

**YEAR 2001  
ABANDONED MINE LAND RECLAMATION AWARD  
NOMINATION**

of the

**VINDEX ABANDONED MINE LAND RECLAMATION PROJECT**

at

West Vindex, Garrett County, Maryland

Submitted by:

**THE MARYLAND DEPARTMENT OF THE ENVIRONMENT  
WATER MANAGEMENT ADMINISTRATION  
MINING PROGRAM  
BUREAU OF MINES**

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Architect/Engineer:

Maryland Bureau of Mines  
Weir Engineering & Environmental Consultants

Contracting Agency: Maryland Department of General Services  
Construction Contractor: Earthmovers Unlimited, Inc.  
Project Construction Date: August 15, 1994 - July 29, 1997  
Construction Cost: \$ 3,335,792.93

## **PROJECT NARRATIVE**

### **VINDEX ABANDONED MINE RECLAMATION PROJECT**

February 1, 2001

#### **SITE HISTORY**

The Vindex Abandoned Mine Land Reclamation Project is located in the South Central portion of Garrett County, Maryland between the named communities of East and West Vindex, approximately 1.9 miles north of Kitzmiller, Maryland. The community of Vindex was first established around 1890 as a lumber town, taking advantage of the virgin stands of trees located along the Upper North Branch of the Potomac River. Vindex soon became a coal town in 1904, when the Three Forks Coal and Coke Company opened a deep mining operation and installed a 42 inch/gauge rail line to service the mining operation and town. In 1912, to accommodate increased coal production from the site, the 42 gauge track was upgraded to standard gauge and a Shay engine was purchased to handle the increased traffic, steep grades and sharp turns of the Chaffee Rail Line. The community of Vindex and the Three Forks Coal and Coke Company's deep mining operation continued to grow, fueled by the demand of WW I. In addition, the mining operation at Vindex also continued to expand, developing into one of the most modern and progressive deep mines of its time. The mine consisted of a company store, tipples, cleaning plant, power house, reservoir and numerous company owned miners dwellings. The powerhouse and reservoir supplied electric and water to both the deep mining operation and community. In 1943, the Vindex mine, then owned by the Johnstown Coal and Coke Company, reached its peak with a maximum production of 302,000 tons per year while employing over 250 miners. The town of Vindex also prospered and at it's peak had a population of over 500, including over 100 homes, two churches, a barber shop, school, post office, poolroom, restaurant, community hall, and theater. Over the life of the Vindex mine, approximately 5.5 million tons of coal was mined, but by the end of WW II, production demands were decreasing while operational costs were increasing. In 1950, the Johnstown Coal and Coke Company closed the Vindex mining operation, marking the end for the community of Vindex. In 1967, the company sold it's holding to its present owner, Douglas Coal Company, Inc. The Company owned houses were vacated and subsequently torn down, including the school and store. By 1969, only three privately owned homes remained. Smaller surface coal mining operations continued at the site until 1970, when the last coal mining operation was terminated and the site abandoned. Today, only one house remains standing as a document to the once thriving community.

Following termination and abandonment of mining operations in 1970, public health, safety and environmental conditions at the site continued to deteriorate. The top of an unguarded dangerous highwall approximately 6,700 feet in length and over 45 feet in height ran parallel to, and within 15 feet of the Vindex county road, posing a severe threat to vehicular traffic on the roadway. (Photo's # 1 & 2). Over 45 acres of dangerous coal refuse piles including several over 75 feet in height remained from the abandoned deep mining operation (Photo's # 1 & 3). Slope instability associated with the abandoned coal refuse material had caused several dangerous landslides to develop, threatening stability of the county road and creating blockage and flooding of Three Forks Run, a tributary to the North Branch of the Potomac River (Photo # 3). Frequent burning of household and residential garbage associated with unauthorized dumping at the site had caused burning of the abandoned coal refuse to develop, further contributing to slope instability and sliding of the refuse to occur (Photo's # 1 & 4). Several abandoned deep mine support facilities, including the abandoned Tipple, Powerhouse, Reservoir and Ventilation Fan were also in a state of disrepair and collapse, posing a threat to the health and safety of the many sightseers, historians and local residents who frequently visited the site. Abandoned deep mine portals, several of which were open and easily accessible to the public including a vertical air shaft approximately 12 feet in diameter and over 30 feet in depth, further threatened the health and safety of the public.

Acid Mine Drainage (Photo # 2) emanating from many of the abandoned deep mine portals was also severely impacting the water quality and aquatic biota of Three Forks Run, Jennings Randolph Lake, and the North Branch of the Potomac River, recently designated as one of the ten American Heritage Rivers. Water Quality Analysis indicated that Acid Mine Drainage from the site contributed a net acid discharge of 3354 lbs. per day to the North Branch of the Potomac, accounting for over 16% of the total acid loadings within the River. In addition, net concentrations of Total Iron (343 Lbs. per day) and Aluminum (290 Lbs. per day) associated with AMD accounted for over 19% of the total Iron and 11% of the total aluminum within the North Branch. Several individual discharges emanating from the abandoned deep mine portals were also identified as the single worst point source AMD discharges in Maryland.

