Appendix B

Glossary and List of Acronyms

Some definitions in this glossary are adapted from definitions from the Environmental Protection Agency, as well as applicable sections of the Michigan General Statutes and the Regulations of Michigan State Agencies. In addition, related guidance documents were consulted such as the Maryland Stormwater Design Manual and the Connecticut Stormwater Quality Manual.

Aquifer	A porous water-bearing formation of permeable rock, sand, or gravel capable of yielding a significant quantity of groundwater.
Bankfull flow	The condition where streamflow fills a stream channel to the top of the bank and at a point where the water begins to overflow onto a floodplain. For incised channels, where the channel has been downcutting, bankfull flow may no longer reach the floodplain.
Base flow	Streamflow that is the result of discharge from groundwater not due to stormwater runoff.
Berm	A shelf that breaks the continuity of a slope; a linear embankment.
Best Management Practice (BMP)	Structural and non-structural practices and techniques that mitigate the adverse impacts caused by land development on water quality and/or water quantity.
Biological oxygen demand (BOD)	A measure of the quantity of organic material in water as measured by its decomposition by oxidation mediated by microorganisms.
Bioretention	A water quality practice that utilizes landscaping and soils to treat stormwater runoff by collecting it in shallow depressions before filtering through a fabricated planting soil media.
Brownfield	Abandoned, idle, or under-used industrial and commercial properties where expansion or redevelopment is hindered or complicated by real or perceived environmental conditions.
Buffer	A zone of variable width located along both sides of a natural feature (e.g., stream or forested area) and designed to provide a protective area along a corridor.
Cation Exchange Capacity (CEC)	The capacity of a soil for ion exchange of positively charged ions between the soil and the soil solution. (A positively-charged ion, which has fewer electrons than protons, is known as a cation.) Cation exchange capacity is used as a measure of fertility, nutrient retention capacity, and the capacity to protect groundwater from cation contamination.
Channel	A natural stream that conveys water; a ditch excavated for the flow of water.
Channel protection volume	A volume of precipitation to be held on a piece of land, not to be released as runoff to a stream or river. The volume is selected that best protects the stream or river banks against erosion. Typically it's the volume of runoff calculated for a two-year, 24-hour storm falling on undeveloped meadow or forest.

Check dam	Small temporary dam constructed across a swale or drainage ditch to reduce the velocity of concentrated stormwater flow.
Cistern	Containers that store large quantities of stormwater above or below ground. They can be used on residential, commercial, and industrial sites.
Clustering	A land use planning term that describes the development pattern of clustering buildings and supportive facilities in one area of a site to conserve open space and natural features.
Combined sewer overflows (CSOs)	Combined sewer systems are generally older systems that were designed to carry both stormwater and sanitary sewage. When combined sewers do not have enough capacity to carry all the runoff and wastewater or the receiving treatment plant cannot accept all of the flow, the combined wastewater overflows into receiving waters as combined sewer overflow.
Constructed filter	Structures or excavated areas containing a layer of sand, compost, organic material, peat, or other filter media that reduce pollutant levels in stormwater runoff by filtering sediments, metals, hydrocarbons, and other pollutants.
Credit	Used in the design process to emphasize the use of BMPs that, when applied, alter the disturbed area in a way that reduces the volume of runoff from that area. The credit only works with designs based on the Curve Number or CN method because it modifies the CN variable so that the amount of runoff generated from an event is reduced.
Curve Number	Also CN. Determines the volume of stormwater removed from rainfall before runoff begins. It's based on land cover type, hydrologic condition, antecedent runoff condition and hydrologic soil group (HSG). The CN is a component in the NRCS Curve Number method for calculating storm runoff.
Darcy's Law	An equation stating that the rate of fluid flow through a porous medium is proportional to the potential energy gradient (typically driven by gravity) within the fluid. The constant of proportionality is the hydraulic conductivity, which is a property of both the porous medium and the fluid moving through the porous medium.
DBH	Diameter of a tree at breast height. DBH is the most frequent measurement made by a forester using either a diameter tape or tree caliper.
Deicers	Materials applied to reduce icing on paved surfaces. These consist of salts and other formulated materials that lower the melting point of ice, including sodium chloride, calcium chloride, and blended products consisting of various combinations of sodium, calcium, magnesium, chloride, and other chemicals.
Denitrification	The conversion of nitrate (NO3) to nitrogen (N2) gas by bacteria.
Detention	The stormwater management practice of temporarily detaining runoff, typically in a detention basin on site, before releasing it downstream.
Disturbed area	An area in which the natural vegetative soil cover has been removed or altered and is susceptible to erosion.

