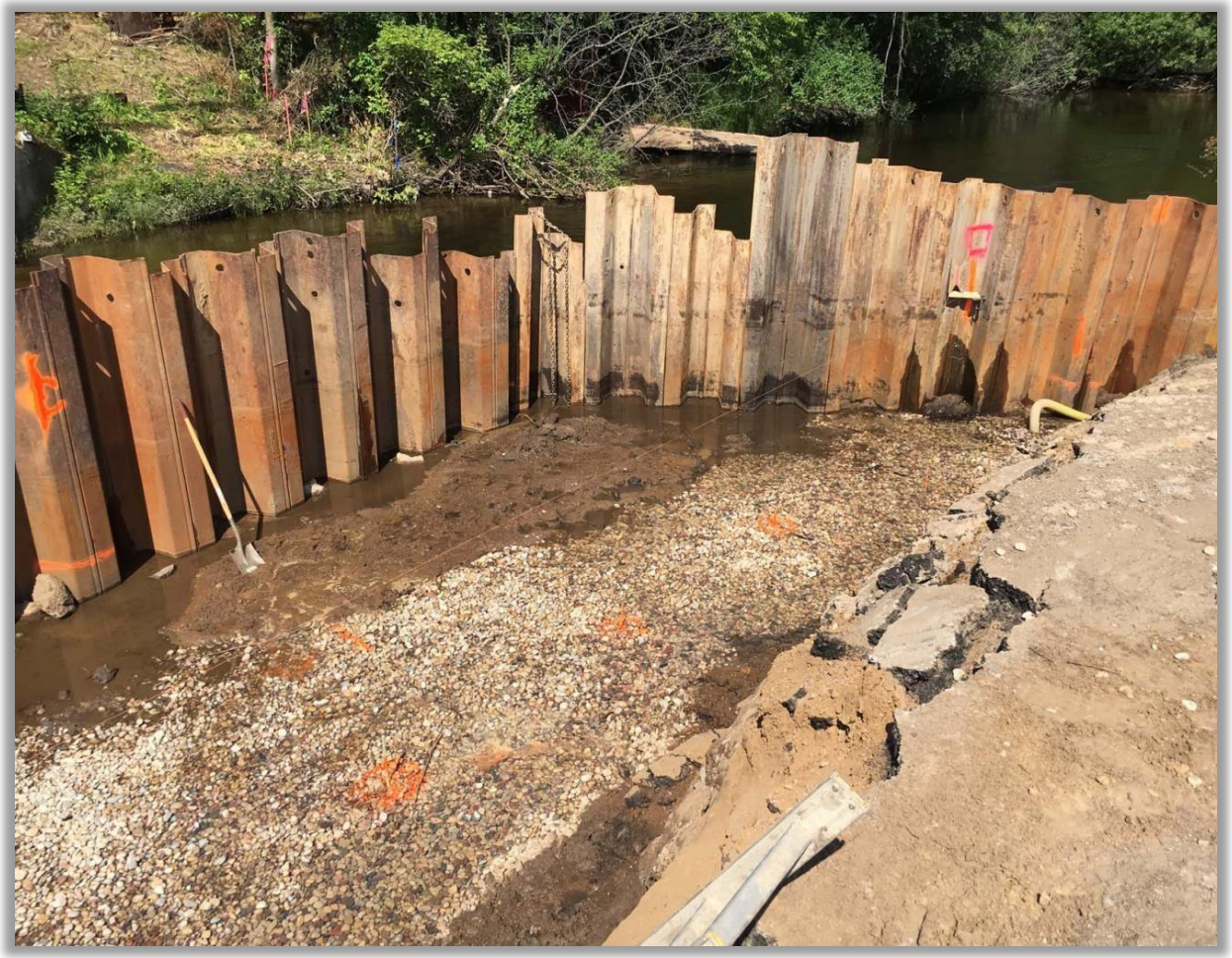
Dewatering

- Background
- Construction guidance
  - Installation – bag location, inlet/ outlet condition
  - Inspections – upstream vs. downstream water turbidity
  - Maintenance – filter clogging
- Filter Bag example

Background

- Dewatering is used to remove water from pits or trenches in work areas that have groundwater present or to discharge accumulated surface water.

