

Well Name: PENS2BHS

API 4708510068	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,083.25	KB-Ground Distance (ft) 26.00	KB-Casing Flange Distance (ft) 26.75	Spud Date (Conductor) 1/16/2014 06:00	Rig Release Date 7/7/2014 14:30

Original Hole	Parent Wellbore	Vertical Section Direction (°) 148.00
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Kick Offs & Key Depths

Date	Point or Interval	Type	Top Depth (ftKB)	Depth Top (TVD) (ftKB)	Bottom Depth (ftKB)	Depth Bottom (TVD) (ftKB)	Length (ft)
6/16/2014		Kick Off					

Deviation Surveys

Date 1/16/2014	Definitive? No	Description ORIGINAL	Proposed? No
MD Tie In (ftKB) 0.00	TVD Tie In (ftKB) 0.00	Inclination Tie In (°) 0.00	Azimuth Tie In (°) 0.00
		NS Tie In (ft) 0.00	EW Tie In (ft) 0.00

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
6/16/2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	GYRO SS	GYRODATA SERVICES CANADA INC.
6/16/2014	100.00	0.80	74.42	100.00	0.20	0.19	0.67	0.80	0.80	74.42	0.70	GYRO SS	GYRODATA SERVICES CANADA INC.
6/16/2014	200.00	0.80	82.07	199.99	0.68	0.47	2.04	0.11	0.00	7.65	2.09	GYRO SS	GYRODATA SERVICES CANADA INC.
6/16/2014	300.00	1.03	120.17	299.98	1.76	0.12	3.50	0.64	0.23	38.10	3.60	GYRO SS	GYRODATA SERVICES CANADA INC.
6/16/2014	400.00	1.41	125.67	399.95	3.69	-1.05	5.28	0.40	0.38	5.50	5.73	GYRO SS	GYRODATA SERVICES CANADA INC.
6/16/2014	500.00	1.48	130.76	499.92	6.06	-2.61	7.26	0.15	0.07	5.09	8.25	GYRO SS	GYRODATA SERVICES CANADA INC.
6/16/2014	528.00	1.39	124.61	527.91	6.72	-3.04	7.81	0.64	-0.32	-21.96	8.95	GYRO SS	GYRODATA SERVICES CANADA INC.
6/17/2014	589.00	1.56	135.24	588.89	8.21	-4.05	9.01	0.53	0.28	17.43	10.51	GYRO SS	GYRODATA SERVICES CANADA INC.
6/17/2014	648.00	1.62	135.37	647.87	9.81	-5.22	10.16	0.10	0.10	0.22	12.15	GYRO SS	GYRODATA SERVICES CANADA INC.
6/17/2014	745.00	2.47	180.72	744.81	12.90	-8.28	11.09	1.82	0.88	46.75	15.35	GYRO SS	GYRODATA SERVICES CANADA INC.
6/17/2014	839.00	3.83	204.91	838.67	16.32	-13.16	9.75	1.99	1.45	25.73	20.41	GYRO SS	GYRODATA SERVICES CANADA INC.
6/17/2014	935.00	5.28	207.85	934.37	20.29	-19.97	6.33	1.53	1.51	3.06	28.03	GYRO SS	GYRODATA SERVICES CANADA INC.
6/17/2014	1,001.00	5.75	209.27	1,000.06	23.41	-25.54	3.30	0.74	0.71	2.15	34.37	MWD	ANADRILL SCHLUMBER GER
6/17/2014	1,097.00	5.26	196.67	1,095.62	28.62	-33.95	-0.32	1.36	-0.51	-13.13	43.53	MWD	ANADRILL SCHLUMBER GER
6/17/2014	1,193.00	4.34	181.75	1,191.29	34.55	-41.80	-1.69	1.61	-0.96	-15.54	51.50	MWD	ANADRILL SCHLUMBER GER
6/17/2014	1,289.00	4.55	175.59	1,287.00	40.94	-49.22	-1.51	0.54	0.22	-6.42	58.92	MWD	ANADRILL SCHLUMBER GER
6/17/2014	1,384.00	3.21	173.55	1,381.78	46.68	-55.62	-0.92	1.42	-1.41	-2.15	65.35	MWD	ANADRILL SCHLUMBER GER