Dry well	Small infiltration pits or trenches filled with aggregate that receive clean runoff primarily from rooftops.
Earth change	A human-made change in the natural cover or topography of land, including cut and fill activities, which may result in or contribute to soil erosion or sedimentation of the waters of the state. Earth change does not include the practice of plowing and tilling soil for the purpose of crop production.
Erosion	The wearing away of land surface by running water, wind, ice, or other geological agents.
Erosion and sedimentation control program	The activities of a county or local enforcing agency or authorized public agency for staff training, developing and reviewing development plans, issuing permits, conducting inspections, and initiating compliance and enforcement actions to effectively minimize erosion and off-site sedimentation.
Evaporation	Phase change of liquid water to water vapor.
Evapotranspiration	The combined process of evaporation and transpiration (transpiration is the conversion of liquid water to water vapor through plant tissue).
Floodplain	Areas adjacent to a stream or river that are subject to flooding during a storm event that occurs once every 100 years (or has a likelihood of occurrence of 1/100 in any given year).
Freeboard	The distance between the maximum water surface elevation anticipated in design and the top of retaining banks or structures. Freeboard is provided to prevent overtopping due to unforeseen conditions.
French drain	A drain consisting of an excavated trench filled with pervious material, such as course sand, gravel, or crushed stone; water percolates through the material and flows to an outlet.
Geotextile fabric	Woven and non-woven material that acts as a permeable separator allowing water to pass into or out of a drainage system while preventing soils and other materials from entering the system. These fabrics are also used to separate, stabilize, and reinforce applications over soft soils, including paved and unpaved roads and embankments.
Green infrastructure	The network of open space, woodlands, wildlife, habitat, parks, and other natural areas which sustain clean air, water, and natural resources, and enhance quality of life.
Green roof	Conventional rooftops that include a thin covering of vegetation allowing the roof to function more like a vegetated surface. The layer thickness varies between 2-6 inches and consists of vegetation, waterproofing, insulation, fabrics, growth media, and other synthetic components.
Groundwater recharge	The replenishment of existing natural water bearing subsurface layers of porous stone, sand, gravel, silt or clay via infiltration.

H:V	Horizontal to vertical ratio.
Headwater stream	The source of a river or stream. Typically a very small, permenantly flowing or intermittent, waterway from which the water in a river or stream originates.
Herbaceous	Plants whose stem die back to the ground after each growing season.
Hotspot	Areas where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.
Hydrodynamic separators	An engineered structure to separate sediments and oils from stormwater runoff using gravitational separation and/or hydraulic flow.
Hydrologic (water) cycle	The movement of rainfall from the atmosphere to the land surface, to receiving waters and then back to the atmosphere.
Hydrologic soil group (HSG)	A soil series rating developed by the Natural Resources Conservation Service which describes the physical drainage and textural properties of each soil type.
Hydroperiod	The period of time, defined by time of year and duration, during which a wetland is covered by water.
Impervious surface	A surface that prevents the infiltration of water into the ground such as roofs, streets, sidewalks, driveways, parking lots, and highly compacted soils.
Incised Channel	A stream, river or man made channel where the base is lowered by erosion to the point where flood flows no longer reach the floodplain. Incised channels typically form in areas where changes in watershed land use increase the frequency, duration and peak flow rates.
Indigenous	Having originated in or being produced, growing, living or occurring naturally in a particular region or environment.
Infiltration practices	Best management practices (bed, trench, basin, well, etc.) that allow for rainfall to soak into the soil mantle.
Integrated pest management (IPM)	An ecosystem-based strategy that focuses on long-term prevention of pests and their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines for the target organism.
Intermittent stream	A stream that only flows for part of the year and is typically marked on topographic maps with a line of blue dashes and dots.
Invasive species	An alien plant species whose introduction does or is likely to cause economic or environmental harm or harm to human health.
Karst	A carbonate-based bedrock, such as limestone or dolomite that is highly soluble. Dissolution of Karst can potentially lead to subsurface voids and sinkholes.

