	7,190.00	13,434.06	7,190.00	47.66	47.80	-90.14	1,649.92	1,554.68	95.23	17.325	0		
13,500.00	7,190.00	13,534.06	7,190.00	48.34	48.48	-90.14	1,649.92	1,553.33	96.59	17.082	0		
13,600.00	7,190.00	13,634.06	7,190.00	49.01	49.15	-90.14	1,649.92	1,551.97	97.95	16.844	0		
13,700.00	7,190.00	13,734.06	7,190.00	49.69	49.83	-90.14	1,649.92	1,550.60	99.31	16.614	0		
13,800.00	7,190.00	13,834.06	7,190.00	50.38	50.51	-90.14	1,649.92	1,549.24	100.67	16.389	0		
13,900.00	7,190.00	13,934.06	7,190.00	51.06	51.19	-90.14	1,649.92	1,547.88	102.04	16.170	0		
14,000.00	7,190.00	14,034.06	7,190.00	51.74	51.87	-90.14	1,649.92	1,546.51	103.40	15.956	0		
14,100.00	7,190.00	14,134.06	7,190.00	52.42	52.55	-90.14	1,649.92	1,545.15	104.77	15.748	0		
14,200.00	7,190.00	14,234.06	7,190.00	53.10	53.23	-90.14	1,649.92	1,543.78	106.13	15.546	0		
14,300.00	7,190.00	14,334.06	7,190.00	53.79	53.91	-90.14	1,649.92	1,542.41	107.50	15.348	0		
14,400.00	7,190.00	14,434.06	7,190.00	54.47	54.60	-90.14	1,649.92	1,541.05	108.87	15.155	0		
14,500.00	7,190.00	14,534.06	7,190.00	55.16	55.28	-90.14	1,649.92	1,539.68	110.24	14.967	0		
14,600.00	7,190.00	14,634.06	7,190.00	55.84	55.96	-90.14	1,649.92	1,538.30	111.61	14.783	0		
14,700.00	7,190.00	14,734.06	7,190.00	56.53	56.65	-90.14	1,649.92	1,536.93	112.98	14.603	0		
14,800.00	7,190.00	14,834.06	7,190.00	57.21	57.33	-90.14	1,649.92	1,535.56	114.36	14.428	0		
14,900.00	7,190.00	14,934.06	7,190.00	57.90	58.02	-90.14	1,649.92	1,534.19	115.73	14.257	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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				
15,000.00	7,190.00	15,034.06	7,190.00	58.59	58.70	-90.14	1,649.92	1,532.81	117.10	14.089	0					
15,100.00	7,190.00	15,134.06	7,190.00	59.27	59.39	-90.14	1,649.92	1,531.44	118.48	13.926	0					
15,200.00	7,190.00	15,234.06	7,190.00	59.96	60.07	-90.14	1,649.92	1,530.06	119.85	13.766	0					
15,300.00	7,190.00	15,334.06	7,190.00	60.65	60.76	-90.14	1,649.92	1,528.69	121.23	13.610	0					
15,400.00	7,190.00	15,434.06	7,190.00	61.34	61.45	-90.14	1,649.92	1,527.31	122.61	13.457	0					
15,500.00	7,190.00	15,534.06	7,190.00	62.02	62.13	-90.14	1,649.92	1,525.93	123.98	13.307	0					
15,600.00	7,190.00	15,634.06	7,190.00	62.71	62.82	-90.14	1,649.92	1,524.55	125.36	13.161	0					
15,700.00	7,190.00	15,734.06	7,190.00	63.40	63.51	-90.14	1,649.92	1,523.17	126.74	13.018	0					
15,800.00	7,190.00	15,834.06	7,190.00	64.09	64.20	-90.14	1,649.92	1,521.79	128.12	12.878	0					
15,900.00	7,190.00	15,934.06	7,190.00	64.78	64.89	-90.14	1,649.92	1,520.41	129.50	12.740	0					
16,000.00	7,190.00	16,034.06	7,190.00	65.47	65.58	-90.14	1,649.92	1,519.03	130.88	12.606	0					
16,100.00	7,190.00	16,134.06	7,190.00	66.16	66.26	-90.14	1,649.92	1,517.65	132.26	12.474	0					
16,200.00	7,190.00	16,234.06	7,190.00	66.85	66.95	-90.14	1,649.92	1,516.27	133.65	12.345	0					
16,300.00	7,190.00	16,334.06	7,190.00	67.54	67.64	-90.14	1,649.92	1,514.89	135.03	12.219	0					
16,400.00	7,190.00	16,434.06	7,190.00	68.24	68.33	-90.14	1,649.92	1,513.50	136.41	12.095	0					
16,500.00	7,190.00	16,534.06	7,190.00	68.93	69.02	-90.14	1,649.92	1,512.12	137.79	11.974	0					
16,600.00	7,190.00	16,634.06	7,190.00	69.62	69.72	-90.14	1,649.92	1,510.74	139.18	11.855	0					
16,700.00	7,190.00	16,734.06	7,190.00	70.31	70.41	-90.14	1,649.92	1,509.35	140.56	11.738	0					
16,800.00	7,190.00	16,834.06	7,190.00	71.00	71.10	-90.14	1,649.92	1,507.97	141.95	11.623	0					
16,900.00	7,190.00	16,934.06	7,190.00	71.70	71.79	-90.14	1,649.92	1,506.58	143.33	11.511	0					
17,000.00	7,190.00	17,034.06	7,190.00	72.39	72.48	-90.14	1,649.92	1,505.20	144.72	11.401	0					
17,100.00	7,190.00	17,134.06	7,190.00	73.08	73.17	-90.14	1,649.92	1,503.81	146.11	11.293	0					
17,200.00	7,190.00	17,234.14	7,190.00	73.77	73.87	-90.14	1,649.91	1,502.42	147.49	11.186	0					
17,234.86	7,190.00	17,269.00	7,190.00	74.02	74.11	-90.14	1,649.91	1,501.94	147.98	11.150	0					
17,254.82	7,190.00	17,273.45	7,190.00	74.15	74.14	-90.14	1,649.98	1,501.84	148.14	11.138	0	SF				



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	-0.04	196.05						0	
100.00	100.00	96.00	96.00	0.15	0.14	-0.04	196.01	195.72	0.29	682.111	0		0	
200.00	200.00	196.00	196.00	0.32	0.31	-0.04	196.01	195.37	0.64	308.524	0		0	
300.00	300.00	296.00	296.00	0.50	0.49	-0.04	196.01	195.02	0.98	199.119	0		0	
400.00	400.00	396.00	396.00	0.67	0.66	-0.04	196.01	194.67	1.33	146.993	0		0	
500.00	500.00	496.00	496.00	0.84	0.84	-0.04	196.01	194.32	1.68	116.497	0		0	
600.00	600.00	596.00	596.00	1.02	1.01	-0.04	196.01	193.97	2.03	96.480	0		0	
700.00	700.00	696.00	696.00	1.19	1.19	-0.04	196.01	193.63	2.38	82.334	0		0	CC, ES
800.00	800.00	790.77	790.76	1.37	1.35	-0.27	197.28	194.56	2.72	72.512	0		0	
900.00	899.98	885.09	884.96	1.54	1.52	135.08	202.56	199.50	3.06	66.200	0		0	
1,000.00	999.84	978.80	978.36	1.72	1.68	134.76	213.07	209.68	3.40	62.722	0		0	
1,100.00	1,099.45	1,071.53	1,070.49	1.90	1.85	134.56	228.74	225.01	3.73	61.292	0		0	
1,197.49	1,196.22	1,161.05	1,159.06	2.07	2.01	134.46	248.91	244.85	4.06	61.352	0		0	
1,200.00	1,198.70	1,163.06	1,161.05	2.07	2.02	134.47	249.49	245.42	4.07	61.373	0		0	
1,300.00	1,297.74	1,260.34	1,257.07	2.26	2.19	134.73	272.63	268.21	4.42	61.742	0		0	
1,400.00	1,396.78	1,357.62	1,353.09	2.44	2.38	134.95	295.77	291.00	4.77	62.042	0		0	
1,500.00	1,495.82	1,454.90	1,449.12	2.62	2.56	135.13	318.92	313.80	5.12	62.289	0		0	
1,600.00	1,594.86	1,552.18	1,545.14	2.80	2.74	135.29	342.07	336.59	5.47	62.494	0		0	
1,700.00	1,693.90	1,649.46	1,641.16	2.99	2.92	135.44	365.22	359.39	5.83	62.668	0		0	
1,800.00	1,792.94	1,746.74	1,737.18	3.17	3.11	135.56	388.37	382.19	6.18	62.816	0		0	
1,900.00	1,891.97	1,844.02	1,833.21	3.36	3.29	135.67	411.53	404.99	6.54	62.944	0		0	
2,000.00	1,991.01	1,941.30	1,929.23	3.55	3.48	135.77	434.68	427.79	6.89	63.055	0		0	
2,100.00	2,090.05	2,038.58	2,025.25	3.73	3.66	135.86	457.84	450.59	7.25	63.152	0		0	
2,200.00	2,189.09	2,135.86	2,121.27	3.92	3.85	135.94	481.00	473.39	7.61	63.237	0		0	
2,300.00	2,288.13	2,233.14	2,217.30	4.11	4.03	136.01	504.16	496.19	7.96	63.314	0		0	
2,400.00	2,387.17	2,330.42	2,313.32	4.29	4.22	136.08	527.32	519.00	8.32	63.382	0		0	
2,500.00	2,486.21	2,427.70	2,409.34	4.48	4.41	136.14	550.48	541.80	8.68	63.443	0		0	
2,600.00	2,585.25	2,524.97	2,505.36	4.67	4.59	136.19	573.64	564.61	9.03	63.497	0		0	
2,700.00	2,684.29	2,622.25	2,601.38	4.85	4.78	136.25	596.80	587.41	9.39	63.547	0		0	
2,800.00	2,783.33	2,719.53	2,697.41	5.04	4.97	136.29	619.96	610.21	9.75	63.593	0		0	
2,900.00	2,882.36	2,816.81	2,793.43	5.23	5.15	136.34	643.13	633.02	10.11	63.634	0		0	
3,000.00	2,981.40	2,914.09	2,889.45	5.42	5.34	136.38	666.29	655.82	10.46	63.672	0		0	
3,100.00	3,080.44	3,011.37	2,985.47	5.60	5.53	136.42	689.45	678.63	10.82	63.707	0		0	
3,200.00	3,179.48	3,108.65	3,081.50	5.79	5.71	136.45	712.61	701.43	11.18	63.739	0		0	
3,300.00	3,278.52	3,205.93	3,177.52	5.98	5.90	136.49	735.78	724.24	11.54	63.769	0		0	
3,400.00	3,377.56	3,303.21	3,273.54	6.17	6.09	136.52	758.94	747.05	11.90	63.796	0		0	
3,500.00	3,476.60	3,400.49	3,369.56	6.36	6.28	136.55	782.11	769.85	12.25	63.822	0		0	
3,600.00	3,575.64	3,497.77	3,465.59	6.55	6.46	136.58	805.27	792.66	12.61	63.846	0		0	
3,700.00	3,674.68	3,595.05	3,561.61	6.73	6.65	136.60	828.43	815.46	12.97	63.868	0		0	
3,800.00	3,773.71	3,692.33	3,657.63	6.92	6.84	136.63	851.60	838.27	13.33	63.889	0		0	
3,900.00	3,872.75	3,789.61	3,753.65	7.11	7.03	136.65	874.76	861.08	13.69	63.908	0		0	
4,000.00	3,971.79	3,886.89	3,849.67	7.30	7.21	136.68	897.93	883.88	14.05	63.926	0		0	
4,100.00	4,070.83	3,984.17	3,945.70	7.49	7.40	136.70	921.09	906.69	14.40	63.944	0		0	
4,200.00	4,169.87	4,081.44	4,041.72	7.67	7.59	136.72	944.26	929.50	14.76	63.960	0		0	
4,300.00	4,268.91	4,178.72	4,137.74	7.86	7.78	136.74	967.42	952.30	15.12	63.975	0		0	
4,400.00	4,367.95	4,276.00	4,233.76	8.05	7.96	136.75	990.59	975.11	15.48	63.990	0		0	
4,500.00	4,466.99	4,373.28	4,329.79	8.24	8.15	136.77	1,013.75	997.92	15.84	64.003	0		0	
4,600.00	4,566.03	4,470.56	4,425.81	8.43	8.34	136.79	1,036.92	1,020.72	16.20	64.017	0		0	
4,700.00	4,665.07	4,567.84	4,521.83	8.62	8.53	136.81	1,060.09	1,043.53	16.56	64.029	0		0	
4,800.00	4,764.10	4,665.12	4,617.85	8.81	8.72	136.82	1,083.25	1,066.34	16.92	64.041	0		0	
4,900.00	4,863.14	4,762.40	4,713.88	8.99	8.90	136.84	1,106.42	1,089.14	17.27	64.052	0		0	
5,000.00	4,962.18	4,859.68	4,809.90	9.18	9.09	136.85	1,129.58	1,111.95	17.63	64.062	0		0	
5,100.00	5,061.22	4,956.96	4,905.92	9.37	9.28	136.86	1,152.75	1,134.76	17.99	64.072	0		0	
5,200.00	5,160.26	5,054.24	5,001.94	9.56	9.47	136.88	1,175.91	1,157.56	18.35	64.082	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	5,259.30	5,151.52	5,097.96	9.75	9.66	136.89	1,199.08	1,180.37	18.71	64.091	0						
5,400.00	5,358.34	5,248.80	5,193.99	9.94	9.84	136.90	1,222.25	1,203.18	19.07	64.100	0						
5,500.00	5,457.38	5,346.08	5,290.01	10.13	10.03	136.91	1,245.41	1,225.99	19.43	64.109	0						
5,600.00	5,556.42	5,443.36	5,386.03	10.32	10.22	136.92	1,268.58	1,248.79	19.79	64.117	0						
5,700.00	5,655.45	5,540.64	5,482.05	10.50	10.41	136.93	1,291.74	1,271.60	20.14	64.125	0						
5,800.00	5,754.49	5,637.91	5,578.08	10.69	10.60	136.94	1,314.91	1,294.41	20.50	64.132	0						
5,900.00	5,853.53	5,735.19	5,674.10	10.88	10.78	136.95	1,338.08	1,317.21	20.86	64.139	0						
6,000.00	5,952.57	5,832.47	5,770.12	11.07	10.97	136.96	1,361.24	1,340.02	21.22	64.146	0						
6,105.61	6,057.16	5,935.21	5,871.53	11.27	11.17	136.97	1,385.71	1,364.11	21.60	64.153	0						
6,200.00	6,150.85	6,027.28	5,962.41	11.44	11.35	137.23	1,406.47	1,384.49	21.97	64.007	0						
6,300.00	6,250.45	6,125.29	6,059.16	11.62	11.54	137.37	1,426.02	1,403.67	22.36	63.780	0						
6,400.00	6,350.30	6,223.67	6,156.26	11.79	11.73	137.38	1,443.07	1,420.34	22.73	63.485	0						
6,503.10	6,453.38	6,325.35	6,256.63	11.96	11.93	1.47	1,458.03	1,434.62	23.41	62.291	0						
6,603.10	6,553.38	6,446.36	6,376.15	12.13	12.16	1.04	1,471.05	1,447.24	23.80	61.803	0						
6,650.00	6,600.24	6,527.20	6,456.32	12.20	12.30	-88.85	1,476.00	1,452.29	23.71	62.254	0						
6,700.00	6,649.91	6,613.26	6,541.95	12.27	12.46	-89.05	1,480.05	1,456.11	23.94	61.833	0						
6,750.00	6,698.98	6,698.83	6,627.31	12.34	12.61	-89.55	1,482.88	1,458.73	24.15	61.393	0						
6,800.00	6,747.16	6,783.55	6,711.96	12.41	12.75	-90.33	1,484.59	1,460.23	24.36	60.939	0						
6,850.00	6,794.14	6,861.74	6,790.14	12.47	12.87	-91.31	1,485.34	1,460.78	24.55	60.496	0						
6,900.00	6,839.64	6,907.23	6,835.64	12.54	12.95	-91.97	1,485.99	1,461.31	24.69	60.198	0						
6,950.00	6,883.37	6,950.96	6,879.37	12.59	13.02	-92.69	1,487.12	1,462.31	24.81	59.938	0						
7,000.00	6,925.07	7,000.38	6,928.74	12.65	13.09	-93.54	1,488.79	1,463.85	24.94	59.701	0						
7,050.00	6,964.47	7,052.99	6,981.01	12.71	13.17	-94.40	1,490.91	1,465.85	25.06	59.493	0						
7,100.00	7,001.34	7,108.62	7,035.53	12.77	13.25	-95.28	1,493.46	1,468.28	25.18	59.310	0						
7,150.00	7,035.45	7,167.72	7,092.19	12.83	13.33	-96.16	1,496.39	1,471.09	25.30	59.149	0						
7,200.00	7,066.59	7,230.83	7,150.69	12.90	13.41	-97.05	1,499.64	1,474.22	25.42	59.002	0						
7,250.00	7,094.56	7,298.51	7,210.48	12.96	13.49	-97.95	1,503.12	1,477.58	25.54	58.860	0						
7,300.00	7,119.20	7,371.31	7,270.67	13.03	13.57	-98.85	1,506.72	1,481.05	25.66	58.709	0						
7,350.00	7,140.35	7,449.76	7,329.84	13.11	13.67	-99.73	1,510.30	1,484.50	25.80	58.532	0						
7,400.00	7,157.88	7,534.22	7,385.94	13.19	13.77	-100.57	1,513.71	1,487.74	25.96	58.302	0						
7,450.00	7,171.68	7,624.76	7,436.26	13.28	13.90	-101.32	1,516.75	1,490.59	26.16	57.990	0						
7,500.00	7,181.67	7,720.99	7,477.48	13.39	14.04	-101.96	1,519.24	1,492.85	26.39	57.560	0						
7,550.00	7,187.79	7,821.95	7,506.15	13.50	14.22	-102.42	1,521.01	1,494.32	26.69	56.988	0						
7,603.10	7,190.00	7,932.55	7,519.61	13.63	14.46	-102.66	1,521.94	1,494.87	27.08	56.210	0						
7,700.00	7,190.00	8,041.21	7,520.00	13.91	14.74	-102.68	1,521.99	1,494.33	27.65	55.040	0						
7,800.00	7,190.00	8,141.21	7,520.00	14.22	15.03	-102.68	1,521.99	1,493.72	28.27	53.838	0						
7,900.00	7,190.00	8,241.21	7,520.00	14.56	15.35	-102.68	1,521.99	1,493.05	28.94	52.591	0						
8,000.00	7,190.00	8,341.21	7,520.00	14.93	15.70	-102.68	1,521.99	1,492.33	29.66	51.316	0						
8,100.00	7,190.00	8,441.21	7,520.00	15.32	16.08	-102.68	1,521.99	1,491.56	30.42	50.026	0						
8,200.00	7,190.00	8,541.21	7,520.00	15.73	16.48	-102.68	1,521.99	1,490.76	31.23	48.734	0						
8,300.00	7,190.00	8,641.21	7,520.00	16.16	16.89	-102.68	1,521.99	1,489.91	32.08	47.449	0						
8,400.00	7,190.00	8,741.21	7,520.00	16.61	17.33	-102.68	1,521.99	1,489.03	32.96	46.179	0						
8,500.00	7,190.00	8,841.21	7,520.00	17.07	17.78	-102.68	1,521.99	1,488.11	33.87	44.931	0						
8,600.00	7,190.00	8,941.21	7,520.00	17.55	18.25	-102.68	1,521.99	1,487.17	34.82	43.710	0						
8,700.00	7,190.00	9,041.21	7,520.00	18.05	18.73	-102.68	1,521.99	1,486.19	35.79	42.521	0						
8,800.00	7,190.00	9,141.21	7,520.00	18.56	19.23	-102.68	1,521.99	1,485.19	36.79	41.365	0						
8,900.00	7,190.00	9,241.21	7,520.00	19.08	19.74	-102.68	1,521.99	1,484.17	37.82	40.245	0						
9,000.00	7,190.00	9,341.21	7,520.00	19.61	20.26	-102.68	1,521.99	1,483.12	38.86	39.162	0						
9,100.00	7,190.00	9,441.21	7,520.00	20.16	20.79	-102.68	1,521.99	1,482.06	39.93	38.116	0						
9,200.00	7,190.00	9,541.21	7,520.00	20.71	21.33	-102.68	1,521.99	1,480.97	41.02	37.108	0						
9,300.00	7,190.00	9,641.21	7,520.00	21.27	21.88	-102.68	1,521.99	1,479.87	42.12	36.136	0						
9,400.00	7,190.00	9,741.21	7,520.00	21.84	22.44	-102.68	1,521.99	1,478.75	43.24	35.202	0						
9,500.00	7,190.00	9,841.21	7,520.00	22.42	23.01	-102.68	1,521.99	1,477.62	44.37	34.303	0						
9,600.00	7,190.00	9,941.21	7,520.00	23.00	23.58	-102.68	1,521.99	1,476.47	45.52	33.439	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	
9,700.00	7,190.00	10,041.21	7,520.00	23.59	24.16	-102.68	1,521.99	1,475.31	46.67	32.608	0		
9,800.00	7,190.00	10,141.21	7,520.00	24.19	24.75	-102.68	1,521.99	1,474.14	47.85	31.810	0		
9,900.00	7,190.00	10,241.21	7,520.00	24.79	25.34	-102.68	1,521.99	1,472.96	49.03	31.044	0		
10,000.00	7,190.00	10,341.21	7,520.00	25.40	25.94	-102.68	1,521.99	1,471.77	50.22	30.307	0		
10,100.00	7,190.00	10,441.21	7,520.00	26.01	26.54	-102.68	1,521.99	1,470.57	51.42	29.599	0		
10,200.00	7,190.00	10,541.21	7,520.00	26.63	27.15	-102.68	1,521.99	1,469.36	52.63	28.918	0		
10,300.00	7,190.00	10,641.21	7,520.00	27.25	27.77	-102.68	1,521.99	1,468.14	53.85	28.264	0		
10,400.00	7,190.00	10,741.21	7,520.00	27.88	28.38	-102.68	1,521.99	1,466.91	55.07	27.635	0		
10,500.00	7,190.00	10,841.21	7,520.00	28.51	29.00	-102.68	1,521.99	1,465.68	56.31	27.030	0		
10,600.00	7,190.00	10,941.21	7,520.00	29.14	29.63	-102.68	1,521.99	1,464.44	57.55	26.448	0		
10,700.00	7,190.00	11,041.21	7,520.00	29.77	30.26	-102.68	1,521.99	1,463.19	58.79	25.887	0		
10,800.00	7,190.00	11,141.21	7,520.00	30.41	30.89	-102.68	1,521.99	1,461.94	60.04	25.348	0		
10,900.00	7,190.00	11,241.21	7,520.00	31.05	31.52	-102.68	1,521.99	1,460.68	61.30	24.828	0		
11,000.00	7,190.00	11,341.21	7,520.00	31.70	32.16	-102.68	1,521.99	1,459.42	62.56	24.327	0		
11,100.00	7,190.00	11,441.21	7,520.00	32.34	32.80	-102.68	1,521.99	1,458.15	63.83	23.844	0		
11,200.00	7,190.00	11,541.21	7,520.00	32.99	33.44	-102.68	1,521.99	1,456.88	65.10	23.378	0		
11,300.00	7,190.00	11,641.21	7,520.00	33.64	34.09	-102.68	1,521.99	1,455.61	66.38	22.929	0		
11,400.00	7,190.00	11,741.21	7,520.00	34.30	34.74	-102.68	1,521.99	1,454.33	67.66	22.495	0		
11,500.00	7,190.00	11,841.21	7,520.00	34.95	35.38	-102.68	1,521.99	1,453.04	68.94	22.076	0		
11,600.00	7,190.00	11,941.21	7,520.00	35.61	36.04	-102.68	1,521.99	1,451.76	70.23	21.671	0		
11,700.00	7,190.00	12,041.21	7,520.00	36.27	36.69	-102.68	1,521.99	1,450.46	71.52	21.280	0		
11,800.00	7,190.00	12,141.21	7,520.00	36.93	37.34	-102.68	1,521.99	1,449.17	72.82	20.902	0		
11,900.00	7,190.00	12,241.21	7,520.00	37.59	38.00	-102.68	1,521.99	1,447.87	74.11	20.536	0		
12,000.00	7,190.00	12,341.21	7,520.00	38.25	38.66	-102.68	1,521.99	1,446.57	75.41	20.182	0		
12,100.00	7,190.00	12,441.21	7,520.00	38.91	39.32	-102.68	1,521.99	1,445.27	76.72	19.839	0		
12,200.00	7,190.00	12,541.21	7,520.00	39.58	39.98	-102.68	1,521.99	1,443.96	78.02	19.507	0		
12,300.00	7,190.00	12,641.21	7,520.00	40.25	40.64	-102.68	1,521.99	1,442.65	79.33	19.185	0		
12,400.00	7,190.00	12,741.21	7,520.00	40.92	41.31	-102.68	1,521.99	1,441.34	80.64	18.873	0		
12,500.00	7,190.00	12,841.21	7,520.00	41.59	41.97	-102.68	1,521.99	1,440.03	81.95	18.571	0		
12,600.00	7,190.00	12,941.21	7,520.00	42.26	42.64	-102.68	1,521.99	1,438.72	83.27	18.278	0		
12,700.00	7,190.00	13,041.21	7,520.00	42.93	43.31	-102.68	1,521.99	1,437.40	84.59	17.993	0		
12,800.00	7,190.00	13,141.21	7,520.00	43.60	43.98	-102.68	1,521.99	1,436.08	85.91	17.717	0		
12,900.00	7,190.00	13,241.21	7,520.00	44.28	44.65	-102.68	1,521.99	1,434.76	87.23	17.449	0		
13,000.00	7,190.00	13,341.21	7,520.00	44.95	45.32	-102.68	1,521.99	1,433.44	88.55	17.188	0		
13,100.00	7,190.00	13,441.21	7,520.00	45.63	45.99	-102.68	1,521.99	1,432.11	89.87	16.935	0		
13,200.00	7,190.00	13,541.21	7,520.00	46.30	46.67	-102.68	1,521.99	1,430.79	91.20	16.688	0		
13,300.00	7,190.00	13,641.21	7,520.00	46.98	47.34	-102.68	1,521.99	1,429.46	92.53	16.449	0		
13,400.00	7,190.00	13,741.21	7,520.00	47.66	48.01	-102.68	1,521.99	1,428.13	93.86	16.216	0		
13,500.00	7,190.00	13,841.21	7,520.00	48.34	48.69	-102.68	1,521.99	1,426.80	95.19	15.989	0		
13,600.00	7,190.00	13,941.21	7,520.00	49.01	49.37	-102.68	1,521.99	1,425.47	96.52	15.769	0		
13,700.00	7,190.00	14,041.21	7,520.00	49.69	50.04	-102.68	1,521.99	1,424.13	97.85	15.554	0		
13,800.00	7,190.00	14,141.21	7,520.00	50.38	50.72	-102.68	1,521.99	1,422.80	99.19	15.344	0		
13,900.00	7,190.00	14,241.21	7,520.00	51.06	51.40	-102.68	1,521.99	1,421.46	100.52	15.141	0		
14,000.00	7,190.00	14,341.21	7,520.00	51.74	52.08	-102.68	1,521.99	1,420.13	101.86	14.942	0		
14,100.00	7,190.00	14,441.21	7,520.00	52.42	52.76	-102.68	1,521.99	1,418.79	103.20	14.748	0		
14,200.00	7,190.00	14,541.21	7,520.00	53.10	53.44	-102.68	1,521.99	1,417.45	104.54	14.559	0		
14,300.00	7,190.00	14,641.21	7,520.00	53.79	54.12	-102.68	1,521.99	1,416.11	105.88	14.375	0		
14,400.00	7,190.00	14,741.21	7,520.00	54.47	54.80	-102.68	1,521.99	1,414.77	107.22	14.195	0		
14,500.00	7,190.00	14,841.21	7,520.00	55.16	55.48	-102.68	1,521.99	1,413.42	108.56	14.020	0		
14,600.00	7,190.00	14,941.21	7,520.00	55.84	56.17	-102.68	1,521.99	1,412.08	109.90	13.848	0		
14,700.00	7,190.00	15,041.21	7,520.00	56.53	56.85	-102.68	1,521.99	1,410.74	111.25	13.681	0		
14,800.00	7,190.00	15,141.21	7,520.00	57.21	57.53	-102.68	1,521.99	1,409.39	112.59	13.517	0		
14,900.00	7,190.00	15,241.21	7,520.00	57.90	58.22	-102.68	1,521.99	1,408.05	113.94	13.358	0		
15,000.00	7,190.00	15,341.21	7,520.00	58.59	58.90	-102.68	1,521.99	1,406.70	115.29	13.202	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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		
15,100.00	7,190.00	15,441.21	7,520.00	59.27	59.59	-102.68	1,521.99	1,405.35	116.63	13.049	0			
15,200.00	7,190.00	15,541.21	7,520.00	59.96	60.27	-102.68	1,521.99	1,404.00	117.98	12.900	0			
15,300.00	7,190.00	15,641.21	7,520.00	60.65	60.96	-102.68	1,521.99	1,402.66	119.33	12.754	0			
15,400.00	7,190.00	15,741.21	7,520.00	61.34	61.65	-102.68	1,521.99	1,401.31	120.68	12.612	0			
15,500.00	7,190.00	15,841.21	7,520.00	62.02	62.33	-102.68	1,521.99	1,399.96	122.03	12.472	0			
15,600.00	7,190.00	15,941.21	7,520.00	62.71	63.02	-102.68	1,521.99	1,398.61	123.38	12.336	0			
15,700.00	7,190.00	16,041.21	7,520.00	63.40	63.71	-102.68	1,521.99	1,397.25	124.73	12.202	0			
15,800.00	7,190.00	16,141.21	7,520.00	64.09	64.39	-102.68	1,521.99	1,395.90	126.08	12.071	0			
15,900.00	7,190.00	16,241.21	7,520.00	64.78	65.08	-102.68	1,521.99	1,394.55	127.44	11.943	0			
16,000.00	7,190.00	16,341.21	7,520.00	65.47	65.77	-102.68	1,521.99	1,393.20	128.79	11.818	0			
16,100.00	7,190.00	16,441.21	7,520.00	66.16	66.46	-102.68	1,521.99	1,391.84	130.14	11.695	0			
16,200.00	7,190.00	16,541.21	7,520.00	66.85	67.15	-102.68	1,521.99	1,390.49	131.50	11.574	0			
16,300.00	7,190.00	16,641.21	7,520.00	67.54	67.84	-102.68	1,521.99	1,389.13	132.85	11.456	0			
16,400.00	7,190.00	16,741.21	7,520.00	68.24	68.53	-102.68	1,521.99	1,387.78	134.21	11.340	0			
16,500.00	7,190.00	16,841.21	7,520.00	68.93	69.22	-102.68	1,521.99	1,386.42	135.56	11.227	0			
16,600.00	7,190.00	16,941.21	7,520.00	69.62	69.91	-102.68	1,521.99	1,385.07	136.92	11.116	0			
16,700.00	7,190.00	17,041.21	7,520.00	70.31	70.60	-102.68	1,521.99	1,383.71	138.28	11.007	0			
16,800.00	7,190.00	17,141.21	7,520.00	71.00	71.29	-102.68	1,521.99	1,382.35	139.63	10.900	0			
16,900.00	7,190.00	17,241.21	7,520.00	71.70	71.98	-102.68	1,521.99	1,380.99	140.99	10.795	0			
17,000.00	7,190.00	17,341.21	7,520.00	72.39	72.67	-102.68	1,521.99	1,379.64	142.35	10.692	0			
17,100.00	7,190.00	17,441.21	7,520.00	73.08	73.36	-102.68	1,521.99	1,378.28	143.71	10.591	0			
17,200.00	7,190.00	17,541.30	7,520.00	73.77	74.05	-102.68	1,521.98	1,376.92	145.07	10.491	0			
17,235.89	7,190.00	17,577.19	7,520.00	74.02	74.30	-102.68	1,521.98	1,376.43	145.56	10.456	0			
17,254.82	7,190.00	17,582.23	7,520.00	74.15	74.34	-102.68	1,522.04	1,376.32	145.72	10.445	0		SF	



