

EXTRACTION OIL & GAS

**WELD COUNTY, COLORADO (NAD 83)
NW SE SEC. 32 T6N R65W 6th P.M.
WAKE NORTH 14**

**ORIGINAL WELLBORE
PROPOSAL #1**

Anticollision Report

30 June, 2016



Anticollision Report



Company:	EXTRACTION OIL & GAS	Local Co-ordinate Reference:	Well WAKE NORTH 14
Project:	WELD COUNTY, COLORADO (NAD 83)	TVD Reference:	KB-EST @ 4666.0usft (Original Well Elev)
Reference Site:	NW SE SEC. 32 T6N R65W 6th P.M.	MD Reference:	KB-EST @ 4666.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	WAKE NORTH 14	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDM 5000.1 Single User Db
Reference Design:	PROPOSAL #1	Offset TVD Reference:	Offset Datum

Reference	PROPOSAL #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD + Stations Interval 100.0usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0 us	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	30/06/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	17,500.7	PROPOSAL #1 (ORIGINAL WELLBORE)	MWD	MWD - Standard

Summary						
Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
NW NE SEC. 5 T5N R65W 6th P.M.						
DT-HABITAT C1-5-6 - ORIGINAL WELLBORE - PROPO	3,314.5	3,136.0	2,694.5	2,671.1	115.125	CC
DT-HABITAT C1-5-6 - ORIGINAL WELLBORE - PROPO	17,400.0	14,563.6	2,892.0	2,383.3	5.685	ES
DT-HABITAT C1-5-6 - ORIGINAL WELLBORE - PROPO	17,500.7	14,563.6	2,897.0	2,385.5	5.664	SF
DT-LOPEZ 2-5-6 - ORIGINAL WELLBORE - PROPOSAL	9,967.9	7,059.9	2,566.7	2,454.0	22.777	CC
DT-LOPEZ 2-5-6 - ORIGINAL WELLBORE - PROPOSAL	17,400.0	14,419.8	2,728.0	2,218.1	5.350	ES
DT-LOPEZ 2-5-6 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	14,419.8	2,732.9	2,220.2	5.331	SF
EXIST HZ DT-HABITAT 1-5-6 - Wellbore #1 - Wellbore #	2,213.0	2,032.0	2,652.3	2,641.9	255.669	CC
EXIST HZ DT-HABITAT 1-5-6 - Wellbore #1 - Wellbore #	17,400.0	14,475.0	3,073.0	2,568.0	6.085	ES
EXIST HZ DT-HABITAT 1-5-6 - Wellbore #1 - Wellbore #	17,500.7	14,475.0	3,079.2	2,571.3	6.064	SF
NW SE SEC. 32 T6N R65W 6th P.M.						
ABDN VERT MONFORT #1-31 - Wellbore #1 - Design #1	13,341.2	6,907.0	2,443.6	2,134.2	7.899	CC
ABDN VERT MONFORT #1-31 - Wellbore #1 - Design #1	13,400.0	6,907.0	2,444.3	2,133.3	7.861	ES
ABDN VERT MONFORT #1-31 - Wellbore #1 - Design #1	13,900.0	6,907.0	2,506.6	2,182.2	7.725	SF
EXIST DD MONFORT E #31-27 - Wellbore #1 - Wellbore	14,055.0	7,159.2	3,197.7	2,990.9	15.464	CC
EXIST DD MONFORT E #31-27 - Wellbore #1 - Wellbore	14,100.0	7,159.3	3,198.0	2,990.0	15.374	ES
EXIST DD MONFORT E #31-27 - Wellbore #1 - Wellbore	15,400.0	7,161.0	3,469.1	3,225.5	14.241	SF
EXIST DD THERMO #5-5-32 - Wellbore #1 - Wellbore #1	9,234.4	7,072.3	270.7	184.9	3.156	CC, ES, SF
EXIST HZ ISALND GROVE #2-32 - Wellbore #1 - Wellbore	11,234.0	8,830.5	49.2	-6.2	0.889	Level 1, CC, ES, SF
EXIST VERT ADAMS #1 - Wellbore #1 - Design #1	6,793.0	6,309.9	2,296.7	2,120.2	13.010	CC
EXIST VERT ADAMS #1 - Wellbore #1 - Design #1	6,850.0	6,366.7	2,297.2	2,119.5	12.926	ES
EXIST VERT ADAMS #1 - Wellbore #1 - Design #1	7,150.0	6,654.2	2,317.7	2,135.5	12.724	SF
EXIST VERT BUCKLEN #12-31 - Wellbore #1 - Design #1	16,890.4	6,897.0	260.6	-145.9	0.641	Level 1, CC, SF
EXIST VERT BUCKLEN #12-31 - Wellbore #1 - Design #1	16,900.0	6,897.0	260.8	-146.0	0.641	Level 1, ES
EXIST VERT BUCKLIN #11-31 - Wellbore #1 - Design #1	15,798.6	6,895.0	811.3	435.0	2.156	CC
EXIST VERT BUCKLIN #11-31 - Wellbore #1 - Design #1	15,800.0	6,895.0	811.3	434.9	2.156	ES, SF
EXIST VERT HARVEST #1 - Wellbore #1 - Design #1	5,036.0	4,720.7	1,095.0	966.8	8.540	CC
EXIST VERT HARVEST #1 - Wellbore #1 - Design #1	7,922.3	6,929.0	1,141.7	951.8	6.011	ES
EXIST VERT HARVEST #1 - Wellbore #1 - Design #1	8,000.0	6,929.0	1,144.4	953.9	6.010	SF
EXIST VERT HUNGENBERG #13-33 - Wellbore #1 - De	6,875.6	6,368.3	685.3	516.3	4.054	CC
EXIST VERT HUNGENBERG #13-33 - Wellbore #1 - De	6,900.0	6,392.6	685.6	516.2	4.046	ES, SF
EXIST VERT HUNGENBERG #14-33 - Wellbore #1 - De	6,893.2	6,376.8	1,985.3	1,809.9	11.320	CC
EXIST VERT HUNGENBERG #14-33 - Wellbore #1 - De	6,900.0	6,383.6	1,985.3	1,809.8	11.312	ES
EXIST VERT HUNGENBERG #14-33 - Wellbore #1 - De	7,050.0	6,530.1	1,992.7	1,815.0	11.214	SF
EXIST VERT JOHNSON OLY #1 - Wellbore #1 - Design	1,100.0	1,142.0	2,238.0	2,213.5	91.528	CC
EXIST VERT JOHNSON OLY #1 - Wellbore #1 - Design	9,500.0	6,942.0	2,348.6	2,135.3	11.011	ES
EXIST VERT JOHNSON OLY #1 - Wellbore #1 - Design	10,000.0	6,942.0	2,416.9	2,192.6	10.778	SF

