BMP Stormwater Management Mechanisms

Water Quality

- O **Sedimentation (SD)** Gravitational settling of particle in the water. Depends on particle velocity, fluid density and viscosity, and particle size and shape. Typically used to remove soil particles and any materials adsorbed to those particles (such as metals or some organics).
- o **Floatation** (**FL**)- Separation by floating of particles that are lighter than water. Trash and oil/grease are typically managed with these processes.
- o **Filtration (FI)** Removal of particles from water by passing the water through a porous media. The media can be organic or inorganic. This can be strictly mechanical removal as when pore sizes are smaller than the particulate being removed, or chemical like such as when soluble nutrients or metals are attracted to organic filtration media (a combination of filtration and adsorption).
- Adsorption (AD)— Attraction of pollutants to the surface of soil particles via ionic charges. Clay soils, because of their chemical make up and particles with large surface area to mass ratios, provide good adsorption of dissolve pollutants such as nutrients and metals.
- O **Biological Uptake (BU)-** Aquatic plants, algae, microorganisms and phytoplankton can remove nutrients from water as they use them for growth. Also plants may uptake toxic materials and certain organics, a specific form of uptake termed phytoremediation.
- o **Biological Conversion (BC)** Organic contaminants can be broken down by the action of aquatic microorganisms in stormwater BMPs, reducing the toxicity of those contaminants.
- O Degradation (DG)— Some BMPs such as ponds and wetlands, typically with open water areas, allow degradation of pollutants such as organics like pesticides and herbicides. Volatilization, hydrolysis, and photolysis are processes of degradation.
- o **Prevention (PR)** Preventing the production of stormwater pollutants
- Minimization (MN) Minimizing the production of stormwater pollutants

Water Quantity

- o **Infiltration** (**IN**)- Percolation of water into the ground. Any infiltration that occurs has both volume and quality benefits for stormwater. Infiltration allows filtration and adsorption in the subsurface soils.
- O **Detention (DT)-** To receive and hold stormwater and release it at a slower rate, usually over a number of hours. The full volume of stormwater received is eventually released.
- Retention (RT)- The portion of the water permanently held on-site, where it infiltrates, evaporates, or is absorbed by surrounding vegetation. The full volume of stormwater that enters a BMP is not released off-site.

Habitat

Habitat conditions are generally dependent on a combinations of the various mechanisms listed above.