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6/17/2014	1,479.00	3.19	171.03	1,475.63	51.52	-60.88	-0.21	0.15	-0.02	-2.65	70.65	MWD	ANADRILL SCHLUMBER GER
6/17/2014	1,575.00	1.96	184.71	1,572.53	55.29	-65.15	0.07	1.42	-1.28	14.25	74.94	MWD	ANADRILL SCHLUMBER GER
6/17/2014	1,670.00	0.58	244.37	1,667.51	56.54	-66.98	-0.49	1.83	-1.45	62.80	76.85	MWD	ANADRILL SCHLUMBER GER
6/17/2014	1,766.00	0.91	256.71	1,763.50	56.24	-67.36	-1.67	0.38	0.34	12.85	78.09	MWD	ANADRILL SCHLUMBER GER
6/17/2014	1,861.00	1.34	250.93	1,858.48	55.75	-67.90	-3.46	0.47	0.45	-6.08	79.96	MWD	ANADRILL SCHLUMBER GER
6/17/2014	1,956.00	0.51	247.62	1,953.47	55.43	-68.43	-4.90	0.88	-0.87	-3.48	81.49	MWD	ANADRILL SCHLUMBER GER
6/18/2014	2,052.00	0.24	201.01	2,049.47	55.48	-68.78	-5.37	0.40	-0.28	-48.55	82.07	MWD	ANADRILL SCHLUMBER GER
6/18/2014	2,147.00	0.27	163.36	2,144.47	55.82	-69.18	-5.37	0.18	0.03	-39.63	82.47	MWD	ANADRILL SCHLUMBER GER
6/18/2014	2,243.00	0.40	181.42	2,240.47	56.31	-69.73	-5.32	0.17	0.14	18.81	83.03	MWD	ANADRILL SCHLUMBER GER
6/18/2014	2,339.00	0.32	165.45	2,336.46	56.85	-70.32	-5.26	0.13	-0.08	-16.64	83.62	MWD	ANADRILL SCHLUMBER GER
6/18/2014	2,433.00	0.31	209.65	2,430.46	57.22	-70.80	-5.32	0.25	-0.01	47.02	84.10	MWD	ANADRILL SCHLUMBER GER
6/18/2014	2,528.00	0.37	243.63	2,525.46	57.31	-71.16	-5.72	0.22	0.06	35.77	84.64	MWD	ANADRILL SCHLUMBER GER
6/18/2014	2,623.00	0.71	261.45	2,620.46	57.05	-71.38	-6.58	0.39	0.36	18.76	85.53	MWD	ANADRILL SCHLUMBER GER
6/19/2014	2,718.00	1.15	271.49	2,715.44	56.29	-71.44	-8.11	0.49	0.46	10.57	87.06	MWD	ANADRILL SCHLUMBER GER
6/19/2014	2,814.00	0.53	335.16	2,811.43	55.32	-71.01	-9.26	1.07	-0.65	66.32	88.29	MWD	ANADRILL SCHLUMBER GER
6/19/2014	2,910.00	0.71	3.61	2,907.43	54.39	-70.02	-9.41	0.37	0.19	-345.36	89.30	MWD	ANADRILL SCHLUMBER GER
6/19/2014	3,005.00	1.13	16.49	3,002.42	53.29	-68.53	-9.11	0.49	0.44	13.56	90.82	MWD	ANADRILL SCHLUMBER GER
6/19/2014	3,101.00	1.50	19.18	3,098.39	51.88	-66.44	-8.43	0.39	0.39	2.80	93.02	MWD	ANADRILL SCHLUMBER GER
6/19/2014	3,196.00	0.51	52.09	3,193.38	51.05	-65.00	-7.68	1.17	-1.04	34.64	94.63	MWD	ANADRILL SCHLUMBER GER
6/19/2014	3,292.00	0.47	104.29	3,289.37	51.30	-64.84	-6.96	0.45	-0.04	54.38	95.37	MWD	ANADRILL SCHLUMBER GER
6/19/2014	3,386.00	0.57	147.21	3,383.37	52.04	-65.33	-6.34	0.42	0.11	45.66	96.16	MWD	ANADRILL SCHLUMBER GER

