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Office of Oil and Gas
JUL 17 2015
WV Department of
Environmental Protection

BAKER HUGHES

Company:	Chevron Appalachia, LLC	Job Number:	6803741	Calculation Method	Minimum Curvature
Well:	Francis 11H	Magnetic Decl.:	-8.65	Proposed Azimuth	141.46
Location:	Continental US	Grid Corr.:	0.00	Depth Reference	Rig Floor
Rig:	Francis Unit	Total Grid Corr.:	-8.65	Tie Into:	

Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Direction	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates N/S (ft)	Coordinates E/W (ft)	Closure Distance (ft)	Closure Angle (deg)	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
Tie In Coordinates														
N/A	0	0.00	0.00	N 0.0 E	0	0	0	0 N	0 E					
Gyro	0	0.00	64.42	N 64.4 E	0	0.00	0.00	0.00 N	0.00 E	0.00	0.00	0.00	0.00	0.00
Gyro	32	0.00	64.42	N 64.4 E	32	32.00	0.00	0.00 N	0.00 E	0.00	0.00	0.00	0.00	0.00
Gyro	100	0.26	64.42	N 64.4 E	68	100.00	0.03	0.07 N	0.14 E	0.15	64.42	0.38	0.38	0.00
Gyro	200	0.25	72.52	N 72.5 E	100	200.00	0.16	0.23 N	0.55 E	0.60	67.37	0.04	-0.01	8.10
Gyro	300	0.28	80.62	N 80.6 E	100	300.00	0.36	0.34 N	1.00 E	1.06	71.47	0.05	0.03	8.10
Gyro	400	0.16	77.14	N 77.1 E	100	400.00	0.54	0.41 N	1.38 E	1.44	73.57	0.12	-0.12	-3.48
Gyro	500	0.14	67.41	N 67.4 E	100	500.00	0.63	0.48 N	1.63 E	1.70	73.42	0.03	-0.02	-9.73
Gyro	600	0.23	55.21	N 55.2 E	100	600.00	0.68	0.65 N	1.90 E	2.01	71.27	0.10	0.09	-12.20
Gyro	700	0.16	8.57	N 8.6 E	100	700.00	0.60	0.90 N	2.09 E	2.28	66.74	0.17	-0.07	-46.64
Gyro	718	0.25	16.39	N 16.4 E	18	718.00	0.56	0.96 N	2.11 E	2.31	65.47	0.52	0.50	43.44
MWD	800	0.34	15.75	N 15.8 E	82	799.99	0.32	1.37 N	2.22 E	2.61	58.40	0.11	0.11	-0.78
MWD	863	0.57	345.34	N 14.7 W	63	862.99	-0.08	1.85 N	2.19 E	2.87	49.86	0.52	0.37	-48.27
MWD	908	0.55	354.23	N 5.8 W	45	907.99	-0.47	2.28 N	2.11 E	3.11	42.83	0.20	-0.04	19.76
MWD	958	0.31	78.17	N 78.2 E	50	957.99	-0.61	2.55 N	2.22 E	3.38	41.11	1.20	-0.48	167.88
MWD	1003	0.57	87.01	N 87.0 E	45	1002.99	-0.42	2.58 N	2.57 E	3.64	44.79	0.60	0.58	19.64
MWD	1052	1.15	120.87	S 59.1 E	49	1051.98	0.18	2.34 N	3.23 E	3.99	54.03	1.53	1.18	69.10
MWD	1097	2.45	130.48	S 49.5 E	45	1096.96	1.55	1.49 N	4.35 E	4.60	71.11	2.96	2.89	21.36
MWD	1147	3.82	134.70	S 45.3 E	50	1146.88	4.25	-0.38 N	6.35 E	6.36	-86.60	2.78	2.74	8.44
MWD	1192	4.47	134.01	S 46.0 E	45	1191.77	7.48	-2.65 N	8.67 E	9.07	-73.01	1.45	1.44	-1.53
MWD	1242	4.81	131.39	S 48.6 E	50	1241.60	11.47	-5.39 N	11.65 E	12.83	-65.17	0.80	0.68	-5.24
