

# FACT SHEET

## Detention Basin Retrofits for Water Quality Benefits

Converting existing dry detention basins to dry extended detention basins or bioretention basins is a cost-effective way for municipalities to achieve water quality goals. This is especially true for existing detention basins that are currently owned by the municipality. The majority of detention basins constructed before 2003 were not designed to provide water quality benefits; rather they were designed to reduce the peak flow of stormwater. It is worthwhile to consider implementing basin-retrofit projects to meet pollutant reduction requirements and improve water quality.

### What is a Dry Extended Detention Basin?

A dry extended detention basin is designed to reduce the peak flow of stormwater discharge and improve water quality, and can store water for up to three days. The basin bottom may be planted with native herbaceous perennials and grasses, shrubs, and small trees. The extended storage and vegetation allows time for sediment to settle-out prior to discharge, and reduces stormwater volumes through evaporation, infiltration, and plant uptake.

### What Key Components are Added to Convert a Detention Basin to a Dry Extended Detention Basin?

- ▶ Construct a small vegetated depression/forebay at the end of all pipes that discharge into the basin so that sediment and debris settles out. This feature filters stormwater runoff, reduces velocity, and minimizes erosion.
- ▶ Construct a micro-pool within the basin to store water for extended periods.
- ▶ Plant native vegetation.
- ▶ Maximize the flow path of water entering and leaving the basin to allow for additional sediment and nutrient removal prior to discharge.

### What is a Bioretention Basin?

A bioretention basin is designed to reduce stormwater volumes by infiltrating stormwater into the ground rather than being discharged downstream. The basin bottom is generally constructed with 12- to 18-inch depth of amended soils, which can be a combination of sand, compost, and topsoil, and planted with deep-rooted native plants that promote water infiltration and provide nutrient uptake.

### What Key Components are Added to Convert a Detention Basin to a Bioretention Basin?

- ▶ Excavate the basin bottom and add amended soils that promote infiltration.
- ▶ Install a forebay to filter runoff, reduce velocity, and minimize erosion.
- ▶ Plant native vegetation.



### TYPICAL OPERATIONS & MAINTENANCE REQUIREMENTS FOR DRY EXTENDED AND BIORETENTION BASINS

- ▶ Weed and prune the newly planted vegetation as it begins to grow until fully established.
- ▶ Inspect pipes, headwalls, endwalls, and outlet structures four times per year and after all storms greater than 1 inch to ensure they function as designed. Remove accumulated debris as needed.
- ▶ Maintain vegetative cover at 90 percent minimum, and re-establish as needed.
- ▶ Remove accumulated sediment from the forebay as needed.
- ▶ Perennial vegetation may be cut back and vegetation trimmed as needed. Remove all clippings.

### DID YOU KNOW?

- ▶ Increasing native vegetation in a community provides more than just water quality benefits. It also provides food and habitat for native wildlife, which provides the base for a viable ecosystem.
- ▶ Increasing native vegetation provides increased aesthetics and a more naturalized look in the community.

*\*NOTE - Basin retrofit projects need to meet stormwater ordinance requirements and be designed by a professional engineer.*

### WE CAN HELP!

- ▶ Jim Caldwell  
(717) 431-3740  
jcaldwell@rettew.com
- ▶ Kara Kalupson, RLA, ASLA, CPMSM  
(717) 431-3706  
kara.kalupson@rettew.com