

EXTRACTION OIL & GAS

Broomfield County

Sec 9-T1S-R68W

NORTHWEST A S20-25-10N

ORIGINAL WELLBORE

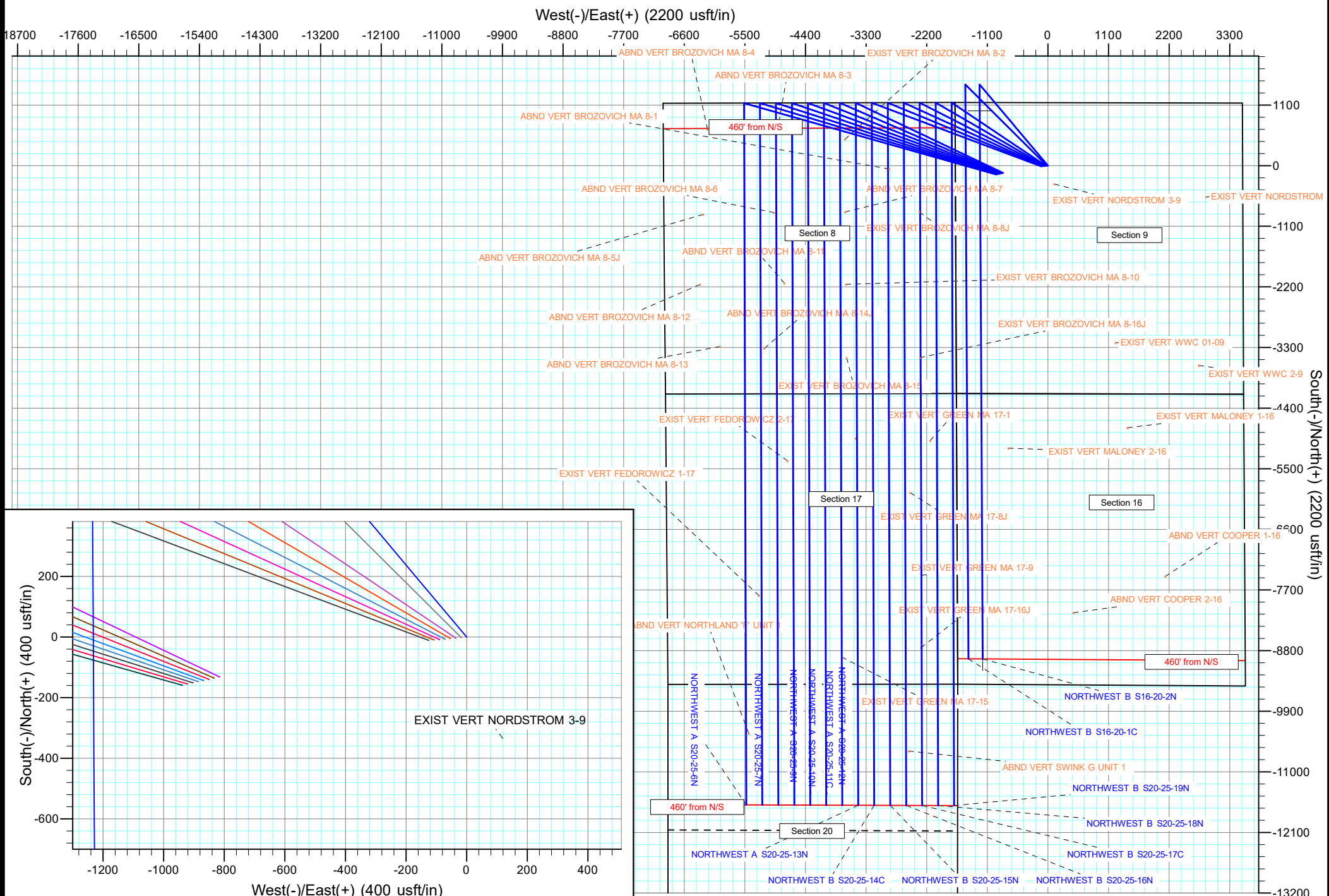
PROPOSAL 1

Anticollision Report

18 January, 2018



Project: Broomfield County
Site: Sec 9-T1S-R68W
Well: NORTHWEST B S16-20-2N
ORIGINAL WELLBORE
PROPOSAL 1