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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					
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	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-0.07	168.00						
100.00	100.00	96.00	96.00	0.15	0.14	-0.07	167.95	167.66	0.29	584.484	0		
200.00	200.00	196.00	196.00	0.32	0.31	-0.07	167.95	167.32	0.64	264.367	0		
300.00	300.00	296.00	296.00	0.50	0.49	-0.07	167.95	166.97	0.98	170.620	0		
400.00	400.00	396.00	396.00	0.67	0.66	-0.07	167.95	166.62	1.33	125.955	0		
500.00	500.00	496.00	496.00	0.84	0.84	-0.07	167.95	166.27	1.68	99.823	0		
600.00	600.00	596.00	596.00	1.02	1.01	-0.07	167.95	165.92	2.03	82.671	0		
700.00	700.00	696.00	696.00	1.19	1.19	-0.07	167.95	165.57	2.38	70.550	0		
800.00	800.00	796.00	796.00	1.37	1.36	-0.07	167.95	165.22	2.73	61.528	0		CC, ES
900.00	899.98	891.74	891.73	1.54	1.53	135.78	170.40	167.33	3.07	55.491	0		
1,000.00	999.84	986.95	986.81	1.72	1.70	135.86	177.94	174.53	3.41	52.181	0		
1,100.00	1,099.45	1,081.43	1,080.98	1.90	1.86	135.95	190.54	186.79	3.75	50.841	0		
1,197.49	1,196.22	1,172.51	1,171.46	2.07	2.03	136.03	207.63	203.55	4.08	50.949	0		
1,200.00	1,198.70	1,174.84	1,173.77	2.07	2.03	136.04	208.13	204.05	4.08	50.965	0		
1,300.00	1,297.74	1,268.98	1,266.91	2.26	2.20	136.13	229.22	224.79	4.43	51.763	0		
1,400.00	1,396.78	1,366.61	1,363.41	2.44	2.38	136.10	250.87	246.09	4.78	52.478	0		
1,500.00	1,495.82	1,464.24	1,459.90	2.62	2.56	136.08	272.51	267.38	5.13	53.083	0		
1,600.00	1,594.86	1,561.87	1,556.40	2.80	2.74	136.06	294.16	288.67	5.49	53.602	0		
1,700.00	1,693.90	1,659.49	1,652.89	2.99	2.92	136.04	315.81	309.96	5.84	54.050	0		
1,800.00	1,792.94	1,757.12	1,749.38	3.17	3.10	136.03	337.45	331.26	6.20	54.441	0		
1,900.00	1,891.97	1,854.75	1,845.88	3.36	3.29	136.01	359.10	352.55	6.55	54.785	0		
2,000.00	1,991.01	1,952.38	1,942.37	3.55	3.47	136.00	380.75	373.84	6.91	55.090	0		
2,100.00	2,090.05	2,050.01	2,038.86	3.73	3.65	135.99	402.39	395.12	7.27	55.363	0		
2,200.00	2,189.09	2,147.64	2,135.36	3.92	3.84	135.98	424.04	416.41	7.63	55.607	0		
2,300.00	2,288.13	2,245.27	2,231.85	4.11	4.02	135.97	445.69	437.70	7.98	55.827	0		
2,400.00	2,387.17	2,342.90	2,328.35	4.29	4.21	135.96	467.33	458.99	8.34	56.027	0		
2,500.00	2,486.21	2,440.53	2,424.84	4.48	4.39	135.96	488.98	480.28	8.70	56.209	0		
2,600.00	2,585.25	2,538.16	2,521.33	4.67	4.58	135.95	510.63	501.57	9.06	56.376	0		
2,700.00	2,684.29	2,635.78	2,617.83	4.85	4.76	135.95	532.27	522.86	9.42	56.528	0		
2,800.00	2,783.33	2,733.41	2,714.32	5.04	4.95	135.94	553.92	544.14	9.77	56.669	0		
2,900.00	2,882.36	2,831.04	2,810.81	5.23	5.13	135.93	575.56	565.43	10.13	56.799	0		
3,000.00	2,981.40	2,928.67	2,907.31	5.42	5.32	135.93	597.21	586.72	10.49	56.919	0		
3,100.00	3,080.44	3,026.30	3,003.80	5.60	5.50	135.93	618.86	608.01	10.85	57.031	0		
3,200.00	3,179.48	3,123.93	3,100.30	5.79	5.69	135.92	640.50	629.29	11.21	57.135	0		
3,300.00	3,278.52	3,221.56	3,196.79	5.98	5.88	135.92	662.15	650.58	11.57	57.233	0		
3,400.00	3,377.56	3,319.19	3,293.28	6.17	6.06	135.91	683.80	671.87	11.93	57.324	0		
3,500.00	3,476.60	3,416.82	3,389.78	6.36	6.25	135.91	705.44	693.16	12.29	57.409	0		
3,600.00	3,575.64	3,514.45	3,486.27	6.55	6.43	135.91	727.09	714.44	12.65	57.489	0		
3,700.00	3,674.68	3,612.08	3,582.77	6.73	6.62	135.90	748.74	735.73	13.01	57.565	0		
3,800.00	3,773.71	3,709.70	3,679.26	6.92	6.81	135.90	770.38	757.02	13.37	57.636	0		
3,900.00	3,872.75	3,807.33	3,775.75	7.11	6.99	135.90	792.03	778.30	13.73	57.703	0		
4,000.00	3,971.79	3,904.96	3,872.25	7.30	7.18	135.90	813.68	799.59	14.09	57.767	0		
4,100.00	4,070.83	4,002.59	3,968.74	7.49	7.37	135.89	835.32	820.88	14.45	57.827	0		
4,200.00	4,169.87	4,100.22	4,065.23	7.67	7.55	135.89	856.97	842.16	14.80	57.884	0		
4,300.00	4,268.91	4,197.85	4,161.73	7.86	7.74	135.89	878.62	863.45	15.16	57.938	0		
4,400.00	4,367.95	4,295.48	4,258.22	8.05	7.93	135.89	900.26	884.74	15.52	57.990	0		
4,500.00	4,466.99	4,393.11	4,354.72	8.24	8.11	135.89	921.91	906.02	15.88	58.039	0		
4,600.00	4,566.03	4,490.74	4,451.21	8.43	8.30	135.88	943.56	927.31	16.24	58.086	0		
4,700.00	4,665.07	4,588.37	4,547.70	8.62	8.49	135.88	965.20	948.60	16.60	58.131	0		
4,800.00	4,764.10	4,685.99	4,644.20	8.81	8.67	135.88	986.85	969.88	16.96	58.173	0		
4,900.00	4,863.14	4,783.62	4,740.69	8.99	8.86	135.88	1,008.49	991.17	17.32	58.214	0		
5,000.00	4,962.18	4,881.25	4,837.18	9.18	9.05	135.88	1,030.14	1,012.46	17.68	58.253	0		
5,100.00	5,061.22	4,978.88	4,933.68	9.37	9.23	135.88	1,051.79	1,033.74	18.04	58.291	0		
5,200.00	5,160.26	5,076.51	5,030.17	9.56	9.42	135.87	1,073.43	1,055.03	18.40	58.327	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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 4 - 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	5,259.30	5,174.14	5,126.67	9.75	9.61	135.87	1,095.08	1,076.32	18.76	58.361	0				
5,400.00	5,358.34	5,271.77	5,223.16	9.94	9.79	135.87	1,116.73	1,097.60	19.12	58.395	0				
5,500.00	5,457.38	5,369.40	5,319.65	10.13	9.98	135.87	1,138.37	1,118.89	19.48	58.427	0				
5,600.00	5,556.42	5,467.03	5,416.15	10.32	10.17	135.87	1,160.02	1,140.18	19.84	58.457	0				
5,700.00	5,655.45	5,564.66	5,512.64	10.50	10.36	135.87	1,181.67	1,161.46	20.20	58.487	0				
5,800.00	5,754.49	5,662.28	5,609.14	10.69	10.54	135.87	1,203.31	1,182.75	20.56	58.515	0				
5,900.00	5,853.53	5,759.91	5,705.63	10.88	10.73	135.87	1,224.96	1,204.04	20.92	58.543	0				
6,000.00	5,952.57	5,857.54	5,802.12	11.07	10.92	135.86	1,246.61	1,225.32	21.28	58.569	0				
6,105.61	6,057.16	5,960.65	5,904.03	11.27	11.11	135.86	1,269.47	1,247.80	21.66	58.596	0				
6,200.00	6,150.85	6,053.03	5,995.33	11.44	11.29	136.09	1,288.81	1,266.77	22.04	58.486	0				
6,300.00	6,250.45	6,192.56	6,133.58	11.62	11.55	136.17	1,305.71	1,283.22	22.49	58.059	0				
6,400.00	6,350.30	6,346.64	6,287.08	11.79	11.82	136.20	1,316.13	1,293.19	22.95	57.353	0				
6,503.10	6,453.38	6,506.81	6,447.16	11.96	12.09	0.41	1,319.88	1,296.33	23.55	56.042	0				
6,603.10	6,553.38	6,609.03	6,549.38	12.13	12.25	0.41	1,319.89	1,295.99	23.89	55.245	0				
6,650.00	6,600.24	6,655.32	6,595.63	12.20	12.33	-89.60	1,319.88	1,295.99	23.89	55.238	0				
6,700.00	6,649.91	6,704.62	6,644.65	12.27	12.40	-89.62	1,319.88	1,295.84	24.05	54.890	0				
6,750.00	6,698.98	6,753.96	6,693.16	12.34	12.47	-89.64	1,319.88	1,295.69	24.19	54.565	0				
6,800.00	6,747.16	6,803.33	6,740.86	12.41	12.54	-89.66	1,319.88	1,295.55	24.32	54.260	0				
6,850.00	6,794.14	6,852.74	6,787.47	12.47	12.60	-89.68	1,319.87	1,295.42	24.45	53.972	0				
6,900.00	6,839.64	6,902.20	6,832.70	12.54	12.66	-89.71	1,319.87	1,295.29	24.58	53.697	0				
6,950.00	6,883.37	6,951.70	6,876.30	12.59	12.72	-89.74	1,319.87	1,295.16	24.70	53.432	0				
7,000.00	6,925.07	7,001.25	6,917.98	12.65	12.78	-89.77	1,319.86	1,295.04	24.82	53.172	0				
7,050.00	6,964.47	7,050.85	6,957.49	12.71	12.83	-89.80	1,319.86	1,294.92	24.94	52.913	0				
7,100.00	7,001.34	7,100.51	6,994.59	12.77	12.89	-89.83	1,319.86	1,294.79	25.07	52.650	0				
7,150.00	7,035.45	7,150.22	7,029.05	12.83	12.95	-89.86	1,319.86	1,294.66	25.20	52.378	0				
7,200.00	7,066.59	7,200.00	7,060.65	12.90	13.02	-89.89	1,319.85	1,294.52	25.34	52.093	0				
7,250.00	7,094.56	7,249.83	7,089.17	12.96	13.08	-89.93	1,319.85	1,294.37	25.48	51.790	0				
7,300.00	7,119.20	7,299.72	7,114.45	13.03	13.15	-89.96	1,319.85	1,294.21	25.65	51.466	0				
7,350.00	7,140.35	7,349.68	7,136.30	13.11	13.23	-90.00	1,319.85	1,294.03	25.82	51.117	0				
7,353.19	7,141.58	7,352.87	7,137.58	13.11	13.23	-90.00	1,319.85	1,294.02	25.83	51.093	0				
7,400.00	7,157.88	7,399.70	7,154.59	13.19	13.31	-90.03	1,319.85	1,293.84	26.01	50.742	0				
7,450.00	7,171.68	7,449.78	7,169.18	13.28	13.40	-90.07	1,319.85	1,293.63	26.22	50.339	0				
7,500.00	7,181.67	7,499.93	7,179.98	13.39	13.50	-90.10	1,319.85	1,293.41	26.45	49.909	0				
7,550.00	7,187.79	7,550.14	7,186.90	13.50	13.61	-90.14	1,319.86	1,293.17	26.69	49.454	0				
7,603.10	7,190.00	7,603.53	7,189.93	13.63	13.74	-90.17	1,319.86	1,292.89	26.97	48.946	0				
7,700.00	7,190.00	7,700.49	7,190.00	13.91	14.00	-90.17	1,319.86	1,292.34	27.51	47.969	0				
7,800.00	7,190.00	7,800.49	7,190.00	14.22	14.31	-90.17	1,319.86	1,291.72	28.14	46.903	0				
7,900.00	7,190.00	7,900.49	7,190.00	14.56	14.64	-90.17	1,319.86	1,291.04	28.82	45.796	0				
8,000.00	7,190.00	8,000.49	7,190.00	14.93	15.01	-90.17	1,319.86	1,290.31	29.55	44.662	0				
8,100.00	7,190.00	8,100.49	7,190.00	15.32	15.39	-90.17	1,319.86	1,289.53	30.33	43.515	0				
8,200.00	7,190.00	8,200.49	7,190.00	15.73	15.80	-90.17	1,319.86	1,288.70	31.15	42.365	0				
8,300.00	7,190.00	8,300.49	7,190.00	16.16	16.23	-90.17	1,319.86	1,287.84	32.02	41.222	0				
8,400.00	7,190.00	8,400.49	7,190.00	16.61	16.67	-90.17	1,319.86	1,286.94	32.92	40.093	0				
8,500.00	7,190.00	8,500.49	7,190.00	17.07	17.14	-90.17	1,319.86	1,286.00	33.86	38.984	0				
8,600.00	7,190.00	8,600.49	7,190.00	17.55	17.62	-90.17	1,319.86	1,285.03	34.82	37.901	0				
8,700.00	7,190.00	8,700.49	7,190.00	18.05	18.11	-90.17	1,319.86	1,284.04	35.82	36.846	0				
8,800.00	7,190.00	8,800.49	7,190.00	18.56	18.62	-90.17	1,319.86	1,283.01	36.84	35.822	0				
8,900.00	7,190.00	8,900.49	7,190.00	19.08	19.14	-90.17	1,319.86	1,281.97	37.89	34.831	0				
9,000.00	7,190.00	9,000.49	7,190.00	19.61	19.67	-90.17	1,319.86	1,280.89	38.96	33.874	0				
9,100.00	7,190.00	9,100.49	7,190.00	20.16	20.21	-90.17	1,319.86	1,279.80	40.06	32.951	0				
9,200.00	7,190.00	9,200.49	7,190.00	20.71	20.76	-90.17	1,319.86	1,278.69	41.17	32.062	0				
9,300.00	7,190.00	9,300.49	7,190.00	21.27	21.32	-90.17	1,319.86	1,277.56	42.29	31.206	0				
9,400.00	7,190.00	9,400.49	7,190.00	21.84	21.89	-90.17	1,319.86	1,276.42	43.44	30.384	0				
9,500.00	7,190.00	9,500.49	7,190.00	22.42	22.46	-90.17	1,319.86	1,275.26	44.60	29.594	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	
9,600.00	7,190.00	9,600.49	7,190.00	23.00	23.05	-90.17	1,319.86	1,274.09	45.77	28.835	0		
9,700.00	7,190.00	9,700.49	7,190.00	23.59	23.64	-90.17	1,319.86	1,272.90	46.96	28.106	0		
9,800.00	7,190.00	9,800.49	7,190.00	24.19	24.23	-90.17	1,319.86	1,271.70	48.16	27.407	0		
9,900.00	7,190.00	9,900.49	7,190.00	24.79	24.83	-90.17	1,319.86	1,270.49	49.37	26.735	0		
10,000.00	7,190.00	10,000.49	7,190.00	25.40	25.44	-90.17	1,319.86	1,269.27	50.59	26.091	0		
10,100.00	7,190.00	10,100.49	7,190.00	26.01	26.05	-90.17	1,319.86	1,268.04	51.82	25.472	0		
10,200.00	7,190.00	10,200.49	7,190.00	26.63	26.66	-90.17	1,319.86	1,266.80	53.05	24.878	0		
10,300.00	7,190.00	10,300.49	7,190.00	27.25	27.28	-90.17	1,319.86	1,265.56	54.30	24.307	0		
10,400.00	7,190.00	10,400.49	7,190.00	27.88	27.91	-90.17	1,319.86	1,264.30	55.55	23.758	0		
10,500.00	7,190.00	10,500.49	7,190.00	28.51	28.54	-90.17	1,319.86	1,263.04	56.82	23.231	0		
10,600.00	7,190.00	10,600.49	7,190.00	29.14	29.17	-90.17	1,319.86	1,261.78	58.08	22.724	0		
10,700.00	7,190.00	10,700.49	7,190.00	29.77	29.80	-90.17	1,319.86	1,260.50	59.36	22.236	0		
10,800.00	7,190.00	10,800.49	7,190.00	30.41	30.44	-90.17	1,319.86	1,259.22	60.64	21.767	0		
10,900.00	7,190.00	10,900.49	7,190.00	31.05	31.08	-90.17	1,319.86	1,257.94	61.92	21.315	0		
11,000.00	7,190.00	11,000.49	7,190.00	31.70	31.72	-90.17	1,319.86	1,256.65	63.21	20.880	0		
11,100.00	7,190.00	11,100.49	7,190.00	32.34	32.37	-90.17	1,319.86	1,255.35	64.51	20.460	0		
11,200.00	7,190.00	11,200.49	7,190.00	32.99	33.01	-90.17	1,319.86	1,254.05	65.81	20.056	0		
11,300.00	7,190.00	11,300.49	7,190.00	33.64	33.66	-90.17	1,319.86	1,252.75	67.11	19.666	0		
11,400.00	7,190.00	11,400.49	7,190.00	34.30	34.32	-90.17	1,319.86	1,251.44	68.42	19.290	0		
11,500.00	7,190.00	11,500.49	7,190.00	34.95	34.97	-90.17	1,319.86	1,250.12	69.73	18.927	0		
11,600.00	7,190.00	11,600.49	7,190.00	35.61	35.63	-90.17	1,319.86	1,248.81	71.05	18.576	0		
11,700.00	7,190.00	11,700.49	7,190.00	36.27	36.28	-90.17	1,319.86	1,247.49	72.37	18.238	0		
11,800.00	7,190.00	11,800.49	7,190.00	36.93	36.94	-90.17	1,319.86	1,246.17	73.69	17.910	0		
11,900.00	7,190.00	11,900.49	7,190.00	37.59	37.60	-90.17	1,319.86	1,244.84	75.02	17.594	0		
12,000.00	7,190.00	12,000.49	7,190.00	38.25	38.27	-90.17	1,319.86	1,243.51	76.35	17.288	0		
12,100.00	7,190.00	12,100.49	7,190.00	38.91	38.93	-90.17	1,319.86	1,242.18	77.68	16.991	0		
12,200.00	7,190.00	12,200.49	7,190.00	39.58	39.60	-90.17	1,319.86	1,240.85	79.01	16.705	0		
12,300.00	7,190.00	12,300.49	7,190.00	40.25	40.26	-90.17	1,319.86	1,239.51	80.35	16.427	0		
12,400.00	7,190.00	12,400.49	7,190.00	40.92	40.93	-90.17	1,319.86	1,238.17	81.69	16.157	0		
12,500.00	7,190.00	12,500.49	7,190.00	41.59	41.60	-90.17	1,319.86	1,236.83	83.03	15.897	0		
12,600.00	7,190.00	12,600.49	7,190.00	42.26	42.27	-90.17	1,319.86	1,235.49	84.37	15.643	0		
12,700.00	7,190.00	12,700.49	7,190.00	42.93	42.94	-90.17	1,319.86	1,234.14	85.72	15.398	0		
12,800.00	7,190.00	12,800.49	7,190.00	43.60	43.61	-90.17	1,319.86	1,232.79	87.06	15.160	0		
12,900.00	7,190.00	12,900.49	7,190.00	44.28	44.29	-90.17	1,319.86	1,231.44	88.41	14.928	0		
13,000.00	7,190.00	13,000.49	7,190.00	44.95	44.96	-90.17	1,319.86	1,230.09	89.76	14.704	0		
13,100.00	7,190.00	13,100.49	7,190.00	45.63	45.64	-90.17	1,319.86	1,228.74	91.12	14.485	0		
13,200.00	7,190.00	13,200.49	7,190.00	46.30	46.31	-90.17	1,319.86	1,227.39	92.47	14.273	0		
13,300.00	7,190.00	13,300.49	7,190.00	46.98	46.99	-90.17	1,319.86	1,226.03	93.83	14.067	0		
13,400.00	7,190.00	13,400.49	7,190.00	47.66	47.67	-90.17	1,319.86	1,224.67	95.18	13.866	0		
13,500.00	7,190.00	13,500.49	7,190.00	48.34	48.34	-90.17	1,319.86	1,223.32	96.54	13.671	0		
13,600.00	7,190.00	13,600.49	7,190.00	49.01	49.02	-90.17	1,319.86	1,221.96	97.90	13.481	0		
13,700.00	7,190.00	13,700.49	7,190.00	49.69	49.70	-90.17	1,319.86	1,220.59	99.26	13.296	0		
13,800.00	7,190.00	13,800.49	7,190.00	50.38	50.38	-90.17	1,319.86	1,219.23	100.63	13.116	0		
13,900.00	7,190.00	13,900.49	7,190.00	51.06	51.06	-90.17	1,319.86	1,217.87	101.99	12.941	0		
14,000.00	7,190.00	14,000.49	7,190.00	51.74	51.75	-90.17	1,319.86	1,216.50	103.36	12.770	0		
14,100.00	7,190.00	14,100.49	7,190.00	52.42	52.43	-90.17	1,319.86	1,215.14	104.72	12.603	0		
14,200.00	7,190.00	14,200.49	7,190.00	53.10	53.11	-90.17	1,319.86	1,213.77	106.09	12.441	0		
14,300.00	7,190.00	14,300.49	7,190.00	53.79	53.79	-90.17	1,319.86	1,212.40	107.46	12.283	0		
14,400.00	7,190.00	14,400.49	7,190.00	54.47	54.48	-90.17	1,319.86	1,211.03	108.83	12.128	0		
14,500.00	7,190.00	14,500.49	7,190.00	55.16	55.16	-90.17	1,319.86	1,209.66	110.20	11.977	0		
14,600.00	7,190.00	14,600.49	7,190.00	55.84	55.85	-90.17	1,319.86	1,208.29	111.57	11.830	0		
14,700.00	7,190.00	14,700.49	7,190.00	56.53	56.53	-90.17	1,319.86	1,206.92	112.94	11.686	0		
14,800.00	7,190.00	14,800.49	7,190.00	57.21	57.22	-90.17	1,319.86	1,205.55	114.31	11.546	0		
14,900.00	7,190.00	14,900.49	7,190.00	57.90	57.90	-90.17	1,319.86	1,204.17	115.69	11.409	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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		
15,000.00	7,190.00	15,000.49	7,190.00	58.59	58.59	-90.17	1,319.86	1,202.80	117.06	11.275	0		
15,100.00	7,190.00	15,100.49	7,190.00	59.27	59.28	-90.17	1,319.86	1,201.42	118.44	11.144	0		
15,200.00	7,190.00	15,200.49	7,190.00	59.96	59.96	-90.17	1,319.86	1,200.05	119.81	11.016	0		
15,300.00	7,190.00	15,300.49	7,190.00	60.65	60.65	-90.17	1,319.86	1,198.67	121.19	10.891	0		
15,400.00	7,190.00	15,400.49	7,190.00	61.34	61.34	-90.17	1,319.86	1,197.29	122.57	10.769	0		
15,500.00	7,190.00	15,500.49	7,190.00	62.02	62.03	-90.17	1,319.86	1,195.91	123.94	10.649	0		
15,600.00	7,190.00	15,600.49	7,190.00	62.71	62.72	-90.17	1,319.86	1,194.53	125.32	10.532	0		
15,700.00	7,190.00	15,700.49	7,190.00	63.40	63.40	-90.17	1,319.86	1,193.16	126.70	10.417	0		
15,800.00	7,190.00	15,800.49	7,190.00	64.09	64.09	-90.17	1,319.86	1,191.78	128.08	10.305	0		
15,900.00	7,190.00	15,900.49	7,190.00	64.78	64.78	-90.17	1,319.86	1,190.40	129.46	10.195	0		
16,000.00	7,190.00	16,000.49	7,190.00	65.47	65.47	-90.17	1,319.86	1,189.01	130.84	10.087	0		
16,100.00	7,190.00	16,100.49	7,190.00	66.16	66.16	-90.17	1,319.86	1,187.63	132.23	9.982	0		
16,200.00	7,190.00	16,200.49	7,190.00	66.85	66.85	-90.17	1,319.86	1,186.25	133.61	9.879	0		
16,300.00	7,190.00	16,300.49	7,190.00	67.54	67.54	-90.17	1,319.86	1,184.87	134.99	9.777	0		
16,400.00	7,190.00	16,400.49	7,190.00	68.24	68.24	-90.17	1,319.86	1,183.48	136.37	9.678	0		
16,500.00	7,190.00	16,500.49	7,190.00	68.93	68.93	-90.17	1,319.86	1,182.10	137.76	9.581	0		
16,600.00	7,190.00	16,600.49	7,190.00	69.62	69.62	-90.17	1,319.86	1,180.72	139.14	9.486	0		
16,700.00	7,190.00	16,700.49	7,190.00	70.31	70.31	-90.17	1,319.86	1,179.33	140.53	9.392	0		
16,800.00	7,190.00	16,800.49	7,190.00	71.00	71.00	-90.17	1,319.86	1,177.95	141.91	9.301	0		
16,900.00	7,190.00	16,900.49	7,190.00	71.70	71.69	-90.17	1,319.86	1,176.56	143.30	9.211	0		
17,000.00	7,190.00	17,000.49	7,190.00	72.39	72.39	-90.17	1,319.86	1,175.18	144.68	9.122	0		
17,100.00	7,190.00	17,100.49	7,190.00	73.08	73.08	-90.17	1,319.86	1,173.79	146.07	9.036	0		
17,166.34	7,190.00	17,166.83	7,190.00	73.54	73.54	-90.17	1,319.86	1,172.87	146.99	8.979	0		
17,200.00	7,190.00	17,200.49	7,190.00	73.77	73.77	-90.17	1,319.86	1,172.40	147.46	8.951	0		
17,225.82	7,190.00	17,226.31	7,190.00	73.95	73.95	-90.17	1,319.86	1,172.04	147.81	8.929	0		
17,254.82	7,190.00	17,242.86	7,190.00	74.15	74.07	-90.17	1,319.92	1,171.79	148.13	8.911	0	SF	



