Spaghetti Hole: Retrofit Options for an Aging Passive Treatment System[1]

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Abstract: For the past 17 years, Spaghetti Hole passive treatment system has been treating net-acidic abandoned mine water from a seep in the Glenwhite watershed located in Western Blair County, PA. The discharge water quality has remained consistent over the life span of the site [pH: 3.67, $CaCO_3$: 0 ppm, Fe: 0.825 ppm, Al: 7.20 ppm, Mn: 2.49 ppm]. The system consists of three treatment cells: a stabilization basin, vertical flow pond, and settling pond. Initially, the mine water effluent was treated sufficiently [pH: 7.53, $CaCO_3$: 234 ppm, Fe: 0.146 ppm, Al: 0.200 ppm, Mn: 1.72 ppm]. As time passed, treatment efficiency has decreased as expected [pH: 6.5, $CaCO_3$: 71.5 ppm, Fe: 0.550 ppm, Al: 2.00 ppm, Mn: 2.73 ppm]. Increased short-circuiting due to clogging has resulted in average percentage bypassing of 43.9% (12.2 L/s). After assessing the current water quality, a design solution has been developed to retrofit more recent treatment technology and practices to the Spaghetti Hole passive system.[3]

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3. Work reported here was conducted near 40.5164° N, 78.5164° W.