

*Model State Program for*  
**CONTROL AND PREVENTION  
OF WATER POLLUTION  
FROM COAL PREPARATION PLANTS  
AND REFUSE DISPOSAL AREAS**

**OHIO RIVER VALLEY WATER SANITATION COMMISSION**

*an interstate agency representing*

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MODEL STATE PROGRAM  
FOR CONTROL AND PREVENTION OF WATER POLLUTION  
FROM COAL PREPARATION PLANTS AND REFUSE DISPOSAL AREAS

June, 1979

Ohio River Valley Water Sanitation Commission  
414 Walnut Street Cincinnati, Ohio

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## FOREWORD

Coal mining may produce a wide range of environmental problems, including mine drainage, sedimentation, surface subsidence, and surface scarring. Wastewaters from coal preparation and disposal areas are not innocuous; they may contain acid-producing material, trace metals, and organic substances. In coal preparation and refuse disposal facilities, each of these pollutants has the propensity to be carried into the aquatic environment via leachate and runoff. Some of the resultant problems can be rectified, however, through proper planning and adequate financing for facility closure.

To address these problems, an ad hoc work group on mine drainage was formed in 1976 by the Ohio River Valley Water Sanitation Commission's Engineering Committee. The group was charged with the task of developing a model state program for control and prevention of water pollution from mining activities, with particular emphasis on coal mining.

The following report is the third and last in a series of model programs developed by the ad hoc group. Already completed are two reports, Model State Program for Control and Prevention of Water Pollution from Underground Mines and Model State Program for Control and Prevention of Water Pollution from Surface Mines.

