

Minimum Radius of Curvature

API: 51-23-51791 **Well: Hens 12NHS** **Wellhead Location N+/S- : 40.327960**
Operator: PDC Energy **Area: DJ** **E+/W- : -104.572340**
Rig: **Type: U-Lateral** **Magnetic Declination: 7.76**
TD: 23,255' **Plane of Proposal: 90.10**

Measured Depth Ft	Drift Angle Deg	Azimuth Direction Deg	Course Length Ft	TVD Ft	Vertical Section Ft	COORDINATES		CLOSURE		Dog Leg Severity Deg/100'	Build / Drop Deg/100'	Left / Right Deg/100'
						N-S Ft	E-W Ft	Distance FT	Direction Deg			
0.00	0.00	0.00		0.0	0.00	0.00	0.00	0.00	0.00			
100	0.00	0.00	100	100.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
200	0.00	0.00	100	200.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
300	0.00	0.00	100	300.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
400	0.00	0.00	100	400.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
500	0.00	0.00	100	500.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
600	0.00	0.00	100	600.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
700	0.00	0.00	100	700.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
800	0.00	0.00	100	800.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
900	0.00	0.00	100	900.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
1000	0.00	0.00	100	1000.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
1100	0.00	0.00	100	1100.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
1200	0.00	0.00	100	1200.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
1300	0.00	0.00	100	1300.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
1400	2.00	241.29	100	1400.0	103.11	-0.84	-1.53	1.75	241.29	2.00	2.00	241.29
1500	4.00	241.29	100	1499.8	98.53	-3.35	-6.12	6.98	241.29	2.00	2.00	0.00
1600	6.00	241.29	100	1599.5	90.89	-7.54	-13.76	15.69	241.29	2.00	2.00	0.00
1700	8.00	241.29	100	1698.7	80.21	-13.39	-24.45	27.88	241.29	2.00	2.00	0.00
1800	10.00	241.29	100	1797.5	66.51	-20.91	-38.17	43.52	241.29	2.00	2.00	0.00
1900	12.00	241.29	100	1895.6	49.79	-30.07	-54.91	62.60	241.29	2.00	2.00	0.00
2000	14.00	241.29	100	1993.1	30.08	-40.88	-74.63	85.10	241.29	2.00	2.00	0.00
2020	14.40	241.29	20	2012.3	25.82	-43.21	-78.89	89.95	241.29	2.02	2.02	0.00
2100	14.40	241.29	80	2089.9	8.35	-52.79	-96.39	109.90	241.29	0.00	0.00	0.00
2200	14.40	241.29	100	2186.8	-13.44	-64.74	-118.20	134.77	241.29	0.00	0.00	0.00
2300	14.40	241.29	100	2283.6	-35.23	-76.69	-140.01	159.64	241.29	0.00	0.00	0.00
2400	14.40	241.29	100	2380.5	-57.03	-88.63	-161.82	184.51	241.29	0.00	0.00	0.00
2500	14.40	241.29	100	2477.4	-78.82	-100.58	-183.63	209.37	241.29	0.00	0.00	0.00
2600	14.40	241.29	100	2574.2	-100.61	-112.53	-205.45	234.24	241.29	0.00	0.00	0.00
2700	14.40	241.29	100	2671.1	-122.40	-124.47	-227.26	259.11	241.29	0.00	0.00	0.00
2800	14.40	241.29	100	2767.9	-144.19	-136.42	-249.07	283.98	241.29	0.00	0.00	0.00
2900	14.40	241.29	100	2864.8	-165.98	-148.36	-270.88	308.85	241.29	0.00	0.00	0.00
3000	14.40	241.29	100	2961.7	-187.77	-160.31	-292.69	333.72	241.29	0.00	0.00	0.00
3100	14.40	241.29	100	3058.5	-209.56	-172.26	-314.50	358.59	241.29	0.00	0.00	0.00
3200	14.40	241.29	100	3155.4	-231.35	-184.20	-336.32	383.46	241.29	0.00	0.00	0.00
3300	14.40	241.29	100	3252.2	-253.14	-196.15	-358.13	408.33	241.29	0.00	0.00	0.00
3400	14.40	241.29	100	3349.1	-274.93	-208.10	-379.94	433.20	241.29	0.00	0.00	0.00
3500	14.40	241.29	100	3445.9	-296.72	-220.04	-401.75	458.06	241.29	0.00	0.00	0.00
3600	14.40	241.29	100	3542.8	-318.51	-231.99	-423.56	482.93	241.29	0.00	0.00	0.00
