

# **EXTRACTION OIL & GAS**

**WELD COUNTY, COLORADO (NAD 83)  
SW SE SEC. 17 T2N R68W 6th P.M. (RVE PAD)  
RINN VALLEY EAST N17-20-2N  
FINAL SURVEYS**

**20 August, 2018**

**Survey: FINAL SURVEYS**





Project: WELD COUNTY, COLORADO (NAD 83)  
 Site: SW SE SEC. 17 T2N R68W 6th P.M. (RVE PAD)  
 Well: RINN VALLEY EAST N17-20-2N  
 Wellbore: FINAL SURVEYS  
 Design: FINAL SURVEYS

ANNOTATIONS

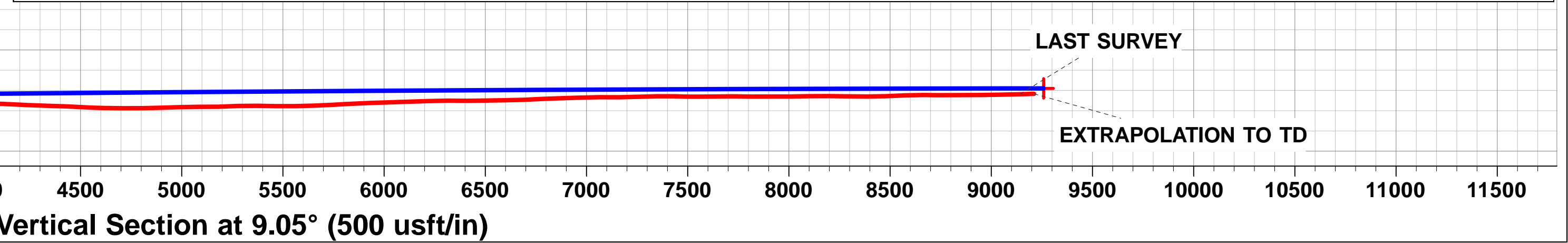
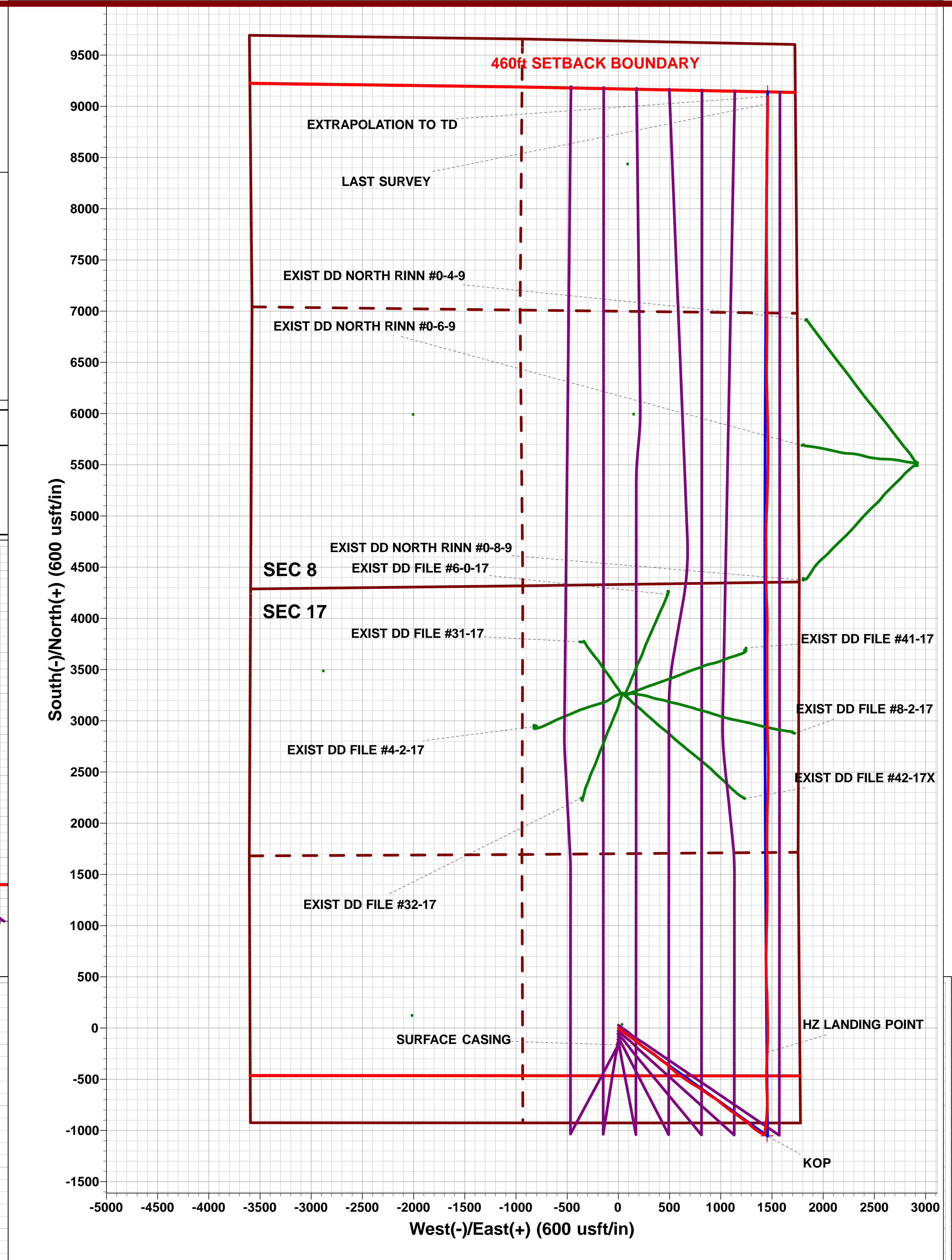
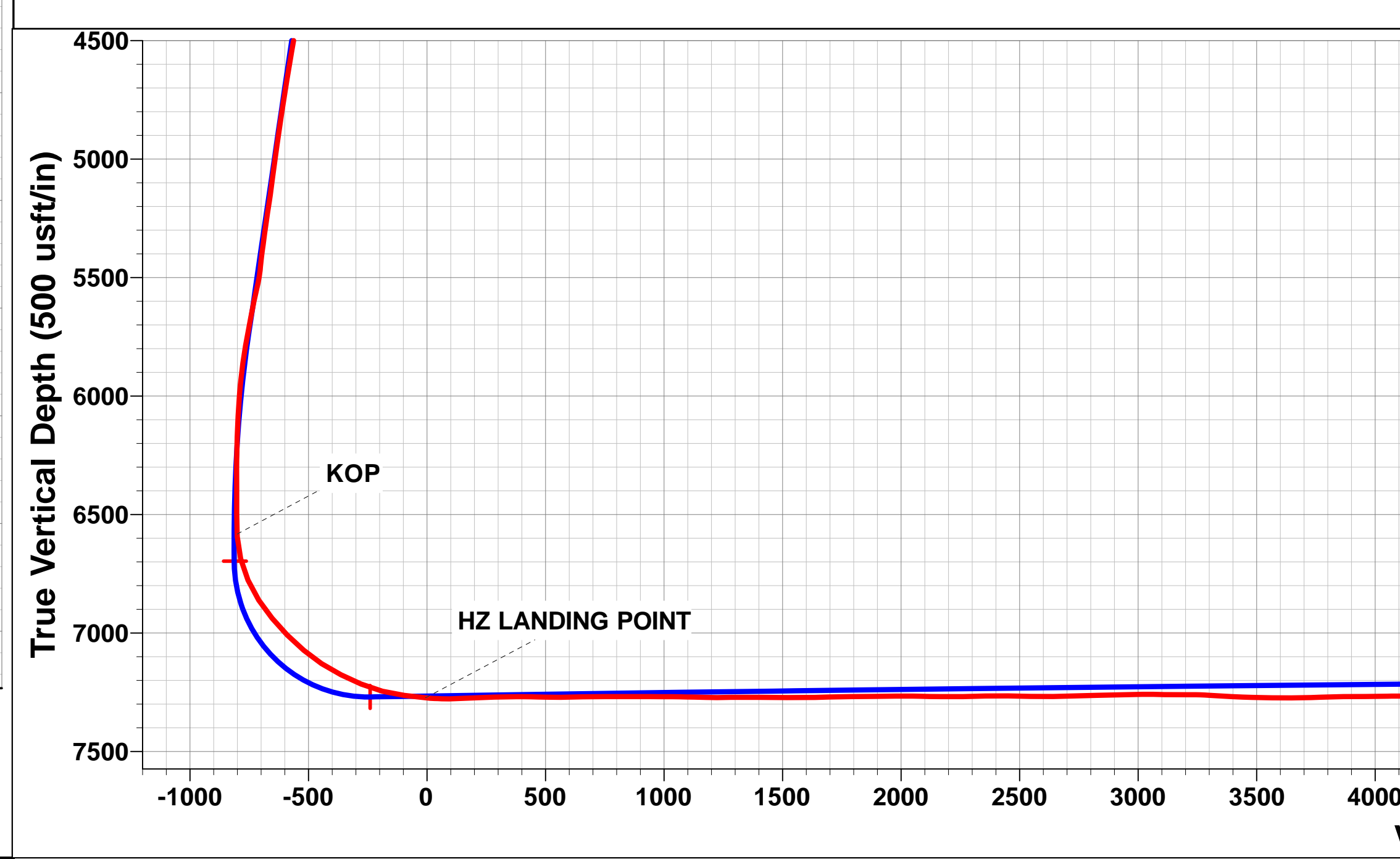
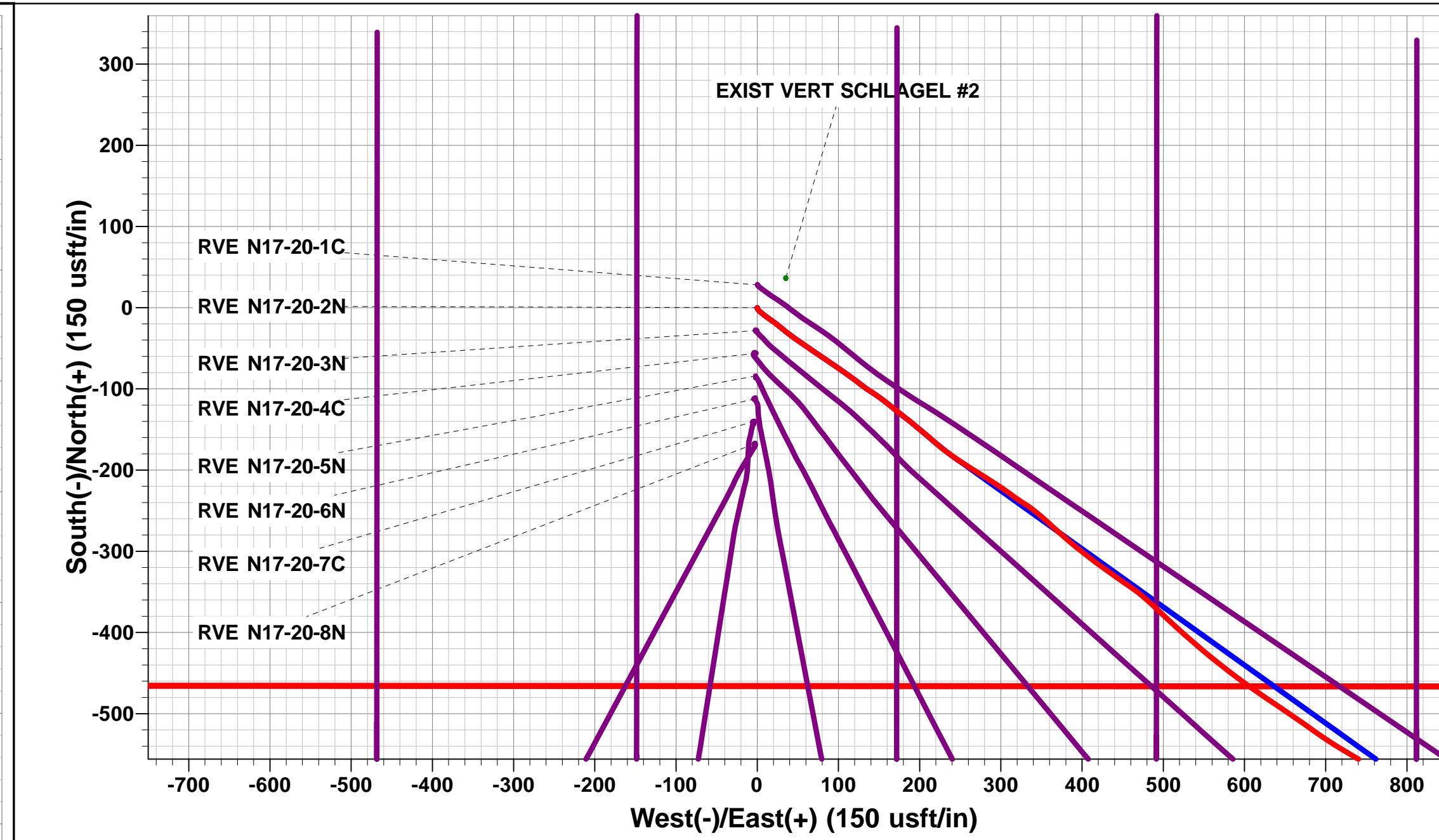
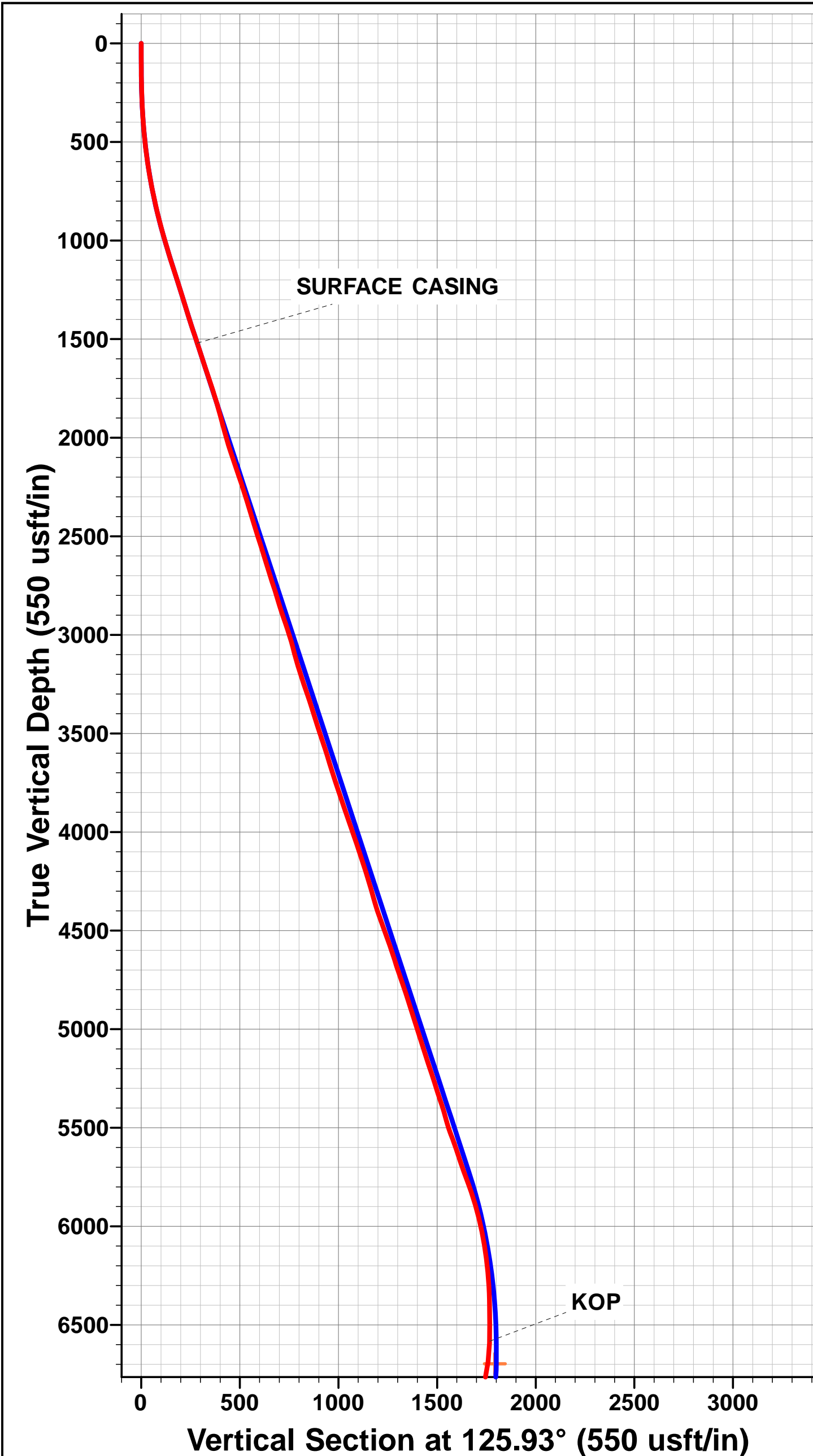
TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Dep	Annotation
1520.30	1557.00	17.91	128.85	-171.72	225.66	-134.07	284.36	SURFACE CASING
6582.69	6850.00	2.07	12.38	-1038.97	1427.83	-801.32	1774.02	KOP
7273.92	8000.00	84.74	2.99	-238.07	1453.11	-6.42	2576.42	HZ LANDING POINT
7219.29	17268.00	91.52	0.16	9025.13	1456.80	9141.93	11841.40	LAST SURVEY
7217.44	17338.00	91.52	0.16	9095.11	1457.00	9211.07	11911.38	EXTRAPOLATION TO TD