Anticollision Report

Company:	EXTRACTION OIL & GAS	Local Co-ordinate Reference:	Well NORTHWEST A S20-25-10N
Project:	Broomfield County	TVD Reference:	KB 25' @ 5318.00usft
Reference Site:	Sec 9-T1S-R68W	MD Reference:	KB 25' @ 5318.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	NORTHWEST A S20-25-10N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDT_32Bit_ODBC
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 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	1/4/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	21,701.04	PROPOSAL 1 (ORIGINAL WELLBORE)	MWD OWSG	OWSG MWD - Standard

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec 17-T1S-R68W						
EXIST VERT FEDOROWICZ 1-17 - Wellbore #1 - Design	17,898.58	8,026.95	915.99	604.73	2.943	CC
EXIST VERT FEDOROWICZ 1-17 - Wellbore #1 - Design	17,900.00	8,026.95	915.99	604.66	2.942	ES
EXIST VERT FEDOROWICZ 1-17 - Wellbore #1 - Design	18,000.00	8,026.95	921.59	606.39	2.924	SF
EXIST VERT FEDOROWICZ 2-17 - Wellbore #1 - Design	15,452.55	8,062.96	391.37	120.35	1.444	Level 3, CC
EXIST VERT FEDOROWICZ 2-17 - Wellbore #1 - Design	15,500.00	8,062.96	394.23	120.25	1.439	Level 3, ES, SF
EXIST VERT GREEN MA 17-1 - Wellbore #1 - Design #1	15,093.86	8,023.97	2,196.91	1,932.57	8.311	CC
EXIST VERT GREEN MA 17-1 - Wellbore #1 - Design #1	15,100.00	8,023.97	2,196.92	1,932.53	8.309	ES
EXIST VERT GREEN MA 17-1 - Wellbore #1 - Design #1	15,200.00	8,023.97	2,199.47	1,934.46	8.300	SF
EXIST VERT GREEN MA 17-15 - Wellbore #1 - Design #	19,000.00	7,988.94	581.95	251.74	1.762	ES, SF
EXIST VERT GREEN MA 17-15 - Wellbore #1 - Design #	19,019.39	7,988.94	581.63	251.93	1.764	CC
EXIST VERT GREEN MA 17-16J - Wellbore #1 - Design	18,852.55	7,972.94	2,018.31	1,691.80	6.181	CC, ES
EXIST VERT GREEN MA 17-16J - Wellbore #1 - Design	18,900.00	7,972.94	2,018.87	1,692.22	6.181	SF
EXIST VERT GREEN MA 17-2 - Wellbore #1 - Design #1	15,049.00	8,042.97	843.32	579.32	3.194	CC, ES, SF
EXIST VERT GREEN MA 17-8J - Wellbore #1 - Design #	16,039.70	8,007.96	1,834.81	1,555.25	6.563	CC, ES
EXIST VERT GREEN MA 17-8J - Wellbore #1 - Design #	16,100.00	8,007.96	1,835.81	1,556.03	6.562	SF
EXIST VERT GREEN MA 17-9 - Wellbore #1 - Design #1	17,538.31	7,983.95	2,034.99	1,730.69	6.688	CC, ES
EXIST VERT GREEN MA 17-9 - Wellbore #1 - Design #1	17,600.00	7,983.95	2,035.93	1,731.41	6.686	SF
Sec 20-T1S-R68W						
ABND VERT NORTHLAND 'F' UNIT 1 - Wellbore #1 - De	20,397.52	7,986.93	1,111.79	758.35	3.146	CC
ABND VERT NORTHLAND 'F' UNIT 1 - Wellbore #1 - De	20,400.00	7,986.93	1,111.79	758.25	3.145	ES
ABND VERT NORTHLAND 'F' UNIT 1 - Wellbore #1 - De	20,500.00	7,986.93	1,116.50	759.34	3.126	SF
ABND VERT SWINK G UNIT 1 - Wellbore #1 - Design #1	20,728.12	7,952.93	1,788.56	1,430.08	4.989	CC, ES, SF