3700	14.40	241.29	100	3639.7	-340.31	-243.94	-445.37	507.80	241.29	0.00	0.00	0.00
3800	14.40	241.29	100	3736.5	-362.10	-255.88	-467.19	532.67	241.29	0.00	0.00	0.00
3900	14.40	241.29	100	3833.4	-383.89	-267.83	-489.00	557.54	241.29	0.00	0.00	0.00
4000	14.40	241.29	100	3930.2	-405.68	-279.78	-510.81	582.41	241.29	0.00	0.00	0.00
4100	14.40	241.29	100	4027.1	-427.47	-291.72	-532.62	607.28	241.29	0.00	0.00	0.00
4200	14.40	241.29	100	4124.0	-449.26	-303.67	-554.43	632.15	241.29	0.00	0.00	0.00
4300	14.40	241.29	100	4220.8	-471.05	-315.62	-576.24	657.02	241.29	0.00	0.00	0.00
4400	14.40	241.29	100	4317.7	-492.84	-327.56	-598.06	681.89	241.29	0.00	0.00	0.00
4500	14.40	241.29	100	4414.5	-514.63	-339.51	-619.87	706.75	241.29	0.00	0.00	0.00
4600	14.40	241.29	100	4511.4	-536.42	-351.45	-641.68	731.62	241.29	0.00	0.00	0.00
4700	14.40	241.29	100	4608.2	-558.21	-363.40	-663.49	756.49	241.29	0.00	0.00	0.00
4800	14.40	241.29	100	4705.1	-580.00	-375.35	-685.30	781.36	241.29	0.00	0.00	0.00
4900	14.40	241.29	100	4802.0	-601.79	-387.29	-707.11	806.23	241.29	0.00	0.00	0.00
5000	14.40	241.29	100	4898.8	-623.59	-399.24	-728.93	831.10	241.29	0.00	0.00	0.00
5100	14.40	241.29	100	4995.7	-645.38	-411.19	-750.74	855.97	241.29	0.00	0.00	0.00
5200	14.40	241.29	100	5092.5	-667.17	-423.13	-772.55	880.84	241.29	0.00	0.00	0.00
5300	14.40	241.29	100	5189.4	-688.96	-435.08	-794.36	905.71	241.29	0.00	0.00	0.00
5400	14.40	241.29	100	5286.3	-710.75	-447.03	-816.17	930.58	241.29	0.00	0.00	0.00
5500	14.40	241.29	100	5383.1	-732.54	-458.97	-837.98	955.44	241.29	0.00	0.00	0.00
5557	14.40	241.29	57	5438.5	-745.00	-465.81	-850.46	969.67	241.29	0.00	0.00	0.00

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						N-S Ft	E-W Ft	Distance FT	Direction Deg			
5600	13.54	241.29	43	5480.0	-754.06	-470.77	-859.52	980.00	241.29	2.01	-2.01	0.00
5700	11.54	241.29	100	5577.7	-773.08	-481.20	-878.56	1001.71	241.29	2.00	-2.00	0.00
5800	9.54	241.29	100	5676.0	-789.11	-489.99	-894.61	1020.00	241.29	2.00	-2.00	0.00
5900	7.54	241.29	100	5774.9	-802.12	-497.12	-907.63	1034.85	241.29	2.00	-2.00	0.00
6000	5.54	241.29	100	5874.2	-812.10	-502.59	-917.62	1046.24	241.29	2.00	-2.00	0.00
6100	3.54	241.29	100	5973.9	-819.03	-506.39	-924.56	1054.16	241.29	2.00	-2.00	0.00
6200	1.54	241.29	100	6073.8	-822.92	-508.52	-928.45	1058.59	241.29	2.00	-2.00	0.00
6277	0.00	0.00	77	6150.8	-823.82	-509.02	-929.36	1059.62	241.29	2.00		
6300	0.00	0.00	23	6173.8	-823.82	-509.02	-929.36	1059.62	241.29	0.00		
6377	0.00	0.00	77	6250.8	-823.82	-509.02	-929.36	1059.62	241.29	0.00		
6378	0.07	90.10	1	6251.7	-823.82	-509.02	-929.36	1059.62	241.29	7.78	7.78	10011.11
6400	1.84	90.10	22	6273.8	-823.45	-509.02	-928.99	1059.30	241.28	8.01	8.01	0.00
6450	5.84	90.10	50	6323.6	-820.11	-509.02	-925.64	1056.37	241.19	8.00	8.00	0.00
6500	9.84	90.10	50	6373.2	-813.29	-509.04	-918.82	1050.40	241.01	8.00	8.00	0.00
6550	13.84	90.10	50	6422.1	-803.03	-509.05	-908.56	1041.45	240.74	8.00	8.00	0.00
6600	17.84	90.10	50	6470.2	-789.39	-509.08	-894.92	1029.58	240.37	8.00	8.00	0.00
6650	21.84	90.10	50	6517.2	-772.42	-509.11	-877.95	1014.88	239.89	8.00	8.00	0.00
6700	25.84	90.10	50	6562.9	-752.21	-509.14	-857.75	997.48	239.31	8.00	8.00	0.00
6750	29.84	90.10	50	6607.1	-728.87	-509.18	-834.40	977.49	238.61	8.00	8.00	0.00
6800	33.84	90.10	50	6649.6	-702.50	-509.23	-808.03	955.11	237.78	8.00	8.00	0.00
6850	37.84	90.10	50	6690.1	-673.23	-509.28	-778.76	930.50	236.82	8.00	8.00	0.00