AS DRILLED LOCAL COORDINATES:

SHL: 926ft FSL & 1770ft FEL Sec 17  
 LANDING PNT: 696.19ft FSL & 318.68ft FEL Sec 17  
 BHL: 508.39ft FNL & 320.09ft FEL Sec 8

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - RINN VALLEY EAST N17-20-2N	6697.06	-1052.02	1451.49	40.131142	-105.018790
BHL - RINN VALLEY EAST N17-20-2N	7190.00	9143.50	1457.09	40.159129	-105.018768
HZ LP - RINN VALLEY EAST N17-20-2N	7270.00	-474.26	1451.79	40.132728	-105.018789



# Survey Report



<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well RINN VALLEY EAST N17-20-2N
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>TVD Reference:</b>	KB 29' @ 4945.00usft (PATT 901)
<b>Site:</b>	SW SE SEC. 17 T2N R68W 6th P.M.	<b>MD Reference:</b>	KB 29' @ 4945.00usft (PATT 901)
<b>Well:</b>	RINN VALLEY EAST N17-20-2N	<b>North Reference:</b>	True
<b>Wellbore:</b>	FINAL SURVEYS	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEYS	<b>Database:</b>	EDM 5000.1 Single User Db

<b>Project</b> WELD COUNTY, COLORADO (NAD 83)			
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b> SW SE SEC. 17 T2N R68W 6th P.M. (RVE PAD)			
<b>Site Position:</b>		<b>Northing:</b>	1,292,056.11 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,133,096.11 usft
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	1.10000ft
		<b>Latitude:</b>	40.134107
		<b>Longitude:</b>	-105.023979
		<b>Grid Convergence:</b>	0.31 °

<b>Well</b> RINN VALLEY EAST N17-20-2N			
<b>Well Position</b>	<b>+N-S</b>	0.00 usft	<b>Northing:</b> 1,292,028.05 usft
	<b>+E-W</b>	0.00 usft	<b>Easting:</b> 3,133,095.70 usft
<b>Position Uncertainty</b>	0.00 usft	<b>Wellhead Elevation:</b>	usft
		<b>Latitude:</b>	40.134030
		<b>Longitude:</b>	-105.023981
		<b>Ground Level:</b>	4,916.00 usft

<b>Wellbore</b> FINAL SURVEYS					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/08/2018	8.20	66.57	52,095

<b>Design</b> FINAL SURVEYS				
<b>Audit Notes:</b>				
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b> 0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	9.05

