

The Spruce Hollow Railroad Embankment Abandoned Mine Reclamation Project

Montel, Allegany County, Maryland

Submitted by:

**STATE OF MARYLAND
DEPARTMENT OF THE ENVIRONMENT
BUREAU OF MINES**

Abandoned Mine Land Section
160 South Water Street
Frostburg, Maryland 21532

Kendl P. Philbrick - Secretary, Maryland Department of the Environment
John E. Carey - Director, Maryland Bureau of Mines
Michael P. Garner - Chief, Abandoned Mine Land Section

DATE: March 12, 2004

CONSTRUCTION START: August, 2002

CONSTRUCTION COMPLETION: December, 2002

CONSTRUCTION COST: \$ 246,771.00

CONSTRUCTION CONTRACTOR: Jim Clark Excavating, Barton, MD

PROJECT ENGINEER: Roger Thomas,
US Department of Agriculture
Natural Resources Conservation Service, Annapolis, MD

PROJECT ADMINISTRATOR: John C. Eilers,
Maryland Bureau of Mines
Abandoned Mine Land Section

CONTRACTING AGENCY: Natural Resources Conservation Service
under Cooperative Agreement with the
Maryland Bureau of Mines.

FUNDED BY: The Abandoned Mine Reclamation Fund administered by the U.S
Department of the Interior, Office of Surface Mining

PROJECT NARATIVE

SITE HISTORY

In order to fully develop the extensive coal reserves located in the Georges Creek valley of Western Maryland, it was recognized that a railroad transportation network was vital to the delivery of coal to the ever expanding eastern markets. To meet this challenge, in 1860 the Consolidation Coal Company was formed and a rail line was constructed to its holding located at Ocean, MD. By 1868, the acquisition of several other rail lines had given Consolidation Coal a virtual transportation monopoly in the Georges Creek valley.

In 1879, in order to break this monopoly, the American Coal Company, the Maryland Coal Company and the New Central Coal Company formed the Georges Creek and Cumberland Railroad and constructed a rail line from Clarysville to Vale Summit and then southwest to Midland, MD. Construction of this line included spanning of the Spruce Hollow stream valley and channel located at Montel, also the site of an expanding deep mining operation owned by the Maryland Georges Creek Coal Company. Crossing of the Spruce Hollow stream channel was accomplished thru construction of an elevated earthen fill embankment 65 feet in height and 450 in length to carry the rail line over the valley. A 2 foot wide by 4 foot high stone masonry box culvert approximately 130 feet in length was also constructed through the earthen embankment to carry the stream flow under the railroad. Several spur lines and associated rail sidings were subsequently constructed adjacent to the embankment to facilitate transportation of coal from the adjacent deep mine. Entrance and egress to the deep mine complex was made through the Montel Tunnel which was driven 2,480 feet into the mountain and thru several coal seams.

Construction and expansion of this rail line provided a competitive alternative to the transportation monopoly previously deterring full development of the vast coal reserves of the Georges Creek Basin. As a result, by 1880 Maryland was ranked as one of the top five bituminous coal producing States in the country. Maryland coal was subsequently in demand through out the world, being exported to Cuba, France, the East and West Indies, Egypt, Brazil, and was the preferred coal of the American Navy.

However, as Maryland coal production expanded throughout the Georges Creek valley, so did construction of a newer and more efficient railroad transportation system. Recently developed railroad lines along the Potomac River and into the Georges Creek valley offered the most direct route between Baltimore and Pittsburgh. As a result, in 1939, the Georges Creek and Cumberland Railroad line across the Spruce Hollow valley was abandoned, and left to become a little known monument to a growing industrial age.

THE PROBLEM

By the early 1980's the Spruce Hollow Railroad embankment was in a continuing state of abandonment and disrepair. Development and deforestation of the upstream watershed, as well as abandoned pre-law mining operations had become a continued source of sedimentation to the site. Increased runoff and sedimentation had caused the stone masonry box culvert to become obstructed, restricting passage of stream flow safely through the embankment. Sedimentation at the upstream side of the embankment was in excess of 20 feet in depth, totally obscuring the box culvert inlet. During periods of high precipitation, obstruction of the box culvert had caused stream flow to impound behind the railroad embankment to depths of 20 feet before receding, posing a significant risk of flooding to downstream residents. In 1986, at the request of local officials and landowners, the Soil Conservation Service, now the Natural Resource Conservation Service developed a project under its Rural Abandoned Mine Program to reduce the every increasing risk of flooding posed by the structure. A concrete drop inlet was installed through the accumulated sediment into the stone box culvert to help pass stream flow and reduce the occurrence of water impounding behind the embankment. However, by the mid 1990's, increased runoff and sedimentation throughout the watershed caused by development had continued, returning the risk of flooding to downstream residents.

In September 6, 1996, remnants of tropical storm "Fran" passed over western Maryland and the Spruce Hollow watershed, dumping 6.33 inches of rainfall in 24 hours, exceeding the predicted 100 year 24-hour rainfall event for the county. The heavy rainfall associated with the storm caused water to impound behind the embankment to depths in excess of 35 feet and within 7 feet of overtopping. Emergency response personnel identified an imminent risk of breach and catastrophic failure of the structure, and in response ordered an immediate evacuation of numerous downstream residents. Subsequently, on September 9, 1996, an evaluation of the embankment by the Maryland Department of the Environment, Dam Safety Division determined that although much of the impounded water had receded, the structure was identified as a high hazard dam due to potential major downstream damage and loss of life in event of failure. A dam breach analysis of the structure also indicated a danger reach in event of catastrophic failure extending 1.25 miles below the impoundment, impacting 23 homes and numerous roads and public utilities located within the reach area. Analysis also indicated the potential catastrophic release of over 22 million gallons of water in the event of breach and failure of the structure. As a result of this analysis, the Spruce Hollow railroad embankment was identified as a priority flood mitigation project in the Short Term Action Plan of the Governors Flood Mitigation Task Force for Western Maryland. The task force subsequently designated the U.S. Department of Agriculture, Natural Resources Conservation Service and the Maryland Department of the Environment, Bureau of Mines as the lead agencies responsible for coordinating mitigation efforts for the site.