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

Anticollision Report



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Site Error:	0.0 usft	North Reference:	True
Reference Well:	WAKE NORTH 14	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDM 5000.1 Single User Db
Reference Design:	PROPOSAL #1	Offset TVD Reference:	Offset Datum

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
NW SE SEC. 32 T6N R65W 6th P.M.						
EXIST VERT JOZ A #5-7-32 - Wellbore #1 - Design #1	9,052.2	6,890.0	1,529.0	1,325.0	7.495	CC
EXIST VERT JOZ A #5-7-32 - Wellbore #1 - Design #1	9,100.0	6,890.0	1,529.7	1,324.9	7.467	ES
EXIST VERT JOZ A #5-7-32 - Wellbore #1 - Design #1	9,300.0	6,890.0	1,548.9	1,340.2	7.422	SF
EXIST VERT STRONG #6-31 - Wellbore #1 - Design #1	15,969.4	6,901.0	1,074.2	693.1	2.819	CC
EXIST VERT STRONG #6-31 - Wellbore #1 - Design #1	16,000.0	6,901.0	1,074.6	692.7	2.813	ES
EXIST VERT STRONG #6-31 - Wellbore #1 - Design #1	16,100.0	6,901.0	1,082.1	697.4	2.813	SF
WAKE NORTH 1 - ORIGINAL WELLBORE - PROPOSAL	100.0	100.0	207.7	207.5	1,099.911	CC, ES
WAKE NORTH 1 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,676.8	2,969.6	2,409.4	5.301	SF
WAKE NORTH 10 - ORIGINAL WELLBORE - PROPOSAL	1,000.0	1,000.0	65.6	61.3	15.486	CC, ES
WAKE NORTH 10 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,463.4	988.7	421.2	1.742	SF
WAKE NORTH 11 - ORIGINAL WELLBORE - PROPOSAL	1,100.0	1,100.0	47.4	42.7	10.111	CC
WAKE NORTH 11 - ORIGINAL WELLBORE - PROPOSAL	1,200.0	1,199.8	47.8	42.7	9.350	ES
WAKE NORTH 11 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,470.7	661.6	92.8	1.163	Level 2, SF
WAKE NORTH 12 - ORIGINAL WELLBORE - PROPOSAL	1,100.0	1,100.0	32.8	28.1	7.000	CC
WAKE NORTH 12 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,641.0	525.4	-12.1	0.978	Level 1, ES, SF
WAKE NORTH 13 - ORIGINAL WELLBORE - PROPOSAL	1,100.0	1,100.0	18.2	13.5	3.889	CC
WAKE NORTH 13 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,504.9	330.7	-239.7	0.580	Level 1, ES, SF
WAKE NORTH 15 - ORIGINAL WELLBORE - PROPOSAL	1,045.5	1,045.5	14.8	10.4	3.345	CC
WAKE NORTH 15 - ORIGINAL WELLBORE - PROPOSAL	17,500.0	17,658.8	242.0	-162.4	0.598	Level 1, ES, SF
WAKE NORTH 16 - ORIGINAL WELLBORE - PROPOSAL	900.0	900.0	32.9	29.1	8.694	CC
WAKE NORTH 16 - ORIGINAL WELLBORE - PROPOSAL	17,500.0	17,501.1	331.6	-238.2	0.582	Level 1, ES, SF
WAKE NORTH 17 - ORIGINAL WELLBORE - PROPOSAL	800.0	800.0	47.4	44.1	14.223	CC, ES
WAKE NORTH 17 - ORIGINAL WELLBORE - PROPOSAL	17,500.0	17,522.3	659.6	90.0	1.158	Level 2, SF
WAKE NORTH 18 - ORIGINAL WELLBORE - PROPOSAL	700.0	700.0	62.0	59.1	21.482	CC, ES