MWD	1289	5.38	132.41	S 47.6 E	47	1288.42	15.59	-8.18 N	14.75 E	16.87	-61.00	1.23	1.21	2.17
MWD	1336	6.77	131.39	S 48.6 E	47	1335.15	20.49	-11.50 N	18.46 E	21.75	-58.09	2.97	2.96	-2.17
MWD	1431	7.25	131.03	S 49.0 E	95	1429.44	31.90	-19.13 N	27.18 E	33.24	-54.86	0.51	0.51	-0.38
MWD	1525	6.75	126.64	S 53.4 E	94	1522.74	43.08	-26.32 N	36.09 E	44.67	-53.89	0.78	-0.53	-4.67
MWD	1620	6.95	127.38	S 52.6 E	95	1617.06	54.05	-33.15 N	45.14 E	56.00	-53.71	0.23	0.21	0.78
MWD	1715	6.72	126.28	S 53.7 E	95	1711.39	64.99	-39.92 N	54.18 E	67.30	-53.62	0.28	-0.24	-1.16
MWD	1810	4.81	122.81	S 57.2 E	95	1805.90	74.13	-45.37 N	62.01 E	76.84	-53.81	2.04	-2.01	-3.65
MWD	1904	3.46	118.04	S 62.0 E	94	1899.66	80.46	-48.84 N	67.83 E	83.58	-54.24	1.48	-1.44	-5.07
MWD	1999	1.86	106.46	S 73.5 E	95	1994.55	84.36	-50.63 N	71.84 E	87.88	-54.83	1.77	-1.68	-12.19
MWD	2094	0.79	60.63	N 60.6 E	95	2089.53	85.72	-50.74 N	73.89 E	89.63	-55.52	1.50	-1.13	-48.24
MWD	2188	1.06	19.45	N 19.5 E	94	2183.51	85.37	-49.60 N	74.74 E	89.70	-56.43	0.74	0.29	-43.81
MWD	2283	1.41	16.65	N 16.7 E	95	2278.49	84.23	-47.65 N	75.37 E	89.17	-57.70	0.37	0.37	-2.95
MWD	2376	1.28	358.22	N 1.8 W	93	2371.47	82.75	-45.52 N	75.66 E	88.30	-58.97	0.48	-0.14	-19.82
MWD	2471	1.29	288.07	N 71.9 W	95	2466.45	81.01	-44.13 N	74.62 E	86.69	-59.40	1.55	0.01	-73.84
MWD	2566	1.47	254.88	S 74.9 W	95	2561.42	79.63	-44.11 N	72.42 E	84.80	-58.65	0.85	0.19	-34.94
MWD	2652	1.71	251.57	S 71.6 W	86	2647.39	78.75	-44.81 N	70.14 E	83.23	-57.43	0.30	0.28	-3.85
MWD	2765	1.61	239.75	S 59.8 W	113	2760.34	77.94	-46.14 N	67.17 E	81.49	-55.51	0.32	-0.09	-10.46
MWD	2859	0.98	221.89	S 41.9 W	94	2854.32	77.88	-47.40 N	65.49 E	80.85	-54.10	0.79	-0.67	-19.00
MWD	2954	1.48	277.39	N 82.6 W	95	2949.30	77.14	-47.85 N	63.73 E	79.70	-53.10	1.29	0.53	58.42
MWD	3048	0.80	321.04	N 39.0 W	94	3043.28	75.61	-47.18 N	62.12 E	78.01	-52.78	1.12	-0.72	46.44
MWD	3143	0.67	316.62	N 43.4 W	95	3138.27	74.39	-46.27 N	61.32 E	76.81	-52.96	0.15	-0.14	-4.65
MWD	3237	0.38	301.56	N 58.4 W	94	3232.27	73.55	-45.70 N	60.67 E	75.96	-53.01	0.34	-0.31	-16.02
MWD	3332	0.47	313.85	N 46.2 W	95	3327.27	72.87	-45.27 N	60.13 E	75.26	-53.02	0.13	0.09	12.94
MWD	3427	0.48	332.22	N 27.8 W	95	3422.26	72.09	-44.65 N	59.66 E	74.51	-53.19	0.16	0.01	19.34
MWD	3522	0.61	331.75	N 28.3 W	95	3517.26	71.20	-43.85 N	59.23 E	73.70	-53.49	0.14	0.14	-0.49
MWD	3616	0.47	173.35	S 6.7 E	94	3611.26	71.04	-43.79 N	59.04 E	73.51	-53.44	1.13	-0.15	-168.51
MWD	3710	0.08	197.78	S 17.8 W	94	3705.26	71.40	-44.24 N	59.07 E	73.79	-53.17	0.42	-0.41	25.99