- Common scenarios requiring dewatering:
  - Bridge abutment work
  - Utility installations
  - Culvert installation in marsh/ wetland
  - Excavated areas with ponded water
  - Detention ponds, sediment traps/basins
  - Fill areas prior to placement of borrow material
  - From within cofferdams such as sheet piling for bridge abutments or bridge piers



Background (cont.)

- The potential to transport sediment when dewatering is high
- Sediment discharge must be prevented or reduced to the maximum extent practicable. Trans 401.06(8)(b)2 and TCGP 3.1.6.9
- To reduce the potential for sediment discharge, dewatering structures should be used to settle and filter sediment-laden water.
- This is most commonly accomplished using filter bags. However other filter devices or tanks to keep sediment from passing downstream into waterways and wetlands are allowable.
- The contractor is responsible for BMP's to ensure sediment-laden water is not discharged.

Construction Guidance

- Current practice for dewatering is for the contractor to describe their means and methods for dewatering in the ECIP.
- WisDOT approves their approach after consultation with WDNR.
- Once the practice is employed on the construction site, WisDOT shall be visually inspecting the discharge water
- Discharge should not cause an objectionable discoloration of the receiving water.
- If the discharge is discolored, adjustments must be made to the dewatering operation
  - Determining dewatering operation adjustments should be done in consultation with WDNR and regional experts (SWEC)
- Geotextile filter bags are the most common way to dewater on WisDOT projects.

Installation of Geotextile Filter Bags

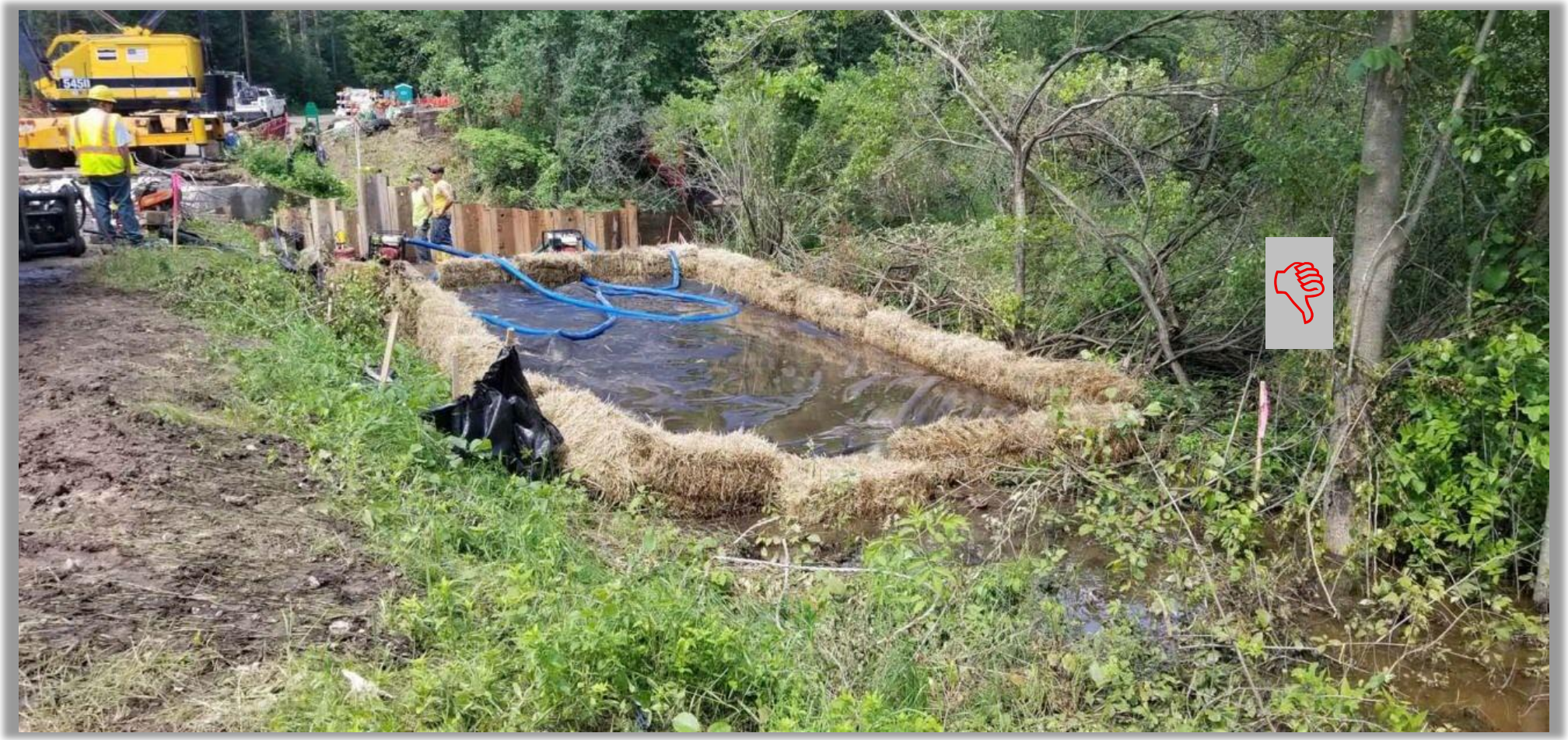
- Intake condition
  - Where much of the sediment comes from
  - Should have measures to limit sediment intake into pump, such as:
    - Floating suction hose
    - Clear stone
- Filter Bag placement
  - Located on flat, vegetated and stable area, (or impervious area)
  - Not in a wetland/waterway
- Filter Bag size
  - Bag must be adequately sized based on anticipated flows and sediment type
- Secondary containment
  - May be necessary if near a sensitive resource

