



TO: Gregg Wood, Wastewater Licensing Program Manager
Bureau of Water Quality Management
Maine Department of Environmental Protection

FROM: Department of Public Works and Department of Planning and Urban Development
City of Portland, ME

RE: MS4GP: City of Portland – Draft Low-Impact Development Regulatory Mechanism

DATE: September 1, 2022

Dear Mr. Wood,

Thank you, in advance, for your review and consideration of the Low-Impact Development Program (LIDP) developed by the City of Portland (City) in partial compliance of the requirements of the Municipal Separate Storm Sewer General Permit (MS4GP), #MER04100 issued October 15, 2020, and the Final Permit Modification, issued November 23, 2021. The LIDP in Portland strives to ensure development within the City follows low-impact development (LID) goals and objectives to minimize potential negative effects to the natural environment.

The City has embraced the tenets of LID for many years, prioritizing protection of our natural resources in guiding documents such as *Portland's Plan*, the comprehensive plan, *One Climate Future*, our climate action plan, and the Integrated Plan. Further, the City has operationalized LID principles through the requirements for site plan review in both the City's Code of Ordinances and supporting regulatory documents, such as the City of Portland *Technical Manual*. In many ways, the City has been a leader in real-world low-impact development programs, enacting development standards that support tree preservation, reduce impervious surfaces, and embrace green infrastructure, and establishing a stormwater service charge and credit program which incentivizes the reduction of impervious area, promotes stormwater management and allows for a comprehensive approach to stormwater upgrades throughout the City. The City is grateful for the opportunity to refine and advance our practices and standards around LID through this comprehensive program which will help staff and developers alike in realizing the best path forward for development and redevelopment while protecting our fragile water resources.

The City recognizes and applauds the work of Southern Maine Planning and Development Commission, Cumberland County Soil and Water Conservation District, and Integrated Environmental Engineering, Inc. in developing the Maine Model Ordinance for Low Impact Development Strategies (Model Ordinance) under award CZM NA20NOS4190064 to the Maine Coastal Program from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce. This Model Ordinance has been an invaluable resource while considering the City's LIDP in the context of the MS4GP. Given the complexity



of the City's existing Code of Ordinances, the fact that many of the recommended strategies and standards are already in place within the City' regulatory tools, and the current effort to streamline and reorganize the City's Code of Ordinances and *Technical Manual*, the City will be employing a hybrid, multi-prong approach to implementing and enforcing the LIDP required by the MS4GP.

The City of Portland Low-Impact Development Program will:

- Be referenced in the appropriate City Ordinance (Chapter 14 Land Use and/or Chapter 32 Stormwater) so that the LIDP is integrated, by code, in the development review process;
- Include a set of Low-Impact Development Technical Standards (Table 1) within the City of Portland *Technical Manual* (including revisions to existing standards, as necessary) based on Appendix F of the MS4GP (Attachment 1) as provided in the Final Permit Modification and based on the Maine Model Ordinance for Low Impact Development Standards (Attachment 2);
- Integrate LID-related materials within site plan applications to help guide development projects through the LID planning process; and
- Integrate LID standards into the development review process to ensure LID is employed to the maximum extent practicable for new and redevelopment projects within the City.

Authority

The City of Portland will enact the LID Technical Standards based on Table 1 herein pursuant to 30-A M.R.S. §§3001 et seq. (municipal home rule ordinance authority), 38 M.R.S. §413 (the Wastewater Discharge Law), 33 USC §§1251 et seq. (the Clean Water Act), and 40 CFR Part 122 (US Environmental Protection Agency's regulations governing the National Pollution Discharge Elimination System (NPDES)). The Maine Department of Environmental Protection, through its promulgation of the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems has listed the City of Portland as having a Regulated Small MS4; under this General Permit, listing as a Regulated Small MS4 necessitates enactment of a regulatory mechanism as part of the City of Portland's Stormwater Management Program in order to satisfy the minimum control measures for Post-Construction Stormwater Management in New Development and Redevelopment.

Purpose

The purpose of these LID Technical Standards is to protect, maintain, and enhance public health, public safety, and general welfare by establishing minimum requirements and procedures to minimize the adverse effects of development and redevelopment on the environment.