WAKE NORTH 18 - ORIGINAL WELLBORE - PROPOSAL	17,500.0	17,705.3	910.4	351.8	1.630	SF
WAKE NORTH 19 - ORIGINAL WELLBORE - PROPOSAL	600.0	600.0	80.2	77.8	32.915	CC, ES
WAKE NORTH 19 - ORIGINAL WELLBORE - PROPOSAL	17,500.0	17,559.1	1,056.8	487.7	1.857	SF
WAKE NORTH 2 - ORIGINAL WELLBORE - PROPOSAL	200.0	200.0	193.1	192.4	302.484	CC, ES
WAKE NORTH 2 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,604.9	2,638.8	2,077.5	4.701	SF
WAKE NORTH 20 - ORIGINAL WELLBORE - PROPOSAL	500.0	500.0	94.8	92.8	47.693	CC, ES
WAKE NORTH 20 - ORIGINAL WELLBORE - PROPOSAL	17,500.0	17,577.1	1,224.4	655.7	2.153	SF
WAKE NORTH 21 - ORIGINAL WELLBORE - PROPOSAL	400.0	400.0	113.0	111.4	73.482	CC, ES
WAKE NORTH 21 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,797.5	1,562.6	998.0	2.768	SF
WAKE NORTH 22 - ORIGINAL WELLBORE - PROPOSAL	300.0	300.0	127.5	126.5	117.239	CC, ES
WAKE NORTH 22 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,663.1	1,720.1	1,151.8	3.027	SF
WAKE NORTH 23 - ORIGINAL WELLBORE - PROPOSAL	200.0	199.0	142.1	141.5	223.412	CC, ES
WAKE NORTH 23 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,715.3	1,960.6	1,392.6	3.452	SF
WAKE NORTH 24 - ORIGINAL WELLBORE - PROPOSAL	100.0	99.0	160.3	160.1	853.416	CC, ES
WAKE NORTH 24 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,904.2	2,135.7	1,570.4	3.778	SF
WAKE NORTH 3 - ORIGINAL WELLBORE - PROPOSAL	300.0	300.0	174.9	173.8	160.746	CC, ES
WAKE NORTH 3 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,739.5	2,481.7	1,921.8	4.433	SF
WAKE NORTH 4 - ORIGINAL WELLBORE - PROPOSAL	400.0	400.0	160.3	158.8	104.266	CC, ES
WAKE NORTH 4 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,560.0	2,308.1	1,745.6	4.104	SF
WAKE NORTH 5 - ORIGINAL WELLBORE - PROPOSAL	500.0	500.0	145.7	143.7	73.342	CC, ES
WAKE NORTH 5 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,509.2	1,980.9	1,417.4	3.515	SF
WAKE NORTH 6 - ORIGINAL WELLBORE - PROPOSAL	600.0	600.0	127.5	125.1	52.334	CC, ES
WAKE NORTH 6 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,652.9	1,822.5	1,261.7	3.250	SF
WAKE NORTH 7 - ORIGINAL WELLBORE - PROPOSAL	700.0	700.0	112.9	110.1	39.133	CC, ES
WAKE NORTH 7 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,484.3	1,650.2	1,085.3	2.922	SF
WAKE NORTH 8 - ORIGINAL WELLBORE - PROPOSAL	800.0	800.0	94.7	91.4	28.398	CC, ES
WAKE NORTH 8 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,462.4	1,319.5	753.4	2.331	SF
WAKE NORTH 9 - ORIGINAL WELLBORE - PROPOSAL	900.0	900.0	80.1	76.4	21.175	CC, ES
WAKE NORTH 9 - ORIGINAL WELLBORE - PROPOSAL	17,500.7	17,617.2	1,169.5	609.8	2.090	SF

