- labels, permanent
- bottle caps
- bottles
- tape for sealing sample (preferably "evidence" tape)
- chain of custody form
- sample log book with: sample number, time, date, temp., weather, refrigerated, who, split sample

Inspection: Procedures and Pitfalls

This section addresses procedural aspects of inspection. Its purpose is to help inspectors avoid enforcement pitfalls. Each program has different performance standards, language, structure, types of enforcement activities, and required documentation. Therefore, the information given below should not be interpreted as policy, but simply as points to consider.

When a potential violation related to water is detected, the inspector should approach each aspect of sample collection and documentation as though all issues surrounding the violation and its documentation would be subjected to formal review proceedings. This extra care will facilitate any enforcement actions that may later be necessary. The following discussion addresses hydrologic problems as they relate to a "generalized" set of performance standards. It also mentions items of reference that might be considered before enforcement. Each citation given here—the language, documentation methods, details, and the style and content of the narrative—is intended simply as a generalized example. Greater detail is not presented in the examples because site-specific conditions in actual cases and the remedial requirements of each real enforcement action will differ.

Permits and Hydrology

Point-Source Discharges

As a rule, an NPDES or an equivalent State water discharge permit (sometimes both) are required before establishing the location of a "point source," or any limits on the quality of effluents discharging from that location. Circumstances and requirements differ, but operators are generally required to have such permits "in hand". Generally the permit must state the effective period, the identity of the points of discharge, and the parameters to be monitored.

Keys:
- — the Permit Application Package usually contains a list of other permits required for the operation.
- — the Permit Application Package usually contains a copy of the discharge permit application.
- — check with the discharge-permitting authority to see if a permit has been issued or applied for.
- — discharge permits may be issued for other than "point source" discharge — examples are multiple point sources, for drainage areas rather than individual outflows, for deep mine bore holes, for sewage treatment, etc.
- — the point source for enforcement is usually where discharge flows from the permit or disturbed area onto an adjacent area.

Typical Citation:

Failure to have an approved point source discharge permit as required prior to the construction of, or discharge from, a point source.

Documentation:
- — photo of the discharge point and its relationship to the permitted area.
- — record of conversations or discussions with the permittee/operator concerning permit availability for inspection.
- — references to pertinent regulations.
- — records — lab analyses, etc. — pertinent to the waters discharged from the point source in question.

The narrative report should clearly indicate the requirement for a permit, the efforts made by the inspector to document its existence, and any correspondence or applications in which the operator/permittee acknowledged the need for such a permit.

Groundwater Problems

The sequence or other operational aspects of mining such as overburden handling or blasting can cause unanticipated disruption of groundwater flow as well as degradation of groundwater quality. Issues related to groundwater are often brought into question when a complaint is raised or when there is an obvious change in flow volume or pressure at sampling points on either the permit or adjacent areas. Since determinations of cause and effect relationships are usually interpretive and sometimes complicated or extremely technical, the inspector may want additional technical assistance before drawing conclusions as to the cause of any observed effects. Before requesting help, an inspector should reread the Permit Application Package as it relates to the problem and make a tentative finding of cause for the observed effect.

Keys:
- — collect all information relevant to the site and the known affected area.
- — investigate other possible water sources and users who may also be affected to determine the probable scope of the problem.
- — consult the Permit Application Package geology and hydrology sections of the permit in question for premine conditions.
- — review the Permit Application Package(s) for adjacent or nearby permits having similar geologic and hydrologic structure and problem histories.
- — examine the PHC and CHIA for the permit.
- — contact local sources of information, including the operator, to accumulate a working reference of site conditions for obvious clues.
- — judge current conditions against previous conditions in light of mining sequence or techniques.

— ascertain whether structures (i.e., fills, ponds, etc.) actually or potentially involved have been properly built.
— collect evidence documenting the nature and degree of any off-site damage.
— obtain photos showing poor or improper mining practices (improper spoil placement, mishandling of acid/toxic materials, reopening of old mine workings, mining outcrop barriers, unapproved diversions, etc.) which may be causative factors.
— make a record of conversations with all parties interviewed regarding the problem or the probable cause.
— determine what would be necessary to present convincing proof of a violation to a third party.
— determine whether:
  • significant aquifers are involved
  • the coal seam is a significant aquifer
  • there is perched water in the area.

Typical citation:

Failure to conduct surface coal mining and reclamation operations in a manner which minimizes disturbance to the hydrologic balance within the permit and/or adjacent areas.

or: Failure to conduct surface coal mining and reclamation operations in a manner which will prevent material damage beyond the permit area.

Documentation:

— Photographic documentation of adverse conditions such as flooding, seepage, dry streams or ponds, or earth movement suspected of being related to the violation; and document the methods and results of pertinent measurements or tests.

The narrative report should discuss the chronological sequence of events before the inspection, steps of the investigation, the methods and models used to determine possible cause and effect relationships, references to factual documents, a statement of conclusions, and records of any requests for, or assistance obtained in completing the investigation.

Groundwater Monitoring

In general, regulations regarding groundwater monitoring require use of methods approved by the permitting authority. Monitoring of one or more of a great variety of quality and flow characteristics may be specified in the operating guidelines. Monitoring is usually required before mining, often for 6 months, to determine pre-mine groundwater condition. It continues through bond release or until such time as the regulatory authority has determined that postreclamation conditions are suitable. Acceptable limits for changes in groundwater flow and quality, as detected by the program, are set forth in the Permit Application Package groundwater monitoring plan. These limits differ considerably from permit to permit. The characteristics addressed by monitoring programs also may differ from permit to permit. This leads to great diversity; therefore, questions of compliance may have to be judged in accord with particular permits rather than by standards of performance.