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Directional Survey

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Survey Data													
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6/19/2014	3,482.00	0.69	155.12	3,479.36	53.09	-66.25	-5.84	0.15	0.13	8.24	97.22	MWD	ANADRILL SCHLUMBER GER
6/20/2014	3,577.00	0.85	172.02	3,574.36	54.30	-67.47	-5.50	0.29	0.17	17.79	98.48	MWD	ANADRILL SCHLUMBER GER
6/20/2014	3,673.00	1.12	187.44	3,670.34	55.68	-69.11	-5.52	0.39	0.28	16.06	100.12	MWD	ANADRILL SCHLUMBER GER
6/20/2014	3,769.00	0.66	170.07	3,766.33	56.92	-70.58	-5.55	0.55	-0.48	-18.09	101.59	MWD	ANADRILL SCHLUMBER GER
6/20/2014	3,865.00	0.65	155.01	3,862.32	57.97	-71.62	-5.22	0.18	-0.01	-15.69	102.68	MWD	ANADRILL SCHLUMBER GER
6/21/2014	3,960.00	0.88	148.78	3,957.31	59.23	-72.73	-4.62	0.26	0.24	-6.56	103.95	MWD	ANADRILL SCHLUMBER GER
6/21/2014	4,005.00	1.12	178.89	4,002.31	59.96	-73.47	-4.43	1.26	0.53	66.91	104.70	MWD	ANADRILL SCHLUMBER GER
6/21/2014	4,053.00	2.19	209.51	4,050.29	60.80	-74.73	-4.87	2.82	2.23	63.79	106.05	MWD	ANADRILL SCHLUMBER GER
6/21/2014	4,100.00	3.63	227.96	4,097.23	61.48	-76.51	-6.42	3.62	3.06	39.26	108.40	MWD	ANADRILL SCHLUMBER GER
6/21/2014	4,148.00	5.56	234.29	4,145.07	61.90	-78.89	-9.43	4.15	4.02	13.19	112.24	MWD	ANADRILL SCHLUMBER GER
6/21/2014	4,195.00	6.96	234.83	4,191.79	62.20	-81.86	-13.61	2.98	2.98	1.15	117.37	MWD	ANADRILL SCHLUMBER GER
6/21/2014	4,244.00	8.23	241.75	4,240.36	62.14	-85.23	-19.13	3.19	2.59	14.12	123.83	MWD	ANADRILL SCHLUMBER GER
6/21/2014	4,291.00	8.97	246.44	4,286.83	61.38	-88.28	-25.45	2.17	1.57	9.98	130.86	MWD	ANADRILL SCHLUMBER GER
6/21/2014	4,339.00	10.45	245.95	4,334.14	60.23	-91.55	-32.86	3.09	3.08	-1.02	138.95	MWD	ANADRILL SCHLUMBER GER
6/21/2014	4,386.00	11.92	246.12	4,380.25	58.95	-95.25	-41.19	3.13	3.13	0.36	148.07	MWD	ANADRILL SCHLUMBER GER
6/21/2014	4,434.00	13.52	245.56	4,427.07	57.51	-99.58	-50.83	3.34	3.33	-1.17	158.64	MWD	ANADRILL SCHLUMBER GER
6/22/2014	4,481.00	14.56	245.62	4,472.66	56.01	-104.29	-61.21	2.21	2.21	0.13	170.04	MWD	ANADRILL SCHLUMBER GER
6/22/2014	4,530.00	15.75	246.44	4,519.96	54.22	-109.50	-72.92	2.47	2.43	1.67	182.85	MWD	ANADRILL SCHLUMBER GER
6/22/2014	4,577.00	16.62	247.22	4,565.10	52.20	-114.65	-84.96	1.91	1.85	1.66	195.95	MWD	ANADRILL SCHLUMBER GER
6/22/2014	4,625.00	18.06	245.68	4,610.91	50.11	-120.37	-98.07	3.15	3.00	-3.21	210.25	MWD	ANADRILL SCHLUMBER GER
6/22/2014	4,672.00	19.85	243.92	4,655.36	48.31	-126.88	-111.88	4.00	3.81	-3.74	225.52	MWD	ANADRILL SCHLUMBER GER

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WellView

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6/22/2014	4,720.00	21.42	243.81	4,700.28	46.58	-134.33	-127.06	3.27	3.27	-0.23	242.43	MWD	ANADRILL SCHLUMBER GER
6/22/2014	4,767.00	22.91	243.70	4,743.81	44.80	-142.17	-142.97	3.17	3.17	-0.23	260.16	MWD	ANADRILL SCHLUMBER GER
6/22/2014	4,816.00	24.28	243.66	4,788.71	42.86	-150.87	-160.55	2.80	2.80	-0.08	279.78	MWD	ANADRILL SCHLUMBER GER
6/22/2014	4,863.00	25.29	243.66	4,831.38	40.92	-159.61	-178.20	2.15	2.15	0.00	299.48	MWD	ANADRILL SCHLUMBER GER
6/22/2014	4,911.00	26.60	243.03	4,874.54	38.97	-169.03	-196.97	2.79	2.73	-1.31	320.48	MWD	ANADRILL SCHLUMBER GER
6/22/2014	4,958.00	28.03	242.10	4,916.30	37.25	-178.97	-216.11	3.18	3.04	-1.98	342.04	MWD	ANADRILL SCHLUMBER GER
6/22/2014	5,007.00	29.34	242.32	4,959.29	35.52	-189.94	-236.92	2.68	2.67	0.45	365.56	MWD	ANADRILL SCHLUMBER GER
6/22/2014	5,054.00	30.93	242.43	4,999.93	33.72	-200.88	-257.82	3.39	3.38	0.23	389.16	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,103.00	32.46	242.19	5,041.62	31.79	-212.84	-280.62	3.13	3.12	-0.49	414.90	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,150.00	32.55	241.35	5,081.26	30.13	-224.79	-302.87	0.98	0.19	-1.79	440.16	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,199.00	32.89	240.83	5,122.49	28.70	-237.59	-326.05	0.90	0.69	-1.06	466.64	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,246.00	33.16	241.53	5,161.89	27.28	-249.94	-348.50	0.99	0.57	1.49	492.26	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,294.00	32.91	243.29	5,202.13	25.27	-262.06	-371.69	2.07	-0.52	3.67	518.42	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,341.00	32.18	245.32	5,241.75	22.50	-273.03	-394.46	2.79	-1.55	4.32	543.71	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,389.00	31.72	246.53	5,282.48	19.00	-283.39	-417.65	1.64	-0.96	2.52	569.10	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,436.00	32.50	245.65	5,322.29	15.48	-293.52	-440.49	1.94	1.65	-1.87	594.09	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,485.00	32.58	244.82	5,363.60	12.16	-304.56	-464.42	0.93	0.16	-1.69	620.44	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,522.00	32.20	244.35	5,394.84	9.89	-313.06	-482.32	1.23	-1.03	-1.27	640.26	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,607.00	30.42	243.27	5,467.46	5.41	-332.55	-521.96	2.20	-2.09	-1.27	684.43	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,703.00	32.80	242.17	5,549.22	1.28	-355.62	-566.67	2.55	2.48	-1.15	734.74	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,798.00	35.25	241.29	5,627.95	-2.16	-380.81	-613.48	2.63	2.58	-0.93	787.89	MWD	ANADRILL SCHLUMBER GER

