51.01711

H WELLPLANNING DETAILED DIRECTIONAL SURVEY REPORT SURVEY_DATE 10/18/2014 **H HEADER INFORMATION -**H COMPANY: Chevron Appalachia, LLC H FIELD : Marshall County, WV H SITE : Francis Pad H WELL : Francis 3H H WELLPATH: Francis 3H HIDEPTH UNIT: ft H-H WELL & MAP INFORMATION H Geodetic System: US State Plane 1983 H GeodeticDatum: North American Datum 1983 H Map Zone: West Virginia Northern Zone H WELL EW MAP: 1633906.41 H WELL NS MAP: 502427.81 H DATUM ELEVN (KB-MSL): 1292.00 H VSECT ANGLE: 112.54 H Azimuth Reference: True H Magnetic Declination: -7.970 H Grid Convergence: -0.760 H SURVEY TYPE INFORMATION H 100.00 - 807.00 SURVEY #1 - SDI GYRO IN 5" DRILL PIPE: SDI STANDARD KEEPER 103 H 852.00 - 2645.00 SURVEY #2 - SDI MWD 12-1/4 HOLE : SDI MWD H 2776.00 - 11655.00 SURVEY #3 - SDI MWD 8-1/2 HOLE : SDI MWD H SURVEY LIST INC TVD DLS N/S E/W EASTING(X) NORTHING(Y) TOOL MD AZI V.Sec. 0 0 0 0 0 0 0 1633906.41 502427.813 UNDEFINED 0 0.12 117.84 100 0.1 0.12 -0.05 0.09 1633906.51 502427.763 SDI Standard Keeper 103 (1) 100 SDI Standard Keeper 103 (1) 502427.633 200 0.1 158.84 200 0.27 0.08 -0.180.22 1633906.63 0.17 1633906.58 502427.523 SDI Standard Keeper 103 (1) 300 0.09 251 300 0.27 0.14 -0.29400 0.07 -0.28 0 1633906.41 502427.533 SDI Standard Keeper 103 (1) 400 0.12 287.81 0.11 1633906.28 502427.523 SDI Standard Keeper 103 (1) 500 0.06 217.26 500 -0.01 0.11 -0.29-0.13-0.03 -0.22 -0.13 1633906.28 502427.593 SDI Standard Keeper 103 (1) 600 0.13 17.26 600 0.19 712 0.12 300.62 712 -0.16 0.14-0.04-0.191633906.22 502427,773 SDI Standard Keeper 103 (1) 502427.743 SDI Standard Keeper 103 (1) -0.07 -0.381633906.03 0.17 807 0.16 231.55 807 -0.32-0.34 0.77 -0.05 -0.39 1633906.02 502427.773 SDI MWD (2) 852 0.19 31.08 852 1633906.03 502427.823 SDI MWD (2) 947 0.14 221.54 947 -0.360.35 0 -0.39SDI MWD (2) 1042 2 49.61 1042 0.36 2.25 0.99 8.0 1633907.22 502428.793 1633910.2 502431.403 SDI MWD (2) 3.74 1135 2.88 46.95 1134.9 2.06 0.95 3.63 7.06 1633913.57 502434.833 SDI MWD (2) 40.53 1228.8 3.8 0.37 7.12 1229 3 3.42 50.06 5.87 0.71 10.82 10.85 1633917.41 502438.493 5DI MWD (2) 1324 1323.6 1633922.97 502441.833 SDI MWD (2) 1419 4.47 64.54 1418.4 9.66 1.52 14.23 16.37 0.54 17.29 22.51 1633929.15 502444.803 SDI MWD (2) 1512 3.99 62.38 1511.1 14.16 SDI MWD (2) 502447,743 28.33 1633935.01 1606 4.01 62.94 1604.9 18.38 0.05 20.3 23.53 1.09 22.84 34.95 1633941.67 502450.183 SDI MWD (2) 74.43 1699.7 1701 4.59 29.24 0.27 24.97 42.03 1633948.77 502452.233 SDI MWD (2) 