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	0.00	0.00	0.00	0.00	0.01	139.94								
100.00	100.00	97.00	97.00	0.15	0.14	0.01	139.90	139.62	0.29	484.406	0				
200.00	200.00	197.00	197.00	0.32	0.32	0.01	139.90	139.27	0.64	219.615	0				
300.00	300.00	297.00	297.00	0.50	0.49	0.01	139.90	138.92	0.99	141.875	0				
400.00	400.00	397.00	397.00	0.67	0.66	0.01	139.90	138.57	1.34	104.784	0				
500.00	500.00	497.00	497.00	0.84	0.84	0.01	139.90	138.22	1.68	83.067	0				
600.00	600.00	597.00	597.00	1.02	1.01	0.01	139.90	137.87	2.03	68.806	0				
700.00	700.00	697.00	697.00	1.19	1.19	0.01	139.90	137.52	2.38	58.725	0				
800.00	800.00	797.00	797.00	1.37	1.36	0.01	139.90	137.17	2.73	51.220	0		CC, ES		
900.00	899.98	896.98	896.98	1.54	1.54	136.28	141.16	138.08	3.08	45.833	0				
1,000.00	999.84	994.36	994.34	1.72	1.71	137.08	145.81	142.39	3.42	42.601	0				
1,100.00	1,099.45	1,091.32	1,091.18	1.90	1.88	137.57	154.79	151.03	3.76	41.122	0				
1,197.49	1,196.22	1,185.27	1,184.80	2.07	2.04	137.74	167.67	163.58	4.10	40.932	0				
1,200.00	1,198.70	1,187.68	1,187.20	2.07	2.05	137.74	168.06	163.95	4.11	40.939	0				
1,300.00	1,297.74	1,285.22	1,284.13	2.26	2.22	137.65	183.93	179.47	4.46	41.283	0				
1,400.00	1,396.78	1,383.93	1,382.19	2.44	2.40	137.50	199.94	195.13	4.81	41.575	0				
1,500.00	1,495.82	1,482.63	1,480.26	2.62	2.57	137.38	215.96	210.79	5.16	41.819	0				
1,600.00	1,594.86	1,581.34	1,578.32	2.80	2.75	137.27	231.97	226.45	5.52	42.025	0				
1,700.00	1,693.90	1,680.05	1,676.39	2.99	2.93	137.17	247.99	242.11	5.88	42.200	0				
1,800.00	1,792.94	1,778.76	1,774.45	3.17	3.11	137.09	264.01	257.77	6.23	42.351	0				
1,900.00	1,891.97	1,877.47	1,872.52	3.36	3.29	137.01	280.02	273.43	6.59	42.483	0				
2,000.00	1,991.01	1,976.18	1,970.58	3.55	3.47	136.95	296.04	289.09	6.95	42.598	0				
2,100.00	2,090.05	2,074.88	2,068.65	3.73	3.65	136.89	312.06	304.75	7.31	42.700	0				
2,200.00	2,189.09	2,173.59	2,166.71	3.92	3.83	136.84	328.08	320.41	7.67	42.790	0				
2,300.00	2,288.13	2,272.30	2,264.78	4.11	4.01	136.79	344.10	336.07	8.03	42.871	0				
2,400.00	2,387.17	2,371.01	2,362.84	4.29	4.19	136.74	360.12	351.73	8.39	42.944	0				
2,500.00	2,486.21	2,469.72	2,460.90	4.48	4.37	136.70	376.14	367.39	8.75	43.010	0				
2,600.00	2,585.25	2,568.42	2,558.97	4.67	4.55	136.67	392.16	383.05	9.11	43.070	0				
2,700.00	2,684.29	2,667.13	2,657.03	4.85	4.73	136.63	408.18	398.71	9.47	43.124	0				
2,800.00	2,783.33	2,765.84	2,755.10	5.04	4.91	136.60	424.20	414.37	9.83	43.174	0				
2,900.00	2,882.36	2,864.55	2,853.16	5.23	5.09	136.57	440.22	430.03	10.19	43.220	0				
3,000.00	2,981.40	2,963.26	2,951.23	5.42	5.27	136.54	456.24	445.69	10.55	43.262	0				
3,100.00	3,080.44	3,061.97	3,049.29	5.60	5.46	136.52	472.26	461.35	10.91	43.301	0				
3,200.00	3,179.48	3,160.67	3,147.36	5.79	5.64	136.49	488.28	477.01	11.27	43.337	0				
3,300.00	3,278.52	3,259.38	3,245.42	5.98	5.82	136.47	504.30	492.67	11.63	43.370	0				
3,400.00	3,377.56	3,358.09	3,343.49	6.17	6.00	136.45	520.32	508.33	11.99	43.401	0				
3,500.00	3,476.60	3,456.80	3,441.55	6.36	6.18	136.43	536.34	523.99	12.35	43.431	0				
3,600.00	3,575.64	3,555.51	3,539.62	6.55	6.36	136.41	552.36	539.65	12.71	43.458	0				
3,700.00	3,674.68	3,654.22	3,637.68	6.73	6.54	136.40	568.38	555.31	13.07	43.483	0				
3,800.00	3,773.71	3,752.92	3,735.75	6.92	6.72	136.38	584.40	570.97	13.43	43.507	0				
3,900.00	3,872.75	3,851.63	3,833.81	7.11	6.91	136.36	600.42	586.63	13.79	43.530	0				
4,000.00	3,971.79	3,950.34	3,931.87	7.30	7.09	136.35	616.44	602.29	14.15	43.551	0				
4,100.00	4,070.83	4,049.05	4,029.94	7.49	7.27	136.33	632.46	617.95	14.52	43.571	0				
4,200.00	4,169.87	4,147.76	4,128.00	7.67	7.45	136.32	648.48	633.61	14.88	43.590	0				
4,300.00	4,268.91	4,246.46	4,226.07	7.86	7.63	136.31	664.50	649.27	15.24	43.608	0				
4,400.00	4,367.95	4,345.17	4,324.13	8.05	7.81	136.30	680.53	664.93	15.60	43.625	0				
4,500.00	4,466.99	4,443.88	4,422.20	8.24	8.00	136.29	696.55	680.59	15.96	43.641	0				
4,600.00	4,566.03	4,542.59	4,520.26	8.43	8.18	136.27	712.57	696.24	16.32	43.657	0				
4,700.00	4,665.07	4,641.30	4,618.33	8.62	8.36	136.26	728.59	711.90	16.68	43.671	0				
4,800.00	4,764.10	4,740.01	4,716.39	8.81	8.54	136.25	744.61	727.56	17.04	43.685	0				
4,900.00	4,863.14	4,838.71	4,814.46	8.99	8.72	136.24	760.63	743.22	17.41	43.699	0				
5,000.00	4,962.18	4,937.42	4,912.52	9.18	8.90	136.23	776.65	758.88	17.77	43.711	0				
5,100.00	5,061.22	5,036.13	5,010.59	9.37	9.09	136.23	792.67	774.54	18.13	43.723	0				
5,200.00	5,160.26	5,134.84	5,108.65	9.56	9.27	136.22	808.69	790.20	18.49	43.735	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	5,259.30	5,233.55	5,206.72	9.75	9.45	136.21	824.71	805.86	18.85	43.746	0				
5,400.00	5,358.34	5,332.25	5,304.78	9.94	9.63	136.20	840.74	821.52	19.21	43.757	0				
5,500.00	5,457.38	5,430.96	5,402.85	10.13	9.81	136.19	856.76	837.18	19.58	43.767	0				
5,600.00	5,556.42	5,529.67	5,500.91	10.32	10.00	136.19	872.78	852.84	19.94	43.777	0				
5,700.00	5,655.45	5,628.38	5,598.97	10.50	10.18	136.18	888.80	868.50	20.30	43.786	0				
5,800.00	5,754.49	5,727.09	5,697.04	10.69	10.36	136.17	904.82	884.16	20.66	43.795	0				
5,900.00	5,853.53	5,825.80	5,795.10	10.88	10.54	136.17	920.84	899.82	21.02	43.804	0				
6,000.00	5,952.57	5,924.50	5,893.17	11.07	10.72	136.16	936.86	915.48	21.38	43.813	0				
6,105.61	6,057.16	6,028.75	5,996.73	11.27	10.91	136.15	953.78	932.02	21.77	43.821	0				
6,200.00	6,150.85	6,122.08	6,089.46	11.44	11.09	136.28	967.80	945.67	22.13	43.735	0				
6,300.00	6,250.45	6,234.94	6,201.68	11.62	11.29	136.25	979.79	957.26	22.52	43.498	0				
6,400.00	6,350.30	6,356.95	6,323.42	11.79	11.50	136.22	987.20	964.28	22.92	43.074	0				
6,503.10	6,453.38	6,483.28	6,449.70	11.96	11.72	0.41	989.82	966.64	23.18	42.709	0				
6,603.10	6,553.38	6,583.96	6,550.38	12.13	11.89	0.41	989.82	966.30	23.52	42.088	0				
6,650.00	6,600.24	6,630.39	6,596.78	12.20	11.96	-89.61	989.82	966.02	23.80	41.594	0				
6,700.00	6,649.91	6,679.87	6,645.96	12.27	12.04	-89.62	989.82	965.87	23.95	41.331	0				
6,750.00	6,698.98	6,729.38	6,694.62	12.34	12.11	-89.64	989.81	965.72	24.09	41.084	0				
6,800.00	6,747.16	6,778.91	6,742.44	12.41	12.18	-89.67	989.81	965.58	24.23	40.853	0				
6,850.00	6,794.14	6,828.48	6,789.15	12.47	12.24	-89.69	989.81	965.45	24.36	40.635	0				
6,900.00	6,839.64	6,878.07	6,834.45	12.54	12.30	-89.71	989.81	965.32	24.48	40.426	0				
6,950.00	6,883.37	6,927.70	6,878.09	12.59	12.36	-89.74	989.81	965.20	24.61	40.225	0				
7,000.00	6,925.07	6,977.37	6,919.78	12.65	12.42	-89.77	989.80	965.08	24.73	40.028	0				
7,050.00	6,964.47	7,027.08	6,959.27	12.71	12.48	-89.80	989.80	964.95	24.85	39.832	0				
7,100.00	7,001.34	7,076.83	6,996.32	12.77	12.54	-89.83	989.80	964.83	24.97	39.632	0				
7,150.00	7,035.45	7,126.62	7,030.69	12.83	12.61	-89.86	989.80	964.69	25.10	39.426	0				
7,200.00	7,066.59	7,176.45	7,062.17	12.90	12.67	-89.90	989.80	964.55	25.24	39.210	0				
7,250.00	7,094.56	7,226.33	7,090.56	12.96	12.74	-89.93	989.80	964.40	25.39	38.980	0				
7,300.00	7,119.20	7,276.26	7,115.67	13.03	12.81	-89.97	989.80	964.24	25.55	38.734	0				
7,330.10	7,132.36	7,306.34	7,129.15	13.08	12.86	-89.99	989.80	964.14	25.66	38.576	0				
7,350.00	7,140.35	7,326.23	7,137.35	13.11	12.89	-90.00	989.80	964.07	25.73	38.469	0				
7,400.00	7,157.88	7,376.25	7,155.45	13.19	12.97	-90.03	989.80	963.88	25.92	38.185	0				
7,450.00	7,171.68	7,426.32	7,169.84	13.28	13.07	-90.07	989.80	963.67	26.13	37.879	0				
7,500.00	7,181.67	7,476.43	7,180.43	13.39	13.18	-90.10	989.80	963.44	26.36	37.554	0				
7,550.00	7,187.79	7,526.59	7,187.14	13.50	13.31	-90.14	989.80	963.20	26.60	37.209	0				
7,603.10	7,190.00	7,579.91	7,189.96	13.63	13.45	-90.17	989.80	962.92	26.88	36.826	0				
7,700.00	7,190.00	7,676.85	7,190.00	13.91	13.73	-90.17	989.80	962.37	27.43	36.083	0				
7,800.00	7,190.00	7,776.85	7,190.00	14.22	14.05	-90.17	989.80	961.74	28.06	35.278	0				
7,900.00	7,190.00	7,876.85	7,190.00	14.56	14.39	-90.17	989.80	961.06	28.74	34.441	0				
8,000.00	7,190.00	7,976.85	7,190.00	14.93	14.76	-90.17	989.80	960.33	29.47	33.584	0				
8,100.00	7,190.00	8,076.85	7,190.00	15.32	15.15	-90.17	989.80	959.55	30.25	32.717	0				
8,200.00	7,190.00	8,176.85	7,190.00	15.73	15.56	-90.17	989.80	958.72	31.08	31.849	0				
8,300.00	7,190.00	8,276.85	7,190.00	16.16	15.99	-90.17	989.80	957.86	31.94	30.985	0				
8,400.00	7,190.00	8,376.85	7,190.00	16.61	16.44	-90.17	989.80	956.96	32.85	30.133	0				
8,500.00	7,190.00	8,476.85	7,190.00	17.07	16.91	-90.17	989.80	956.02	33.79	29.297	0				
8,600.00	7,190.00	8,576.85	7,190.00	17.55	17.40	-90.17	989.80	955.05	34.75	28.480	0				
8,700.00	7,190.00	8,676.85	7,190.00	18.05	17.90	-90.17	989.80	954.05	35.75	27.685	0				
8,800.00	7,190.00	8,776.85	7,190.00	18.56	18.41	-90.17	989.81	953.03	36.78	26.913	0				
8,900.00	7,190.00	8,876.85	7,190.00	19.08	18.93	-90.17	989.81	951.98	37.83	26.166	0				
9,000.00	7,190.00	8,976.85	7,190.00	19.61	19.47	-90.17	989.81	950.91	38.90	25.445	0				
9,100.00	7,190.00	9,076.85	7,190.00	20.16	20.01	-90.17	989.81	949.81	39.99	24.749	0				
9,200.00	7,190.00	9,176.85	7,190.00	20.71	20.57	-90.17	989.81	948.70	41.11	24.080	0				
9,300.00	7,190.00	9,276.85	7,190.00	21.27	21.13	-90.17	989.81	947.57	42.24	23.435	0				
9,400.00	7,190.00	9,376.85	7,190.00	21.84	21.70	-90.17	989.81	946.43	43.38	22.816	0				
9,500.00	7,190.00	9,476.85	7,190.00	22.42	22.28	-90.17	989.81	945.26	44.54	22.222	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	
9,600.00	7,190.00	9,576.85	7,190.00	23.00	22.87	-90.17	989.81	944.09	45.72	21.650	0		
9,700.00	7,190.00	9,676.85	7,190.00	23.59	23.46	-90.17	989.81	942.90	46.91	21.102	0		
9,800.00	7,190.00	9,776.85	7,190.00	24.19	24.06	-90.17	989.81	941.70	48.10	20.576	0		
9,900.00	7,190.00	9,876.85	7,190.00	24.79	24.67	-90.17	989.81	940.49	49.32	20.071	0		
10,000.00	7,190.00	9,976.85	7,190.00	25.40	25.28	-90.17	989.81	939.27	50.54	19.586	0		
10,100.00	7,190.00	10,076.85	7,190.00	26.01	25.89	-90.17	989.81	938.04	51.77	19.121	0		
10,200.00	7,190.00	10,176.85	7,190.00	26.63	26.51	-90.17	989.81	936.80	53.00	18.674	0		
10,300.00	7,190.00	10,276.85	7,190.00	27.25	27.13	-90.17	989.81	935.56	54.25	18.245	0		
10,400.00	7,190.00	10,376.85	7,190.00	27.88	27.76	-90.17	989.81	934.30	55.51	17.832	0		
10,500.00	7,190.00	10,476.85	7,190.00	28.51	28.39	-90.17	989.81	933.04	56.77	17.436	0		
10,600.00	7,190.00	10,576.85	7,190.00	29.14	29.03	-90.17	989.81	931.77	58.04	17.055	0		
10,700.00	7,190.00	10,676.85	7,190.00	29.77	29.66	-90.17	989.81	930.50	59.31	16.688	0		
10,800.00	7,190.00	10,776.85	7,190.00	30.41	30.30	-90.17	989.81	929.22	60.59	16.335	0		
10,900.00	7,190.00	10,876.85	7,190.00	31.05	30.95	-90.17	989.81	927.93	61.88	15.996	0		
11,000.00	7,190.00	10,976.85	7,190.00	31.70	31.59	-90.17	989.81	926.64	63.17	15.669	0		
11,100.00	7,190.00	11,076.85	7,190.00	32.34	32.24	-90.17	989.81	925.35	64.47	15.354	0		
11,200.00	7,190.00	11,176.85	7,190.00	32.99	32.89	-90.17	989.81	924.05	65.77	15.050	0		
11,300.00	7,190.00	11,276.85	7,190.00	33.64	33.54	-90.17	989.81	922.74	67.07	14.757	0		
11,400.00	7,190.00	11,376.85	7,190.00	34.30	34.19	-90.17	989.81	921.43	68.38	14.475	0		
11,500.00	7,190.00	11,476.85	7,190.00	34.95	34.85	-90.17	989.81	920.12	69.69	14.202	0		
11,600.00	7,190.00	11,576.85	7,190.00	35.61	35.51	-90.17	989.81	918.80	71.01	13.939	0		
11,700.00	7,190.00	11,676.85	7,190.00	36.27	36.17	-90.17	989.81	917.48	72.33	13.684	0		
11,800.00	7,190.00	11,776.85	7,190.00	36.93	36.83	-90.17	989.81	916.16	73.65	13.439	0		
11,900.00	7,190.00	11,876.85	7,190.00	37.59	37.49	-90.17	989.81	914.83	74.98	13.201	0		
12,000.00	7,190.00	11,976.85	7,190.00	38.25	38.16	-90.17	989.82	913.51	76.31	12.971	0		
12,100.00	7,190.00	12,076.85	7,190.00	38.91	38.82	-90.17	989.82	912.17	77.64	12.749	0		
12,200.00	7,190.00	12,176.85	7,190.00	39.58	39.49	-90.17	989.82	910.84	78.98	12.533	0		
12,300.00	7,190.00	12,276.85	7,190.00	40.25	40.16	-90.17	989.82	909.50	80.31	12.324	0		
12,400.00	7,190.00	12,376.85	7,190.00	40.92	40.83	-90.17	989.82	908.16	81.65	12.122	0		
12,500.00	7,190.00	12,476.85	7,190.00	41.59	41.50	-90.17	989.82	906.82	82.99	11.926	0		
12,600.00	7,190.00	12,576.85	7,190.00	42.26	42.17	-90.17	989.82	905.48	84.34	11.736	0		
12,700.00	7,190.00	12,676.85	7,190.00	42.93	42.84	-90.17	989.82	904.13	85.68	11.552	0		
12,800.00	7,190.00	12,776.85	7,190.00	43.60	43.52	-90.17	989.82	902.79	87.03	11.373	0		
12,900.00	7,190.00	12,876.85	7,190.00	44.28	44.19	-90.17	989.82	901.44	88.38	11.199	0		
13,000.00	7,190.00	12,976.85	7,190.00	44.95	44.87	-90.17	989.82	900.09	89.73	11.031	0		
13,100.00	7,190.00	13,076.85	7,190.00	45.63	45.54	-90.17	989.82	898.73	91.09	10.867	0		
13,200.00	7,190.00	13,176.85	7,190.00	46.30	46.22	-90.17	989.82	897.38	92.44	10.708	0		
13,300.00	7,190.00	13,276.85	7,190.00	46.98	46.90	-90.17	989.82	896.02	93.80	10.553	0		
13,400.00	7,190.00	13,376.85	7,190.00	47.66	47.58	-90.17	989.82	894.67	95.15	10.402	0		
13,500.00	7,190.00	13,476.85	7,190.00	48.34	48.25	-90.17	989.82	893.31	96.51	10.256	0		
13,600.00	7,190.00	13,576.85	7,190.00	49.01	48.93	-90.17	989.82	891.95	97.87	10.113	0		
13,700.00	7,190.00	13,676.85	7,190.00	49.69	49.62	-90.17	989.82	890.59	99.23	9.975	0		
13,800.00	7,190.00	13,776.85	7,190.00	50.38	50.30	-90.17	989.82	889.22	100.60	9.839	0		
13,900.00	7,190.00	13,876.85	7,190.00	51.06	50.98	-90.17	989.82	887.86	101.96	9.708	0		
14,000.00	7,190.00	13,976.85	7,190.00	51.74	51.66	-90.17	989.82	886.49	103.33	9.579	0		
14,100.00	7,190.00	14,076.85	7,190.00	52.42	52.34	-90.17	989.82	885.13	104.69	9.454	0		
14,200.00	7,190.00	14,176.85	7,190.00	53.10	53.03	-90.17	989.82	883.76	106.06	9.333	0		
14,300.00	7,190.00	14,276.85	7,190.00	53.79	53.71	-90.17	989.82	882.39	107.43	9.214	0		
14,400.00	7,190.00	14,376.85	7,190.00	54.47	54.40	-90.17	989.82	881.02	108.80	9.098	0		
14,500.00	7,190.00	14,476.85	7,190.00	55.16	55.08	-90.17	989.82	879.65	110.17	8.985	0		
14,600.00	7,190.00	14,576.85	7,190.00	55.84	55.77	-90.17	989.82	878.28	111.54	8.874	0		
14,700.00	7,190.00	14,676.85	7,190.00	56.53	56.45	-90.17	989.82	876.91	112.91	8.766	0		
14,800.00	7,190.00	14,776.85	7,190.00	57.21	57.14	-90.17	989.82	875.54	114.29	8.661	0		
14,900.00	7,190.00	14,876.85	7,190.00	57.90	57.83	-90.17	989.82	874.16	115.66	8.558	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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		
15,000.00	7,190.00	14,976.85	7,190.00	58.59	58.51	-90.17	989.82	872.79	117.03	8.458	0			
15,100.00	7,190.00	15,076.85	7,190.00	59.27	59.20	-90.17	989.82	871.41	118.41	8.359	0			
15,200.00	7,190.00	15,176.85	7,190.00	59.96	59.89	-90.17	989.83	870.04	119.79	8.263	0			
15,300.00	7,190.00	15,276.85	7,190.00	60.65	60.58	-90.17	989.83	868.66	121.16	8.169	0			
15,400.00	7,190.00	15,376.85	7,190.00	61.34	61.27	-90.17	989.83	867.28	122.54	8.078	0			
15,500.00	7,190.00	15,476.85	7,190.00	62.02	61.96	-90.17	989.83	865.91	123.92	7.988	0			
15,600.00	7,190.00	15,576.85	7,190.00	62.71	62.64	-90.17	989.83	864.53	125.30	7.900	0			
15,700.00	7,190.00	15,676.85	7,190.00	63.40	63.33	-90.17	989.83	863.15	126.68	7.814	0			
15,800.00	7,190.00	15,776.85	7,190.00	64.09	64.02	-90.17	989.83	861.77	128.06	7.730	0			
15,900.00	7,190.00	15,876.85	7,190.00	64.78	64.71	-90.17	989.83	860.39	129.44	7.647	0			
16,000.00	7,190.00	15,976.85	7,190.00	65.47	65.40	-90.17	989.83	859.01	130.82	7.566	0			
16,100.00	7,190.00	16,076.85	7,190.00	66.16	66.10	-90.17	989.83	857.63	132.20	7.487	0			
16,200.00	7,190.00	16,176.85	7,190.00	66.85	66.79	-90.17	989.83	856.24	133.58	7.410	0			
16,300.00	7,190.00	16,276.85	7,190.00	67.54	67.48	-90.17	989.83	854.86	134.97	7.334	0			
16,400.00	7,190.00	16,376.85	7,190.00	68.24	68.17	-90.17	989.83	853.48	136.35	7.259	0			
16,500.00	7,190.00	16,476.85	7,190.00	68.93	68.86	-90.17	989.83	852.10	137.73	7.187	0			
16,600.00	7,190.00	16,576.85	7,190.00	69.62	69.55	-90.17	989.83	850.71	139.12	7.115	0			
16,700.00	7,190.00	16,676.85	7,190.00	70.31	70.25	-90.17	989.83	849.33	140.50	7.045	0			
16,800.00	7,190.00	16,776.85	7,190.00	71.00	70.94	-90.17	989.83	847.94	141.89	6.976	0			
16,900.00	7,190.00	16,876.85	7,190.00	71.70	71.63	-90.17	989.83	846.56	143.27	6.909	0			
17,000.00	7,190.00	16,976.85	7,190.00	72.39	72.32	-90.17	989.83	845.17	144.66	6.842	0			
17,100.00	7,190.00	17,076.85	7,190.00	73.08	73.02	-90.17	989.83	843.78	146.05	6.778	0			
17,200.00	7,190.00	17,176.85	7,190.00	73.77	73.71	-90.17	989.83	842.40	147.43	6.714	0			
17,240.56	7,190.00	17,218.61	7,190.00	74.05	74.00	-90.17	989.81	841.81	148.00	6.688	0			
17,254.82	7,190.00	17,222.47	7,190.00	74.15	74.03	-90.17	989.85	841.72	148.13	6.682	0		SF	



