EXTRACTION OIL & GAS

Broomfield County
Sec 7-T1S-R68W
LIVINGSTON S19-25-9N

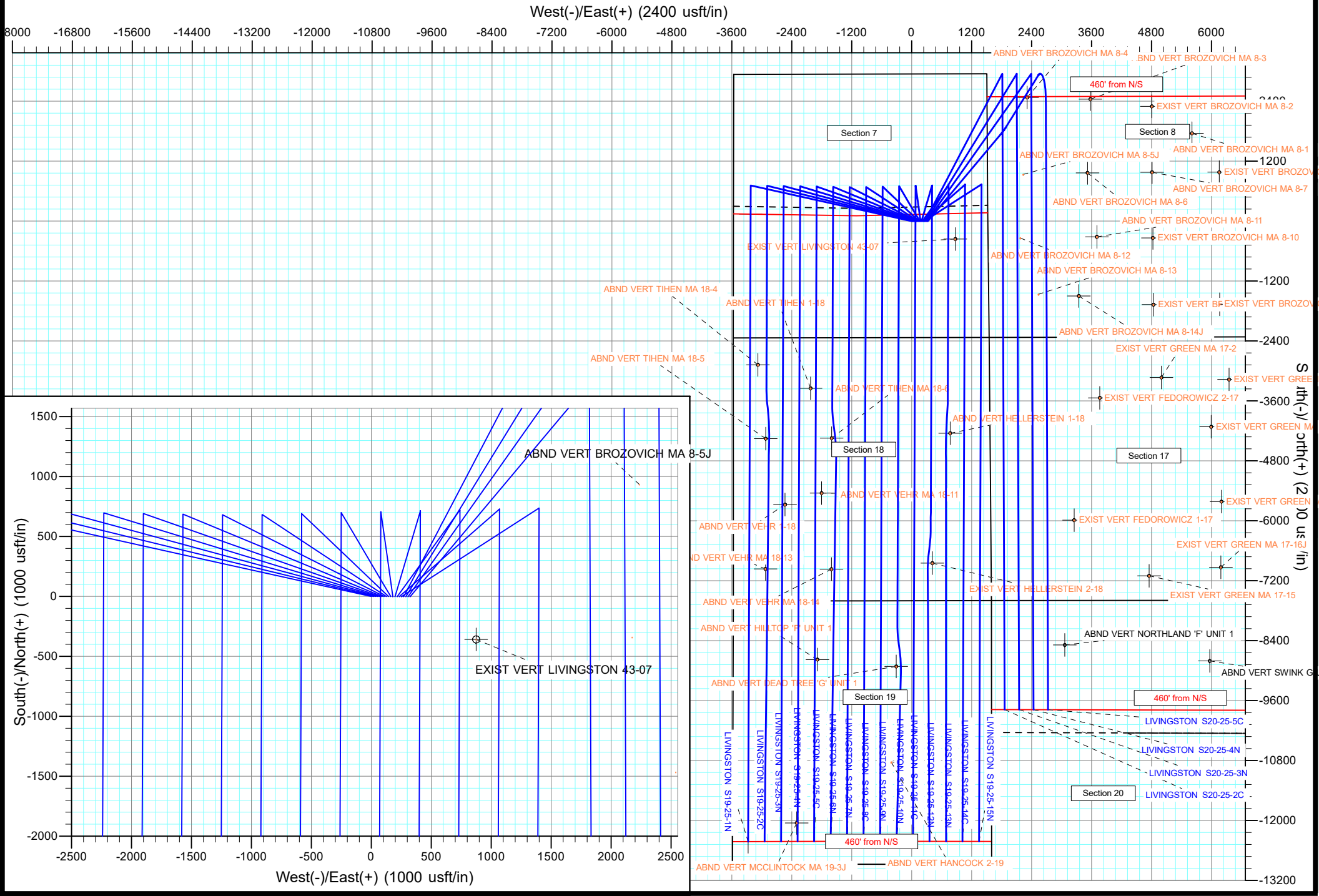
ORIGINAL WELLBORE
PROPOSAL 1

Anticollision Report

11 January, 2018

EXTRACTION Oil & Gas

Project: Broomfield County
Site: Sec 7-T1S-R68W
Well: LIVINGSTON S19-25-1N
ORIGINAL WELLBORE
PROPOSAL 1



