



Job Number: SVGJ-141396
 Company: PDC
 Lease/Well: Mark 11-35
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.31°
 Grid: East To True North
 File name: S:\2014SU-1\PDC\GJ\MARK\1135.SVY
 Date/Time: 12-Dec-14 / 16:05
 Curve Name: Surface - 6770' 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	.39	98.61	100.00	-.05	.34	-.05	.34	98.61	.39
200.00	.13	102.97	200.00	-.13	.78	-.13	.79	99.23	.26
300.00	.01	217.90	300.00	-.16	.89	-.16	.90	100.19	.13
400.00	.03	254.10	400.00	-.17	.86	-.17	.88	101.45	.02
500.00	.10	176.96	500.00	-.27	.84	-.27	.88	107.75	.10
600.00	.05	146.30	600.00	-.39	.87	-.39	.95	114.32	.06
700.00	.03	142.11	700.00	-.45	.91	-.45	1.01	116.32	.02
800.00	.12	188.53	800.00	-.57	.91	-.57	1.07	122.26	.10
900.00	.12	141.21	900.00	-.76	.96	-.76	1.22	128.37	.10

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	.09	114.14	1000.00	-.87	1.09	-.87	1.40	128.53	.06
1100.00	.03	56.16	1100.00	-.89	1.19	-.89	1.48	126.81	.08
1200.00	.05	71.98	1200.00	-.86	1.25	-.86	1.52	124.53	.02
1300.00	.08	75.88	1300.00	-.83	1.36	-.83	1.59	121.40	.03
1400.00	.12	72.94	1400.00	-.78	1.53	-.78	1.72	117.12	.04
1500.00	.16	55.25	1500.00	-.67	1.74	-.67	1.87	111.10	.06
1600.00	.10	16.10	1600.00	-.51	1.88	-.51	1.95	105.14	.10
1700.00	.25	295.17	1700.00	-.33	1.71	-.33	1.74	101.01	.25
1800.00	.47	277.50	1799.99	-.19	1.10	-.19	1.12	99.56	.24
1900.00	.80	277.76	1899.99	-.04	.01	-.04	.04	170.50	.33
2000.00	.90	285.07	1999.98	.26	-1.44	.26	1.47	280.21	.15
2100.00	1.29	295.09	2099.96	.94	-3.22	.94	3.36	286.29	.43
2200.00	1.21	296.81	2199.93	1.90	-5.18	1.90	5.52	290.08	.09
2300.00	1.20	296.22	2299.91	2.83	-7.06	2.83	7.61	291.86	.02
2400.00	1.19	294.03	2399.89	3.72	-8.95	3.72	9.69	292.56	.05
2500.00	.82	318.80	2499.88	4.68	-10.37	4.68	11.38	294.29	.56
2600.00	.91	352.76	2599.87	6.01	-10.94	6.01	12.48	298.76	.51
2700.00	.97	352.05	2699.85	7.63	-11.16	7.63	13.52	304.37	.06
2800.00	.86	345.81	2799.84	9.20	-11.46	9.20	14.70	308.75	.15
2900.00	.71	348.72	2899.83	10.53	-11.77	10.53	15.79	311.84	.16
3000.00	.52	348.11	2999.82	11.59	-11.98	11.59	16.67	314.04	.19
3100.00	.24	328.83	3099.82	12.21	-12.18	12.21	17.25	315.06	.30
3200.00	.12	251.56	3199.82	12.36	-12.39	12.36	17.50	314.92	.24
3300.00	.38	210.72	3299.82	12.04	-12.66	12.04	17.47	313.55	.30
3400.00	.76	192.02	3399.81	11.10	-12.97	11.10	17.07	310.57	.42
3500.00	1.07	188.22	3499.80	9.53	-13.24	9.53	16.31	305.75	.32
3600.00	1.22	197.45	3599.78	7.59	-13.69	7.59	15.66	299.00	.24
3700.00	1.37	216.58	3699.76	5.62	-14.72	5.62	15.76	290.87	.46
3800.00	1.44	221.46	3799.73	3.71	-16.27	3.71	16.69	282.86	.14

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	1.43	221.43	3899.70	1.84	-17.93	1.84	18.02	275.85	.01
4000.00	1.49	222.55	3999.66	-.06	-19.63	-.06	19.63	269.83	.07
4100.00	1.58	224.44	4099.63	-2.00	-21.48	-2.00	21.57	264.68	.10
4200.00	1.57	234.63	4199.59	-3.78	-23.56	-3.78	23.86	260.89	.28
4300.00	1.67	248.46	4299.55	-5.10	-26.03	-5.10	26.53	258.91	.40
4400.00	1.89	255.98	4399.50	-6.04	-28.99	-6.04	29.61	258.23	.32
4500.00	1.99	260.99	4499.44	-6.71	-32.30	-6.71	32.99	258.26	.20
4600.00	1.88	265.72	4599.39	-7.10	-35.65	-7.10	36.35	258.73	.19
4700.00	1.87	273.00	4699.33	-7.14	-38.92	-7.14	39.57	259.60	.24
4800.00	1.74	291.53	4799.29	-6.50	-41.96	-6.50	42.46	261.19	.60
4900.00	1.81	307.86	4899.24	-4.97	-44.62	-4.97	44.89	263.64	.51
5000.00	1.34	310.64	4999.20	-3.24	-46.75	-3.24	46.86	266.03	.48
5100.00	1.39	311.99	5099.17	-1.67	-48.54	-1.67	48.57	268.03	.06
5200.00	1.36	309.39	5199.14	-.10	-50.36	-.10	50.36	269.88	.07
5300.00	1.18	303.01	5299.12	1.21	-52.14	1.21	52.15	271.33	.23
5400.00	.95	301.25	5399.10	2.20	-53.71	2.20	53.76	272.35	.23
5500.00	.73	297.34	5499.09	2.92	-54.99	2.92	55.06	273.04	.23
5600.00	.22	315.07	5599.09	3.35	-55.69	3.35	55.79	273.44	.52
5700.00	.53	326.48	5699.08	3.87	-56.08	3.87	56.21	273.95	.32
5800.00	.55	322.15	5799.08	4.64	-56.63	4.64	56.82	274.68	.05
5900.00	.57	304.86	5899.08	5.30	-57.33	5.30	57.57	275.28	.17
6000.00	.61	284.05	5999.07	5.71	-58.25	5.71	58.53	275.60	.22
6100.00	.62	285.35	6099.06	5.99	-59.29	5.99	59.59	275.77	.02
6200.00	.36	281.96	6199.06	6.20	-60.12	6.20	60.44	275.88	.26
6300.00	.29	297.97	6299.06	6.38	-60.65	6.38	60.99	276.00	.11
6400.00	.43	287.07	6399.06	6.61	-61.24	6.61	61.59	276.16	.16
6500.00	.30	273.29	6499.05	6.73	-61.86	6.73	62.22	276.21	.16
6600.00	.25	283.32	6599.05	6.80	-62.33	6.80	62.70	276.22	.07
6700.00	.24	260.74	6699.05	6.82	-62.75	6.82	63.12	276.20	.10

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	
Last Survey Depth Recorded									
6770.00	.15	156.26	6769.05	6.71	-62.86	6.71	63.21	276.09	.45