







DELANO AND ORWIGSBURG, PA QUADS

SCHUYLKILL CONSERVATION DISTRICT  
 ABANDONED MINE DRAINAGE REMEDIATION  
 BELL COLLIERY

SCHUYLKILL TOWNSHIP

SCHUYLKILL COUNTY

**RETTEW**

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**ABANDONED MINE DRAINAGE REMEDIATION PROJECT  
FOR THE BELL COLLIERY DRIFT, SCHUYLKILL TOWNSHIP, SCHUYLKILL  
COUNTY, PA**

Abandoned mine drainage (AMD) from the Bell Colliery Drift located in Schuylkill Township, Schuylkill County, PA adds metals and acidity to the Schuylkill River near its headwaters. Above its confluence with the Bell Discharge, the Schuylkill River runs clear and is near neutral; below its confluence, the water and streambed take on a decidedly orange tint owing to iron and other metal loadings from Bell Discharge and additional AMD sources downstream. Hence, the Upper Schuylkill River is designated "impaired because of metals" on the Pennsylvania Department of Environmental Protection's 303(d) List of Impaired Waterways. The Upper Schuylkill River Watershed Assessment (2000) focusing on AMD nonpoint source problems in the Upper Schuylkill Watershed ranked the Bell Colliery Discharge as one of the most severe in the watershed and recommended that its remediation be given highest priority because of its location near the upstream boundary of the watershed and feasibility for treatment.

Recent flow and chemistry data collected by the U.S. Geological Survey (USGS) for the Bell Colliery Discharge and a downstream sampling site before its confluence with the Schuylkill River show the discharge water has consistently been acidic (pH 3.7 - 4.0; acidity 36-160 mg/L CaCO<sub>3</sub>), slightly oxygenated (0.8 - 3.5 mg/L O<sub>2</sub>), and contaminated with dissolved metals (Al 0.8 - 1.1 mg/L; Fe 2.5 - 12.0 mg/L; Mn 1.3 - 1.5 mg/L).

The project, funded by a \$270,000 USEPA 319 grant and completed in 2004, implements and evaluates a two-stage treatment system consisting of a downflow limestone cell followed by an aerobic wetland cell for neutralization of the acid and reduction of the metals loadings from the Bell Discharge. Compost is layered over half of the limestone bed in the upper cell; the other half consists of simply limestone. Two separate underdrain networks and outflow pipes beneath the limestone and compost plus limestone beds, respectively to (1) enable flushing of accumulated metals from the downflow cell to the wetland cell where final oxidation, precipitation, and settling of metallic-rich particles will occur and (2) allow for comparison of the effectiveness of the different downflow treatment designs.

The primary goal of this project was to eliminate AMD (acid and metal) loadings from the Bell Colliery Drift to the Schuylkill River. A secondary goal was to evaluate the relative effectiveness of downflow treatment system designs using compost plus limestone and limestone only. Ultimately the knowledge gained from this evaluation will be useful for improving remedial designs for treatment of AMD.

A number of organizations and agencies partnered together in order to make this project a success. They include the Schuylkill County Conservation District, Schuylkill Headwaters Association, Inc., U.S. Geological Survey, Pennsylvania Department of Environmental Protection, Blaschak Coal Corp., Reading Anthracite Co., landowners Robert, Ronald, and Joseph Kuperavage, RETTEW Associates, Inc., Martin Limestone, Lloyd S. Aungst Excavating, and Dudash Pipeline Company, Inc.