<b>Survey Program</b>		<b>Date</b> 20/08/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
72.00	17,338.00	FINAL SURVEYS (FINAL SURVEYS)	OWSG (Rev2) MWD	OWSG MWD - Standard

<b>Survey</b>											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	4,945.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72.00	0.21	181.45	72.00	4,873.00	-0.13	0.00	-0.13	0.29	0.29	0.00	
133.00	0.37	167.69	133.00	4,812.00	-0.44	0.04	-0.43	0.28	0.26	-22.56	
164.00	0.49	183.19	164.00	4,781.00	-0.67	0.05	-0.65	0.54	0.39	50.00	
194.00	0.84	160.57	194.00	4,751.00	-1.00	0.12	-0.97	1.44	1.17	-75.40	
225.00	1.19	150.07	224.99	4,720.01	-1.49	0.35	-1.42	1.27	1.13	-33.87	
256.00	1.76	150.63	255.98	4,689.02	-2.19	0.75	-2.04	1.84	1.84	1.81	
286.00	2.34	135.64	285.96	4,659.04	-3.03	1.40	-2.77	2.62	1.93	-49.97	
316.00	3.29	130.60	315.93	4,629.07	-4.03	2.48	-3.59	3.27	3.17	-16.80	
347.00	3.80	131.84	346.87	4,598.13	-5.29	3.92	-4.61	1.66	1.65	4.00	
377.00	4.24	130.93	376.79	4,568.21	-6.68	5.50	-5.73	1.48	1.47	-3.03	
408.00	4.40	129.89	407.70	4,537.30	-8.19	7.28	-6.95	0.57	0.52	-3.35	
438.00	4.70	127.01	437.61	4,507.39	-9.67	9.14	-8.11	1.26	1.00	-9.60	

# Survey Report



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<b>Site:</b>	SW SE SEC. 17 T2N R68W 6th P.M.	<b>MD Reference:</b>	KB 29' @ 4945.00usft (PATT 901)
<b>Well:</b>	RINN VALLEY EAST N17-20-2N	<b>North Reference:</b>	True
<b>Wellbore:</b>	FINAL SURVEYS	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEYS	<b>Database:</b>	EDM 5000.1 Single User Db

## Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
469.00	5.53	125.84	468.49	4,476.51	-11.31	11.37	-9.38	2.70	2.68	-3.77
500.00	6.35	124.61	499.32	4,445.68	-13.16	13.99	-10.79	2.68	2.65	-3.97
530.00	7.06	124.20	529.11	4,415.89	-15.14	16.88	-12.29	2.37	2.37	-1.37
573.00	7.64	127.25	571.76	4,373.24	-18.35	21.34	-14.77	1.63	1.35	7.09
614.00	7.83	128.41	612.39	4,332.61	-21.74	25.70	-17.42	0.60	0.46	2.83
656.00	8.82	129.96	653.94	4,291.06	-25.58	30.41	-20.48	2.42	2.36	3.69
699.00	10.44	128.49	696.34	4,248.66	-30.13	35.99	-24.09	3.81	3.77	-3.42
742.00	11.64	125.58	738.54	4,206.46	-35.07	42.56	-27.94	3.08	2.79	-6.77
785.00	12.18	125.57	780.61	4,164.39	-40.24	49.78	-31.90	1.26	1.26	-0.02
827.00	13.05	123.14	821.60	4,123.40	-45.41	57.36	-35.81	2.43	2.07	-5.79
868.00	13.54	125.68	861.50	4,083.50	-50.74	65.13	-39.85	1.86	1.20	6.20
911.00	14.49	123.59	903.22	4,041.78	-56.65	73.70	-44.34	2.50	2.21	-4.86
986.00	15.64	125.01	975.64	3,969.36	-67.64	89.80	-52.67	1.61	1.53	1.89
1,017.00	16.28	123.93	1,005.45	3,939.55	-72.46	96.83	-56.32	2.28	2.06	-3.48
1,049.00	16.64	124.53	1,036.14	3,908.86	-77.56	104.32	-60.18	1.24	1.12	1.87
1,080.00	16.79	125.87	1,065.83	3,879.17	-82.70	111.61	-64.11	1.33	0.48	4.32
1,112.00	17.36	126.56	1,096.42	3,848.58	-88.26	119.19	-68.40	1.89	1.78	2.16
1,144.00	17.78	127.68	1,126.92	3,818.08	-94.09	126.89	-72.94	1.68	1.31	3.50
1,176.00	18.48	125.34	1,157.34	3,787.66	-100.01	134.89	-77.53	3.16	2.19	-7.31
1,207.00	18.29	122.08	1,186.75	3,758.25	-105.43	143.02	-81.61	3.37	-0.61	-10.52
1,239.00	17.86	125.77	1,217.18	3,727.82	-110.97	151.26	-85.78	3.82	-1.34	11.53
1,271.00	17.08	127.65	1,247.70	3,697.30	-116.71	158.96	-90.24	3.01	-2.44	5.87
1,303.00	16.69	130.26	1,278.32	3,666.68	-122.55	166.19	-94.87	2.66	-1.22	8.16
1,334.00	16.77	129.35	1,308.01	3,636.99	-128.26	173.04	-99.43	0.88	0.26	-2.94
1,366.00	17.17	126.22	1,338.62	3,606.38	-133.98	180.42	-103.91	3.12	1.25	-9.78
1,397.00	17.78	129.44	1,368.19	3,576.81	-139.69	187.77	-108.40	3.69	1.97	10.39
1,428.00	18.17	130.46	1,397.67	3,547.33	-145.83	195.10	-113.31	1.62	1.26	3.29
1,460.00	18.55	129.03	1,428.04	3,516.96	-152.27	202.86	-118.45	1.84	1.19	-4.47
1,523.00	17.68	132.01	1,487.92	3,457.08	-164.99	217.75	-128.66	2.02	-1.38	4.73
1,555.00	17.90	129.03	1,518.39	3,426.61	-171.34	225.18	-133.76	2.93	0.69	-9.31
<b>SURFACE CASING</b>										
<b>1,557.00</b>	<b>17.91</b>	<b>128.85</b>	<b>1,520.30</b>	<b>3,424.70</b>	<b>-171.72</b>	<b>225.66</b>	<b>-134.07</b>	<b>2.83</b>	<b>0.53</b>	<b>-9.05</b>
1,587.00	18.09	126.16	1,548.83	3,396.17	-177.37	233.01	-138.49	2.83	0.60	-8.96
1,680.00	18.47	123.04	1,637.14	3,307.86	-193.92	257.02	-151.05	1.13	0.41	-3.35
1,776.00	18.60	121.27	1,728.16	3,216.84	-210.16	282.85	-163.02	0.60	0.14	-1.84
1,871.00	16.57	126.52	1,818.72	3,126.28	-226.08	306.69	-175.00	2.71	-2.14	5.53
1,967.00	14.98	122.24	1,911.10	3,033.90	-240.85	328.19	-186.20	2.05	-1.66	-4.46
2,062.00	15.55	131.01	2,002.76	2,942.24	-255.76	348.19	-197.78	2.50	0.60	9.23
2,158.00	19.18	132.47	2,094.37	2,850.63	-274.86	369.54	-213.28	3.81	3.78	1.52
2,253.00	18.38	129.12	2,184.32	2,760.68	-294.84	392.67	-229.37	1.41	-0.84	-3.53
2,348.00	17.99	126.83	2,274.57	2,670.43	-313.09	416.03	-243.72	0.86	-0.41	-2.41
2,444.00	17.45	124.98	2,366.02	2,578.98	-330.23	439.69	-256.92	0.81	-0.56	-1.93
2,539.00	16.39	124.54	2,456.91	2,488.09	-345.99	462.40	-268.91	1.12	-1.12	-0.46
2,634.00	18.38	133.35	2,547.58	2,397.42	-363.88	484.34	-283.12	3.47	2.09	9.27
2,730.00	16.84	133.17	2,639.08	2,305.92	-383.78	505.49	-299.45	1.61	-1.60	-0.19
2,826.00	18.21	131.23	2,730.62	2,214.38	-403.18	526.91	-315.24	1.55	1.43	-2.02
2,921.00	16.62	130.40	2,821.26	2,123.74	-421.77	548.43	-330.21	1.69	-1.67	-0.87
3,016.00	19.53	128.24	2,911.56	2,033.44	-440.41	571.25	-345.03	3.14	3.06	-2.27
3,208.00	14.54	123.79	3,095.09	1,849.91	-473.70	616.52	-370.78	2.68	-2.60	-2.32
3,303.00	17.37	124.62	3,186.42	1,758.58	-488.39	638.10	-381.89	2.99	2.98	0.87
3,399.00	19.58	124.40	3,277.47	1,667.53	-505.63	663.17	-394.96	2.30	2.30	-0.23
3,494.00	17.23	125.81	3,367.60	1,577.40	-522.85	687.72	-408.11	2.52	-2.47	1.48
3,590.00	17.72	121.50	3,459.18	1,485.82	-538.81	711.71	-420.09	1.44	0.51	-4.49

