EXTRACTION OIL & GAS

WELD COUNTY, COLORADO (NAD 83)
NW SW SEC. 21 T2N R67W 6th P.M.
LEONARD 1C

ORIGINAL WELLBORE
PROPOSAL #1

Anticollision Report

27 March, 2017

Company:	EXTRACTION OIL & GAS	**Local Co-ordinate Reference:**	Well LEONARD 1C - Slot LEONARD 1C
Project:	WELD COUNTY, COLORADO (NAD 83)	**TVD Reference:**	KB-EST @ 5016.0usft (Original Well Elev)
Reference Site:	NW SW SEC. 21 T2N R67W 6th P.M.	**MD Reference:**	KB-EST @ 5016.0usft (Original Well Elev)
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	LEONARD 1C	**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** 22/11/2016

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	12,499.3	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 SW SEC. 21 T2N R67W 6th P.M.						
ABDN VERT BERNARD E TEETS B6 - Wellbore #1 - De	4,334.0	4,192.2	888.6	786.9	8.738	CC
ABDN VERT BERNARD E TEETS B6 - Wellbore #1 - De	5,300.0	5,135.0	891.2	776.0	7.732	ES, SF
ABDN VERT BERNARD E TEETS B9 - Wellbore #1 - De	100.0	87.0	1,798.3	1,798.2	10,000.000	CC
ABDN VERT BERNARD E TEETS B9 - Wellbore #1 - De	700.0	682.7	1,804.3	1,791.1	136.451	ES
ABDN VERT BERNARD E TEETS B9 - Wellbore #1 - De	5,300.0	5,173.0	2,065.5	1,949.0	17.723	SF
EXIST HZ TROUDT #2 - Wellbore #1 - Wellbore #1	7,225.5	18,091.0	2,734.4	2,535.6	13.755	ES, SF
EXIST HZ TROUDT #2 - Wellbore #1 - Wellbore #1	7,533.5	18,091.0	2,706.1	2,663.4	63.290	CC
EXIST HZ TROUDT 1 - Wellbore #1 - Wellbore #1	7,225.5	17,860.0	2,653.2	2,454.3	13.340	ES, SF
EXIST HZ TROUDT 1 - Wellbore #1 - Wellbore #1	7,501.5	17,860.0	2,640.0	2,592.5	55.630	CC
EXIST VERT BERNARD E TEETS #2 - Wellbore #1 - De	4,290.0	4,176.2	1,459.7	1,358.8	14.465	CC
EXIST VERT BERNARD E TEETS #2 - Wellbore #1 - De	7,250.0	7,130.5	1,461.9	1,296.9	8.860	ES
EXIST VERT BERNARD E TEETS #2 - Wellbore #1 - De	7,300.0	7,180.3	1,464.9	1,299.4	8.853	SF
EXIST VERT ELKHORN COMPANY B2 - Wellbore #1 - I	8,325.5	7,705.0	789.3	609.9	4.400	CC, ES
EXIST VERT ELKHORN COMPANY B2 - Wellbore #1 - I	8,400.0	7,705.0	792.8	612.1	4.388	SF
EXIST VERT ELKHORN COMPANY B5 - Wellbore #1 - I	5,500.0	5,210.0	3,669.9	3,550.1	30.627	SF
EXIST VERT ELKHORN COMPANY B5 - Wellbore #1 - I	11,144.1	5,210.0	2,629.1	2,561.5	38.887	CC, ES
EXIST VERT ELKHORN COMPANY B7 - Wellbore #1 - I	695.5	719.2	1,994.0	1,978.5	128.171	CC
EXIST VERT ELKHORN COMPANY B7 - Wellbore #1 - I	1,800.0	1,799.6	2,007.2	1,965.0	47.583	ES
EXIST VERT ELKHORN COMPANY B7 - Wellbore #1 - I	5,400.0	5,230.0	2,159.5	2,040.7	18.167	SF
EXIST VERT ELKHORN COMPANY B9 - Wellbore #1 - I	12,475.4	5,216.0	2,641.7	2,554.2	30.187	CC
EXIST VERT ELKHORN COMPANY B9 - Wellbore #1 - I	12,499.3	5,216.0	2,641.8	2,554.1	30.099	ES, SF
EXIST VERT HORST 44-21 - Wellbore #1 - Design #1	12,165.8	5,220.0	3,179.5	3,037.0	22.310	CC
EXIST VERT HORST 44-21 - Wellbore #1 - Design #1	12,200.0	5,220.0	3,179.7	3,036.6	22.217	ES
EXIST VERT HORST 44-21 - Wellbore #1 - Design #1	12,499.3	5,220.0	3,196.9	3,048.5	21.531	SF
EXIST VERT JOHN HORST 43-21 - Wellbore #1 - Desig	12,287.3	5,240.0	2,619.6	2,543.6	34.480	CC
EXIST VERT JOHN HORST 43-21 - Wellbore #1 - Desig	12,300.0	5,240.0	2,619.6	2,543.5	34.423	ES
EXIST VERT JOHN HORST 43-21 - Wellbore #1 - Desig	12,499.3	5,240.0	2,628.2	2,550.0	33.646	SF
EXIST VERT LEONARD 13-21 - Wellbore #1 - Design #1	100.0	95.0	176.4	176.3	1,868.482	CC
EXIST VERT LEONARD 13-21 - Wellbore #1 - Design #1	200.0	195.0	177.3	175.9	122.752	ES
EXIST VERT LEONARD 13-21 - Wellbore #1 - Design #1	5,300.0	5,200.0	987.5	865.4	8.083	SF
EXIST VERT LEONARD 14-21 - Wellbore #1 - Design #1	100.0	102.0	1,317.0	1,316.8	10,000.000	CC, ES
EXIST VERT LEONARD 14-21 - Wellbore #1 - Design #1	5,300.0	5,146.0	2,094.0	1,973.8	17.424	SF
EXIST VERT LEONARD 23-21 - Wellbore #1 - Design #1	100.0	125.0	1,486.8	1,486.5	5,113.128	CC
EXIST VERT LEONARD 23-21 - Wellbore #1 - Design #1	200.0	225.0	1,488.0	1,486.3	873.893	ES
EXIST VERT LEONARD 23-21 - Wellbore #1 - Design #1	5,300.0	5,216.0	2,190.1	2,069.1	18.114	SF
EXIST VERT LEONARD 24-21 - Wellbore #1 - Design #1	100.0	115.0	1,978.3	1,978.0	8,519.777	CC, ES
EXIST VERT LEONARD 24-21 - Wellbore #1 - Design #1	5,400.0	5,216.0	2,861.6	2,739.1	23.356	SF

