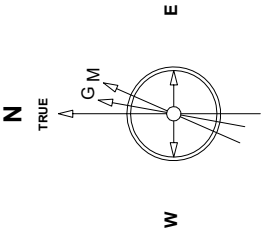


Great Western Operating Company, LLC

Location	Colorado	Slot	E04 - Rio LC 12-368HN
Field	Wattenburg	Well	Rio LC 12-368HN
Installation	Rio	Wellbore	Rio LC 12-368HN (AWB)

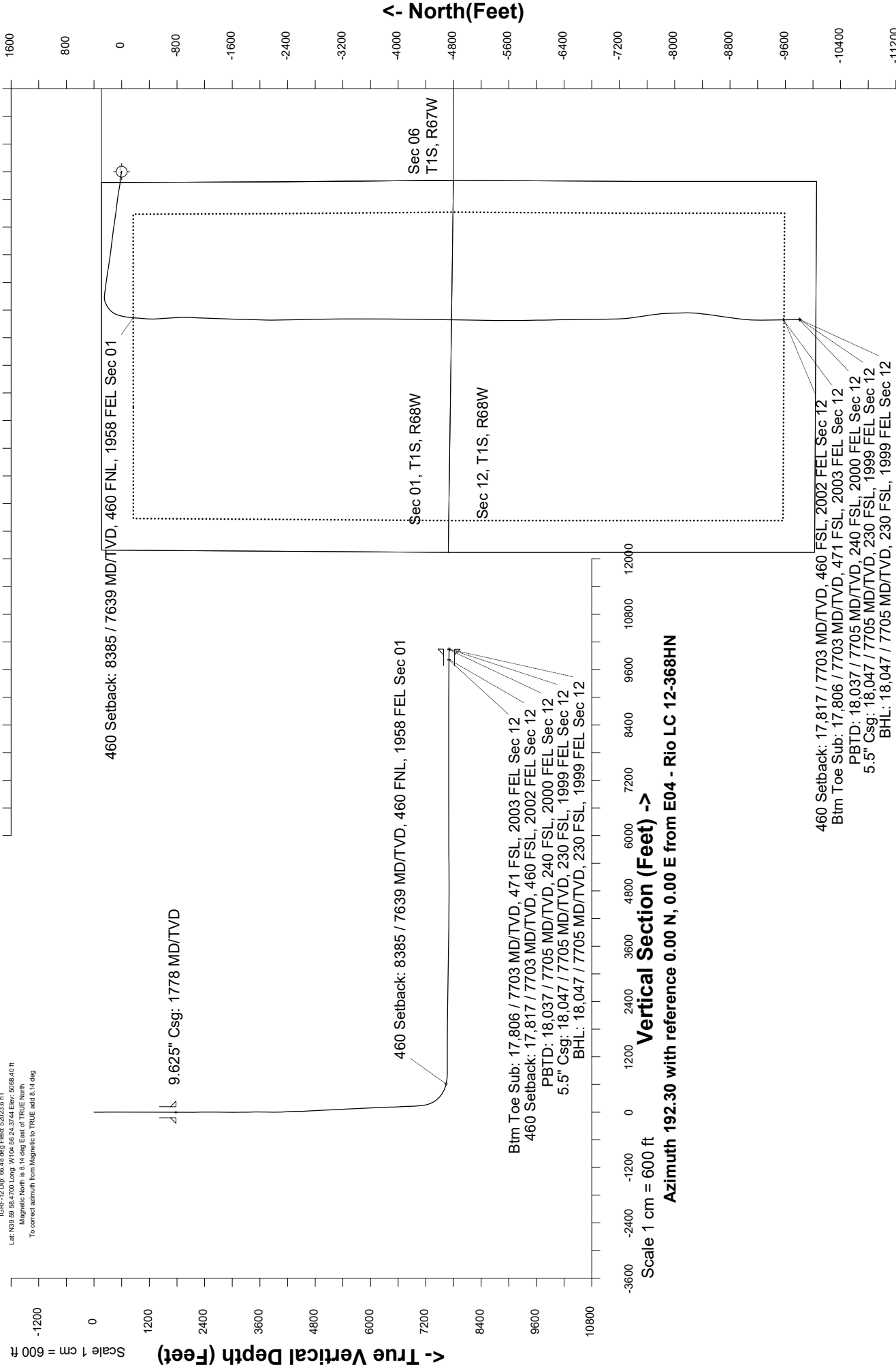
Created by	mmount
Date plotted	9-Sep-2019
Plot reference is	Rio LC 12-368HN (AWB).
Ref wellpath is	Rio LC 12-368HN (AWP#1).
Coordinates are in	Feet reference E04 - Rio LC 12-368HN.
True Vertical Depths are	reference Rig Datum.
Measured Depths are	reference Rig Datum.
Rig Datum:	Actual Datum #1
Rig Datum to Mean Sea Level:	5088.40 ft.
Plot North is aligned to	TRUE North.