Applicability

The LID Technical Standards in the City of Portland will apply to any development applying for Site Plan approval after 6/30/2024 which has stormwater discharges to the Regulated Small MS4 within the Municipality's Urbanized Area and results in:

- Construction Activity with Disturbed Area of one or more acres of land, or
- Construction Activity with Disturbed Area that is less than one acre of land if the Construction Activity creating Disturbed Area less than one acre of land is part of a larger Common Plan of Development or Sale that as approved or amended would create Disturbed Area of one acre or more.

In considering the LID Program, the City of Portland may explore varying applicability frameworks which recognize the differing contexts for greenfield sites, redevelopment sites, and various urban settings. Any thresholds will be at least as stringent as the above.

Technical Standards

The City's Land Use Code provides the authority and structure under which LID strategies will be required for development projects within the City. The existing *Technical Manual*, incorporated by reference into the Land Use Code, will provide the detailed technical standards against which development projects will be reviewed during the site plan review process. This framework is already in place for technical standards such as stormwater and sewer standards, erosion and sedimentation control standards, and transportation design standards. This structure is familiar to staff and to the development community and will establish the LIDP as a measurable and enforceable program.

The LID Technical Standards to be included in the City of Portland *Technical Manual* will be based on those standards included in the table below. As noted above, some of these standards currently exist within the *Technical Manual*, and will simply require reorganization and refinement. Others represent new policy. In the event of any conflicting regulation – whether municipal, state, or federal – the more stringent standard shall apply.



TABLE 1: LID Technical Standards for Development

Guiding Principal	Applicability	Technical Standard
Minimize Site Clearing & Protect Natural Resources	All development projects	Project must prioritize protection of: <ul style="list-style-type: none"> • Waters of the State and associated shoreland protection areas • Protected natural resources • Predevelopment drainage pathways • High permeability soils • Maine Native and Climate-Resilient Northeastern Native Vegetation in General Buffer areas and Shoreland Zoning Setback Buffer areas • Significant and Essential Wildlife Habitats
	All development projects (submission requirements, <i>Technical Manual</i> Section 16)	Site Plan application documents shall show any/all resources listed above.
	All development projects (submission requirements, <i>Technical Manual</i> Section 16)	Construction documents shall depict limits of disturbance. Limits of disturbance shall be established on-site prior to disturbance using flagging, fencing, signs or other means to provide a clear indication.
	Projects using vegetated buffers for stormwater treatment, projects that require a percentage of open space (OS)	(OPTIONAL) Projects with OS requirements provide conservation easements (legally enforceable, tied to deed) protecting OS
Protect Natural Drainage System & Maintain or Improve Pre-Development Time of Concentration	Any greenfield site development and for redevelopment projects with existing or proposed crossings of the main stem of urban impaired streams.	Protect Waters of the State (in order of priority): <ol style="list-style-type: none"> 1) avoid any crossing or modification of Waters of the State; 2) if avoidance isn't feasible, any Stream Crossings for Waters of the State shall use Maine Stream Smart Principles to preserve natural pre-development drainage pathways.



	Exception: Stream crossings over portions of streams that are artificially channelized are not subject to this standard.	
	All development projects	Protect waters of the state, natural drainage ways, and intermittent streams by (in order of priority): <ol style="list-style-type: none"> 1) avoid any modification of or to natural drainage channel; 2) recreate natural drainage channel (above-ground, naturalized) if avoidance isn't feasible; 3) use a culvert, meeting DEP standards, for drainage ways and intermittent stream only if open channel isn't feasible.
Minimize Impervious Area or Effect of Impervious Area	All development projects	Individual Stormwater Treatment Measure may not treat more than 1-acre of impervious cover
		Projects shall minimize impervious surface by minimizing off-street parking, minimizing drive aisle widths, and using compact parking provisions to the extent practicable.
Minimize Soil Compaction	All development projects	Construction equipment movement, laydown areas and parking shall be restricted to the disturbed area.
		Areas to be vegetated shall be tilled and the soils amended with organic matter as needed based on the results of soil tests.
		Areas of proposed revegetation, and which are to be used toward stormwater runoff calculations, shall be tilled according to the DEP BMP Manual, and permanently protected by conservation easement or other equivalent deed restriction.
		Areas of proposed infiltration BMPs should be roped off and protected from construction activity so as to not compact soils. This should be shown on ESC plan.
Minimize Lawns and Maximize Landscaping that	All development projects	Projects must meet Landscape Preservation Standards as specified in the City's <i>Technical Manual</i> Section 4. In meeting those