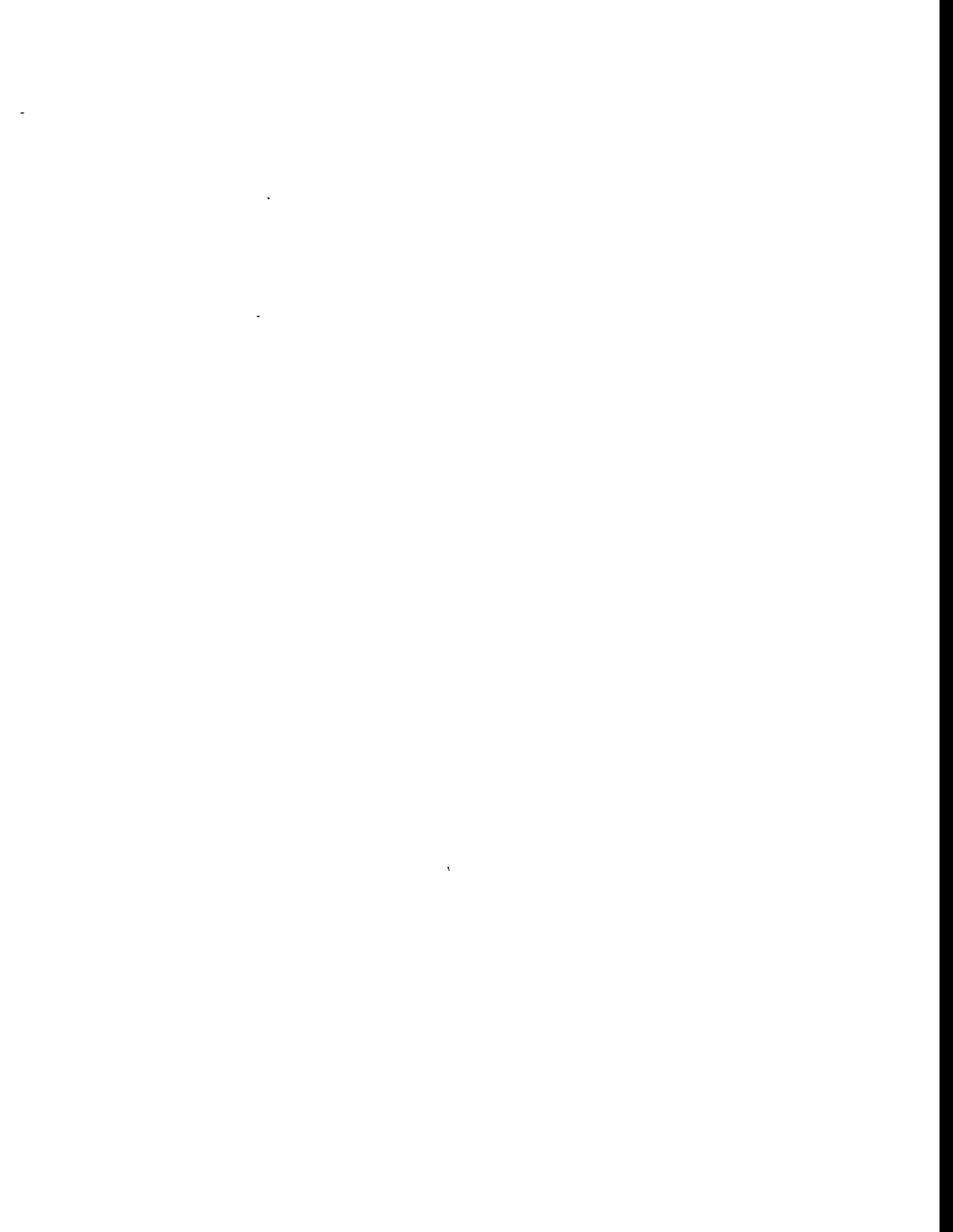


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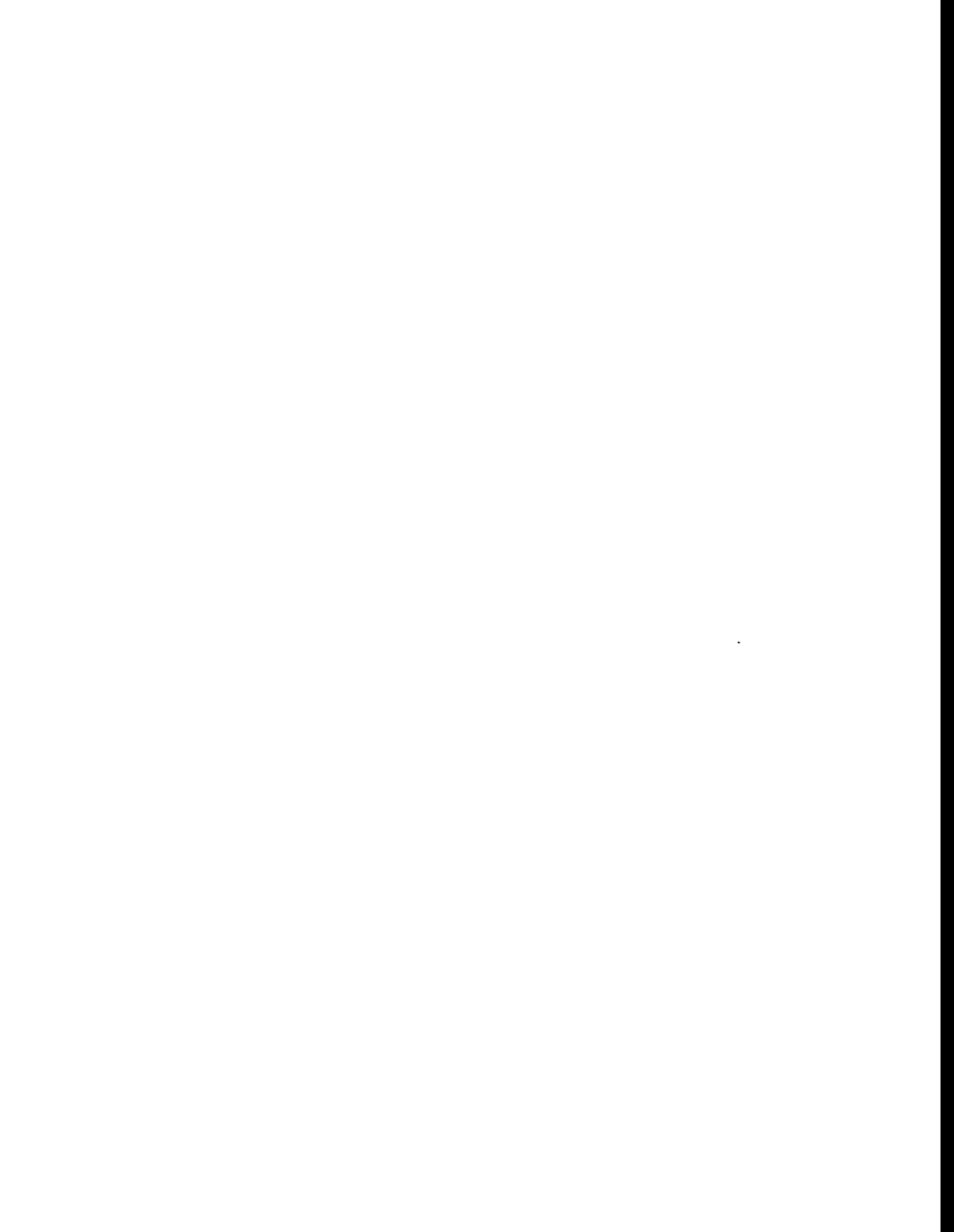




