

# How Water Works

ILLUSTRATED PROCESSES, EQUIPMENT, AND TECHNOLOGY

## Manage Stormwater Runoff to Prevent Drinking Water Contamination

**S**tormwater runoff is rainwater or snowmelt that flows over the land. Runoff carries sediment and contaminants from streets, rooftops, and lawns to surface water bodies or infiltrates the soil to groundwater. Established best management practices mitigate stormwater pollution.

1. A storm drain is designed to drain excess rain and groundwater from paved streets, parking lots, sidewalks,

and roofs. Heavier sediment and small objects may settle in a catchbasin, lying just below the outlet.

2. Most storm drains have a single large exit at their point of discharge (often covered by a grating); many are designed to drain stormwater, untreated, into rivers, lakes, and other large bodies of water.

3. Constructed stormwater wetlands are similar to natural wetlands

but typically have less biodiversity. Wetlands remove pollutants through settling of solids and biochemical processes.

4. Stormwater ponds are permanent wet ponds in which solids settle during and between storms. The ponds include zones of emergent wetland vegetation where dissolved contaminants are removed by a secondary treatment of biochemical processes.

5. Grassed swales are shallow, vegetated ditches that reduce the speed and volume of runoff.

6. Minimized impervious areas reduce the flow and volume of runoff. Planners should direct runoff from roofs, sidewalks, and other surfaces over grassed areas to promote stormwater infiltration into the ground, allowing for filtration of pollutants before discharge to surface water and groundwater.

7. Green roofs are partially or completely covered with vegetation. They're often constructed as a layered system with

a waterproof layer, drainage layer, filter membrane, soil, and plants.

A green roof can capture from 15 percent to 90 percent of rainwater.

8. Permeable paving materials can be used in building sidewalks, driveways, and parking lots to allow stormwater infiltration.

9. Infiltration basins are shallow impoundments designed to permit stormwater to infiltrate into the soil. Infiltration trenches are long, narrow stone-filled excavated trenches, 3 to 12 feet deep. Runoff is stored in a basin or in voids between trench

stones and slowly infiltrates into the soil matrix below, where filtering removes pollutants.

10. Construction sites must be worked using special measures, such as silt fencing (woven geotextile fabric) and posts trenched into the ground, to prevent sediment deposition on adjacent property.

11. Buffer strips contain trees, shrubs, and/or grasses parallel to a stream, shoreline, or wetland, providing physical barriers to protect water bodies from disturbance or encroachment and pollution.



### PIPELINE KEY

- UNTREATED WATER
- TREATED WATER
- WASTEWATER

Some illustration elements exaggerated for emphasis.

ILLUSTRATION: RON KNOWLTON