MWD	3805	0.27	279.33	N 80.7 W	95	3800.26	71.27	-44.26 N	58.83 E	73.62	-53.04	0.28	0.20	85.84
MWD	3900	0.47	321.47	N 38.5 W	95	3895.25	70.72	-43.92 N	58.36 E	73.04	-53.04	0.34	0.21	44.36
MWD	3994	0.32	126.20	S 53.8 E	94	3989.25	70.58	-43.77 N	58.33 E	72.93	-53.11	0.83	-0.16	175.24
MWD	4089	0.40	123.68	S 56.3 E	95	4084.25	71.16	-44.12 N	58.82 E	73.53	-53.13	0.09	0.08	-2.65
MWD	4184	0.31	56.24	N 56.2 E	95	4179.25	71.49	-44.16 N	59.31 E	73.94	-53.33	0.42	-0.09	-70.99
MWD	4278	0.20	26.07	N 26.1 E	94	4273.25	71.44	-43.87 N	59.60 E	74.00	-53.64	0.18	-0.12	-32.10
MWD	4373	0.47	335.16	N 24.8 W	95	4368.25	70.99	-43.37 N	59.51 E	73.63	-53.92	0.40	0.28	-53.59
MWD	4467	0.27	318.13	N 41.9 W	94	4462.25	70.40	-42.85 N	59.20 E	73.08	-54.10	0.24	-0.21	-18.12
MWD	4562	0.47	302.45	N 57.6 W	95	4557.24	69.81	-42.47 N	58.72 E	72.47	-54.12	0.23	0.21	-16.51
MWD	4657	0.55	295.16	N 64.8 W	95	4652.24	69.03	-42.07 N	57.98 E	71.63	-54.03	0.11	0.08	-7.67
MWD	4693	0.38	279.84	N 80.2 W	36	4688.24	68.79	-41.98 N	57.70 E	71.36	-53.96	0.58	-0.47	-42.56
MWD	4751	2.28	320.21	N 39.8 W	58	4746.22	67.49	-41.06 N	56.77 E	70.06	-54.13	3.46	3.28	69.60
MWD	4793	5.53	326.14	N 33.9 W	42	4788.12	64.64	-38.74 N	55.11 E	67.36	-54.90	7.79	7.74	14.12
MWD	4845	7.85	327.20	N 32.8 W	52	4839.76	58.60	-33.67 N	51.79 E	61.77	-56.97	4.47	4.46	2.04
MWD	4892	9.52	325.63	N 34.4 W	47	4886.22	51.53	-27.76 N	47.86 E	55.33	-59.88	3.59	3.55	-3.34
MWD	4940	11.59	325.06	N 34.9 W	48	4933.41	42.76	-20.53 N	42.86 E	47.52	-64.40	4.32	4.31	-1.19
MWD	5034	16.77	323.72	N 36.3 W	94	5024.51	19.77	-1.85 N	29.41 E	29.47	-86.41	5.52	5.51	-1.43
MWD	5129	22.34	320.31	N 39.7 W	95	5114.00	-12.00	23.11 N	9.76 E	25.09	22.89	5.98	5.86	-3.59
MWD	5223	30.17	317.31	N 42.7 W	94	5198.24	-53.49	54.27 N	-17.71 E	57.09	-18.07	8.45	8.33	-3.19
MWD	5318	40.41	321.93	N 38.1 W	95	5275.69	-108.24	96.18 N	-52.98 E	109.81	-28.85	11.13	10.78	4.86
MWD	5362	45.64	324.88	N 35.1 W	44	5307.85	-138.23	120.29 N	-70.84 E	139.60	-30.49	12.73	11.89	6.70
MWD	5413	46.40	326.09	N 33.9 W	51	5343.27	-174.83	150.53 N	-91.63 E	176.23	-31.33	2.27	1.49	2.37
MWD	5508	33.22	328.16	N 31.8 W	95	5416.08	-235.24	201.41 N	-124.70 E	236.89	-31.76	13.94	-13.87	2.18
MWD	5602	29.90	329.91	N 30.1 W	94	5496.17	-284.00	243.57 N	-150.04 E	286.07	-31.63	3.66	-3.53	1.86
MWD	5697	22.71	332.55	N 27.5 W	95	5581.28	-325.47	280.38 N	-170.39 E	328.10	-31.29	7.67	-7.57	2.78
MWD	5792	14.76	337.09	N 22.9 W	95	5671.18	-355.17	307.85 N	-183.58 E	358.43	-30.81	8.50	-8.37	4.78