Encourages Stormwater Retention		standards, priority shall be given to preservation of tree canopy with naturalized, unmanicured vegetated buffers.
		Vegetation used in Stormwater Treatment Measures shall be Maine Native or Climate-Resilient Northeastern Native Vegetation
Stormwater Quality Treatment and Green Infrastructure (including Vegetated Open-Chanel Conveyance Systems)	All development projects	City of Portland and Chapter 500 stormwater requirements as specified in the City's <i>Technical Manual</i> Section 5 apply. In meeting these standards, priority shall be given to vegetated open-channel conveyance systems and green infrastructure treatment devices.



Review and Approval Procedures

Guidance for Applicants

The City recognizes that for the LIDP to be most effective, LID strategies must be part of the initial phases of project planning for development sites within the City. Before a project is laid out for a site, the development team must first identify and flag for preservation any areas on site affecting site hydrology, such as high-permeability soils, large tracts of mature vegetation, natural waterways, or wetlands. The City will develop a comprehensive checklist or other guidance to assist development teams. The City will also modify the overall submission requirements in Section 16 of the *Technical Manual* to ensure that all LID-related documentation is submitted as part of the site plan application package.

Additionally, the City will ensure that the LID Technical Standards are broadly shared prior to project submittal and will discuss the LID requirements with project proponents during pre-application meetings. This will allow development projects to modify plans and designs, if needed, to meet the LID Technical Standards prior to site plan application submission. City staff will also be available for consultation with development teams by request.

Review Mechanism for Review Staff

The City also understands that enforcement of LID Technical Standards consists of ensuring that development projects are meeting the Technical Standards to the maximum extent practicable prior to and as a condition of project approval. This process will be the responsibility of the City staff reviewing the project during site plan review. In order to provide an efficient yet comprehensive review, and to ensure that the review will be consistent among staff, the City will develop and employ a structured review process for LID Technical Standards. The structured review process will include an evaluation of the suitability of each standard for their site and the project's proposed method of meeting the standard, and may include checklists and/or scoring criteria.

Timeline

The City of Portland will have all components of the LIDP in place prior to the July 1, 2024 deadline as stated in the MS4GP and Final Permit Modification. To meet this deadline, interim project milestones are proposed as follows (subject to change):

September 1, 2022	Establish proposed framework for LIDP and submit to MEDEP
June 2023	Draft of LID Technical Standards <u>and</u> Land Use Code amendments (if needed) to City staff for review and comment
September 2023	Finalize LID Technical Standards and Land Use Code amendments (if needed)
November 2023	LID Technical Standards and Land Use Code amendments brought to Planning Board and City Council (as needed) for review and approval

City of Portland | Department of Public Works
Water Resources Division



The City of Portland looks forward to DEP's thoughts and comments on the comprehensive Low-Impact Development Program proposed herein. We very much appreciate your careful consideration and look forward to hearing from you and working with you as we move toward full implementation by July 1, 2024.

Kind regards,

William C. Boornazian, P.E.
Water Resources Manager

Enclosures: Attachment 1: Appendix F from the MS4GP
 Attachment 2: Maine Model Ordinance for Low-Impact Development Standards

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Guidance

Low Impact Development (LID)

LID is a process of developing land that mimics the natural hydrologic regime. LID begins at the design phase of a new development or redevelopment, incorporating planning techniques that minimize site clearing and impervious surfaces to reduce impact and stormwater runoff generated from the site. By reducing the volume of water leaving a site, the pollutant loading is also reduced. Other techniques that will reduce the volume and peak flow rates of runoff from the development are then incorporated throughout the site. LID is an effective tool that reduces pollutant loading, thermal impacts, stream flows, and minimizes stream channel erosion.

LID is not a rigid set of standards, or a one size fits all approach and has many benefits:

- ✓ **Benefits to the Developer:** The owner and developer will see reduced costs for land clearing and grading, infrastructure, and stormwater management while seeing an increased aesthetic value in the development.
- ✓ **Benefits to the Municipality:** The local government and community will benefit from reduced infrastructure maintenance costs and reductions in property damage from flooding, while having more green space, protected natural resources, and increased water quality.
- ✓ **Benefits to the Environment:** The hydrologic cycle is preserved; streams are less prone to erosion, and stream flows are maintained which benefits fish and wildlife.

