Introduction

THE PURPOSE OF THIS GUIDE

This guide is intended to familiarize citizens and grassroots groups with the history and chemistry of coal mine drainage (CMD) from abandoned mines and to provide the tools needed to attack the problem creek by creek, river by river, until the waters of Appalachia once again run clean.

The guide provides an overview of the step-by-step process of contaminated CMD clean-up and the role that citizens and grassroots groups can play in that process. The steps include:

Step 1. Understanding Coal Mine Drainage
Step 2. Getting Organized
Step 3. Assessing the Watershed
Step 4. Understanding Clean-up Options
Step 5. Establishing a Clean-up Plan
Step 6. Financing and Implementing Your Plan

It is ***not*** a technical or regulatory document: it is a guide for citizens who want to join with public agencies, universities, businesses, industry and other watershed stakeholders, to do something about CMD from abandoned mines in their watershed.

In This Chapter...

THE PROBLEM

Cleaning up and protecting waterways is built on three main principles:

- *First, the target watersheds should be those where pollution poses the greatest risk to human health, ecological resources, desirable uses of the water, or a combination of these factors.*
- *Second, all parties with a stake in the specific local situation should participate in the analysis of problems and the creation of solutions.*
- *Third, the actions undertaken should draw on the full range of methods and tools available, integrating them into a coordinated, multi-organization attack on the problems.*

Environmental Impacts from CMD

Contaminated water seeping from abandoned coal mine areas is the most severe water pollution problem in the coal fields of the Appalachian mountains of the eastern United States. Although there are many possible contaminants in and around abandoned mines, the most common and severe problem is the formation of acid mine drainage (AMD), which can kill fish and aquatic insects, stunt plant growth, eat away concrete and metal structures, raise water treatment costs, and color stream banks and beds a bright, rusty, garish orange. In addition, AMD can leach toxic concentrations of metals like iron, and aluminum from mine rocks, causing further contamination of creeks, rivers, and ground water. The problems of coal mine drainage are not always from AMD; toxicities of certain metals and even alkaline mine drainage can cause water quality problems in the eastern United States.

While millions of dollars in water treatment have been spent on CMD, serious problems remain. More than 7,500 miles of Appalachian streams are affected by CMD, with 80 percent of them in western Pennsylvania and West Virginia.

Economic Impacts of CMD

The Pennsylvania Fish and Boat Commission estimates the economic losses from CMD impacts on fisheries and recreational uses in that state alone at $67 million annually.

The U.S. Bureau of Mines estimates that the mining industry spends about $1 million a day on treatment at working mines. Clean-up projects at abandoned mines often involve costs in the hundreds of thousands of dollars and more. However, lost revenues from degraded recreational areas, increased drinking water treatment costs, and the impact CMD can have on local communities is often much greater than the expense involved in preventing and treating it. Successful clean-up projects, though often expensive, have significant impacts on communities and their economic development potential. For example, after a heavily contaminated 13-mile stretch of Pennsylvania's Clarion River was restored through the efforts of a CMD clean-up coalition, a thousand delighted people turned out to witness the first fish-stocking. The revitalization of parts of the Clarion has led to a proposal to designate the waterway as a National Wild and Scenic River, a distinction enjoyed by only the Nation's highest-quality waters. The environmental, economic, aesthetic, and community benefits of cleaning up CMD make the endeavor more than worthwhile.

THE CHALLENGE

Eliminating CMD from abandoned mines and restoring rivers and streams to a healthy state represent significant challenges. While the federal Surface Mining Control and Reclamation Act of 1977 (SMCRA, often pronounced "smack-ra" or "smick-ra") provides a powerful vehicle for citizen and agency oversight of post 1977 mining operations, the authority for government action at pre-law, or abandoned mines is limited; identifying parties responsible for conditions at abandoned sites is difficult and often impossible.

Considering the scope of the challenge and the resources required to mount a successful clean-up program, it is widely recognized that an active, cooperative partnership between involved citizens, academia, industry, and public agencies is essential in attacking CMD from abandoned mines. For more information on SMCRA and citizen involvement under SMCRA, see **Appendix B.**

What are "Pre-law" Mines?