## **PROJECT DEVELOPMENT AND DESIGN**

Project development began in September of 1989 when a Preliminary Feasibility Study was completed by the engineering firm of Howard, Needles Tammen & Bergendoff of Lexington Kentucky. This study inventoried and catalogued the various abandoned mine land problems and features existing at the site and identified abatement methods, design requirements and field investigations necessary for reclamation, including surface, subsurface, geologic and hydrologic evaluation requirements.

Design of the Vindex Abandoned Mine Reclamation Project began in February of 1990 by the firm of Morgan Mining and Environment Consultants, Inc., of Lexington, Kentucky under a contract with the State of Maryland. Engineering and design services included: sediment and erosion control, temporary access roads, site preparation, utility identification and relocation, traffic control, structure demolition and debris removal, earthwork and grading, impoundment dewatering and water treatment, underdrain and subdrain installation, mine portal dewatering and closure, stream channel reconstruction and restoration, surface water diversion installation, and landscaping and revegetation. Final design of the Project was completed by Maryland's AML engineering staff in the summer of 1993.

During the design process, several innovative design concepts, techniques, and construction practices were incorporated into the project in order to overcome several obstacles encountered during development of the Project. Specifically, laboratory analysis indicated that although much of the abandoned coal refuse contained a high coal content, marginal quality made it economically infeasible to recover the resource at that time. In order to preserve this resource and assist in future recovery, refuse identified as having a high coal recoverability potential was loaded and transported to a predetermined disposed area within the abandoned pit area for future recovery and marketing. Also, field investigations conducted during the design process determined that the Acid Mine Drainage emanating from the site was creating a chemical barrier to fish migrating out of Jennings Randolph Lake into the upper reaches of the North Branch of the Potomac River. In order to eliminate this barrier, the Bureau of Mines designed a Mechanical Lime Doser to neutralize acid loadings and improve water quality within the North Branch and Three Forks Run. Calcium Oxide (Pebble Quick Lime) was chosen for use in operation of the Doser in order to treat the large volume (350 GPM) of Acid Mine Drainage.

## **PROJECT CONSTRUCTION**

Bid solicitation for the Vindex Abandoned Mine Reclamation Project was completed by the MD Bureau of Mines and MD Department of General Services on January 26, 1994 utilizing a competitive sealed bidding procurement method. The construction contract was subsequently approved by the Maryland Board of Public Works on July 13, 1994. The contract was awarded to the low bidder, Earthmovers Unlimited, Inc. of Tyrone, PA in the amount of \$ 2,974,327. Subsequently, Project construction was subcontracted to Pyramid Equipment Company of LaVale, Maryland, who completed all work at the site. Project construction was initiated on August 15, 1994 and completed on July 29, 1997. Subsequent Change Orders issued during construction of the Project brought the final construction cost to \$ 3,335,762.93.

Reclamation accomplishments associated with the project included:

<b>Feature</b>	<b>Units Reclaimed</b>
Clogged Stream	1584 linear feet
Clogged Stream Land	2.3 Acres
Dangerous Highwall	6,750 linear feet
Dangerous Impoundments	1
Dangerous piles or Embankment	25 Acres
Hazardous Equipment and Facilities	4
Hazardous Water Bodies	1
Industrial/Residential Waste	10 Acres (1000 Tons)
Portals	12
Vertical Openings	1
Polluted Water	350 GPM
Gob	20 Acres

Project construction took 3 years to complete, and included: backfilling and regrading of over 1/2 million cubic yards of earthwork, including salvaging of 155,000 cubic yards of abandoned coal refuse and spreading of approximately 94,000 cubic yards of topsoil; installation of 6,700 linear feet of subsurface drain; construction of 9,685 linear feet of surface water diversion channel; reconstruction of 1,580 linear feet of stream channel of Three Forks Run; installation of over 60,000 tons of stone, 10,000 linear feet of silt fence; construction of 5 sediment traps, 2 sediment basins; collection and disposal of 1,000 Tons of industrial and residential waste; and revegetation of 74 acres.

### **PROJECT SUMMARY**

Construction of the Project remains to this day the single most complex, time consuming, and costly Abandoned Mine Land Reclamation Project ever completed by the Maryland Abandoned Mine Reclamation Program. From its initial development through completion of construction, the Project took over seven years to complete, requiring over 55,000 man hours of work, and costing more than twice Maryland's total annual Title IV AML Grant allocation. During the course of construction, the contractor consistently demonstrated an excellent ability and desire to complete the required reclamation, resulting in exemplary reclamation of the site. (Photo's # 7 & 8)

The lime Doser has also eliminated the chemical barrier to fish migrating up stream from Jennings Randolph Lake and has dramatically improved the water quality of Three Forks Run, the North Branch of the Potomac River, Jennings Randolph Lake, and 8 miles of tailwater below the Dam. The improvements in water quality have been well documented by the Maryland Bureau of Mines, the University of Maryland, Maryland's Department of Natural

Resources, and the U.S. Army Corps of Engineers not only through laboratory analysis of the water, but also through Biological evaluation which has documented increased numbers of species in the stream, increased numbers of individuals of a given species, and larger mass of the individuals.

**Maryland Bureau of Mines  
Average Annual Operating Cost  
VINDEXTOSER**

<b>Material</b>	<b>Tonnage Used</b>	<b>Cost Per Ton</b>	<b>Annual Operating Cost</b>
CaO	145.54	\$79.67	\$11,595.49