



Job Number: SVGJ-120823

Company: PDC

Lease/Well: Cook 20D

Location: Weld County, CO

Rig Name: MS Wireline

RKB: 0'

G.L. or M.S.L.: GL

State/Country: Colorado/USA

Declination: 8.50°

Grid: East To True North

File name: F:\SURVEY\2012SU~1\PDC\LORENZ\COOK\20D.SVY

Date/Time: 22-Aug-12 / 11:57

Curve Name: Surface - 6725' M.D. (Rate Gyro)

WINSERVE SURVEY CALCULATIONS  
 Minimum Curvature Method  
 Vertical Section Plane .00  
 Vertical Section Referenced to Wellhead  
 Rectangular Coordinates Referenced to Wellhead

We hereby certify that our survey data from  
 Surface MD to 6,725' MD is, to the best of  
 our knowledge a true and accurate account of  
 the well bore.

Mark Simmons 8/22/12  
 MS Energy Services Date

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
100.00	.17	53.31	100.00	.09	.12	.09	.15	53.31	.17
200.00	.54	39.14	200.00	.54	.54	.54	.76	44.61	.38
300.00	.55	61.58	299.99	1.14	1.25	1.14	1.69	47.83	.21
400.00	.57	61.64	399.99	1.60	2.11	1.60	2.65	52.87	.02
500.00	.83	57.31	499.98	2.23	3.16	2.23	3.87	54.82	.27
600.00	.95	55.01	599.97	3.10	4.45	3.10	5.42	55.18	.13
700.00	1.16	45.83	699.95	4.28	5.86	4.28	7.25	53.86	.27
800.00	1.29	43.84	799.93	5.79	7.36	5.79	9.37	51.80	.14
900.00	1.41	38.82	899.90	7.56	8.91	7.56	11.69	49.68	.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	1.44	35.63	999.87	9.54	10.42	9.54	14.13	47.50	.08
1100.00	1.48	30.78	1099.84	11.67	11.81	11.67	16.61	45.33	.13
1200.00	1.53	30.39	1199.80	13.94	13.14	13.94	19.16	43.33	.05
1300.00	1.55	27.84	1299.77	16.28	14.45	16.28	21.77	41.59	.07
1400.00	1.37	24.10	1399.73	18.57	15.57	18.57	24.23	39.98	.20
1500.00	1.22	29.50	1499.71	20.59	16.58	20.59	26.44	38.85	.19
1600.00	1.26	30.77	1599.69	22.46	17.67	22.46	28.58	38.20	.05
1700.00	1.33	24.23	1699.66	24.46	18.71	24.46	30.80	37.41	.16
1800.00	1.29	15.93	1799.63	26.60	19.49	26.60	32.98	36.23	.19
1900.00	1.02	4.54	1899.61	28.57	19.87	28.57	34.80	34.82	.35
2000.00	.70	19.23	1999.60	30.04	20.15	30.04	36.17	33.85	.39
2100.00	.91	34.89	2099.59	31.26	20.80	31.26	37.55	33.64	.30
2200.00	1.03	22.88	2199.58	32.74	21.60	32.74	39.23	33.42	.24
2300.00	.70	33.91	2299.57	34.08	22.30	34.08	40.72	33.19	.37
2400.00	1.09	30.01	2399.56	35.41	23.11	35.41	42.28	33.13	.39
2500.00	.90	15.51	2499.54	36.99	23.80	36.99	43.98	32.75	.31
2600.00	1.47	7.29	2599.52	39.02	24.17	39.02	45.90	31.78	.59
2700.00	1.35	6.19	2699.49	41.46	24.46	41.46	48.14	30.54	.12
2800.00	1.63	351.47	2799.45	44.04	24.38	44.04	50.34	28.96	.47
2900.00	1.78	.03	2899.41	47.00	24.17	47.00	52.85	27.21	.30
3000.00	1.64	359.15	2999.37	49.98	24.15	49.98	55.51	25.78	.14
3100.00	2.06	353.31	3099.31	53.20	23.91	53.20	58.33	24.21	.46
3200.00	2.39	357.06	3199.24	57.07	23.60	57.07	61.75	22.47	.36
3300.00	2.33	14.74	3299.15	61.12	24.01	61.12	65.66	21.45	.73
3400.00	1.75	21.11	3399.09	64.51	25.08	64.51	69.21	21.24	.62
3500.00	1.42	17.65	3499.05	67.11	26.00	67.11	71.97	21.18	.34
3600.00	1.63	18.67	3599.02	69.64	26.83	69.64	74.63	21.07	.21
3700.00	1.85	30.55	3698.97	72.38	28.11	72.38	77.64	21.22	.42
3800.00	1.88	29.85	3798.92	75.19	29.75	75.19	80.86	21.58	.04