PROJECT DEVELOPMENT AND DESIGN

Following the convening of the Governors Flood Mitigation Task Force, it was determined that numerous commitments and efforts from governmental agencies of the State of Maryland, Allegany County, and the federal government would be required to mitigate flooding hazards posed by the site. Project coordination, administration, and funding activities were completed by the Maryland Department of the Environment, Bureau of Mines' Abandoned Mine Land Section. Funding for construction of the project was obtained through the Bureau's Abandoned Mine Land Reclamation Program construction grant, administered by the U.S. Department of the Interior, Office of Surface Mining. Project design, contracting, construction management and inspection activities were completed by the U.S. Department of Agriculture, Natural Resources Conservation Service under Cooperative Agreement and in consultation with the Bureau.

Development of design criteria for mitigation of the flooding hazards posed by the abandoned railroad embankment began in the summer of 1998, and included evaluation of two separate design alternatives. These alternatives were: 1.) Upgrading of the structure to meet current Dam Standards, and; 2.) Removal of the structure.

Four public informational meetings were conducted to solicit input from surrounding residents and concerned individuals regarding the proposed reclamation design alternatives. Public input received relating to these alternatives suggested that some stormwater management potential existed at the structure in its unaltered condition, in that peak runoff storage was provided behind the embankment, and subsequently released at a slower rate. This potential was confirmed thru TR-20, HEC-1 and HEC-RAS computer modeling and analysis of peak flow rates of various storm frequency events for both the existing and proposed embankment conditions. Analysis of design alternative 2 indicated that although the catastrophic dam breach flooding hazards to the 23 residences located within the danger reach would be eliminated thru removal of the structure, six residences would experience minimal increases in flooding frequency during the 100 year storm. However, it was also determined that other flood mitigation measures could be implemented for those houses that would experience increases in flooding frequency, at significantly lower cost and intrusiveness to the landowners. Further analysis of design alternative 1 indicated that upgrading of the structure presented both short and long term disadvantages in that a high hazard structure would remain at the site requiring long-term operation and maintenance. In addition, no governmental agencies were capable of accepting or funding long term operation and maintenance liabilities associated with a privately owned structure. As a result, design alternative 2.) Removal of the Structure, was selected.

Final design of the Spruce Hollow Railroad Embankment AML Project began in winter of 2000. During this process, the Natural Resources Conservation Service worked closely with representatives of the Maryland Bureau of Mines, the MD Dam Safety Division and other permitting agencies to incorporate innovative design concepts for mitigation of the flooding hazards and reclamation of the stream channel to an

environmentally natural condition.

The abandoned railroad embankment and accumulated sediments would be excavated and removed to provide for safe passage of the 100 year storm and eliminate catastrophic flooding hazards to downstream residents and structures. An on site spoil disposal area was designed for disposal of excess material excavated from the embankment and floodplain. Fluvial Geomorphic characterization of the stream channel and valley was performed to determine stream type, sinuosity, slope and shape to develop a stream channel geometry and floodplain restoration design replicating stable and natural stream conditions. The steep grade of the proposed channel, 13%, made for design and construction challenges. Thirty-seven rock cross vanes were to be “stacked” with the arms of the consecutive vanes overlapping to form a step/pool channel. Willow bundles would be planted within the riparian area to provide stream shading and long-term bank stabilization.

A cost effective wetland restoration plan was developed for the site that included removal of the accumulated sediments and abandoned coal refuse material deposited within the floodplain and reestablishment of approximately 1 acre of wetland utilizing native species salvaged from the area. In addition, a site specific wetland revegetation mixture was developed utilizing selected wetland grass species to further promote wetland recovery and colonization by native species.

PROJECT CONSTRUCTION

Construction of the Spruce Hollow Railroad Embankment Abandoned Mine Reclamation Project was completed during the fall of 2002. A competitive sealed bid procurement method was utilized. The contract was awarded to the successful low bidder, Jim Clark Excavating of Barton, Maryland.

Project construction took 3 months to complete and included excavation and on site disposal and grading of 30,000 cubic yards of spoil and coal refuse; salvaging and spreading of 3,000 cubic yards of topsoil; construction of 500 linear feet of temporary stream diversion; installation of 580 linear feet of reconstructed stream channel including 1,100 tons of rock cross vane; restoration of 1 acre of wetland; collection and disposal of abandoned residential and industrial waste; construction of 1 sediment basin; construction of 1,300 linear feet of permanent access road; installation of 1 reinforced timber plank bridge; and revegetation of 5.5 acres. Post construction tree planting was completed with much consultation and input from the landowner who was very interested in wildlife habitat development on the effected area.

SUMMARY OF BENEFITS

The removal of the abandoned railroad embankment and impoundment eliminated an imminent catastrophic flooding hazard impacting 23 residences and numerous public roads and utilities, and removed a high priority public health and safety threat to a local community. In addition, 580 feet of stream channel was returned to a natural and stable condition. This project exemplifies the cooperation and dedication of numerous Federal,

State, and County governmental organizations and officials who, with the help and cooperation of the public, have made a local community a safer place to live for its families and children.