



Job Number: SVGJ-141193
 Company: PDC
 Lease/Well: Stonehocker 32-8
 Location: Adams County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.47°
 Grid: East To True North
 File name: S:\2014SU~1\PDC\GJ\STONEH~1\328.SVY
 Date/Time: 24-Sep-14 / 13:03
 Curve Name: Surface - 8300' 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	.26	233.87	100.00	-.13	-.18	-.13	.23	233.87	.26
200.00	.19	169.79	200.00	-.43	-.34	-.43	.55	218.05	.25
300.00	.43	208.35	300.00	-.92	-.49	-.92	1.04	207.73	.31
400.00	.40	216.75	399.99	-1.53	-.87	-1.53	1.77	209.64	.07
500.00	.35	231.26	499.99	-2.00	-1.32	-2.00	2.40	213.36	.11
600.00	.34	231.26	599.99	-2.38	-1.79	-2.38	2.98	216.92	.01
700.00	.46	263.32	699.99	-2.61	-2.42	-2.61	3.56	222.79	.25
800.00	.72	252.29	799.98	-2.85	-3.42	-2.85	4.45	230.15	.28
900.00	.84	260.78	899.97	-3.16	-4.74	-3.16	5.70	236.30	.17

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	.83	270.10	999.96	-3.28	-6.19	-3.28	7.00	242.09	.14
1100.00	.72	290.56	1099.95	-3.05	-7.50	-3.05	8.10	247.84	.30
1200.00	.50	298.10	1199.95	-2.63	-8.47	-2.63	8.87	252.76	.23
1300.00	.37	27.42	1299.95	-2.14	-8.71	-2.14	8.97	256.22	.62
1400.00	.37	39.58	1399.94	-1.60	-8.35	-1.60	8.51	259.15	.08
1500.00	.10	65.34	1499.94	-1.32	-8.07	-1.32	8.18	260.74	.28
1600.00	.18	41.96	1599.94	-1.16	-7.89	-1.16	7.97	261.61	.10
1700.00	.29	241.04	1699.94	-1.17	-8.00	-1.17	8.09	261.69	.46
1800.00	.14	251.76	1799.94	-1.33	-8.34	-1.33	8.44	260.94	.15
1900.00	.43	229.80	1899.94	-1.61	-8.74	-1.61	8.89	259.57	.30
2000.00	.44	267.54	1999.94	-1.87	-9.41	-1.87	9.60	258.77	.28
2100.00	.41	272.93	2099.94	-1.87	-10.15	-1.87	10.32	259.58	.05
2200.00	.42	274.91	2199.93	-1.82	-10.88	-1.82	11.03	260.52	.02
2300.00	.57	280.52	2299.93	-1.69	-11.73	-1.69	11.85	261.78	.16
2400.00	.75	256.02	2399.92	-1.76	-12.85	-1.76	12.97	262.20	.33
2500.00	.70	282.64	2499.92	-1.79	-14.08	-1.79	14.20	262.77	.34
2600.00	1.17	275.76	2599.90	-1.55	-15.70	-1.55	15.77	264.36	.48
2700.00	1.16	287.41	2699.88	-1.14	-17.68	-1.14	17.72	266.30	.24
2800.00	1.48	287.65	2799.85	-.45	-19.87	-.45	19.88	268.70	.32
2900.00	1.32	289.18	2899.82	.32	-22.19	.32	22.20	270.83	.16
3000.00	1.36	294.62	2999.80	1.19	-24.36	1.19	24.39	272.80	.13
3100.00	1.19	308.35	3099.77	2.33	-26.25	2.33	26.36	275.07	.35
3200.00	.88	316.84	3199.76	3.54	-27.59	3.54	27.82	277.30	.35
3300.00	.52	316.00	3299.75	4.42	-28.43	4.42	28.78	278.84	.36
3400.00	.60	323.48	3399.74	5.17	-29.06	5.17	29.52	280.09	.11
3500.00	.53	320.83	3499.74	5.95	-29.66	5.95	30.25	281.34	.07
3600.00	.82	331.80	3599.73	6.94	-30.29	6.94	31.08	282.90	.32
3700.00	1.15	339.32	3699.72	8.51	-30.99	8.51	32.13	285.35	.35
3800.00	.99	328.92	3799.70	10.19	-31.79	10.19	33.38	287.77	.25

