



THE REPORT

## REPORT ABSTRACT

Cogley Run was selected for this mine drainage study because it is currently discharging a large acid load into East Sandy Creek which previously supported a healthy game fishery and recreational potential for the Commonwealth.

The specific purpose of this study is to determine the extent and severity of mine drainage in the Cogley Run Watershed, conduct a detailed pollution source inventory, determine the impact of this pollution on East Sandy Creek, develop remedial measures for each pollution source, estimate the cost of abating the pollution and recommend an abatement plan for the watershed.

Cogley Run is an 3.81 square mile watershed located in Elk and Ashland Townships, Clarion County and Pinegrove Township, Venango County, Pennsylvania. The watershed has a total relief of approximately 460 feet. The coal measures within the counties range vertically from the Mercer bed in the Pottsville Series to the Lower Kittanning formation within the Allegheny group.

The watershed study was planned and executed in phases. All available information was gathered and reviewed in detail. Weir locations were selected and weirs constructed to monitor the watershed throughout the study.

Detailed field explorations were undertaken to locate, define and evaluate all pollution sources to clearly establish the criterion for abatement plans.

Analysis confirm that Cogley Run is acid in its headwaters and gathers acid loadings downstream to its Junction with East Sandy Creek. The average

pH at the mouth of Cogley Run is 3.42 with an average acid load of 7,779 pounds per day.

The abatement plan is based on all findings gathered during the course of the study and is presented in this report. The plan includes priority ranking of the pollution sources, recommended implementation of abatement measures and the preparation of plans and specifications for approved pollution abatement projects.

The abatement as recommended should show a considerable improvement of the water quality in East Sandy Creek. The sealing of an abandoned oil well will reduce the acid load delivered by Cogley Run by 1,145 pounds per day. The restoration of three other pollution source areas including two proposed mine seals should reduce the acid loadings from these areas by approximately 9% or 5,023 pounds of acid per day. This would account for a total acid load reduction to East Sandy Creek of 6,168 pounds per day.

The total iron load delivered by Cogley Run to East Sandy Creek should also be reduced by 431 pounds per day, using the above methods of calculation for the reclamation of all source areas.

Completion of all recommended abatement measures for Cogley Run should greatly improve the lower nine miles of East-Sandy Creek and return this stream to an outdoors recreation area once more.

The average abatement cost per pound of acid prevented from entering East Sandy Creek from Cogley Run is \$49.87.

## INTRODUCTION

The Pennsylvania State Legislature mirrored the desires of the citizenry by stating its intentions in the 1965 Clean Streams Law; "...to reclaim and restore to a clean, unpolluted condition every stream in Pennsylvania that is presently polluted..."

It was known that in order to accomplish this goal, abandoned mine drainage (the most serious source of pollution in Pennsylvania) would have to be abated. During December 1967, the State Legislature enacted "The Land and Water Conservation and Reclamation Act" (Act 443) which authorized the establishment of an indebtedness of \$500 million for the conservation and reclamation of land and water resources. Of this total, \$150 million was allocated for the prevention, control and elimination of stream pollution from mine drainage.

The Department of Mines and Mineral Industries began the investigation of the acid mine drainage pollution of Cogley Run in 1968. The date of the first investigative visit to the area is unknown but under date of December 5, 1968, Mine Inspector Charles Spielman, in a memorandum to the Honorable Charles Manula, Deputy Secretary of the Department of Mines and Mineral Industries, reported that he and Mine Inspector Robert Emigh, together, on November 22, 1968 and again on November 27, 1968 revisited the Cogley Run watershed area. The memorandum made certain recommendations for the abatement of some of the pollution. The memorandum was accompanied by a map which, by symbols, was related to the report.

In February, 1970, the Bureau of Mining Area Restoration of the Pennsylvania Department of Mines and Mineral Industries was requested to conduct an investigation of the mine drainage pollution of Cogley Run. A preliminary investigation was begun on May 4, 1970.

On January 19, 1971, the Department of Mines and Mineral Industries was abolished and the Department of Environmental Resources was formed. The Office of Resources Management under the Department of Environmental Resources continued the investigation of coal mine drainage pollution within the Cogley Run Watershed in Clarion and Venango Counties.

The investigation was directed by 141r. A. E. Molinski, District Engineer, Office of Resources Management. The Project Engineers in charge were Walter Zimmerman and Michael R. Ferko with the assistance of the District Office staff.

Cogley Run is one of several tributaries to East Sandy Creek which in turn is a source of pollution to the Allegheny River. Cogley Run currently is acid throughout its length. The bulk of the mining conducted within the watershed has been confined to the upper reaches of the stream and this past mining activity combined with a discharge from an abandoned oil well degrades the entire stream and ultimately the water quality of East Sandy Creek and the Allegheny River.

An improvement of Cogley Run water quality may ultimately improve East Sandy Creek from its junction downstream to the Allegheny River. Any successful abatement procedures on Cogley Run would tend to improve the water quality of both Cogley Run and East Sandy Creek. This report is one step in meeting this challenging problem.

## PURPOSE

The purpose of this study was to:

- (1) Determine the extent and severity of mine drainage pollution of Cogley Run and its tributaries.
- (2) Conduct a pollution source inventory by locating and measuring the specific discharges associated with past and present mining.
- (3) Determine the impact of Cogley Run on the quality of East Sandy Creek.
- (4) Develop measures for each significant source of pollution which would control and/or eliminate the pollution.
- (5) Rank the measures according to recommended priority.
- (6) Develop and recommend an "abatement plan" for the watershed.