



Job Number: 452D-2017
 Company: TRANSCANADA / CPG
 Lease/Well: RIPLEY 12598
 Location: JACKSON COUNTY
 Rig Name: YOST #6
 RKB: 768
 G.L. or M.S.L.: MSL

State/Country: WEST VIRGINIA
 Declination: -7.805
 Grid: -7.38
 File name: C:\WINSERVE\2017AS-1\RIPLEY-1.SVY
 Date/Time: 13-Jul-17 / 11:08
 Curve Name: Ripley 12598 (AS DRILLED SURVEYS)

**Panther Drilling Systems
 SURVEY REPORT**

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WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane 248.82
 Vertical Section Referenced to Wellhead
 Rectangular Coordinates Referenced to Wellhead

WV Department of
 Environmental Protection

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2516.00	.17	303.13	2516.00	2.04	-3.13	2.18	3.73	303.13	.01
2561.00	.39	242.42	2561.00	2.01	-3.32	2.37	3.88	301.16	.76
2603.00	3.07	238.62	2602.97	1.35	-4.40	3.62	4.61	287.08	6.38
2648.00	7.73	243.81	2647.76	-.61	-8.15	7.82	8.17	265.72	10.40
2693.00	12.43	248.64	2692.05	-3.71	-15.38	15.68	15.82	256.43	10.60
2738.00	15.95	252.51	2735.68	-7.34	-25.79	26.70	26.82	254.12	8.10
2782.00	19.20	254.88	2777.62	-11.04	-38.55	39.93	40.10	254.02	7.56
2827.00	22.98	258.31	2819.60	-14.75	-54.30	55.96	56.27	254.80	8.83
2872.00	26.67	260.33	2860.43	-18.23	-72.86	74.53	75.11	255.95	8.41
2917.00	29.13	259.10	2900.20	-22.00	-93.58	95.20	96.13	256.77	5.61
2959.00	30.67	258.40	2936.61	-26.08	-114.11	115.83	117.05	257.12	3.76
3004.00	32.51	257.34	2974.94	-31.04	-137.15	139.10	140.62	257.25	4.27
3049.00	34.84	255.50	3012.39	-36.91	-161.40	163.83	165.57	257.12	5.65
3091.00	37.26	254.71	3046.34	-43.27	-185.28	188.40	190.27	256.85	5.87
3136.00	39.37	251.19	3081.65	-51.47	-211.94	216.22	218.10	256.35	6.74
3178.00	39.90	245.39	3114.01	-61.37	-236.80	242.98	244.63	255.47	8.90
3222.00	41.35	242.40	3147.40	-73.99	-262.52	271.52	272.75	254.26	5.52
3267.00	44.03	240.91	3180.48	-88.48	-289.36	301.78	302.59	253.00	6.36
3312.00	45.30	239.41	3212.48	-104.22	-316.80	333.05	333.50	251.79	3.67
3357.00	43.60	243.79	3244.61	-119.22	-344.49	364.30	364.54	250.91	7.79
3402.00	42.49	249.08	3277.51	-131.50	-372.62	394.96	395.15	250.56	8.39
3447.00	44.12	248.90	3310.26	-142.57	-401.43	425.83	426.00	250.45	3.63
3492.00	45.26	244.51	3342.26	-155.09	-430.48	457.44	457.57	250.19	7.31
3536.00	47.15	240.73	3372.71	-169.70	-458.66	489.00	489.05	249.70	7.54