6900	41.84	90.10	50	6728.5	-641.20	-509.34	-746.73	903.90	235.70	8.00	8.00	0.00
6950	45.83	90.10	50	6764.6	-606.58	-509.40	-712.11	875.55	234.42	7.98	7.98	0.00
7000	49.83	90.10	50	6798.1	-569.53	-509.46	-675.06	845.73	232.96	8.00	8.00	0.00
7050	53.83	90.10	50	6829.0	-530.23	-509.53	-635.76	814.75	231.29	8.00	8.00	0.00
7100	57.83	90.10	50	6857.1	-488.87	-509.60	-594.40	782.95	229.39	8.00	8.00	0.00
7150	61.83	90.10	50	6882.2	-445.65	-509.68	-551.18	750.72	227.24	8.00	8.00	0.00
7200	65.83	90.10	50	6904.3	-400.78	-509.76	-506.32	718.48	224.81	8.00	8.00	0.00
7250	69.83	90.10	50	6923.1	-354.49	-509.84	-460.02	686.70	222.06	8.00	8.00	0.00
7300	73.83	90.10	50	6938.7	-306.99	-509.92	-412.53	655.89	218.97	8.00	8.00	0.00
7315	75.00	90.10	15	6942.6	-292.93	-509.94	-398.46	647.16	218.00	8.01	8.01	0.00
7350	77.83	90.10	35	6951.0	-258.52	-510.00	-364.06	626.61	215.52	7.99	7.99	0.00
7369	79.34	90.10	19	6954.7	-240.10	-510.04	-345.63	616.11	214.12	8.03	8.03	0.00
7400	81.83	90.10	31	6959.8	-209.32	-510.09	-314.85	599.44	211.68	7.98	7.98	0.00
7450	85.83	90.10	50	6965.2	-159.62	-510.18	-265.15	574.97	207.46	8.00	8.00	0.00
7500	89.83	90.10	50	6967.0	-109.66	-510.26	-215.20	553.79	202.87	8.00	8.00	0.00
7513	90.86	90.10	13	6967.0	-96.86	-510.29	-202.40	548.96	201.64	8.05	8.05	0.00
7600	90.86	90.10	87	6965.7	-9.67	-510.44	-115.21	523.28	192.72	0.00	0.00	0.00
7700	90.86	90.10	100	6964.2	90.31	-510.61	-15.22	510.84	181.71	0.00	0.00	0.00
7791	90.86	90.10	91	6962.8	180.80	-510.77	75.27	516.29	171.62	0.00	0.00	0.00
7800	90.86	90.10	10	6962.7	190.30	-510.79	84.77	517.77	170.58	0.00	0.00	0.00
7842	90.86	90.10	42	6962.0	232.30	-510.86	126.76	526.35	166.06	0.00	0.00	0.00
7900	90.86	90.10	58	6961.2	290.29	-510.96	184.76	543.34	160.12	0.00	0.00	0.00
8000	90.86	90.10	100	6959.7	390.28	-511.14	284.75	585.10	150.88	0.00	0.00	0.00
8100	90.86	90.10	100	6958.2	490.27	-511.31	384.73	639.89	143.04	0.00	0.00	0.00
8200	90.86	90.10	100	6956.7	590.26	-511.49	484.72	704.68	136.54	0.00	0.00	0.00
8300	90.86	90.10	100	6955.2	690.25	-511.66	584.71	776.97	131.19	0.00	0.00	0.00
8400	90.86	90.10	100	6953.7	790.24	-511.84	684.70	854.86	126.78	0.00	0.00	0.00
8500	90.86	90.10	100	6952.2	890.22	-512.01	784.69	936.96	123.12	0.00	0.00	0.00
8600	90.86	90.10	100	6950.7	990.21	-512.18	884.68	1022.25	120.07	0.00	0.00	0.00
8700	90.86	90.10	100	6949.2	1090.20	-512.36	984.67	1109.99	117.49	0.00	0.00	0.00
8800	90.86	90.10	100	6947.7	1190.19	-512.53	1084.65	1199.65	115.29	0.00	0.00	0.00
8900	90.86	90.10	100	6946.1	1290.18	-512.71	1184.64	1290.83	113.40	0.00	0.00	0.00
9000	90.86	90.10	100	6944.6	1390.17	-512.88	1284.63	1383.23	111.76	0.00	0.00	0.00
9100	90.86	90.10	100	6943.1	1490.16	-513.06	1384.62	1476.62	110.33	0.00	0.00	0.00
9200	90.86	90.10	100	6941.6	1590.15	-513.23	1484.61	1570.82	109.07	0.00	0.00	0.00
9300	90.86	90.10	100	6940.1	1690.13	-513.41	1584.60	1665.69	107.95	0.00	0.00	0.00
9385	90.86	90.10	85	6938.9	1775.02	-513.55	1669.49	1746.69	107.10	0.00	0.00	0.00

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9400	90.86	90.10	15	6938.6	1790.12	-513.58	1684.59	1761.13	106.95	0.00	0.00	0.00
9500	90.86	90.10	100	6937.1	1890.11	-513.76	1784.57	1857.05	106.06	0.00	0.00	0.00
9600	90.86	90.10	100	6935.6	1990.10	-513.93	1884.56	1953.38	105.25	0.00	0.00	0.00
9700	90.86	90.10	100	6934.1	2090.09	-514.10	1984.55	2050.06	104.52	0.00	0.00	0.00
9800	90.86	90.10	100	6932.6	2190.08	-514.28	2084.54	2147.04	103.86	0.00	0.00	0.00
