

Neds Branch Impoundment

Submitted by:

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Office Abandoned Mine Lands & Reclamation
Division of Land Restoration
West Virginia Department of Environmental
Protection**

Project Name and Location:

Neds Branch Impoundment – About one mile south of the Town of Gilbert in Mingo County, West Virginia

Name, Title Organization, Address, Phone Numbers and E-Mail:

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Project Start and Completion Dates:

Phase 1: February 17, 2003 – March 12, 2003

Phase 2: March 13, 2003 - October 23, 2003

Construction Costs and Funding Sources:

West Virginia AML Emergency Program

Phase 1 ----- \$ 675,225

Phase 2 ----- \$ 2,400,000

Total Project Cost ----- \$ 3,075,225

Contractor:

Phase 1:

**Green Mountain Company
#4 Port Amherst Drive
Charleston, WV 25306**

Phase 2:

**Eastern Arrow, Inc.
P.O. Box 100
Widen, WV 25211**

Consultant:

**GAI Consultants
3412 Chesterfield Avenue
Charleston, WV 25304**

West Virginia Department of Environmental Protection Staff:

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Submission Date:

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I. Background and Project Need

On February 16, 2003, after heavy, sustained rainfall in the southern portions of West Virginia, a twelve acre abandoned coal refuse slurry dam, located in a hollow in Mingo County, failed releasing thousands of cubic yards of slurry, coal refuse and debris. This material entered the Right Fork of Neds Branch, blocking the stream channel and then buried Neds Branch Road, which provided the only access into the hollow. Consequently, nearly 50 residents were now either trapped in the hollow or unable to return to their homes.

Personnel from the West Virginia Department of Environmental Protection's Office of Abandoned Mine Lands and Reclamation (AML&R) emergency section responded immediately and rushed to the site. After reviewing the situation, AML&R officials determined immediate action was crucial. Within hours, an experienced construction contractor was on-site to reestablish access into the hollow so its fifteen families could again freely travel to and from their homes. The contractor also started removing material from the creek channel to prevent additional flood damage and installed temporary diversion channels around the perimeter of the dam.

Quickly restoring access into the hollow was deemed a top priority of the emergency response effort. Some of the hollow's residents had serious health problems, which required the regular attention and care of skilled emergency medical services personnel as well as the opportunity for immediate response should a severe, life-threatening situation occur. Medical personnel also made routine visits to a few of the families to deliver food and medicine. With access impeded, school age children were likewise unable to get to their bus stops to ride the bus to school. AML&R officials were quite cognizant of each of these concerns and in response worked feverishly to speedily re-establish access, particularly for the benefit of those residents with life threatening health problems.

Neds Branch Impoundment was originally part of a large abandoned deep mine and coal processing facility that began operation during the 1950's. As part of the cleaning process, waste coal refuse material was mixed with water to form slurry, which was piped directly into the impoundment to dewater and dry. This process continued for more than a decade until the facility ceased operation during the 1960's. The AML&R office's engineering consultant was well underway with a detailed design and restoration plan and had intended to solicit construction bids to completely restore the site in the not-to-distant future. A sudden change in events as a result of extremely wet conditions, however, ultimately redirected their efforts.

II. Reclamation Plan

Reclamation at the Neds Branch Impoundment site was completed in two phases. Phase 1 work started immediately and consisted of swiftly removing coal refuse, slurry and debris out of the hollow and roadway to reestablish access to the homes, as well as to restore proper stream flow within the main channel of Neds Branch. Temporary measures were also undertaken to prevent additional coal slurry releases from occurring at the head of the hollow until a permanent abatement plan could be initiated. Phase 1 work primarily consisted of constructing several thousand feet of temporary roadway, excavating several thousand cubic yards of refuse material and debris, reestablishing the stream channel, and installing temporary diversion channels around the failed impoundment to prevent further slurry movement.

II. Reclamation Plan (continued)

Within five days, a temporary access road was in service and residents as well as emergency service vehicles were again able to travel in and out of the hollow. As work on the first phase proceeded, a design consultant quickly developed a final site reclamation plan to permanently stabilize the remaining impoundment. For a period of twenty-five days, construction crews and AML&R personnel worked 24 hours a day, seven days a week. On March 12, 2003, Phase 1 work ended with the reclamation cost totaling \$675,225.