Sept-10-2018
IGRF-12 Dec 69.43 deg Field: 52023.6 nT
Lat: N19 59 58.4700 Long: W104 56 24.3744 Elev: 5088.40 ft
Magnetic North is 8.14 deg East of TRUE North.
To correct azimuth from Magnetic to TRUE add 8.14 deg

East (Feet) ->

Scale 1 cm = 400 ft



Great Western Operating Co, LLC
Directional Survey Report
Wellpath: Rio LC 12-368HN
MDs and TVDs are from Rig Floor 5088.4ft above Mean Sea Level

Wellbore Information

Date Created	Date Revised	API #	RKB above GL	Well Name
Sep-1-2019	Sep-9-2019	05-001-10466	20.00	Rio LC 12-368HN

Slot Coordinates

Latitude	Longitude
39.99953600	-104.93978100

Pad Information

Pad Name	Ground Elev.
Rio	5068.40

Field

Name
Wattenburg

Wellpath Report

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	DLS [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
0.00	0.00	0.00	0.00	0.00	0.00		0.00	39.99953600	-104.93978100
12.40	0.00	278.06	12.40	0.00	0.00	0.00	0.00	39.99953600	-104.93978100
92.40	0.48	278.06	92.40	0.05	-0.33	0.60	0.02	39.99953613	-104.93978218
182.40	0.66	249.23	182.39	-0.08	-1.19	0.37	0.34	39.99953577	-104.93978525
272.40	0.57	258.99	272.39	-0.35	-2.11	0.15	0.80	39.99953503	-104.93978854
361.40	0.44	248.09	361.39	-0.57	-2.87	0.18	1.16	39.99953445	-104.93979123
451.40	0.57	30.56	451.38	-0.31	-2.96	1.06	0.93	39.99953515	-104.93979156
541.40	0.62	38.82	541.38	0.46	-2.43	0.11	0.07	39.99953725	-104.93978966
631.40	0.66	50.42	631.37	1.17	-1.72	0.15	-0.77	39.99953920	-104.93978714
721.40	0.83	85.58	721.37	1.55	-0.67	0.53	-1.37	39.99954024	-104.93978340
811.40	0.62	149.48	811.36	1.18	0.23	0.88	-1.20	39.99953923	-104.93978019
901.40	0.75	145.08	901.35	0.27	0.81	0.16	-0.44	39.99953675	-104.93977811
991.40	0.92	141.30	991.35	-0.77	1.60	0.20	0.41	39.99953388	-104.93977529
1081.40	0.26	221.46	1081.34	-1.49	1.92	1.01	1.05	39.99953191	-104.93977416
1171.40	0.31	242.64	1171.34	-1.75	1.56	0.13	1.38	39.99953118	-104.93977542
1261.40	0.57	300.21	1261.34	-1.64	0.96	0.53	1.40	39.99953150	-104.93977757
1351.40	0.31	322.36	1351.33	-1.22	0.43	0.34	1.10	39.99953264	-104.93977948
1441.40	0.48	325.43	1441.33	-0.72	0.06	0.19	0.69	39.99953402	-104.93978077
1531.40	1.01	330.27	1531.32	0.28	-0.54	0.59	-0.16	39.99953677	-104.93978294
1621.40	0.79	322.97	1621.31	1.46	-1.31	0.28	-1.15	39.99954002	-104.93978568
1711.40	0.48	302.58	1711.31	2.16	-2.00	0.42	-1.69	39.99954194	-104.93978815
1778.00	0.76	294.74	1777.90	2.50	-2.64	0.43	-1.88	39.99954285	-104.93979041
1800.00	0.85	293.28	1799.90	2.62	-2.92	0.43	-1.94	39.99954320	-104.93979142
1889.00	1.98	332.53	1888.87	4.25	-4.23	1.60	-3.25	39.99954766	-104.93979611
1979.00	1.73	298.70	1978.83	6.28	-6.14	1.23	-4.83	39.99955324	-104.93980293
2068.00	1.90	238.70	2067.79	6.16	-8.58	2.05	-4.19	39.99955290	-104.93981163
2158.00	3.03	250.79	2157.71	4.60	-12.10	1.38	-1.92	39.99954863	-104.93982420
2247.00	0.81	165.76	2246.66	3.22	-14.17	3.45	-0.12	39.99954483	-104.93983158
2337.00	1.01	161.21	2336.65	1.85	-13.76	0.24	1.13	39.99954107	-104.93983011
2426.00	1.38	8.92	2425.64	2.16	-13.34	2.61	0.73	39.99954194	-104.93982861