## SUMMARY

The following report describes a model state program for control and prevention of water pollution from coal preparation plants and coal refuse disposal areas. This program is composed of four elements: 1) evaluation of the proposed site to assess suitability for detailed engineering design, 2) pre-construction planning to provide proper design of the new facility, 3) control of the facility's operation to insure that the approved plan is followed during its active life, and 4) post-operation control to guarantee satisfactory closure, reclamation, and maintenance of the area.

The evaluation of the proposed site identifies technical details required to determine site suitability for developing a preconstruction plan. Information to be gathered includes details of the facility site, conformance to basin/areawide plans, and a plan for collection of environmental data. Preconstruction planning covers such areas as site description, the facility plan, hydrologic assessment, drainage control and treatment needs, proposed monitoring, and plans for reclamation and closure. Factors of importance during facility operation include compliance monitoring, facility inspection, operation and maintenance of facilities, coal refuse disposal progress reports, and the enforcement program. Post-operation control insures that adverse environmental impacts are minimized through reclamation, closure of monitoring wells, inspection and monitoring, establishing a perpetual term of responsibility, and enforcement. The program also delineates the extent of legal authority necessary for conducting an effective control program and professional expertise required to implement such program.



## INTRODUCTION

This model program is intended to provide administrative/regulatory guidance to the states signatory to the Ohio River Valley Water Sanitation Compact for the abatement of water pollution resulting from coal preparation plants and coal refuse disposal facilities. It addresses implementation of the Federal Surface Mining Control and Reclamation Act, PL 95-87, as it relates to the impacts of coal preparation and coal refuse disposal activities on water quality. The requirements of the Clean Water Act, PL 95-217, and the Resources Conservation and Recovery Act, PL 94-580, were also considered in this model program.

The adequacy of the state's existing regulatory programs in terms of program coverage, legal authority possessed, and personnel resources available is variable, owing largely to the geographical and mining conditions in each state. This model program describes elements necessary for an ideal regulatory program to control and prevent water pollution from coal preparation plants and coal refuse disposal facilities. It discusses the areas and extent of control necessary, the type of legal authority needed to carry out such controls, and personnel resources required to staff such a program.

The term, "facility," when used in this program, refers to all structures and activities at a site, including the preparation plants, coal refuse disposal areas, wastewater treatment plants, storage areas, transfer lines, haul roads, and all other related areas and activities.

### Objectives

The objective of this administrative/regulatory program is to prevent, to the extent possible, the adverse impact of coal preparation and coal refuse disposal activities on both surface water and groundwater quality and quantity. Prevention means minimizing the disturbance to the hydrologic system and treating any contaminated water in order to meet water quality standards.

To achieve these objectives, the responsible state agencies must have the legislative authority to require submission of adequate information and to issue and enforce the necessary permits, as well as the continuing resources to employ adequate, trained staffs. Interaction and cooperation among the agencies is essential to minimize duplication of effort.

The complete program incorporates four major elements: preliminary evaluation of and action on the proposed sites; pre-construction plan review; facility operation and maintenance to comply with conditions of all permits; and closure and reclamation requirements, along with site monitoring.

There must be a provision in the state program which would allow for public participation in the form of a local hearing before a pre-construction plan is approved. Notice of a public hearing should be given in the newspaper and other media of general circulation in the locality of the proposed site and should include exact location of the site, boundaries, and a description of the facility's ownership.