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Company: Chevron Appalachia, LLC
Well: Francis 11H
Location: Continental US
Rig: Francis Unit

Job Number: 6803741
Magnetic Decl.: -8.65
Grid Corr.: 0.00
Total Grid Corr.: -8.65

Calculation Method: Minimum Curvature
Proposed Azimuth: 141.46
Depth Reference: Rig Floor
Tie Into:

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Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Direction	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates N/S (ft)	Coordinates E/W (ft)	Closure Distance (ft)	Closure Angle (deg)	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')	
MWD	5886	19.75	347.53	N 12.5 W	94	5760.94	-380.99	334.41 N	-191.67 E	385.45	-29.82	6.23	5.31	11.01	
MWD	5981	18.07	9.00	N 9.0 E	95	5850.92	-405.39	364.67 N	-192.84 E	412.52	-27.87	7.49	-1.77	22.60	
MWD	6075	12.06	57.82	N 57.8 E	94	5941.99	-414.18	384.39 N	-182.19 E	425.39	-25.36	14.36	-6.39	51.94	
MWD	6170	15.55	87.96	N 88.0 E	95	6034.35	-405.49	390.14 N	-161.04 E	422.07	-22.43	8.29	3.67	31.73	
MWD	6265	22.44	106.26	S 73.7 E	95	6124.20	-383.06	385.51 N	-130.84 E	407.11	-18.75	9.51	7.25	19.26	
MWD	6311	28.97	112.20	S 67.8 E	46	6165.63	-366.14	378.83 N	-112.08 E	395.06	-16.48	15.24	14.20	12.91	
MWD	6359	34.57	117.67	S 62.3 E	48	6206.43	-343.52	368.10 N	-89.23 E	378.77	-13.63	13.11	11.67	11.40	
MWD	6406	40.47	122.57	S 57.4 E	47	6243.70	-316.85	353.69 N	-64.54 E	359.53	-10.34	14.06	12.55	10.43	
MWD	6454	46.47	127.85	S 52.2 E	48	6278.53	-285.17	334.60 N	-37.64 E	336.71	-6.42	14.60	12.50	11.00	
MWD	6502	53.26	132.54	S 47.5 E	48	6309.46	-249.20	310.88 N	-9.69 E	311.03	-1.78	15.99	14.15	9.77	
MWD	6548	59.27	135.05	S 45.0 E	46	6335.00	-211.31	284.40 N	17.89 E	284.97	3.60	13.83	13.07	5.46	
MWD	6642	66.93	138.10	S 41.9 E	94	6377.51	-127.85	223.52 N	75.41 E	235.90	18.64	8.65	8.15	3.24	
MWD	6690	75.20	140.12	S 39.9 E	48	6393.07	-82.53	189.22 N	105.09 E	216.44	29.05	17.68	17.23	4.21	
MWD	6737	79.70	142.77	S 37.2 E	47	6403.28	-36.67	153.35 N	133.66 E	203.43	41.08	11.04	9.57	5.64	
MWD	6786	85.97	145.28	S 34.7 E	49	6409.39	11.87	114.02 N	162.20 E	198.27	54.89	13.77	12.80	5.12	
MWD	6832	87.88	144.63	S 35.4 E	46	6411.86	57.72	76.42 N	188.57 E	203.47	67.94	4.39	4.15	-1.41	
MWD	6879	87.91	145.30	S 34.7 E	47	6413.58	104.60	37.96 N	215.54 E	218.85	80.01	1.43	0.06	1.43	
MWD	6927	90.25	148.32	S 31.7 E	48	6414.35	152.37	-2.19 N	241.80 E	241.81	-89.48	7.96	4.87	6.29	LANDING POINT
MWD	7021	90.40	148.87	S 31.1 E	94	6413.82	245.65	-82.42 N	290.79 E	302.24	-74.17	0.61	0.16	0.59	
MWD	7116	90.46	151.31	S 28.7 E	95	6413.11	339.56	-164.76 N	338.15 E	376.15	-64.02	2.57	0.06	2.57	
MWD	7211	90.25	152.14	S 27.9 E	95	6412.52	433.04	-248.42 N	383.15 E	456.64	-57.04	0.90	-0.22	0.87	