Keys: — is monitoring being conducted?
— is monitoring according to the Permit Application Package plan?
— do the required wells and monitoring points exist at the site?
— do the wells actually contain water?
— what do reports indicate, as compared to site conditions?
— do accesses to monitoring points and facilities appear to be used on a routine basis?
— does the person responsible for sampling know the locations of the monitoring points and the requirements of the permit?
— do monitoring reports contain all information required in the approved plan?
— are correct techniques being used by the person collecting samples? Can he or she describe the correct procedure?
— has approval for reduced monitoring been received in writing for a reclaimed site?

Typical Citation:

Failure to conduct groundwater monitoring in a manner that demonstrates compliance with the approved permit's groundwater monitoring plan.

Documentation:

— request copy of monitoring reports from the operator.
— copy essential report dates and information during review of these reports, when available, and note when such records are not available or are incomplete.
— confirm attempts to obtain missing records and data by appropriate reference to the lab which usually performed the analysis.
— record all requests for and conversations concerning monitoring records and information.

The narrative should document requests for and efforts to locate monitoring reports, and should describe information required by the monitoring plan. Statements by permittee or operator that indicate noncompliance or confusion about the monitoring requirement should be related. Include reasoning which leads to the conclusion that specifics of the permit monitoring plan were not followed, or that actual monitoring was inappropriate or was incomplete.

Surface Water Monitoring

Like groundwater monitoring, surface-water monitoring needs to be in accord with the permit and with the requirements of NPDES or other water permit authorities. Therefore, only a few items in addition to those mentioned previously under groundwater monitoring will be men-

tioned here. Keep in mind that programs differ in their monitoring requirements and that specific conditions or requirements may be imposed for individual permits.

Keys:
- when possible, observe the operator's sample-collection procedures.
- question sample-handling techniques and elapsed time between collection and lab analysis.
- compare reports with known high- or low-flow data.
- cross-check analysis if suspicious of sampling procedures or data.
- observe pond conditions in relation to sediment suspension and short circuiting.
- where continual treatment is necessary (AMD plants, etc.), check whether facilities appear to be maintained and operational during all required periods.
- look for telltale signs of sampling activity at monitoring discharge points.
- see whether monitoring reports and lab data for the permit area generally agree with those of nearby permits in the same area or drainage basin.

Acid and Toxic-Forming Materials

Surface and ground water contamination with acid or toxic-forming materials is commonplace in areas disturbed by mining. Surface waters and groundwaters in Appalachia may be degraded by iron and pH changes, while water in the Midwest may be high in manganese and western waters may have salinity problems. Various "best technology" approaches to handling potential problem materials have evolved, but no system has proven totally effective, even when properly planned and implemented. Many of the facilities and techniques currently used in mining were also used during the prelaw era. Their environmental effects are well known. An inspection of the handling and treatment of acid- or toxic-forming materials must consider the entire scope of operations if it is to address water quality problems properly and provide a basis for constructive solutions.

Keys:
- what is the relevance of acid- or toxic-forming materials as discussed in the Permit Application Package? Have the materials pertinent to the question at hand been identified?
- what aspects of the permit or treatment facility are associated with those materials?
- is volume of surface or groundwater influencing the nature or degree of the problem?
- what does the monitoring plan indicate for the mine and adjacent areas?
- are material handling, treatment, and placement operations consistent with those of the permit and with their applicable performance standards?
- what facilities or practices were to be built or implemented in order to minimize water contact with acid or toxic materials, and are they properly designed, constructed, and maintained?
- how long is the current situation likely to last?

Typical Citation:

Failure to [(use appropriate one or combination) identify, treat, handle, bury, or store] acid- and toxic-forming materials in a manner that will prevent or minimize, to the extent possible, adverse effects on the quality of surface water and groundwater.

Documentation:
- samples of problem-causing materials and the results of tests run on those materials.
- water samples and test results that demonstrate a cause-and-effect relationship with materials mismanagement.
- photos showing improper handling, placement, compaction, covering, or treatment of materials.
- photos or documentation showing the absence or ineffectiveness of runoff diversions or other schemes for preventing contact between water and potentially acid or toxic materials.
- evidence of improper or long-term storage of materials.
- previous inspection reports or other documentation of similar problems on prior occasions.

The narrative should clearly delineate the various factors and actions associated with the handling of acid- or toxic-forming materials as they pertain to the violation. It should construct a chronological, historical chain of events and actions from initial cause(s) of current problems (example: "On June 9, 1983 at 3:15 p.m. seepage was noted near the toe of the embankment of sediment control structure designated A-12 on Permit No. _____. The seepage was at a point 25' left of the main spillway, approximately 42.5' right of the emergency spillway, and at an elevation 5.5' above the flow line of the main spillway outlet. The inspection report for this structure dated October 15, 1983 documents that underdrains were not installed at the time of its construction. There is no documentation or field evidence that underdrains have since been installed."). Indicate what differences there are between material handling practices and the results obtained at this operation and those at other comparable operations in the general vicinity.

References

Bachmat, Yehuda; Andrews, Barbara; Holtz, David; Sebastian, Scott. Utilization of numerical groundwater models for water resources management. EPA 600/8-78/012. Ada, Okla.: U. S. Environmental Protection Agency; 1978. 189 p.

Brown, Eugene; Skougstad, M. W.; Fishman, M. J. Methods for collection and analysis of water samples for dissolved minerals and gases. Techniques of Water-Resources Investigations Book 5, Chap. A1. Washington, D.C.: U. S. Geological Survey; 1979. 160 p.