

Glossary¹

Note: This glossary is not intended to provide regulatory or legal definitions of terms. Instead, it is intended to provide users of Volume 3 with a basic understanding of terms used in this manual.

303(d) List: Section 303(d) of federal Clean Water Act requires states to list those waterbodies that are not attaining water quality standards, including designated uses, and identify relative priorities among the impaired waterbodies. Once a stream is listed on the state 303(d) list, a Total Maximum Daily Load (TMDL) is typically required to assign allowable pollutant loads to various sources to enable the waterbody to attain designated uses in the future.

404 Permit: A federal discharge permit authorized under Section 404 of the Clean Water Act, which regulates the discharge of dredged, excavated, or fill material into wetlands, streams, rivers, and other Waters of the U.S. The U.S. Army Corps of Engineers is the federal agency authorized to issue Section 404 Permits for certain activities conducted in wetlands or other U.S. waters. When working in or around waterways or wetlands, 404 Permits are often required.

Best Management Practice (BMP): A technique, process, activity, or structure used to reduce pollutant discharges in stormwater. BMPs include source control practices (non-structural BMPs) and engineered structures designed to treat runoff. BMPs are most effective when used in combination and selected and designed based on site-specific characteristics.

Biofilter: Dense vegetation designed to filter pollutants from stormwater runoff. (Also see definition of Grass Buffer and Grass Swale.)

Bioretention: A method of stormwater quality treatment that relies on soils and vegetation for reduction of the quantity (volume) of stormwater runoff and removal/retention of stormwater pollutants. Bioretention facilities reduce runoff volume discharged downstream by infiltration and evapotranspiration. Bioretention facilities may be designed for infiltration to subsoils or with underdrains, depending on site-specific conditions. Pollutant removal processes include filtration, biological uptake, sorption and sedimentation (in the temporary surface pool during an event). Bioretention facilities are also known as rain gardens and porous landscape detention.

Buffer Zone: A designated transitional area around a stream, lake, or wetland left in a natural, usually vegetated state so as to protect the waterbody from runoff pollution. Development is often restricted or prohibited in a buffer zone.

Catch Basin: A depressed entryway to the storm drain system, usually located at a street corner.

¹ Definitions in this glossary have been compiled from several key references and websites including: Denver Water Quality Management Plan Glossary, Denver Wastewater Management Division Rules and Regulations <http://www.denvergov.org/admin/template3/forms/Sewer%20charges.PDF>, CWQCD <http://www.cdph.state.co.us/wq/>, Utah APWA <http://www.ulct.org/apwa/Glossary.htm>, EPA website glossaries <http://www.epa.gov/ednrmr/main/gloss.htm> and http://cfpub.epa.gov/npdes/glossary.cfm?program_id=0, the Low Impact Development website: <http://www.lowimpactdevelopment.org/school/glossary.html>, the Maryland website <http://www.mde.state.md.us/assets/document/sedimentstormwater/Glossary.pdf>, and the NRDC website <http://www.nrdc.org/water/pollution/storm/gloss.asp>.

Clean Water Act: Federal legislation that provides statutory authority for the National Pollutant Discharge Elimination System (NPDES) program and other water quality protection requirements; Public law 92-500; 33 U.S.C. 1251 et seq. Also known as the Federal Water Pollution Control Act. Under the Clean Water Act stormwater requirements, most urban areas must meet requirements of Municipal Separate Storm Sewer System (MS4) permits, and many industries and institutions such as state departments of transportation must also meet NPDES stormwater permit requirements. Operators of regulated MS4s are required to develop a Stormwater Management Plan (SWMP) that includes measurable goals and to implement needed stormwater management controls (BMPs). MS4s are also required to assess controls and the effectiveness of their stormwater programs and reduce the discharge of pollutants to the "maximum extent practicable."

Colorado Discharge Permit System (CDPS): The State of Colorado's system of permitting discharges (e.g., stormwater, wastewater) to Waters of the State that corresponds to the federal NPDES permits under the federal Clean Water Act.

Constructed Wetland Basin: An engineered stormwater BMP designed with a permanent shallow water surface and hydrophytic vegetation such as rushes, willows, cattails, and reeds. Constructed wetland basins included outlet structures to control peak flows and treat the WQCV through settling of pollutants and biological uptake. A perennial supply of water is necessary for constructed wetland basins.