9900	90.86	90.10	100	6931.1	2290.07	-514.45	2184.53	2244.29	103.25	0.00	0.00	0.00
9952	90.86	90.10	52	6930.4	2342.26	-514.54	2236.72	2295.14	102.96	0.00	0.00	0.00
10000	90.86	90.10	48	6929.6	2390.06	-514.63	2284.52	2341.76	102.69	0.00	0.00	0.00
10100	90.86	90.10	100	6928.1	2490.04	-514.80	2384.51	2439.44	102.18	0.00	0.00	0.00
10200	90.86	90.10	100	6926.6	2590.03	-514.98	2484.49	2537.30	101.71	0.00	0.00	0.00
10300	90.86	90.10	100	6925.1	2690.02	-515.15	2584.48	2635.32	101.27	0.00	0.00	0.00
10400	90.86	90.10	100	6923.6	2790.01	-515.33	2684.47	2733.49	100.87	0.00	0.00	0.00
10408	90.86	90.10	8	6923.5	2798.11	-515.34	2692.57	2741.44	100.83	0.00	0.00	0.00
10410	90.86	90.10	2	6923.5	2800.01	-515.34	2694.47	2743.31	100.83	0.00	0.00	0.00
10500	90.86	90.10	90	6922.1	2890.00	-515.50	2784.46	2831.78	100.49	0.00	0.00	0.00
10600	90.86	90.10	100	6920.6	2989.99	-515.67	2884.45	2930.18	100.14	0.00	0.00	0.00
10607	90.86	90.10	7	6920.5	2997.29	-515.69	2891.75	2937.37	100.11	0.00	0.00	0.00
10700	90.86	90.10	93	6919.1	3089.98	-515.85	2984.44	3028.69	99.81	0.00	0.00	0.00
10800	90.86	90.10	100	6917.6	3189.96	-516.02	3084.43	3127.29	99.50	0.00	0.00	0.00
10900	90.86	90.10	100	6916.1	3289.95	-516.20	3184.42	3225.98	99.21	0.00	0.00	0.00
11000	90.86	90.10	100	6914.6	3389.94	-516.37	3284.40	3324.75	98.93	0.00	0.00	0.00
11048	90.86	90.10	48	6913.9	3438.24	-516.46	3332.70	3372.48	98.81	0.00	0.00	0.00
11073	90.86	90.10	25	6913.5	3463.33	-516.50	3357.80	3397.29	98.74	0.00	0.00	0.00
11100	90.86	90.10	27	6913.1	3489.93	-516.55	3384.39	3423.58	98.68	0.00	0.00	0.00
11186	90.86	90.10	86	6911.8	3575.52	-516.70	3469.98	3508.24	98.47	0.00	0.00	0.00
11200	90.86	90.10	14	6911.6	3589.92	-516.72	3484.38	3522.49	98.44	0.00	0.00	0.00
11300	90.86	90.10	100	6910.1	3689.91	-516.90	3584.37	3621.45	98.21	0.00	0.00	0.00
11400	90.86	90.10	100	6908.6	3789.90	-517.07	3684.36	3720.46	97.99	0.00	0.00	0.00
11500	90.86	90.10	100	6907.1	3889.89	-517.25	3784.35	3819.53	97.78	0.00	0.00	0.00
11600	90.86	90.10	100	6905.6	3989.87	-517.42	3884.34	3918.65	97.59	0.00	0.00	0.00
11700	90.86	90.10	100	6904.1	4089.86	-517.59	3984.32	4017.80	97.40	0.00	0.00	0.00
11730	90.86	90.10	30	6903.7	4119.66	-517.65	4014.12	4047.36	97.35	0.00	0.00	0.00
11736	90.86	90.10	6	6903.6	4125.46	-517.66	4019.92	4053.11	97.34	0.00	0.00	0.00
11741	90.86	90.10	5	6903.5	4130.76	-517.67	4025.22	4058.37	97.33	0.00	0.00	0.00
11800	90.86	90.10	59	6902.6	4189.85	-517.77	4084.31	4117.00	97.22	0.00	0.00	0.00
11900	90.86	90.10	100	6901.1	4289.84	-517.94	4184.30	4216.24	97.06	0.00	0.00	0.00
12000	90.86	90.10	100	6899.6	4389.83	-518.12	4284.29	4315.50	96.90	0.00	0.00	0.00
12100	90.86	90.10	100	6898.1	4489.82	-518.29	4384.28	4414.81	96.74	0.00	0.00	0.00
12200	90.86	90.10	100	6896.6	4589.81	-518.47	4484.27	4514.14	96.60	0.00	0.00	0.00
12300	90.86	90.10	100	6895.1	4689.80	-518.64	4584.26	4613.50	96.45	0.00	0.00	0.00
12386	90.86	90.10	86	6893.8	4775.39	-518.79	4669.85	4698.57	96.34	0.00	0.00	0.00
12400	90.86	90.10	14	6893.6	4789.78	-518.82	4684.24	4712.89	96.32	0.00	0.00	0.00
12439	90.86	90.10	39	6893.0	4829.08	-518.88	4723.54	4751.95	96.27	0.00	0.00	0.00
12500	90.86	90.10	61	6892.1	4889.77	-518.99	4784.23	4812.30	96.19	0.00	0.00	0.00
12600	90.86	90.10	100	6890.6	4989.76	-519.16	4884.22	4911.74	96.07	0.00	0.00	0.00
12700	90.86	90.10	100	6889.1	5089.75	-519.34	4984.21	5011.19	95.95	0.00	0.00	0.00
12800	90.86	90.10	100	6887.6	5189.74	-519.51	5084.20	5110.67	95.83	0.00	0.00	0.00