Survey Report



<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well RINN VALLEY EAST N17-20-2N
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>TVL Reference:</b>	KB 29' @ 4945.00usft (PATT 901)
<b>Site:</b>	SW SE SEC. 17 T2N R68W 6th P.M.	<b>MD Reference:</b>	KB 29' @ 4945.00usft (PATT 901)
<b>Well:</b>	RINN VALLEY EAST N17-20-2N	<b>North Reference:</b>	True
<b>Wellbore:</b>	FINAL SURVEYS	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEYS	<b>Database:</b>	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,685.00	19.05	120.66	3,549.33	1,395.67	-554.27	737.37	-431.32	1.43	1.40	-0.88
3,780.00	16.97	119.03	3,639.67	1,305.33	-568.90	762.83	-441.77	2.25	-2.19	-1.72
3,876.00	17.63	124.14	3,731.33	1,213.67	-583.86	787.12	-452.72	1.73	0.69	5.32
3,972.00	19.58	125.02	3,822.31	1,122.69	-601.25	812.32	-465.92	2.05	2.03	0.92
4,067.00	17.72	125.06	3,912.31	1,032.69	-618.69	837.20	-479.23	1.96	-1.96	0.04
4,162.00	20.28	124.54	4,002.13	942.87	-636.34	862.60	-492.66	2.70	2.69	-0.55
4,258.00	17.81	123.43	4,092.87	852.13	-653.86	888.56	-505.88	2.60	-2.57	-1.16
4,353.00	18.56	122.29	4,183.12	761.88	-669.94	913.46	-517.84	0.87	0.79	-1.20
4,449.00	15.29	119.78	4,274.96	670.04	-684.39	937.37	-528.35	3.49	-3.41	-2.61
4,544.00	16.53	127.14	4,366.32	578.68	-698.78	959.02	-539.15	2.49	1.31	7.75
4,640.00	20.99	129.96	4,457.20	487.80	-718.08	983.10	-554.42	4.74	4.65	2.94
4,736.00	19.35	129.25	4,547.31	397.69	-739.18	1,008.60	-571.25	1.73	-1.71	-0.74
4,831.00	17.50	128.50	4,637.44	307.56	-758.03	1,031.96	-586.19	1.96	-1.95	-0.79
4,926.00	19.31	127.22	4,727.58	217.42	-776.43	1,055.65	-600.62	1.95	1.91	-1.35
5,021.00	18.43	126.87	4,817.47	127.53	-794.94	1,080.18	-615.04	0.93	-0.93	-0.37
5,117.00	17.10	125.55	4,908.89	36.11	-812.25	1,103.80	-628.42	1.45	-1.39	-1.37
5,212.00	18.25	124.27	4,999.40	-54.40	-828.75	1,127.46	-640.99	1.28	1.21	-1.35
5,308.00	16.79	122.64	5,090.95	-145.95	-844.69	1,151.56	-652.94	1.60	-1.52	-1.70
5,404.00	19.18	126.61	5,182.26	-237.26	-861.58	1,175.90	-665.79	2.80	2.49	4.14
5,499.00	17.32	125.46	5,272.47	-327.47	-879.09	1,199.94	-679.30	1.99	-1.96	-1.21
5,595.00	18.47	123.57	5,363.83	-418.83	-895.79	1,224.25	-691.96	1.34	1.20	-1.97
5,690.00	15.25	120.17	5,454.73	-509.73	-910.40	1,247.60	-702.71	3.54	-3.39	-3.58
5,786.00	21.30	136.26	5,545.91	-600.91	-929.37	1,270.61	-717.83	8.15	6.30	16.76
5,905.00	17.85	134.32	5,658.01	-713.01	-957.73	1,298.61	-741.43	2.95	-2.90	-1.63
6,000.00	20.90	129.12	5,747.63	-802.63	-978.60	1,322.18	-758.34	3.69	3.21	-5.47
6,096.00	18.12	125.11	5,838.11	-893.11	-998.00	1,347.68	-773.48	3.21	-2.90	-4.18
6,191.00	15.29	122.20	5,929.10	-984.10	-1,013.17	1,370.37	-784.89	3.11	-2.98	-3.06
6,287.00	11.53	118.41	6,022.46	-1,077.46	-1,024.49	1,389.53	-793.05	4.02	-3.92	-3.95
6,383.00	8.35	115.68	6,117.01	-1,172.01	-1,032.08	1,404.25	-798.22	3.35	-3.31	-2.84
6,478.00	6.94	114.09	6,211.16	-1,266.16	-1,037.41	1,415.71	-801.69	1.50	-1.48	-1.67
6,573.00	3.23	97.04	6,305.78	-1,360.78	-1,040.08	1,423.61	-803.08	4.17	-3.91	-17.95
6,669.00	0.66	98.36	6,401.72	-1,456.72	-1,040.49	1,426.84	-802.98	2.68	-2.68	1.37
6,764.00	0.09	52.40	6,496.71	-1,551.71	-1,040.52	1,427.44	-802.92	0.63	-0.60	-48.38
<b>KOP</b>										
<b>6,850.00</b>	<b>2.07</b>	<b>12.38</b>	<b>6,582.69</b>	<b>-1,637.69</b>	<b>-1,038.97</b>	<b>1,427.83</b>	<b>-801.32</b>	<b>2.33</b>	<b>2.30</b>	<b>-46.54</b>
6,860.00	2.30	12.21	6,592.69	-1,647.69	-1,038.60	1,427.91	-800.94	2.33	2.32	-1.68
6,956.00	15.51	4.97	6,687.32	-1,742.32	-1,023.86	1,429.43	-786.15	13.78	13.76	-7.54
7,051.00	22.45	8.51	6,777.10	-1,832.10	-993.23	1,433.22	-755.30	7.40	7.31	3.73
7,147.00	34.03	7.61	6,861.53	-1,916.53	-948.32	1,439.51	-709.96	12.07	12.06	-0.94
7,242.00	39.06	4.48	6,937.84	-1,992.84	-892.09	1,445.38	-653.51	5.65	5.29	-3.29
7,337.00	44.81	4.44	7,008.48	-2,063.48	-828.82	1,450.31	-590.26	6.05	6.05	-0.04
7,433.00	50.16	1.00	7,073.34	-2,128.34	-758.18	1,453.57	-519.98	6.17	5.57	-3.58
7,528.00	57.31	357.74	7,129.51	-2,184.51	-681.66	1,452.63	-444.56	8.02	7.53	-3.43
7,624.00	63.99	358.05	7,176.54	-2,231.54	-598.09	1,449.57	-362.51	6.96	6.96	0.32
7,719.00	66.95	358.49	7,215.97	-2,270.97	-511.71	1,446.96	-277.62	3.14	3.12	0.46
7,815.00	76.54	0.91	7,246.01	-2,301.01	-420.66	1,446.54	-187.77	10.27	9.99	2.52
7,910.00	82.10	2.19	7,263.61	-2,318.61	-327.37	1,449.07	-95.25	6.00	5.85	1.35
<b>HZ LANDING POINT</b>										
<b>8,000.00</b>	<b>84.74</b>	<b>2.99</b>	<b>7,273.92</b>	<b>-2,328.92</b>	<b>-238.07</b>	<b>1,453.11</b>	<b>-6.42</b>	<b>3.07</b>	<b>2.94</b>	<b>0.88</b>
8,005.00	84.89	3.03	7,274.38	-2,329.38	-233.09	1,453.37	-1.47	3.07	2.94	0.88
8,101.00	90.63	1.31	7,278.13	-2,333.13	-137.28	1,457.00	93.72	6.24	5.98	-1.79
8,196.00	93.24	359.86	7,274.92	-2,329.92	-42.35	1,457.97	187.62	3.14	2.75	-1.53
8,292.00	91.52	358.80	7,270.93	-2,325.93	53.56	1,456.85	282.16	2.10	-1.79	-1.10