Anticollision Report

Company:	EXTRACTION OIL & GAS	**Local Co-ordinate Reference:**	Well LIVINGSTON S19-25-9N
Project:	Broomfield County	**TVD Reference:**	KB 25' @ 5336.00usft
Reference Site:	Sec 7-T1S-R68W	**MD Reference:**	KB 25' @ 5336.00usft
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	LIVINGSTON S19-25-9N	**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** 1/11/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	20,998.10	PROPOSAL 1 (ORIGINAL WELLBORE)	MWD OWSG	OWSG 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
Sec 18-T1S-R68W						
ABND VERT HELLERSTEIN 1-18 - Wellbore #1 - Design	12,823.60	8,121.98	1,371.92	1,124.49	5.545	CC, ES
ABND VERT HELLERSTEIN 1-18 - Wellbore #1 - Design	12,900.00	8,121.98	1,374.04	1,125.88	5.537	SF
ABND VERT TIHEN 1-18 - Wellbore #1 - Design #1	11,934.56	8,083.99	1,426.23	1,194.05	6.143	CC, ES
ABND VERT TIHEN 1-18 - Wellbore #1 - Design #1	12,100.00	8,083.99	1,435.79	1,200.56	6.104	SF
ABND VERT TIHEN MA 18-4 - Wellbore #1 - Design #1	11,468.60	8,016.99	2,481.82	2,258.35	11.106	CC
ABND VERT TIHEN MA 18-4 - Wellbore #1 - Design #1	11,500.00	8,016.99	2,482.02	2,257.98	11.078	ES
ABND VERT TIHEN MA 18-4 - Wellbore #1 - Design #1	11,900.00	8,016.99	2,519.04	2,288.42	10.923	SF
ABND VERT TIHEN MA 18-5 - Wellbore #1 - Design #1	12,946.95	8,048.98	2,319.34	2,071.34	9.352	CC
ABND VERT TIHEN MA 18-5 - Wellbore #1 - Design #1	13,000.00	8,048.98	2,319.95	2,070.92	9.316	ES
ABND VERT TIHEN MA 18-5 - Wellbore #1 - Design #1	13,300.00	8,048.98	2,346.06	2,091.99	9.234	SF
ABND VERT TIHEN MA 18-6 - Wellbore #1 - Design #1	12,931.05	8,114.98	999.22	750.16	4.012	CC, ES
ABND VERT TIHEN MA 18-6 - Wellbore #1 - Design #1	13,000.00	8,114.98	1,001.60	751.07	3.998	SF
ABND VERT VEHR 1-18 - Wellbore #1 - Design #1	14,264.17	8,084.98	1,927.59	1,790.14	14.024	CC
ABND VERT VEHR 1-18 - Wellbore #1 - Design #1	14,300.00	8,084.98	1,927.92	1,789.74	13.952	ES
ABND VERT VEHR 1-18 - Wellbore #1 - Design #1	14,600.00	8,084.98	1,956.63	1,813.70	13.689	SF
ABND VERT VEHR MA 18-11 - Wellbore #1 - Design #1	14,031.92	8,107.98	1,196.87	929.46	4.476	CC, ES
ABND VERT VEHR MA 18-11 - Wellbore #1 - Design #1	14,100.00	8,107.98	1,198.80	929.96	4.459	SF
ABND VERT VEHR MA 18-13 - Wellbore #1 - Design #1	15,555.15	8,139.97	2,315.19	2,155.44	14.492	CC
ABND VERT VEHR MA 18-13 - Wellbore #1 - Design #1	15,600.00	8,139.97	2,315.63	2,154.97	14.414	ES
ABND VERT VEHR MA 18-13 - Wellbore #1 - Design #1	15,900.00	8,139.97	2,340.74	2,175.28	14.147	SF
ABND VERT VEHR MA 18-14 - Wellbore #1 - Design #1	15,553.82	8,119.97	994.60	700.93	3.387	CC, ES
ABND VERT VEHR MA 18-14 - Wellbore #1 - Design #1	15,600.00	8,119.97	995.67	700.97	3.379	SF
EXIST VERT HELLERSTEIN 2-18 - Wellbore #1 - Design	15,425.14	8,049.97	1,024.90	734.85	3.534	CC, ES, SF
Sec 19-T1S-R68W						
ABND VERT DEAD TREE 'G' UNIT 1 - Wellbore #1 - De	17,496.99	8,052.97	309.64	-16.34	0.950	Level 1, CC, ES, SF
ABND VERT HANCOCK 2-19 - Wellbore #1 - Design #1	19,413.43	8,028.96	218.88	-140.05	0.610	Level 1, CC, ES, SF
ABND VERT HILLTOP 'F' UNIT 1 - Wellbore #1 - Design	17,365.31	8,064.97	1,268.08	944.15	3.915	CC
ABND VERT HILLTOP 'F' UNIT 1 - Wellbore #1 - Design	17,400.00	8,064.97	1,268.55	943.86	3.907	ES, SF
ABND VERT MCCLINTOCK MA 19-3J - Wellbore #1 - De	20,638.01	8,057.95	1,670.66	1,289.71	4.386	CC
ABND VERT MCCLINTOCK MA 19-3J - Wellbore #1 - De	20,700.00	8,057.95	1,671.81	1,289.62	4.374	ES, SF