Inspection and Maintenance of Geotextile Filter Bags

- Inspect daily during dewatering operations. Special attention to the dewatering operation should be shown during initial setup or during a change of construction operations.
- Inspection elements:
  - Filter condition – fabric tears, flow capacity, sediment clogging
  - Pump system – leakage, proper hose or pipe connections to filter bag
  - Outlet condition
    - Erosion between filter bag and waterway
    - Receiving water discoloration

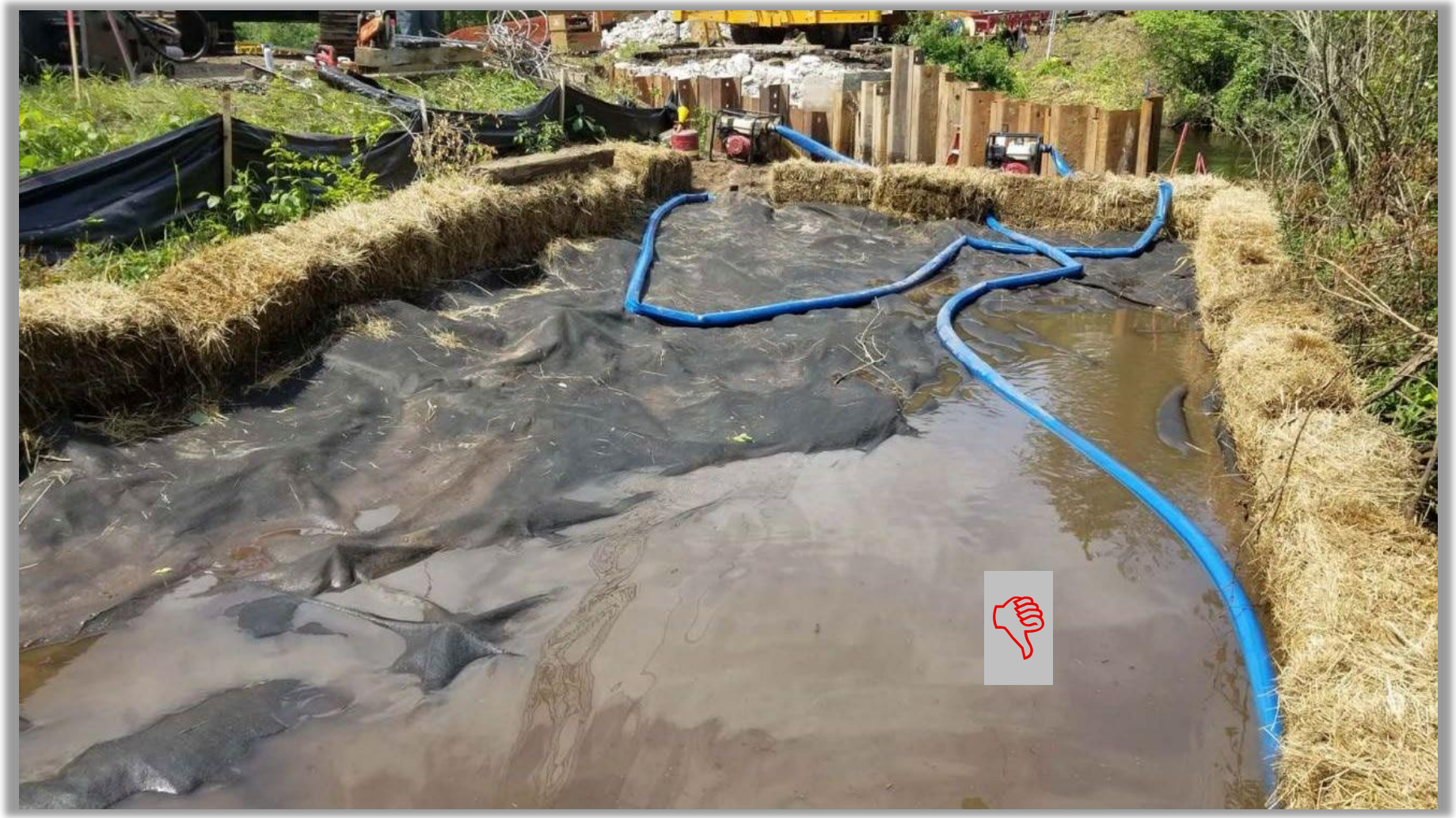
Filter Bag Example

- This example shows common issues with dewatering using a filter bag
  - Issue: Bag placement appears to be in wetlands, not approved in ECIP



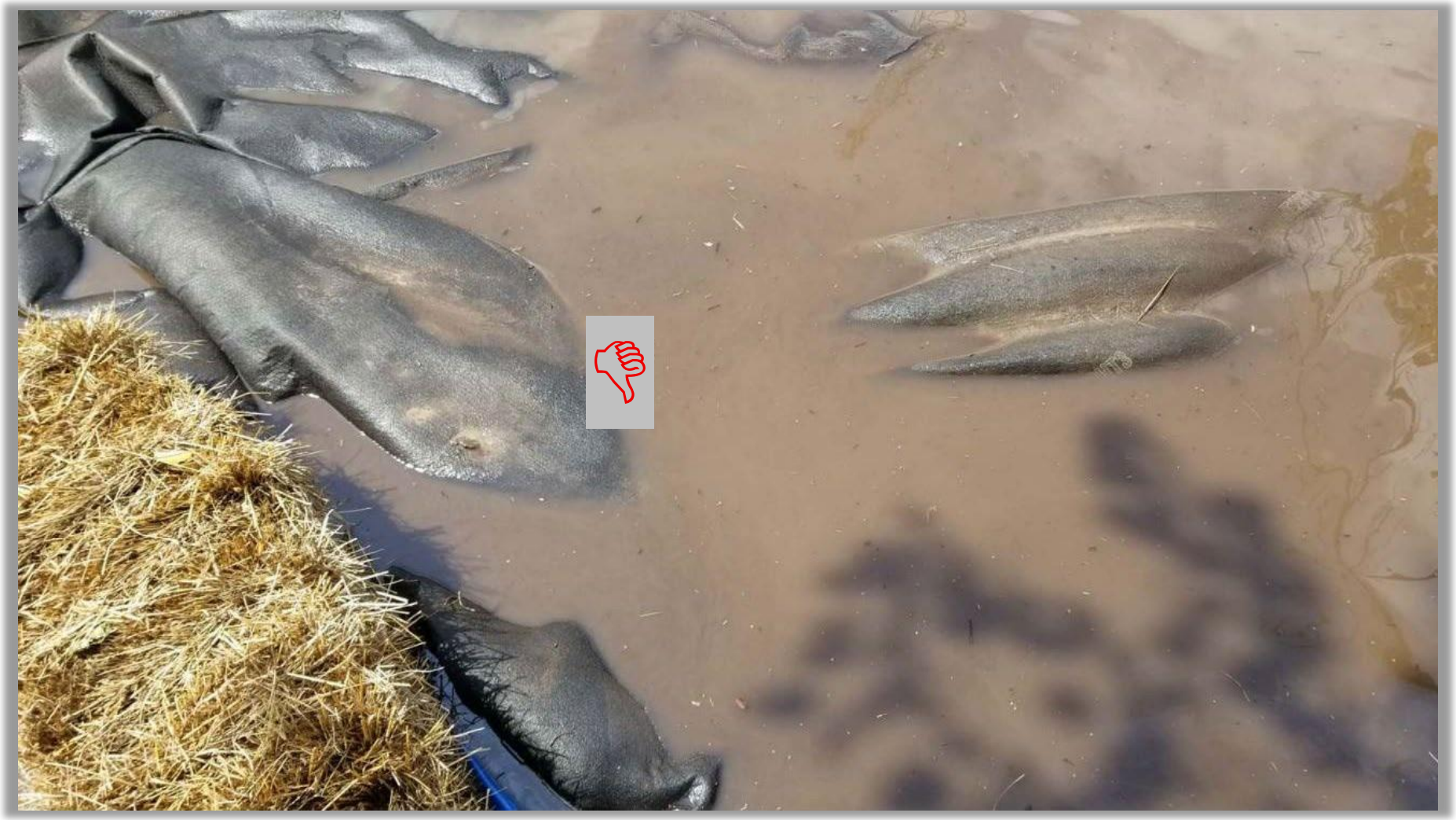
Filter bag example (cont.)