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	0.00	0.00	0.00	0.00	-0.02	111.87					0					
100.00	100.00	98.00	98.00	0.15	0.14	-0.02	111.85	111.56	0.29	385.304	0						
200.00	200.00	198.00	198.00	0.32	0.32	-0.02	111.85	111.21	0.64	175.092	0						
300.00	300.00	298.00	298.00	0.50	0.49	-0.02	111.85	110.86	0.99	113.222	0						
400.00	400.00	398.00	398.00	0.67	0.67	-0.02	111.85	110.51	1.34	83.660	0						
500.00	500.00	498.00	498.00	0.84	0.84	-0.02	111.85	110.16	1.69	66.339	0						
600.00	600.00	598.00	598.00	1.02	1.02	-0.02	111.85	109.81	2.04	54.960	0						
700.00	700.00	698.00	698.00	1.19	1.19	-0.02	111.85	109.46	2.38	46.913	0						
800.00	800.00	798.00	798.00	1.37	1.36	-0.02	111.85	109.11	2.73	40.922	0		CC, ES				
900.00	899.98	897.98	897.98	1.54	1.54	136.37	113.10	110.02	3.08	36.703	0						
1,000.00	999.84	997.84	997.84	1.72	1.71	138.09	116.95	113.52	3.43	34.109	0						
1,100.00	1,099.45	1,096.33	1,096.31	1.90	1.89	139.94	124.02	120.25	3.77	32.878	0						
1,197.49	1,196.22	1,192.07	1,191.93	2.07	2.05	141.04	134.47	130.37	4.11	32.753	0						
1,200.00	1,198.70	1,194.53	1,194.38	2.07	2.06	141.06	134.79	130.67	4.11	32.760	0						
1,300.00	1,297.74	1,292.64	1,292.14	2.26	2.23	141.26	147.72	143.26	4.46	33.087	0						
1,400.00	1,396.78	1,391.76	1,390.78	2.44	2.41	140.98	160.98	156.17	4.82	33.410	0						
1,500.00	1,495.82	1,490.87	1,489.42	2.62	2.58	140.74	174.25	169.07	5.17	33.683	0						
1,600.00	1,594.86	1,589.99	1,588.06	2.80	2.76	140.53	187.51	181.98	5.53	33.916	0						
1,700.00	1,693.90	1,689.10	1,686.70	2.99	2.94	140.35	200.78	194.90	5.89	34.117	0						
1,800.00	1,792.94	1,788.21	1,785.35	3.17	3.11	140.20	214.05	207.81	6.24	34.291	0						
1,900.00	1,891.97	1,887.33	1,883.99	3.36	3.29	140.06	227.32	220.72	6.60	34.444	0						
2,000.00	1,991.01	1,986.44	1,982.63	3.55	3.47	139.94	240.59	233.64	6.96	34.580	0						
2,100.00	2,090.05	2,085.56	2,081.27	3.73	3.65	139.83	253.87	246.55	7.32	34.700	0						
2,200.00	2,189.09	2,184.67	2,179.91	3.92	3.83	139.73	267.14	259.47	7.67	34.808	0						
2,300.00	2,288.13	2,283.78	2,278.55	4.11	4.00	139.64	280.42	272.38	8.03	34.905	0						
2,400.00	2,387.17	2,382.90	2,377.20	4.29	4.18	139.56	293.69	285.30	8.39	34.993	0						
2,500.00	2,486.21	2,482.01	2,475.84	4.48	4.36	139.49	306.97	298.21	8.75	35.073	0						
2,600.00	2,585.25	2,581.13	2,574.48	4.67	4.54	139.42	320.24	311.13	9.11	35.146	0						
2,700.00	2,684.29	2,680.24	2,673.12	4.85	4.72	139.36	333.52	324.05	9.47	35.212	0						
2,800.00	2,783.33	2,779.36	2,771.76	5.04	4.90	139.30	346.80	336.97	9.83	35.274	0						
2,900.00	2,882.36	2,878.47	2,870.40	5.23	5.08	139.24	360.07	349.88	10.19	35.330	0						
3,000.00	2,981.40	2,977.58	2,969.05	5.42	5.26	139.20	373.35	362.80	10.55	35.383	0						
3,100.00	3,080.44	3,076.70	3,067.69	5.60	5.44	139.15	386.63	375.72	10.91	35.431	0						
3,200.00	3,179.48	3,175.81	3,166.33	5.79	5.62	139.11	399.91	388.64	11.27	35.476	0						
3,300.00	3,278.52	3,274.93	3,264.97	5.98	5.80	139.06	413.19	401.55	11.63	35.518	0						
3,400.00	3,377.56	3,374.04	3,363.61	6.17	5.98	139.03	426.46	414.47	11.99	35.558	0						
3,500.00	3,476.60	3,473.15	3,462.25	6.36	6.16	138.99	439.74	427.39	12.35	35.594	0						
3,600.00	3,575.64	3,572.27	3,560.90	6.55	6.34	138.96	453.02	440.31	12.71	35.629	0						
3,700.00	3,674.68	3,671.38	3,659.54	6.73	6.52	138.93	466.30	453.23	13.08	35.661	0						
3,800.00	3,773.71	3,770.50	3,758.18	6.92	6.69	138.90	479.58	466.14	13.44	35.692	0						
3,900.00	3,872.75	3,869.61	3,856.82	7.11	6.87	138.87	492.86	479.06	13.80	35.721	0						
4,000.00	3,971.79	3,968.72	3,955.46	7.30	7.05	138.84	506.14	491.98	14.16	35.748	0						
4,100.00	4,070.83	4,067.84	4,054.10	7.49	7.23	138.82	519.42	504.90	14.52	35.774	0						
4,200.00	4,169.87	4,166.95	4,152.75	7.67	7.41	138.79	532.70	517.82	14.88	35.799	0						
4,300.00	4,268.91	4,266.07	4,251.39	7.86	7.59	138.77	545.98	530.74	15.24	35.822	0						
4,400.00	4,367.95	4,365.18	4,350.03	8.05	7.77	138.75	559.26	543.65	15.60	35.844	0						
4,500.00	4,466.99	4,464.30	4,448.67	8.24	7.95	138.73	572.54	556.57	15.96	35.865	0						
4,600.00	4,566.03	4,563.41	4,547.31	8.43	8.13	138.71	585.82	569.49	16.32	35.885	0						
4,700.00	4,665.07	4,662.52	4,645.95	8.62	8.31	138.69	599.10	582.41	16.69	35.904	0						
4,800.00	4,764.10	4,761.64	4,744.60	8.81	8.49	138.67	612.38	595.33	17.05	35.922	0						
4,900.00	4,863.14	4,860.75	4,843.24	8.99	8.67	138.65	625.66	608.25	17.41	35.940	0						
5,000.00	4,962.18	4,959.87	4,941.88	9.18	8.85	138.63	638.94	621.17	17.77	35.956	0						
5,100.00	5,061.22	5,058.98	5,040.52	9.37	9.03	138.62	652.22	634.09	18.13	35.972	0						
5,200.00	5,160.26	5,158.09	5,139.16	9.56	9.21	138.60	665.50	647.00	18.49	35.987	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	5,259.30	5,257.21	5,237.81	9.75	9.39	138.59	678.78	659.92	18.85	36.002	0		
5,400.00	5,358.34	5,356.32	5,336.45	9.94	9.57	138.57	692.06	672.84	19.22	36.016	0		
5,500.00	5,457.38	5,455.44	5,435.09	10.13	9.75	138.56	705.34	685.76	19.58	36.030	0		
5,600.00	5,556.42	5,554.55	5,533.73	10.32	9.93	138.55	718.62	698.68	19.94	36.043	0		
5,700.00	5,655.45	5,653.66	5,632.37	10.50	10.11	138.53	731.90	711.60	20.30	36.055	0		
5,800.00	5,754.49	5,752.78	5,731.01	10.69	10.29	138.52	745.18	724.52	20.66	36.067	0		
5,900.00	5,853.53	5,851.89	5,829.66	10.88	10.47	138.51	758.46	737.44	21.02	36.079	0		
6,000.00	5,952.57	5,951.01	5,928.30	11.07	10.65	138.50	771.74	750.36	21.38	36.090	0		
6,105.61	6,057.16	6,055.68	6,032.47	11.27	10.84	138.49	785.77	764.00	21.77	36.102	0		
6,200.00	6,150.85	6,149.37	6,125.72	11.44	11.01	138.55	797.15	775.02	22.13	36.029	0		
6,300.00	6,250.45	6,248.85	6,224.72	11.62	11.19	138.43	806.68	784.19	22.50	35.860	0		
6,400.00	6,350.30	6,348.44	6,323.83	11.79	11.38	138.12	813.64	790.79	22.85	35.602	0		
6,503.10	6,453.38	6,451.10	6,426.00	11.96	11.56	1.81	818.17	795.13	23.04	35.510	0		
6,603.10	6,553.38	6,552.82	6,527.25	12.13	11.75	1.16	821.29	797.91	23.38	35.121	0		
6,650.00	6,600.24	6,604.30	6,578.56	12.20	11.84	-89.14	822.52	798.78	23.74	34.653	0		
6,700.00	6,649.91	6,658.86	6,633.02	12.27	11.93	-89.70	823.52	799.61	23.91	34.442	0		
6,750.00	6,698.98	6,712.97	6,687.08	12.34	12.03	-90.49	824.30	800.22	24.08	34.231	0		
6,800.00	6,747.16	6,766.46	6,740.55	12.41	12.12	-91.50	825.00	800.76	24.25	34.026	0		
6,850.00	6,794.14	6,818.05	6,792.14	12.47	12.20	-92.67	825.79	801.39	24.40	33.838	0		
6,900.00	6,839.64	6,863.55	6,837.64	12.54	12.28	-93.85	827.09	802.54	24.55	33.695	0		
6,950.00	6,883.37	6,907.28	6,881.37	12.59	12.36	-95.12	829.26	804.58	24.68	33.603	0		
7,000.00	6,925.07	6,957.54	6,931.58	12.65	12.44	-96.64	832.38	807.57	24.81	33.555	0		
7,050.00	6,964.47	7,010.78	6,984.44	12.71	12.52	-98.18	836.28	811.36	24.92	33.555	0		
7,100.00	7,001.34	7,067.11	7,039.59	12.77	12.60	-99.72	840.90	815.88	25.02	33.603	0		
7,150.00	7,035.45	7,127.00	7,096.87	12.83	12.68	-101.27	846.15	821.04	25.11	33.694	0		
7,200.00	7,066.59	7,190.95	7,155.94	12.90	12.77	-102.82	851.90	826.71	25.19	33.823	0		
7,250.00	7,094.56	7,259.53	7,216.21	12.96	12.85	-104.37	857.99	832.74	25.25	33.979	0		
7,300.00	7,119.20	7,333.27	7,276.71	13.03	12.94	-105.89	864.21	838.90	25.31	34.146	0		
7,350.00	7,140.35	7,412.66	7,335.91	13.11	13.04	-107.36	870.32	844.95	25.37	34.302	0		
7,400.00	7,157.88	7,497.98	7,391.69	13.19	13.16	-108.73	876.03	850.58	25.45	34.417	0		
7,450.00	7,171.68	7,589.23	7,441.23	13.28	13.29	-109.95	881.05	855.47	25.57	34.451	0		
7,500.00	7,181.67	7,685.91	7,481.21	13.39	13.45	-110.93	885.05	859.30	25.75	34.365	0		
7,550.00	7,187.79	7,786.95	7,508.28	13.50	13.67	-111.60	887.78	861.76	26.02	34.124	0		
7,603.10	7,190.00	7,897.17	7,519.88	13.63	13.94	-111.92	889.04	862.65	26.40	33.680	0		
7,700.00	7,190.00	8,000.39	7,520.00	13.91	14.24	-111.93	889.06	862.10	26.96	32.972	0		
7,800.00	7,190.00	8,100.39	7,520.00	14.22	14.55	-111.93	889.06	861.48	27.58	32.231	0		
7,900.00	7,190.00	8,200.39	7,520.00	14.56	14.88	-111.93	889.06	860.81	28.25	31.467	0		
7,939.24	7,190.00	8,239.63	7,520.00	14.70	15.02	-111.93	889.06	860.53	28.53	31.158	0		
8,000.00	7,190.00	8,300.39	7,520.00	14.93	15.24	-111.93	889.06	860.09	28.97	30.691	0		
8,100.00	7,190.00	8,400.39	7,520.00	15.32	15.63	-111.93	889.06	859.34	29.72	29.910	0		
8,200.00	7,190.00	8,500.39	7,520.00	15.73	16.03	-111.93	889.06	858.54	30.52	29.130	0		
8,300.00	7,190.00	8,600.39	7,520.00	16.16	16.46	-111.93	889.06	857.71	31.35	28.358	0		
8,400.00	7,190.00	8,700.39	7,520.00	16.61	16.91	-111.93	889.06	856.85	32.22	27.597	0		
8,500.00	7,190.00	8,800.39	7,520.00	17.07	17.37	-111.93	889.06	855.95	33.11	26.851	0		
8,600.00	7,190.00	8,900.39	7,520.00	17.55	17.84	-111.93	889.06	855.03	34.03	26.122	0		
8,700.00	7,190.00	9,000.39	7,520.00	18.05	18.34	-111.93	889.06	854.08	34.98	25.414	0		
8,800.00	7,190.00	9,100.39	7,520.00	18.56	18.84	-111.93	889.06	853.11	35.96	24.726	0		
8,900.00	7,190.00	9,200.39	7,520.00	19.08	19.36	-111.93	889.06	852.11	36.95	24.060	0		
9,000.00	7,190.00	9,300.39	7,520.00	19.61	19.89	-111.93	889.06	851.10	37.97	23.417	0		
9,100.00	7,190.00	9,400.39	7,520.00	20.16	20.43	-111.93	889.06	850.06	39.00	22.796	0		
9,200.00	7,190.00	9,500.39	7,520.00	20.71	20.98	-111.93	889.06	849.01	40.05	22.197	0		
9,300.00	7,190.00	9,600.39	7,520.00	21.27	21.54	-111.93	889.06	847.94	41.12	21.621	0		
9,400.00	7,190.00	9,700.39	7,520.00	21.84	22.10	-111.93	889.06	846.86	42.20	21.067	0		
9,500.00	7,190.00	9,800.39	7,520.00	22.42	22.68	-111.93	889.06	845.77	43.30	20.534	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16")
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16")
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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		
9,600.00	7,190.00	9,900.39	7,520.00	23.00	23.26	-111.93	889.06	844.66	44.40	20.022	0			
9,700.00	7,190.00	10,000.39	7,520.00	23.59	23.85	-111.93	889.06	843.54	45.52	19.529	0			
9,800.00	7,190.00	10,100.39	7,520.00	24.19	24.44	-111.93	889.06	842.41	46.66	19.056	0			
9,900.00	7,190.00	10,200.39	7,520.00	24.79	25.04	-111.93	889.06	841.27	47.80	18.601	0			
10,000.00	7,190.00	10,300.39	7,520.00	25.40	25.64	-111.93	889.06	840.12	48.95	18.164	0			
10,100.00	7,190.00	10,400.39	7,520.00	26.01	26.25	-111.93	889.06	838.96	50.10	17.744	0			
10,200.00	7,190.00	10,500.39	7,520.00	26.63	26.87	-111.93	889.06	837.79	51.27	17.340	0			
10,300.00	7,190.00	10,600.39	7,520.00	27.25	27.49	-111.93	889.06	836.62	52.45	16.952	0			
10,400.00	7,190.00	10,700.39	7,520.00	27.88	28.11	-111.93	889.06	835.44	53.63	16.579	0			
10,500.00	7,190.00	10,800.39	7,520.00	28.51	28.74	-111.93	889.06	834.25	54.82	16.219	0			
10,600.00	7,190.00	10,900.39	7,520.00	29.14	29.37	-111.93	889.06	833.05	56.01	15.873	0			
10,700.00	7,190.00	11,000.39	7,520.00	29.77	30.00	-111.93	889.06	831.85	57.21	15.540	0			
10,800.00	7,190.00	11,100.39	7,520.00	30.41	30.64	-111.93	889.06	830.65	58.42	15.220	0			
10,900.00	7,190.00	11,200.39	7,520.00	31.05	31.28	-111.93	889.06	829.44	59.63	14.911	0			
11,000.00	7,190.00	11,300.39	7,520.00	31.70	31.92	-111.93	889.06	828.22	60.84	14.613	0			
11,100.00	7,190.00	11,400.39	7,520.00	32.34	32.56	-111.93	889.06	827.00	62.06	14.326	0			
11,200.00	7,190.00	11,500.39	7,520.00	32.99	33.21	-111.93	889.06	825.78	63.29	14.048	0			
11,300.00	7,190.00	11,600.39	7,520.00	33.64	33.86	-111.93	889.06	824.55	64.51	13.781	0			
11,400.00	7,190.00	11,700.39	7,520.00	34.30	34.51	-111.93	889.06	823.32	65.75	13.523	0			
11,500.00	7,190.00	11,800.39	7,520.00	34.95	35.16	-111.93	889.06	822.08	66.98	13.273	0			
11,600.00	7,190.00	11,900.39	7,520.00	35.61	35.82	-111.93	889.06	820.84	68.22	13.032	0			
11,700.00	7,190.00	12,000.39	7,520.00	36.27	36.47	-111.93	889.06	819.60	69.46	12.799	0			
11,800.00	7,190.00	12,100.39	7,520.00	36.93	37.13	-111.93	889.06	818.35	70.71	12.574	0			
11,900.00	7,190.00	12,200.39	7,520.00	37.59	37.79	-111.93	889.06	817.11	71.96	12.355	0			
12,000.00	7,190.00	12,300.39	7,520.00	38.25	38.46	-111.93	889.06	815.85	73.21	12.144	0			
12,100.00	7,190.00	12,400.39	7,520.00	38.91	39.12	-111.93	889.06	814.60	74.46	11.940	0			
12,200.00	7,190.00	12,500.39	7,520.00	39.58	39.78	-111.93	889.06	813.34	75.72	11.742	0			
12,300.00	7,190.00	12,600.39	7,520.00	40.25	40.45	-111.93	889.06	812.09	76.98	11.550	0			
12,400.00	7,190.00	12,700.39	7,520.00	40.92	41.12	-111.93	889.06	810.82	78.24	11.364	0			
12,500.00	7,190.00	12,800.39	7,520.00	41.59	41.78	-111.93	889.06	809.56	79.50	11.183	0			
12,600.00	7,190.00	12,900.39	7,520.00	42.26	42.45	-111.93	889.06	808.30	80.77	11.008	0			
12,700.00	7,190.00	13,000.39	7,520.00	42.93	43.13	-111.93	889.06	807.03	82.03	10.838	0			
12,800.00	7,190.00	13,100.39	7,520.00	43.60	43.80	-111.93	889.06	805.76	83.30	10.673	0			
12,900.00	7,190.00	13,200.39	7,520.00	44.28	44.47	-111.93	889.06	804.49	84.57	10.513	0			
13,000.00	7,190.00	13,300.39	7,520.00	44.95	45.14	-111.93	889.06	803.22	85.84	10.357	0			
13,100.00	7,190.00	13,400.39	7,520.00	45.63	45.82	-111.93	889.06	801.95	87.12	10.205	0			
13,200.00	7,190.00	13,500.39	7,520.00	46.30	46.49	-111.93	889.06	800.67	88.39	10.058	0			
13,300.00	7,190.00	13,600.39	7,520.00	46.98	47.17	-111.93	889.06	799.39	89.67	9.915	0			
13,400.00	7,190.00	13,700.39	7,520.00	47.66	47.85	-111.93	889.06	798.11	90.95	9.776	0			
13,500.00	7,190.00	13,800.39	7,520.00	48.34	48.52	-111.93	889.06	796.84	92.23	9.640	0			
13,600.00	7,190.00	13,900.39	7,520.00	49.01	49.20	-111.93	889.06	795.55	93.51	9.508	0			
13,700.00	7,190.00	14,000.39	7,520.00	49.69	49.88	-111.93	889.06	794.27	94.79	9.379	0			
13,800.00	7,190.00	14,100.39	7,520.00	50.38	50.56	-111.93	889.06	792.99	96.07	9.254	0			
13,900.00	7,190.00	14,200.39	7,520.00	51.06	51.24	-111.93	889.06	791.70	97.36	9.132	0			
14,000.00	7,190.00	14,300.39	7,520.00	51.74	51.92	-111.93	889.06	790.42	98.64	9.013	0			
14,100.00	7,190.00	14,400.39	7,520.00	52.42	52.60	-111.93	889.06	789.13	99.93	8.897	0			
14,200.00	7,190.00	14,500.39	7,520.00	53.10	53.29	-111.93	889.06	787.84	101.22	8.784	0			
14,300.00	7,190.00	14,600.39	7,520.00	53.79	53.97	-111.93	889.06	786.56	102.51	8.673	0			
14,400.00	7,190.00	14,700.39	7,520.00	54.47	54.65	-111.93	889.06	785.27	103.80	8.565	0			
14,500.00	7,190.00	14,800.39	7,520.00	55.16	55.34	-111.93	889.06	783.98	105.09	8.460	0			
14,600.00	7,190.00	14,900.39	7,520.00	55.84	56.02	-111.93	889.06	782.68	106.38	8.358	0			
14,700.00	7,190.00	15,000.39	7,520.00	56.53	56.71	-111.93	889.06	781.39	107.67	8.257	0			
14,800.00	7,190.00	15,100.39	7,520.00	57.21	57.39	-111.93	889.06	780.10	108.96	8.159	0			
14,900.00	7,190.00	15,200.39	7,520.00	57.90	58.08	-111.93	889.06	778.80	110.26	8.063	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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		
15,000.00	7,190.00	15,300.39	7,520.00	58.59	58.76	-111.93	889.06	777.51	111.55	7.970	0			
15,100.00	7,190.00	15,400.39	7,520.00	59.27	59.45	-111.93	889.06	776.21	112.85	7.878	0			
15,200.00	7,190.00	15,500.39	7,520.00	59.96	60.14	-111.93	889.06	774.92	114.14	7.789	0			
15,300.00	7,190.00	15,600.39	7,520.00	60.65	60.82	-111.93	889.06	773.62	115.44	7.701	0			
15,400.00	7,190.00	15,700.39	7,520.00	61.34	61.51	-111.93	889.06	772.32	116.74	7.616	0			
15,500.00	7,190.00	15,800.39	7,520.00	62.02	62.20	-111.93	889.06	771.03	118.04	7.532	0			
15,600.00	7,190.00	15,900.39	7,520.00	62.71	62.89	-111.93	889.06	769.73	119.33	7.450	0			
15,700.00	7,190.00	16,000.39	7,520.00	63.40	63.58	-111.93	889.06	768.43	120.63	7.370	0			
15,800.00	7,190.00	16,100.39	7,520.00	64.09	64.27	-111.93	889.06	767.13	121.93	7.291	0			
15,900.00	7,190.00	16,200.39	7,520.00	64.78	64.95	-111.93	889.06	765.83	123.23	7.214	0			
16,000.00	7,190.00	16,300.39	7,520.00	65.47	65.64	-111.93	889.06	764.53	124.54	7.139	0			
16,100.00	7,190.00	16,400.39	7,520.00	66.16	66.33	-111.93	889.06	763.23	125.84	7.065	0			
16,200.00	7,190.00	16,500.39	7,520.00	66.85	67.02	-111.93	889.06	761.92	127.14	6.993	0			
16,300.00	7,190.00	16,600.39	7,520.00	67.54	67.71	-111.93	889.06	760.62	128.44	6.922	0			
16,400.00	7,190.00	16,700.39	7,520.00	68.24	68.41	-111.93	889.06	759.32	129.74	6.852	0			
16,500.00	7,190.00	16,800.39	7,520.00	68.93	69.10	-111.93	889.06	758.01	131.05	6.784	0			
16,600.00	7,190.00	16,900.39	7,520.00	69.62	69.79	-111.93	889.06	756.71	132.35	6.717	0			
16,700.00	7,190.00	17,000.39	7,520.00	70.31	70.48	-111.93	889.06	755.41	133.66	6.652	0			
16,800.00	7,190.00	17,100.39	7,520.00	71.00	71.17	-111.93	889.06	754.10	134.96	6.588	0			
16,900.00	7,190.00	17,200.39	7,520.00	71.70	71.86	-111.93	889.06	752.80	136.27	6.524	0			
17,000.00	7,190.00	17,300.39	7,520.00	72.39	72.55	-111.93	889.06	751.49	137.57	6.463	0			
17,100.00	7,190.00	17,400.39	7,520.00	73.08	73.25	-111.93	889.06	750.18	138.88	6.402	0			
17,166.54	7,190.00	17,466.93	7,520.00	73.54	73.71	-111.93	889.06	749.32	139.75	6.362	0			
17,200.00	7,190.00	17,500.00	7,520.00	73.77	73.94	-111.93	889.06	748.88	140.18	6.342	0			
17,226.08	7,190.00	17,526.03	7,520.00	73.95	74.12	-111.93	889.08	748.55	140.52	6.327	0			
17,254.82	7,190.00	17,547.64	7,520.00	74.15	74.27	-111.93	889.12	748.27	140.85	6.312	0		SF	