# I

## EVALUATION OF THE PROPOSED SITE

Evaluation of the proposed site involves a preliminary investigation of the feasibility and suitability of locating, constructing, and operating a coal preparation and/or waste disposal facility. The review should be done quickly and should result in a recommendation for the company either to proceed with the detailed engineering plan or select an alternate site. The facility will not be allowed in an area of critical environmental concern or where the mining is incompatible with federal/state/local plans.

The evaluation of the proposed site is a first step in the process of developing a pre-construction plan for approval of the facility. A positive recommendation would allow the company to proceed with further applications. The preliminary approval does not guarantee that future approval (permits) will be issued.

Evaluation of the proposed site involves the following:

### A. Facility Siting

Sufficient information should be submitted to locate the proposed facility precisely and to provide a general description of the facility and water pollution control measures. This will also include the readily available data on geology, hydrology, topography, surface water and groundwater quality and quantity, and terrestrial ecology.

#### (1) Information Needed

- . Exact site location
- . General description of the facility
- . Proposed drainage control and reclamation plan
- . Layout of construction plan
- . Adjacent land use
- . Proximity to surface water
- . Readily available data for the following sections

#### (2) Authority Needed

The agency must have the authority to require submission of general information for a preliminary review and approval or disapproval of the site.

#### (3) Personnel Needs

Expertise in hydrology, geology, and reclamation is required for all phases of the review process.

## B. Conformance to Basin/Areawide Plans

Areas not suitable for preparation plants and coal refuse disposal or environmentally sensitive areas should be included within the scope of the areawide 208 planning process.

### (1) Information Needed

The regulatory agency responsible for mining activities should cooperate with those agencies doing the planning. Information on the planning activities--areawide plans and federal/state/local land use plans or restrictions--must be available to the mining company and the regulatory agency.

### (2) Authority Needed

The state agency must have authority to require that the proposed site conform to state and areawide water quality management plans and federal/state/local land use plans or restrictions.

### (3) Personnel Needs

No special expertise is needed.

## C. Baseline Data Collection

This is the plan for the collection of pre-construction baseline data on surface water and groundwater quality and quantity and monitoring locations.

### (1) Information Needed

- . Monitoring locations
- . Sampling frequency
- . Parameters to be monitored
- . Type of sample
- . Construction of monitoring wells and procedures to minimize groundwater contamination .
- . Depth of groundwater

### (2) Authority Needed

The regulatory agency must have the authority to require the above information and approve or disapprove the plan.

### (3) Personnel Needs

There is a need for expertise in hydrology, geology, and environmental engineering/science.

## II

### PRE-CONSTRUCTION PLANNING

An adequate pre-construction plan is a prerequisite for ameliorating the adverse impacts of proposed coal preparation and coal refuse disposal facility operation on surface water and groundwater quality and quantity. It is based on a study which details physical, chemical, hydrologic, and biological systems operative at the proposed site.

Pre-construction planning includes construction, operation, and reclamation plans. It identifies the procedures to be used for grading, erosion control, water management, treatment, and construction, along with plans for establishing vegetation on all disturbed areas.

Administratively, the pre-construction plan serves as a mechanism for approving or disapproving a proposed coal preparation and coal refuse disposal facility. Sufficient technical detail must be available in a pre-construction plan to provide a sound basis for either approving or denying permits for the construction and operation of the facility.

The program for evaluating a pre-construction plan involves several considerations.

#### A. Site Description

Sufficient hydrologic and geologic data must be collected and submitted to provide a basis for assessing the effect of proposed facilities on surface water and groundwater quality and quantity. These predictions may then be used as a basis for the design of appropriate prevention and control measures.

##### (1) Information Needed

Geologic data, including faults, joints, fractures, porosity, permeability, and types of surface soils, are important factors in the evaluation of a construction plan. The following information must be submitted either by the operator or obtained from the agency records.

- . Climatological data
- . Geological structure--known faults and fractures and their effect on the groundwater flow system around the facility
- . Physical data on soil and surface strata
- . Regional and local groundwater flow systems
- . Surface water and groundwater quality and quantity
- . Location and depth of groundwater and location of all surface springs and seeps
- . Description of existing land use

(2) Authority Needed

State laws and regulations must provide the authority to require the applicant to submit the needed information. There should be provisions in the law and regulations to insure coordination and cooperation among the various state agencies. This is necessary to avoid duplication of effort, to provide notifications of future facility construction, and to prevent any accumulative adverse impact on the watershed.

