

## INTRODUCTION

### Statement of Problem

Underground mining has been conducted in western Pennsylvania for more than two centuries. Many long-established communities are centered near old mining operations with homes built over workings. (See Appendix A to compare McDonald, PA in 1897 with 2000 aerial photography.) Subsidence problems and drainage associated with abandoned mines can often occur slowly over time or quickly without warning.

On 01/25/05, there was a catastrophic "blowout" from a mine pool in the abandoned Nickle Plate Mine (ca. 1890s thru 1930s) in the Pittsburgh coalbed (Pittsburgh Fm., Monongahela Gp.). The extent of the mine workings is estimated to underlie more than a thousand acres and to interconnect with other abandoned underground and surface mines. (See Appendix B for overlay of Underground Mine Map.)

The "blowout" was responsible for damage to public streets and utilities and to private property. Reportedly, with minimal excavation to determine if a water main leak was responsible for the discharge, the mine pool was under such pressure (confined condition) that an open conduit ("hole") was created into a mine void, enlarged by roof collapse, within 10 feet of the surface.

In order to restore the use of public streets and sidewalks and to eliminate noise and costs associated with pumping, a permanent or long-term solution with minimal impact to the community had to be developed and implemented.

### Project Location

The "blowout" occurred at 135 Liberty Street, between the sidewalk and the cartway, in McDonald Borough, Washington County, PA. Options to control the mine pool were considered in that area underlain by, or in the immediate vicinity of, abandoned workings associated with the Nickle Plate Mine in McDonald Borough, Washington and Allegheny Counties, Robinson Township, Washington County, and North Fayette Township, Allegheny County. (See Site Plan for project location and Appendix C - Conceptual Options.)

Three permanent facilities were constructed as part of the project. The receiving streams listed in the table below are tributaries to Robinson Run within the Chartiers Creek Watershed, Ohio River Basin.

### **Permanent Facilities**

<b>Facility</b>	<b>Location Description</b>	<b>Latitude/Longitude</b>
Primary Drain	Aloe Family Limited Partners property (at Test Pit 1) "Alexander Run" Subwatershed North Fayette Township, Allegheny County	40.37844774/-80.23009914
Secondary Drain	Aloe Family Limited Partners property (at Test Pit 3) "Miller Run" Subwatershed North Fayette Township, Allegheny County	40.37631529/-80.23032449
Early Warning System	135 Liberty Street (at "blowout" in replaced sidewalk) Robb Run Subwatershed McDonald Borough, Washington County	40.37269150/-80.23388143

## **Scope of Work**

Initially, the Scope of Work included the following tasks:

- (1) continued pumping at the "blowout" to control mine pool elevation until implementation of a permanent solution,
- (2) development of cooperative efforts with McDonald Borough Council, local businesses, and residents,
- (3) compilation and evaluation of all available, relevant, historical data, including mine maps and previous investigations by US OSM in 2005 and by the former PA Department of Environmental Resources in 1979, 1980, 1981, 1987, as provided by BAMR,
- (4) development of a monitoring program to include the installation of piezometers,
- (5) evaluation of monitoring data collected daily throughout the work week by BAMR,
- (6) investigations of site conditions, including location of existing public utilities and private structures, and
- (7) determination and evaluation of options for an effective and economical permanent or long-term solution to control the mine pool with low impact to the community.

Upon evaluation of the selected option with the implementation and available monitoring of temporary facilities, a conceptual design and proposal to build permanent facilities were submitted to BAMR on 04/18/05. With incorporation of recommended revisions by BAMR, the Scope of Work was revised to include the installation of the following permanent facilities:

- (1) **Primary Drain** to discharge by gravity to "Alexander Run" in order to control the mine pool elevation at the "blowout", includes flexibility to manipulate mine pool elevation, as needed,
- (2) **Secondary Drain** to provide a "back-up" discharge point to "Miller Run" in the event of compromise to the Primary Drain and/or change in mine hydrology over time, and
- (3) **Early Warning System** at "blowout" on Liberty Street to allow the mine pool to remain unconfined (prevent pressure "build-up" of mine pool) in the event of compromise of both the Primary and Secondary Drains and/or of substantial change to in-mine conditions.

The Primary Drain and the Early Warning System are to be equipped with dataloggers for continuous, long-term monitoring of the mine pool. The ability to monitor the mine pool at the Secondary Drain, by manual, downhole, methods, has also been provided.