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

Company:	EXTRACTION OIL & GAS	**Local Co-ordinate Reference:**	Well LEONARD 1C - Slot LEONARD 1C
Project:	WELD COUNTY, COLORADO (NAD 83)	**TVD Reference:**	KB-EST @ 5016.0usft (Original Well Elev)
Reference Site:	NW SW SEC. 21 T2N R67W 6th P.M.	**MD Reference:**	KB-EST @ 5016.0usft (Original Well Elev)
Site Error:	0.0 usft	**North Reference:**	True
Reference Well:	LEONARD 1C	**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 SW SEC. 21 T2N R67W 6th P.M.						
EXIST VERT LEONARD 3-21J - Wellbore #1 - Design #1	11,450.0	7,751.0	1,245.5	988.4	4.843	CC
EXIST VERT LEONARD 3-21J - Wellbore #1 - Design #1	11,500.0	7,751.0	1,246.5	988.0	4.822	ES
EXIST VERT LEONARD 3-21J - Wellbore #1 - Design #1	11,600.0	7,751.0	1,254.5	993.2	4.801	SF
EXIST VERT LEONARD 33-21 - Wellbore #1 - Design #1	5,400.0	5,218.0	3,481.5	3,361.2	28.941	SF
EXIST VERT LEONARD 33-21 - Wellbore #1 - Design #1	10,975.4	5,218.0	2,608.4	2,550.5	45.123	CC
EXIST VERT LEONARD 33-21 - Wellbore #1 - Design #1	11,000.0	5,218.0	2,608.5	2,550.4	44.946	ES
EXIST VERT LEONARD 34-21 - Wellbore #1 - Design #1	100.0	139.0	3,098.4	3,098.1	9,444.848	CC
EXIST VERT LEONARD 34-21 - Wellbore #1 - Design #1	11,000.0	5,250.0	3,155.4	3,033.8	25.951	ES
EXIST VERT LEONARD 34-21 - Wellbore #1 - Design #1	12,400.0	5,250.0	3,459.0	3,312.6	23.623	SF
EXIST VERT LEONARD 4-21J - Wellbore #1 - Design #1	100.0	112.0	1,050.8	1,050.6	5,017.497	CC, ES
EXIST VERT LEONARD 4-21J - Wellbore #1 - Design #1	9,200.0	7,722.0	1,310.4	1,113.8	6.665	SF
EXIST VERT LEONARD 43-21 - Wellbore #1 - Design #1	11,479.3	7,748.0	1,387.2	1,129.3	5.378	CC
EXIST VERT LEONARD 43-21 - Wellbore #1 - Design #1	11,500.0	7,748.0	1,387.4	1,128.9	5.367	ES
EXIST VERT LEONARD 43-21 - Wellbore #1 - Design #1	11,700.0	7,748.0	1,404.7	1,140.7	5.320	SF
LEONARD 10 - ORIGINAL WELLBORE - PROPOSAL #1	100.0	104.0	251.8	251.6	1,272.846	CC
LEONARD 10 - ORIGINAL WELLBORE - PROPOSAL #1	103.6	107.6	251.8	251.5	1,175.644	ES
LEONARD 10 - ORIGINAL WELLBORE - PROPOSAL #1	12,499.3	12,286.8	2,224.8	1,961.6	8.455	SF
LEONARD 11 - ORIGINAL WELLBORE - PROPOSAL #1	0.0	4.0	279.8			
LEONARD 11 - ORIGINAL WELLBORE - PROPOSAL #1	100.0	100.0	279.8	279.7	1,482.206	ES
LEONARD 11 - ORIGINAL WELLBORE - PROPOSAL #1	12,499.3	12,351.5	2,562.7	2,299.6	9.740	SF