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Anticollision Report



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Reference Well:	WAKE NORTH 14	Survey Calculation Method:	Minimum Curvature
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Reference Wellbore	ORIGINAL WELLBORE	Database:	EDM 5000.1 Single User Db
Reference Design:	PROPOSAL #1	Offset TVD Reference:	Offset Datum

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. 36 T6N R66W 6th P.M.						
HINER 36C-17W - ORIGINAL WELLBORE - ORIGINAL	17,500.7	6,845.0	3,003.1	2,695.1	9.749	CC, ES, SF
HINER 36C-20W - ORIGINAL WELLBORE - ORIGINAL	17,500.7	6,829.5	1,888.7	1,582.1	6.160	CC, ES, SF
HINER 36C-22W - ORIGINAL WELLBORE - ORIGINAL	17,500.7	6,913.5	1,254.1	948.1	4.099	CC, ES, SF
HINER 36C-24W - ORIGINAL WELLBORE - ORIGINAL	17,500.7	7,011.0	632.4	345.5	2.204	CC, ES, SF
HINER 36NB-19W - ORIGINAL WELLBORE - ORIGINAL	17,500.7	6,936.0	2,222.5	1,915.1	7.230	CC, ES, SF
HINER 36NB-21W - ORIGINAL WELLBORE - ORIGINAL	17,500.7	6,844.2	1,602.5	1,297.8	5.259	CC, ES, SF
HINER 36NB-23W - ORIGINAL WELLBORE - ORIGINAL	17,500.7	6,883.3	1,101.0	802.4	3.687	CC, ES, SF
HINER 36NC-18W - ORIGINAL WELLBORE - ORIGINAL	17,500.7	6,817.0	2,525.1	2,217.8	8.218	CC, ES, SF