Anticollision Report

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Reference Site:	Sec 7-T1S-R68W	**MD Reference:**	KB 25' @ 5336.00usft
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	LIVINGSTON S19-25-9N	**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 Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Sec 7-T1S-R68W						
EXIST VERT LIVINGSTON 43-07 - Wellbore #1 - Design	900.00	912.00	813.72	792.78	38.866	CC
EXIST VERT LIVINGSTON 43-07 - Wellbore #1 - Design	1,000.00	1,011.98	815.38	792.08	34.985	ES
EXIST VERT LIVINGSTON 43-07 - Wellbore #1 - Design	9,000.00	8,070.00	1,460.79	1,266.94	7.536	SF
LIVINGSTON S19-25-10N - ORIGINAL WELLBORE - PR	900.00	900.00	17.94	11.93	2.987	CC
LIVINGSTON S19-25-10N - ORIGINAL WELLBORE - PR	20,998.12	20,992.55	330.20	-121.32	0.731	Level 1, ES, SF
LIVINGSTON S19-25-11C - ORIGINAL WELLBORE - PR	900.00	900.00	35.87	29.87	5.974	CC, ES
LIVINGSTON S19-25-11C - ORIGINAL WELLBORE - PR	20,998.12	21,213.28	703.91	273.71	1.636	SF
LIVINGSTON S19-25-12N - ORIGINAL WELLBORE - PR	900.00	900.00	53.81	47.80	8.961	CC, ES
LIVINGSTON S19-25-12N - ORIGINAL WELLBORE - PR	20,998.12	20,983.87	990.55	539.54	2.196	SF
LIVINGSTON S19-25-13N - ORIGINAL WELLBORE - PR	900.00	900.00	72.02	66.02	11.995	CC, ES
LIVINGSTON S19-25-13N - ORIGINAL WELLBORE - PR	20,998.12	21,018.26	1,320.60	869.48	2.927	SF
LIVINGSTON S19-25-14C - ORIGINAL WELLBORE - PR	900.00	900.00	89.96	83.95	14.982	CC, ES
LIVINGSTON S19-25-14C - ORIGINAL WELLBORE - PR	20,998.12	21,310.48	1,668.82	1,221.52	3.731	SF
LIVINGSTON S19-25-15N - ORIGINAL WELLBORE - PR	900.00	900.00	107.90	101.89	17.969	CC, ES
LIVINGSTON S19-25-15N - ORIGINAL WELLBORE - PR	20,998.12	21,136.91	1,980.90	1,530.04	4.394	SF
LIVINGSTON S19-25-1N - ORIGINAL WELLBORE - PR	0.00	25.00	144.05			
LIVINGSTON S19-25-1N - ORIGINAL WELLBORE - PR	100.00	123.83	144.15	143.79	405.142	ES
LIVINGSTON S19-25-1N - ORIGINAL WELLBORE - PR	20,998.12	21,728.66	2,641.26	2,188.66	5.836	SF
LIVINGSTON S19-25-2C - ORIGINAL WELLBORE - PR	105.56	130.56	126.11	125.71	316.620	CC
LIVINGSTON S19-25-2C - ORIGINAL WELLBORE - PR	200.00	223.97	126.21	125.14	117.807	ES
LIVINGSTON S19-25-2C - ORIGINAL WELLBORE - PR	20,998.12	91,946.54	2,321.05	653.70	1.392	Level 3, SF
LIVINGSTON S19-25-3N - ORIGINAL WELLBORE - PR	300.00	300.00	107.90	106.19	63.366	CC, ES