2516.00	1.34	248.22	2515.63	2.84	-14.15	2.63	0.24	39.99954381	-104.93983150
2605.00	0.83	149.46	2604.62	1.90	-14.79	1.89	1.29	39.99954122	-104.93983378
2695.00	0.89	17.35	2694.62	2.01	-14.25	1.75	1.07	39.99954151	-104.93983186
2784.00	0.85	9.62	2783.61	3.32	-13.93	0.14	-0.28	39.99954511	-104.93983073
2874.00	0.85	353.18	2873.60	4.64	-13.90	0.27	-1.57	39.99954874	-104.93983061
2963.00	1.08	16.22	2962.58	6.10	-13.74	0.50	-3.03	39.99955275	-104.93983006
3053.00	0.28	290.84	3052.58	6.99	-13.71	1.22	-3.91	39.99955520	-104.93982994
3142.00	1.67	212.39	3141.57	5.98	-14.61	1.84	-2.73	39.99955241	-104.93983315
3232.00	0.89	148.46	3231.55	4.27	-14.95	1.68	-0.99	39.99954773	-104.93983435
3321.00	0.73	157.78	3320.54	3.16	-14.37	0.23	-0.02	39.99954467	-104.93983230
3410.00	0.80	229.20	3409.53	2.23	-14.63	1.01	0.94	39.99954212	-104.93983321
3500.00	1.49	258.47	3499.51	1.58	-16.25	0.98	1.91	39.99954035	-104.93983900
3590.00	3.42	270.52	3589.43	1.37	-20.08	2.21	2.94	39.99953977	-104.93985267
3679.00	5.90	279.57	3678.13	2.16	-27.25	2.90	3.70	39.99954193	-104.93987825
3768.00	9.12	287.56	3766.35	5.05	-38.49	3.79	3.27	39.99954986	-104.93991837
3858.00	11.40	294.23	3854.91	10.85	-53.40	2.85	0.77	39.99956579	-104.93997160
3947.00	14.70	286.37	3941.61	17.65	-72.26	4.20	-1.85	39.99958444	-104.94003892
4037.00	17.12	271.40	4028.19	21.19	-96.47	5.27	-0.15	39.99959417	-104.94012535
4126.00	19.85	267.41	4112.59	20.83	-124.67	3.38	6.21	39.99959317	-104.94022599
4216.00	21.39	275.98	4196.85	21.85	-156.27	3.76	11.95	39.99959597	-104.94033877
4305.00	24.66	277.35	4278.75	25.91	-190.83	3.72	15.34	39.99960714	-104.94046215
4395.00	28.82	280.68	4359.11	32.34	-230.79	4.91	17.57	39.99962477	-104.94060477
4484.00	30.57	282.70	4436.42	41.29	-273.95	2.26	18.02	39.99964935	-104.94075883
4574.00	31.04	278.53	4513.73	49.77	-319.23	2.43	19.39	39.99967261	-104.94092045
4663.00	30.87	274.20	4590.06	54.84	-364.70	2.51	24.12	39.99968654	-104.94108274
4753.00	29.98	278.86	4667.68	60.00	-409.96	2.80	28.72	39.99970069	-104.94124426
4842.00	30.23	280.84	4744.68	67.64	-453.93	1.15	30.63	39.99972166	-104.94140123
4931.00	31.13	276.65	4821.23	74.51	-498.79	2.61	33.46	39.99974054	-104.94156136
5021.00	30.99	274.07	4898.33	78.85	-545.02	1.49	39.07	39.99975244	-104.94172634
5111.00	30.13	276.52	4975.83	83.06	-590.57	1.68	44.67	39.99976400	-104.94188895
5200.00	30.07	278.57	5052.83	88.92	-634.81	1.16	48.37	39.99978008	-104.94204686
5289.00	30.03	279.72	5129.87	96.01	-678.81	0.65	50.82	39.99979952	-104.94220391
5379.00	30.11	278.56	5207.75	103.17	-723.33	0.65	53.31	39.99981918	-104.94236282
5469.00	30.18	277.89	5285.58	109.63	-768.07	0.38	56.52	39.99983692	-104.94252248
5558.00	30.08	278.92	5362.56	116.16	-812.26	0.59	59.56	39.99985484	-104.94268022
5647.00	30.26	276.74	5439.50	122.25	-856.56	1.25	63.05	39.99987155	-104.94283837
5737.00	29.22	275.41	5517.65	126.99	-900.96	1.37	67.88	39.99988454	-104.94299681
5826.00	29.52	277.65	5595.21	131.95	-944.31	1.28	72.26	39.99989817	-104.94315158