1795 4.43 71.89 1793.4 27.32 49.02 1633955.79 502454.483 SDI MWD (2) 1890 4.48 71.04 1888.1 34.8 0.09 SDI MWD (2) 502457.193 4.58 64.57 1981.8 40.07 0.55 30.12 55.88 1633962.69 1984 0.41 33.67 62.88 1633969.73 502460.643 SDI MWD (2) 2079 4.89 61.79 2076.5 45.17 SDI MWD (2) 0.25 37.48 70.21 1633977.11 502464.363 2174 5.09 63.2 2171.1 50.48 1633983.4 502467.423 SDI MWD (2) 63.42 2263.8 55.04 1.68 40.62 76.45 2267 3.53 0.43 43.03 81.41 1633988.39 502469.763 SDI MWD (2) 2362 3.13 64.86 2358.7 58.7 502471.903 SDI MWD (2) 2457 2.84 62.08 2453.5 61.94 0.34 45.24 85.84 1633992.85 502474.303 SDI MWD (2) 90.13 1633997.17 47.69 2551 3.19 58.6 2547.4 64.97 0.42 94.28 1634001.35 502477.043 SDI MWD (2) 67.72 0.42 50.49 53.14 2641.3 2645 2.92 1634006.09 502480.833 SDI MWD (3) 2776 2.39 47.41 2772.1 70.57 0.45 54.34 98.96 502483.183 SDI MWD (3) 71.81 8.0 56.72 101.29 1634008.45 2870 1.68 40.12 2866.1 502484.653 eived 102.62 1634009.79 SDI MWD (3) 58.2 2964 0.75 45.46 2960.1 72.47 1 60/20(64D (3) 0.49 58.87 103.17 1634010.36 3059 26.35 3055 72.73 Heat Oil S 0.31 103.25 1634010.43 SDI MWD (3) 3149 72.74 0.45 59.02 3153 0.11 207 SDI MWD (3) 1634010.04 3248 0.45 249.92 3244 72.45 0.4 58.81 102.85 502485.393 **3 0** 2(1)15 SDI MWD (3) 1634009.24 0.51 102.05 3343 0.63 299.42 3339 71.66 58.94 502485.933 SDI MWD (3) 0.27 59.47 101.35 1634008.55 70.82 318.28 3433 3437 0.45 324.45 3527 70.01 0.25 60.2 100.78 1634007.99 502486.663 SDI MWD (3) 3531 0.68 SDI MWD (3) 502487.643 3626 0.92 311.06 3622 68.81 0.32 61.15 99.88 1634007.1 1634005.93 502488.593 SDI MWD (3) 0.09 98.7 3720 0.92 305.52 3716 67.36 62.09

3815	0.84	306.6	3811	65.94	0.09	62.95	97.52	1634004.76	502489.463	SDI MWD (3)
3910	0.89	318.45	3906	64.6	0.2	63.91	96.47	1634003.72	502490.443	SDI MWD (3)
4004	0.67	342.43	4000	63.59	0.41	64.98	95.82	1634003.09	502491.523	SDI MWD (3)
4099	0.65	354.71	4095	62. 98	0.15	. 66.05	95.6	1634002.88	502492.593	SDI MWD (3)
4194	0.6	346.92	4190	62.44	0.1	67.07	95.44	1634002.73	502493.613	SDI MWD (3)
4316	0.7	336.25	4312	61.53	0.13	68.38	94,99	1634002.31	502494.923	SDI MWD (3)
4410 4505	0.71 0.83	203.7 196.86	4406 4501	61.1 61.16	1.37 0.16	68.37 67.17	94.53 94.09	1634001.84 1634001.39	502494.923 502493.733	SDI MWD (3) SDI MWD (3)
4552	0.83	194.07	4547.9	61.24	0.10	66.52	93.91	1634001.39	502493.083	SDI MWD (3)
4600	1.14	101.24	4595.9	61.76	2.99	66.09	94.3	1634001.58	502492.653	SDI MWD (3)
4647	3.57	87.44	4642.9	63.54	5.27	66.07	96.22	1634003.5	502492.603	SDI MWD (3)