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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	-0.07	83.82							
100.00	100.00	98.00	98.00	0.15	0.14	-0.07	83.79	83.50	0.29	288.663	0			
200.00	200.00	198.00	198.00	0.32	0.32	-0.07	83.79	83.16	0.64	131.176	0			
300.00	300.00	298.00	298.00	0.50	0.49	-0.07	83.79	82.81	0.99	84.824	0			
400.00	400.00	398.00	398.00	0.67	0.67	-0.07	83.79	82.46	1.34	62.677	0			
500.00	500.00	498.00	498.00	0.84	0.84	-0.07	83.79	82.11	1.69	49.700	0			
600.00	600.00	598.00	598.00	1.02	1.02	-0.07	83.79	81.76	2.04	41.175	0			
700.00	700.00	698.00	698.00	1.19	1.19	-0.07	83.79	81.41	2.38	35.147	0			
800.00	800.00	798.00	798.00	1.37	1.36	-0.07	83.79	81.06	2.73	30.658	0			
900.00	899.98	897.98	897.98	1.54	1.54	136.53	85.05	81.97	3.08	27.600	0			
1,000.00	999.84	997.84	997.84	1.72	1.71	138.80	88.92	85.50	3.43	25.936	0			
1,100.00	1,099.45	1,097.45	1,097.45	1.90	1.89	142.15	95.66	91.89	3.77	25.351	0			
1,197.49	1,196.22	1,194.48	1,194.46	2.07	2.06	145.15	105.16	101.05	4.11	25.601	0			
1,200.00	1,198.70	1,196.97	1,196.95	2.07	2.06	145.21	105.44	101.32	4.12	25.615	0			
1,300.00	1,297.74	1,296.65	1,296.49	2.26	2.24	146.59	116.50	112.04	4.47	26.078	0			
1,400.00	1,396.78	1,396.42	1,395.89	2.44	2.41	146.17	127.28	122.46	4.82	26.398	0			
1,500.00	1,495.82	1,495.82	1,494.79	2.62	2.59	145.23	137.95	132.78	5.18	26.649	0			
1,600.00	1,594.86	1,595.23	1,593.70	2.80	2.76	144.42	148.66	143.13	5.53	26.868	0			
1,700.00	1,693.90	1,694.63	1,692.61	2.99	2.94	143.72	159.39	153.50	5.89	27.061	0			
1,800.00	1,792.94	1,794.04	1,791.52	3.17	3.12	143.11	170.14	163.89	6.25	27.232	0			
1,900.00	1,891.97	1,893.44	1,890.42	3.36	3.30	142.57	180.91	174.30	6.61	27.384	0			
2,000.00	1,991.01	1,992.85	1,989.33	3.55	3.48	142.09	191.69	184.72	6.97	27.520	0			
2,100.00	2,090.05	2,092.25	2,088.24	3.73	3.65	141.67	202.48	195.16	7.32	27.643	0			
2,200.00	2,189.09	2,191.66	2,187.14	3.92	3.83	141.28	213.29	205.60	7.68	27.754	0			
2,300.00	2,288.13	2,291.06	2,286.05	4.11	4.01	140.94	224.10	216.05	8.05	27.854	0			
2,400.00	2,387.17	2,390.47	2,384.96	4.29	4.19	140.62	234.92	226.51	8.41	27.946	0			
2,500.00	2,486.21	2,489.87	2,483.86	4.48	4.37	140.33	245.74	236.98	8.77	28.031	0			
2,600.00	2,585.25	2,589.28	2,582.77	4.67	4.55	140.07	256.57	247.45	9.13	28.108	0			
2,700.00	2,684.29	2,688.68	2,681.68	4.85	4.73	139.83	267.41	257.92	9.49	28.179	0			
2,800.00	2,783.33	2,788.09	2,780.58	5.04	4.91	139.61	278.25	268.40	9.85	28.245	0			
2,900.00	2,882.36	2,887.49	2,879.49	5.23	5.09	139.40	289.10	278.88	10.21	28.306	0			
3,000.00	2,981.40	2,986.90	2,978.40	5.42	5.27	139.21	299.94	289.37	10.58	28.363	0			
3,100.00	3,080.44	3,086.30	3,077.30	5.60	5.45	139.03	310.79	299.86	10.94	28.416	0			
3,200.00	3,179.48	3,185.71	3,176.21	5.79	5.63	138.87	321.65	310.35	11.30	28.465	0			
3,300.00	3,278.52	3,285.11	3,275.12	5.98	5.81	138.71	332.50	320.84	11.66	28.511	0			
3,400.00	3,377.56	3,384.52	3,374.02	6.17	5.99	138.57	343.36	331.34	12.02	28.554	0			
3,500.00	3,476.60	3,483.92	3,472.93	6.36	6.17	138.43	354.22	341.84	12.39	28.595	0			
3,600.00	3,575.64	3,583.33	3,571.84	6.55	6.35	138.30	365.09	352.33	12.75	28.633	0			
3,700.00	3,674.68	3,682.73	3,670.74	6.73	6.53	138.18	375.95	362.84	13.11	28.669	0			
3,800.00	3,773.71	3,782.14	3,769.65	6.92	6.71	138.07	386.81	373.34	13.48	28.703	0			
3,900.00	3,872.75	3,881.54	3,868.56	7.11	6.89	137.96	397.68	383.84	13.84	28.735	0			
4,000.00	3,971.79	3,980.95	3,967.46	7.30	7.07	137.86	408.55	394.35	14.20	28.766	0			
4,100.00	4,070.83	4,080.35	4,066.37	7.49	7.25	137.76	419.42	404.85	14.57	28.795	0			
4,200.00	4,169.87	4,179.76	4,165.28	7.67	7.43	137.67	430.29	415.36	14.93	28.822	0			
4,300.00	4,268.91	4,279.16	4,264.18	7.86	7.61	137.58	441.16	425.87	15.29	28.848	0			
4,400.00	4,367.95	4,378.57	4,363.09	8.05	7.80	137.50	452.03	436.38	15.66	28.873	0			
4,500.00	4,466.99	4,477.97	4,462.00	8.24	7.98	137.42	462.91	446.89	16.02	28.897	0			
4,600.00	4,566.03	4,577.38	4,560.91	8.43	8.16	137.35	473.78	457.40	16.38	28.920	0			
4,700.00	4,665.07	4,676.78	4,659.81	8.62	8.34	137.27	484.66	467.91	16.75	28.942	0			
4,800.00	4,764.10	4,776.19	4,758.72	8.81	8.52	137.20	495.53	478.42	17.11	28.962	0			
4,900.00	4,863.14	4,875.59	4,857.63	8.99	8.70	137.14	506.41	488.94	17.47	28.982	0			
5,000.00	4,962.18	4,975.00	4,956.53	9.18	8.88	137.08	517.29	499.45	17.84	29.001	0			
5,100.00	5,061.22	5,074.40	5,055.44	9.37	9.06	137.01	528.16	509.96	18.20	29.020	0			
5,200.00	5,160.26	5,173.81	5,154.35	9.56	9.24	136.96	539.04	520.48	18.56	29.037	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	5,259.30	5,273.21	5,253.25	9.75	9.42	136.90	549.92	530.99	18.93	29.054	0			
5,400.00	5,358.34	5,372.62	5,352.16	9.94	9.60	136.85	560.80	541.51	19.29	29.070	0			
5,500.00	5,457.38	5,472.02	5,451.07	10.13	9.78	136.80	571.68	552.03	19.65	29.086	0			
5,600.00	5,556.42	5,571.43	5,549.97	10.32	9.96	136.75	582.56	562.54	20.02	29.101	0			
5,700.00	5,655.45	5,670.83	5,648.88	10.50	10.15	136.70	593.44	573.06	20.38	29.115	0			
5,800.00	5,754.49	5,770.24	5,747.79	10.69	10.33	136.65	604.32	583.58	20.75	29.129	0			
5,900.00	5,853.53	5,869.64	5,846.69	10.88	10.51	136.61	615.20	594.09	21.11	29.143	0			
6,000.00	5,952.57	5,969.05	5,945.60	11.07	10.69	136.56	626.09	604.61	21.47	29.156	0			
6,105.61	6,057.16	6,074.03	6,050.05	11.27	10.88	136.52	637.58	615.72	21.86	29.169	0			
6,200.00	6,150.85	6,167.96	6,143.51	11.44	11.05	136.51	646.73	624.51	22.22	29.108	0			
6,300.00	6,250.45	6,269.17	6,244.31	11.62	11.23	136.36	653.89	631.31	22.59	28.950	0			
6,400.00	6,350.30	6,371.12	6,346.10	11.79	11.41	136.25	658.24	635.31	22.94	28.696	0			
6,503.10	6,453.38	6,476.38	6,451.34	11.96	11.59	0.42	659.76	636.72	23.04	28.632	0			
6,603.10	6,553.38	6,576.42	6,551.38	12.13	11.76	0.42	659.76	636.38	23.39	28.213	0			
6,650.00	6,600.24	6,622.99	6,597.91	12.20	11.83	-89.59	659.76	635.99	23.77	27.753	0			
6,700.00	6,649.91	6,672.63	6,647.24	12.27	11.91	-89.61	659.76	635.84	23.92	27.577	0			
6,750.00	6,698.98	6,722.29	6,696.02	12.34	11.98	-89.63	659.76	635.69	24.07	27.413	0			
6,800.00	6,747.16	6,771.96	6,743.95	12.41	12.05	-89.65	659.76	635.55	24.20	27.259	0			
6,850.00	6,794.14	6,821.66	6,790.74	12.47	12.12	-89.67	659.75	635.42	24.33	27.114	0			
6,900.00	6,839.64	6,871.37	6,836.10	12.54	12.18	-89.70	659.75	635.30	24.46	26.976	0			
6,950.00	6,883.37	6,921.12	6,879.76	12.59	12.24	-89.73	659.75	635.17	24.58	26.843	0			
7,000.00	6,925.07	6,970.88	6,921.45	12.65	12.30	-89.76	659.75	635.05	24.70	26.713	0			
7,050.00	6,964.47	7,020.68	6,960.91	12.71	12.36	-89.79	659.75	634.93	24.82	26.583	0			
7,100.00	7,001.34	7,070.50	6,997.90	12.77	12.42	-89.82	659.75	634.80	24.94	26.450	0			
7,150.00	7,035.45	7,120.35	7,032.19	12.83	12.49	-89.85	659.75	634.67	25.07	26.312	0			
7,200.00	7,066.59	7,170.23	7,063.56	12.90	12.56	-89.89	659.75	634.53	25.21	26.167	0			
7,250.00	7,094.56	7,220.15	7,091.82	12.96	12.63	-89.92	659.74	634.38	25.36	26.013	0			
7,300.00	7,119.20	7,270.09	7,116.78	13.03	12.71	-89.96	659.74	634.22	25.52	25.848	0			
7,350.00	7,140.35	7,320.07	7,138.29	13.11	12.80	-89.99	659.74	634.04	25.70	25.671	0			
7,357.37	7,143.16	7,327.43	7,141.16	13.12	12.81	-90.00	659.74	634.02	25.73	25.643	0			
7,400.00	7,157.88	7,370.08	7,156.21	13.19	12.89	-90.03	659.74	633.85	25.89	25.481	0			
7,450.00	7,171.68	7,420.12	7,170.42	13.28	13.00	-90.07	659.74	633.64	26.10	25.276	0			
7,500.00	7,181.67	7,470.19	7,180.82	13.39	13.11	-90.10	659.74	633.42	26.33	25.058	0			
7,550.00	7,187.79	7,520.30	7,187.35	13.50	13.24	-90.14	659.75	633.17	26.57	24.828	0			
7,603.10	7,190.00	7,573.55	7,189.98	13.63	13.37	-90.17	659.75	632.90	26.85	24.572	0			
7,700.00	7,190.00	7,670.46	7,190.00	13.91	13.65	-90.17	659.75	632.34	27.40	24.075	0			
7,800.00	7,190.00	7,770.46	7,190.00	14.22	13.97	-90.17	659.75	631.72	28.03	23.536	0			
7,900.00	7,190.00	7,870.46	7,190.00	14.56	14.31	-90.17	659.75	631.03	28.71	22.977	0			
8,000.00	7,190.00	7,970.46	7,190.00	14.93	14.68	-90.17	659.75	630.30	29.45	22.404	0			
8,100.00	7,190.00	8,070.46	7,190.00	15.32	15.07	-90.17	659.75	629.52	30.23	21.825	0			
8,200.00	7,190.00	8,170.46	7,190.00	15.73	15.48	-90.17	659.75	628.69	31.05	21.245	0			
8,300.00	7,190.00	8,270.46	7,190.00	16.16	15.91	-90.17	659.75	627.83	31.92	20.668	0			
8,400.00	7,190.00	8,370.46	7,190.00	16.61	16.37	-90.17	659.75	626.92	32.82	20.099	0			
8,500.00	7,190.00	8,470.46	7,190.00	17.07	16.84	-90.17	659.75	625.98	33.76	19.541	0			
8,600.00	7,190.00	8,570.46	7,190.00	17.55	17.32	-90.17	659.75	625.01	34.73	18.995	0			
8,700.00	7,190.00	8,670.46	7,190.00	18.05	17.82	-90.17	659.75	624.02	35.73	18.464	0			
8,800.00	7,190.00	8,770.46	7,190.00	18.56	18.33	-90.17	659.75	622.99	36.76	17.949	0			
8,900.00	7,190.00	8,870.46	7,190.00	19.08	18.86	-90.17	659.75	621.94	37.81	17.450	0			
9,000.00	7,190.00	8,970.46	7,190.00	19.61	19.40	-90.17	659.75	620.87	38.88	16.969	0			
9,100.00	7,190.00	9,070.46	7,190.00	20.16	19.94	-90.17	659.75	619.77	39.97	16.504	0			
9,200.00	7,190.00	9,170.46	7,190.00	20.71	20.50	-90.17	659.75	618.66	41.09	16.057	0			
9,300.00	7,190.00	9,270.46	7,190.00	21.27	21.07	-90.17	659.75	617.53	42.22	15.627	0			
9,400.00	7,190.00	9,370.46	7,190.00	21.84	21.64	-90.17	659.75	616.38	43.36	15.214	0			
9,500.00	7,190.00	9,470.46	7,190.00	22.42	22.22	-90.17	659.75	615.22	44.53	14.817	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	
9,600.00	7,190.00	9,570.46	7,190.00	23.00	22.81	-90.17	659.75	614.05	45.70	14.436	0		
9,700.00	7,190.00	9,670.46	7,190.00	23.59	23.41	-90.17	659.75	612.86	46.89	14.071	0		
9,800.00	7,190.00	9,770.46	7,190.00	24.19	24.01	-90.17	659.75	611.66	48.09	13.720	0		
9,900.00	7,190.00	9,870.46	7,190.00	24.79	24.61	-90.17	659.75	610.45	49.30	13.383	0		
10,000.00	7,190.00	9,970.46	7,190.00	25.40	25.22	-90.17	659.75	609.23	50.52	13.059	0		
10,100.00	7,190.00	10,070.46	7,190.00	26.01	25.84	-90.17	659.75	608.00	51.75	12.749	0		
10,200.00	7,190.00	10,170.46	7,190.00	26.63	26.46	-90.17	659.75	606.76	52.99	12.450	0		
10,300.00	7,190.00	10,270.46	7,190.00	27.25	27.08	-90.17	659.75	605.51	54.24	12.164	0		
10,400.00	7,190.00	10,370.46	7,190.00	27.88	27.71	-90.17	659.75	604.25	55.49	11.889	0		
10,500.00	7,190.00	10,470.46	7,190.00	28.51	28.34	-90.17	659.75	602.99	56.75	11.625	0		
10,600.00	7,190.00	10,570.46	7,190.00	29.14	28.98	-90.17	659.75	601.72	58.02	11.370	0		
10,700.00	7,190.00	10,670.46	7,190.00	29.77	29.61	-90.17	659.75	600.45	59.30	11.126	0		
10,800.00	7,190.00	10,770.46	7,190.00	30.41	30.26	-90.17	659.75	599.17	60.58	10.891	0		
10,900.00	7,190.00	10,870.46	7,190.00	31.05	30.90	-90.17	659.75	597.88	61.87	10.664	0		
11,000.00	7,190.00	10,970.46	7,190.00	31.70	31.54	-90.17	659.75	596.59	63.16	10.446	0		
11,100.00	7,190.00	11,070.46	7,190.00	32.34	32.19	-90.17	659.75	595.29	64.45	10.236	0		
11,200.00	7,190.00	11,170.46	7,190.00	32.99	32.84	-90.17	659.75	593.99	65.75	10.033	0		
11,300.00	7,190.00	11,270.46	7,190.00	33.64	33.50	-90.17	659.75	592.69	67.06	9.838	0		
11,400.00	7,190.00	11,370.46	7,190.00	34.30	34.15	-90.17	659.75	591.38	68.37	9.650	0		
11,500.00	7,190.00	11,470.46	7,190.00	34.95	34.81	-90.17	659.75	590.06	69.68	9.468	0		
11,600.00	7,190.00	11,570.46	7,190.00	35.61	35.47	-90.17	659.75	588.75	71.00	9.292	0		
11,700.00	7,190.00	11,670.46	7,190.00	36.27	36.13	-90.17	659.75	587.43	72.32	9.123	0		
11,800.00	7,190.00	11,770.46	7,190.00	36.93	36.79	-90.17	659.75	586.10	73.64	8.959	0		
11,900.00	7,190.00	11,870.46	7,190.00	37.59	37.45	-90.17	659.75	584.78	74.97	8.800	0		
12,000.00	7,190.00	11,970.46	7,190.00	38.25	38.12	-90.17	659.75	583.45	76.30	8.647	0		
12,100.00	7,190.00	12,070.46	7,190.00	38.91	38.78	-90.17	659.75	582.12	77.63	8.499	0		
12,200.00	7,190.00	12,170.46	7,190.00	39.58	39.45	-90.17	659.75	580.78	78.97	8.355	0		
12,300.00	7,190.00	12,270.46	7,190.00	40.25	40.12	-90.17	659.75	579.44	80.30	8.216	0		
12,400.00	7,190.00	12,370.46	7,190.00	40.92	40.79	-90.17	659.75	578.11	81.64	8.081	0		
12,500.00	7,190.00	12,470.46	7,190.00	41.59	41.46	-90.17	659.75	576.76	82.98	7.950	0		
12,600.00	7,190.00	12,570.46	7,190.00	42.26	42.13	-90.17	659.75	575.42	84.33	7.824	0		
12,700.00	7,190.00	12,670.46	7,190.00	42.93	42.81	-90.17	659.75	574.07	85.67	7.701	0		
12,800.00	7,190.00	12,770.46	7,190.00	43.60	43.48	-90.17	659.75	572.73	87.02	7.581	0		
12,900.00	7,190.00	12,870.46	7,190.00	44.28	44.16	-90.17	659.75	571.38	88.37	7.466	0		
13,000.00	7,190.00	12,970.46	7,190.00	44.95	44.83	-90.17	659.75	570.02	89.72	7.353	0		
13,100.00	7,190.00	13,070.46	7,190.00	45.63	45.51	-90.17	659.75	568.67	91.08	7.244	0		
13,200.00	7,190.00	13,170.46	7,190.00	46.30	46.19	-90.17	659.75	567.32	92.43	7.138	0		
13,300.00	7,190.00	13,270.46	7,190.00	46.98	46.86	-90.17	659.75	565.96	93.79	7.035	0		
13,400.00	7,190.00	13,370.46	7,190.00	47.66	47.54	-90.17	659.75	564.60	95.14	6.934	0		
13,500.00	7,190.00	13,470.46	7,190.00	48.34	48.22	-90.17	659.75	563.24	96.50	6.837	0		
13,600.00	7,190.00	13,570.46	7,190.00	49.01	48.90	-90.17	659.75	561.88	97.86	6.741	0		
13,700.00	7,190.00	13,670.46	7,190.00	49.69	49.58	-90.17	659.75	560.52	99.23	6.649	0		
13,800.00	7,190.00	13,770.46	7,190.00	50.38	50.27	-90.17	659.75	559.16	100.59	6.559	0		
13,900.00	7,190.00	13,870.46	7,190.00	51.06	50.95	-90.17	659.75	557.79	101.95	6.471	0		
14,000.00	7,190.00	13,970.46	7,190.00	51.74	51.63	-90.17	659.75	556.43	103.32	6.386	0		
14,100.00	7,190.00	14,070.46	7,190.00	52.42	52.32	-90.17	659.75	555.06	104.68	6.302	0		
14,200.00	7,190.00	14,170.46	7,190.00	53.10	53.00	-90.17	659.75	553.69	106.05	6.221	0		
14,300.00	7,190.00	14,270.46	7,190.00	53.79	53.68	-90.17	659.75	552.33	107.42	6.142	0		
14,400.00	7,190.00	14,370.46	7,190.00	54.47	54.37	-90.17	659.75	550.96	108.79	6.064	0		
14,500.00	7,190.00	14,470.46	7,190.00	55.16	55.05	-90.17	659.75	549.59	110.16	5.989	0		
14,600.00	7,190.00	14,570.46	7,190.00	55.84	55.74	-90.17	659.75	548.21	111.53	5.915	0		
14,700.00	7,190.00	14,670.46	7,190.00	56.53	56.43	-90.17	659.75	546.84	112.91	5.843	0		
14,800.00	7,190.00	14,770.46	7,190.00	57.21	57.11	-90.17	659.75	545.47	114.28	5.773	0		
14,900.00	7,190.00	14,870.46	7,190.00	57.90	57.80	-90.17	659.75	544.09	115.65	5.705	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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				
15,000.00	7,190.00	14,970.46	7,190.00	58.59	58.49	-90.17	659.75	542.72	117.03	5.638	0					
15,100.00	7,190.00	15,070.46	7,190.00	59.27	59.18	-90.17	659.75	541.34	118.40	5.572	0					
15,200.00	7,190.00	15,170.46	7,190.00	59.96	59.86	-90.17	659.75	539.97	119.78	5.508	0					
15,300.00	7,190.00	15,270.46	7,190.00	60.65	60.55	-90.17	659.75	538.59	121.16	5.445	0					
15,400.00	7,190.00	15,370.46	7,190.00	61.34	61.24	-90.17	659.75	537.21	122.53	5.384	0					
15,500.00	7,190.00	15,470.46	7,190.00	62.02	61.93	-90.17	659.75	535.84	123.91	5.324	0					
15,600.00	7,190.00	15,570.46	7,190.00	62.71	62.62	-90.17	659.75	534.46	125.29	5.266	0					
15,700.00	7,190.00	15,670.46	7,190.00	63.40	63.31	-90.17	659.75	533.08	126.67	5.208	0					
15,800.00	7,190.00	15,770.46	7,190.00	64.09	64.00	-90.17	659.75	531.70	128.05	5.152	0					
15,900.00	7,190.00	15,870.46	7,190.00	64.78	64.69	-90.17	659.75	530.32	129.43	5.097	0					
16,000.00	7,190.00	15,970.46	7,190.00	65.47	65.38	-90.17	659.75	528.93	130.81	5.043	0					
16,100.00	7,190.00	16,070.46	7,190.00	66.16	66.07	-90.17	659.75	527.55	132.19	4.991	0					
16,200.00	7,190.00	16,170.46	7,190.00	66.85	66.76	-90.17	659.75	526.17	133.58	4.939	0					
16,300.00	7,190.00	16,270.46	7,190.00	67.54	67.45	-90.17	659.75	524.79	134.96	4.888	0					
16,400.00	7,190.00	16,370.46	7,190.00	68.24	68.15	-90.17	659.75	523.40	136.34	4.839	0					
16,500.00	7,190.00	16,470.46	7,190.00	68.93	68.84	-90.17	659.75	522.02	137.73	4.790	0					
16,600.00	7,190.00	16,570.46	7,190.00	69.62	69.53	-90.17	659.75	520.64	139.11	4.743	0					
16,700.00	7,190.00	16,670.46	7,190.00	70.31	70.22	-90.17	659.75	519.25	140.50	4.696	0					
16,800.00	7,190.00	16,770.46	7,190.00	71.00	70.92	-90.17	659.75	517.87	141.88	4.650	0					
16,900.00	7,190.00	16,870.46	7,190.00	71.70	71.61	-90.17	659.75	516.48	143.27	4.605	0					
17,000.00	7,190.00	16,970.46	7,190.00	72.39	72.30	-90.17	659.75	515.09	144.65	4.561	0					
17,100.00	7,190.00	17,070.46	7,190.00	73.08	73.00	-90.17	659.75	513.71	146.04	4.518	0					
17,200.00	7,190.00	17,170.46	7,190.00	73.77	73.69	-90.17	659.75	512.32	147.43	4.475	0					
17,229.30	7,190.00	17,199.76	7,190.00	73.98	73.89	-90.17	659.75	511.91	147.83	4.463	0					
17,254.82	7,190.00	17,219.06	7,190.00	74.15	74.03	-90.17	659.78	511.63	148.14	4.454	0	SF				