12894	90.86	90.10	94	6886.2	5283.43	-519.68	5177.89	5203.90	95.73	0.00	0.00	0.00
12900	90.86	90.10	6	6886.1	5289.73	-519.69	5184.19	5210.17	95.72	0.00	0.00	0.00
13000	90.86	90.10	100	6884.6	5389.72	-519.86	5284.18	5309.69	95.62	0.00	0.00	0.00
13100	90.86	90.10	100	6883.1	5489.71	-520.04	5384.16	5409.22	95.52	0.00	0.00	0.00
13200	90.86	90.10	100	6881.6	5589.69	-520.21	5484.15	5508.77	95.42	0.00	0.00	0.00
13300	90.86	90.10	100	6880.1	5689.68	-520.39	5584.14	5608.34	95.32	0.00	0.00	0.00
13400	90.86	90.10	100	6878.6	5789.67	-520.56	5684.13	5707.92	95.23	0.00	0.00	0.00
13500	90.86	90.10	100	6877.1	5889.66	-520.74	5784.12	5807.51	95.14	0.00	0.00	0.00
13600	90.86	90.10	100	6875.6	5989.65	-520.91	5884.11	5907.12	95.06	0.00	0.00	0.00
13700	90.86	90.10	100	6874.1	6089.64	-521.08	5984.10	6006.74	94.98	0.00	0.00	0.00
13725	90.86	90.10	25	6873.7	6114.94	-521.13	6009.39	6031.95	94.96	0.00	0.00	0.00

Minimum Radius of Curvature

API: 51-23-51791 **Well: Hens 12NHS** **Wellhead Location N+/S- : 40.327960**
Operator: PDC Energy **Area: DJ** **E+/W- : -104.572340**
Rig: **Type: U-Lateral** **Magnetic Declination: 7.76**
TD: 23,255' **Plane of Proposal: 90.10**

Measured Depth Ft	Drift Angle Deg	Azimuth Direction Deg	Course Length Ft	TVD Ft	Vertical Section Ft	COORDINATES		CLOSURE		Dog Leg Severity Deg/100'	Build / Drop Deg/100'	Left / Right Deg/100'
						N-S Ft	E-W Ft	Distance FT	Direction Deg			
13800	90.86	90.10	75	6872.6	6189.63	-521.26	6084.08	6106.37	94.90	0.00	0.00	0.00
13900	90.86	90.10	100	6871.1	6289.62	-521.43	6184.07	6206.02	94.82	0.00	0.00	0.00
14000	90.86	90.10	100	6869.6	6389.60	-521.61	6284.06	6305.67	94.74	0.00	0.00	0.00
14100	90.86	90.10	100	6868.1	6489.59	-521.78	6384.05	6405.34	94.67	0.00	0.00	0.00
14200	90.86	90.10	100	6866.6	6589.58	-521.96	6484.04	6505.01	94.60	0.00	0.00	0.00
14300	90.86	90.10	100	6865.1	6689.57	-522.13	6584.03	6604.70	94.53	0.00	0.00	0.00
14342	90.86	90.10	42	6864.5	6731.47	-522.20	6625.92	6646.47	94.51	0.00	0.00	0.00
14350	90.91	90.87	8	6864.3	6739.56	-522.27	6634.02	6654.55	94.50	9.53	0.62	9.51
14400	91.24	95.63	50	6863.4	6789.47	-525.11	6683.92	6704.51	94.49	9.54	0.66	9.52
14450	91.56	100.39	50	6862.2	6838.96	-532.07	6733.40	6754.39	94.52	9.54	0.64	9.52
14500	91.87	105.15	50	6860.7	6887.71	-543.11	6782.13	6803.84	94.58	9.54	0.62	9.52
14550	92.17	109.92	50	6858.9	6935.37	-558.16	6829.76	6852.53	94.67	9.55	0.60	9.54
14600	92.45	114.68	50	6856.9	6981.61	-577.12	6875.97	6900.15	94.80	9.53	0.56	9.52
14650	92.71	119.45	50	6854.7	7026.12	-599.84	6920.44	6946.38	94.95	9.54	0.52	9.54
14700	92.96	124.22	50	6852.2	7068.58	-626.17	6962.85	6990.95	95.14	9.54	0.50	9.54
14750	93.18	128.99	50	6849.5	7108.70	-655.93	7002.92	7033.57	95.35	9.54	0.44	9.54
14753	93.19	129.24	3	6849.4	7110.79	-657.63	7005.01	7035.81	95.36	9.25	0.37	9.26
14800	93.38	133.76	47	6846.6	7146.20	-688.92	7040.37	7074.00	95.59	9.55	0.40	9.56
14850	93.56	138.53	50	6843.6	7180.84	-724.89	7074.94	7111.98	95.85	9.53	0.36	9.54
14900	93.72	143.31	50	6840.4	7212.35	-763.62	7106.39	7147.30	96.13	9.55	0.32	9.56
14927	93.79	145.87	27	6838.7	7227.88	-785.41	7121.88	7165.06	96.29	9.54	0.26	9.55
14950	93.85	148.09	23	6837.1	7240.53	-804.82	7134.49	7179.74	96.44	9.55	0.26	9.57
15000	93.95	152.87	50	6833.7	7265.18	-848.21	7159.07	7209.14	96.76	9.54	0.20	9.56
15050	94.02	157.65	50	6830.3	7286.13	-893.50	7179.93	7235.32	97.09	9.54	0.14	9.56