4694	6.93	79.57	4689.7	67.25	7.29	66.65	100.47	1634007.76	502493.123	SDI MWD (3)
4789	13.6	72.81	4783.1	80.66	7.12	70.99	116.8	1634024.14	502497.253	SDI MWD (3)
4883	19.61	71.94	4873.2	101.16	6.4	79.1 5	142.37	1634049.83	502505.073	SDI MWD (3)
4978	25.49	70.29	4960.9	128.42	6.22	91	176.8	1634084.41	502516.463	SDI MWD (3)
5072	30.19	68.88	5044	160.5	5.05	106.35	217.92	1634125.72	502531.263	SDI MWD (3)
5167	39.61	71.48	5121.8	200.71	10.04	124.62	269.03	1634177.08	502548.853	SDI MWD (3)
5262 5357	51.72 65.55	73.99 68.98	5188.1 5237.4	252.91 313.73	12.88 15.23	144.59 170.53	333.84 410.45	1634242.14 1634319.09	502567.963 502592.883	SDI MWD (3) SDI MWD (3)
5451	67.83	66.01	5237.4 5274.6	374.69	3.78	203.58	490.18	1634319.09	502624.873	5DI MWD (3)
5545	67.16	64.8	5310.6	433.77	1.39	239.72	569.14	1634478.68	502659.963	SDI MWD (3)
5640	66.63	63.55	5347.9	491.82	1.33	277.78	647.79	1634557.83	502696.973	SDI MWD (3)
5735	65.86	62.58	5386.1	548.32	1.24	317.17	725.31	1634635.86	502735.333	SDI MWD (3)
5829	64.35	64.25	5425.7	604.11	2.28	355.33	801.55	1634712.61	502772.473	SDI MWD (3)
5925	62.11	65.7	5469	661.93	2.69	391.59	879.2	1634790.73	502807.703	SDI MWD (3)
6019	59.1	66.13	5515.1	718.17	3.23	425.01	953.96	1634865.93	502840.133	SDI MWD (3)
6113	56.96	67.67	5564.9	773.91	2.67	456.31	1027.29	1634939.67	502870.453	SDI MWD (3)
6208	58.2	67.63	5615.8	830.72	1.31	486.8	1101.46	1635014.24	502899.953	SDI MWD (3)
6302	56.87	66.81 66.23	5666.2 5718.2	886.49 941.73	1.59 0.51	517.51 549.2	1174.58 1247.55	1635087.76 1635161.14	502929.683 502960.413	SDI MWD (3) SDI MWD (3)
6397 6491	56.86 55.2	65.19	5718.2 5770.7	995.06	1.99	581.26	1318.6	1635232.61	502991.523	SDI MWD (3)
6586	56.57	65.92	5824	1048.72	1.58	613.8	1390.2	1635304.64	503023.113	SDI MWD (3)
6680	56.63	67.73	5875.7	1103.51	1.61	644.68	1462.34	1635377.18	503053.033	SDI MWD (3)
6775	55.94	67.01	5928.5	1159.22	0.96	675.09	1535.28	1635450.51	503082.473	SDI MWD (3)
6870	56.58	68.24	5981.2	1215.17	1.27	705.16	1608.33	1635523.96	503111.563	SDI MWD (3)
6965 ·	55.9	68.15	6034	1271.65	0.72	734.49	1681.66	1635597.67	503139.923	SDI MWD (3)
7060	54.74	67.47	6088.1	1327.15	1.36	763.99	1753.99	1635670.39	503168.463	SDI MWD (3)
7154	56.73	66.5	6141	1381.54	2.28	794.37	1825.49	1635742.28	503197.893	SDI MWD (3)
7249	56.42	66.53	6193.3	1436.59	0.33	825.97	1898.21	1635815.41	503228.523 503258.823	SDI MWD (3) SDI MWD (3)
7343 7390	55.57 5 6.61	66.18 70.85	6245.9 6272.1	1490.54 1518. 5 8	0.96 8.54	857.22 871.49	1969.59 2005.87	1635887.2 1635923.67	503272.613	SDI MWD (3)