Schlumberger

Anticollision Risk Report



Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	-0.16	55.78						CC, ES	
100.00	100.00	98.00	98.00	0.15	0.14	-0.16	55.74	55.45	0.29	192.021	0			
200.00	200.00	198.00	198.00	0.32	0.32	-0.16	55.74	55.10	0.64	87.260	0			
300.00	300.00	298.00	298.00	0.50	0.49	-0.16	55.74	54.75	0.99	56.426	0			
400.00	400.00	398.00	398.00	0.67	0.67	-0.16	55.74	54.40	1.34	41.693	0			
500.00	500.00	498.00	498.00	0.84	0.84	-0.16	55.74	54.05	1.69	33.061	0			
600.00	600.00	598.00	598.00	1.02	1.02	-0.16	55.74	53.71	2.04	27.390	0			
700.00	700.00	698.00	698.00	1.19	1.19	-0.16	55.74	53.36	2.38	23.380	0			
800.00	800.00	798.00	798.00	1.37	1.36	-0.16	55.74	53.01	2.73	20.394	0			
900.00	899.98	897.98	897.98	1.54	1.54	136.84	57.00	53.92	3.08	18.497	0			
1,000.00	999.84	997.84	997.84	1.72	1.71	140.16	60.93	57.50	3.43	17.770	0			
1,100.00	1,099.45	1,098.77	1,098.75	1.90	1.89	143.67	66.89	63.12	3.78	17.718	0		CC, ES	
1,197.49	1,196.22	1,197.39	1,197.24	2.07	2.06	145.85	73.67	69.56	4.11	17.912	0			
1,200.00	1,198.70	1,199.93	1,199.77	2.07	2.07	145.89	73.86	69.73	4.12	17.918	0			
1,300.00	1,297.74	1,301.37	1,300.82	2.26	2.25	146.43	80.15	75.67	4.48	17.897	0			
1,400.00	1,396.78	1,401.48	1,400.32	2.44	2.42	145.69	85.10	80.27	4.83	17.604	0			
1,500.00	1,495.82	1,501.35	1,499.59	2.62	2.60	145.02	90.06	84.86	5.19	17.347	0			
1,600.00	1,594.86	1,601.22	1,598.86	2.80	2.78	144.41	95.02	89.47	5.55	17.123	0			
1,700.00	1,693.90	1,701.10	1,698.12	2.99	2.96	143.87	99.99	94.08	5.91	16.924	0			
1,800.00	1,792.94	1,800.97	1,797.39	3.17	3.14	143.37	104.97	98.70	6.27	16.748	0			
1,900.00	1,891.97	1,900.84	1,896.66	3.36	3.32	142.93	109.96	103.33	6.63	16.591	0			
2,000.00	1,991.01	2,000.71	1,995.93	3.55	3.50	142.52	114.95	107.96	6.99	16.449	0		CC, ES	
2,100.00	2,090.05	2,100.58	2,095.19	3.73	3.68	142.14	119.95	112.60	7.35	16.321	0			
2,200.00	2,189.09	2,200.46	2,194.46	3.92	3.86	141.80	124.95	117.24	7.71	16.205	0			
2,300.00	2,288.13	2,300.33	2,293.73	4.11	4.05	141.48	129.96	121.89	8.07	16.098	0			
2,400.00	2,387.17	2,400.20	2,392.99	4.29	4.23	141.18	134.97	126.53	8.43	16.001	0			
2,500.00	2,486.21	2,500.07	2,492.26	4.48	4.41	140.91	139.98	131.19	8.80	15.912	0			
2,600.00	2,585.25	2,599.94	2,591.53	4.67	4.59	140.65	145.00	135.84	9.16	15.829	0			
2,700.00	2,684.29	2,699.82	2,690.80	4.85	4.77	140.42	150.02	140.50	9.52	15.753	0			
2,800.00	2,783.33	2,799.69	2,790.06	5.04	4.96	140.19	155.04	145.16	9.89	15.682	0			
2,900.00	2,882.36	2,899.56	2,889.33	5.23	5.14	139.99	160.07	149.82	10.25	15.616	0			
3,000.00	2,981.40	2,999.43	2,988.60	5.42	5.32	139.79	165.09	154.48	10.61	15.555	0		CC, ES	
3,100.00	3,080.44	3,099.31	3,087.87	5.60	5.50	139.61	170.12	159.15	10.98	15.497	0			
3,200.00	3,179.48	3,199.18	3,187.13	5.79	5.69	139.43	175.15	163.81	11.34	15.443	0			
3,300.00	3,278.52	3,299.05	3,286.40	5.98	5.87	139.27	180.18	168.48	11.71	15.393	0			
3,400.00	3,377.56	3,398.92	3,385.67	6.17	6.05	139.11	185.22	173.15	12.07	15.345	0			
3,500.00	3,476.60	3,498.79	3,484.93	6.36	6.23	138.97	190.25	177.82	12.43	15.300	0			
3,600.00	3,575.64	3,598.67	3,584.20	6.55	6.42	138.83	195.29	182.49	12.80	15.258	0			
3,700.00	3,674.68	3,698.54	3,683.47	6.73	6.60	138.70	200.32	187.16	13.16	15.218	0			
3,800.00	3,773.71	3,798.41	3,782.74	6.92	6.78	138.57	205.36	191.83	13.53	15.180	0			
3,900.00	3,872.75	3,898.28	3,882.00	7.11	6.96	138.45	210.40	196.51	13.89	15.144	0			
4,000.00	3,971.79	3,998.15	3,981.27	7.30	7.15	138.34	215.44	201.18	14.26	15.110	0		CC, ES	
4,100.00	4,070.83	4,098.03	4,080.54	7.49	7.33	138.23	220.48	205.86	14.62	15.078	0			
4,200.00	4,169.87	4,197.90	4,179.81	7.67	7.51	138.12	225.52	210.53	14.99	15.047	0			
4,300.00	4,268.91	4,297.77	4,279.07	7.86	7.70	138.02	230.56	215.21	15.35	15.017	0			
4,400.00	4,367.95	4,397.64	4,378.34	8.05	7.88	137.93	235.60	219.89	15.72	14.989	0			
4,500.00	4,466.99	4,497.51	4,477.61	8.24	8.06	137.84	240.65	224.56	16.08	14.963	0			
4,600.00	4,566.03	4,597.39	4,576.87	8.43	8.25	137.75	245.69	229.24	16.45	14.937	0			
4,700.00	4,665.07	4,697.26	4,676.14	8.62	8.43	137.67	250.73	233.92	16.81	14.912	0			
4,800.00	4,764.10	4,797.13	4,775.41	8.81	8.61	137.58	255.78	238.60	17.18	14.889	0			
4,900.00	4,863.14	4,897.00	4,874.68	8.99	8.80	137.51	260.82	243.28	17.54	14.866	0			
5,000.00	4,962.18	4,996.87	4,973.94	9.18	8.98	137.43	265.87	247.96	17.91	14.845	0		CC, ES	
5,100.00	5,061.22	5,096.75	5,073.21	9.37	9.16	137.36	270.91	252.64	18.28	14.824	0			
5,200.00	5,160.26	5,196.62	5,172.48	9.56	9.34	137.29	275.96	257.32	18.64	14.804	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	5,259.30	5,296.49	5,271.74	9.75	9.53	137.22	281.01	262.00	19.01	14.785	0					
5,400.00	5,358.34	5,396.36	5,371.01	9.94	9.71	137.16	286.05	266.68	19.37	14.767	0					
5,500.00	5,457.38	5,496.23	5,470.28	10.13	9.89	137.10	291.10	271.37	19.74	14.749	0					
5,600.00	5,556.42	5,596.11	5,569.55	10.32	10.08	137.04	296.15	276.05	20.10	14.732	0					
5,700.00	5,655.45	5,695.98	5,668.81	10.50	10.26	136.98	301.20	280.73	20.47	14.715	0					
5,800.00	5,754.49	5,795.85	5,768.08	10.69	10.44	136.92	306.25	285.41	20.83	14.699	0					
5,900.00	5,853.53	5,895.72	5,867.35	10.88	10.63	136.87	311.30	290.10	21.20	14.684	0					
6,000.00	5,952.57	5,995.59	5,966.62	11.07	10.81	136.82	316.34	294.78	21.57	14.669	0					
6,105.61	6,057.16	6,101.07	6,071.45	11.27	11.00	136.76	321.68	299.72	21.95	14.654	0					
6,200.00	6,150.85	6,194.05	6,163.89	11.44	11.17	136.60	325.37	303.06	22.30	14.589	0					
6,300.00	6,250.45	6,289.08	6,258.56	11.62	11.34	136.40	327.93	305.27	22.65	14.477	0					
6,400.00	6,350.30	6,384.13	6,353.49	11.79	11.51	136.27	329.47	306.48	22.98	14.337	0					
6,503.10	6,453.38	6,484.04	6,453.38	11.96	11.68	0.42	329.99	306.85	23.13	14.265	0					
6,537.11	6,487.39	6,516.06	6,485.39	12.02	11.73	0.42	329.98	306.73	23.25	14.195	0					
6,603.10	6,553.38	6,582.04	6,551.38	12.13	11.84	0.42	329.98	306.51	23.47	14.059	0					
6,650.00	6,600.24	6,628.78	6,598.08	12.20	11.92	-89.60	329.98	306.19	23.79	13.869	0					
6,700.00	6,649.91	6,678.61	6,647.60	12.27	11.99	-89.63	329.98	306.03	23.94	13.781	0					
6,750.00	6,698.98	6,728.45	6,696.55	12.34	12.06	-89.67	329.98	305.89	24.09	13.698	0					
6,800.00	6,747.16	6,778.31	6,744.64	12.41	12.13	-89.70	329.97	305.75	24.23	13.621	0					
6,850.00	6,794.14	6,828.18	6,791.58	12.47	12.20	-89.74	329.97	305.62	24.36	13.548	0					
6,900.00	6,839.64	6,878.07	6,837.07	12.54	12.26	-89.78	329.97	305.49	24.48	13.479	0					
6,950.00	6,883.37	6,927.98	6,880.83	12.59	12.32	-89.82	329.97	305.37	24.60	13.412	0					
7,000.00	6,925.07	6,977.91	6,922.59	12.65	12.38	-89.86	329.97	305.25	24.72	13.347	0					
7,050.00	6,964.47	7,027.85	6,962.10	12.71	12.44	-89.90	329.97	305.13	24.84	13.282	0					
7,100.00	7,001.34	7,077.81	6,999.11	12.77	12.50	-89.94	329.97	305.00	24.97	13.215	0					
7,150.00	7,035.45	7,127.80	7,033.39	12.83	12.57	-89.99	329.97	304.87	25.10	13.146	0					
7,166.82	7,046.27	7,144.62	7,044.27	12.85	12.59	-90.00	329.97	304.82	25.15	13.122	0					
7,200.00	7,066.59	7,177.80	7,064.72	12.90	12.63	-90.03	329.97	304.73	25.24	13.073	0					
7,250.00	7,094.56	7,227.82	7,092.91	12.96	12.70	-90.07	329.97	304.58	25.39	12.996	0					
7,300.00	7,119.20	7,277.86	7,117.78	13.03	12.77	-90.11	329.97	304.42	25.55	12.914	0					
7,350.00	7,140.35	7,327.92	7,139.17	13.11	12.85	-90.16	329.97	304.24	25.73	12.825	0					
7,400.00	7,157.88	7,378.00	7,156.95	13.19	12.93	-90.20	329.97	304.05	25.92	12.730	0					
7,450.00	7,171.68	7,428.10	7,171.00	13.28	13.04	-90.24	329.97	303.84	26.13	12.628	0					
7,500.00	7,181.67	7,478.21	7,181.22	13.39	13.16	-90.27	329.97	303.62	26.36	12.519	0					
7,550.00	7,187.79	7,528.35	7,187.57	13.50	13.28	-90.31	329.98	303.37	26.60	12.404	0					
7,603.10	7,190.00	7,581.60	7,190.00	13.63	13.42	-90.35	329.98	303.10	26.88	12.276	0					
7,700.00	7,190.00	7,678.51	7,190.00	13.91	13.71	-90.35	329.98	302.54	27.43	12.028	0					
7,800.00	7,190.00	7,778.51	7,190.00	14.22	14.02	-90.35	329.98	301.91	28.06	11.759	0					
7,900.00	7,190.00	7,878.51	7,190.00	14.56	14.37	-90.35	329.98	301.23	28.74	11.480	0					
8,000.00	7,190.00	7,978.51	7,190.00	14.93	14.73	-90.35	329.98	300.50	29.48	11.194	0					
8,100.00	7,190.00	8,078.51	7,190.00	15.32	15.13	-90.35	329.98	299.72	30.26	10.905	0					
8,200.00	7,190.00	8,178.51	7,190.00	15.73	15.54	-90.35	329.98	298.89	31.08	10.616	0					
8,300.00	7,190.00	8,278.51	7,190.00	16.16	15.97	-90.35	329.98	298.02	31.95	10.328	0					
8,400.00	7,190.00	8,378.51	7,190.00	16.61	16.42	-90.35	329.97	297.12	32.85	10.044	0					
8,500.00	7,190.00	8,478.51	7,190.00	17.07	16.89	-90.35	329.97	296.18	33.79	9.765	0					
8,600.00	7,190.00	8,578.51	7,190.00	17.55	17.38	-90.35	329.97	295.21	34.76	9.492	0					
8,700.00	7,190.00	8,678.51	7,190.00	18.05	17.88	-90.35	329.97	294.21	35.76	9.227	0					
8,800.00	7,190.00	8,778.51	7,190.00	18.56	18.39	-90.35	329.97	293.19	36.79	8.970	0					
8,900.00	7,190.00	8,878.51	7,190.00	19.08	18.91	-90.35	329.97	292.14	37.84	8.721	0					
9,000.00	7,190.00	8,978.52	7,190.00	19.61	19.45	-90.35	329.97	291.06	38.91	8.481	0					
9,100.00	7,190.00	9,078.52	7,190.00	20.16	20.00	-90.35	329.97	289.97	40.00	8.249	0					
9,200.00	7,190.00	9,178.52	7,190.00	20.71	20.55	-90.35	329.97	288.85	41.11	8.026	0					
9,300.00	7,190.00	9,278.52	7,190.00	21.27	21.12	-90.35	329.97	287.72	42.24	7.811	0					
9,400.00	7,190.00	9,378.52	7,190.00	21.84	21.69	-90.35	329.97	286.58	43.39	7.605	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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		
9,500.00	7,190.00	9,478.52	7,190.00	22.42	22.27	-90.35	329.97	285.41	44.55	7.406	0			
9,600.00	7,190.00	9,578.52	7,190.00	23.00	22.86	-90.35	329.96	284.24	45.73	7.216	0			
9,700.00	7,190.00	9,678.52	7,190.00	23.59	23.45	-90.35	329.96	283.05	46.91	7.033	0			
9,800.00	7,190.00	9,778.52	7,190.00	24.19	24.05	-90.35	329.96	281.85	48.11	6.858	0			
9,900.00	7,190.00	9,878.52	7,190.00	24.79	24.66	-90.35	329.96	280.64	49.32	6.690	0			
10,000.00	7,190.00	9,978.52	7,190.00	25.40	25.27	-90.35	329.96	279.41	50.55	6.528	0			
10,100.00	7,190.00	10,078.52	7,190.00	26.01	25.88	-90.35	329.96	278.18	51.78	6.373	0			
10,200.00	7,190.00	10,178.52	7,190.00	26.63	26.50	-90.35	329.96	276.94	53.01	6.224	0			
10,300.00	7,190.00	10,278.52	7,190.00	27.25	27.12	-90.35	329.95	275.69	54.26	6.081	0			
10,400.00	7,190.00	10,378.52	7,190.00	27.88	27.75	-90.35	329.95	274.44	55.52	5.943	0			
10,500.00	7,190.00	10,478.52	7,190.00	28.51	28.38	-90.35	329.95	273.17	56.78	5.811	0			
10,600.00	7,190.00	10,578.52	7,190.00	29.14	29.02	-90.35	329.95	271.90	58.05	5.684	0			
10,700.00	7,190.00	10,678.52	7,190.00	29.77	29.65	-90.35	329.95	270.63	59.32	5.562	0			
10,800.00	7,190.00	10,778.52	7,190.00	30.41	30.29	-90.35	329.95	269.34	60.60	5.444	0			
10,900.00	7,190.00	10,878.52	7,190.00	31.05	30.94	-90.35	329.94	268.05	61.89	5.331	0			
11,000.00	7,190.00	10,978.52	7,190.00	31.70	31.58	-90.35	329.94	266.76	63.18	5.222	0			
11,100.00	7,190.00	11,078.52	7,190.00	32.34	32.23	-90.35	329.94	265.46	64.48	5.117	0			
11,200.00	7,190.00	11,178.52	7,190.00	32.99	32.88	-90.35	329.94	264.16	65.78	5.016	0			
11,300.00	7,190.00	11,278.52	7,190.00	33.64	33.53	-90.35	329.94	262.85	67.08	4.918	0			
11,400.00	7,190.00	11,378.52	7,190.00	34.30	34.19	-90.35	329.93	261.54	68.39	4.824	0			
11,500.00	7,190.00	11,478.52	7,190.00	34.95	34.84	-90.35	329.93	260.23	69.71	4.733	0			
11,600.00	7,190.00	11,578.52	7,190.00	35.61	35.50	-90.35	329.93	258.91	71.02	4.645	0			
11,700.00	7,190.00	11,678.52	7,190.00	36.27	36.16	-90.35	329.93	257.58	72.34	4.561	0			
11,800.00	7,190.00	11,778.52	7,190.00	36.93	36.82	-90.35	329.92	256.26	73.66	4.479	0			
11,900.00	7,190.00	11,878.52	7,190.00	37.59	37.49	-90.35	329.92	254.93	74.99	4.399	0			
12,000.00	7,190.00	11,978.52	7,190.00	38.25	38.15	-90.35	329.92	253.60	76.32	4.323	0			
12,100.00	7,190.00	12,078.52	7,190.00	38.91	38.82	-90.35	329.92	252.26	77.65	4.249	0			
12,200.00	7,190.00	12,178.52	7,190.00	39.58	39.49	-90.35	329.91	250.93	78.99	4.177	0			
12,300.00	7,190.00	12,278.52	7,190.00	40.25	40.15	-90.35	329.91	249.59	80.32	4.107	0			
12,400.00	7,190.00	12,378.52	7,190.00	40.92	40.82	-90.35	329.91	248.24	81.66	4.040	0			
12,500.00	7,190.00	12,478.52	7,190.00	41.59	41.49	-90.35	329.90	246.90	83.00	3.975	0			
12,600.00	7,190.00	12,578.52	7,190.00	42.26	42.17	-90.35	329.90	245.55	84.35	3.911	0			
12,700.00	7,190.00	12,678.52	7,190.00	42.93	42.84	-90.35	329.90	244.20	85.69	3.850	0			
12,800.00	7,190.00	12,778.52	7,190.00	43.60	43.51	-90.35	329.90	242.85	87.04	3.790	0			
12,900.00	7,190.00	12,878.52	7,190.00	44.28	44.19	-90.35	329.89	241.50	88.39	3.732	0			
13,000.00	7,190.00	12,978.52	7,190.00	44.95	44.86	-90.35	329.89	240.15	89.74	3.676	0			
13,100.00	7,190.00	13,078.52	7,190.00	45.63	45.54	-90.35	329.89	238.79	91.10	3.621	0			
13,200.00	7,190.00	13,178.52	7,190.00	46.30	46.22	-90.35	329.88	237.43	92.45	3.568	0			
13,300.00	7,190.00	13,278.52	7,190.00	46.98	46.89	-90.35	329.88	236.07	93.81	3.517	0			
13,400.00	7,190.00	13,378.52	7,190.00	47.66	47.57	-90.35	329.88	234.71	95.16	3.466	0			
13,500.00	7,190.00	13,478.52	7,190.00	48.34	48.25	-90.35	329.87	233.35	96.52	3.418	0			
13,600.00	7,190.00	13,578.52	7,190.00	49.01	48.93	-90.35	329.87	231.99	97.88	3.370	0			
13,700.00	7,190.00	13,678.52	7,190.00	49.69	49.61	-90.35	329.87	230.62	99.25	3.324	0			
13,800.00	7,190.00	13,778.52	7,190.00	50.38	50.30	-90.35	329.86	229.25	100.61	3.279	0			
13,900.00	7,190.00	13,878.52	7,190.00	51.06	50.98	-90.35	329.86	227.89	101.97	3.235	0			
14,000.00	7,190.00	13,978.53	7,190.00	51.74	51.66	-90.35	329.85	226.52	103.34	3.192	0			
14,100.00	7,190.00	14,078.53	7,190.00	52.42	52.34	-90.35	329.85	225.15	104.70	3.150	0			
14,200.00	7,190.00	14,178.53	7,190.00	53.10	53.03	-90.35	329.85	223.77	106.07	3.110	0			
14,300.00	7,190.00	14,278.53	7,190.00	53.79	53.71	-90.35	329.84	222.40	107.44	3.070	0			
14,400.00	7,190.00	14,378.53	7,190.00	54.47	54.40	-90.35	329.84	221.03	108.81	3.031	0			
14,500.00	7,190.00	14,478.53	7,190.00	55.16	55.08	-90.35	329.83	219.65	110.18	2.994	0			
14,600.00	7,190.00	14,578.53	7,190.00	55.84	55.77	-90.35	329.83	218.28	111.55	2.957	0			
14,700.00	7,190.00	14,678.53	7,190.00	56.53	56.45	-90.35	329.83	216.90	112.92	2.921	0			
14,800.00	7,190.00	14,778.53	7,190.00	57.21	57.14	-90.35	329.82	215.52	114.30	2.886	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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				
14,900.00	7,190.00	14,878.53	7,190.00	57.90	57.83	-90.35	329.82	214.15	115.67	2.851	0					
15,000.00	7,190.00	14,978.53	7,190.00	58.59	58.51	-90.35	329.81	212.77	117.05	2.818	0					
15,100.00	7,190.00	15,078.53	7,190.00	59.27	59.20	-90.35	329.81	211.39	118.42	2.785	0					
15,200.00	7,190.00	15,178.53	7,190.00	59.96	59.89	-90.35	329.80	210.01	119.80	2.753	0					
15,300.00	7,190.00	15,278.53	7,190.00	60.65	60.58	-90.35	329.80	208.63	121.17	2.722	0					
15,400.00	7,190.00	15,378.53	7,190.00	61.34	61.27	-90.35	329.79	207.24	122.55	2.691	0					
15,500.00	7,190.00	15,478.53	7,190.00	62.02	61.96	-90.35	329.79	205.86	123.93	2.661	0					
15,600.00	7,190.00	15,578.53	7,190.00	62.71	62.65	-90.35	329.79	204.48	125.31	2.632	0					
15,700.00	7,190.00	15,678.53	7,190.00	63.40	63.33	-90.35	329.78	203.09	126.69	2.603	0					
15,800.00	7,190.00	15,778.53	7,190.00	64.09	64.02	-90.35	329.78	201.71	128.07	2.575	0					
15,900.00	7,190.00	15,878.53	7,190.00	64.78	64.72	-90.35	329.77	200.32	129.45	2.547	0					
16,000.00	7,190.00	15,978.53	7,190.00	65.47	65.41	-90.35	329.77	198.94	130.83	2.521	0					
16,100.00	7,190.00	16,078.53	7,190.00	66.16	66.10	-90.35	329.76	197.55	132.21	2.494	0					
16,200.00	7,190.00	16,178.53	7,190.00	66.85	66.79	-90.35	329.76	196.16	133.59	2.468	0					
16,300.00	7,190.00	16,278.53	7,190.00	67.54	67.48	-90.35	329.75	194.77	134.98	2.443	0					
16,400.00	7,190.00	16,378.53	7,190.00	68.24	68.17	-90.35	329.75	193.38	136.36	2.418	0					
16,500.00	7,190.00	16,478.53	7,190.00	68.93	68.86	-90.35	329.74	192.00	137.74	2.394	0					
16,600.00	7,190.00	16,578.53	7,190.00	69.62	69.56	-90.35	329.73	190.61	139.13	2.370	0					
16,700.00	7,190.00	16,678.53	7,190.00	70.31	70.25	-90.35	329.73	189.22	140.51	2.347	0					
16,800.00	7,190.00	16,778.53	7,190.00	71.00	70.94	-90.35	329.72	187.82	141.90	2.324	0					
16,900.00	7,190.00	16,878.53	7,190.00	71.70	71.63	-90.35	329.72	186.43	143.28	2.301	0					
17,000.00	7,190.00	16,978.53	7,190.00	72.39	72.33	-90.35	329.71	185.04	144.67	2.279	0					
17,100.00	7,190.00	17,078.53	7,190.00	73.08	73.02	-90.35	329.71	183.65	146.06	2.257	0					
17,200.00	7,190.00	17,178.53	7,190.00	73.77	73.71	-90.35	329.70	182.26	147.44	2.236	0					
17,240.87	7,190.00	17,219.40	7,190.00	74.06	74.00	-90.35	329.70	181.69	148.01	2.228	0					
17,254.82	7,190.00	17,230.36	7,190.00	74.15	74.07	-90.35	329.71	181.53	148.18	2.225	0		SF			