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	1.83	23.32	3898.87	78.08	31.19	78.08	84.08	21.78	.22
4000.00	1.85	19.46	3998.81	81.07	32.36	81.07	87.29	21.76	.13
4100.00	1.81	17.80	4098.76	84.09	33.38	84.09	90.48	21.65	.07
4200.00	1.62	23.88	4198.72	86.89	34.44	86.89	93.46	21.62	.26
4300.00	1.28	34.29	4298.69	89.10	35.64	89.10	95.97	21.80	.43
4400.00	1.11	44.94	4398.67	90.71	36.95	90.71	97.95	22.16	.28
4500.00	1.10	345.13	4498.65	92.33	37.39	92.33	99.61	22.05	1.10
4600.00	1.18	332.79	4598.63	94.17	36.67	94.17	101.06	21.28	.26
4700.00	.86	316.66	4698.61	95.63	35.69	95.63	102.07	20.47	.43
4800.00	.62	276.49	4798.61	96.24	34.64	96.24	102.28	19.79	.56
4900.00	.67	262.73	4898.60	96.22	33.52	96.22	101.90	19.21	.16
5000.00	.46	280.50	4998.60	96.22	32.54	96.22	101.58	18.69	.27
5100.00	.13	292.01	5098.59	96.34	32.04	96.34	101.53	18.40	.33
5200.00	.07	35.01	5198.59	96.43	31.97	96.43	101.59	18.34	.16
5300.00	.17	109.94	5298.59	96.43	32.15	96.43	101.65	18.44	.17
5400.00	.16	118.34	5398.59	96.31	32.41	96.31	101.62	18.60	.03
5500.00	.27	119.20	5498.59	96.13	32.74	96.13	101.56	18.81	.11
5600.00	.33	145.56	5598.59	95.78	33.11	95.78	101.34	19.07	.15
5700.00	.40	162.65	5698.59	95.21	33.37	95.21	100.89	19.32	.13
5800.00	.58	161.34	5798.59	94.40	33.64	94.40	100.21	19.61	.18
5900.00	.78	136.31	5898.58	93.43	34.27	93.43	99.51	20.15	.35
6000.00	.64	130.28	5998.57	92.57	35.17	92.57	99.03	20.80	.16
6100.00	.35	119.79	6098.57	92.06	35.86	92.06	98.80	21.28	.30
6200.00	.51	158.80	6198.56	91.49	36.29	91.49	98.43	21.63	.32
6300.00	.52	166.21	6298.56	90.64	36.56	90.64	97.73	21.96	.07
6400.00	.75	149.53	6398.55	89.63	37.00	89.63	96.97	22.43	.29
6500.00	.77	146.52	6498.55	88.51	37.70	88.51	96.20	23.07	.04
6600.00	.65	147.16	6598.54	87.47	38.38	87.47	95.52	23.69	.12
6700.00	.54	141.95	6698.53	86.62	38.97	86.62	94.99	24.22	.12

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	
<b>Last Survey Depth Recorded</b>									
6725.00	.81	169.19	6723.53	86.36	39.08	86.36	94.79	24.35	1.65