(3) Personnel Needs

Expertise in hydrology is necessary to evaluate the information submitted.

B. Facility Plan

The facility plan includes a detailed engineering layout of the proposed site, the sequence of construction, and a description of the facility operation. This plan must be evaluated to determine its compatibility with the hydrologic and geologic features of the proposed site.

(1) Information Needed

In order to evaluate the facility plan the following information is needed:

- . Facility layout plan and construction schedule
- . Detailed layout of storage areas, top soil, etc.
- . Location of haul roads
- . Location of discharges
- . General layout of drainage control plan over the entire site
- . Waste handling methods of sludge and slurry, i.e., layering, compacting, and sealing

(2) Authority Needed

The regulatory agency must have the authority to require the above information from the operator and to approve or disapprove the proposed plan.

(3) Personnel Needs

Expertise in geology and civil engineering is needed to perform a proper evaluation of the facility plan.

C. Hydrologic Assessment

This assessment will evaluate the potential adverse impacts on the surface water and groundwater systems.



(1) Information Needed

- . Water quality standards--both surface water and groundwater
- . Surface water and groundwater uses
- . Data collected under elements A and B

(2) Authority Needed

The regulatory agency must have the authority to require the above information and to establish water quality standards.

(3) Personnel Needs

Expertise in hydrology, geology, and civil engineering is needed for this assessment.

D. Drainage Control and Treatment Needs

The prevention of pollution from surface facilities and storm-water runoff is necessary to protect water uses. In order to evaluate the impact of water quality, it is necessary to estimate quality and quantity of discharges from the proposed facility, to establish treatment requirements to meet water quality standards, and to develop management practices to control stormwater runoff.

The pre-construction plan should include specifications of any proposed treatment facility and engineering design for drainage, erosion and leachate control, and procedures for ameliorating the adverse impacts on surface water and groundwater quality and quantity. The specifications must be in compliance with the state/federal requirements and standards.

(1) Information Needed

- . Location and flow of natural drainage courses within the area
- . Means of transporting contaminated water, including leachate, process water, and slurry area runoff, to the treatment plant and, if necessary, the chemical treatment to be used
- . Water diversion plans
- . Erosion control plan
- . Settling basin size and construction

(2) Authority Needed

The regulatory agency must have the authority to require the submission of the above information and to approve or disapprove drainage/erosion/treatment plans.

(3) Personnel Needs

Expertise in civil engineering and chemistry is needed to perform this evaluation.

## E. Monitoring Plan

The operator must present a self-monitoring program to determine impacts of coal preparation and coal refuse disposal facilities on surface water and groundwater quality and quantity. Such a plan would include the pre- and post-operation monitoring. The plan should also provide data to assist in the proper operation of the treatment facility.

### (1) Information Needed

The monitoring plan must provide the following information:

- . Monitoring locations
- . Parameters to be monitored
- . Types of sampling
- . Frequency of sampling
- . Groundwater level, infiltration rate, and storage characteristics of the area
- . Construction of monitoring wells

### (2) Authority Needed

The regulatory agency must have the authority to require the above information and modifications to the monitoring plan. Authority is also needed for regional groundwater level monitoring to determine the effects of facility operation on aquifer recharge capacity and other groundwater factors. The regulatory agency can require the operator to drill additional wells.

### (3) Personnel Needs

Expertise in hydrology, geology, and environmental engineering is needed for this evaluation.

## F. Reclamation of Closure Plan

Reclamation of surface areas disturbed by preparation plants and coal refuse disposal facilities will minimize erosion and sedimentation and adverse hydrologic impacts.

### (1) Information Needed

In order to be certain that the reclamation is properly done, the reclamation plan must include:

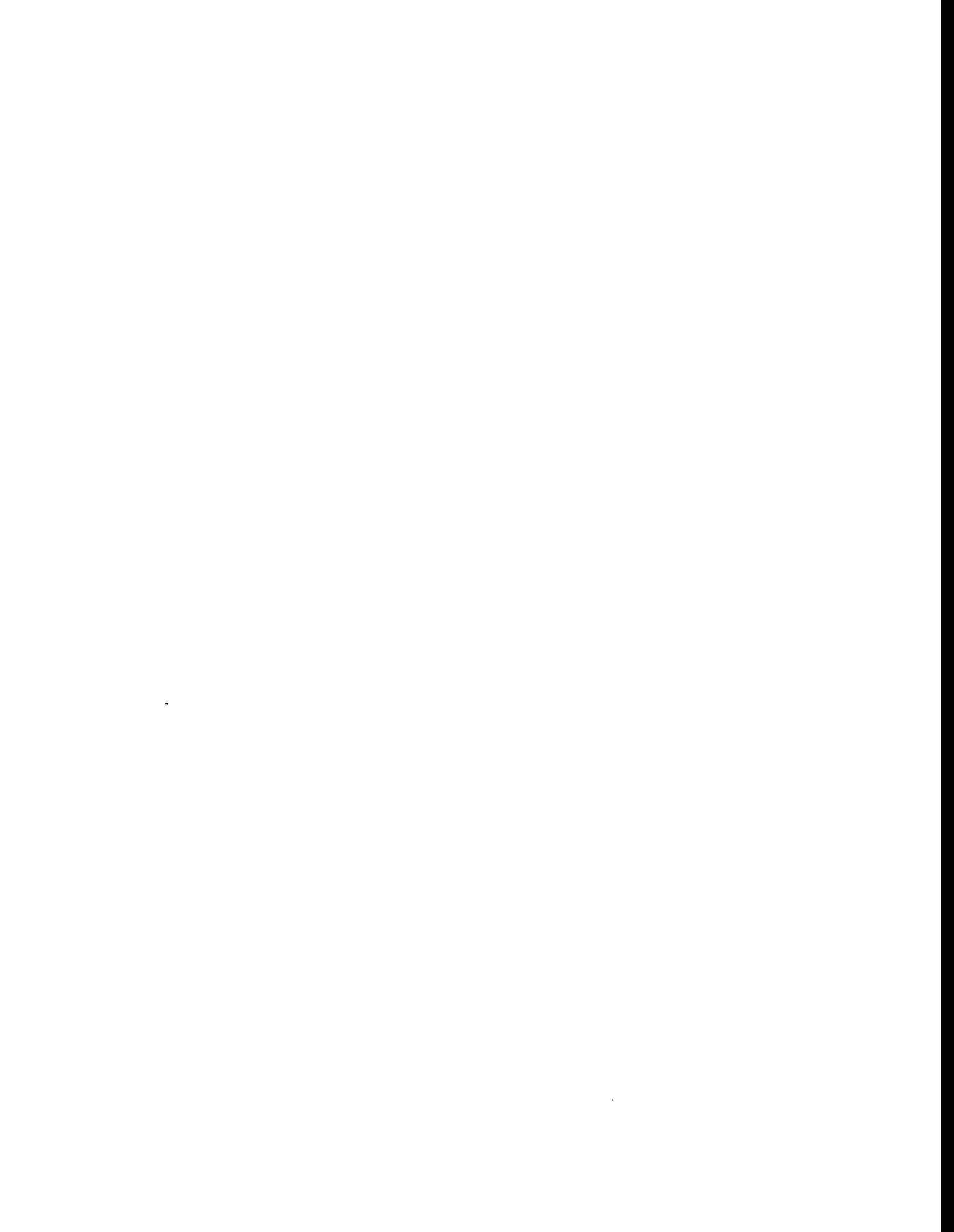
- . Limits of the area to be disturbed
- . The grading and final slope to be maintained
- . The type of cover to be planted on the exposed area
- . The plan to minimize adverse impacts to the hydrologic system

(2) Authority Needed

The state agency must have the authority to require the needed information from the facility operator, to require that the land be properly maintained and stabilized, and to approve or disapprove the plans.

(3) Personnel Needs

Expertise in agronomy, soil science, and civil engineering is needed for this evaluation.



III  
FACILITY OPERATION

The period of facility operation begins with site preparation and ends with closure. During this period, there is a potential for surface and subsurface changes which could have an adverse impact on the surface water and groundwater quality and quantity both on and off the site.

The program regulating facility operation involves several factors:

A. Compliance Monitoring

The inspection and analysis of discharges emanating from the subject operations are necessary to determine compliance with permits and regulations. Compliance monitoring is a combination of monitoring and inspection by the agency, self-monitoring and reporting by the operator, and review of the self-monitoring reports by the agency. It includes a quality control program to insure that the methods of analysis used by the operator are adequate.