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6/23/2014	5,894.00	34.60	238.99	5,706.66	-4.23	-408.16	-661.14	1.53	-0.68	-2.40	842.85	MWD	ANADRILL SCHLUMBER GER
6/23/2014	5,989.00	33.37	238.88	5,785.43	-5.09	-435.56	-706.63	1.30	-1.29	-0.12	895.95	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,036.00	35.72	241.14	5,824.14	-6.05	-448.86	-729.71	5.69	5.00	4.81	922.59	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,084.00	38.47	238.66	5,862.43	-6.99	-463.40	-754.74	6.52	5.73	-5.17	951.54	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,131.00	38.69	229.96	5,899.20	-5.10	-480.46	-778.49	11.55	0.47	-18.51	980.78	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,180.00	38.22	218.84	5,937.61	2.03	-502.15	-799.75	14.13	-0.96	-22.69	1,011.15	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,227.00	41.13	208.72	5,973.82	14.37	-527.06	-816.32	15.06	6.19	-21.53	1,041.07	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,274.00	43.21	203.76	6,008.67	30.99	-555.35	-830.23	8.35	4.43	-10.55	1,072.60	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,321.00	43.35	197.75	6,042.90	50.48	-585.46	-841.64	8.77	0.30	-12.79	1,104.79	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,370.00	42.65	191.87	6,078.75	73.32	-617.73	-850.18	8.31	-1.43	-12.00	1,138.18	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,417.00	45.46	185.99	6,112.54	98.01	-649.99	-855.21	10.55	5.98	-12.51	1,170.82	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,466.00	49.51	181.69	6,145.65	127.30	-686.01	-857.58	10.49	8.27	-8.78	1,206.92	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,513.00	53.97	179.16	6,174.75	158.45	-722.90	-857.83	10.39	9.49	-5.38	1,243.81	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,561.00	58.71	176.09	6,201.35	193.18	-762.79	-856.15	11.22	9.88	-6.40	1,283.74	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,608.00	63.81	173.19	6,223.95	230.01	-803.80	-852.27	12.12	10.85	-6.17	1,324.93	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,657.00	69.39	169.20	6,243.41	271.33	-848.21	-845.36	13.52	11.39	-8.14	1,369.87	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,704.00	74.95	164.53	6,257.80	313.64	-891.74	-835.17	15.14	11.83	-9.94	1,414.58	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,752.00	80.09	160.15	6,268.17	359.03	-936.37	-820.95	13.93	10.71	-9.13	1,461.42	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,799.00	83.21	156.98	6,275.00	404.73	-979.64	-803.95	9.41	6.64	-6.74	1,507.91	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,847.00	85.39	154.48	6,279.77	452.05	-1,023.17	-784.32	6.89	4.54	-5.21	1,555.67	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,880.00	85.98	153.30	6,282.25	484.78	-1,052.72	-769.84	3.99	1.79	-3.58	1,588.57	MWD	ANADRILL SCHLUMBER GER

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WV Department of
Environmental Protection



Directional Survey

Well Name: PENS2BHS

API 4708510068	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,083.25	KB-Ground Distance (ft) 26.00	KB-Casing Flange Distance (ft) 26.75	Spud Date (Conductor) 1/16/2014 06:00	Rig Release Date 7/7/2014 14:30