Schlumberger

Anticollision Risk Report

PATHFINDER
A Schlumberger Company

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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				
0.00	0.00	0.00	0.00	0.00	0.00	-0.45	28.07					0				
100.00	100.00	99.00	99.00	0.15	0.15	-0.45	28.05	27.76	0.29	96.151	0					
200.00	200.00	199.00	199.00	0.32	0.32	-0.45	28.05	27.41	0.64	43.795	0					
300.00	300.00	299.00	299.00	0.50	0.49	-0.45	28.05	27.06	0.99	28.347	0					
400.00	400.00	399.00	399.00	0.67	0.67	-0.45	28.05	26.71	1.34	20.955	0					
500.00	500.00	499.00	499.00	0.84	0.84	-0.45	28.05	26.36	1.69	16.621	0					
600.00	600.00	599.00	599.00	1.02	1.02	-0.45	28.05	26.02	2.04	13.773	0					
700.00	700.00	699.00	699.00	1.19	1.19	-0.45	28.05	25.67	2.39	11.758	0					
800.00	800.00	799.00	799.00	1.37	1.37	-0.45	28.05	25.32	2.73	10.257	0		CC, ES			
900.00	899.98	898.98	898.98	1.54	1.54	137.73	29.32	26.24	3.08	9.509	0					
1,000.00	999.84	999.62	999.60	1.72	1.72	141.62	32.18	28.75	3.43	9.378	0					
1,100.00	1,099.45	1,100.39	1,100.23	1.90	1.89	144.18	35.47	31.70	3.78	9.387	0					
1,197.49	1,196.22	1,198.74	1,198.20	2.07	2.07	145.65	39.03	34.91	4.12	9.479	0					
1,200.00	1,198.70	1,201.27	1,200.72	2.07	2.07	145.68	39.12	35.00	4.13	9.481	0					
1,300.00	1,297.74	1,301.51	1,300.31	2.26	2.25	145.82	42.24	37.76	4.48	9.424	0					
1,400.00	1,396.78	1,401.47	1,399.60	2.44	2.43	145.82	45.25	40.41	4.84	9.354	0					
1,500.00	1,495.82	1,501.42	1,498.90	2.62	2.61	145.83	48.27	43.07	5.19	9.291	0					
1,600.00	1,594.86	1,601.38	1,598.19	2.80	2.79	145.83	51.28	45.73	5.55	9.235	0					
1,700.00	1,693.90	1,701.33	1,697.49	2.99	2.97	145.83	54.29	48.38	5.91	9.186	0					
1,800.00	1,792.94	1,801.29	1,796.78	3.17	3.15	145.84	57.31	51.04	6.27	9.141	0					
1,900.00	1,891.97	1,901.24	1,896.07	3.36	3.33	145.84	60.32	53.69	6.63	9.101	0					
2,000.00	1,991.01	2,001.19	1,995.37	3.55	3.52	145.84	63.33	56.35	6.99	9.064	0					
2,100.00	2,090.05	2,101.15	2,094.66	3.73	3.70	145.84	66.35	59.00	7.35	9.030	0					
2,200.00	2,189.09	2,201.10	2,193.96	3.92	3.88	145.85	69.36	61.65	7.71	9.000	0					
2,300.00	2,288.13	2,301.06	2,293.25	4.11	4.06	145.85	72.37	64.31	8.07	8.972	0					
2,400.00	2,387.17	2,401.01	2,392.54	4.29	4.25	145.85	75.39	66.96	8.43	8.946	0					
2,500.00	2,486.21	2,500.97	2,491.84	4.48	4.43	145.85	78.40	69.61	8.79	8.922	0					
2,600.00	2,585.25	2,600.92	2,591.13	4.67	4.61	145.85	81.41	72.27	9.15	8.900	0					
2,700.00	2,684.29	2,700.88	2,690.43	4.85	4.79	145.85	84.43	74.92	9.51	8.879	0					
2,800.00	2,783.33	2,800.83	2,789.72	5.04	4.98	145.85	87.44	77.57	9.87	8.860	0					
2,900.00	2,882.36	2,900.79	2,889.01	5.23	5.16	145.85	90.46	80.22	10.23	8.842	0					
3,000.00	2,981.40	3,000.74	2,988.31	5.42	5.34	145.86	93.47	82.88	10.59	8.825	0					
3,100.00	3,080.44	3,100.70	3,087.60	5.60	5.53	145.86	96.48	85.53	10.95	8.809	0					
3,200.00	3,179.48	3,200.65	3,186.90	5.79	5.71	145.86	99.50	88.18	11.31	8.794	0					
3,300.00	3,278.52	3,300.60	3,286.19	5.98	5.90	145.86	102.51	90.83	11.67	8.780	0					
3,400.00	3,377.56	3,400.56	3,385.48	6.17	6.08	145.86	105.52	93.49	12.04	8.767	0					
3,500.00	3,476.60	3,500.51	3,484.78	6.36	6.26	145.86	108.54	96.14	12.40	8.755	0					
3,600.00	3,575.64	3,600.47	3,584.07	6.55	6.45	145.86	111.55	98.79	12.76	8.743	0					
3,700.00	3,674.68	3,700.42	3,683.37	6.73	6.63	145.86	114.56	101.44	13.12	8.732	0					
3,800.00	3,773.71	3,800.38	3,782.66	6.92	6.81	145.86	117.58	104.10	13.48	8.721	0					
3,900.00	3,872.75	3,900.33	3,881.95	7.11	7.00	145.86	120.59	106.75	13.84	8.711	0					
4,000.00	3,971.79	4,000.29	3,981.25	7.30	7.18	145.86	123.60	109.40	14.20	8.702	0					
4,100.00	4,070.83	4,100.24	4,080.54	7.49	7.37	145.86	126.62	112.05	14.57	8.693	0					
4,200.00	4,169.87	4,200.20	4,179.83	7.67	7.55	145.86	129.63	114.70	14.93	8.684	0					
4,300.00	4,268.91	4,300.15	4,279.13	7.86	7.73	145.86	132.64	117.36	15.29	8.676	0					
4,400.00	4,367.95	4,400.10	4,378.42	8.05	7.92	145.87	135.66	120.01	15.65	8.668	0					
4,500.00	4,466.99	4,500.06	4,477.72	8.24	8.10	145.87	138.67	122.66	16.01	8.660	0					
4,600.00	4,566.03	4,600.01	4,577.01	8.43	8.29	145.87	141.69	125.31	16.37	8.653	0					
4,700.00	4,665.07	4,699.97	4,676.30	8.62	8.47	145.87	144.70	127.96	16.74	8.646	0					
4,800.00	4,764.10	4,799.92	4,775.60	8.81	8.66	145.87	147.71	130.62	17.10	8.639	0					
4,900.00	4,863.14	4,899.88	4,874.89	8.99	8.84	145.87	150.73	133.27	17.46	8.633	0					
5,000.00	4,962.18	4,999.83	4,974.19	9.18	9.02	145.87	153.74	135.92	17.82	8.627	0					
5,100.00	5,061.22	5,099.79	5,073.48	9.37	9.21	145.87	156.75	138.57	18.18	8.621	0					
5,200.00	5,160.26	5,199.74	5,172.77	9.56	9.39	145.87	159.77	141.22	18.54	8.615	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	5,259.30	5,299.70	5,272.07	9.75	9.58	145.87	162.78	143.87	18.91	8.610	0				
5,400.00	5,358.34	5,399.65	5,371.36	9.94	9.76	145.87	165.79	146.53	19.27	8.605	0				
5,500.00	5,457.38	5,499.61	5,470.66	10.13	9.94	145.87	168.81	149.18	19.63	8.600	0				
5,600.00	5,556.42	5,599.56	5,569.95	10.32	10.13	145.87	171.82	151.83	19.99	8.595	0				
5,700.00	5,655.45	5,699.51	5,669.24	10.50	10.31	145.87	174.83	154.48	20.35	8.590	0				
5,800.00	5,754.49	5,799.47	5,768.54	10.69	10.50	145.87	177.85	157.13	20.72	8.585	0				
5,900.00	5,853.53	5,899.42	5,867.83	10.88	10.68	145.87	180.86	159.78	21.08	8.581	0				
6,000.00	5,952.57	5,999.38	5,967.13	11.07	10.87	145.87	183.87	162.44	21.44	8.577	0				
6,105.61	6,057.16	6,104.94	6,071.99	11.27	11.06	145.87	187.06	165.24	21.82	8.572	0				
6,200.00	6,150.85	6,199.31	6,165.73	11.44	11.23	145.62	188.62	166.45	22.17	8.507	0				
6,300.00	6,250.45	6,299.26	6,265.02	11.62	11.42	144.75	187.49	164.96	22.53	8.320	0				
6,400.00	6,350.30	6,399.06	6,364.16	11.79	11.60	143.18	183.60	160.71	22.89	8.020	0				
6,503.10	6,453.38	6,500.00	6,464.44	11.96	11.79	5.00	176.91	153.58	23.33	7.583	0				
6,603.10	6,553.38	6,596.92	6,560.92	12.13	11.96	2.72	170.68	147.05	23.63	7.222	0				
6,650.00	6,600.24	6,641.88	6,605.77	12.20	12.04	-88.85	168.54	144.73	23.81	7.077	0				
6,700.00	6,649.91	6,689.54	6,653.37	12.27	12.12	-91.52	166.92	142.90	24.02	6.949	0				
6,742.25	6,691.43	6,729.48	6,693.27	12.33	12.19	-94.52	166.41	142.21	24.20	6.876	0				
6,750.00	6,698.98	6,736.76	6,700.55	12.34	12.20	-95.14	166.43	142.19	24.24	6.867	0				
6,800.00	6,747.16	6,783.36	6,747.14	12.41	12.28	-99.54	167.67	143.22	24.45	6.859	0				
6,850.00	6,794.14	6,829.36	6,793.14	12.47	12.36	-104.49	171.34	146.72	24.62	6.960	0				
6,900.00	6,839.64	6,874.86	6,838.64	12.54	12.44	-109.87	178.03	153.32	24.71	7.205	0				
6,950.00	6,883.37	6,918.59	6,882.37	12.59	12.51	-115.24	188.45	163.77	24.68	7.635	0				
7,000.00	6,925.07	6,969.50	6,933.22	12.65	12.59	-121.22	202.28	177.78	24.50	8.258	0				
7,050.00	6,964.47	7,023.31	6,986.63	12.71	12.67	-126.59	218.22	194.06	24.16	9.034	0				
7,100.00	7,001.34	7,080.27	7,042.35	12.77	12.75	-131.36	235.66	211.97	23.69	9.948	0				
7,150.00	7,035.45	7,140.87	7,100.22	12.83	12.83	-135.57	254.00	230.87	23.13	10.982	0				
7,200.00	7,066.59	7,205.61	7,159.87	12.90	12.92	-139.28	272.69	250.17	22.51	12.112	0				
7,250.00	7,094.56	7,275.06	7,220.65	12.96	13.00	-142.51	291.17	269.29	21.88	13.307	0				
7,300.00	7,119.20	7,349.72	7,281.52	13.03	13.09	-145.32	308.92	287.65	21.27	14.523	0				
7,350.00	7,140.35	7,430.06	7,340.87	13.11	13.19	-147.73	325.39	304.65	20.73	15.696	0				
7,400.00	7,157.88	7,516.30	7,396.47	13.19	13.30	-149.72	340.01	319.71	20.30	16.749	0				
7,450.00	7,171.68	7,608.36	7,445.42	13.28	13.43	-151.32	352.25	332.22	20.02	17.592	0				
7,500.00	7,181.67	7,705.64	7,484.38	13.39	13.59	-152.49	361.57	341.63	19.94	18.137	0				
7,550.00	7,187.79	7,806.97	7,510.06	13.50	13.79	-153.22	367.54	347.48	20.06	18.321	0				
7,603.10	7,190.00	7,917.08	7,519.99	13.63	14.06	-153.50	369.86	349.43	20.43	18.103	0				
7,700.00	7,190.00	8,015.29	7,520.00	13.91	14.34	-153.50	369.86	348.83	21.03	17.589	0				
7,800.00	7,190.00	8,115.29	7,520.00	14.22	14.66	-153.50	369.86	348.21	21.65	17.080	0				
7,900.00	7,190.00	8,215.29	7,520.00	14.56	14.99	-153.50	369.86	347.57	22.29	16.590	0				
8,000.00	7,190.00	8,315.29	7,520.00	14.93	15.35	-153.50	369.86	346.91	22.95	16.117	0				
8,100.00	7,190.00	8,415.29	7,520.00	15.32	15.74	-153.50	369.86	346.25	23.61	15.662	0				
8,200.00	7,190.00	8,515.29	7,520.00	15.73	16.14	-153.50	369.86	345.57	24.29	15.226	0				
8,300.00	7,190.00	8,615.29	7,520.00	16.16	16.57	-153.50	369.86	344.88	24.98	14.807	0				
8,400.00	7,190.00	8,715.29	7,520.00	16.61	17.01	-153.50	369.86	344.19	25.67	14.406	0				
8,500.00	7,190.00	8,815.29	7,520.00	17.07	17.47	-153.50	369.86	343.48	26.38	14.021	0				
8,600.00	7,190.00	8,915.29	7,520.00	17.55	17.95	-153.50	369.86	342.77	27.09	13.652	0				
8,700.00	7,190.00	9,015.29	7,520.00	18.05	18.44	-153.50	369.86	342.05	27.81	13.298	0				
8,800.00	7,190.00	9,115.29	7,520.00	18.56	18.94	-153.50	369.86	341.32	28.54	12.959	0				
8,900.00	7,190.00	9,215.29	7,520.00	19.08	19.46	-153.50	369.86	340.59	29.27	12.635	0				
9,000.00	7,190.00	9,315.29	7,520.00	19.61	19.99	-153.50	369.86	339.85	30.01	12.324	0				
9,100.00	7,190.00	9,415.29	7,520.00	20.16	20.52	-153.50	369.86	339.10	30.76	12.026	0				
9,200.00	7,190.00	9,515.29	7,520.00	20.71	21.07	-153.50	369.86	338.35	31.51	11.740	0				