15100	94.07	162.43	50	6826.7	7303.23	-940.37	7196.96	7258.13	97.44	9.54	0.10	9.56
15150	94.09	167.21	50	6823.2	7316.37	-988.49	7210.01	7277.46	97.81	9.54	0.04	9.56
15200	94.08	171.99	50	6819.6	7325.45	-1037.53	7219.01	7293.19	98.18	9.54	-0.02	9.56
15250	94.04	176.77	50	6816.1	7330.42	-1087.15	7223.89	7305.24	98.56	9.54	-0.08	9.56
15300	93.97	181.55	50	6812.6	7331.24	-1137.00	7224.62	7313.55	98.94	9.54	-0.14	9.56
15350	93.88	186.33	50	6809.1	7327.90	-1186.75	7221.20	7318.07	99.33	9.54	-0.18	9.56
15400	93.76	191.11	50	6805.8	7320.43	-1236.05	7213.64	7318.77	99.72	9.54	-0.24	9.56
15450	93.61	195.88	50	6802.6	7308.87	-1284.56	7202.00	7315.66	100.11	9.52	-0.30	9.54
15500	93.44	200.66	50	6799.5	7293.31	-1331.93	7186.36	7308.74	100.50	9.55	-0.34	9.56
15550	93.25	205.43	50	6796.6	7273.86	-1377.85	7166.82	7298.07	100.88	9.53	-0.38	9.54
15600	93.03	210.20	50	6793.9	7250.65	-1421.99	7143.53	7283.69	101.26	9.54	-0.44	9.54
15646	92.81	214.60	46	6791.5	7226.05	-1460.86	7118.87	7267.21	101.60	9.54	-0.48	9.54
15650	92.79	214.97	4	6791.3	7223.83	-1464.06	7116.65	7265.68	101.62	9.49	-0.51	9.49
15678	92.65	217.62	28	6790.0	7207.50	-1486.36	7100.27	7254.18	101.82	9.57	-0.51	9.57
15697	92.55	219.42	19	6789.1	7195.70	-1501.21	7088.45	7245.67	101.96	9.48	-0.53	9.47
15700	92.53	219.74	3	6789.0	7193.60	-1503.75	7086.35	7244.14	101.98	9.71	-0.61	9.70
15750	92.26	224.51	50	6786.9	7160.17	-1540.79	7052.85	7219.19	102.32	9.55	-0.54	9.54
15800	91.97	229.27	50	6785.1	7123.76	-1574.92	7016.38	7190.97	102.65	9.53	-0.58	9.52
15850	91.66	234.03	50	6783.5	7084.64	-1605.92	6977.20	7159.63	102.96	9.54	-0.62	9.52
15900	91.35	238.79	50	6782.2	7043.06	-1633.57	6935.58	7125.36	103.25	9.54	-0.62	9.52
15950	91.02	243.55	50	6781.1	6999.32	-1657.67	6891.80	7088.35	103.52	9.54	-0.66	9.52
16000	90.69	248.31	50	6780.4	6953.72	-1678.05	6846.16	7048.82	103.77	9.54	-0.66	9.52
16050	90.35	253.06	50	6779.9	6906.58	-1694.58	6798.99	7006.99	104.00	9.52	-0.68	9.50
16100	90.01	257.82	50	6779.8	6858.22	-1707.15	6750.61	6963.13	104.19	9.54	-0.68	9.52
16150	89.67	262.58	50	6779.9	6808.98	-1715.66	6701.36	6917.49	104.36	9.54	-0.68	9.52
16200	89.33	267.34	50	6780.3	6759.20	-1720.05	6651.57	6870.36	104.50	9.54	-0.68	9.52
16238	89.08	270.97	38	6780.9	6721.02	-1720.61	6613.38	6833.54	104.58	9.52	-0.65	9.50
16293	89.74	270.10	55	6781.4	6665.92	-1720.10	6558.29	6780.11	104.70	1.98	1.20	-1.58
16300	89.74	270.10	7	6781.5	6659.22	-1720.08	6551.59	6773.62	104.71	0.00	0.00	0.00
16397	89.74	270.10	97	6781.9	6562.22	-1719.92	6454.59	6679.81	104.92	0.00	0.00	0.00
16400	89.74	270.10	3	6781.9	6559.22	-1719.91	6451.59	6676.91	104.93	0.00	0.00	0.00
16500	89.74	270.10	100	6782.4	6459.22	-1719.74	6351.59	6580.29	105.15	0.00	0.00	0.00
16600	89.74	270.10	100	6782.8	6359.22	-1719.56	6251.59	6483.77	105.38	0.00	0.00	0.00
16700	89.74	270.10	100	6783.3	6259.23	-1719.39	6151.59	6387.36	105.62	0.00	0.00	0.00

Minimum Radius of Curvature

API: 51-23-51791 **Well: Hens 12NHS** **Wellhead Location N+/S- : 40.327960**
Operator: PDC Energy **Area: DJ** **E+/W- : -104.572340**
Rig: **Type: U-Lateral** **Magnetic Declination: 7.76**
TD: 23,255' **Plane of Proposal: 90.10**

Measured Depth Ft	Drift Angle Deg	Azimuth Direction Deg	Course Length Ft	TVD Ft	Vertical Section Ft	COORDINATES		CLOSURE		Dog Leg Severity Deg/100'	Build / Drop Deg/100'	Left / Right Deg/100'
						N-S Ft	E-W Ft	Distance FT	Direction Deg			
16800	89.74	270.10	100	6783.7	6159.23	-1719.21	6051.59	6291.06	105.86	0.00	0.00	0.00