Survey Data													
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
6/23/2014	6,931.00	88.94	152.71	6,284.51	535.53	1,098.11	-746.72	5.92	5.80	-1.16	1,639.52	MWD	ANADRILL SCHLUMBER GER
6/23/2014	6,982.00	92.10	151.30	6,284.05	586.40	1,143.14	-722.78	6.78	6.20	-2.76	1,690.51	MWD	ANADRILL SCHLUMBER GER
6/23/2014	7,044.00	92.40	150.90	6,281.61	648.26	1,197.37	-692.84	0.81	0.48	-0.65	1,752.46	MWD	ANADRILL SCHLUMBER GER
6/23/2014	7,139.00	93.60	144.60	6,276.64	743.08	1,277.57	-642.25	6.74	1.26	-6.63	1,847.28	MWD	ANADRILL SCHLUMBER GER
6/23/2014	7,235.00	91.10	139.40	6,272.70	838.43	1,353.12	-583.21	6.01	-2.60	-5.42	1,943.16	MWD	ANADRILL SCHLUMBER GER
6/23/2014	7,330.00	89.90	138.20	6,271.87	932.20	1,424.59	-520.64	1.79	-1.26	-1.26	2,038.15	MWD	ANADRILL SCHLUMBER GER
6/23/2014	7,425.00	89.50	138.60	6,272.37	1,025.87	1,495.63	-457.57	0.60	-0.42	0.42	2,133.15	MWD	ANADRILL SCHLUMBER GER
6/23/2014	7,521.00	89.40	141.60	6,273.29	1,120.95	1,569.27	-396.00	3.13	-0.10	3.13	2,229.13	MWD	ANADRILL SCHLUMBER GER
6/23/2014	7,616.00	89.38	141.01	6,274.30	1,215.29	1,643.41	-336.61	0.62	-0.02	-0.62	2,324.13	MWD	ANADRILL SCHLUMBER GER
6/23/2014	7,712.00	88.83	140.73	6,275.80	1,310.54	1,717.87	-276.04	0.64	-0.57	-0.29	2,420.11	MWD	ANADRILL SCHLUMBER GER
6/23/2014	7,807.00	88.32	140.74	6,278.16	1,404.75	1,791.40	-215.93	0.54	-0.54	0.01	2,515.09	MWD	ANADRILL SCHLUMBER GER
6/23/2014	7,903.00	88.45	141.25	6,280.87	1,499.99	1,865.97	-155.53	0.55	0.14	0.53	2,611.05	MWD	ANADRILL SCHLUMBER GER
6/23/2014	7,999.00	89.48	141.47	6,282.60	1,595.33	1,940.94	-95.60	1.10	1.07	0.23	2,707.03	MWD	ANADRILL SCHLUMBER GER
6/23/2014	8,094.00	89.90	140.94	6,283.12	1,689.66	2,014.98	-36.08	0.71	0.44	-0.56	2,802.03	MWD	ANADRILL SCHLUMBER GER
6/23/2014	8,190.00	89.97	141.76	6,283.22	1,785.02	2,089.95	23.88	0.86	0.07	0.85	2,898.03	MWD	ANADRILL SCHLUMBER GER
6/23/2014	8,286.00	89.90	140.22	6,283.33	1,880.30	2,164.55	84.30	1.61	-0.07	-1.60	2,994.02	MWD	ANADRILL SCHLUMBER GER
6/23/2014	8,381.00	90.21	139.76	6,283.24	1,974.37	2,237.31	145.38	0.58	0.33	-0.48	3,089.02	MWD	ANADRILL SCHLUMBER GER
6/23/2014	8,476.00	89.42	140.78	6,283.55	2,068.60	2,310.37	206.10	1.36	-0.83	1.07	3,184.02	MWD	ANADRILL SCHLUMBER GER
6/23/2014	8,572.00	89.38	140.05	6,284.55	2,163.66	2,384.35	267.27	0.76	-0.04	-0.76	3,280.02	MWD	ANADRILL SCHLUMBER GER
6/23/2014	8,668.00	89.42	140.47	6,285.56	2,258.78	2,458.17	328.64	0.44	0.04	0.44	3,376.01	MWD	ANADRILL SCHLUMBER GER
6/23/2014	8,764.00	89.86	140.63	6,286.16	2,353.95	2,532.29	389.64	0.49	0.46	0.17	3,472.01	MWD	ANADRILL SCHLUMBER GER



Directional Survey

SEP 18 2017

Well Name: PENS2BHS

WV Department of
Environmental Protection

API 4708510068	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Construction HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,083.25	KB-Ground Distance (ft) 26.00	KB-Casing Flange Distance (ft) 26.75	Spud Date (Conductor) 1/16/2014 06:00	Rig Release Date 7/7/2014 14:30