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	DLS [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
5916.00	29.67	276.56	5673.47	137.45	-988.42	0.62	76.29	39.99991326	-104.94330900
6005.00	30.65	276.40	5750.42	142.49	-1032.85	1.10	80.83	39.99992710	-104.94346759
6095.00	30.75	278.05	5827.81	148.27	-1078.43	0.94	84.89	39.99994296	-104.94363028
6184.00	30.82	277.30	5904.27	154.36	-1123.57	0.44	88.56	39.99995965	-104.94379141
6274.00	29.82	277.84	5981.96	160.34	-1168.61	1.15	92.31	39.99997607	-104.94395217
6363.00	29.92	278.93	6059.14	166.80	-1212.46	0.62	95.34	39.99999381	-104.94410868
6452.00	29.71	278.15	6136.36	173.38	-1256.22	0.50	98.24	40.00001184	-104.94426487
6542.00	29.80	277.86	6214.49	179.60	-1300.45	0.19	101.59	40.00002891	-104.94442275
6631.00	29.82	277.19	6291.71	185.39	-1344.31	0.37	105.27	40.00004481	-104.94457931
6720.00	29.59	280.11	6369.02	192.02	-1387.90	1.65	108.09	40.00006300	-104.94473490
6810.00	29.99	281.39	6447.13	200.36	-1431.83	0.83	109.29	40.00008589	-104.94489169
6899.00	30.01	277.39	6524.21	207.62	-1475.71	2.25	111.55	40.00010580	-104.94504832
6989.00	29.72	277.04	6602.26	213.24	-1520.17	0.38	115.52	40.00012125	-104.94520702
7078.00	29.64	277.06	6679.59	218.65	-1563.91	0.09	119.56	40.00013609	-104.94536313
7168.00	29.59	278.58	6757.83	224.70	-1607.96	0.84	123.03	40.00015269	-104.94552039
7257.00	30.39	277.46	6834.91	230.91	-1652.01	1.10	126.36	40.00016970	-104.94567762
7346.00	30.03	277.83	6911.83	236.86	-1696.40	0.46	129.99	40.00018605	-104.94583604
7436.00	30.02	277.24	6989.75	242.77	-1741.04	0.33	133.74	40.00020225	-104.94599540
7526.00	29.38	276.55	7067.93	248.12	-1785.31	0.81	137.94	40.00021694	-104.94615341
7615.00	29.62	267.37	7145.43	249.60	-1828.99	5.08	145.79	40.00022100	-104.94630933
7704.00	30.90	253.63	7222.39	242.15	-1872.95	7.90	162.45	40.00020052	-104.94646620
7794.00	33.14	243.33	7298.75	224.57	-1917.14	6.55	189.03	40.00015227	-104.94662395
7883.00	38.49	238.15	7370.92	199.02	-1962.45	6.90	223.65	40.00008210	-104.94678566
7973.00	45.72	225.96	7437.76	161.73	-2009.54	12.10	270.12	39.99997974	-104.94695374
8062.00	49.11	208.75	7498.22	109.86	-2048.79	14.71	329.16	39.99983735	-104.94709383
8152.00	56.90	197.60	7552.44	43.87	-2076.65	13.13	399.57	39.99965619	-104.94719325
8241.00	65.85	190.20	7595.08	-31.86	-2095.17	12.42	477.51	39.99944829	-104.94725933
8331.00	74.60	186.44	7625.51	-115.57	-2107.34	10.48	561.89	39.99921849	-104.94730273
8384.92	76.01	184.73	7639.19	-167.48	-2112.41	4.03	613.68	39.99907601	-104.94732082
8420.00	76.93	183.63	7647.40	-201.49	-2114.90	4.03	647.45	39.99898263	-104.94732968
