

# Treatment Device Information Sheet

Treatment System Component: Ponds

Description: Wet pond/Wet basin: constructed ponds with a permanent pool of water

Pollutants of Concern:

- ☒ TSS/SSC/Turbidity [Click here to enter text.](#)
- ☐ Total Dissolved Solids (TDS) [May export TDS](#)
- ☒ Total Metals [Click here to enter text.](#)
- ☒ Dissolved Metals - Cd, Cr, Cu, Zn
- ☐ Dissolved Metals – Pb, Ni
- ☒ Total Phosphorus [Click here to enter text.](#)
- ☐ Ortho Phosphorus [May export orthophosphate](#)
- ☐ Nitrates [Click here to enter text.](#)
- ☒ Oil/Grease [Click here to enter text.](#)
- ☒ Bacteria [Click here to enter text.](#)
- ☒ Organics (PCB/PAH) [Click here to enter text.](#)
- ☐ Other [Click here to enter text.](#)

Data Available in International Stormwater Database ☒ Yes ☐ No

References

## Component Specific Considerations

- *Space restrictions – 1 to 3 percent of contributing drainage area*
- *Soil type – low infiltration rate or lined with low permeability material*
- *Vegetation – wetland plants (in permanent pool) and plants tolerant of wet and dry cycles (on embankment)*
- *Topography – slopes adjacent to ponds should promote flow toward the wet pond*
- *Temperature issues - increase overall heat inputs compared to untreated surface runoff, but reduce peak heat loading rates*
- *Long dry periods – permanent pool must be maintained*
- *Pollutant concentration concerns – limited removal of dissolved pollutants; may export dissolved pollutants if not properly maintained*
- *Construction costs – low to moderate*
- *Maintenance costs - moderate*
- *Mosquitoes – if water does not drain properly, wet ponds can become mosquito breeding grounds*
- *Groundwater – in accordance with local requirements, maintain separation from groundwater used for drinking supply*

Design Criteria

# Treatment Device Information Sheet

- [California Stormwater Quality Association. New Development and Redevelopment BMP Handbook. Section 5.7. TC-20 Wet Ponds](#)
- [Georgia Stormwater Manual. Volume 2 – Technical Handbook \(See section 4.25\)](#)
- [Maine Stormwater Best Practices Manual. Chapter 4. Wet Ponds.](#)
- [Minnesota Pollution Control Agency – Design criteria for stormwater ponds](#)
- [New York State Stormwater Management Design Manual](#)
- [North Carolina Department of Environmental Quality Stormwater BMP Manual. C-3 Wet Pond](#)
- [Virginia Department of Conservation and Recreation Stormwater Design Specification No 14: Wet Pond](#)
- [2014 Stormwater Management Manual for Western Washington. BMP Type 10: Wetponds – Basic and Large](#)

## Certifications

Washington State TAPE, ☐ TSS ☐ Enhanced (Dissolved Metals)  
☐ Total Phosphorus ☐ Oil/Grease

New Jersey CAT ☐ TSS

Other: ☐ \_\_\_\_\_

- [Hyperlinks to Certification Documents](#)

## Construction Information

### Sequence

- Pre-construction meeting
- Stabilize the drainage area
- Assemble construction materials on-site and ensure they meet design specifications
- Clear and strip the project area to the desired sub-grade
- Install erosion and sediment controls
- Excavate the core trench and install the spillway pipe
- Install the riser or outflow structure
- Construct the embankment and internal berms
- Construct the impoundment area
- Construct the emergency spillway
- Install outlet pipes
- Stabilize exposed soils
- Plant the pond buffer area

# Treatment Device Information Sheet

- References
  - [New York State Stormwater Management Design Manual](#)
  - [Virginia Department of Conservation and Recreation Stormwater Design Specification No 14: Wet Pond](#)

## Considerations

- Sediment that has accumulated in the pond during construction must be removed after construction or may be used as pond liner material
- Conduct inspections prior to construction, during initial site preparation, during excavation and grading, during installation of major features, at the time of vegetation establishment, and at the end of the project
- Example inspection checklists
  - [D.C. Department of Energy and Environment](#) (See Appendix L)
  - [Minnesota](#)
  - [New York State Stormwater Management Design Manual](#)
  - [Tennessee](#) (Section 5)