MWD	7305	90.46	152.42	S 27.6 E	94	6411.94	525.36	-331.63 N	426.88 E	540.56	-52.16	0.37	0.22	0.30	
MWD	7400	89.85	151.11	S 28.9 E	95	6411.68	618.83	-415.33 N	471.82 E	628.58	-48.64	1.52	-0.64	-1.38	
MWD	7494	90.34	146.05	S 34.0 E	94	6411.52	712.07	-495.52 N	520.80 E	718.87	-46.43	5.41	0.52	-5.38	
MWD	7588	89.48	139.67	S 40.3 E	94	6411.67	806.00	-570.41 N	577.53 E	811.73	-45.36	6.85	-0.91	-6.79	
MWD	7683	89.29	133.56	S 46.4 E	95	6412.69	900.61	-639.42 N	642.75 E	906.63	-45.15	6.43	-0.20	-6.43	
MWD	7777	89.42	131.03	S 49.0 E	94	6413.75	993.39	-702.66 N	712.27 E	1000.53	-45.39	2.69	0.14	-2.69	
MWD	7872	89.51	135.05	S 45.0 E	95	6414.64	1087.34	-767.49 N	781.69 E	1095.48	-45.53	4.23	0.09	4.23	
MWD	7967	88.92	137.27	S 42.7 E	95	6415.94	1181.92	-836.00 N	847.48 E	1190.42	-45.39	2.42	-0.62	2.34	
MWD	8061	89.05	142.12	S 37.9 E	94	6417.61	1275.84	-907.65 N	908.25 E	1284.04	-45.02	5.16	0.14	5.16	
MWD	8156	89.51	147.49	S 32.5 E	95	6418.80	1370.63	-985.25 N	962.98 E	1377.70	-44.35	5.67	0.48	5.65	
MWD	8251	89.54	162.85	S 17.2 E	95	6419.59	1462.65	-1071.20 N	1002.75 E	1467.31	-43.11	16.17	0.03	16.17	
MWD	8345	89.57	157.77	S 22.2 E	94	6420.32	1551.57	-1159.68 N	1034.41 E	1553.98	-41.73	5.40	0.03	-5.40	
MWD	8440	89.54	153.02	S 27.0 E	95	6421.06	1643.75	-1246.02 N	1073.96 E	1644.98	-40.76	5.00	-0.03	-5.00	
MWD	8535	89.51	144.77	S 35.2 E	95	6421.85	1737.86	-1327.29 N	1122.99 E	1738.62	-40.23	8.68	-0.03	-8.68	
MWD	8629	89.85	138.11	S 41.9 E	94	6422.38	1831.81	-1400.75 N	1181.55 E	1832.53	-40.15	7.09	0.36	-7.09	
MWD	8724	90.06	134.90	S 45.1 E	95	6422.45	1926.44	-1469.66 N	1246.93 E	1927.36	-40.31	3.39	0.22	-3.38	
MWD	8818	90.22	130.22	S 49.8 E	94	6422.22	2019.28	-1533.22 N	1316.15 E	2020.65	-40.64	4.98	0.17	-4.98	
MWD	8912	89.32	132.35	S 47.7 E	94	6422.60	2111.80	-1595.24 N	1386.78 E	2113.75	-41.00	2.46	-0.96	2.27	
MWD	9006	88.98	134.31	S 45.7 E	94	6423.99	2204.84	-1659.73 N	1455.14 E	2207.29	-41.24	2.12	-0.36	2.09	
MWD	9100	88.98	138.46	S 41.5 E	94	6425.67	2298.43	-1727.76 N	1519.96 E	2301.18	-41.34	4.41	0.00	4.41	
MWD	9195	89.02	141.08	S 38.9 E	95	6427.33	2393.37	-1800.27 N	1581.30 E	2396.14	-41.30	2.76	0.04	2.76	
MWD	9289	88.55	137.66	S 42.3 E	94	6429.32	2487.27	-1871.58 N	1642.49 E	2490.10	-41.27	3.67	-0.50	-3.64	
MWD	9383	88.37	139.57	S 40.4 E	94	6431.85	2581.12	-1942.08 N	1704.61 E	2584.06	-41.27	2.04	-0.19	2.03	
MWD	9477	88.89	143.89	S 36.1 E	94	6434.09	2675.07	-2015.84 N	1762.80 E	2677.89	-41.17	4.63	0.55	4.60	
MWD	9572	89.02	143.69	S 36.3 E	95	6435.83	2769.97	-2092.48 N	1818.91 E	2772.53	-41.00	0.25	0.14	-0.21	
MWD	9667	88.86	139.66	S 40.3 E	95	6437.59	2864.94	-2166.98 N	1877.80 E	2867.39	-40.91	4.24	-0.17	-4.24	
MWD	9761	88.55	137.67	S 42.3 E	94	6439.71	2958.80	-2237.54 N	1939.86 E	2961.36	-40.92	2.14	-0.33	-2.12	