8509.00	84.51	185.13	7661.74	-289.01	-2121.61	8.68	734.38	39.99874241	-104.94735362
8599.00	89.63	184.16	7666.34	-378.56	-2128.89	5.79	823.43	39.99849656	-104.94737956
8688.00	90.49	179.80	7666.25	-467.49	-2131.96	4.99	910.97	39.99825246	-104.94739051
8777.00	90.18	174.82	7665.73	-556.36	-2127.79	5.61	996.91	39.99800850	-104.94737558
8867.00	90.46	174.40	7665.22	-645.96	-2119.33	0.56	1082.65	39.99776254	-104.94734538
8956.00	89.82	176.83	7665.01	-734.69	-2112.53	2.82	1167.90	39.99751896	-104.94732106
9045.00	90.00	177.75	7665.15	-823.59	-2108.32	1.05	1253.86	39.99727492	-104.94730602
9135.00	89.69	180.78	7665.39	-913.57	-2107.17	3.38	1341.53	39.99702792	-104.94730187
9224.00	90.80	182.48	7665.01	-1002.53	-2109.70	2.28	1428.99	39.99678372	-104.94731088
9314.00	89.85	182.19	7664.50	-1092.45	-2113.36	1.10	1517.63	39.99653687	-104.94732394
9403.00	90.03	182.70	7664.59	-1181.37	-2117.16	0.61	1605.31	39.99629278	-104.94733746
9493.00	90.15	181.24	7664.45	-1271.32	-2120.25	1.63	1693.85	39.99604587	-104.94734848
9582.00	89.45	181.65	7664.76	-1360.29	-2122.50	0.91	1781.26	39.99580164	-104.94735646
9672.00	88.46	183.98	7666.40	-1450.16	-2126.92	2.81	1870.00	39.99555494	-104.94737220
9761.00	89.54	181.98	7667.96	-1539.02	-2131.54	2.55	1957.81	39.99531101	-104.94738868
9851.00	89.02	180.83	7669.09	-1628.98	-2133.75	1.40	2046.18	39.99506405	-104.94739653
9940.00	88.83	180.25	7670.76	-1717.96	-2134.59	0.69	2133.29	39.99481979	-104.94739950
10030.00	89.05	181.72	7672.42	-1807.93	-2136.13	1.65	2221.53	39.99457282	-104.94740499
10119.00	88.86	182.41	7674.04	-1896.86	-2139.34	0.80	2309.09	39.99432871	-104.94741641
10209.00	89.29	182.04	7675.50	-1986.78	-2142.83	0.63	2397.69	39.99408187	-104.94742885
10298.00	89.23	181.91	7676.65	-2075.72	-2145.90	0.16	2485.24	39.99383772	-104.94743977
10388.00	89.35	179.46	7677.76	-2165.70	-2146.98	2.73	2573.39	39.99359072	-104.94744358
10477.00	89.38	179.02	7678.75	-2254.68	-2145.80	0.50	2660.08	39.99334644	-104.94743934
10567.00	89.32	178.94	7679.77	-2344.66	-2144.20	0.11	2747.65	39.99309944	-104.94743359
10656.00	89.20	179.14	7680.92	-2433.64	-2142.70	0.26	2834.27	39.99285518	-104.94742825
10746.00	88.98	178.78	7682.35	-2523.62	-2141.07	0.47	2921.83	39.99260819	-104.94742239
10835.00	89.11	178.85	7683.83	-2612.58	-2139.23	0.17	3008.37	39.99236397	-104.94741579
10925.00	89.08	178.99	7685.25	-2702.56	-2137.53	0.16	3095.91	39.99211698	-104.94740971
11014.00	89.14	178.94	7686.64	-2791.53	-2135.93	0.09	3182.50	39.99187274	-104.94740395
11104.00	89.20	179.12	7687.94	-2881.51	-2134.40	0.21	3270.09	39.99162575	-104.94739848
11194.00	88.92	178.97	7689.42	-2971.48	-2132.90	0.35	3357.68	39.99137876	-104.94739310