## **Operation and Maintenance Information**

### Monitoring

- Inspect the condition of stormwater inlets to the pond for material damage, erosion or undercutting
- Ensure the low flow orifice is not blocked or clogged
- Inspect the condition of the principal spillway and riser for evidence of spalling, joint failure, leakage, corrosion, etc.
- Inspect the pond outfall channel for erosion, undercutting, rip-rap displacement, woody growth, etc.
- Inspect the condition of all trash racks, reverse-sloped pipes, or flashboard risers for evidence of clogging, leakage, debris accumulation, etc.
- Inspect for animal burrows, sinkholes, wet areas, etc. along the fill embankments
- Inspect for gullies, evidence of erosion, slumping, and other disturbances on the bank
- Inspect internal and external side slopes of the pond for evidence of sparse vegetative cover
- Inspect the banks of upstream and downstream channels for evidence of sloughing, animal burrows, boggy areas, woody growth, or gully erosion that may undermine embankment integrity
- Monitor the growth of wetland plants, trees and shrubs planted. Record the species and their approximate coverage, and note the presence of any weeds, noxious plants, or invasive plant species.
- Determine if vegetation needs maintenance (e.g. mowing, weeding)

# Treatment Device Information Sheet

- Inspect vegetation to maintain efficacy of mosquito fish (if applicable)
- Measure sediment accumulation levels, particularly in the forebay. In areas where road sand is used, an inspection of the forebay and permanent pool should be scheduled after the spring melt to determine if clean-out is necessary.
- Inspect water levels to ensure a permanent pool of water is maintained
- Inspect annually during winter freeze periods to look for signs of improper operation
- Inspect maintenance access to ensure it is free of woody vegetation, and check to see whether valves, manholes and locks can be opened and operated
- Determine if there is evidence of illicit discharges to the pond
- Inspect the water to determine if there is a surface sheen (oil or gasoline), the color is murky (suspended sediment), green color (algae or other biological activity), or if there is an odor (gasoline or oil)
- Inspect pretreatment practices to ensure they are functioning properly

## Maintenance

### First or second year activities

- Water vegetation as needed, particularly trees
- Remove and replace any dead or dying plantings
- Pond buffer and aquatic bench reinforcement plantings should occur in the second year after construction

### Monthly to quarterly, after major storms, or as needed

- Remove sediment from the low flow orifice and the pond inlets and outlets
- Remove trash from trash rack
- Keep vegetation at heights that allow inspection for animal burrows, sinkholes, wet areas, etc. along the fill embankments. Common mistakes are not mowing important areas because they are too steep or ignoring mowing completely. The amount of maintenance depends on the type of vegetation surrounding the basin. Some grasses need weekly mowing, and others can be maintained a couple of times a year.
- Repair undercut, eroded, bare soil areas, and gullies in the bank
- Maintain aquatic vegetation to maintain efficacy of mosquito fish (if applicable)

### Semi-annually to annually, or as needed

- Conduct shoreline cleanup to remove trash, debris and floatables
- Open up the riser to access and test the valves
- Repair broken mechanical components, if needed

### Non-routine maintenance

- Sediment removal in the forebay should occur every 5 to 7 years or after 50 percent of total forebay capacity has been lost. Sediment removal in the primary pool should occur approximately every 25 years or after 50

# Treatment Device Information Sheet

percent of the pool capacity has been reached. Sediments excavated from stormwater ponds that do not receive runoff from designated hotspots are not considered toxic or hazardous material and can be safely disposed by either land application or land filling. Sediment testing may be required prior to sediment disposal when a hotspot land use is present. Sediment removed from stormwater ponds should be disposed of according to an approved erosion and sediment control plan.

- BMP components should be replaced if showing signs of wear, which typically occurs at times ranging from 5 to 25 years. Components may include
  - inflow and outflow devices;
  - trash racks and anti-vortex devices;
  - valves, orifices, and aerators;
  - concrete structures;
  - pumps and switches; and
  - earthworks such as embankments and side slopes.
- Repair of structural components is required immediately if they impair the functionality of the pond.
- Mowing of the pond buffer not located along maintenance rights-of-way and the embankment can be managed as a meadow (mowing every other year), prairie, or forest.
- Ponds may be drained in an attempt to improve their functionality or conduct repairs. Ponds should not be drained during the spring, as temperature stratification and high chloride concentrations at the bottom can occur, which could result in negative downstream effects. Care should be exercised while draining the pond to prevent rapid release and minimize the discharge of sediments or anoxic water. The approving jurisdiction should be notified before draining a pond.

## Example inspection checklists

- [Virginia DEQ](#)
- [Richmond, Kentucky](#)
- [Oregon State University Extension](#)
- [Metropolitan Nashville](#)
- [Tinkers Creek](#)
- [Center for Watershed Protection](#) (see Appendix B)
- [Alliance of Rogue Communities](#)
- [The Ohio State University](#) (see Appendix B-2)
- [Clemson University](#) (see Appendix D)
- [San Francisco](#)
- [University of Minnesota](#)

## Example maintenance agreements

## Treatment Device Information Sheet

- [Wake County, North Carolina](#)
- [City of Winston-Salem](#)
- [Cary, North Carolina](#)
- [Henderson County](#)
- [Apex North Carolina](#)

PLACEHOLDER VERSION