Anticollision Report

Company:	EXTRACTION OIL & GAS	Local Co-ordinate Reference:	Well NORTHWEST A S20-25-10N
Project:	Broomfield County	TVD Reference:	KB 25' @ 5318.00usft
Reference Site:	Sec 9-T1S-R68W	MD Reference:	KB 25' @ 5318.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	NORTHWEST A S20-25-10N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDT_32Bit_ODBC
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 8-T1S-R68W						
ABND VERT BROZOVICH MA 8-1 - Wellbore #1 - Desig	4,872.61	4,263.06	614.65	485.95	4.776	CC
ABND VERT BROZOVICH MA 8-1 - Wellbore #1 - Desig	4,900.00	4,284.28	614.89	485.38	4.748	ES
ABND VERT BROZOVICH MA 8-1 - Wellbore #1 - Desig	5,000.00	4,361.76	619.90	487.69	4.689	SF
ABND VERT BROZOVICH MA 8-11 - Wellbore #1 - Desi	12,228.54	8,064.98	438.55	216.45	1.975	CC, ES, SF
ABND VERT BROZOVICH MA 8-12 - Wellbore #1 - Desi	12,248.45	8,058.98	1,971.58	1,882.35	22.095	CC
ABND VERT BROZOVICH MA 8-12 - Wellbore #1 - Desi	12,300.00	8,058.98	1,972.25	1,882.21	21.904	ES
ABND VERT BROZOVICH MA 8-12 - Wellbore #1 - Desi	13,100.00	8,058.98	2,147.62	2,041.50	20.237	SF
ABND VERT BROZOVICH MA 8-13 - Wellbore #1 - Desi	13,375.38	8,150.98	1,611.39	1,371.45	6.716	CC
ABND VERT BROZOVICH MA 8-13 - Wellbore #1 - Desi	13,400.00	8,150.98	1,611.58	1,371.07	6.701	ES
ABND VERT BROZOVICH MA 8-13 - Wellbore #1 - Desi	13,600.00	8,150.98	1,626.97	1,381.72	6.634	SF
ABND VERT BROZOVICH MA 8-14J - Wellbore #1 - Des	13,411.11	8,107.98	804.37	564.79	3.357	CC, ES
ABND VERT BROZOVICH MA 8-14J - Wellbore #1 - Des	13,500.00	8,107.98	809.27	566.84	3.338	SF
ABND VERT BROZOVICH MA 8-3 - Wellbore #1 - Desig	9,325.00	8,005.46	575.88	362.10	2.694	SF
ABND VERT BROZOVICH MA 8-3 - Wellbore #1 - Desig	9,425.00	8,007.81	559.32	353.78	2.721	ES
ABND VERT BROZOVICH MA 8-3 - Wellbore #1 - Desig	9,470.55	8,008.00	557.47	355.31	2.758	CC
ABND VERT BROZOVICH MA 8-4 - Wellbore #1 - Desig	9,175.00	7,905.95	1,839.27	1,632.53	8.896	SF
ABND VERT BROZOVICH MA 8-4 - Wellbore #1 - Desig	9,400.00	7,963.44	1,823.10	1,620.95	9.019	ES
ABND VERT BROZOVICH MA 8-4 - Wellbore #1 - Desig	9,433.87	7,964.98	1,822.79	1,621.41	9.051	CC
ABND VERT BROZOVICH MA 8-5J - Wellbore #1 - Desi	10,974.45	8,011.99	1,906.92	1,699.56	9.196	CC, ES
ABND VERT BROZOVICH MA 8-5J - Wellbore #1 - Desi	11,100.00	8,011.99	1,911.05	1,703.09	9.190	SF
ABND VERT BROZOVICH MA 8-6 - Wellbore #1 - Desig	10,900.00	8,031.99	622.28	413.90	2.986	SF
ABND VERT BROZOVICH MA 8-6 - Wellbore #1 - Desig	10,946.36	8,031.99	620.55	413.01	2.990	CC, ES
ABND VERT BROZOVICH MA 8-7 - Wellbore #1 - Desig	10,939.35	8,036.99	670.23	462.65	3.229	CC, ES
ABND VERT BROZOVICH MA 8-7 - Wellbore #1 - Desig	11,000.00	8,036.99	672.97	463.52	3.213	SF
EXIST VERT BROZOVICH MA 8-10 - Wellbore #1 - Des	12,254.43	8,106.02	682.34	592.87	7.626	CC, ES
EXIST VERT BROZOVICH MA 8-10 - Wellbore #1 - Des	12,300.00	8,106.02	683.86	594.03	7.613	SF
EXIST VERT BROZOVICH MA 8-15 - Wellbore #1 - Des	13,589.89	8,067.98	688.50	447.00	2.851	CC, ES, SF
EXIST VERT BROZOVICH MA 8-16J - Wellbore #1 - De	13,588.77	8,028.98	2,014.42	1,773.73	8.369	CC
EXIST VERT BROZOVICH MA 8-16J - Wellbore #1 - De	13,600.00	8,028.98	2,014.45	1,773.67	8.366	ES
EXIST VERT BROZOVICH MA 8-16J - Wellbore #1 - De	13,700.00	8,028.97	2,017.49	1,775.94	8.352	SF
EXIST VERT BROZOVICH MA 8-2 - Wellbore #1 - Desig	6,358.64	5,438.47	384.45	211.16	2.219	CC
EXIST VERT BROZOVICH MA 8-2 - Wellbore #1 - Desig	6,400.00	5,470.52	385.33	210.91	2.209	ES, SF
EXIST VERT BROZOVICH MA 8-8J - Wellbore #1 - Desi	3,638.25	3,332.64	1,157.80	1,064.98	12.473	CC
EXIST VERT BROZOVICH MA 8-8J - Wellbore #1 - Desi	3,700.00	3,380.49	1,158.46	1,063.84	12.243	ES
EXIST VERT BROZOVICH MA 8-8J - Wellbore #1 - Desi	11,300.00	8,021.99	2,046.51	1,833.67	9.616	SF

