

CROOKED CREEK MINE DRAINAGE POLLUTION
ABATEMENT PROJECT
ERNEST MINE COMPLEX
INDIANA, PENNSYLVANIA

PROJECT NO. SL-107-2

INTRODUCTION

"Operation Scarlift" is a statewide project of the Pennsylvania Department of Environmental Resources (DER) (formerly Department of Mines and Mineral Industries) to control acid mine drainage pollution from coal mining operations. As part of "Operation Scarlift," a study of the Ernest Mine Complex (Indiana County, Pennsylvania) was conducted in an effort to develop a mine drainage abatement system. The Ernest Complex has been contributing to the mine drainage pollution of the Crooked Creek watershed for several years. This report presents the results of the study and the subsequent construction.

The Ernest Mine Coal Complex, located northwest of Indiana, Pennsylvania, has been continuously discharging acid mine water into the Crooked Creek basin from two mine openings, (1) a large, vertical shaft located one mile east of the Borough of Creekside, Pennsylvania, and (2) a cluster of four closely spaced large diameter boreholes situated one mile west of Creekside, Pennsylvania.

The mine drainage abatement scheme developed for the Ernest Mine Complex included a system of seals and barriers at the previously existing mine openings to divert the acid mine water to a central location where it could be treated and discharged into McKee Run, a tributary of Crooked Creek. To accomplish this objective, it was necessary to increase the elevation of

the water in the mine an additional 35 feet, achieving a gravity flow, without pumping, to the treatment plant site.

The scope of the work was divided into five (5) phases. A discussion of each phase of the work follows.

Phase I - Ernest Mine Complex

Studies were conducted using available mine maps, related documentation, and field surficial investigations to determine those areas directly affected by the mine drainage into Crooked Creek. Development of the mine drainage abatement scheme considered the existing mine water elevations, elevation and seals of adjoining mine complexes, possible effects on residential water supplies, and the proposed treatment facilities. Particular emphasis was placed on the development of a feasible abatement scheme having minimum construction and treatment costs.

Phase II - Surficial and Subsurface Investigation

During Phase II, a surficial and subsurface drilling program was conducted to gather the necessary information for properly designing the mine drainage abatement system as dictated by the abatement scheme developed in Phase I.

Phase III - Design Considerations

Designs for borehole seals, mine entry seals, barriers, and drainage pipe were developed to effect the proposed diversion of the mine water. Design Drawings and Technical Specifications were prepared and submitted to the Department of Environmental Resources to obtain construction bids on the work.

Phase IV - Construction of the Mine Drainage Abatement System.

Construction of the mine drainage abatement system was completed under Phase IV of the project. Several modifications in the design were required to comply with field conditions that varied from the design assumptions. However, the basic concept was not altered and the facilities were constructed at a cost of approximately 85 percent of the base bid.

Phase V - Piezometer Monitoring Program

The final phase of the project was to determine the effectiveness of the various mine seals and barriers by monitoring (1) the water level in the mine and (2) the general area to detect seepage or other water breakouts at ground surface. Water quality tests were conducted by the Department of Environmental Resources during this phase of the project to record the change in water quality resulting from the diversion of the water in the mine.

Appropriate Tables, Figures, and Drawings pertaining to all phases of the study are included herein and related correspondence is presented in the Appendices.