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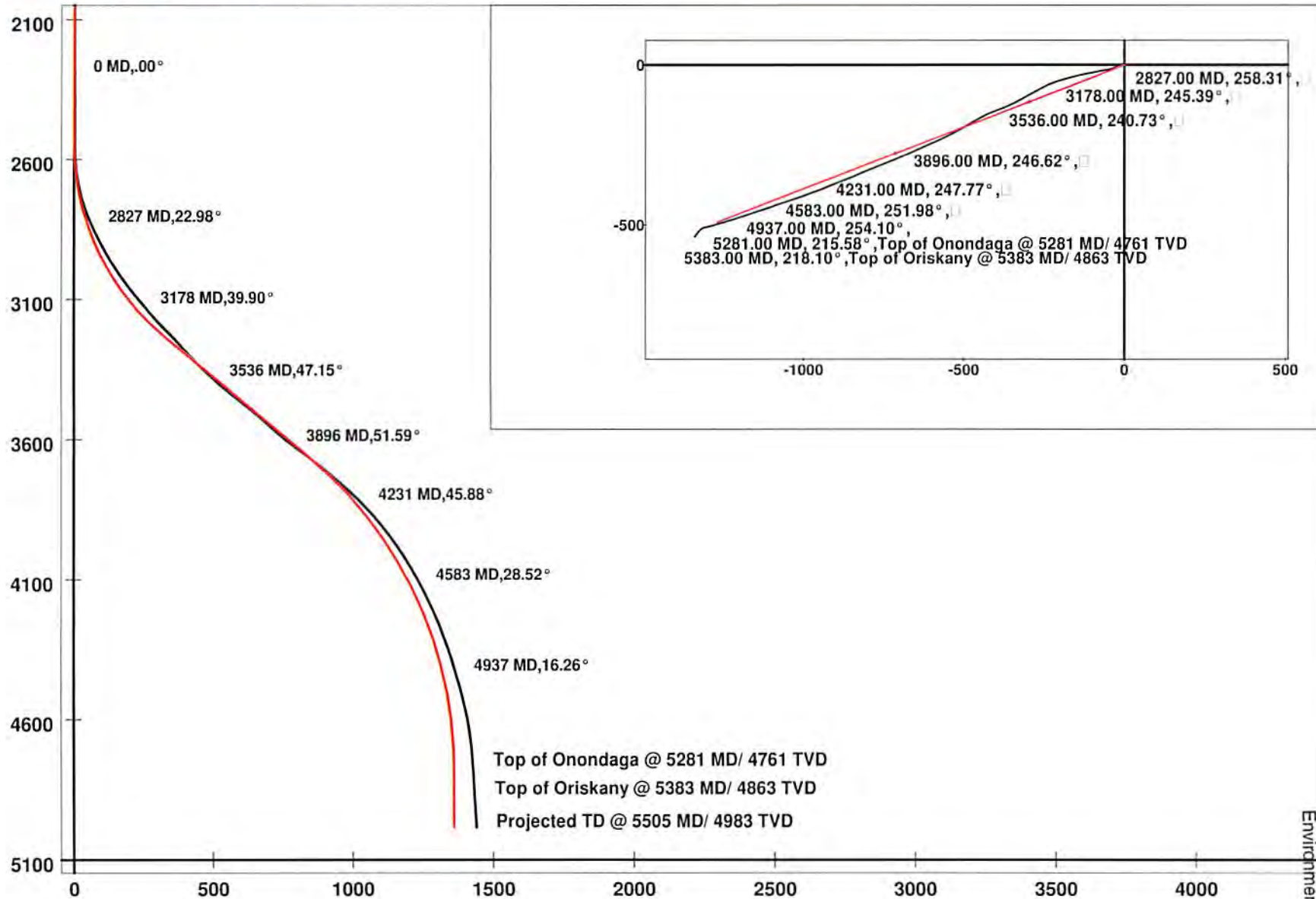
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	WV Dept Environment Deg / Direction
3581.00	49.57	238.89	3402.61	-186.62	-487.72	522.20	522.21	249.06	6.18
3626.00	51.06	240.29	3431.35	-204.15	-517.59	556.38	556.39	248.47	4.09
3671.00	52.38	243.89	3459.23	-220.67	-548.80	591.46	591.50	248.10	6.93
3716.00	52.16	246.62	3486.77	-235.56	-581.12	626.97	627.05	247.93	4.82
3761.00	50.05	246.45	3515.02	-249.51	-613.24	661.97	662.06	247.86	4.70
3806.00	47.46	245.22	3544.69	-263.35	-644.11	695.75	695.87	247.76	6.11
3851.00	49.30	245.22	3574.58	-277.45	-674.65	729.32	729.48	247.65	4.09
3896.00	51.59	246.62	3603.23	-291.60	-706.33	763.97	764.15	247.57	5.63
3938.00	54.18	248.47	3628.58	-304.38	-737.28	797.45	797.64	247.57	7.10
3961.00	54.36	248.38	3642.01	-311.25	-754.64	816.12	816.31	247.59	.84
4006.00	52.51	247.94	3668.81	-324.69	-788.19	852.26	852.45	247.61	4.19
4051.00	51.11	247.33	3696.64	-338.15	-820.90	887.62	887.82	247.61	3.29
4096.00	49.70	247.24	3725.32	-351.53	-852.88	922.28	922.49	247.60	3.14
4141.00	48.64	248.29	3754.74	-364.42	-884.40	956.32	956.54	247.61	2.94
4186.00	47.50	248.91	3784.81	-376.64	-915.57	989.80	990.01	247.64	2.73
4231.00	45.88	247.77	3815.67	-388.72	-946.00	1022.54	1022.75	247.66	4.04
4275.00	43.33	249.26	3847.00	-400.04	-974.74	1053.43	1053.64	247.69	6.26
4317.00	40.47	251.19	3878.26	-409.54	-1001.13	1081.47	1081.66	247.75	7.47
4358.00	38.54	251.54	3909.89	-417.88	-1025.84	1107.52	1107.69	247.84	4.74
4403.00	36.95	251.10	3945.47	-426.70	-1051.94	1135.04	1135.18	247.92	3.58
4448.00	34.71	250.75	3981.95	-435.30	-1076.83	1161.37	1161.49	247.99	5.00
4493.00	32.25	251.01	4019.49	-443.44	-1100.28	1186.17	1186.28	248.05	5.48
4538.00	30.36	252.07	4057.93	-450.84	-1122.46	1209.53	1209.62	248.12	4.37