Anticollision Report

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Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDT_32Bit_ODBC
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 9-T1S-R68W						
EXIST VERT NORDSTROM 1-9 - Wellbore #1 - Design #	900.00	845.00	3,764.16	3,744.56	192.089	CC
EXIST VERT NORDSTROM 1-9 - Wellbore #1 - Design #	1,000.00	944.98	3,765.85	3,743.89	171.458	ES
EXIST VERT NORDSTROM 1-9 - Wellbore #1 - Design #	13,200.00	7,947.98	7,647.00	7,416.93	33.237	SF
EXIST VERT NORDSTROM 3-9 - Wellbore #1 - Design #	900.00	886.00	1,003.72	983.30	49.148	CC
EXIST VERT NORDSTROM 3-9 - Wellbore #1 - Design #	1,000.00	985.98	1,005.45	982.66	44.118	ES
EXIST VERT NORDSTROM 3-9 - Wellbore #1 - Design #	11,500.00	7,988.99	4,591.60	4,376.98	21.394	SF
EXIST VERT WWC 01-09 - Wellbore #1 - Design #1	900.00	853.00	3,717.14	3,697.39	188.142	CC
EXIST VERT WWC 01-09 - Wellbore #1 - Design #1	1,000.00	952.98	3,718.57	3,696.44	168.069	ES
EXIST VERT WWC 01-09 - Wellbore #1 - Design #1	14,700.00	7,955.97	5,734.70	5,483.61	22.839	SF
EXIST VERT WWC 2-9 - Wellbore #1 - Design #1	900.00	835.00	5,012.66	4,993.27	258.460	CC
EXIST VERT WWC 2-9 - Wellbore #1 - Design #1	1,000.00	934.98	5,014.26	4,992.50	230.408	ES
EXIST VERT WWC 2-9 - Wellbore #1 - Design #1	15,800.00	7,937.96	7,369.63	7,104.08	27.752	SF
NORTHWEST A S20-25-11C - ORIGINAL WELLBORE -	900.00	900.00	18.10	12.10	3.015	CC
NORTHWEST A S20-25-11C - ORIGINAL WELLBORE -	21,615.16	29,342.14	378.37	-81.92	0.822	Level 1, ES, SF
NORTHWEST A S20-25-12N - ORIGINAL WELLBORE -	900.00	900.00	36.21	30.20	6.030	CC, ES
NORTHWEST A S20-25-12N - ORIGINAL WELLBORE -	21,701.99	21,473.75	579.59	148.41	1.344	Level 3, SF
NORTHWEST A S20-25-13N - ORIGINAL WELLBORE -	900.00	900.00	54.04	48.03	8.999	CC, ES
NORTHWEST A S20-25-13N - ORIGINAL WELLBORE -	21,699.96	21,360.91	869.73	439.09	2.020	SF
NORTHWEST A S20-25-6N - ORIGINAL WELLBORE - P	100.00	100.00	71.79	71.52	267.012	CC, ES
NORTHWEST A S20-25-6N - ORIGINAL WELLBORE - P	21,702.00	22,182.19	1,160.66	728.62	2.686	SF
NORTHWEST A S20-25-7N - ORIGINAL WELLBORE - P	300.00	300.00	53.96	52.26	31.689	CC, ES
NORTHWEST A S20-25-7N - ORIGINAL WELLBORE - P	21,702.00	22,058.86	870.50	438.39	2.015	SF
NORTHWEST A S20-25-8C - ORIGINAL WELLBORE - P	500.00	500.00	35.85	32.72	11.431	CC, ES
NORTHWEST A S20-25-8C - ORIGINAL WELLBORE - P	21,702.00	22,120.34	629.53	230.93	1.579	SF
NORTHWEST A S20-25-9N - ORIGINAL WELLBORE - P	700.00	700.00	17.75	13.18	3.884	CC
NORTHWEST A S20-25-9N - ORIGINAL WELLBORE - P	21,702.00	21,815.17	290.14	-142.47	0.671	Level 1, ES, SF

