

APPENDIX C

NATIONAL COAL AREA HYDROLOGY REPORTS

A. The Coal Hydrology Program Of The U.S. Geological Survey As It Pertains To Public Law 95-87¹

In 1974, a cooperative hydrologic studies program was established between the U.S. Geological Survey (USGS) and the Bureau of Land Management (Bureau or BLM) to aid the latter in the acquisition of data and preparation of Environmental Impact Statements (EIS) and Environmental Assessments (EA) required for Federal coal leases.

In fiscal year 1975, the USGS was funded by Congress to investigate the relationship between coal development and water resources, primarily on Federal lands. This complemented and supplemented the work being done for the Bureau but also addressed more basic research needs. In particular, studies of the geochemistry of coal and coal spoils were initiated to assess water-quality impacts.

In 1977, Public Law 95-87, Surface Mining Control and Reclamation Act (SMCRA), was enacted and served to place environmental constraints on all coal through the permitting process. SMCRA stipulated that a state or federal agency would supply the hydrologic information necessary to describe the hydrology of the general area of mining; furthermore, that each mining permit applicant would make an analysis of the potential hydrologic consequences of the proposed mine operation and that the regulatory agency, federal or state, would perform a probable cumulative impact analysis of all anticipated mining in the area. Thus, as a result of the Act, the USGS received significant increases in funding in 1979 and 1980 for hydrologic data acquisition and dissemination, particularly for work in the heavily mined areas of the East.

The passage of the Act set national policy regarding the control of the surface impacts on water resources, and the need to assess and mitigate these potential impacts is spelled out in the Act. One section, 507(b)(11), requires the "appropriate Federal or State agency" to provide "hydrologic information on the general area" to the mining permit applicant. The Congress recognized that this requirement could not be met by existing hydrologic data systems and, therefore, authorized over seven years beginning in Fiscal Year 1979, a total of approximately \$40 million to the Water Resources Division (WRD) to be used in acquiring and disseminating the necessary hydrology information in

¹ Adapted from : Kilpatrick, F. A., 1984, Coal Hydrology Program of the U.S. Geological Survey: 1984 Symposium on the Geology of Rocky Mountain Coal, Proceedings: North Dakota Geological Society, Bismarck, North Dakota 58502, 80 - 88 pp.

support of the Act. Particularly significant is that the program now addresses coal mining related hydrology nationwide on both Federal and private lands.

Deficiencies in hydrologic data were most widespread in the eastern coal areas because of the emphasis in previous years on Federal coal. Furthermore, the intensity of mining and number of mines in the East posed a much greater permitting load on regulatory authorities as well as on the USGS to supply supporting hydrologic data. Initial efforts in the eastern states have been concentrated on surface-water data networks due to the complexity of ground water in the Appalachian coal areas. It is expected that site-specific ground-water data eventually will be available from monitoring requirements imposed on mining permittees. The program which was implemented in the East took two approaches: (1) additional water-quality and sediment data were collected at continuous recording surface-water stations and a limited number of new stations were installed on small drainage area streams, and (2) several thousand synoptic sites were established on small streams draining the coal areas. Synoptic measurements are those taken intensely over a broad area at a set time to give a "snap shot" of hydrologic conditions. For example, many measurements are made quickly over a large area during a period of low flow to reveal the severity of underground mine drainage to compare with a similar set of measurements made during a period of runoff to measure the effects of surface mining which would be more pronounced during periods of rainfall.

B. Products

The principal products of the USGS's Coal Hydrology Program are reports which convey to the mining industry and to regulatory and management agencies, data and knowledge of the hydrology of coal mining. As mentioned earlier, a primary responsibility of the USGS in support of the Act was to acquire and disseminate hydrologic information on the general areas of mining. To accomplish this objective, a series of 62 "coal area" reports was planned to provide an overview of the hydrology of the major coal areas of the Nation.

The reporting units are major regional hydrologic sub-basins and correspond to areas of actual and potential coal mining. Fifty seven of the reports are currently completed. Five of the reports are unscheduled due to low priority and lack of funds. The reports are based on existing data and include much of the water-quality data collected as part of the monitoring program. These reports rely heavily on map presentation of data. They typically contain the following types of information on the area being described:

1. General discussions on:
 - (a) Geology
 - (b) Land forms
 - (c) Surface drainage
 - (d) Land use
 - (e) Soils
 - (f) Precipitation
2. Water-use and stream classifications.
3. A description of the hydrologic networks, including surface and ground water where such exist
4. Hydrologic data and information on surface-water quantity such as:
 - (a) low flow
 - (b) flood flow
 - (c) flow duration
5. Information on surface-water quality includes:
 - (a) specific conductance
 - (b) pH
 - (c) sediment
 - (d) iron
 - (e) manganese
 - (f) sulfate
 - (g) trace elements
 - (h) other as available
6. Information on ground water includes:
 - (a) source, recharge, and movement
 - (b) water-level fluctuations
 - (c) availability
 - (d) quality
7. Water-data sources and references to other information that may be useful in appraising the hydrology of the data

C. Examples of Coal Area Reports

Destroy, M. G., Skelton, J., and others, 1983, Hydrology of Area 38, Western Region, Interior Coal Province, Iowa and Missouri: U.S. Geological Survey Water-Resources Investigations 82-1014.

Herb, W. J., and others, 1983, Hydrology of Area I, Eastern Coal Province, Pennsylvania: U.S. Geological Survey Water-Resources Investigations 82-223.

Slagle, S. E., and others, 1983, Hydrology of Area 49, Northern Great Plains and Rocky Mountain Coal Provinces, Montana and Wyoming: U.S. Geological Survey Water-Resources Investigation 82-682.

Wangsness, D. J., and others, 1983, Hydrology of Area 30, Eastern Region, Interior Province, Illinois and Indiana: U.S. Geological Survey Water-Resources Investigation 82-1005.

D. Additional Information

For details about obtaining copies of specific coal area reports and related hydrologic data contact:

Office of Assistant Chief Hydrologist for Information
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