4583.00	28.52	251.98	4097.12	-457.67	-1143.50	1231.61	1231.68	248.19	4.09
4628.00	26.71	251.54	4136.99	-464.20	-1163.31	1252.44	1252.50	248.25	4.05
4673.00	25.04	251.45	4177.48	-470.43	-1181.93	1272.06	1272.11	248.30	3.71
4715.00	23.90	252.16	4215.71	-475.86	-1198.46	1289.43	1289.47	248.34	2.80
4760.00	22.50	252.42	4257.07	-481.26	-1215.34	1307.12	1307.16	248.40	3.12
4805.00	20.65	252.33	4298.91	-486.27	-1231.11	1323.64	1323.67	248.45	4.11
4850.00	18.98	252.42	4341.25	-490.88	-1245.65	1338.86	1338.88	248.49	3.71
4895.00	17.44	252.86	4383.99	-495.08	-1259.07	1352.89	1352.91	248.53	3.44
4937.00	16.26	254.10	4424.19	-498.55	-1270.74	1365.03	1365.04	248.58	2.94
4987.00	15.46	256.00	4472.28	-502.08	-1283.94	1378.61	1378.62	248.64	1.91
5032.00	14.98	257.52	4515.71	-504.79	-1295.44	1390.31	1390.31	248.71	1.39
5077.00	12.56	253.56	4559.41	-507.43	-1305.81	1400.94	1400.94	248.76	5.77
5122.00	10.06	241.26	4603.54	-510.70	-1313.95	1409.71	1409.71	248.76	7.69
5167.00	8.43	228.78	4647.96	-514.77	-1319.88	1416.71	1416.71	248.69	5.72
5211.00	6.81	219.46	4691.57	-518.91	-1323.96	1422.01	1422.02	248.60	4.62
5256.00	4.88	212.77	4736.33	-522.58	-1326.70	1425.88	1425.91	248.50	4.54
Top of Onondaga @ 5281 MD/ 4761 TVD									
5281.00	4.31	215.58	4761.25	-524.24	-1327.82	1427.53	1427.56	248.46	2.45
5299.00	3.91	218.10	4779.21	-525.27	-1328.59	1428.62	1428.66	248.43	2.45
5363.00	3.91	218.10	4843.06	-528.70	-1331.28	1432.37	1432.43	248.34	.00
Top of Oriskany @ 5383 MD/ 4863 TVD									
5383.00	3.91	218.10	4863.01	-529.78	-1332.12	1433.55	1433.60	248.31	.00
Projected TD @ 5505 MD/ 4983 TVD									
5505.00	3.91	218.10	4984.73	-536.32	-1337.26	1440.70	1440.80	248.15	.00

Job Number: 452D-2017
 Company: TRANSCANADA / CPG
 Lease/Well: RIPLEY #12598
 Location: JACKSON COUNTY
 Rig Name: YOST #6
 State/Country: WEST VIRGINIA

Declination: -7.805
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