



Job Number: SVGJ-141349
 Company: PDC
 Lease/Well: National Hog Farm 41-17
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.23°
 Grid: East To True North
 File name: S:\2014SU~1\PDC\GJ\NATION~1\4117.SVY
 Date/Time: 21-Nov-14 / 13:41
 Curve Name: Surface - 6000' M.D. (Rate Gyro)

MS SURVEY

WINSERVE SURVEY CALCULATIONS

Minimum Curvature Method

Vertical Section Plane .00

Vertical Section Referenced to Wellhead

Rectangular Coordinates Referenced to Wellhead

<i>Measured Depth FT</i>	<i>Incl Angle Deg</i>	<i>Drift Direction Deg</i>	<i>True Vertical Depth</i>	<i>N-S FT</i>	<i>E-W FT</i>	<i>Vertical Section FT</i>	<i>C L O S U R E</i>		<i>Dogleg Severity Deg/100</i>
							<i>Distance FT</i>	<i>Direction Deg</i>	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
100.00	.82	254.46	100.00	-.19	-.69	-.19	.72	254.46	.82
200.00	2.36	266.15	199.96	-.52	-3.43	-.52	3.47	261.36	1.57
300.00	4.43	340.16	299.81	2.97	-6.80	2.97	7.42	293.63	4.41
400.00	6.90	355.90	399.32	12.60	-8.54	12.60	15.22	325.87	2.90
500.00	6.86	356.75	498.60	24.56	-9.31	24.56	26.26	339.24	.11
600.00	6.62	357.17	597.91	36.27	-9.93	36.27	37.61	344.69	.25
700.00	6.36	355.64	697.27	47.55	-10.64	47.55	48.73	347.39	.31
800.00	5.81	356.09	796.71	58.13	-11.40	58.13	59.24	348.90	.55
900.00	5.37	357.72	896.23	67.85	-11.93	67.85	68.89	350.02	.47

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
1000.00	5.14	358.78	995.81	77.01	-12.22	77.01	77.97	350.99	.25
1100.00	5.09	357.17	1095.41	85.92	-12.53	85.92	86.82	351.70	.15
1200.00	4.67	354.03	1195.05	94.40	-13.17	94.40	95.31	352.06	.50
1300.00	4.29	352.79	1294.74	102.15	-14.07	102.15	103.12	352.16	.39
1400.00	3.74	352.66	1394.50	109.10	-14.95	109.10	110.12	352.20	.55
1500.00	3.58	354.80	1494.29	115.44	-15.65	115.44	116.50	352.28	.21
1600.00	3.59	354.21	1594.10	121.67	-16.25	121.67	122.75	352.39	.04
1700.00	3.55	349.57	1693.90	127.83	-17.13	127.83	128.97	352.37	.29
1800.00	3.67	348.52	1793.71	134.01	-18.32	134.01	135.26	352.21	.14
1900.00	3.77	345.02	1893.50	140.32	-19.81	140.32	141.71	351.96	.25
2000.00	3.83	341.65	1993.28	146.67	-21.71	146.67	148.27	351.58	.23
2100.00	3.84	340.72	2093.05	153.00	-23.87	153.00	154.85	351.13	.06
2200.00	3.89	339.42	2192.82	159.33	-26.17	159.33	161.47	350.67	.10
2300.00	3.91	338.47	2292.59	165.68	-28.61	165.68	168.13	350.20	.07
2400.00	3.94	339.32	2392.36	172.07	-31.08	172.07	174.85	349.76	.07
2500.00	4.06	340.64	2492.11	178.62	-33.46	178.62	181.73	349.39	.15
2600.00	4.24	341.76	2591.85	185.47	-35.79	185.47	188.89	349.08	.20
2700.00	4.39	341.77	2691.57	192.62	-38.15	192.62	196.36	348.80	.15
2800.00	4.28	342.74	2791.28	199.82	-40.45	199.82	203.87	348.56	.13
2900.00	4.16	343.33	2891.01	206.86	-42.60	206.86	211.20	348.36	.13
3000.00	4.27	343.23	2990.74	213.89	-44.71	213.89	218.52	348.19	.11
3100.00	4.07	341.65	3090.48	220.83	-46.91	220.83	225.75	348.01	.23
3200.00	3.73	340.53	3190.25	227.26	-49.11	227.26	232.51	347.81	.35
3300.00	3.34	339.96	3290.05	233.07	-51.19	233.07	238.62	347.61	.39
3400.00	2.97	339.66	3389.90	238.23	-53.09	238.23	244.08	347.44	.37
3500.00	2.81	346.36	3489.78	243.04	-54.57	243.04	249.09	347.35	.37
3600.00	2.97	345.26	3589.65	247.93	-55.80	247.93	254.13	347.32	.17
3700.00	2.81	342.78	3689.52	252.78	-57.19	252.78	259.17	347.25	.20
3800.00	3.22	338.12	3789.38	257.72	-58.96	257.72	264.38	347.11	.48

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
3900.00	3.01	344.80	3889.24	262.86	-60.70	262.86	269.78	347.00	.42
4000.00	2.98	347.91	3989.10	267.94	-61.93	267.94	275.00	346.99	.17
4100.00	2.24	342.18	4088.99	272.34	-63.07	272.34	279.55	346.96	.78
4200.00	2.04	340.05	4188.93	275.88	-64.28	275.88	283.26	346.88	.22
4300.00	1.74	342.67	4288.87	279.00	-65.34	279.00	286.55	346.82	.31
4400.00	1.55	343.73	4388.83	281.75	-66.17	281.75	289.41	346.78	.19
4500.00	1.48	341.92	4488.79	284.27	-66.95	284.27	292.05	346.75	.08
4600.00	1.42	343.78	4588.76	286.69	-67.69	286.69	294.57	346.71	.08
4700.00	1.40	3.34	4688.73	289.10	-67.97	289.10	296.98	346.77	.48
4800.00	1.55	24.90	4788.70	291.54	-67.33	291.54	299.22	347.00	.57
4900.00	1.61	31.08	4888.66	293.97	-66.03	293.97	301.30	347.34	.18
5000.00	1.70	36.98	4988.62	296.36	-64.42	296.36	303.28	347.74	.19
5100.00	1.44	40.85	5088.58	298.50	-62.70	298.50	305.01	348.14	.28
5200.00	1.27	54.65	5188.56	300.09	-60.98	300.09	306.22	348.51	.37
5300.00	1.09	76.96	5288.53	300.95	-59.15	300.95	306.70	348.88	.49
5400.00	1.17	98.80	5388.52	301.00	-57.21	301.00	306.39	349.24	.44
5500.00	1.47	110.56	5488.49	300.40	-55.00	300.40	305.39	349.62	.40
5600.00	1.40	107.41	5588.46	299.58	-52.63	299.58	304.17	350.04	.11
5700.00	1.49	112.25	5688.43	298.72	-50.26	298.72	302.92	350.45	.15
5800.00	1.85	118.62	5788.38	297.46	-47.64	297.46	301.25	350.90	.40
5900.00	2.31	133.08	5888.32	295.31	-44.76	295.31	298.68	351.38	.69
Last Survey Depth Recorded									
6000.00	1.69	167.61	5988.26	292.49	-42.97	292.49	295.63	351.64	1.33