Lake	The Great Lakes and all natural and artificial inland lakes or impoundments that have definite banks, a bed, visible evidence of a continued occurrence of water, and a surface area of water that is equal to, or greater than, 1 acre. "Lake" does not include sediment basins and basins constructed for the sole purpose of storm water retention, cooling water, or treating polluted water.
LEED	Leadership in Energy and Environmental Design (LEED) is a measuring system created by the U.S. Green Building Council that rates buildings based on their eco-friendliness in the areas of energy efficiency, water consumption, materials usage, indoor air quality and other contributions that promote sustainability in buildings.
Level spreader	A device for distributing stormwater uniformly over the ground surface as sheet flow to prevent concentrated, erosive flows and promote infiltration.
Low impact development (LID)	Activities that mimic a site's presettlement hydrology by using design techniques that are spatially distributed, decentralized micro-scale controls that infiltrate, filter, store, evaporate, and detain runoff close to its source.
Mitigation	Making something less harsh or severe. LID mitigates by lessening the impacts of stormwater runoff from impervious surfaces.
Native plants	Plants that historically co-evolved with the local ecology, geology and climate. EPA has categorized native (presettlement by Europeans) plant groups by Ecoregions.
Nonerosive velocity	The speed of water movement that is not conducive to the development of accelerated soil erosion.
Nonpoint source pollution	Pollution that does not come from a point source, such as a wastewater treatment plant, and are normally associated with precipitation and runoff from the land or percolation.
Nonstructural BMPs	Stormwater runoff treatment techniques that use natural measures to reduce pollution levels that do not involve the construction or installation of devices (e.g., management actions)
One-year storm	A stormwater event which occurs on average once every year or statistically has a 100% chance of occurring in a given year.
Outfall structure	The point where stormwater drainage discharges from a pipe, ditch, or other conveyance system to receiving waters.
Permanent soil erosion and sedimentation control measures	Control measures which are installed or constructed to control soil erosion and sedimentation and which are maintained after project completion.
Permeable	Allows liquid to pass through. Porous. Also pervious, the opposite of impervious.
Pervious	See Permeable.
Peak discharge rate	The maximum instantaneous rate of flow (volume of water passing a given point over a specific duration, such as cubic feet per second) during a storm, usually in reference to a specific design storm event.

Planter box	A device containing trees and plants near streets and buildings constructed to prevent stormwater from directly draining into sewers.
Pervious pavement	An infiltration technique that combines stormwater infiltration, storage, and structural pavement that consists of a permeable surface underlain by a storage reservoir.
Phase I Stormwater Regulations	Phase I of the U.S. EPA's National Pollutant Discharge Elimination System Program (NPDES) that addressed sources of stormwater runoff that had the greatest negative impact on water quality. Permit coverage was required for stormwater discharges from medium and large municipal separate storm sewer systems (MS4s) serving populations of 100,000 or more as well as industrial activities, including construction activity that disturbs five or more acres of land.
Phase II Stormwater Regulations	The second phase of the NPDES program which targets small MS4s in densely populated areas and construction activity disturbing between one and five acres of land.
Positive overflow	A technique that uses a catch basin with a higher inlet than outlet to provide adequate release of stormwater so the underlying bed system of pervious pavement does not overflow and saturate the pavement.
Presettlement	Time period before significant human change to the landscape. For the purpose of this manual, presettlement can also be used as the presettlement site condition. In the LID design calculations, presettlement is further defined as either woods or meadow in good condition. This definition will not represent the actual presettlement condition of all land in Michigan. It does provide a simple, conservative value to use in site design that meets common LID objectives.
Pretreatment	Techniques used to provide storage and removal of course materials, floatables, or other pollutants from stormwater before it is discharged downstream to a water body or another BMP.
Rain barrel	A barrel designed to retain small volumes of stormwater runoff for reuse for gardening and landscaping.
Rain garden	Landscape elements that combine plantings and depressions that allow water to pool for a short time (e.g., a few days) after a rainfall then slowly absorbed by the soil and vegetation.
Riparian buffer	An area next to a stream or river (sometimes also used for lakes) where development is restricted or prohibited. The buffers should be vegetated with herbaceous and woody native plants, or left in their natural state. Buffers filter stormwater before it reaches the waterbody and slow the stormwater velocity.
Riparian corridor	The area adjacent to a stream or river (sometimes also used for lakes) that preserves water quality by filtering sediments and pollutants from stormwater before it enters the waterbody, protects banks from erosion, provides storage area for flood waters, preserves open space, and provides food and habitat for wildlife.
Retention	The storage of stormwater to prevent it from leaving a developed or developing site.
Sanitary sewer overflows (SSOs)	Discharge from a sanitary sewer system which contains untreated or partially treated sanitary sewage. This type of overflow comes from systems designed to only carry sanitary sewage, however, overflows can result because of a storm event. This is because stormwater, groundwater inflow, and infiltration can enter sanitary lines through cracks, illicit connections, or undersized systems.