Survey Data													
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
6/23/2014	8,859.00	89.86	140.05	6,286.39	2,448.12	-2,605.43	450.27	0.61	0.00	-0.61	3,567.01	MWD	ANADRILL SCHLUMBER GER
6/23/2014	8,955.00	89.86	139.58	6,286.63	2,543.14	-2,678.77	512.21	0.49	0.00	-0.49	3,663.01	MWD	ANADRILL SCHLUMBER GER
6/23/2014	9,050.00	89.73	139.31	6,286.97	2,637.08	-2,750.95	573.98	0.32	-0.14	-0.28	3,758.01	MWD	ANADRILL SCHLUMBER GER
6/23/2014	9,146.00	90.31	139.77	6,286.94	2,732.04	-2,823.99	636.27	0.77	0.60	0.48	3,854.00	MWD	ANADRILL SCHLUMBER GER
6/23/2014	9,242.00	90.28	139.45	6,286.44	2,827.01	-2,897.11	698.48	0.33	-0.03	-0.33	3,950.00	MWD	ANADRILL SCHLUMBER GER
6/23/2014	9,338.00	89.76	139.25	6,286.41	2,921.92	-2,969.94	761.02	0.58	-0.54	-0.21	4,046.00	MWD	ANADRILL SCHLUMBER GER
6/23/2014	9,433.00	88.76	138.89	6,287.63	3,015.75	-3,041.71	823.25	1.12	-1.05	-0.38	4,140.99	MWD	ANADRILL SCHLUMBER GER
6/23/2014	9,528.00	88.18	138.57	6,290.17	3,109.48	-3,113.08	885.89	0.70	-0.61	-0.34	4,235.96	MWD	ANADRILL SCHLUMBER GER
6/23/2014	9,622.00	88.69	139.63	6,292.74	3,202.31	-3,184.11	947.41	1.25	0.54	1.13	4,329.92	MWD	ANADRILL SCHLUMBER GER
6/23/2014	9,718.00	90.41	141.30	6,293.49	3,297.47	-3,258.14	1,008.51	2.50	1.79	1.74	4,425.91	MWD	ANADRILL SCHLUMBER GER
6/23/2014	9,814.00	89.59	141.42	6,293.49	3,392.83	-3,333.12	1,068.46	0.86	-0.85	0.12	4,521.91	MWD	ANADRILL SCHLUMBER GER
6/23/2014	9,909.00	89.73	138.87	6,294.06	3,486.93	-3,406.04	1,129.33	2.69	0.15	-2.68	4,616.90	MWD	ANADRILL SCHLUMBER GER
6/23/2014	10,003.00	89.73	140.36	6,294.50	3,579.92	-3,477.64	1,190.23	1.59	0.00	1.59	4,710.90	MWD	ANADRILL SCHLUMBER GER
6/23/2014	10,098.00	90.14	139.55	6,294.61	3,673.98	-3,550.37	1,251.36	0.96	0.43	-0.85	4,805.90	MWD	ANADRILL SCHLUMBER GER
6/23/2014	10,193.00	89.59	138.51	6,294.83	3,767.82	-3,622.09	1,313.64	1.24	-0.58	-1.09	4,900.90	MWD	ANADRILL SCHLUMBER GER
6/23/2014	10,288.00	89.83	138.86	6,295.31	3,861.57	-3,693.45	1,376.36	0.45	0.25	0.37	4,995.89	MWD	ANADRILL SCHLUMBER GER
6/23/2014	10,384.00	89.83	138.87	6,295.60	3,956.35	-3,765.75	1,439.51	0.01	0.00	0.01	5,091.89	MWD	ANADRILL SCHLUMBER GER
6/23/2014	10,479.00	90.27	139.71	6,295.51	4,050.25	-3,837.76	1,501.47	1.00	0.46	0.88	5,186.89	MWD	ANADRILL SCHLUMBER GER
6/23/2014	10,574.00	89.66	139.10	6,295.57	4,144.19	-3,909.90	1,563.29	0.91	-0.64	-0.64	5,281.89	MWD	ANADRILL SCHLUMBER GER
6/23/2014	10,668.00	89.90	138.86	6,295.93	4,237.02	-3,980.82	1,624.98	0.36	0.26	-0.26	5,375.89	MWD	ANADRILL SCHLUMBER GER
6/23/2014	10,763.00	89.42	138.58	6,296.50	4,330.78	-4,052.21	1,687.66	0.58	-0.51	-0.29	5,470.89	MWD	ANADRILL SCHLUMBER GER

Well Name: PENS2BHS

WV Department of Environmental Protection
Well Completion Type
HORIZONTAL

API 4708510068	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Completion Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,083.25	KB-Ground Distance (ft) 26.00	KB-Casing Flange Distance (ft) 26.75	Spud Date (Conductor) 1/16/2014 06:00	Rig Release Date 7/7/2014 14:30

Survey Data													
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
6/23/2014	10,858.00	90.55	139.62	6,296.52	4,424.63	-4,124.01	1,749.86	1.62	1.19	1.09	5,565.89	MWD	ANADRILL SCHLUMBER GER
6/23/2014	10,952.00	89.59	139.29	6,296.41	4,517.59	-4,195.44	1,810.96	1.08	-1.02	-0.35	5,659.88	MWD	ANADRILL SCHLUMBER GER
6/23/2014	11,047.00	89.66	139.76	6,297.03	4,611.55	-4,267.71	1,872.62	0.50	0.07	0.49	5,754.88	MWD	ANADRILL SCHLUMBER GER
6/23/2014	11,142.00	90.34	141.04	6,297.03	4,705.71	-4,340.90	1,933.18	1.53	0.72	1.35	5,849.88	MWD	ANADRILL SCHLUMBER GER
6/23/2014	11,238.00	90.00	142.25	6,296.74	4,801.12	-4,416.18	1,992.75	1.31	-0.35	1.26	5,945.88	MWD	ANADRILL SCHLUMBER GER
6/23/2014	11,333.00	90.00	141.15	6,296.74	4,895.54	-4,490.73	2,051.63	1.16	0.00	-1.16	6,040.88	MWD	ANADRILL SCHLUMBER GER
6/23/2014	11,429.00	90.03	141.61	6,296.72	4,990.90	-4,565.74	2,111.54	0.48	0.03	0.48	6,136.88	MWD	ANADRILL SCHLUMBER GER
6/23/2014	11,524.00	89.66	141.87	6,296.98	5,085.34	-4,640.33	2,170.37	0.48	-0.39	0.27	6,231.88	MWD	ANADRILL SCHLUMBER GER
6/23/2014	11,620.00	89.69	142.56	6,297.52	5,180.85	-4,716.20	2,229.19	0.72	0.03	0.72	6,327.87	MWD	ANADRILL SCHLUMBER GER
6/23/2014	11,715.00	89.62	142.29	6,298.09	5,275.39	-4,791.49	2,287.12	0.29	-0.07	-0.28	6,422.87	MWD	ANADRILL SCHLUMBER GER
6/23/2014	11,810.00	90.41	140.60	6,298.07	5,369.77	-4,865.78	2,346.33	1.96	0.83	-1.78	6,517.87	MWD	ANADRILL SCHLUMBER GER
6/23/2014	11,905.00	89.90	139.98	6,297.81	5,463.91	-4,938.86	2,407.02	0.85	-0.54	-0.65	6,612.87	MWD	ANADRILL SCHLUMBER GER
6/23/2014	12,001.00	89.83	138.44	6,298.04	5,558.78	-5,011.54	2,469.73	1.61	-0.07	-1.60	6,708.86	MWD	ANADRILL SCHLUMBER GER
6/23/2014	12,096.00	89.45	136.97	6,298.63	5,652.25	-5,081.81	2,533.66	1.60	-0.40	-1.55	6,803.86	MWD	ANADRILL SCHLUMBER GER
6/23/2014	12,190.00	89.79	135.91	6,299.26	5,744.34	-5,149.92	2,598.44	1.18	0.36	-1.13	6,897.85	MWD	ANADRILL SCHLUMBER GER
6/23/2014	12,285.00	90.14	135.81	6,299.31	5,837.21	-5,218.10	2,664.60	0.38	0.37	-0.11	6,992.85	MWD	ANADRILL SCHLUMBER GER
6/23/2014	12,380.00	90.00	136.68	6,299.20	5,930.22	-5,286.72	2,730.29	0.93	-0.15	0.92	7,087.85	MWD	ANADRILL SCHLUMBER GER
6/23/2014	12,475.00	89.69	138.37	6,299.46	6,023.63	-5,356.78	2,794.44	1.81	-0.33	1.78	7,182.85	MWD	ANADRILL SCHLUMBER GER
6/23/2014	12,569.00	88.59	138.93	6,300.87	6,116.37	-5,427.34	2,856.54	1.31	-1.17	0.60	7,276.84	MWD	ANADRILL SCHLUMBER GER
6/23/2014	12,664.00	90.79	142.15	6,301.38	6,210.55	-5,500.67	2,916.90	4.10	2.32	3.39	7,371.82	MWD	ANADRILL SCHLUMBER GER
6/23/2014	12,760.00	90.07	143.48	6,300.66	6,306.15	-5,577.15	2,974.92	1.58	-0.75	1.39	7,467.81	MWD	ANADRILL SCHLUMBER GER