Offset Design												Offset Site Error:	0.00 usft
Survey Program: 0-INC												Offset Well Error:	0.00 usft
Reference													
Offset													
Semi Major Axis													
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)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	24.00	24.00	0.00	0.28	-150.27	-7,659.55	-4,373.38	8,820.16				
100.00	100.00	124.00	124.00	0.13	1.71	-150.27	-7,659.55	-4,373.38	8,820.16	8,818.31	1.84	4,782.217	
200.00	200.00	224.00	224.00	0.49	3.96	-150.27	-7,659.55	-4,373.38	8,820.16	8,815.71	4.45	1,982.631	
300.00	300.00	324.00	324.00	0.85	6.03	-150.27	-7,659.55	-4,373.38	8,820.16	8,813.28	6.88	1,282.484	
400.00	400.00	424.00	424.00	1.21	8.07	-150.27	-7,659.55	-4,373.38	8,820.16	8,810.88	9.28	950.955	
500.00	500.00	524.00	524.00	1.57	10.09	-150.27	-7,659.55	-4,373.38	8,820.16	8,808.49	11.66	756.373	
600.00	600.00	624.00	624.00	1.93	12.11	-150.27	-7,659.55	-4,373.38	8,820.16	8,806.11	14.04	628.147	
700.00	700.00	724.00	724.00	2.29	14.13	-150.27	-7,659.55	-4,373.38	8,820.16	8,803.74	16.42	537.199	
800.00	800.00	824.00	824.00	2.64	16.15	-150.27	-7,659.55	-4,373.38	8,820.16	8,801.36	18.79	469.305	
900.00	900.00	924.00	924.00	3.00	18.17	-150.27	-7,659.55	-4,373.38	8,820.16	8,798.99	21.17	416.673	
1,000.00	999.98	1,023.98	1,023.98	3.36	20.18	-80.46	-7,659.55	-4,373.38	8,819.87	8,796.33	23.54	374.748	
1,100.00	1,099.84	1,123.84	1,123.84	3.71	22.19	-80.51	-7,659.55	-4,373.38	8,819.00	8,793.10	25.90	340.531	
1,200.00	1,199.45	1,223.45	1,223.45	4.07	24.20	-80.59	-7,659.55	-4,373.38	8,817.56	8,789.30	28.26	312.002	
1,300.00	1,298.70	1,322.70	1,322.70	4.44	26.19	-80.71	-7,659.55	-4,373.38	8,815.57	8,784.94	30.63	287.834	
1,400.00	1,397.47	1,421.47	1,421.47	4.82	28.18	-80.86	-7,659.55	-4,373.38	8,813.03	8,780.03	33.00	267.074	
1,500.00	1,495.62	1,519.62	1,519.62	5.23	30.16	-81.04	-7,659.55	-4,373.38	8,809.97	8,774.60	35.38	249.024	
1,600.00	1,593.06	1,617.06	1,617.06	5.66	32.12	-81.25	-7,659.55	-4,373.38	8,806.42	8,768.65	37.77	233.162	
1,700.00	1,689.64	1,713.64	1,713.64	6.13	34.06	-81.49	-7,659.55	-4,373.38	8,802.40	8,762.23	40.18	219.091	

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