# Survey Report



<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well RINN VALLEY EAST N17-20-2N
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>TVD Reference:</b>	KB 29' @ 4945.00usft (PATT 901)
<b>Site:</b>	SW SE SEC. 17 T2N R68W 6th P.M.	<b>MD Reference:</b>	KB 29' @ 4945.00usft (PATT 901)
<b>Well:</b>	RINN VALLEY EAST N17-20-2N	<b>North Reference:</b>	True
<b>Wellbore:</b>	FINAL SURVEYS	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEYS	<b>Database:</b>	EDM 5000.1 Single User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,388.00	90.23	0.08	7,269.47	-2,324.47	149.54	1,455.91	376.79	1.89	-1.34	1.33
8,483.00	88.60	357.78	7,270.44	-2,325.44	244.51	1,454.14	470.30	2.97	-1.72	-2.42
8,579.00	90.01	357.52	7,271.60	-2,326.60	340.41	1,450.20	564.40	1.49	1.47	-0.27
8,674.00	92.14	357.04	7,269.82	-2,324.82	435.29	1,445.70	657.37	2.30	2.24	-0.51
8,770.00	89.09	359.72	7,268.79	-2,323.79	531.22	1,442.98	751.69	4.23	-3.18	2.79
8,866.00	90.99	358.89	7,268.72	-2,323.72	627.21	1,441.82	846.30	2.16	1.98	-0.86
8,961.00	88.95	1.53	7,268.77	-2,323.77	722.19	1,442.17	940.15	3.51	-2.15	2.78
9,056.00	90.23	1.09	7,269.45	-2,324.45	817.17	1,444.34	1,034.28	1.42	1.35	-0.46
9,152.00	88.03	1.31	7,270.91	-2,325.91	913.13	1,446.35	1,129.36	2.30	-2.29	0.23
9,247.00	89.75	1.66	7,272.75	-2,327.75	1,008.07	1,448.81	1,223.52	1.85	1.81	0.37
9,343.00	91.30	0.96	7,271.87	-2,326.87	1,104.04	1,451.00	1,318.63	1.77	1.61	-0.73
9,438.00	88.73	0.96	7,271.84	-2,326.84	1,199.02	1,452.60	1,412.68	2.71	-2.71	0.00
9,534.00	89.70	0.74	7,273.16	-2,328.16	1,295.00	1,454.02	1,507.69	1.04	1.01	-0.23
9,629.00	91.60	359.46	7,272.08	-2,327.08	1,389.99	1,454.19	1,601.52	2.41	2.00	-1.35
9,725.00	90.46	0.34	7,270.36	-2,325.36	1,485.97	1,454.02	1,696.28	1.50	-1.19	0.92
9,820.00	91.65	359.28	7,268.61	-2,323.61	1,580.95	1,453.70	1,790.02	1.68	1.25	-1.12
9,916.00	89.57	359.06	7,267.58	-2,322.58	1,676.93	1,452.31	1,884.59	2.18	-2.17	-0.23
10,011.00	91.30	359.15	7,266.86	-2,321.86	1,771.91	1,450.83	1,978.15	1.82	1.82	0.09
10,107.00	88.29	0.78	7,267.21	-2,322.21	1,867.90	1,450.77	2,072.93	3.57	-3.14	1.70
10,202.00	89.57	0.52	7,268.98	-2,323.98	1,962.87	1,451.85	2,166.89	1.37	1.35	-0.27
10,298.00	90.85	1.31	7,268.63	-2,323.63	2,058.85	1,453.38	2,261.92	1.57	1.33	0.82
10,393.00	92.05	1.66	7,266.22	-2,321.22	2,153.79	1,455.84	2,356.06	1.32	1.26	0.37
10,489.00	88.60	1.66	7,265.68	-2,320.68	2,249.73	1,458.62	2,451.25	3.59	-3.59	0.00
10,585.00	89.00	1.44	7,267.69	-2,322.69	2,345.68	1,461.22	2,546.40	0.48	0.42	-0.23
10,681.00	90.54	0.65	7,268.08	-2,323.08	2,441.66	1,462.97	2,641.46	1.80	1.60	-0.82
10,776.00	92.53	1.00	7,265.53	-2,320.53	2,536.61	1,464.34	2,735.45	2.13	2.09	0.37
10,872.00	90.10	357.87	7,263.33	-2,318.33	2,632.56	1,463.39	2,830.05	4.13	-2.53	-3.26
10,967.00	92.36	357.30	7,261.29	-2,316.29	2,727.45	1,459.39	2,923.13	2.45	2.38	-0.60
11,063.00	90.10	359.41	7,259.23	-2,314.23	2,823.37	1,456.63	3,017.43	3.22	-2.35	2.20
11,158.00	88.56	359.41	7,260.34	-2,315.34	2,918.36	1,455.66	3,111.07	1.62	-1.62	0.00
11,254.00	90.77	359.33	7,260.90	-2,315.90	3,014.35	1,454.60	3,205.70	2.30	2.30	-0.08
11,350.00	86.39	359.41	7,263.28	-2,318.28	3,110.29	1,453.54	3,300.28	4.56	-4.56	0.08
11,445.00	87.23	0.25	7,268.56	-2,323.56	3,205.14	1,453.26	3,393.90	1.25	0.88	0.88
11,541.00	88.33	0.08	7,272.28	-2,327.28	3,301.06	1,453.54	3,488.68	1.16	1.15	-0.18
11,636.00	89.35	359.72	7,274.21	-2,329.21	3,396.04	1,453.37	3,582.45	1.14	1.07	-0.38
11,732.00	91.30	359.81	7,273.66	-2,328.66	3,492.04	1,452.98	3,677.18	2.03	2.03	0.09
11,827.00	91.43	358.84	7,271.40	-2,326.40	3,587.00	1,451.86	3,770.79	1.03	0.14	-1.02
11,923.00	91.60	359.94	7,268.86	-2,323.86	3,682.96	1,450.84	3,865.39	1.16	0.18	1.15
12,018.00	89.31	1.05	7,268.11	-2,323.11	3,777.95	1,451.66	3,959.32	2.68	-2.41	1.17
12,113.00	91.87	1.84	7,267.13	-2,322.13	3,872.90	1,454.06	4,053.47	2.82	2.69	0.83
12,209.00	86.74	358.93	7,268.29	-2,323.29	3,968.85	1,454.70	4,148.33	6.14	-5.34	-3.03
12,304.00	87.58	357.96	7,273.00	-2,328.00	4,063.70	1,452.13	4,241.59	1.35	0.88	-1.02
12,400.00	88.56	357.21	7,276.23	-2,331.23	4,159.56	1,448.08	4,335.61	1.29	1.02	-0.78
12,495.00	87.80	358.58	7,279.25	-2,334.25	4,254.44	1,444.60	4,428.77	1.65	-0.80	1.44
12,591.00	86.96	359.11	7,283.64	-2,338.64	4,350.32	1,442.66	4,523.15	1.03	-0.87	0.55
12,686.00	88.95	0.25	7,287.03	-2,342.03	4,445.25	1,442.13	4,616.81	2.41	2.09	1.20
12,782.00	89.88	0.74	7,288.01	-2,343.01	4,541.24	1,442.96	4,711.74	1.09	0.97	0.51
12,877.00	90.54	359.72	7,287.66	-2,342.66	4,636.24	1,443.34	4,805.61	1.28	0.69	-1.07
12,972.00	91.60	358.14	7,285.89	-2,340.89	4,731.20	1,441.57	4,899.11	2.00	1.12	-1.66
13,067.00	92.36	1.13	7,282.60	-2,337.60	4,826.13	1,440.97	4,992.76	3.25	0.80	3.15
13,163.00	89.35	1.62	7,281.17	-2,336.17	4,922.08	1,443.27	5,087.88	3.18	-3.14	0.51
13,258.00	91.30	2.63	7,280.63	-2,335.63	5,017.01	1,446.79	5,182.18	2.31	2.05	1.06
13,354.00	92.67	2.37	7,277.31	-2,332.31	5,112.86	1,450.98	5,277.49	1.45	1.43	-0.27

# Survey Report



<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well RINN VALLEY EAST N17-20-2N
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>TVD Reference:</b>	KB 29' @ 4945.00usft (PATT 901)
<b>Site:</b>	SW SE SEC. 17 T2N R68W 6th P.M.	<b>MD Reference:</b>	KB 29' @ 4945.00usft (PATT 901)
<b>Well:</b>	RINN VALLEY EAST N17-20-2N	<b>North Reference:</b>	True
<b>Wellbore:</b>	FINAL SURVEYS	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEYS	<b>Database:</b>	EDM 5000.1 Single User Db

**Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,450.00	88.82	1.53	7,276.06	-2,331.06	5,208.77	1,454.24	5,372.73	4.10	-4.01	-0.87
13,545.00	89.31	1.00	7,277.61	-2,332.61	5,303.74	1,456.34	5,466.84	0.76	0.52	-0.56
13,640.00	90.77	1.31	7,277.54	-2,332.54	5,398.72	1,458.25	5,560.93	1.57	1.54	0.33
13,736.00	91.69	1.00	7,275.48	-2,330.48	5,494.67	1,460.19	5,656.00	1.01	0.96	-0.32
13,831.00	93.15	1.05	7,271.47	-2,326.47	5,589.57	1,461.89	5,749.98	1.54	1.54	0.05
13,927.00	92.31	358.89	7,266.90	-2,321.90	5,685.45	1,461.83	5,844.66	2.41	-0.87	-2.25
14,023.00	93.86	358.58	7,261.73	-2,316.73	5,781.29	1,459.72	5,938.97	1.65	1.61	-0.32
14,118.00	90.54	359.28	7,258.09	-2,313.09	5,876.19	1,457.95	6,032.41	3.57	-3.49	0.74
14,213.00	91.21	358.97	7,256.63	-2,311.63	5,971.17	1,456.50	6,125.97	0.78	0.71	-0.33
14,309.00	93.28	358.62	7,252.87	-2,307.87	6,067.07	1,454.48	6,220.36	2.19	2.16	-0.36
14,404.00	89.17	358.36	7,250.84	-2,305.84	6,161.99	1,451.98	6,313.71	4.33	-4.33	-0.27
14,500.00	89.97	358.58	7,251.56	-2,306.56	6,257.95	1,449.41	6,408.07	0.86	0.83	0.23
14,595.00	91.38	358.75	7,250.44	-2,305.44	6,352.92	1,447.20	6,501.51	1.49	1.48	0.18
14,691.00	90.63	1.27	7,248.76	-2,303.76	6,448.89	1,447.22	6,596.29	2.74	-0.78	2.62
14,786.00	91.78	0.65	7,246.76	-2,301.76	6,543.86	1,448.81	6,690.32	1.38	1.21	-0.65
14,882.00	93.42	0.30	7,242.41	-2,297.41	6,639.75	1,449.60	6,785.14	1.75	1.71	-0.36
14,977.00	91.03	0.78	7,238.72	-2,293.72	6,734.67	1,450.50	6,879.02	2.57	-2.52	0.51
15,073.00	92.67	0.38	7,235.62	-2,290.62	6,830.61	1,451.47	6,973.92	1.76	1.71	-0.42
15,168.00	89.40	359.68	7,233.91	-2,288.91	6,925.58	1,451.52	7,067.71	3.52	-3.44	-0.74
15,263.00	90.46	359.68	7,234.02	-2,289.02	7,020.58	1,450.99	7,161.44	1.12	1.12	0.00
15,359.00	92.40	359.24	7,231.63	-2,286.63	7,116.54	1,450.08	7,256.07	2.07	2.02	-0.46
15,454.00	90.59	359.68	7,229.15	-2,284.15	7,211.50	1,449.19	7,349.70	1.96	-1.91	0.46
15,550.00	88.47	359.77	7,229.93	-2,284.93	7,307.49	1,448.73	7,444.42	2.21	-2.21	0.09
15,645.00	89.88	359.81	7,231.30	-2,286.30	7,402.48	1,448.38	7,538.17	1.48	1.48	0.04
15,740.00	91.60	359.33	7,230.08	-2,285.08	7,497.46	1,447.67	7,631.86	1.88	1.81	-0.51
15,835.00	89.04	0.30	7,229.55	-2,284.55	7,592.45	1,447.36	7,725.62	2.88	-2.69	1.02
15,931.00	89.66	359.50	7,230.63	-2,285.63	7,688.44	1,447.19	7,820.39	1.05	0.65	-0.83
16,026.00	90.63	359.33	7,230.39	-2,285.39	7,783.44	1,446.22	7,914.05	1.04	1.02	-0.18
16,122.00	89.84	359.99	7,230.00	-2,285.00	7,879.43	1,445.65	8,008.76	1.07	-0.82	0.69
16,217.00	91.47	359.77	7,228.91	-2,283.91	7,974.42	1,445.46	8,102.53	1.73	1.72	-0.23
16,313.00	89.17	1.05	7,228.38	-2,283.38	8,070.41	1,446.14	8,197.43	2.74	-2.40	1.33
16,408.00	89.04	0.65	7,229.86	-2,284.86	8,165.39	1,447.55	8,291.45	0.44	-0.14	-0.42
16,504.00	90.37	0.43	7,230.36	-2,285.36	8,261.38	1,448.46	8,386.39	1.40	1.39	-0.23
16,600.00	91.47	0.47	7,228.81	-2,283.81	8,357.37	1,449.21	8,481.29	1.15	1.15	0.04
16,695.00	93.46	0.25	7,224.73	-2,279.73	8,452.27	1,449.81	8,575.11	2.11	2.09	-0.23
16,791.00	88.82	1.31	7,222.82	-2,277.82	8,548.21	1,451.11	8,670.06	4.96	-4.83	1.10
16,886.00	90.10	1.00	7,223.72	-2,278.72	8,643.19	1,453.03	8,764.16	1.39	1.35	-0.33
16,982.00	90.50	0.69	7,223.21	-2,278.21	8,739.18	1,454.44	8,859.17	0.53	0.42	-0.32
17,078.00	90.32	0.78	7,222.53	-2,277.53	8,835.17	1,455.68	8,954.16	0.21	-0.19	0.09
17,173.00	91.03	0.21	7,221.41	-2,276.41	8,930.16	1,456.50	9,048.09	0.96	0.75	-0.60
<b>LAST SURVEY</b>										
<b>17,268.00</b>	<b>91.52</b>	<b>0.16</b>	<b>7,219.29</b>	<b>-2,274.29</b>	<b>9,025.13</b>	<b>1,456.80</b>	<b>9,141.93</b>	<b>0.52</b>	<b>0.52</b>	<b>-0.05</b>
<b>EXTRAPOLATION TO TD</b>										
<b>17,338.00</b>	<b>91.52</b>	<b>0.16</b>	<b>7,217.44</b>	<b>-2,272.44</b>	<b>9,095.11</b>	<b>1,457.00</b>	<b>9,211.07</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

# Survey Report



<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well RINN VALLEY EAST N17-20-2N
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>TVD Reference:</b>	KB 29' @ 4945.00usft (PATT 901)
<b>Site:</b>	SW SE SEC. 17 T2N R68W 6th P.M.	<b>MD Reference:</b>	KB 29' @ 4945.00usft (PATT 901)
<b>Well:</b>	RINN VALLEY EAST N17-20-2N	<b>North Reference:</b>	True
<b>Wellbore:</b>	FINAL SURVEYS	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEYS	<b>Database:</b>	EDM 5000.1 Single User Db

Targets										
Target Name	- hit/miss target	Dip Angle	Dip Dir.	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
	- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
BHL - RINN VALLEY		0.00	0.00	7,190.00	9,143.50	1,457.09	1,301,178.86	3,134,503.63	40.159129	-105.018768
	- survey misses target center by 55.63usft at 17338.00usft MD (7217.44 TVD, 9095.11 N, 1457.00 E)									
	- Point									
HZ LP - RINN VALLE'		0.00	0.00	7,270.00	-474.26	1,451.79	1,291,561.61	3,134,549.95	40.132728	-105.018789
	- survey misses target center by 37.99usft at 7771.53usft MD (7234.30 TVD, -462.50 N, 1446.26 E)									
	- Point									
KOP - RINN VALLEY		0.00	0.00	6,697.06	-1,052.02	1,451.49	1,290,983.88	3,134,552.76	40.131142	-105.018790
	- survey misses target center by 37.02usft at 6957.01usft MD (6688.29 TVD, -1023.59 N, 1429.46 E)									
	- Point									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N-S	+E-W	
		(usft)	(usft)	
1,557.00	1,520.30	-171.72	225.66	SURFACE CASING
6,850.00	6,582.69	-1,038.97	1,427.83	KOP
8,000.00	7,273.92	-238.07	1,453.11	HZ LANDING POINT
17,268.00	7,219.29	9,025.13	1,456.80	LAST SURVEY
17,338.00	7,217.44	9,095.11	1,457.00	EXTRAPOLATION TO TD

Checked By: _____	Approved By: _____	Date: _____
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