Design Storm: A rainfall event of specific duration, intensity, and return frequency (e.g., the 1-year, 24-hour storm) that is used to calculate runoff volume and peak discharge rate for the purpose of designing stormwater facilities.

Detention: The storage and slow release of stormwater from an excavated pond, enclosed depression, or tank. Detention is used for pollutant removal, stormwater storage, and peak flow reduction. Both wet and dry detention methods can be applied.

Directly Connected Impervious Area (DCIA): The impervious portion of a site that drains directly to the storm sewer system. DCIA is a key component of the conceptual model used in the volume reduction calculations in Chapter 3 of this manual.

Distributed Controls: Use of multiple BMPs distributed throughout a development site to control and treat stormwater close to its source, as opposed to routing flows to a larger, centralized stormwater facility. Use of distributed stormwater controls is a key component of Low Impact Development.

Dry Pond: See definition of Extended Detention Basin (EDB).

Dry Weather Flows: Flows from municipal storm sewer systems that are not due to rain or snow-generated urban runoff.

Effective Imperviousness: Impervious areas that contribute surface runoff to the drainage system. For the purposes of this manual, Effective Imperviousness includes Directly Connected Impervious Area and portions of the Unconnected Impervious Area that also contribute to runoff from a site. For small, frequently occurring events, the Effective Imperviousness may be equivalent to Directly Connected Impervious Area since runoff from Unconnected Impervious Areas may infiltrate into Receiving Pervious Areas; however, for larger events, the Effective Imperviousness is increased to account for runoff from Unconnected Impervious Areas that exceeds the infiltration capacity of the Receiving Pervious Area. *Note: Users should be aware that some national engineering literature defines the Effective Impervious Area more narrowly to include only Directly Connected Impervious Area.*

Effluent Limitation Guidelines (ELGs): EPA-published guidelines in the Federal Register (Volume 74, Number 229, pages 62997-63057) establishing technology-based effluent limitation guidelines and new source performance standards for the construction and development industry. This rule requires construction site owners and operators to implement a range of erosion and sediment control measures and pollution prevention practices to control pollutants in discharges from construction sites. Additionally, the rule will eventually require monitoring and sampling of stormwater discharges and compliance with a numeric standard for turbidity in these discharges for larger construction sites (i.e., 10 acres or more).

Endangered Species Act: The Endangered Species Act of 1973 protects animal and plant species currently in danger of extinction (endangered) and those that may become endangered in the foreseeable future (threatened). It provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend, both through federal action and by encouraging the establishment of state programs.

Erosion Control Measures: Source controls used to limit erosion of soil at construction sites and other erosion-prone areas. Representative measures include surface treatments that stabilize soil that has been exposed due to excavation or grading and flow controls that redirect flows or reduce velocities of concentrated flow.

Erosion: Process by which soil particles are detached and transported by wind, water, and gravity to a downslope or downstream location

Eutrophication: An increase in the concentration of chemical nutrients (e.g., phosphorus, nitrogen) in an ecosystem to an extent that increases the primary productivity (e.g., algal growth) of the ecosystem, resulting in decreased oxygen levels and deteriorated water quality.

Event Mean Concentration (EMC): Pollutant concentration based on a composite of multiple samples (aliquots) collected during the course of a storm. Because EMCs represent conditions at multiple points on a storm hydrograph, they are most representative of average pollutant concentrations over an entire runoff event. EMCs are contrasted with single "grab" samples, which reflect storm conditions at a particular point in time.

Excess Urban Runoff Volume (EURV): The difference between urban and pre-development runoff volumes. The EURV is the basis of design for Full Spectrum Detention facilities.

Extended Detention Basin (EDB): An engineered basin with an outlet structure designed to slowly release urban runoff over an extended time period to provide water quality benefits and control peak flows for frequently occurring storm events. The basins are sometimes called "dry ponds" because they are designed not to have a significant permanent pool of water remaining between storm runoff events. Outlet structures for extended detention basins are sized to control more frequently occurring storm events, whereas flood control detention facilities are designed to control less frequent, larger storm events. Outlet structures can be designed to integrate water quality and flood control into a single detention facility. Also see Full Spectrum Detention.

Extensive Green Roof: A shallow green roof, typically 6 inches or shallower, that is designed to satisfy specific engineering and performance goals such as water quality treatment. An extensive green roof has low lying plants designed to provide maximum groundcover, water retention, erosion resistance, and respirative transpiration of moisture. Extensive green roofs usually use plants with foliage from 2 to 6 inches and provide 2 to 4 inches of soil/growing media.