SEP 18 2017

WV Department of
Environmental Protection

WellView

Directional Survey

Well Name: PENS2BHS

API 4708510068	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,083.25	KB-Ground Distance (ft) 26.00	KB-Casing Flange Distance (ft) 26.75	Spud Date (Conductor) 1/16/2014 06:00	Rig Release Date 7/7/2014 14:30

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
6/23/2014	12,855.00	88.87	140.91	6,301.54	6,400.65	5,652.20	3,033.14	2.99	-1.26	-2.71	7,562.80	MWD	ANADRILL SCHLUMBER GER
6/23/2014	12,961.00	90.89	140.74	6,301.76	6,505.81	5,734.37	3,100.10	1.91	1.91	-0.16	7,668.79	MWD	ANADRILL SCHLUMBER GER
6/23/2014	13,056.00	89.00	138.14	6,301.85	6,599.74	5,806.53	3,161.86	3.38	-1.99	-2.74	7,763.78	MWD	ANADRILL SCHLUMBER GER
6/23/2014	13,152.00	90.58	140.53	6,302.20	6,694.64	5,879.34	3,224.41	2.98	1.65	2.49	7,859.77	MWD	ANADRILL SCHLUMBER GER
6/23/2014	13,248.00	90.07	142.05	6,301.66	6,789.97	5,954.25	3,284.45	1.67	-0.53	1.58	7,955.76	MWD	ANADRILL SCHLUMBER GER
6/23/2014	13,343.00	90.89	142.40	6,300.86	6,884.49	6,029.34	3,342.64	0.94	0.86	0.37	8,050.76	MWD	ANADRILL SCHLUMBER GER
6/23/2014	13,439.00	91.75	142.67	6,298.65	6,980.03	6,105.51	3,401.01	0.94	0.90	0.28	8,146.73	MWD	ANADRILL SCHLUMBER GER
6/23/2014	13,534.00	90.31	142.62	6,296.94	7,074.59	6,181.01	3,458.65	1.52	-1.52	-0.05	8,241.72	MWD	ANADRILL SCHLUMBER GER
6/23/2014	13,630.00	90.10	142.16	6,296.50	7,170.13	6,257.06	3,517.23	0.53	-0.22	-0.48	8,337.71	MWD	ANADRILL SCHLUMBER GER
6/23/2014	13,725.00	89.93	139.77	6,296.58	7,264.41	6,330.85	3,577.06	2.52	-0.18	-2.52	8,432.71	MWD	ANADRILL SCHLUMBER GER
6/23/2014	13,820.00	90.86	138.84	6,295.92	7,358.32	6,402.87	3,639.00	1.38	0.98	-0.98	8,527.70	MWD	ANADRILL SCHLUMBER GER
6/23/2014	13,916.00	89.97	137.48	6,295.23	7,452.90	6,474.39	3,703.03	1.69	-0.93	-1.42	8,623.70	MWD	ANADRILL SCHLUMBER GER
6/23/2014	14,011.00	90.82	139.38	6,294.57	7,546.57	6,545.46	3,766.06	2.19	0.89	2.00	8,718.69	MWD	ANADRILL SCHLUMBER GER
6/23/2014	14,106.00	90.58	140.30	6,293.41	7,640.60	6,618.06	3,827.33	1.00	-0.25	0.97	8,813.68	MWD	ANADRILL SCHLUMBER GER
6/23/2014	14,201.00	90.58	140.28	6,292.45	7,734.74	6,691.13	3,888.02	0.02	0.00	-0.02	8,908.68	MWD	ANADRILL SCHLUMBER GER
6/23/2014	14,296.00	90.52	142.63	6,291.54	7,829.11	6,765.43	3,947.21	2.47	-0.06	2.47	9,003.67	MWD	ANADRILL SCHLUMBER GER
6/23/2014	14,392.00	90.52	140.06	6,290.67	7,924.45	6,840.39	4,007.17	2.68	0.00	-2.68	9,099.65	MWD	ANADRILL SCHLUMBER GER
6/23/2014	14,487.00	90.17	138.18	6,290.09	8,018.30	6,912.21	4,069.34	2.01	-0.37	-1.98	9,194.65	MWD	ANADRILL SCHLUMBER GER
6/23/2014	14,583.00	89.97	137.72	6,289.98	8,112.83	6,983.50	4,133.63	0.52	-0.21	-0.48	9,290.65	MWD	ANADRILL SCHLUMBER GER
6/23/2014	14,677.00	89.97	140.33	6,290.02	8,205.67	7,054.46	4,195.27	2.78	0.00	2.78	9,384.64	MWD	ANADRILL SCHLUMBER GER
6/23/2014	14,773.00	89.83	140.45	6,290.19	8,300.63	7,128.42	4,256.47	0.19	-0.15	0.12	9,480.64	MWD	ANADRILL SCHLUMBER GER