Seasonally high water table (SHWT)	The highest elevation of the groundwater table typically observed during the year.
Sediment basin	A naturally occurring or constructed depression used for the sole purpose of capturing sediment during or after an earth change activity.
Sheet flow	Overland flow of stormwater across the ground or another flat surface like a rooftop, taking the form of a thin, continuous layer of water, and not a concentrated flow as in a pipe, culvert, channel, ditch, or stream.
Smart Growth	Development strategies that aim to preserve natural land and critical environmental areas by concentrating areas of development, protect water and air quality, re-use developed land, provide pedestrian friendly neighborhoods, and provide affordable housing.
Soil erosion	The increased loss of the land surface that occurs as a result of the wearing away of land by the action of wind, water, gravity, or a combination of wind, water, gravity or human activities.
Stabilization	The establishment of vegetation or the proper placement, grading, or covering of soil to ensure its resistance to soil erosion, sliding, or other earth movement.
Stormwater	Water consisting of precipitation runoff or snowmelt.
Stormwater retention basin	An area which is constructed to capture surface water runoff and which does not discharge directly to a lake or stream through an outlet. Water leaves the basin by infiltration and evaporation.
Stormwater runoff	Rainfall or snowmelt that runs off the land and is released into our rivers and lakes.
Stream	A river, creek, or other surface watercourse which may or may not be serving as a drain as defined in Act No. 40 of the Public Acts of 1956, as amended, being §280.1 et seq. of the Michigan Compiled Laws, and which has definite banks, a bed, and visible evidence of the continued flow or continued occurrence of water, including the connecting waters of the Great Lakes.
Structural BMPs	Devices constructed for temporary storage and treatment of stormwater runoff.
Subsoiling:	A conservation practice that breaks up the soil layer below the topsoil, from 12 – 18 inches down to 2 to 3 feetdeep, allowing increased water movement, better aeration of the roots and access to additional minerals and nutrients for plant growth.
Swale	A shallow stormwater channel that can be vegetated with some combination of grasses, shrubs, and/or trees designed to slow, filter, and often infiltrate stormwater runoff.
Temporary soil erosion and sedimentation control measures	Interim control measures which are installed or constructed to control soil erosion and sedimentation and which are not maintained after project completion.
Time of concentration	Time required for water to flow from the most remote point of a watershed to a downstream outlet. Flow paths, ground surface slope and roughness, and channel characteristics affect this time.

Total phosphorous (TP)	The total amount of phosphorus that is contained in the water column.
Total suspended solids (TSS)	The total amount of particulate matter that is suspended in the water column.
Transpiration	The conversion of liquid water to water vapor through plant tissue.
Vegetated filter strip	Uniformly graded vegetated surface located between pollutant source areas and down-stream receiving waters.
Waters of the state	The Great Lakes and their connecting waters, inland lakes and streams as defined in rules promulgated under Part 31, and wetlands regulated under Part 303 of Michigan's Natural Resources and Environmental Protection Act, Act 451 of 1994, as amended..
Watershed	The geographic area that drains to a specific watercourse outlet. The watershed for a major river may encompass a number of smaller watersheds that ultimately contribute to their common outlet.
Watershed plan	A plan that identifies and implements actions needed to resolve water quality and quantity concerns. The plan assesses the current nature and status of the watershed ecosystem; identifies short and long-term goals, the actions needed to meet those goals; and includes a method for progress evaluation.
Wellhead protection area	A protected surface and subsurface zone surrounding a well or well field supplying a public water system to keep contaminants from reaching the well water.
Wetland	An area that is saturated by surface or groundwater with vegetation adapted for life under those soil conditions, such as swamps, bogs, fens, marshes, and estuaries.
Wet pond/constructed wetland	Surface or underground structures that provide temporary storage of stormwater runoff to prevent downstream flooding and the attenuation of runoff peaks.