Pre-law mines *refer to coal mines that were abandoned before the 1977 Surface Mining Control and Reclamation Act (SMCRA) law took effect. This guide specifically addresses these "pre-law" mines since the authority and resources for government action at these sites is limited and the magnitude of the problem is so great.*

A FRAMEWORK FOR ACTION

Starting in the 1930's under the Works Progress Administration (WPA) program, through the 1970's with "Operation Scarlift," and continuing up to the present under the various abandoned mine land programs, public agencies have been actively working to tackle CMD. To bring greater awareness, attention, and resources to abandoned CMD, the Office of Surface Mining (OSM) Appalachian Clean Streams Initiative (ACSI) and the U.S. Environmental Protection Agency (EPA) Region 3 Coal Mine Drainage Initiative (CMDI) have teamed up to provide leadership to a coalition of parties interested in CMD. In 1995, the coalition developed the Statement of Mutual Intent (SMI) Strategic Plan. The SMI provides a framework for action to address water quality problems at abandoned coal mines; more than 80 parties have signed the SMI.

Role of Citizens and Grassroots Organizations

Participation by citizens and grassroots organizations in the watershed is critical because they often have the greatest understanding of the problem, as well as the

Objectives of the Statement of Mutual Intent

Build a clearinghouse to share and exchange data and information identifying mine drainage sites and catalogue abatement technologies that can restore water quality adversely affected by CMD.

Raise public awareness about the serious environmental problems associated with abandoned coal mine drainage.

Focus efforts to target streams degraded by mine drainage for cleanup.

Work to develop and apply the best technology available for cleaning up and preventing contaminated mine drainage.

Support an effective remining program to eliminate some of the mine drainage problems.

Provide forums to transfer technology and other information about improving and restoring watersheds degraded by mine drainage.

Develop shared information management systems to minimize overlap in data collection and development.

Prepare periodic reports describing the extent and severity of the mine drainage problem and the current status of ongoing efforts to improve and restore degraded watersheds.

greatest interest in cleaning up the stream or creek. The role of citizens and the organizations they form was highly regarded by the coalition of public agencies and nongovernment groups involved in developing the 1995 SMI. A progress report issued by the group in 1995 noted that:

"Grassroots organizations, in the form of watershed coalitions, associations, advocacy groups, improvement committees, etc., are the heart and soul of the movement to clean up [contaminated] mine drainage and polluted streams."

ABOUT THIS GUIDE

This guide was developed through a cooperative effort by an ad-hoc citizen's workgroup, EPA Region 3, and the Office of Surface Mining (OSM). It has been designed to help citizens understand CMD issues and clean-up options for abandoned coal mine drainage sites.

A Citizen's Handbook to Address Contaminated Coal Mine Drainage was one of the needs identified in the SMI Strategic Plan. The guide does not contain engineering specifications for treatment systems, detailed information on water testing methodologies, or parameters for computer modeling of affected watersheds. It does, however, provide a straightforward explanation of the issues involved, actions required to address them, and references for more comprehensive discussions on the various topics.

Two CMD case studies are woven throughout the guide to highlight where watershed groups have successfully tackled CMD problems. The case studies are clearly identified with icons.  refers to the Oven Run Project in Somerset County, PA, and  refers to the Mill Creek Project in Clarion and Jefferson Counties, PA. In addition, the guide provides a resource information section at the end of each step for those who want more information on the material covered.

Appendices are located at the end of the guide that include the following:

Appendix A: Glossary of Terms
Appendix B: Information on the Federal Surface Mining Control and Reclamation Act of 1977
Appendix C: Watershed Delineation Instructions
Appendix D: Stream Water Quality Form
Appendix E: Detailed Information on Treatment Technologies
Appendix F: Matrix of Possible Funding Sources
Appendix G: Fact Sheet on Frequently Asked Questions About OSM's Appalachian Clean Streams Initiative (ACS I) Funding