Forebay: Storage space located near a stormwater BMP inlet designed to trap incoming coarse sediments and other gross solids before they accumulate in the main treatment area of the BMP.

Full Spectrum Detention: A stormwater detention facility design to provide water quality and flood control benefits and reduced impacts on downstream channels by detaining the Excess Urban Runoff Volume (EURV) and releasing it over a 72 hour period. The EURV is approximately

Geographic Information System (GIS): A database of digital information and data on land-use, land cover, ecological characteristics, and other geographic attributes that can be overlaid, statistically analyzed, mathematically manipulated, and graphically displayed using maps, charts, and graphs.

Grass Buffer: Uniformly graded and densely vegetated area, typically turfgrass. This BMP requires sheet flow to promote filtration, infiltration, and settling to reduce runoff pollutants.

Grass Swale: Densely vegetated drainageway with low-pitched side slopes that collects and slowly conveys runoff. The design of the longitudinal slope and cross-section size forces the flow to be slow and shallow, thereby facilitating sedimentation while limiting erosion.

Green Roof: An engineered vegetated roof that can be used to detain and treat precipitation. Green roofs require an engineered structure that can support soils, vegetation and loads associated with rainfall, snow, people and equipment. Key components include a waterproof membrane, root barrier, drainage layer, soil/growing medium, irrigation system and plants.

Hot Spot: Area where land use or activities have the potential to generate highly contaminated runoff with concentrations of pollutants in excess of those typically found in stormwater.

Household Hazardous Waste: Common everyday products such as paint, paint thinner and pesticides that can be hazardous if not properly disposed.

Illicit Connection: A sanitary plumbing fixture connected to a storm sewer, resulting in illicit discharges to the storm sewer system.

Illicit Discharge: A discharge to a municipal separate storm sewer that is not composed entirely of stormwater and is not authorized by an NPDES permit, with some exceptions (e.g., discharges due to fire-fighting activities).

Impervious Area: A hard surface area (e.g., parking lot or rooftop) that prevents or retards the infiltration of water into the soil, thus causing water to run off the surface in greater quantities and at an increased rate of flow relative to pervious areas.

Infiltration: The percolation of water from the land surface into the ground.

Inlet: An entrance into a ditch, storm sewer, or other waterway.

Integrated Pest Management (IPM): The practice of using biological, chemical, cultural, and physical measures to manage pests while minimizing or eliminating the use of chemical pesticides.

Intensive Green Roof: Landscaped roofs with several feet of soil and a variety of plant types, often including trees.

Level Spreader: An engineered structure designed to convert concentrated runoff to sheet flow and disperse it uniformly across a slope, thereby preventing/minimizing erosion.

Low Impact Development (LID): LID is an overall land planning and engineering design approach to managing stormwater runoff. LID emphasizes conservation and use of on-site natural features to protect water quality. This approach implements engineered small-scale hydrologic controls to mimic the pre-development hydrologic regime of watersheds through infiltrating, filtering, storing, evaporating, and detaining runoff close to its source. The term Green Infrastructure (GI) may also be used, particularly in areas with combined sewer overflow (CSO) issues.

Low Impact Development Practice: Individual practices used as part of overall LID developments or integrated into traditional developments include practices such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, permeable pavements and other infiltration-oriented practices.

Materials Management Practices: Source control practices at construction sites intended to limit contact of runoff with pollutants such as construction materials and equipment-related fluids. By intentionally controlling and managing areas where chemicals are handled, the likelihood of these materials being transported to waterways is reduced.

Media Filter: A stormwater BMP designed to filter runoff as it passes through media such as sand, compost, sand-peat, perlite-zeolite, or similar materials. (See Sand Filter Extended Detention Basin.)

Micropool: A smaller permanent pool incorporated into the design of larger stormwater ponds to reduce potential of clogging of the outlet and minimize resuspension of sediment.

Minimizing Directly Connected Impervious Areas (MDCIA): A variety of runoff reduction strategies that route runoff from impervious surfaces over pervious areas to decrease runoff velocities and promote infiltration.