(1) Information Needed

Information on the quality and quantity of all point and nonpoint source discharges from the area is necessary for the evaluation. The parameters needed to evaluate the surface water quality impacts would include, but are not limited to, flow, pH, conductivity (total dissolved solids), total suspended solids, acidity/alkalinity, sulfate, and trace metals associated with the drainage and leachate. The parameters needed to evaluate groundwater impact would include the same parameters as above except suspended solids, as well as the level and direction of groundwater flow. The frequency of sampling would be determined by variability of discharges, type of receiving waters, level of activity, field conditions, permit limits, and other regulatory requirements.

(2) Authority Needed

There must be adequate legislation to require self-monitoring by the operator and to allow regulatory authorities to monitor compliance with permits, laws, and regulations; to enter private property for the purpose of inspection; and to inspect records.

(3) Personnel Needs

Expertise needed for this evaluation includes chemistry, hydrology, and environmental engineering.

## B. Facility Inspection

The inspection of facility operations is necessary to insure compliance with pre-construction plans and to evaluate the water handling procedures. An inspection of pollution control facilities should be conducted to insure that the facilities are being operated and maintained in accordance with the approved plans.

### (1) Information Needed

Information needed for this inspection includes the facility development plan and schedule, the water handling plan, and the haul road maintenance and reclamation plans.

### (2) Authority Needed

The state agency must have the authority to require the submission of the above information, to make inspections, and to require corrective actions.

### (3) Personnel Needs

Expertise in the design and operation of coal preparation facilities, water treatment, and coal refuse disposal is needed for this evaluation.

## C. Operation and Maintenance of Facilities

Proper maintenance and operation of equipment will greatly reduce the chances of failure, thereby minimizing water quality problems and violation of permit requirements. Assurance is necessary that the operation and management plan is being implemented.

### (1) Information Needed

Information needed for this evaluation includes an operating report, a description of the maintenance program, and maintenance logs.

### (2) Authority Needed

Authority must exist to require proper maintenance and operation of water pollution control facilities, notification of facility failure and abnormal discharges, and correction of any facility failure.

### (3) Personnel Needs

The personnel required for this evaluation would be field inspectors knowledgeable in maintenance and operation of pollution control facilities.

D. Coal Refuse Disposal Progress Report

A certified map showing the extent and cross-section of coal refuse disposal operations should be submitted periodically to record the extent of disposal activities and to compare with the pre-construction plan.

(1) Information Needed

A disposal progression report and maps should be submitted periodically. The map should show the active disposal area, area regraded, area revegetated, and modification of water pollution control facilities necessitated by coal disposal and reclamation progress.

(2) Authority Needed

Authority is necessary for the agency to require the submission of the above information.

(3) Personnel Needs

Expertise in water pollution control, coal refuse disposal, and reclamation is needed for this evaluation.

E. Enforcement Program

The regulatory agency must have the capability to initiate administrative, civil, or criminal actions to obtain compliance and assess penalties for noncompliance with rules, regulations, and other permit requirements.

(1) Information Needed

Violation of permits, regulations, and laws must be documented with sufficient evidence to undertake needed actions.

(2) Authority Needed

The state agency must have sufficient authority to initiate:

(a) Administrative and civil actions

- . Verbal orders/instructions
- . Violation notices
- . Orders (written) to correct violations
- . Order to cease and desist operations
- . Permit revocation/suspension
- . Future permit denials
- . Economic sanctions
- . Provide for hearings

(b) Criminal actions

- . First level judicial actions by field inspectors for relatively minor offenses (usually heard before a district magistrate)
- . Second level judicial court actions for more serious offenses (usually before a criminal court)

(3) Personnel Needs

Expertise required in field inspection and assessment techniques and law/environmental law.



## IV

### POST-OPERATION CONTROL

In the past, many coal preparation plants and coal refuse disposal facilities were abandoned without the benefit of adequate reclamation. Abandonment was often the beginning of continuing environmental degradation and the source of countless pollution problems. This abandonment imposed huge costs on the public in the form of stream pollution, flooding, landslides, loss of fish and wildlife habitats, scarred and unreclaimed land, erosion, and loss of aesthetic values.