Issue: End of pump hose not connected to filter bag (lower right corner of picture)



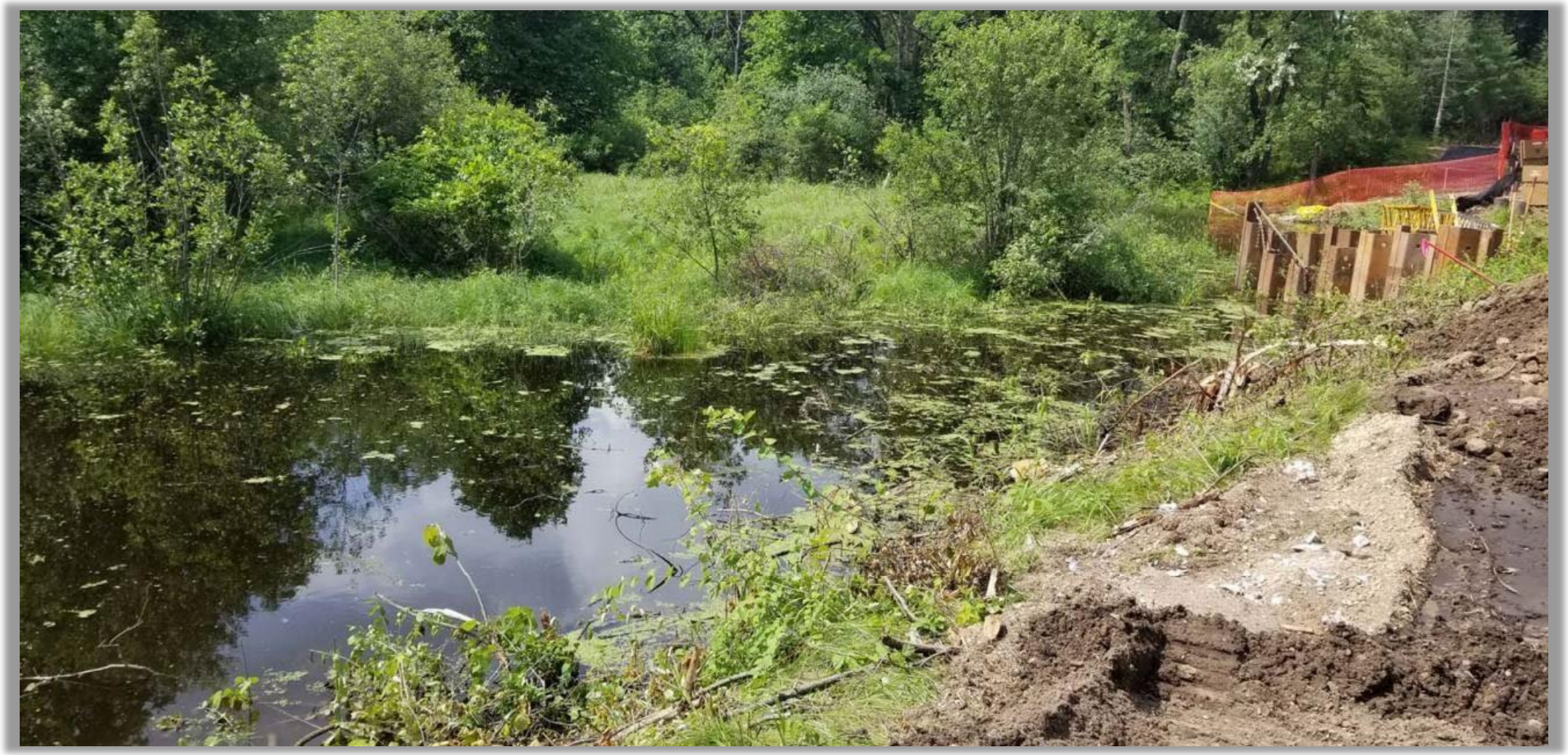
Filter bag example (cont.)