Well Name: PENS2BHS

API 4708510068	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,083.25	KB-Ground Distance (ft) 26.00	KB-Casing Flange Distance (ft) 26.75	Spud Date (Conductor) 1/16/2014 06:00	Rig Release Date 7/7/2014 14:30

Survey Data													
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
6/23/2014	14,867.00	89.48	138.07	6,290.76	8,393.73	-7,199.63	4,317.82	2.56	-0.37	-2.53	9,574.63	MWD	ANADRILL SCHLUMBER GER
6/23/2014	14,961.00	89.42	137.99	6,291.66	8,486.30	-7,269.52	4,380.67	0.11	-0.06	-0.09	9,668.63	MWD	ANADRILL SCHLUMBER GER
6/23/2014	15,056.00	89.35	137.43	6,292.68	8,579.77	-7,339.79	4,444.59	0.59	-0.07	-0.59	9,763.62	MWD	ANADRILL SCHLUMBER GER
6/23/2014	15,151.00	90.07	137.90	6,293.16	8,673.23	-7,410.01	4,508.57	0.91	0.76	0.49	9,858.62	MWD	ANADRILL SCHLUMBER GER
6/23/2014	15,246.00	90.10	139.88	6,293.02	8,767.02	-7,481.59	4,571.03	2.08	0.03	2.08	9,953.61	MWD	ANADRILL SCHLUMBER GER
6/23/2014	15,341.00	90.10	142.05	6,292.85	8,861.30	-7,555.38	4,630.86	2.28	0.00	2.28	10,048.61	MWD	ANADRILL SCHLUMBER GER
6/23/2014	15,437.00	89.69	142.58	6,293.03	8,956.83	-7,631.35	4,689.54	0.70	-0.43	0.55	10,144.61	MWD	ANADRILL SCHLUMBER GER
6/23/2014	15,533.00	89.48	142.62	6,293.73	9,052.40	-7,707.61	4,747.85	0.22	-0.22	0.04	10,240.60	MWD	ANADRILL SCHLUMBER GER
6/23/2014	15,629.00	89.62	142.78	6,294.48	9,147.99	-7,783.97	4,806.02	0.22	0.15	0.17	10,336.60	MWD	ANADRILL SCHLUMBER GER
6/23/2014	15,725.00	89.38	141.05	6,295.32	9,243.44	-7,859.53	4,865.24	1.82	-0.25	-1.80	10,432.59	MWD	ANADRILL SCHLUMBER GER
6/23/2014	15,821.00	89.52	140.74	6,296.24	9,338.70	-7,934.02	4,925.78	0.35	0.15	-0.32	10,528.59	MWD	ANADRILL SCHLUMBER GER
6/23/2014	15,917.00	89.66	140.51	6,296.93	9,433.90	-8,008.23	4,986.68	0.28	0.15	-0.24	10,624.59	MWD	ANADRILL SCHLUMBER GER
6/23/2014	15,985.00	89.59	140.31	6,297.37	9,501.30	-8,060.63	5,030.02	0.31	-0.10	-0.29	10,692.59	MWD	ANADRILL SCHLUMBER GER
6/23/2014	16,010.00	89.59	140.31	6,297.55	9,526.08	-8,079.87	5,045.98	0.00	0.00	0.00	10,717.59	PJ	ANADRILL SCHLUMBER GER

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