Minimum Measures: Stormwater management activities required under Phase II MS4 permits. The six minimum measures include 1) public education and outreach, 2) public participation/involvement, 3) illicit discharge detection and elimination, 4) construction site stormwater runoff control, 5) post-construction stormwater management, and 6) pollution prevention/good housekeeping for municipal operations.

Municipal Separate Storm Sewer System (MS4): A publicly owned conveyance or system of conveyances that discharges to waters of the U.S. and is designed or used for collecting or conveying stormwater, is not a combined sewer, and is not part of a publicly owned treatment works (POTW).

MS4 Permit: A state or federal stormwater discharge permit to regulate discharges from municipal separate storm sewers (MS4s) for compliance with Clean Water Act regulations.

National Pollutant Discharge Elimination System (NPDES): The national program under Section 402 of the Clean Water Act for regulation of discharges of pollutants from point sources to waters of the U.S.

Non-Point Source (NPS) Pollution: Pollution that occurs when rainwater, snowmelt, or irrigation transports pollutants from diffuse sources across land surfaces into waterbodies. Nonpoint source pollution is contrasted with point source pollution in that it is not discharged from single discharge points such as storm sewers and wastewater treatment plants.

Non-Structural BMPs: Stormwater BMPs that focus on management of pollutants at their source by minimizing exposure to runoff, rather than treating runoff in constructed facilities. Non-structural BMPs are referred to as source controls in this manual.

NPDES: National Pollutant Discharge Elimination System, as described above.

Peak Runoff Rate: The highest actual or predicted flow rate (typically measured in cubic feet per second) for runoff from a site for a specific event.

Permeability: The ability of a material to allow the passage of a liquid, such as water through rocks or soil. Permeable materials, such as gravel and sand, allow water to move quickly through them, whereas impermeable material, such as clay, does not allow water to flow freely.

Permeable Pavement Systems (PPS): A general term to describe pavements designed to allow infiltration of water from the paved surface into subsurface layers. Depending on the design, permeable pavements can be used to promote volume reduction, provide treatment and slow release of the WQCV, and/or reduce effective imperviousness. Permeable pavement systems include permeable interlocking concrete pavement, concrete grid, pervious concrete, reinforced grass, and porous gravel.

Point Source Pollution: Pollutants from a single, identifiable source such as a factory, refinery, or place of business. In the context of TMDLs, point sources typically include NPDES-permitted sanitary wastewater treatment facilities, municipal separate storm sewer systems (MS4s), and confined animal feeding operations (CAFOs).

Pollutant (as defined by CDPS Regulation 6.3.0 [51]): Dredged spoil, dirt, slurry, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological nutrient, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand, or any industrial, municipal or agriculture waste.

Pollutant Load: The mass of pollutants carried in runoff, calculated based on flow volume multiplied by pollutant concentration. Pollutant loading has units of mass and is calculated over specific timescales such as day, month or year.

Porous Landscape Detention (PLD): Also known as a rain garden or bioretention facility, this stormwater quality BMP consists of a low lying vegetated area underlain by a permeable media with an underdrain. A shallow surcharge zone exists above the porous landscape detention for temporary storage of the WQCV.

Rain Garden: See definitions of Bioretention and Porous Landscape Detention (PLD).

Receiving Pervious Area (RPA): The pervious portion of a site that receives runoff from an upgradient impervious area prior to draining to the storm sewer system. RPA is a key component of the conceptual model used in the volume reduction calculations in Chapter 3 of this manual.

Redevelopment: Improvements to an existing developed area, typically involving removal of existing structures and construction of new buildings and associated infrastructure. Depending on the scale of the redevelopment activity, post-development stormwater permit requirements may be triggered.

Retention Pond: A BMP consisting of a permanent pool of water designed to treat runoff by detaining water long enough for settling, filtering, and biological uptake. Also known as wet ponds, these ponds may also be designed to have an aesthetic and/or recreational value. These BMPs have a permanent pool of water that is replaced with stormwater, in part or in total, during storm runoff events. In addition, a temporary extended detention volume is provided above this permanent pool to capture storm runoff and enhance sedimentation. Retention ponds require a perennial supply of water to maintain the pool and are typically used on larger sites.

Retrofit: The creation or modification of a stormwater management practice, usually in a developed area, that improves or combines treatment with existing stormwater infrastructure.

