



Job Number: SVGJ-141383

Company: PDC

Lease/Well: National Hog Farm 17-21

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\1721.SVY

Date/Time: 11-Dec-14 / 13:34

Curve Name: Surface - 6700' 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

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	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
100.00	.07	228.85	100.00	-.04	-.05	-.04	.06	228.85	.07
200.00	.11	149.95	200.00	-.16	-.04	-.16	.17	195.04	.12
300.00	.12	105.55	300.00	-.27	.11	-.27	.29	159.07	.09
400.00	.26	128.57	400.00	-.44	.38	-.44	.59	139.21	.16
500.00	.30	136.33	500.00	-.77	.74	-.77	1.07	136.27	.06
600.00	.25	138.24	600.00	-1.13	1.07	-1.13	1.55	136.55	.05
700.00	.24	131.11	700.00	-1.43	1.37	-1.43	1.98	136.16	.03
800.00	.17	106.61	800.00	-1.61	1.67	-1.61	2.32	133.90	.11
900.00	.05	168.21	900.00	-1.69	1.82	-1.69	2.49	132.90	.15

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	.13	121.55	999.99	-1.79	1.93	-1.79	2.63	132.96	.10
1100.00	.17	126.22	1099.99	-1.94	2.14	-1.94	2.89	132.17	.04
1200.00	.16	140.06	1199.99	-2.14	2.35	-2.14	3.18	132.24	.04
1300.00	.14	182.51	1299.99	-2.37	2.44	-2.37	3.40	134.15	.11
1400.00	.09	169.48	1399.99	-2.56	2.45	-2.56	3.54	136.36	.06
1500.00	.16	157.37	1499.99	-2.77	2.51	-2.77	3.74	137.78	.07
1600.00	.20	155.74	1599.99	-3.06	2.64	-3.06	4.04	139.21	.04
1700.00	.26	170.54	1699.99	-3.44	2.75	-3.44	4.40	141.39	.08
1800.00	.18	158.82	1799.99	-3.81	2.84	-3.81	4.76	143.29	.09
1900.00	.12	307.60	1899.99	-3.89	2.82	-3.89	4.81	144.13	.29
2000.00	.38	341.82	1999.99	-3.52	2.63	-3.52	4.39	143.20	.29
2100.00	.56	335.94	2099.99	-2.75	2.33	-2.75	3.61	139.80	.19
2200.00	.46	333.05	2199.98	-1.95	1.95	-1.95	2.76	135.06	.10
2300.00	.24	303.14	2299.98	-1.48	1.59	-1.48	2.17	132.93	.28
2400.00	.23	191.83	2399.98	-1.56	1.37	-1.56	2.08	138.66	.39
2500.00	.47	166.32	2499.98	-2.16	1.43	-2.16	2.59	146.47	.28
2600.00	.55	169.69	2599.97	-3.03	1.61	-3.03	3.43	151.97	.09
2700.00	.50	187.46	2699.97	-3.93	1.64	-3.93	4.26	157.35	.17
2800.00	.64	202.86	2799.97	-4.88	1.37	-4.88	5.07	164.35	.21
2900.00	.72	217.85	2899.96	-5.89	.76	-5.89	5.94	172.60	.19
3000.00	.80	212.33	2999.95	-6.97	.01	-6.97	6.97	179.95	.11
3100.00	.95	212.86	3099.94	-8.26	-.82	-8.26	8.30	185.65	.15
3200.00	1.23	205.35	3199.92	-9.93	-1.73	-9.93	10.08	189.87	.31
3300.00	1.72	210.95	3299.89	-12.18	-2.96	-12.18	12.54	193.65	.51
3400.00	1.27	221.66	3399.85	-14.30	-4.47	-14.30	14.98	197.35	.53
3500.00	1.26	215.08	3499.83	-16.03	-5.84	-16.03	17.06	200.01	.15
3600.00	1.29	200.05	3599.80	-17.98	-6.85	-17.98	19.25	200.86	.33
3700.00	1.41	188.49	3699.78	-20.26	-7.42	-20.26	21.57	200.12	.30
3800.00	1.50	188.59	3799.74	-22.77	-7.80	-22.77	24.07	198.90	.09

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	1.52	185.39	3899.71	-25.38	-8.12	-25.38	26.65	197.73	.09
4000.00	1.43	180.22	3999.68	-27.95	-8.25	-27.95	29.14	196.44	.16
4100.00	1.51	166.52	4099.64	-30.48	-7.94	-30.48	31.50	194.61	.36
4200.00	1.95	154.04	4199.60	-33.29	-6.89	-33.29	34.00	191.70	.58
4300.00	2.13	154.60	4299.53	-36.50	-5.35	-36.50	36.89	188.34	.18
4400.00	1.39	179.93	4399.49	-39.39	-4.55	-39.39	39.65	186.59	1.06
4500.00	2.64	275.26	4499.44	-40.39	-6.84	-40.39	40.97	189.62	3.10
4600.00	4.33	296.56	4599.26	-38.50	-12.52	-38.50	40.48	198.01	2.10
4700.00	4.09	287.26	4698.99	-35.75	-19.30	-35.75	40.63	208.36	.72
4800.00	3.31	278.26	4798.78	-34.28	-25.56	-34.28	42.76	216.71	.97
4900.00	3.13	279.01	4898.63	-33.43	-31.11	-33.43	45.67	222.94	.18
5000.00	2.88	281.41	4998.49	-32.51	-36.27	-32.51	48.71	228.13	.28
5100.00	2.64	280.90	5098.37	-31.58	-41.00	-31.58	51.75	232.40	.24
5200.00	2.44	278.56	5198.27	-30.82	-45.36	-30.82	54.85	235.80	.23
5300.00	1.71	278.75	5298.21	-30.28	-48.94	-30.28	57.55	238.26	.73
5400.00	1.55	277.62	5398.17	-29.87	-51.76	-29.87	59.76	240.01	.16
5500.00	1.13	281.08	5498.14	-29.51	-54.07	-29.51	61.59	241.38	.43
5600.00	1.02	289.60	5598.12	-29.02	-55.87	-29.02	62.96	242.55	.19
5700.00	.79	338.73	5698.11	-28.08	-56.96	-28.08	63.50	243.76	.78
5800.00	.79	61.85	5798.10	-27.11	-56.60	-27.11	62.76	244.41	1.05
5900.00	.76	55.33	5898.09	-26.41	-55.45	-26.41	61.42	244.54	.09
6000.00	.79	341.81	5998.09	-25.37	-55.12	-25.37	60.68	245.28	.93
6100.00	3.87	333.42	6097.99	-21.70	-56.85	-21.70	60.85	249.11	3.09
6200.00	.94	172.32	6197.93	-19.49	-58.25	-19.49	61.42	251.50	4.77
6300.00	1.58	166.85	6297.91	-21.65	-57.82	-21.65	61.74	249.47	.65
6400.00	1.79	162.74	6397.86	-24.48	-57.05	-24.48	62.08	246.77	.24
6500.00	1.58	174.70	6497.82	-27.35	-56.46	-27.35	62.73	244.15	.41
6600.00	1.00	216.59	6597.80	-29.42	-56.85	-29.42	64.01	242.64	1.07

Last Survey Depth Recorded

6700.00	.84	260.13	6697.78	-30.25	-58.09	-30.25	65.49	242.49	.70
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