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| | U·S·DEPARTMENT OF THE INTERIOR<br>OFFICE OF SURFACE MINING<br>RECLAMATION AND ENFORCEMENT<br>DIRECTIVES SYSTEM | Subject Number: TSR-10<br>Transmittal Number: 468<br>Date: 9/8/88 |

**Subject:** Use of Wetland Treatment Systems for Coal Mine Drainage

**Approval:** [signature] **Title:** Deputy Director

1. PURPOSE.

This directive establishes guidelines for the use of wetlands to treat discharges from surface coal mining and reclamation operations.

2. DEFINITIONS.

a. Federal permitting entity. The Office of Surface Mining Reclamation and Enforcement (OSMRE) organizational unit with responsibility for receiving and processing applications for permits and permit revisions, i.e., the Western Field Operations office or the Division of Tennessee Permitting.

b. Wetland treatment system, man-made wetland, or constructed wetland. A passive biological effluent treatment system consisting of a shallow depression or impoundment or series of such depressions or impoundments designed and constructed to support hydrophilic vegetation for the purpose of removing dissolved metals and otherwise improving discharge quality.

3. POLICY/PROCEDURES.

a. Background and General Policy.

Wetland treatment systems have proven to be a useful low-cost means of treating acid mine drainage under certain circumstances, but experience has demonstrated that their effectiveness is highly dependent on maintenance of controlled inflow volumes and velocities, circulation patterns and water depth. Also, efficiency may vary on a seasonal basis. In addition, the capacity of any wetland for removal of dissolved metals may be finite, and not all water quality parameters, such as pH and manganese, can be adequately addressed.

The Federal regulations at 30 CFR 780.21(h) and 784.14(g) require that each permit application contain a hydrologic reclamation plan which must include both preventive and remedial measures to address any potential adverse hydrologic consequences identified in the determination of probable hydrologic consequences (PHC), to prevent material damage outside the permit area, and to meet applicable Federal and State water quality laws and regulations. Since, as discussed above, wetlands are dynamic organic systems, it is impossible to quantify how they will meet these requirements under all anticipated conditions. Therefore, chemical and other conventional treatment systems, which have a consistent capability to neutralize acid mine drainage and remove metals and which can respond or be adjusted to respond rapidly to changes in volume, are necessary elements of the hydrologic reclamation plan if the PHC determination indicates acid or toxic drainage may occur. Design of the treatment systems shall be based on the quality and quantity of flows predicted in the PHC determination.

Any wetland treatment system used to treat discharges during the excavation, coal removal and backfilling phases of mining must be supported by an operable chemical or other conventional treatment system to ensure that discharges are in accordance with applicable laws and regulations. If the wetland system itself provides sufficient treatment to meet effluent limitations, the chemical or other conventional system need not be activated. However, in the event the wetland system does not adequately treat the discharge, chemical or other treatment must be initiated. Wetland treatment systems installed to treat discharges from backfilled and regraded areas need not be supported by operable conventional treatment systems provided the operator documents that sudden changes in flow volume and quality are unlikely. However, the operator must include a design for such a system in the application and must construct the wetland system in a manner that preserves his or her ability to immediately install down-gradient effluent detention and conventional treatment facilities should the wetland system fail to achieve its purpose or cease to operate.

Sections 515(b)(10) and 516(b)(9) of SMCRA require that surface coal mining and reclamation operations be conducted to minimize disturbances to the prevailing hydrologic balance and to the quality and quantity of water in surface and ground water systems both during and after mining and during reclamation. In addition, section 510(b) prohibits the regulatory authority from approving a permit application unless the applicant has demonstrated that reclamation can be accomplished and that the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

To implement these provisions, the regulations at 30 CFR 816.41(a) specify that "mining and reclamation practices that minimize water pollution and changes in flow shall be used in preference to water treatment." Consistent with this approach, 30 CFR 816.41(b), (d), and (f) emphasize that groundwater and surface water quality shall be protected by handling earth materials and runoff in a manner that minimizes the formation of acidic or toxic drainage.