Issue: Large amount of sediment present in water because not filtered by bag



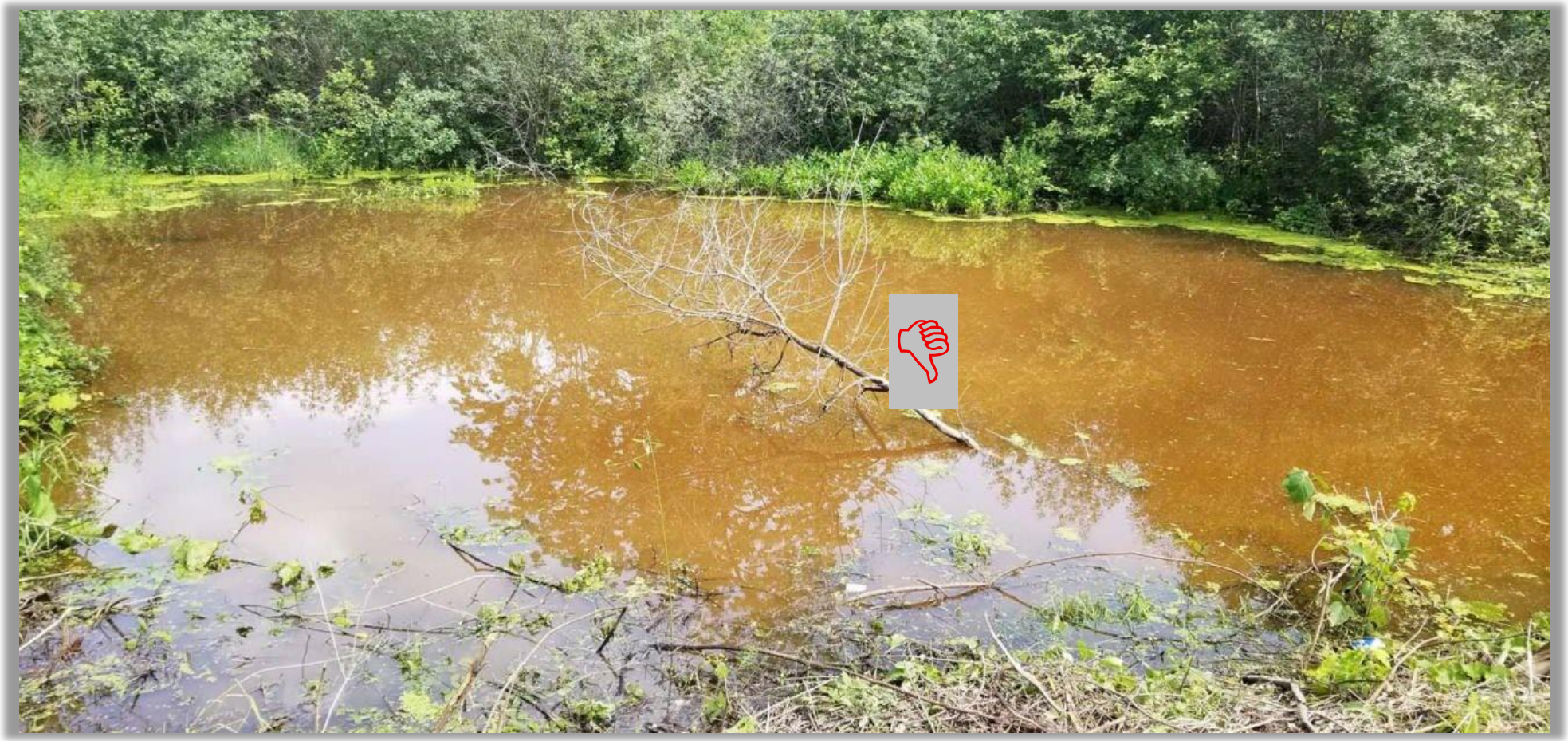
Filter bag example (cont.)

