



**Job Number:** SVGJ-120534  
**Company:** PDC  
**Lease/Well:** State Lease 8461 12-16  
**Location:** Weld County, CO  
**Rig Name:** M.S. Wireline  
**RKB:** 0'  
**G.L. or M.S.L.:** GL

**State/Country:** Colorado/USA  
**Declination:** 8.60°  
**Grid:** East To True  
**File name:** F:\2012SU~1\PDC\LORENZ\STATEL~1\84611216.SVY  
**Date/Time:** 07-May-12 / 11:34  
**Curve Name:** Surface - 7000' M.D. (Rate Gyro)

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	.21	188.10	100.00	-.18	-.03	-.18	.18	188.10	.21
200.00	.16	67.83	200.00	-.31	.08	-.31	.32	165.94	.32
300.00	.29	22.08	300.00	-.02	.30	-.02	.30	94.35	.21
400.00	.16	353.35	400.00	.35	.38	.35	.52	47.41	.17
500.00	.69	193.29	500.00	-.10	.23	-.10	.25	113.20	.84
600.00	.86	190.18	599.99	-1.42	-.04	-1.42	1.42	181.80	.18
700.00	.33	213.80	699.98	-2.40	-.34	-2.40	2.42	188.00	.57
800.00	.34	251.17	799.98	-2.73	-.78	-2.73	2.84	195.89	.21
900.00	.55	237.19	899.98	-3.09	-1.46	-3.09	3.42	205.33	.23
1000.00	.49	208.72	999.97	-3.73	-2.07	-3.73	4.26	209.07	.26
1100.00	.33	177.29	1099.97	-4.39	-2.26	-4.39	4.94	207.28	.27
1200.00	.18	141.24	1199.97	-4.80	-2.15	-4.80	5.26	204.15	.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	
1300.00	.28	188.14	1299.97	-5.16	-2.09	-5.16	5.57	202.02	.20
1400.00	.46	168.48	1399.97	-5.80	-2.04	-5.80	6.15	199.40	.22
1500.00	.44	148.79	1499.96	-6.52	-1.76	-6.52	6.75	195.13	.16
1600.00	.27	159.32	1599.96	-7.07	-1.48	-7.07	7.22	191.83	.18
1700.00	.37	203.85	1699.96	-7.58	-1.53	-7.58	7.74	191.39	.26
1800.00	.60	186.77	1799.96	-8.40	-1.72	-8.40	8.57	191.58	.27
1900.00	.49	172.09	1899.95	-9.34	-1.72	-9.34	9.50	190.45	.18
2000.00	.38	215.53	1999.95	-10.04	-1.86	-10.04	10.21	190.48	.34
2100.00	.66	221.22	2099.95	-10.74	-2.43	-10.74	11.01	192.75	.28
2200.00	.89	210.38	2199.94	-11.84	-3.20	-11.84	12.27	195.13	.27
2300.00	.80	223.97	2299.93	-13.02	-4.08	-13.02	13.64	197.40	.22
2400.00	1.11	225.83	2399.91	-14.19	-5.26	-14.19	15.14	200.33	.31
2500.00	1.20	207.39	2499.89	-15.80	-6.44	-15.80	17.06	202.16	.38
2600.00	1.18	182.21	2599.87	-17.76	-6.96	-17.76	19.07	201.39	.52
2700.00	1.24	175.94	2699.85	-19.86	-6.92	-19.86	21.03	199.21	.15
2800.00	1.34	170.88	2799.82	-22.10	-6.66	-22.10	23.08	196.77	.15
2900.00	1.06	165.52	2899.80	-24.15	-6.24	-24.15	24.94	194.49	.30
3000.00	1.16	176.71	2999.78	-26.05	-5.95	-26.05	26.73	192.87	.24
3100.00	1.35	172.10	3099.76	-28.23	-5.73	-28.23	28.81	191.48	.22
3200.00	1.19	182.70	3199.73	-30.44	-5.62	-30.44	30.95	190.46	.28
3300.00	1.32	198.42	3299.71	-32.57	-6.03	-32.57	33.12	190.49	.37