Phase 2 work commenced the following day, on March 13, 2003. During this stage, activities basically involved completely reconstructing and stabilizing the slurry embankment, establishing proper drainage control and site regarding, and permanently replacing the original access road. By the time the project ended, more than one-half million cubic yards of refuse and rock had been excavated, 6,000 lineal feet of drainage control channels and piping were built, four deep mine portals had been sealed, 2,400 lineal feet of county roadway was reconstructed and paved, and a total of 43 acres were revegetated. Most of the excavated rock was used to construct the large rock-toe buttress and provide the select embankment fill to stabilize the breached slurry impoundment.

Just as with the work on Phase 1, construction crews and AML&R personnel worked 24 hours a day, seven days a week. On October 23, 2003, after a period of thirty-three weeks of non-stop effort, Phase 2 work ended with a reclamation cost of \$2.4 million. Collectively, restoration expenses amounted to just over \$3 million.

III. Reclamation Benefits

The rapid response by AML&R emergency personnel helped to minimize the inconvenience and hardship imposed upon the area's local residents by this unpredictable event. Even after the material had ceased to move, and everything seemed calm, the site was still quite dangerous. AML&R emergency personnel directed the Phase 1 contractor to construct diversion ditches around the remaining material, still precariously perched at the head of the hollow, to prevent additional rainfall from causing further movement. Unbelievably, a few local ATV enthusiasts continued to ride through the area, attempting to venture out on what remained of the slurry impoundment. AML&R emergency personnel promptly stopped these individuals and remained on-site 24 hours per day to keep riders out of the hazard zone and work area. At the same time, everyone involved worked feverously to re-establish access for those individuals that lived along Ned Branch, so they could again travel freely to and from their homes.

In addition to the addressed health and safety aspects mentioned above, AML&R's swift response also helped to minimize negative environmental impacts on the state's waterways. These events caused an enormous volume of coal slurry and refuse to end up in Neds Branch near its confluence with the Guyandotte River. Crews moved quickly to excavate this material from the blocked stream channel, which restored the waterway's natural flow and eliminated further black water contamination of the Guyandotte River. Removal of coal slurry and refuse that washed into the Guyandotte River was also a high priority. The Guyandotte serves as an important source of recreation and drinking water for thousands of downstream residents in numerous communities along its course. The speedy removal of slurry and refuse helped the river return as soon as possible to its former pristine condition.

Totally reconstructing and stabilizing the slurry embankment, which was achieved during Phase 2, helped to eliminate future health and safety threats. Constructing drainage control structures throughout the project site also insures that material in the restored structure will never again be given the opportunity to become mobilized and endanger the lives of the West

III. Reclamation Benefits (continued)

Virginia citizens that live along Neds Branch. This project's success was achieved through the professional commitment, knowledge and around-the-clock perseverance of all those involved.

Attached are six before, during and after photographs. These pictures further attest to this project's success and plainly display the astounding transformation achieved through the quick and successful reclamation from all those involved. Captions for each photograph are noted below.

Photo #1: Aerial view looking westward immediately after the structure's failure. The breached slurry dam is shown at the photo's top. Thousands of cubic yards of slurry and coal refuse slid down the hollow for a distance of more than 1,500 feet where it intercepted the county road. It then turned downstream to the right, and moved an additional 1,000 feet to the Guyandotte River. At the bottom left of the photo, the county road is hidden, buried under 20 feet of material. Phase 1, emergency response construction equipment can be seen working on-site. Access into the hollow was via a concrete bridge across the Guyandotte River, visible in the photo's lower right corner.

Photo #2: Surface level view looking up the hollow. Neds Branch road, located at the photo's center, is buried beneath 20 feet of slurry, coal refuse, and broken timber. The path of destruction is about 200 feet wide in this photo. Note the refuse material half way up the power pole at the upper center of the photo.

Photo #3: Regrading the dam face during the early stages of Phase 2 construction to a stable configuration.

Photo #4: Aerial view looking east about half way through Phase 2 construction activities. Construction equipment is seen excavating material out of the valley and wasting it at the head of the hollow. Slurry is being covered with soil and equipment is continuing to regrade the dam's face. The temporary access road is shown at the photo's upper right, now on the far side of Neds Branch.

Photo #5: Restoration during the final stages of Phase 2. This photo shows a rock-toe buttress at the base of the dam with new embankment fill material located directly behind.

Cover Photo - Photo #6: Beautiful post-reclamation aerial view of the project, looking southwest. Shown are the restored and stabilized embankment, fully encapsulated coal slurry and refuse material, final drainage control structures, a re-established stream channel, and a fully restored access road for local residents. Most of the newly restored access road is hidden behind the trees near the bottom of the photo.