MWD	9856	89.91	140.35	S 39.7 E	95	6440.99	3053.69	-2309.23 N	2002.16 E	3056.34	-40.93	3.16	1.43	2.82	
MWD	9951	89.97	140.10	S 39.9 E	95	6441.09	3148.67	-2382.25 N	2062.94 E	3151.32	-40.89	0.27	0.06	-0.26	
MWD	10044	89.94	140.32	S 39.7 E	93	6441.16	3241.65	-2453.71 N	2122.46 E	3244.30	-40.86	0.24	-0.03	0.24	
MWD	10139	89.97	144.68	S 35.3 E	95	6441.23	3336.61	-2529.06 N	2180.28 E	3339.12	-40.76	4.59	0.03	4.59	
MWD	10233	90.34	144.47	S 35.5 E	94	6440.98	3430.47	-2605.66 N	2234.76 E	3432.73	-40.62	0.45	0.39	-0.22	
MWD	10327	89.23	138.93	S 41.1 E	94	6441.33	3524.43	-2679.39 N	2293.00 E	3526.61	-40.56	6.01	-1.18	-5.89	
MWD	10422	89.08	138.57	S 41.4 E	95	6442.73	3619.31	-2750.81 N	2355.63 E	3621.60	-40.57	0.41	-0.16	-0.38	
MWD	10517	89.08	142.02	S 38.0 E	95	6444.26	3714.27	-2823.88 N	2416.30 E	3716.56	-40.55	3.63	0.00	3.63	
MWD	10612	89.20	144.46	S 35.5 E	95	6445.69	3809.20	-2899.97 N	2473.14 E	3811.34	-40.46	2.57	0.13	2.57	
MWD	10706	89.14	145.21	S 34.8 E	94	6447.05	3903.03	-2976.81 N	2527.28 E	3904.94	-40.33	0.80	-0.06	0.80	
MWD	10800	89.11	145.50	S 34.5 E	94	6448.48	3996.80	-3054.13 N	2580.71 E	3998.47	-40.20	0.31	-0.03	0.31	
MWD	10894	89.26	146.08	S 33.9 E	94	6449.82	4090.52	-3131.86 N	2633.55 E	4091.96	-40.06	0.64	0.16	0.62	
MWD	10989	89.01	145.31	S 34.7 E	95	6451.25	4185.25	-3210.33 N	2687.09 E	4186.48	-39.93	0.85	-0.26	-0.81	
MWD	11083	88.98	142.73	S 37.3 E	94	6452.90	4279.13	-3286.38 N	2742.30 E	4280.24	-39.84	2.74	-0.03	-2.74	
MWD	11178	89.66	141.17	S 38.8 E	95	6454.03	4374.12	-3361.18 N	2800.85 E	4375.19	-39.80	1.79	0.72	-1.64	
MWD	11272	89.23	142.56	S 37.4 E	94	6454.94	4468.11	-3435.11 N	2858.89 E	4469.14	-39.77	1.55	-0.46	1.48	
MWD	11367	89.17	141.09	S 38.9 E	95	6456.27	4563.10	-3509.78 N	2917.60 E	4564.09	-39.74	1.55	-0.06	-1.55	
MWD	11461	88.68	139.75	S 40.3 E	94	6458.03	4657.06	-3582.22 N	2977.48 E	4658.07	-39.73	1.52	-0.52	-1.43	
MWD	11556	88.77	135.90	S 44.1 E	95	6460.15	4751.83	-3652.59 N	3041.23 E	4752.95	-39.78	4.05	0.09	-4.05	
MWD	11650	88.74	141.40	S 38.6 E	94	6462.19	4845.66	-3723.11 N	3103.30 E	4846.85	-39.81	5.85	-0.03	5.85	
MWD	11745	88.68	142.55	S 37.5 E	95	6464.33	4940.63	-3797.92 N	3161.80 E	4941.78	-39.78	1.21	-0.06	1.21	
MWD	11840	89.17	140.05	S 40.0 E	95	6466.11	5035.61	-3872.05 N	3221.18 E	5036.74	-39.76	2.68	0.52	-2.63	
MWD	11935	89.23	130.86	S 49.1 E	95	6467.44	5129.97	-3939.67 N	3287.75 E	5131.31	-39.85	9.67	0.06	-9.67	
MWD	12028	89.14	132.86	S 47.1 E	93	6468.76	5221.66	-4001.72 N	3357.00 E	5223.34	-39.99	2.15	-0.10	2.15	
MWD	12123	89.05	140.56	S 39.4 E	95	6470.27	5316.25	-4070.81 N	3422.08 E	5318.10	-40.05	8.10	-0.09	8.11	
MWD	12217	89.08	144.73	S 35.3 E	94	6471.80	5410.19	-4145.51 N	3479.10 E	5411.96	-40.00	4.44	0.03	4.44	
MWD	12312	89.11	147.30	S 32.7 E	95	6473.30	5504.87	-4224.26 N	3532.19 E	5506.43	-39.90	2.71	0.03	2.71	