11283.00	89.08	179.05	7690.97	-3060.46	-2131.37	0.20	3444.28	39.99113452	-104.94738759
11373.00	89.05	178.60	7692.44	-3150.43	-2129.52	0.50	3531.79	39.99088754	-104.94738098
11462.00	89.02	178.71	7693.94	-3239.39	-2127.43	0.13	3618.27	39.99064333	-104.94737349
11551.00	89.08	180.84	7695.41	-3328.37	-2127.08	2.39	3705.13	39.99039907	-104.94737222
11641.00	89.11	180.41	7696.83	-3418.35	-2128.06	0.48	3793.26	39.99015206	-104.94737570
11730.00	89.20	180.61	7698.15	-3507.34	-2128.86	0.25	3880.37	39.98990778	-104.94737850
11820.00	89.42	180.89	7699.23	-3597.33	-2130.03	0.40	3968.54	39.98966076	-104.94738267
11909.00	89.08	180.26	7700.40	-3686.31	-2130.93	0.80	4055.68	39.98941648	-104.94738583
11999.00	89.14	180.51	7701.79	-3776.30	-2131.53	0.29	4143.73	39.98916946	-104.94738796
12088.00	89.94	179.79	7702.51	-3865.30	-2131.77	1.21	4230.73	39.98892516	-104.94738877
12178.00	89.97	180.38	7702.58	-3955.30	-2131.90	0.66	4318.69	39.98867810	-104.94738922
12267.00	90.06	179.86	7702.56	-4044.30	-2132.08	0.59	4405.69	39.98843379	-104.94738985
12357.00	90.22	180.95	7702.34	-4134.29	-2132.72	1.22	4493.75	39.98818674	-104.94739210
12446.00	89.69	181.44	7702.41	-4223.27	-2134.58	0.81	4581.08	39.98794248	-104.94739869
12536.00	89.91	181.10	7702.72	-4313.25	-2136.57	0.45	4669.42	39.98769549	-104.94740578
12625.00	90.00	180.68	7702.79	-4402.24	-2137.95	0.48	4756.66	39.98745120	-104.94741069
12715.00	89.85	180.03	7702.91	-4492.24	-2138.51	0.74	4844.71	39.98720415	-104.94741265
12805.00	89.97	180.51	7703.05	-4582.23	-2138.94	0.55	4932.73	39.98695710	-104.94741414
12894.00	89.88	180.85	7703.17	-4671.23	-2139.99	0.40	5019.91	39.98671280	-104.94741788
12983.00	89.94	180.71	7703.31	-4760.22	-2141.20	0.17	5107.11	39.98646851	-104.94742218
13073.00	89.88	180.65	7703.45	-4850.21	-2142.27	0.09	5195.27	39.98622147	-104.94742596
13162.00	90.83	181.77	7702.90	-4939.19	-2144.15	1.65	5282.60	39.98597722	-104.94743264
13251.00	90.71	181.29	7701.70	-5028.15	-2146.53	0.56	5370.03	39.98573302	-104.94744109
13341.00	90.49	180.86	7700.76	-5118.13	-2148.22	0.54	5458.30	39.98548602	-104.94744709
13431.00	90.74	181.20	7699.79	-5208.11	-2149.83	0.47	5546.56	39.98523901	-104.94745283
13520.00	90.55	180.85	7698.79	-5297.09	-2151.43	0.45	5633.84	39.98499475	-104.94745849
13610.00	89.88	181.26	7698.45	-5387.07	-2153.08	0.87	5722.11	39.98474774	-104.94746437
13699.00	90.25	179.19	7698.35	-5476.07	-2153.43	2.36	5809.13	39.98450344	-104.94746559
13789.00	89.97	179.28	7698.18	-5566.06	-2152.23	0.33	5896.80	39.98425641	-104.94746128
13878.00	89.85	179.71	7698.32	-5655.05	-2151.45	0.50	5983.59	39.98401210	-104.94745845