Therefore, wetland treatment systems shall not be approved for use in lieu of preventive measures such as the proper handling of overburden and isolation of acid or toxic-forming materials. However, when treatment is necessary, neither SMCRA nor the Federal regulations place limitations on the methodology used, provided the method chosen enables the operation to meet all State and Federal water quality laws and regulations. Accordingly, use of constructed wetlands for treatment of mine drainage is neither to be promoted nor discouraged.

b. Application Review Criteria.

When evaluating a permit or permit revision application proposing installation of a wetland treatment system, the Federal permitting entity shall ensure that:

(1) The system has been designed in accordance with currently accepted biological treatment principles and impoundment design requirements, if the latter are applicable.

(2) The plan includes a monitoring program adequate to determine when the chemical or other conventional treatment system must be activated.

(3) In accordance with 30 CFR 816.97(f) and 817.97(f) and OSMRE's wetlands protection policy (45 FR 49872-49874, July 25, 1980) the design and operation plans avoid use or degradation of natural wetlands unless the applicant gains the approval of the appropriate agencies for disturbance in accordance with all State and Federal requirements concerning wetlands protection.

(4) The location of the planned conventional treatment system is downgradient from the outlet of the wetland treatment system to facilitate treatment and minimize chemical disruption of the wetland.

(5) Unless wetland retention is compatible with the approved postmining land use, the reclamation plan includes a plan for wetland removal and reclamation consistent with the approved postmining land use and the requirements governing the disposal of acid and toxic-forming materials.

c. Bond Release Considerations.

Section 519(c)(3) of SMCRA and 30 CFR 800.40(c)(3) provide that no bond shall be fully released until all reclamation requirements of the Act and the permit are fully met. While wetlands have demonstrated potential in treating acid mine drainage, they have not yet been proven effective for all parameters or on a long-term basis. Also, their effectiveness appears to decrease over time. Therefore, applications for final bond release which rely on the use of wetland treatment systems for permanent control of acid mine drainage shall not be granted at this time. Where the influent to a wetland treatment system would not cause a violation of State or Federal water quality laws or regulations if discharged directly, final bond release would be appropriate if the structure is approved as a permanent impoundment and is compatible with the postmining land use.

d. Responsibilities.

(1) The Federal permitting entities are responsible for ensuring that permit and permit revision applications are evaluated in accordance with the requirements of this directive.

(2) The Field Office Directors are responsible for:

(a) Ensuring that State regulatory programs are implemented as approved and in a manner consistent with all applicable Federal requirements, and

(b) In Federal program States and on lands where OSMRE has primary inspection and enforcement authority, conducting bond release inspections and evaluating applications for bond release in accordance with the standards established in this directive.

e. Effect on Approved State Programs.

Unless a State program contains approved provisions or policies specifically addressing wetland treatment systems, the policies set forth in this directive shall be used as guidance when conducting oversight of a State's implementation of its approved program.

The establishment of a wetlands treatment system for discharges that would otherwise be in noncompliance does not justify final bond release because it is inadequate to demonstrate that all the requirements of the Act and regulations have been met. Any interpretation of a State program to allow final bond release under these conditions would render that program less stringent than SMCRA and less effective than the Federal regulations. Unless the issues can be otherwise resolved, the Field Office Director shall initiate the procedures prescribed by 30 CFR 732.17(c) to notify the State that it must amend its program to remedy this deficiency.

4. REPORTING REQUIREMENTS. None.

5. REFERENCES.

a. OSMRE Statement of Policy, "Floodplain Management and Wetlands Protection" (45 FR 49872-49874, July 25, 1980).

b. Executive Order 11990, "Protection of Wetlands," May 24, 1977.

6. EFFECT ON OTHER DOCUMENTS. None.

7. EFFECTIVE DATE. Upon signature by the Director.

8. CONTACT. Chief, Division of Regulatory Programs; (202) 343-5351.