3400.00	1.25	215.51	3399.68	-34.55	-7.03	-34.55	35.25	191.50	.39
3500.00	1.08	235.80	3499.66	-35.96	-8.44	-35.96	36.94	193.21	.44
3600.00	2.37	265.52	3599.62	-36.66	-11.28	-36.66	38.35	197.11	1.53
3700.00	2.77	270.73	3699.52	-36.79	-15.76	-36.79	40.02	203.19	.46
3800.00	2.71	274.39	3799.40	-36.57	-20.53	-36.57	41.94	209.31	.18
3900.00	3.32	266.39	3899.27	-36.58	-25.78	-36.58	44.75	215.18	.74
4000.00	3.39	260.59	3999.09	-37.24	-31.59	-37.24	48.83	220.30	.35
4100.00	3.38	263.49	4098.92	-38.06	-37.43	-38.06	53.38	224.53	.17
4200.00	3.06	257.99	4198.76	-38.95	-42.97	-38.95	58.00	227.81	.44
4300.00	2.37	238.68	4298.65	-40.58	-47.35	-40.58	62.36	229.40	1.14
4400.00	2.19	230.85	4398.57	-42.86	-50.60	-42.86	66.31	229.73	.36
4500.00	1.35	213.56	4498.52	-45.05	-52.73	-45.05	69.35	229.49	.99
4600.00	1.46	218.76	4598.49	-47.02	-54.18	-47.02	71.74	229.05	.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	
4700.00	1.65	213.45	4698.46	-49.22	-55.77	-49.22	74.38	228.57	.24
4800.00	1.90	221.16	4798.41	-51.67	-57.66	-51.67	77.42	228.14	.35
4900.00	2.38	228.77	4898.34	-54.28	-60.31	-54.28	81.14	228.01	.56
5000.00	2.55	222.26	4998.25	-57.30	-63.37	-57.30	85.43	227.88	.33
5100.00	2.43	224.06	5098.15	-60.47	-66.34	-60.47	89.76	227.65	.14
5200.00	2.35	221.59	5198.07	-63.52	-69.17	-63.52	93.92	227.44	.13
5300.00	1.87	214.96	5298.00	-66.40	-71.47	-66.40	97.55	227.11	.54
5400.00	1.19	202.47	5397.96	-68.69	-72.80	-68.69	100.09	226.66	.75
5500.00	1.11	202.49	5497.94	-70.55	-73.57	-70.55	101.93	226.20	.08
5600.00	1.23	174.11	5597.92	-72.51	-73.83	-72.51	103.48	225.52	.59
5700.00	1.20	152.00	5697.90	-74.50	-73.22	-74.50	104.46	224.50	.47
5800.00	1.18	152.94	5797.88	-76.34	-72.26	-76.34	105.12	223.43	.03
5900.00	1.65	152.49	5897.85	-78.54	-71.13	-78.54	105.96	222.17	.47
6000.00	1.59	153.58	5997.81	-81.06	-69.85	-81.06	107.00	220.75	.07
6100.00	2.01	145.64	6097.76	-83.75	-68.24	-83.75	108.03	219.18	.49
6200.00	2.14	147.72	6197.69	-86.77	-66.26	-86.77	109.18	217.36	.15
6300.00	2.69	137.32	6297.60	-90.08	-63.67	-90.08	110.31	215.25	.70
6400.00	2.94	130.72	6397.48	-93.47	-60.13	-93.47	111.15	212.75	.41
6500.00	2.32	154.35	6497.38	-96.97	-57.31	-96.97	112.64	210.58	1.24
6600.00	1.25	182.31	6597.33	-99.89	-56.48	-99.89	114.75	209.49	1.35
6700.00	.70	267.87	6697.32	-101.00	-57.14	-101.00	116.04	209.50	1.38
6800.00	.89	295.70	6797.31	-100.69	-58.45	-100.69	116.42	210.13	.42
6900.00	.75	325.91	6897.30	-99.81	-59.51	-99.81	116.20	210.81	.45
Last Survey Depth Recorded									
7000.00	.95	331.78	6997.29	-98.53	-60.27	-98.53	115.51	211.45	.22