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	DLS [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
13968.00	89.94	179.81	7698.48	-5745.05	-2151.07	0.15	6071.44	39.98376505	-104.94745708
14057.00	89.94	179.16	7698.58	-5834.05	-2150.27	0.73	6158.22	39.98352075	-104.94745419
14147.00	89.82	178.74	7698.76	-5924.03	-2148.62	0.49	6245.79	39.98327373	-104.94744828
14236.00	89.88	179.72	7699.00	-6013.02	-2147.42	1.10	6332.48	39.98302944	-104.94744399
14326.00	90.12	178.68	7699.00	-6103.01	-2146.17	1.19	6420.14	39.98278241	-104.94743947
14415.00	89.97	179.39	7698.93	-6192.00	-2144.67	0.82	6506.76	39.98253814	-104.94743410
14505.00	89.51	178.46	7699.34	-6281.98	-2142.98	1.15	6594.32	39.98229113	-104.94742805
14594.00	90.31	179.30	7699.48	-6370.96	-2141.24	1.30	6680.89	39.98204687	-104.94742181
14684.00	90.25	179.08	7699.04	-6460.95	-2139.97	0.25	6768.54	39.98179984	-104.94741724
14773.00	90.68	180.16	7698.31	-6549.95	-2139.38	1.31	6855.36	39.98155554	-104.94741511
14863.00	90.31	178.01	7697.54	-6639.93	-2137.94	2.42	6942.97	39.98130854	-104.94740995
14952.00	90.68	181.48	7696.77	-6728.91	-2137.54	3.92	7029.83	39.98106427	-104.94740851
15042.00	90.65	178.40	7695.72	-6818.89	-2137.45	3.42	7117.72	39.98081726	-104.94740815
15131.00	89.91	178.66	7695.29	-6907.86	-2135.17	0.88	7204.16	39.98057303	-104.94739997
15221.00	89.97	178.06	7695.38	-6997.82	-2132.59	0.67	7291.51	39.98032608	-104.94739076
15310.00	89.11	179.20	7696.10	-7086.79	-2130.46	1.60	7377.98	39.98008185	-104.94738314
15400.00	90.03	179.33	7696.77	-7176.78	-2129.31	1.03	7465.66	39.97983482	-104.94737899
15489.00	89.82	175.76	7696.89	-7265.69	-2125.50	4.02	7551.71	39.97959077	-104.94736536
15579.00	90.34	173.30	7696.76	-7355.27	-2116.92	2.79	7637.41	39.97934486	-104.94733472
15668.00	90.95	170.83	7695.76	-7443.40	-2104.63	2.86	7720.91	39.97910293	-104.94729086
15758.00	90.22	171.75	7694.84	-7532.36	-2091.01	1.30	7804.92	39.97885874	-104.94724221
15847.00	90.12	170.64	7694.58	-7620.31	-2077.38	1.25	7887.94	39.97861731	-104.94719357
15937.00	89.38	172.73	7694.97	-7709.36	-2064.37	2.46	7972.17	39.97837287	-104.94714711
16026.00	89.26	175.26	7696.03	-7797.85	-2055.06	2.85	8056.66	39.97812994	-104.94711386
16116.00	89.72	177.42	7696.83	-7887.66	-2049.31	2.45	8143.18	39.97778341	-104.94709334
16205.00	89.66	179.23	7697.31	-7976.62	-2046.71	2.03	8229.54	39.97763921	-104.94708403
16295.00	89.97	178.04	7697.60	-8066.59	-2044.57	1.37	8316.99	39.97739223	-104.94707635
16385.00	90.18	178.85	7697.48	-8156.56	-2042.13	0.93	8404.37	39.97714527	-104.94706761
16475.00	89.23	181.48	7697.94	-8246.55	-2042.39	3.11	8492.35	39.97698924	-104.94706851
16564.00	89.78	185.19	7698.71	-8335.38	-2047.56	4.21	8580.24	39.97665439	-104.94708695
16654.00	90.00	188.15	7698.89	-8424.76	-2058.02	3.30	8669.80	39.97640903	-104.94712422
16743.00	90.28	187.92	7698.67	-8512.88	-2070.46	0.41	8758.55	39.97616711	-104.94716859
16833.00	90.25	187.58	7698.25	-8602.06	-2082.59	0.38	8848.26	39.97592231	-104.94721186
16923.00	90.55	188.11	7697.62	-8691.21	-2094.88	0.68	8937.99	39.97567757	-104.94725567
17012.00	89.54	188.62	7697.55	-8779.27	-2107.82	1.27	9026.78	39.97543585	-104.94730184
17102.00	89.45	187.30	7698.35	-8868.39	-2120.29	1.47	9116.51	39.97519119	-104.94734628
17191.00	90.31	186.60	7698.53	-8956.74	-2131.06	1.25	9205.12	39.97494867	-104.94738467
17281.00	89.32	185.09	7698.82	-9046.27	-2140.22	2.01	9294.55	39.97470291	-104.94741735
17371.00	89.91	181.74	7699.43	-9136.09	-2145.58	3.78	9383.45	39.97445633	-104.94743645
17460.00	89.54	179.72	7699.86	-9225.08	-2146.71	2.31	9470.64	39.97421205	-104.94744046
17549.00	89.35	179.92	7700.72	-9314.07	-2146.43	0.31	9557.53	39.97396775	-104.94743944
17639.00	89.26	179.05	7701.81	-9404.06	-2145.63	0.97	9645.28	39.97372072	-104.94743652
17728.00	89.60	179.24	7702.70	-9493.05	-2144.30	0.44	9731.94	39.97347645	-104.94743176
17806.21	89.60	178.65	7703.24	-9571.24	-2142.86	0.76	9808.03	39.97326180	-104.94742660
17816.91	89.60	178.57	7703.32	-9581.94	-2142.60	0.76	9818.43	39.97323243	-104.94742566
17818.00	89.60	178.56	7703.32	-9583.03	-2142.57	0.76	9819.49	39.97322944	-104.94742557
17907.00	89.54	179.84	7703.99	-9672.02	-2141.33	1.44	9906.17	39.97298516	-104.94742111
17997.00	89.45	178.96	7704.79	-9762.01	-2140.38	0.98	9993.89	39.97273813	-104.94741772
18023.00	89.51	179.11	7705.02	-9788.00	-2139.95	0.62	10019.20	39.97266677	-104.94741615
18036.66	89.51	179.11	7705.14	-9801.66	-2139.73	0.00	10032.50	39.97262928	-104.94741538
18047.00	89.51	179.11	7705.23	-9812.00	-2139.57	0.00	10042.56	39.97260090	-104.94741481