7437	57.69	76.93	6297.6	1549.4	11.11	882.43	2043.78	1635961.72	503283.043	SDI MWD (3)
7484	57.87	79.76	6322.7	1582.29	5.11	890.46	2082.72	1636000.76	503290.553	SDI MWD (3)
7532	57.44	80.84	6348.4	1616.58	2.1	897.29	2122.69	1636040.82	503296.853	SDI MWD (3)
7579	58.32	82.15	6373.4	1650.69	3.01	903.18	2162.06	1636080.26	503302.223	SDI MWD (3)
7627	58.01	85.98	6398.7	1686.52	6.81	907.39	2202.61	1636120.86	503305.903	SDI MWD (3)
7674	58.42	90.04	6423.5	1722.86	7.39	908.78	2242.52	1636160.79	503306.753	SDI MWD (3)
7722	61.84	94.89	6447.4	1761.94	11.29	906.96	2284.08	1636202.32	503304.383	SDI MWD (3)
7769	69.18	103.2	6466.9	1803.47	22.41	900.16	2326.23	1636244.38	503297.023 503283.653	SDI MWD (3) SDI MWD (3)
7817 7864	75.95 76.75	109.15 109.25	6481.3 6492.3	1848.94 1894.54	18.4 1.71	887.37 872.35	2370.15 2413.28	1636288.12 1636331.05	503268.063	SDI MWD (3)
7912	78.15	114.25	6502.8	1941.37	10.58	854.99	2456.78	1636374.32	503250.123	SDI MWD (3)
7959	80.2	119.83	6511.6	1987.37	12.45	834.01	2497.87	1636415.13	503228.603	SDI MWD (3)
8006	82.33	123.78	6518.8	2033.2	9.46	809.53	2537.34	1636454.27	503203.603	SDI MWD (3)
8053	81.8	124.13	6525.2	2078.83	1.35	783.53	2575.95	1636492.53	503177.093	SDI MWD (3)
8101	80.43	127.02	6532.7	2125.03	6.6	755.94	2614.52	1636530.73	503148.993	SDI MWD (3)
8148	78.03	130	6541.4	2169.41	8.05	727.2	2650.64	1636566.47	503119.783	SDI MWD (3)
8196	80.04	135.89	6550.6	2213.55	12.75	695.11	2685.12	1636600.51	503087.233	SDI MWD (3)
8243	84.08	139.57	6557.1	2255.65	11.58	660.67	2716.41	1636631.35	503052.383	SDI MWD (3)
8290	88.52	140.97	6560.1	2297.16	9.9 7.20	624.61 500.07	2746.38	1636660.83	503015.923 502979.883	SDI MWD (3) SDI MWD (3)
8337	87.18 97.01	137.77 137.4	6561.9 6564.3	2339.06 2382.49	7.38 0.85	588.97 553.58	2776.96 2809.29	1636690.94 1636722.8	502944.0 6 3	SDI MWD (3)
8385 8480	87.01 91.01	137.4 139.24	6565.9	2382.49	0.83 4.63	482.65	2872.44	1636785	502872.303	SDI MWD (3)
8575	89.78	141.09	6565.3	2552.17	2.34	409.71	2933.29	1636844.87	502798.563	SDI MWD (3)
8669	90.04	139.77	6565.4	2635.25	1.43	337.25	2993.16	1636903.78	502725.313	SDI MWD (3)
8764	89.16	140.74	6566.1	2719.34	1.38	264.21	3053.9	1636963.55	502651.473	SDI MWD (3)
8859	87.67	139.6	65 68.7	2803.47	1.97	191.29	3114.72	1637023.4	502577.753	SDI MWD (3)
8953	86.88	139.6	6573.2	2887.0 9	0.84	119.78	3175.58	1637083.3	502505.443	SDI MWD (3)

51.01711

9048	89.52	138.37	6576.2	2972.1	3.07	48.15	3237.89	1637144.65	502432.993	SDI MWD (3)