To determine if dewatering operation is adding turbidity, look upstream of operation. In this example, the upstream water showed no turbidity.

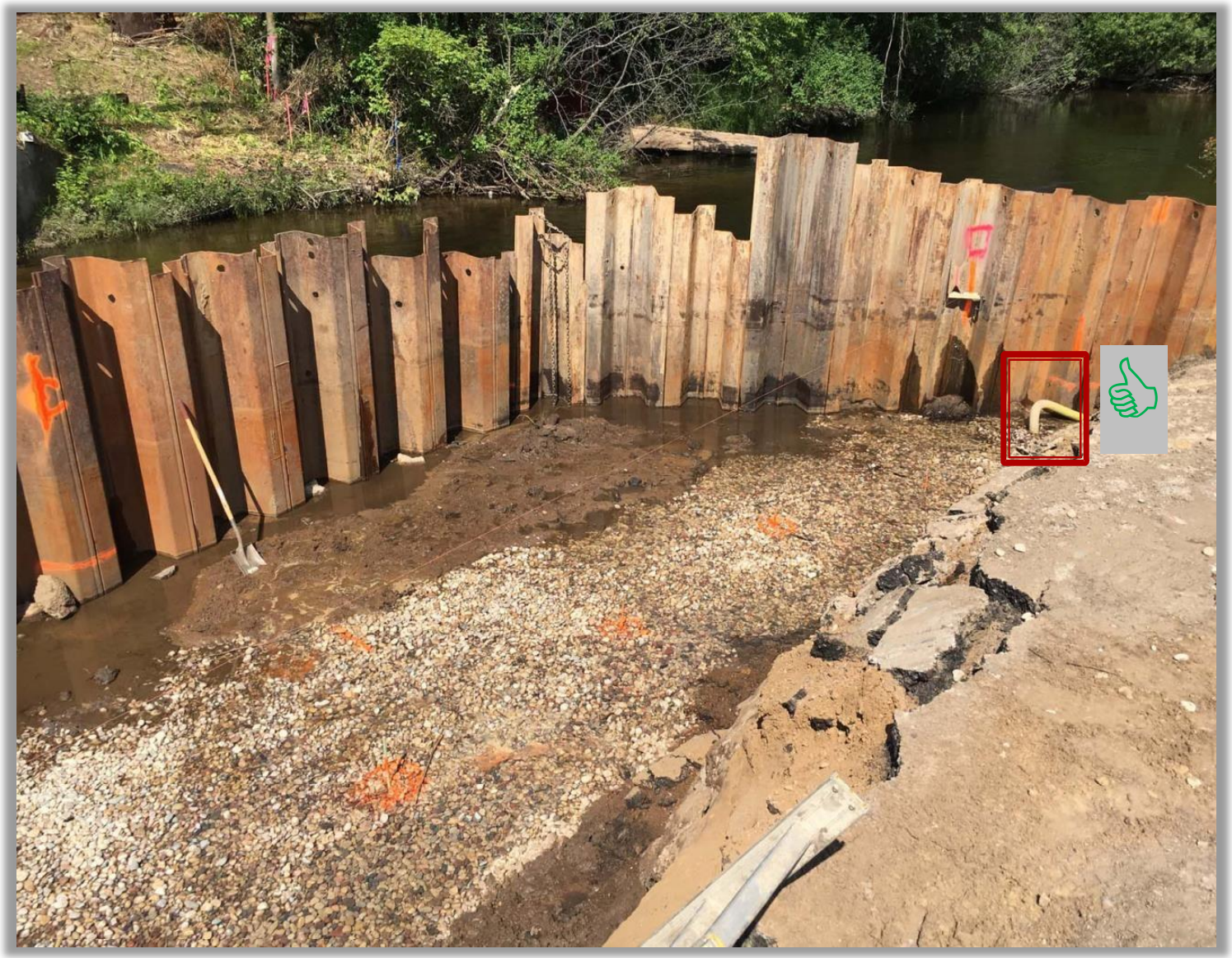


Filter bag example (cont.)

