

**DEPARTMENT OF MINES, MINERALS AND ENERGY
DIVISION OF MINED LAND RECLAMATION**

GUIDANCE MEMORANDUM¹ No. 15-07

Issue Date: March 12, 2007

Subject: Potential Problem Discharges during Reclamation and Bond Release

This guidance is intended to facilitate the decision-making process for evaluating and addressing potential “problem discharges”² on a permit during the post reclamation and bond release phase and whether or not the site would be eligible for bond release based on the discharge status.

A potential problem discharge may or may not reach a receiving stream and could adversely impact the hydrologic balance, water supplies, post-mining land use, or constitute material damage due to water quality or quantity characteristics. Additionally, situations have arisen where sediment ponds are to be removed, but the influent would not meet effluent limits. The discharges in some situations had flows of less than 3 gallons per minute and some were also intermittent. These discharges may be from:

- Sediment ponds
- Fill underdrains
- Gravity discharges from underground mines
- Discharges of impounded water in underground mines through fractures
- Discrete seeps in backfill

DMLR will use the following four criteria when deciding whether such a discharge requires remedial action or should be released:

1. Are applicable receiving stream standards being violated?
2. Does the discharge interfere with the post-mining land use?
3. Will water supplies and/or beneficial uses of the stream as defined in §62.1-242 of the Code of Virginia be adversely affected?
4. Could the situation be considered “material damage” or constitute an adverse impact to the hydrologic balance under Virginia’s laws and regulations?

¹ This Memorandum is to be considered a guideline issued under the authority of § 45.1-230.A1 of the Code of Virginia which reads:

"In addition to the adoption of regulations under this chapter, the Director may at his discretion issue or distribute to the public interpretative, advisory or procedural bulletins or guidelines pertaining to permit applications or to matters reasonably related thereto without following any of the procedures set forth in the Administrative Process Act (§ 2.2-4000 et seq.). The materials shall be clearly designated as to their nature, shall be solely for purposes of public information and education, and shall not have the force of regulations under this chapter or under any other provision of this Code."

² Problem discharges are point source discharges that may not meet the applicable Virginia Coal Surface Mining Reclamation Regulations requirements.

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If the answer is “yes” to any of these four criteria, then some remedial action is likely needed.

The following example scenarios, along with a decision flowchart (Figure 1), are presented to facilitate decisions on potential problem discharges. The flow chart illustrates the decision process for the majority of potential problem discharges that may be encountered with references to some of the applicable regulations. The examples and flowchart should aid decision making for addressing these discharges and also increase consistency among DMLR Field Inspectors and Technical reviewers.

For each of the following scenarios, the quality and quantity of the discharge should be well documented with laboratory analyses and measured flows to determine the volume and nature of the influent.

Scenario 1 – Potential problem discharge controlled by sediment pond

The influent to a sediment pond to be removed as part of the reclamation plan does not meet NPDES effluent limits, but the discharge is in compliance. No chemical treatment has been necessary over the life of the permit in order for the discharge to meet effluent limits as the pond either dilutes the influent or allows oxidation and precipitation of dissolved iron or manganese prior to discharge. The discharge is in compliance if the pond remains as a permanent structure and is properly maintained, but the applicant risks not meeting the four criteria if the pond is removed.

Two possible solutions are:

Solution 1 - Pond Removal

The four criteria for evaluating potential problem discharges (see Page 1) should be used when deciding whether the influent would require remedial action if the sediment pond was removed.

As previously stated, if the answer is “yes” to any of the criteria, then likely some remedial action is needed.

Solution 2 - Permanent Pond³

The following criteria should be used when deciding whether a pond may be left as a permanent structure:

1. The pond will meet the standards for a permanent structure per 4 VAC 25-130-780.25 and 4 VAC 25-130-816.49 or 4 VAC 25-130-817.49, as applicable.
2. The landowner has given permission to leave the pond as a permanent structure and is aware that he will be responsible for maintaining a structure that is treating a problem discharge. The operator/permittee must submit a notarized letter signed by the landowner

³ This solution does not apply to an instream pond because the influent is the stream itself.

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stating that the landowner is granting permission to leave the pond that is treating a problem discharge and will assume responsibility for the pond after final bond release.

3. The pond is approved for the post mining land use.
4. The pond discharge will not adversely affect the post mining land use or beneficial uses of the stream.

Scenario 2 – Problem discharges through fractures from underground mine works

An underground mine begins to impound water and a surface discharge develops (often through fractures that connect the mine void to the surface). These discharges often have elevated dissolved iron concentrations and may have low pH values. The discharges usually occur outside of the permitted area and may appear as increased stream flow over a small area, usually a few hundred feet in length and width. Normally, very diffuse seeps from impounded underground mines are not considered as point source discharges by DMLR. Diffuse seeps are those that do not emanate from discrete fractures but may manifest themselves as moist and/or discolored areas with no discernable surface flow.

The four criteria on page 1 should again be considered. Final bond release would be contingent upon a successful solution to the problem discharge. Two possible solutions are:

Solution 1 – Monitor Discharge

Allow the discharge to continue in its current location and monitor the effluent. The following items should be considered:

1. If the discharge is relatively large (e.g., 500 gpm), provisions of 4 VAC 25-130-817.41 may apply (on preservation of hydrologic balance). That is, transfer of groundwater from one watershed to another could be a significant change in the existing flow system.
2. Does the discharge have a negative effect on the receiving stream's quality, quantity, beneficial uses, or land use?
3. Is the discharge a point source? If so, it should be monitored as an NPDES discharge and appropriate treatment should be applied, if necessary, to bring the discharge into compliance with applicable water quality standards.
4. Is a public water supply intake located in the receiving stream? If so, numerical standards from 9VAC25-260-140 would apply.