Offset Design										NW NE SEC. 5 T5N R65W 6th P.M. - DT-HABITAT C1-5-6 - ORIGINAL WELLBORE - PROPOSAL #3				Offset Site Error:		0.0 usft
Survey Program: 0-MWD												Offset Well Error:		0.0 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 (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
0.0	0.0	0.0	0.0	0.0	0.0	169.40	-2,750.6	515.0	2,798.4							
100.0	100.0	91.9	91.9	0.1	0.1	169.40	-2,750.6	515.0	2,798.4	2,798.2	0.18	N/A				
200.0	200.0	191.9	191.9	0.3	0.3	169.40	-2,750.6	515.0	2,798.4	2,797.7	0.62	4,512.962				
300.0	300.0	291.9	291.9	0.5	0.5	169.40	-2,750.6	515.0	2,798.4	2,797.3	1.07	2,616.262				
400.0	400.0	391.9	391.9	0.8	0.8	169.40	-2,750.6	515.0	2,798.4	2,796.8	1.52	1,842.077				
500.0	500.0	491.9	491.9	1.0	1.0	169.40	-2,750.6	515.0	2,798.4	2,796.4	1.97	1,421.451				
600.0	600.0	591.9	591.9	1.2	1.2	169.40	-2,750.6	515.0	2,798.4	2,795.9	2.42	1,157.210				
700.0	700.0	691.9	691.9	1.4	1.4	169.40	-2,750.6	515.0	2,798.4	2,795.5	2.87	975.812				
800.0	800.0	791.9	791.9	1.7	1.6	169.40	-2,750.6	515.0	2,798.4	2,795.1	3.32	843.577				
900.0	900.0	891.9	891.9	1.9	1.9	169.40	-2,750.6	515.0	2,798.4	2,794.6	3.77	742.904				
1,000.0	1,000.0	991.9	991.9	2.1	2.1	169.40	-2,750.6	515.0	2,798.4	2,794.2	4.22	663.698				
1,100.0	1,100.0	1,091.9	1,091.9	2.3	2.3	169.40	-2,750.6	515.0	2,798.4	2,793.7	4.67	599.754				
1,200.0	1,200.0	1,191.9	1,191.9	2.6	2.5	74.30	-2,750.6	515.0	2,797.9	2,792.8	5.10	548.497				
1,300.0	1,299.8	1,291.7	1,291.7	2.8	2.8	74.43	-2,750.6	515.0	2,796.5	2,791.0	5.53	505.899				
1,400.0	1,399.5	1,391.4	1,391.4	3.0	3.0	74.65	-2,750.6	515.0	2,794.2	2,788.2	5.97	468.305				
1,500.0	1,498.7	1,490.6	1,490.6	3.2	3.2	74.95	-2,750.6	515.0	2,790.9	2,784.5	6.42	434.464				
1,600.0	1,597.5	1,589.4	1,589.4	3.5	3.4	75.33	-2,750.6	515.0	2,786.9	2,780.0	6.91	403.391				
1,602.6	1,600.0	1,591.9	1,591.9	3.5	3.4	75.34	-2,750.6	515.0	2,786.8	2,779.8	6.92	402.648				
1,700.0	1,695.6	1,687.5	1,687.5	3.8	3.7	75.80	-2,750.6	515.0	2,782.0	2,774.6	7.43	374.485				
1,800.0	1,793.1	1,785.0	1,785.0	4.1	3.9	76.35	-2,750.6	515.0	2,776.5	2,768.5	8.00	347.237				
1,900.0	1,889.6	1,881.5	1,881.5	4.6	4.1	76.97	-2,750.6	515.0	2,770.3	2,761.7	8.62	321.441				
2,000.0	1,985.3	1,977.2	1,977.2	5.0	4.3	77.67	-2,750.6	515.0	2,763.6	2,754.3	9.30	297.012				
2,100.0	2,079.8	2,071.7	2,071.7	5.6	4.5	78.44	-2,750.6	515.0	2,756.5	2,746.5	10.06	273.954				
2,200.0	2,173.2	2,165.1	2,165.1	6.2	4.7	79.27	-2,750.6	515.0	2,749.1	2,738.2	10.90	252.312				
2,300.0	2,265.2	2,257.1	2,257.1	6.9	4.9	80.16	-2,750.6	515.0	2,741.6	2,729.7	11.81	232.135				
2,400.0	2,355.8	2,347.7	2,347.7	7.7	5.1	81.10	-2,750.6	515.0	2,734.0	2,721.2	12.81	213.452				
2,481.7	2,428.7	2,420.6	2,420.6	8.5	5.3	81.91	-2,750.6	515.0	2,727.9	2,714.2	13.69	199.300				
2,500.0	2,445.0	2,436.9	2,436.9	8.6	5.3	82.06	-2,750.6	515.0	2,726.6	2,712.7	13.89	196.277				
2,600.0	2,533.6	2,525.5	2,525.5	9.5	5.5	82.92	-2,750.6	515.0	2,719.7	2,704.7	15.02	181.064				
2,700.0	2,622.2	2,614.1	2,614.1	10.5	5.7	83.78	-2,750.6	515.0	2,713.7	2,697.5	16.17	167.802				
2,800.0	2,710.7	2,702.6	2,702.6	11.4	5.9	84.65	-2,750.6	515.0	2,708.4	2,691.1	17.34	156.201				
2,900.0	2,799.3	2,791.2	2,791.2	12.4	6.1	85.52	-2,750.6	515.0	2,703.9	2,685.4	18.52	146.010				
3,000.0	2,887.9	2,879.8	2,879.8	13.4	6.3	86.39	-2,750.6	515.0	2,700.3	2,680.5	19.71	137.015				
3,100.0	2,976.5	2,968.4	2,968.4	14.4	6.5	87.26	-2,750.6	515.0	2,697.4	2,676.5	20.90	129.041				
3,200.0	3,065.1	3,049.8	3,049.8	15.4	6.7	88.07	-2,750.6	514.6	2,695.3	2,673.2	22.08	122.078				

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