16854	89.74	270.10	54	6784.0	6105.03	-1719.12	5997.39	6238.92	105.99	0.00	0.00	0.00
16900	89.74	270.10	46	6784.2	6059.23	-1719.04	5951.59	6194.88	106.11	0.00	0.00	0.00
17000	89.74	270.10	100	6784.6	5959.23	-1718.86	5851.60	6098.82	106.37	0.00	0.00	0.00
17100	89.74	270.10	100	6785.1	5859.23	-1718.69	5751.60	6002.90	106.64	0.00	0.00	0.00
17200	89.74	270.10	100	6785.6	5759.23	-1718.51	5651.60	5907.10	106.91	0.00	0.00	0.00
17300	89.74	270.10	100	6786.0	5659.23	-1718.34	5551.60	5811.45	107.20	0.00	0.00	0.00
17400	89.74	270.10	100	6786.5	5559.23	-1718.16	5451.60	5715.95	107.49	0.00	0.00	0.00
17429	89.74	270.10	29	6786.6	5530.23	-1718.11	5422.60	5688.28	107.58	0.00	0.00	0.00
17500	89.74	270.10	71	6786.9	5459.23	-1717.99	5351.60	5620.60	107.80	0.00	0.00	0.00
17600	89.74	270.10	100	6787.4	5359.23	-1717.82	5251.60	5525.42	108.11	0.00	0.00	0.00
17700	89.74	270.10	100	6787.8	5259.24	-1717.64	5151.60	5430.41	108.44	0.00	0.00	0.00
17704	89.74	270.10	4	6787.8	5255.64	-1717.63	5148.00	5426.99	108.45	0.00	0.00	0.00
17800	89.74	270.10	96	6788.3	5159.24	-1717.47	5051.60	5335.58	108.78	0.00	0.00	0.00
17900	89.74	270.10	100	6788.7	5059.24	-1717.29	4951.61	5240.94	109.13	0.00	0.00	0.00
18000	89.74	270.10	100	6789.2	4959.24	-1717.12	4851.61	5146.51	109.49	0.00	0.00	0.00
18100	89.74	270.10	100	6789.6	4859.24	-1716.94	4751.61	5052.29	109.87	0.00	0.00	0.00
18200	89.74	270.10	100	6790.1	4759.24	-1716.77	4651.61	4958.30	110.26	0.00	0.00	0.00
18300	89.74	270.10	100	6790.5	4659.24	-1716.59	4551.61	4864.55	110.66	0.00	0.00	0.00
18400	89.74	270.10	100	6791.0	4559.24	-1716.42	4451.61	4771.05	111.09	0.00	0.00	0.00
18500	89.74	270.10	100	6791.5	4459.24	-1716.24	4351.61	4677.82	111.52	0.00	0.00	0.00
18600	89.74	270.10	100	6791.9	4359.25	-1716.07	4251.61	4584.88	111.98	0.00	0.00	0.00
18700	89.74	270.10	100	6792.4	4259.25	-1715.90	4151.62	4492.24	112.46	0.00	0.00	0.00
18787	89.74	270.10	87	6792.8	4172.75	-1715.74	4065.12	4412.36	112.88	0.00	0.00	0.00
18800	89.74	270.10	14	6792.8	4159.25	-1715.72	4051.62	4399.92	112.95	0.00	0.00	0.00
18900	89.74	270.10	100	6793.3	4059.25	-1715.55	3951.62	4307.94	113.47	0.00	0.00	0.00
19000	89.74	270.10	100	6793.7	3959.25	-1715.37	3851.62	4216.33	114.01	0.00	0.00	0.00
19100	89.74	270.10	100	6794.2	3859.25	-1715.20	3751.62	4125.11	114.57	0.00	0.00	0.00
19200	89.74	270.10	100	6794.6	3759.25	-1715.02	3651.62	4034.31	115.16	0.00	0.00	0.00
19300	89.74	270.10	100	6795.1	3659.25	-1714.85	3551.62	3943.95	115.77	0.00	0.00	0.00
19400	89.74	270.10	100	6795.5	3559.25	-1714.67	3451.62	3854.06	116.42	0.00	0.00	0.00
19500	89.74	270.10	100	6796.0	3459.25	-1714.50	3351.62	3764.69	117.09	0.00	0.00	0.00
19512	89.74	270.10	12	6796.0	3447.45	-1714.48	3339.82	3754.18	117.17	0.00	0.00	0.00
19571	89.74	270.10	59	6796.3	3388.76	-1714.38	3281.13	3702.01	117.59	0.00	0.00	0.00
19600	89.74	270.10	30	6796.4	3359.26	-1714.33	3251.63	3675.86	117.80	0.00	0.00	0.00
19700	89.74	270.10	100	6796.9	3259.26	-1714.15	3151.63	3587.63	118.54	0.00	0.00	0.00
19800	89.74	270.10	100	6797.4	3159.26	-1713.98	3051.63	3500.02	119.32	0.00	0.00	0.00
19900	89.74	270.10	100	6797.8	3059.26	-1713.80	2951.63	3413.10	120.14	0.00	0.00	0.00
20000	89.74	270.10	100	6798.3	2959.26	-1713.63	2851.63	3326.91	121.00	0.00	0.00	0.00
20100	89.74	270.10	100	6798.7	2859.26	-1713.45	2751.63	3241.51	121.91	0.00	0.00	0.00
20200	89.74	270.10	100	6799.2	2759.26	-1713.28	2651.63	3156.97	122.87	0.00	0.00	0.00