Solution 2 – Reduce hydraulic head on barrier.

Pumping or installation of a horizontal boring may lower the hydraulic head in the mine pool in order to abate the discharge. The following items should be considered:

1. This solution would undoubtedly create a point source discharge at the pumping location that would require NPDES monitoring while pumping is being conducted.
2. Treatment may be required if the discharge is not in compliance with the applicable water quality standards.

3. If drainage through the boring is not by gravity, pumping may have to be conducted on a permanent basis to abate the discharge or until inflow to the mine ceases.

Scenario 3 – Problem discharge that is non-compliant for total manganese only

Discharge is non-compliant for total manganese, but total suspended solids, total iron and pH are in compliance. If the water meets the criteria for alkaline mine drainage, the manganese standard does not apply. EPA⁴ defines alkaline mine drainage in 40 CFR 434.11(c): “*The term ‘alkaline, mine drainage’ means mine drainage which, before any treatment, has a pH equal to or greater than 6.0 and total iron concentration of less than 10 mg/L.*” However, be aware that problem discharges from refuse areas will not be given alkaline limits.

Scenario 4 – Problem discharges from fill underdrains

A fill underdrain may develop a discharge that does not meet NPDES effluent limits. This situation sometimes occurs after the fill has been in place for a few years without ever discharging. These discharges have occurred both before and after removal of the associated sediment pond. In some cases where the sediment pond was removed, DMLR has required that the pond or another treatment structure be installed to treat the underdrain discharge. Several solutions may be available, depending on the situation.

- The two solutions posed for Scenario 1, “Problem discharge controlled by sediment pond”, may be considered if the sediment control structure is still in place.
- If the pond has been removed and the problem discharge crosses the permit boundary, the four criteria listed on Page 1 apply.

If the answer is yes to any of the criteria, then some remedial action is likely needed.

⁴ The federal Environmental Protection Agency.

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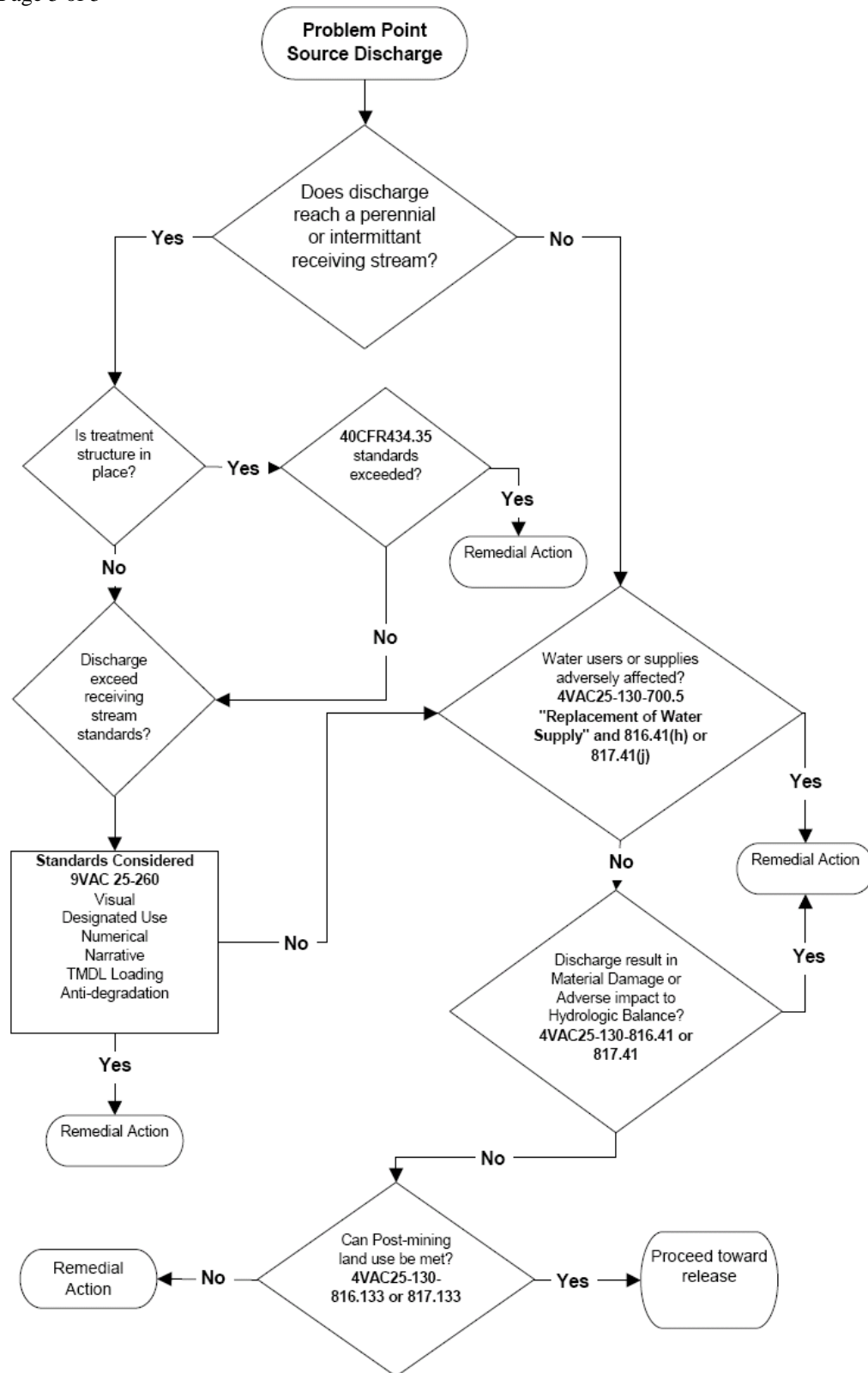


Figure 1