9143	89.96	138.1	6576.6	3057.7	0.54	-22.71	3301.16	1637206.98	502361.303	SDI MWD (3)
9238	89.87	137.4	6576.8	3143.65	0.74	-93.03	3365.04	1637269.91	502290.133	SDI MWD (3)
9332	89.6	135.9	6577.2	3229.45	1.62	-161.38	3429.56	1637333.52	502220.933	SDI MWD (3)
9426	91.63	143.73	6576.2	3312.92	8.6	-233.13	3490.16	1637393.17	502148.393	SDI MWD (3)
9521	88.2	142.94	6576.3	3394.52	3.71	-309.32	3546.88	1637448.87	502071.453	SDI MWD (3)
9615	86.09	141.53	6581	3476.06	2.7	-383.54	3604.37	1637505.37	501996.483	SDI MWD (3)
9710	89.52	142.06	6584.6	3558.87	3.65	-458.12	3663.07	1637563.08	501921.123	SDI MWD (3)
9804	89.16	141.62	6585.7	3640.84	0.6	-532.03	3721.15	1637620.17	501846.453	SDI MWD (3)
9899	93.21	140.91	6583.8	3724.11	4.33	-606.1	3780.57	1637678.6	501771.603	5DI MWD (3)
9994	93.21	140.91	6578.4	3807.57	0	-679.72	3840.37	1637737.42	501697.193	5DI MWD (3)
10089	93.3	143.9	6573	3889.81	3.14	-754.86	3898.23	1637794.28	501621.293	5DI MWD (3)
10183	89.25	144.96	6570.9	3969.59	4.45	-831.29	3952.88	1637847.91	501544.153	SDI MWD (3)
10278	86.7	144.69	6574.3	4049.84	2.7	-908.88	4007.57	1637901.57	501465.833	SDI MWD (3)
10372	86.17	144.69	6580.2	4129.28	0.56	-985.44	4061.8	1637954.77	501388.563	SDI MWD (3)
10467	86	144.69	6586.6	4209.52	0.18	-1062.79	4116.58	1638008.52	501310.493	SDI MWD (3)
10562	89.87	143.37	6590.1	4290.46	4.3	-1139.6	4172.33	1638063.25	501232.943	SDI MWD (3)
10657	90.31	142.67	6589.9	4372.33	0.87	-1215.49	4229.48	1638119.38	501156.303	SDI MWD (3)
10751	89.6	141	6590	4454.31	1.93	-1289.4	4287.56	1638176.48	501081.643	SDI MWD (3)
10846	89.69	140.3	6590.6	4538.1	0.74	-1362.86	4347.8	1638235.73	501007.383	SDI MWD (3)
10941	88.9	140.21	6591.7	4622.19	0.84	-1435.9	4408.53	1638295.49	500933.543	SDI MWD (3)
11036	88.37	139.95	6594	4706.4	0.62	-1508.74	4469.48	1638355.47	500859.903	SDI MWD (3)
11130	88.11	139.77	6596.9	4789.88	0.34	-1580.56	4530.05	1638415.08	500787.283	SDI MWD (3)
11225	88.02	140.47	6600.1	4874.04	0.74	-1653.42	4590.92	1638474.98	500713.623	SDI MWD (3)
11320	87.58	140.21	6603.7	4958.01	0.54	-1726.5	4651.51	1638534.59	500639.743	SDI MWD (3)
11414	87.49	139.51	6607.8	5041.45	0.75	-1798.3	4712.05	1638594.18	500567.153	5DI MWD (3)
11509	91.8	139.24	6508.4	5126.19	4.55	-1870.38	4773.89	1638655.05	500494.253	SDI MWD (3)
11583	91.63	139.77	6606.2	5192.12	0.75	-1926.63	4821.92	1638702.34	500437.373	SDI MWD (3)
11655	91.63	139.77	6604.1	5256.11	0	-1981.58	4868.41	1638748.09	500381.813	SDI MWD (3)

Peceived
Office of Oil & Gas
JUL 3 0 2015