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	.97	358.17	3899.69	11.77	-32.26	11.77	34.34	290.05	.50
4000.00	1.14	12.88	3999.67	13.59	-32.07	13.59	34.83	292.96	.32
4100.00	.92	26.22	4099.65	15.28	-31.49	15.28	35.00	295.88	.32
4200.00	.34	45.76	4199.65	16.20	-30.92	16.20	34.91	297.66	.61
4300.00	.35	119.36	4299.65	16.26	-30.44	16.26	34.51	298.11	.41
4400.00	.47	134.28	4399.64	15.83	-29.88	15.83	33.81	297.91	.16
4500.00	.35	141.96	4499.64	15.30	-29.40	15.30	33.14	297.49	.13
4600.00	.42	188.11	4599.64	14.70	-29.26	14.70	32.75	296.66	.31
4700.00	.82	192.88	4699.63	13.64	-29.48	13.64	32.48	294.83	.40
4800.00	1.27	192.75	4799.62	11.86	-29.88	11.86	32.15	291.64	.45
4900.00	1.51	188.69	4899.59	9.47	-30.32	9.47	31.77	287.35	.26
5000.00	1.46	182.03	4999.55	6.90	-30.57	6.90	31.34	282.72	.18
5100.00	1.50	193.38	5099.52	4.35	-30.92	4.35	31.22	278.01	.30
5200.00	1.64	196.29	5199.48	1.70	-31.62	1.70	31.67	273.09	.16
5300.00	1.72	195.76	5299.44	-1.11	-32.43	-1.11	32.45	268.03	.08
5400.00	1.86	194.60	5399.39	-4.13	-33.25	-4.13	33.50	262.92	.14
5500.00	1.84	196.68	5499.34	-7.24	-34.12	-7.24	34.87	258.02	.07
5600.00	1.90	192.45	5599.28	-10.39	-34.93	-10.39	36.45	253.43	.15
5700.00	1.79	187.91	5699.23	-13.56	-35.51	-13.56	38.01	249.10	.18
5800.00	1.73	186.14	5799.19	-16.61	-35.88	-16.61	39.54	245.17	.08
5900.00	1.40	181.33	5899.15	-19.33	-36.07	-19.33	40.92	241.82	.35
6000.00	1.05	183.92	5999.12	-21.46	-36.16	-21.46	42.05	239.31	.35
6100.00	1.01	208.87	6099.11	-23.15	-36.65	-23.15	43.35	237.72	.45
6200.00	.96	214.33	6199.09	-24.61	-37.55	-24.61	44.90	236.76	.11
6300.00	1.00	225.11	6299.08	-25.92	-38.64	-25.92	46.53	236.14	.19
6400.00	1.00	237.48	6399.06	-27.01	-39.99	-27.01	48.26	235.97	.22
6500.00	.81	240.05	6499.05	-27.83	-41.34	-27.83	49.84	236.05	.19
6600.00	1.02	231.20	6599.04	-28.74	-42.65	-28.74	51.43	236.03	.25
6700.00	1.18	235.37	6699.02	-29.88	-44.19	-29.88	53.34	235.93	.18

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	
6800.00	1.14	237.09	6799.00	-31.01	-45.87	-31.01	55.37	235.94	.05
6900.00	.69	238.54	6898.99	-31.86	-47.22	-31.86	56.96	235.99	.45
7000.00	.57	233.39	6998.98	-32.47	-48.13	-32.47	58.06	235.99	.13
7100.00	.82	229.72	7098.97	-33.23	-49.08	-33.23	59.27	235.90	.25
7200.00	.90	227.71	7198.96	-34.22	-50.21	-34.22	60.76	235.72	.09
7300.00	1.07	231.27	7298.95	-35.34	-51.51	-35.34	62.47	235.55	.18
7400.00	1.20	240.31	7398.93	-36.44	-53.15	-36.44	64.44	235.57	.22
7500.00	.55	201.16	7498.92	-37.40	-54.24	-37.40	65.88	235.41	.85
7600.00	.82	171.59	7598.91	-38.56	-54.30	-38.56	66.60	234.62	.44
7700.00	.91	126.97	7698.90	-39.75	-53.57	-39.75	66.70	233.42	.66
7800.00	1.84	81.06	7798.87	-39.97	-51.34	-39.97	65.07	232.10	1.37
7900.00	1.87	83.21	7898.82	-39.53	-48.14	-39.53	62.29	230.61	.08
8000.00	1.08	94.12	7998.79	-39.41	-45.58	-39.41	60.25	229.15	.83
8100.00	.59	100.16	8098.78	-39.56	-44.13	-39.56	59.27	228.12	.50
8200.00	.62	103.54	8198.77	-39.78	-43.10	-39.78	58.65	227.29	.05

Last Survey Depth Recorded									
8300.00	.97	103.01	8298.76	-40.10	-41.75	-40.10	57.89	226.15	.35