Revised Universal Soil Loss Equation (RUSLE): An erosion prediction method originally developed for agricultural land use that can also be used for estimating erosion potential on construction sites and adjusting BMPs to reduce the estimated erosion. Factors included in this equation include rainfall-runoff erosivity, soil erodibility, slope length and steepness, surface cover management, and erosion control practice implementation.

Runoff: Water from rain, melted snow, or irrigation that flows over the land surface.

Sand Filter Extended Detention Basin: A stormwater quality BMP consisting of a sand bed and underdrain system. Above the vegetated sand bed is an extended detention basin sized to capture the WQCV. A sand filter extended detention basin provides pollutant removal through settling and filtering and is generally suited to off-line, on-site configurations where there is no base flow and the sediment load is relatively low.

Sediment Control Measures: Practices that reduce transport of sediment off-site to downstream properties and receiving waters. Sediment controls generally either provide filtration through a permeable media or slow or detain runoff to allow settling of suspended particles.

Separate Pervious Area (SPA): The pervious portion of a site that drains to the storm sewer system, but does not receive runoff from upgradient impervious areas. SPA is a key component of the conceptual model used in the volume reduction calculations in Chapter 3 of this manual.

Sheet Flow: The portion of precipitation that flows overland in very shallow depths before eventually reaching a stream channel or other conveyance.

Site Management Practices: A combination of construction site management practices that help reduce pollutants leaving a construction site. These include practices such as construction sequencing and scheduling, vehicle tracking controls and street sweeping, and good management of practices associated with site construction such as stream crossing, temporary batch plants, dewatering operations and other measures.

Slotted Curbs: Curbs with slots or cut-out areas that allow stormwater to flow away from the curbed pavement into an adjacent landscape or turf area, as opposed to transporting runoff directly to a storm sewer system.

Source Controls: A variety of practices implemented to minimize pollutant transport in runoff by controlling pollutants where they originate and/or accumulate. Representative source controls include good housekeeping measures, landscape management practices, pet waste controls, public education regarding household hazardous waste, covering outdoor storage areas, etc.

Spill Prevention Control and Countermeasure (SPCC) Plan: A written plan prepared for an industrial, commercial or construction operation identifying measure to minimize the likelihood of a spill and to expedite control and cleanup activities should a spill occur. SPCC plans are legally required for certain types of operations.

Stormwater Management Plan (SWMP): A written plan required under state and federal stormwater discharge permits identifying measures that will be implemented to minimize the discharge of pollutants in stormwater. Requirements for SWMPs are legally specified in state and federal discharge permits. Requirements vary depending on whether the discharge permit is associated with municipal, industrial, or construction activities.

Structural BMPs: Engineered structures constructed to provide temporary storage and treatment of stormwater runoff.

Surface Water: Water that remains on the surface of the ground, including rivers, lakes, reservoirs, streams, wetlands, impoundments, seas, estuaries, etc.

Total Maximum Daily Load (TMDL): The maximum allowable loading of a pollutant that a designated waterbody can assimilate and still meet numeric and narrative water quality standards. Section 303(d) of the federal Clean Water Act requires states to identify waterbodies that do not meet federal water quality standards and establish TMDLs that result in attainment of stream standards.

Trash Rack: Grill, grate or other device installed at the intake of a channel, pipe, drain, or spillway for the purpose of preventing oversized debris from entering the structure. Trash racks may also serve a safety function.

Treatment Train: BMPs that work together in series to provide stormwater quality treatment.

Unconnected Impervious Area (UIA): The impervious portion of a site that drains over a receiving pervious area before discharging to the storm sewer system. UIA is a key component of the conceptual model used in the volume reduction calculations in Chapter 3 of this manual.

Underdrain: A perforated pipe, typically 4- to 6-inches in diameter, placed longitudinally at the invert of a stormwater facility for the purposes of achieving a desired discharge rate and controlling nuisance ponding.

Water Quality Capture Volume (WQCV): The quantity of stormwater runoff that must be treated in stormwater quality BMPs in Denver. This volume is equivalent to the runoff from an 80th percentile storm, meaning that 80 percent of the most frequently occurring storms are fully captured and treated and larger events are partially treated.

Waters of the United States: All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide. Waters of the U.S. include all interstate waters and intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds. [See 40 CFR 122.2 for the complete definition.]

Watershed: A geographical area that drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Pond: See definition of Retention Pond.

Wet Weather Flows: Water entering storm sewer systems as a result of precipitation events.

Wetlands: Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.