Post-operation control insures that adverse environmental impacts are minimized through proper reclamation and maintenance. The various considerations involved in post-operation control are:

#### A. Reclamation

Reclamation of surface areas disturbed by all phases of coal preparation and coal refuse disposal activities is essential for preventing pollution from the area, removing hazards, and making the site aesthetically pleasing and available for alternate uses.

##### (1) Information Needed

A copy of the reclamation program submitted in the pre-construction plan is required, as well as an evaluation of the program's adequacy in relation to existing conditions of the site, 208/303(e) plans, and other regional plans.

##### (2) Authority Needed

The state agency must have the authority to require compliance with the approved reclamation plan and with regional programs. Authority is also needed to conduct final inspection and require modifications where necessary.

##### (3) Personnel Needs

Personnel required would include experts in reclamation procedures and personnel familiar with federal/state/local land use plans.

#### B. Closure of Monitoring Wells

All monitoring wells need to be sealed to remove hazards and prevent groundwater pollution. However, some of the wells may remain open for a period of time after reclamation to determine the long-term impacts on water quality.

(1) Information Needed

Information needed would include the closure plan approved in the pre-construction plan and an evaluation of its current adequacy, and a statement from the permittee that the approved closure plan was followed. The information submitted in the pre-construction monitoring plan, including location of monitoring wells and operator's self-monitoring plan, will also be needed.

(2) Authority Needed

The state regulatory agency must have the authority to require closure of monitoring wells and modifications to the approved closure plan, if needed.

(3) Personnel Needs

This evaluation requires expertise in hydrology, geology, and environmental engineering.

C. Inspection and Monitoring

In order to insure that adverse hydrologic impacts on and off the site are minimized, an evaluation of the effectiveness of reclamation and other control measures is needed. Site inspection and monitoring will supply information as to whether problems exist and corrective measures are required.

(1) Information Needed

Necessary information required for inspection and monitoring would include the general hydrologic and geologic data already submitted in the pre-construction plan, the location and specification of permanent water diversions and impoundment structures, the pre- and post-operation surface water and subsurface water quality, the location of monitoring points, and the final reclamation map.

(2) Authority Needed

Authority is needed to conduct water quality monitoring, hydrologic assessment, and inspections. Authority to require correction of existing and/or potential problems identified during inspections is also necessary.

(3) Personnel Needs

Expertise in reclamation procedures, geology, hydrology, and civil engineering is required.

#### D. Term and Scope of Responsibility

The operator should be responsible for the abatement of adverse impacts on surface water and groundwater quality and quantity, both on and off the site. Generally, the term of responsibility is perpetual. Initially, this responsibility should be guaranteed through the posting of a bond by the permittee. The period of bonding should not be less than five years. The bond should be released when the regulatory authority is satisfied that reclamation requirements and other hydrologic system protection requirements have been met. This bond release in no way relieves the operator from his perpetual responsibility. The operator may be released from the responsibility only if it is legally accepted by another institution.

##### (1) Information Needed

The permittee must submit the appropriate bond and describe the arrangements that have been made for perpetual responsibility.

##### (2) Authority Needed

There must be state legislation which makes the permittee responsible in perpetuity for pollution and/or adverse hydrologic impacts resulting from this operation after reclamation. The state agency must have the authority to require bonding and to approve financial and institutional arrangements to insure that any post-operation problems are corrected.

##### (3) Personnel Needs

Expertise in finance, law/environmental law, insurance, and land reclamation is needed for this program.

##### (4) Institutions

Responsibility for perpetual care of a site could create some legal problems if the operator were to go out of business. The protection against such uncertainty of post-operation pollution control and hydrologic system protection may be provided through institutional arrangements with the state or the mining industry. These institutions may assume responsibility for perpetual care, with rights to assess the operator for such care--an arrangement similar to the perpetual care concept of cemeteries.

#### E. Post-Operation Enforcement

When post-mining pollution problems are identified, the regulatory agency must have the capability to initiate administrative or enforcement actions against the mine operator or his legal agent.

(1) Information Needed

The agency should have evidence to show that the post-operation pollution or adverse impacts on the pre-operation hydrologic system are occurring.

(2) Authority Needed

General authority must be available to require remedial action by the operator or responsible agent.

(3) Personnel Needs

Experts in field inspection and assessment techniques and law/environmental law are required.





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