BAKER HUGHES

Company: Chevron Appalachia, LLC
Well: Francis 11H
Location: Continental US
Rig: Francis Unit

Job Number: 6803741
Magnetic Decl.: -8.65
Grid Corr.: 0.00
Total Grid Corr.: -8.65

Calculation Method: Minimum Curvature
Proposed Azimuth: 141.46
Depth Reference: Rig Floor
Tie Into:

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Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Direction	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates N/S (ft)	Coordinates E/W (ft)	Closure Distance (ft)	Closure Angle (deg)	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
MWD	12407	89.23	142.25	S 37.8 E	95	6474.68	5599.67	-4301.83 N	3586.96 E	5601.08	-39.82	5.32	0.13	4.38
MWD	12501	89.29	146.85	S 33.2 E	94	6475.89	5693.51	-4378.38 N	3641.46 E	5694.77	-39.75	4.89	0.06	4.89
MWD	12594	89.48	147.73	S 32.3 E	93	6476.89	5786.02	-4456.63 N	3691.71 E	5787.08	-39.64	0.97	0.20	0.95
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BAKER HUGHES

Company: Chevron Appalachia, LLC
Well: Francis 11H
Location: Continental US
Rig: Francis Unit

Job Number: 6803741
Magnetic Decl.: -8.65
Grid Corr.: 0.00
Total Grid Corr.: -8.65

Calculation Method: Minimum Curvature
Proposed Azimuth: 141.46
Depth Reference: Rig Floor
Tie Into:

Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Direction	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates N/S (ft)	Coordinates E/W (ft)	Closure Distance (ft)	Closure Angle (deg)	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
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BAKER HUGHES

Company:	Chevron Appalachia, LLC	Job Number:	6803741
Well:	Francis 11H	Magnetic Decl.:	-8.65
Location:	Continental US	Grid Corr.:	0.00
Rig:	Francis Unit	Total Grid Corr.:	-8.65

Calculation Method: Minimum Curvature
Proposed Azimuth: 141.46
Depth Reference: Rig Floor
Tie Into:

Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Direction	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates N/S (ft)	Coordinates E/W (ft)	Closure Distance (ft)	Closure Angle (deg)	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
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BAKER HUGHES

Company:	Chevron Appalachia, LLC	Job Number:	6803741	Calculation Method	Minimum Curvature
Well:	Francis 11H	Magnetic Decl.:	-8.65	Proposed Azimuth	141.46
Location:	Continental US	Grid Corr.:	0.00	Depth Reference	Rig Floor
Rig:	Francis Unit	Total Grid Corr.:	-8.65	Tie Into:	

Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Direction	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates N/S (ft)	Coordinates E/W (ft)	Closure Distance (ft)	Closure Angle (deg)	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
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