LIVINGSTON S19-25-3N - ORIGINAL WELLBORE - PR	20,998.12	21,466.68	1,980.86	1,528.86	4.382	SF
LIVINGSTON S19-25-4N - ORIGINAL WELLBORE - PR	400.00	400.00	89.96	87.54	37.178	CC, ES
LIVINGSTON S19-25-4N - ORIGINAL WELLBORE - PR	20,998.12	21,359.36	1,650.61	1,198.86	3.654	SF
LIVINGSTON S19-25-5C - ORIGINAL WELLBORE - PR	500.00	500.00	72.02	68.89	22.962	CC, ES
LIVINGSTON S19-25-5C - ORIGINAL WELLBORE - PR	20,998.12	21,484.54	1,342.95	899.00	3.025	SF
LIVINGSTON S19-25-6N - ORIGINAL WELLBORE - PR	600.00	600.00	54.09	50.23	14.036	CC, ES
LIVINGSTON S19-25-6N - ORIGINAL WELLBORE - PR	20,998.12	21,154.92	990.19	538.90	2.194	SF
LIVINGSTON S19-25-7N - ORIGINAL WELLBORE - PR	700.00	700.00	36.15	31.58	7.910	CC, ES
LIVINGSTON S19-25-7N - ORIGINAL WELLBORE - PR	20,998.12	21,081.09	660.27	209.00	1.463	Level 3, SF
LIVINGSTON S19-25-8C - ORIGINAL WELLBORE - PR	800.00	800.00	17.94	12.65	3.392	CC, ES
LIVINGSTON S19-25-8C - ORIGINAL WELLBORE - PR	20,998.12	21,268.04	410.41	30.60	1.081	Level 2, SF
LIVINGSTON S20-25-2C - ORIGINAL WELLBORE - PR	400.00	400.00	125.83	123.41	52.003	CC, ES
LIVINGSTON S20-25-2C - ORIGINAL WELLBORE - PR	18,500.00	21,633.46	2,497.79	2,120.77	6.625	SF
LIVINGSTON S20-25-3N - ORIGINAL WELLBORE - PR	300.00	300.00	144.05	142.34	84.597	CC, ES
LIVINGSTON S20-25-3N - ORIGINAL WELLBORE - PR	18,600.00	21,479.55	2,782.69	2,402.91	7.327	SF
LIVINGSTON S20-25-4N - ORIGINAL WELLBORE - PR	200.00	200.00	161.98	161.00	164.315	CC, ES
LIVINGSTON S20-25-4N - ORIGINAL WELLBORE - PR	18,600.00	21,546.10	3,071.81	2,691.92	8.086	SF
LIVINGSTON S20-25-5C - ORIGINAL WELLBORE - PR	100.00	100.00	179.92	179.65	669.205	CC, ES
LIVINGSTON S20-25-5C - ORIGINAL WELLBORE - PR	18,700.00	21,756.63	3,378.83	2,998.58	8.886	SF

Offset Design Sec 18-T1S-R68W - ABND VERT HELLERSTEIN 1-18 - Wellbore #1 - Design #1

Offset Site Error: 0.00 usft

Survey Program: 0-INC

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	64.00	64.00	0.00	0.76	171.58	-4,245.23	628.41	4,291.49				
100.00	100.00	164.00	164.00	0.13	2.65	171.58	-4,245.23	628.41	4,291.49	4,288.70	2.79	1,540.043	
200.00	200.00	264.00	264.00	0.49	4.81	171.58	-4,245.23	628.41	4,291.49	4,286.19	5.30	809.610	
300.00	300.00	364.00	364.00	0.85	6.86	171.58	-4,245.23	628.41	4,291.49	4,283.77	7.71	556.290	

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