LEONARD 2 - ORIGINAL WELLBORE - PROPOSAL #1	100.0	101.0	28.1	27.9	146.895	CC, ES
LEONARD 2 - ORIGINAL WELLBORE - PROPOSAL #1	12,499.3	12,236.1	303.0	143.8	1.903	SF
LEONARD 3 - ORIGINAL WELLBORE - PROPOSAL #1	100.0	102.0	55.8	55.6	288.422	CC, ES
LEONARD 3 - ORIGINAL WELLBORE - PROPOSAL #1	12,499.3	12,213.8	568.9	328.8	2.369	SF
LEONARD 4 - ORIGINAL WELLBORE - PROPOSAL #1	100.0	103.0	83.8	83.6	428.581	CC, ES
LEONARD 4 - ORIGINAL WELLBORE - PROPOSAL #1	12,499.3	12,205.7	886.8	631.4	3.473	SF
LEONARD 5 - ORIGINAL WELLBORE - PROPOSAL #1	100.0	103.0	111.9	111.7	572.033	CC, ES
LEONARD 5 - ORIGINAL WELLBORE - PROPOSAL #1	12,499.3	12,457.3	1,020.1	754.3	3.838	SF
LEONARD 6 - ORIGINAL WELLBORE - PROPOSAL #1	100.0	104.0	139.9	139.7	707.377	CC, ES
LEONARD 6 - ORIGINAL WELLBORE - PROPOSAL #1	12,499.3	12,211.5	1,216.6	956.8	4.683	SF
LEONARD 7 - ORIGINAL WELLBORE - PROPOSAL #1	100.0	104.0	168.0	167.8	849.199	CC, ES
LEONARD 7 - ORIGINAL WELLBORE - PROPOSAL #1	12,499.3	12,227.1	1,551.0	1,289.3	5.926	SF
LEONARD 8 - ORIGINAL WELLBORE - PROPOSAL #1	100.0	104.0	196.0	195.8	991.042	CC, ES
LEONARD 8 - ORIGINAL WELLBORE - PROPOSAL #1	12,499.3	12,247.7	1,887.1	1,624.8	7.193	SF
LEONARD 9 - ORIGINAL WELLBORE - PROPOSAL #1	100.0	104.0	224.1	223.9	1,132.865	CC, ES
LEONARD 9 - ORIGINAL WELLBORE - PROPOSAL #1	12,499.3	12,507.7	2,040.1	1,775.6	7.714	SF

Offset Design NW SW SEC. 21 T2N R67W 6th P.M. - ABDN VERT BERNARD E TEETS B6 - Wellbore #1 - Design #1

Survey Program: 0-INC

Offset Site Error: 0.0 usft

Offset Well Error: 0.0 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
0.0	0.0	0.0	0.0	0.0	0.0	-91.36	-28.8	-1,207.6	1,209.3				
100.0	100.0	42.0	42.0	0.1	0.2	-91.36	-28.8	-1,207.6	1,207.9	1,207.6	0.33	3,668.704	
200.0	200.0	142.0	142.0	0.3	1.6	-47.44	-28.8	-1,207.6	1,206.8	1,204.8	1.91	631.664	
300.0	299.8	241.8	241.8	0.6	3.9	-47.68	-28.8	-1,207.6	1,203.2	1,198.8	4.43	271.374	
400.0	399.5	341.5	341.5	0.8	5.9	-48.07	-28.8	-1,207.6	1,197.4	1,190.6	6.72	178.052	
500.0	498.7	440.7	440.7	1.1	8.0	-48.63	-28.8	-1,207.6	1,189.2	1,180.2	8.99	132.227	
600.0	597.5	539.5	539.5	1.5	10.0	-49.35	-28.8	-1,207.6	1,178.9	1,167.6	11.26	104.668	
700.0	695.7	637.7	637.7	1.8	11.9	-50.25	-28.8	-1,207.6	1,166.4	1,152.9	13.54	86.126	

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