20300	89.74	270.10	100	6799.6	2659.26	-1713.10	2551.63	3073.36	123.88	0.00	0.00	0.00
20400	89.74	270.10	100	6800.1	2559.26	-1712.93	2451.64	2990.76	124.94	0.00	0.00	0.00
20500	89.74	270.10	100	6800.5	2459.26	-1712.75	2351.64	2909.25	126.07	0.00	0.00	0.00
20600	89.74	270.10	100	6801.0	2359.27	-1712.58	2251.64	2828.92	127.26	0.00	0.00	0.00
20700	89.74	270.10	100	6801.4	2259.27	-1712.41	2151.64	2749.89	128.51	0.00	0.00	0.00
20800	89.74	270.10	100	6801.9	2159.27	-1712.23	2051.64	2672.26	129.85	0.00	0.00	0.00
20900	89.74	270.10	100	6802.3	2059.27	-1712.06	1951.64	2596.16	131.26	0.00	0.00	0.00
21000	89.74	270.10	100	6802.8	1959.27	-1711.88	1851.64	2521.73	132.75	0.00	0.00	0.00
21043	89.74	270.10	43	6803.0	1915.87	-1711.81	1808.24	2489.98	133.43	0.00	0.00	0.00
21100	89.74	270.10	57	6803.3	1859.27	-1711.71	1751.64	2449.12	134.34	0.00	0.00	0.00
21137	89.74	270.10	37	6803.4	1821.97	-1711.64	1714.34	2422.54	134.95	0.00	0.00	0.00
21200	89.74	270.10	63	6803.7	1759.27	-1711.53	1651.64	2378.50	136.02	0.00	0.00	0.00
21247	89.74	270.10	47	6803.9	1712.37	-1711.45	1604.75	2346.12	136.84	0.00	0.00	0.00
21300	89.74	270.10	53	6804.2	1659.27	-1711.36	1551.65	2310.05	137.80	0.00	0.00	0.00
21400	89.74	270.10	100	6804.6	1559.27	-1711.18	1451.65	2243.98	139.69	0.00	0.00	0.00
21500	89.74	270.10	100	6805.1	1459.28	-1711.01	1351.65	2180.48	141.69	0.00	0.00	0.00
21600	89.74	270.10	100	6805.5	1359.28	-1710.83	1251.65	2119.81	143.81	0.00	0.00	0.00

Minimum Radius of Curvature

API: 51-23-51791 **Well: Hens 12NHS** **Wellhead Location N+/S- : 40.327960**
Operator: PDC Energy **Area: DJ** **E+/W- : -104.572340**
Rig: **Type: U-Lateral** **Magnetic Declination: 7.76**
TD: 23,255' **Plane of Proposal: 90.10**

Measured Depth Ft	Drift Angle Deg	Azimuth Direction Deg	Course Length Ft	TVD Ft	Vertical Section Ft	COORDINATES		CLOSURE		Dog Leg Severity Deg/100'	Build / Drop Deg/100'	Left / Right Deg/100'
						N-S Ft	E-W Ft	Distance FT	Direction Deg			
21700	89.74	270.10	100	6806.0	1259.28	-1710.66	1151.65	2062.20	146.05	0.00	0.00	0.00
21800	89.74	270.10	100	6806.4	1159.28	-1710.49	1051.65	2007.92	148.42	0.00	0.00	0.00
21900	89.74	270.10	100	6806.9	1059.28	-1710.31	951.65	1957.24	150.91	0.00	0.00	0.00
22000	89.74	270.10	100	6807.3	959.28	-1710.14	851.65	1910.47	153.53	0.00	0.00	0.00
22100	89.74	270.10	100	6807.8	859.28	-1709.96	751.66	1867.87	156.27	0.00	0.00	0.00
22200	89.74	270.10	100	6808.2	759.28	-1709.79	651.66	1829.76	159.14	0.00	0.00	0.00
22300	89.74	270.10	100	6808.7	659.28	-1709.61	551.66	1796.41	162.12	0.00	0.00	0.00
22400	89.74	270.10	100	6809.2	559.28	-1709.44	451.66	1768.10	165.20	0.00	0.00	0.00
22500	89.74	270.10	100	6809.6	459.29	-1709.26	351.66	1745.06	168.37	0.00	0.00	0.00
22600	89.74	270.10	100	6810.1	359.29	-1709.09	251.66	1727.52	171.62	0.00	0.00	0.00
22700	89.74	270.10	100	6810.5	259.29	-1708.91	151.66	1715.63	174.93	0.00	0.00	0.00
22800	89.74	270.10	100	6811.0	159.29	-1708.74	51.66	1709.52	178.27	0.00	0.00	0.00
22818	89.74	270.10	18	6811.0	141.69	-1708.71	34.06	1709.05	178.86	0.00	0.00	0.00
22900	89.74	270.10	82	6811.4	59.29	-1708.57	-48.34	1709.25	181.62	0.00	0.00	0.00
23000	89.74	270.10	100	6811.9	-40.71	-1708.39	-148.33	1714.82	184.96	0.00	0.00	0.00
23100	89.74	270.10	100	6812.3	-140.71	-1708.22	-248.33	1726.17	188.27	0.00	0.00	0.00
23200	89.74	270.10	100	6812.8	-240.71	-1708.04	-348.33	1743.20	191.53	0.00	0.00	0.00
23255	89.74	270.10	55	6813.0	-295.41	-1707.95	-403.03	1754.85	193.28	0.00	0.00	0.00