Issue: the downstream water has visible plume of discolored water when comparing to upstream water quality – therefore issue with dewatering operation that needs attention.



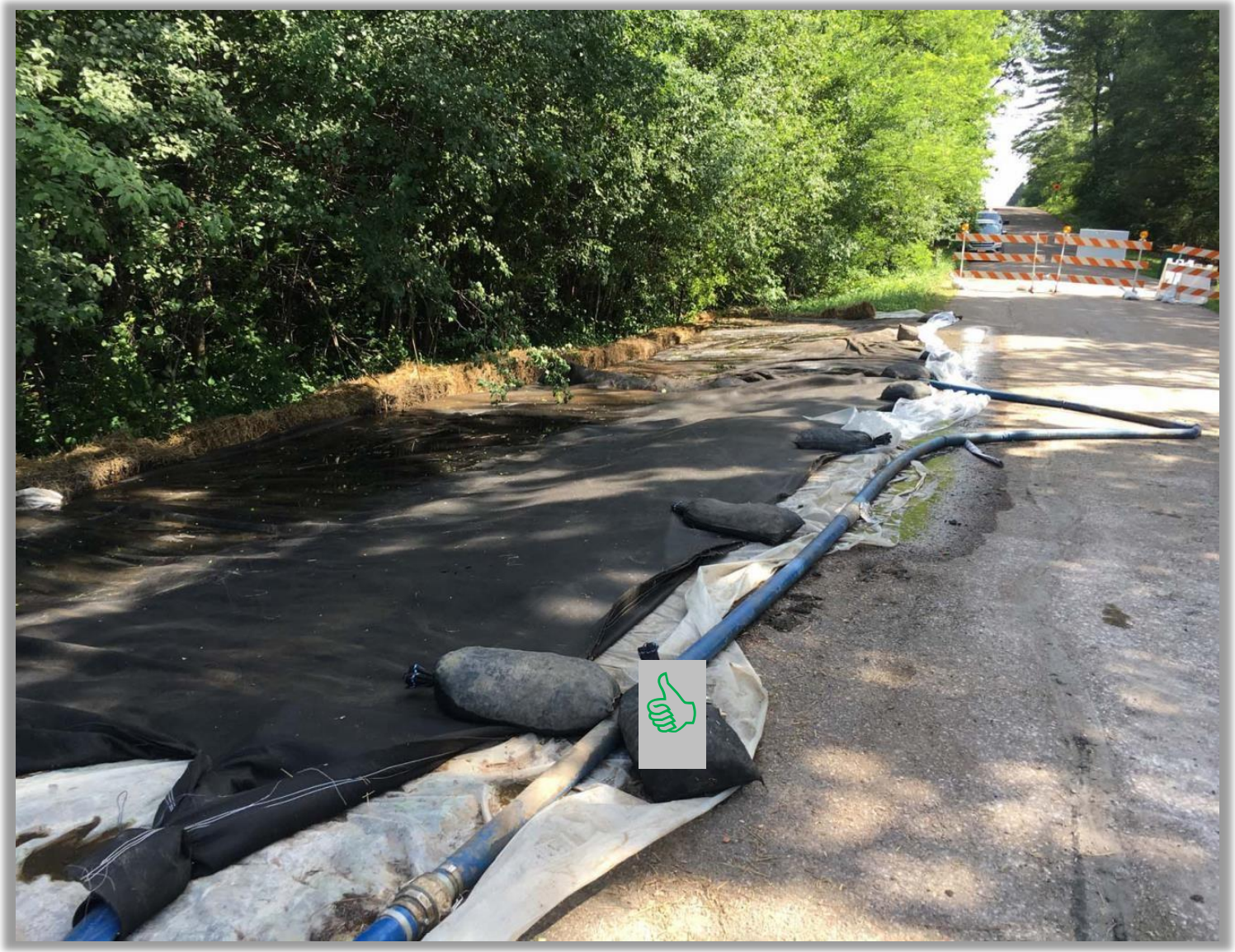
Filter bag example (cont.)



How situation was fixed:

- Pump intake was trenched in stone pit to limit sediment intake

Filter bag example (cont.)



How situation was fixed

- New bag location out of wetland and pump hose connected

Filter Bag Example

- Good example regarding bag placement and setup, which includes filter fabric and straw bales for additional protection.
- However, the bag is probably undersized based on shape.