



Job Number: SVGJ-140789
 Company: PDC
 Lease/Well: Lucas 1
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.32°
 Grid: East To True North
 File name: Y:\WINSER~1\2014SU~1\PDC\GJ\LUCAS\1.SVY
 Date/Time: 02-Jul-14 / 10:47
 Curve Name: Surface - 6600' 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	.33	271.49	100.00	.01	-.29	.01	.29	271.49	.33
200.00	.31	226.19	200.00	-.17	-.77	-.17	.79	257.40	.25
300.00	.37	143.02	300.00	-.62	-.77	-.62	.99	231.34	.45
400.00	.18	141.24	400.00	-1.00	-.48	-1.00	1.11	205.66	.19
500.00	.75	152.41	499.99	-1.70	-.08	-1.70	1.70	182.62	.57
600.00	.62	194.54	599.99	-2.80	.09	-2.80	2.81	178.18	.51
700.00	.63	148.33	699.98	-3.80	.24	-3.80	3.80	176.35	.49
800.00	.95	175.24	799.97	-5.09	.60	-5.09	5.13	173.28	.48
900.00	1.16	177.02	899.95	-6.93	.72	-6.93	6.96	174.06	.21

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	.69	186.08	999.94	-8.54	.71	-8.54	8.57	175.25	.49
1100.00	.69	198.21	1099.93	-9.71	.46	-9.71	9.72	177.30	.15
1200.00	.81	168.43	1199.93	-10.97	.41	-10.97	10.98	177.85	.40
1300.00	.54	214.23	1299.92	-12.05	.29	-12.05	12.06	178.63	.58
1400.00	.92	191.08	1399.91	-13.23	-.13	-13.23	13.23	180.57	.47
1500.00	.58	166.73	1499.90	-14.51	-.17	-14.51	14.51	180.67	.46
1600.00	.51	170.36	1599.90	-15.44	.02	-15.44	15.44	179.92	.08
1700.00	.57	189.48	1699.89	-16.37	.01	-16.37	16.37	179.95	.19
1800.00	.56	158.95	1799.89	-17.32	.11	-17.32	17.32	179.64	.30
1900.00	.95	108.00	1899.88	-18.03	1.07	-18.03	18.06	176.60	.74
2000.00	.96	74.29	1999.87	-18.06	2.67	-18.06	18.26	171.60	.55
2100.00	1.31	76.10	2099.85	-17.56	4.58	-17.56	18.15	165.37	.35
2200.00	1.45	82.07	2199.82	-17.11	6.95	-17.11	18.47	157.91	.20
2300.00	1.52	106.47	2299.79	-17.31	9.47	-17.31	19.73	151.32	.63
2400.00	1.11	76.13	2399.76	-17.46	11.68	-17.46	21.00	146.21	.79
2500.00	1.19	84.59	2499.74	-17.13	13.66	-17.13	21.90	141.43	.19
2600.00	1.04	92.77	2599.72	-17.07	15.60	-17.07	23.12	137.58	.22
2700.00	.86	97.56	2699.71	-17.21	17.25	-17.21	24.37	134.94	.20
2800.00	.87	92.33	2799.70	-17.34	18.75	-17.34	25.54	132.77	.08
2900.00	1.64	91.22	2899.67	-17.40	20.94	-17.40	27.23	129.73	.77
3000.00	1.79	96.72	2999.63	-17.62	23.92	-17.62	29.71	126.37	.22
3100.00	1.45	105.33	3099.59	-18.14	26.69	-18.14	32.27	124.19	.42
3200.00	1.25	101.51	3199.56	-18.69	28.98	-18.69	34.48	122.81	.22
3300.00	.66	37.89	3299.55	-18.45	30.40	-18.45	35.56	121.25	1.12
3400.00	.76	316.77	3399.54	-17.51	30.30	-17.51	35.00	120.02	.93
3500.00	.88	288.74	3499.53	-16.78	29.12	-16.78	33.61	119.95	.41
3600.00	.99	279.00	3599.52	-16.40	27.54	-16.40	32.05	120.77	.19
3700.00	1.35	276.93	3699.50	-16.12	25.52	-16.12	30.19	122.29	.36
3800.00	1.01	264.36	3799.48	-16.07	23.47	-16.07	28.45	124.39	.43

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	.79	178.91	3899.47	-16.84	22.61	-16.84	28.19	126.69	1.23
4000.00	1.06	164.52	3999.45	-18.42	22.87	-18.42	29.37	128.86	.35
4100.00	1.18	159.39	4099.44	-20.28	23.48	-20.28	31.02	130.82	.16
4200.00	1.51	155.99	4199.41	-22.45	24.38	-22.45	33.14	132.64	.34
4300.00	1.73	169.23	4299.37	-25.13	25.19	-25.13	35.59	134.93	.43
4400.00	1.56	169.21	4399.33	-27.95	25.73	-27.95	37.99	137.37	.17
4500.00	1.09	126.54	4499.30	-29.86	26.75	-29.86	40.09	138.14	1.06
4600.00	1.08	148.75	4599.29	-31.23	28.00	-31.23	41.95	138.12	.42
4700.00	1.57	146.71	4699.26	-33.18	29.24	-33.18	44.23	138.61	.49
4800.00	2.19	140.33	4799.20	-35.80	31.22	-35.80	47.49	138.91	.65
4900.00	2.60	145.59	4899.12	-39.14	33.72	-39.14	51.66	139.26	.46
5000.00	3.40	154.28	4998.98	-43.68	36.29	-43.68	56.79	140.28	.92
5100.00	3.47	153.89	5098.80	-49.07	38.90	-49.07	62.62	141.59	.07
5200.00	2.66	141.29	5198.66	-53.60	41.69	-53.60	67.90	142.12	1.05
5300.00	2.08	135.40	5298.57	-56.70	44.41	-56.70	72.02	141.93	.63
5400.00	1.77	121.17	5398.51	-58.79	47.01	-58.79	75.28	141.36	.57
5500.00	1.55	125.44	5498.47	-60.38	49.43	-60.38	78.03	140.69	.25
5600.00	1.42	94.06	5598.44	-61.25	51.77	-61.25	80.20	139.79	.81
5700.00	.94	93.74	5698.42	-61.39	53.82	-61.39	81.64	138.76	.48
5800.00	1.17	84.33	5798.40	-61.34	55.66	-61.34	82.83	137.78	.29
5900.00	.73	32.37	5898.39	-60.70	57.02	-60.70	83.28	136.79	.92
6000.00	.81	350.78	5998.38	-59.47	57.24	-59.47	82.54	136.09	.55
6100.00	.87	327.24	6098.37	-58.13	56.72	-58.13	81.22	135.70	.35
6200.00	1.20	312.57	6198.36	-56.78	55.54	-56.78	79.43	135.64	.42
6300.00	1.54	321.12	6298.33	-55.03	53.92	-55.03	77.05	135.58	.40
6400.00	2.11	313.06	6398.28	-52.73	51.73	-52.73	73.87	135.54	.62
6500.00	1.74	325.89	6498.22	-50.21	49.54	-50.21	70.54	135.39	.57
Last Survey Depth Recorded									
6600.00	1.51	356.78	6598.18	-47.64	48.61	-47.64	68.06	134.42	.89