9,300.00	7,190.00	9,615.29	7,520.00	21.27	21.63	-153.50	369.86	337.60	32.26	11.465	0				
9,400.00	7,190.00	9,715.29	7,520.00	21.84	22.19	-153.50	369.86	336.84	33.02	11.202	0				
9,500.00	7,190.00	9,815.29	7,520.00	22.42	22.77	-153.50	369.86	336.08	33.78	10.949	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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		
9,600.00	7,190.00	9,915.29	7,520.00	23.00	23.34	-153.50	369.86	335.31	34.55	10.706	0			
9,700.00	7,190.00	10,015.29	7,520.00	23.59	23.93	-153.50	369.86	334.54	35.32	10.473	0			
9,800.00	7,190.00	10,115.29	7,520.00	24.19	24.52	-153.50	369.86	333.77	36.09	10.249	0			
9,900.00	7,190.00	10,215.29	7,520.00	24.79	25.12	-153.50	369.86	332.99	36.86	10.033	0			
10,000.00	7,190.00	10,315.29	7,520.00	25.40	25.73	-153.50	369.86	332.22	37.64	9.825	0			
10,100.00	7,190.00	10,415.29	7,520.00	26.01	26.33	-153.50	369.86	331.43	38.43	9.625	0			
10,200.00	7,190.00	10,515.29	7,520.00	26.63	26.95	-153.50	369.86	330.65	39.21	9.433	0			
10,300.00	7,190.00	10,615.29	7,520.00	27.25	27.57	-153.50	369.86	329.86	40.00	9.247	0			
10,400.00	7,190.00	10,715.29	7,520.00	27.88	28.19	-153.50	369.86	329.07	40.79	9.068	0			
10,500.00	7,190.00	10,815.29	7,520.00	28.51	28.81	-153.50	369.86	328.28	41.58	8.896	0			
10,600.00	7,190.00	10,915.29	7,520.00	29.14	29.44	-153.50	369.86	327.49	42.37	8.729	0			
10,700.00	7,190.00	11,015.29	7,520.00	29.77	30.07	-153.50	369.86	326.70	43.16	8.569	0			
10,800.00	7,190.00	11,115.29	7,520.00	30.41	30.71	-153.50	369.86	325.90	43.96	8.413	0			
10,900.00	7,190.00	11,215.29	7,520.00	31.05	31.35	-153.50	369.86	325.10	44.76	8.263	0			
11,000.00	7,190.00	11,315.29	7,520.00	31.70	31.99	-153.50	369.86	324.30	45.56	8.118	0			
11,100.00	7,190.00	11,415.29	7,520.00	32.34	32.63	-153.50	369.86	323.50	46.36	7.978	0			
11,200.00	7,190.00	11,515.29	7,520.00	32.99	33.28	-153.50	369.86	322.70	47.16	7.842	0			
11,300.00	7,190.00	11,615.29	7,520.00	33.64	33.92	-153.50	369.86	321.89	47.97	7.710	0			
11,400.00	7,190.00	11,715.29	7,520.00	34.30	34.58	-153.50	369.86	321.09	48.77	7.583	0			
11,500.00	7,190.00	11,815.29	7,520.00	34.95	35.23	-153.50	369.86	320.28	49.58	7.460	0			
11,600.00	7,190.00	11,915.29	7,520.00	35.61	35.88	-153.50	369.86	319.47	50.39	7.340	0			
11,700.00	7,190.00	12,015.29	7,520.00	36.27	36.54	-153.50	369.86	318.66	51.20	7.224	0			
11,800.00	7,190.00	12,115.29	7,520.00	36.93	37.20	-153.50	369.86	317.85	52.01	7.111	0			
11,900.00	7,190.00	12,215.29	7,520.00	37.59	37.86	-153.50	369.86	317.04	52.82	7.002	0			
12,000.00	7,190.00	12,315.29	7,520.00	38.25	38.52	-153.50	369.86	316.23	53.63	6.896	0			
12,100.00	7,190.00	12,415.29	7,520.00	38.91	39.18	-153.50	369.86	315.41	54.45	6.793	0			
12,200.00	7,190.00	12,515.29	7,520.00	39.58	39.84	-153.50	369.86	314.60	55.26	6.693	0			
12,300.00	7,190.00	12,615.29	7,520.00	40.25	40.51	-153.50	369.86	313.78	56.08	6.596	0			
12,400.00	7,190.00	12,715.29	7,520.00	40.92	41.18	-153.50	369.86	312.97	56.89	6.501	0			
12,500.00	7,190.00	12,815.29	7,520.00	41.59	41.84	-153.50	369.86	312.15	57.71	6.409	0			
12,600.00	7,190.00	12,915.29	7,520.00	42.26	42.51	-153.50	369.86	311.33	58.53	6.319	0			
12,700.00	7,190.00	13,015.29	7,520.00	42.93	43.18	-153.50	369.86	310.51	59.35	6.232	0			
12,800.00	7,190.00	13,115.29	7,520.00	43.60	43.85	-153.50	369.86	309.70	60.16	6.148	0			
12,900.00	7,190.00	13,215.29	7,520.00	44.28	44.53	-153.50	369.86	308.88	60.98	6.065	0			
13,000.00	7,190.00	13,315.29	7,520.00	44.95	45.20	-153.50	369.86	308.06	61.80	5.984	0			
13,100.00	7,190.00	13,415.29	7,520.00	45.63	45.87	-153.50	369.86	307.23	62.62	5.906	0			
13,200.00	7,190.00	13,515.29	7,520.00	46.30	46.55	-153.50	369.86	306.41	63.45	5.829	0			
13,300.00	7,190.00	13,615.29	7,520.00	46.98	47.22	-153.50	369.86	305.59	64.27	5.755	0			
13,400.00	7,190.00	13,715.29	7,520.00	47.66	47.90	-153.50	369.86	304.77	65.09	5.682	0			
13,500.00	7,190.00	13,815.29	7,520.00	48.34	48.58	-153.50	369.86	303.95	65.91	5.611	0			
13,600.00	7,190.00	13,915.29	7,520.00	49.01	49.25	-153.50	369.86	303.12	66.74	5.542	0			
13,700.00	7,190.00	14,015.29	7,520.00	49.69	49.93	-153.50	369.86	302.30	67.56	5.474	0			
13,800.00	7,190.00	14,115.29	7,520.00	50.38	50.61	-153.50	369.86	301.47	68.39	5.408	0			
13,900.00	7,190.00	14,215.29	7,520.00	51.06	51.29	-153.50	369.86	300.65	69.21	5.344	0			
14,000.00	7,190.00	14,315.29	7,520.00	51.74	51.97	-153.50	369.86	299.82	70.04	5.281	0			
14,100.00	7,190.00	14,415.29	7,520.00	52.42	52.65	-153.50	369.86	299.00	70.86	5.219	0			
14,200.00	7,190.00	14,515.29	7,520.00	53.10	53.34	-153.50	369.86	298.17	71.69	5.159	0			
14,300.00	7,190.00	14,615.29	7,520.00	53.79	54.02	-153.50	369.86	297.34	72.52	5.100	0			
14,400.00	7,190.00	14,715.29	7,520.00	54.47	54.70	-153.50	369.86	296.52	73.34	5.043	0			
14,500.00	7,190.00	14,815.29	7,520.00	55.16	55.39	-153.50	369.86	295.69	74.17	4.987	0			
14,600.00	7,190.00	14,915.29	7,520.00	55.84	56.07	-153.50	369.86	294.86	75.00	4.932	0			
14,700.00	7,190.00	15,015.29	7,520.00	56.53	56.75	-153.50	369.86	294.03	75.83	4.878	0			
14,800.00	7,190.00	15,115.29	7,520.00	57.21	57.44	-153.50	369.86	293.20	76.65	4.825	0			
14,900.00	7,190.00	15,215.29	7,520.00	57.90	58.12	-153.50	369.86	292.38	77.48	4.773	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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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	Riskd Separation Factor	Probability of Collision				
15,000.00	7,190.00	15,315.29	7,520.00	58.59	58.81	-153.50	369.86	291.55	78.31	4.723	0					
15,100.00	7,190.00	15,415.29	7,520.00	59.27	59.50	-153.50	369.86	290.72	79.14	4.673	0					
15,200.00	7,190.00	15,515.29	7,520.00	59.96	60.18	-153.50	369.86	289.89	79.97	4.625	0					
15,300.00	7,190.00	15,615.29	7,520.00	60.65	60.87	-153.50	369.86	289.06	80.80	4.577	0					
15,400.00	7,190.00	15,715.29	7,520.00	61.34	61.56	-153.50	369.86	288.23	81.63	4.531	0					
15,500.00	7,190.00	15,815.29	7,520.00	62.02	62.24	-153.50	369.86	287.40	82.46	4.485	0					
15,600.00	7,190.00	15,915.29	7,520.00	62.71	62.93	-153.50	369.86	286.57	83.29	4.440	0					
15,700.00	7,190.00	16,015.29	7,520.00	63.40	63.62	-153.50	369.86	285.74	84.12	4.397	0					
15,800.00	7,190.00	16,115.29	7,520.00	64.09	64.31	-153.50	369.86	284.90	84.96	4.354	0					
15,836.53	7,190.00	16,151.82	7,520.00	64.34	64.56	-153.50	369.86	284.60	85.26	4.338	0					
15,900.00	7,190.00	16,215.29	7,520.00	64.78	65.00	-153.50	369.86	284.07	85.79	4.311	0					
16,000.00	7,190.00	16,315.29	7,520.00	65.47	65.69	-153.50	369.86	283.24	86.62	4.270	0					
16,100.00	7,190.00	16,415.29	7,520.00	66.16	66.38	-153.50	369.86	282.41	87.45	4.229	0					
16,200.00	7,190.00	16,515.29	7,520.00	66.85	67.07	-153.50	369.86	281.58	88.28	4.189	0					
16,300.00	7,190.00	16,615.29	7,520.00	67.54	67.76	-153.50	369.86	280.74	89.12	4.150	0					
16,400.00	7,190.00	16,715.29	7,520.00	68.24	68.45	-153.50	369.86	279.91	89.95	4.112	0					
16,500.00	7,190.00	16,815.29	7,520.00	68.93	69.14	-153.50	369.86	279.08	90.78	4.074	0					
16,600.00	7,190.00	16,915.29	7,520.00	69.62	69.83	-153.50	369.86	278.25	91.61	4.037	0					
16,700.00	7,190.00	17,015.29	7,520.00	70.31	70.52	-153.50	369.86	277.41	92.45	4.001	0					
16,800.00	7,190.00	17,115.29	7,520.00	71.00	71.21	-153.50	369.86	276.58	93.28	3.965	0					
16,900.00	7,190.00	17,215.29	7,520.00	71.70	71.90	-153.50	369.86	275.75	94.11	3.930	0					
17,000.00	7,190.00	17,315.29	7,520.00	72.39	72.60	-153.50	369.86	274.91	94.95	3.895	0					
17,100.00	7,190.00	17,415.29	7,520.00	73.08	73.29	-153.50	369.86	274.08	95.78	3.861	0					
17,200.00	7,190.00	17,515.30	7,520.00	73.77	73.98	-153.50	369.86	273.24	96.62	3.828	0					
17,241.31	7,190.00	17,556.61	7,520.00	74.06	74.27	-153.50	369.86	272.90	96.96	3.815	0					
17,254.82	7,190.00	17,568.49	7,520.00	74.15	74.35	-153.50	369.86	272.80	97.07	3.810	0	SF				

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Thornton 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
Reference Well:	Thornton 10	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 @ 5053.00usft (Xtreme 7 - 16')

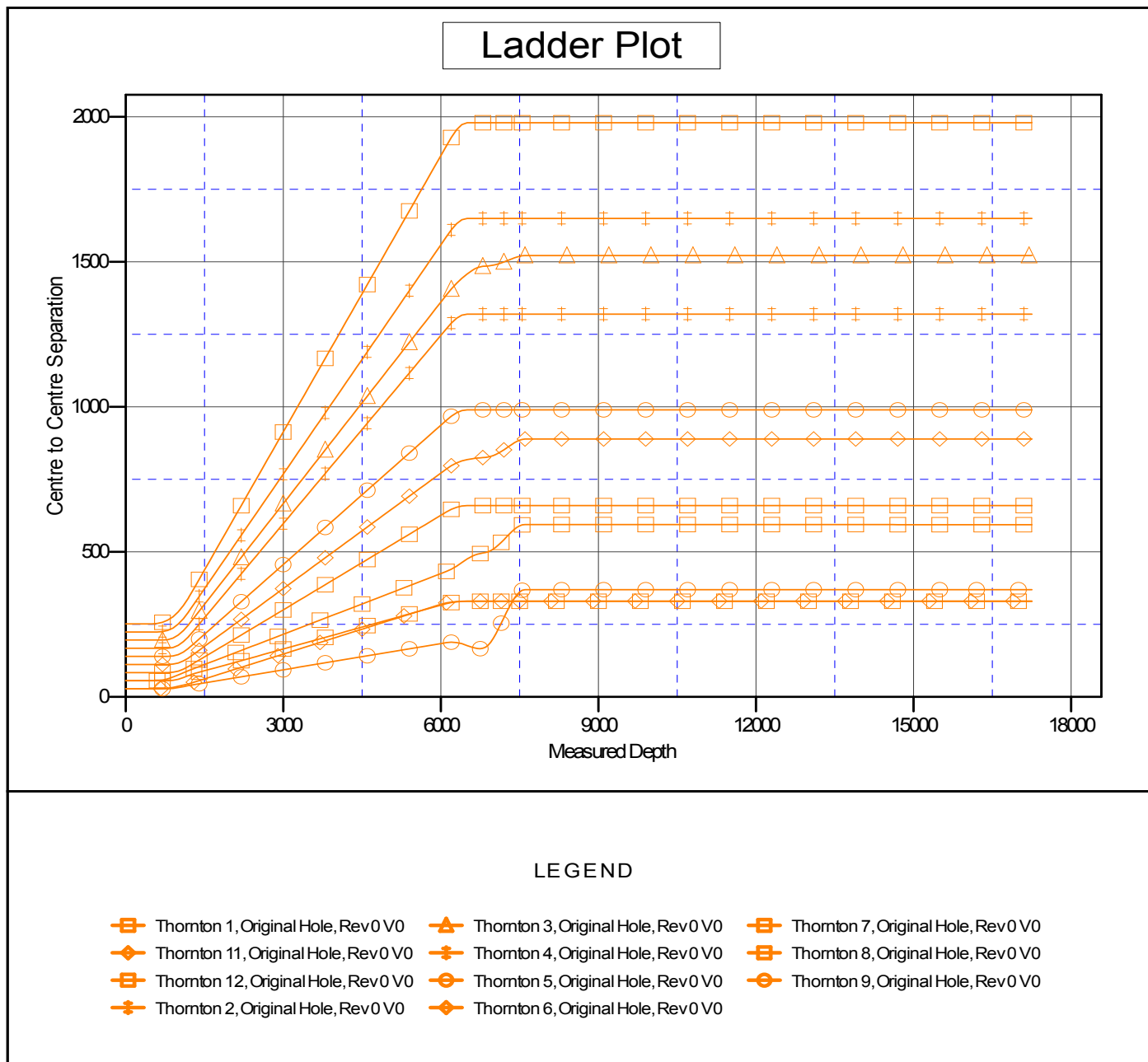
Offset Depths are relative to Offset Datum

Central Meridian is 105° 30' 0.000 W °

Coordinates are relative to: Thornton 10

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 10
Project:	Weld Co., Co	TVD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Reference Site:	Sec.08-T07N-R66W	MD Reference:	KB @ 5053.00usft (Xtreme 7 - 16')
Site Error:	0.00	North Reference:	Grid
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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 @ 5053.00usft (Xtreme 7 - 16')

Offset Depths are relative to Offset Datum

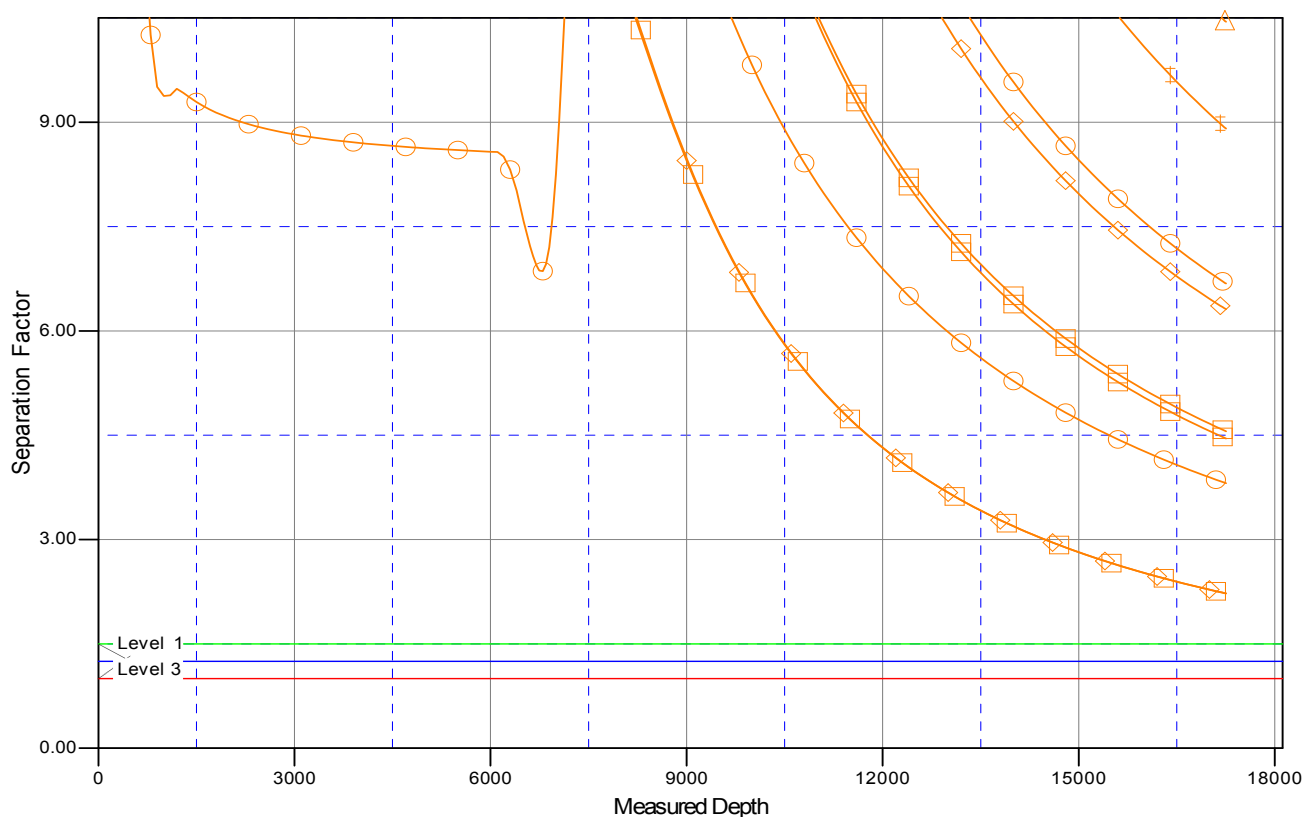
Central Meridian is 105° 30' 0.000 W °

Coordinates are relative to: Thornton 10

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 3, Original Hole, Rev0 V0 | Thornton 7, Original Hole, Rev0 V0 |
| Thornton 11, Original Hole, Rev0 V0 | Thornton 4, Original Hole, Rev0 V0 | Thornton 8, Original Hole, Rev0 V0 |
| Thornton 12, Original Hole, Rev0 V0 | Thornton 5, Original Hole, Rev0 V0 | Thornton 9, Original Hole, Rev0 V0 |
| Thornton 2, Original Hole, Rev0 V0 | Thornton 6, Original Hole, Rev0 V0 | |