Comments

MD[ft]	TVD[ft]	North[ft]	East[ft]	Lat - NAD 83	Long - NAD 83	Comment
1778.00	1777.90	2.50	-2.64	39.99954285	-104.93979041	9.625" Csg: 1778 MD/TVD
8384.92	7639.19	-167.48	-2112.41	39.99907601	-104.94732082	460 Setback: 8385 / 7639 MD/TVD, 460 FNL, 1958 FEL Sec 01
17806.21	7703.24	-9571.24	-2142.86	39.97326180	-104.94742660	Btm Toe Sub: 17,806 / 7703 MD/TVD, 471 FSL, 2003 FEL Sec 12
17816.91	7703.32	-9581.94	-2142.60	39.97323243	-104.94742566	460 Setback: 17,817 / 7703 MD/TVD, 460 FSL, 2002 FEL Sec 12
18036.66	7705.14	-9801.66	-2139.73	39.97262928	-104.94741538	PBTD: 18,037 / 7705 MD/TVD, 240 FSL, 2000 FEL Sec 12
18047.00	7705.23	-9812.00	-2139.57	39.97260090	-104.94741481	5.5" Csg: 18,047 / 7705 MD/TVD, 230 FSL, 1999 FEL Sec 12
18047.00	7705.23	-9812.00	-2139.57	39.97260090	-104.94741481	BHL: 18,047 / 7705 MD/TVD, 230 FSL, 1999 FEL Sec 12

Hole Sections

Diameter [in]	Start MD[ft]	Start TVD[ft]	Start North[ft]	Start East[ft]	End MD[ft]	End TVD[ft]	End North[ft]	End East[ft]
13.500	0.00	0.00	0.00	0.00	1778.00	1777.90	2.50	-2.64
8.500	1778.00	1777.90	2.50	-2.64	18047.00	7705.23	-9812.00	-2139.57

Casings

Name	Top MD[ft]	Top TVD[ft]	Top North[ft]	Top East[ft]	Shoe MD[ft]	Shoe TVD[ft]	Shoe North[ft]	Shoe East[ft]
9 5/8in Casing	0.00	0.00	0.00	0.00	1778.00	1777.90	2.50	-2.64
5 1/2in Casing	0.00	0.00	0.00	0.00	18047.00	7705.23	-9812.00	-2139.57

Survey Tool Program

Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool
607786	As Drilled - 20190901	18047.00	7705.23	MWD

Coordinates are from Slot

MD's and TVD's are from Rig Floor 5088.4ft above Mean Sea Level

Vertical Section is from Wellhead on azimuth 192.30 degrees

Bottom hole distance is 10042.56 Feet on azimuth 192.30 degrees from Wellhead

Survey calculation uses Minimum Curvature method