LID goals and objectives shall be incorporated into the site planning process as early as possible. The following steps serve as a guideline to use in the planning stage:

- ✓ Identify and preserve areas that will affect the hydrology of the site. Features that should be protected are sensitive areas and natural resources including down gradient waterways.
- ✓ Minimize site disturbance and impervious areas with an alternative layout for the development within the constraints of local development criteria.
- ✓ Minimize the impervious surfaces directly connected to drainage conveyance systems to reduce the time of concentration.
- ✓ Break the site into smaller drainage areas that can be handled using basic LID techniques.

PLANNING FOR LID

Minimize Site Clearing: Development typically involves new impervious surfaces such as roads and buildings, and landscaped areas for lawns. Avoid developing soils with high permeability where possible. Protect areas that are sensitive to disturbance and that will sustain groundwater recharge and reduce runoff. For example, developing a vegetated, tight clay soil area will have less impact on stormwater runoff than developing a forested area on sandy soils. Once the sensitive areas have been identified, the layout of the development should be aligned with the conservation of these areas.

Minimize Impervious Areas: The traffic distribution network (roadways, sidewalks, driveways, and parking areas) is generally the greatest source of site imperviousness and should be the focus for reducing impervious area. The following techniques may be considered, where appropriate and permitted by local land use codes and/or ordinances:

Alternative Roadway Layout: Alternative roadway layouts can be used to reduce total pavement, while allowing for the same amount of development. Cluster development, in accordance with and as allowed by local ordinances can decrease imperviousness.

- ✓ *Narrow Road Sections:* The width of pavement can be reduced by including the primary driving surface, a pervious base for the shoulders, and ditch drainage swale in place of curb and gutter, as deemed appropriate. Use of this technique should be evaluated in accordance with site-specific conditions.
- ✓ *Sidewalks:* Sidewalks can be reduced to one side of the road or eliminated. The use of pervious materials can reduce runoff.
- ✓ *On-Street Parking:* Reduction to one side or elimination of on-street parking has significant potential to reduce overall site imperviousness. On-street parking may be a desirable practice in highly urbanized areas to reduce on-site disturbance.
- ✓ *Rooftops:* The number and size of buildings dictates the impervious area associated with rooftops. Vertical construction and/or the use of green roofs can minimize imperviousness.
- ✓ *Driveways:* Minimizing paved or impervious driveway area can be accomplished through the design of narrower driveways or by reducing the length of driveways. Shared driveways can also reduce imperviousness, where appropriate. In addition, the use of pervious materials can minimize runoff.

Minimize Connected Impervious Areas: The impacts from impervious surfaces can be minimized by disconnecting these areas from piped drainage networks and by managing runoff at the source.

- ✓ Paved driveways and roads can be directed to stabilized, vegetated areas.
- ✓ Flows from large, paved surfaces can be broken up to facilitate on-site management of smaller flows. Breaking flows up allows the flows to be directed to vegetation as sheet flow.
- ✓ LID techniques can be dispersed throughout the development, such as at individual houselots to obtain the most benefit. They can be incorporated into the landscaping of the property to provide a natural treatment system.

Maintain Time of Concentration: When development occurs, the time of concentration (T_c) is often shortened due to the impervious area, causing greater flows over a shorter period of time. LID practices can maintain the pre-development T_c by:

- ✓ Minimizing land disturbance,
- ✓ Detaining flows on site,
- ✓ Increasing the flow length,
- ✓ Increasing the surface roughness of the flow path,
- ✓ Creating flatter slopes, and/or
- ✓ Disconnecting impervious areas, which will decrease their travel rates.

Manage Stormwater at the Source: The impact from a development can be mitigated at the source by reestablishing a more natural hydrologic cycle that sustains a clean stream base flow. Typically, the most economical and simplistic stormwater management strategy is achieved by controlling runoff at the source with a variety of small treatment structures that will result in the reduction of stormwater discharge and more flexibility in the site design.

Soil Considerations:

Minimize Compaction: Compaction reduces the natural infiltrating ability of soils; thus, avoiding disturbance by heavy equipment can benefit infiltration. Designing development to situate impervious surfaces and development disturbances on the more impermeable soils of a site can leave more pervious soils to continue infiltrating runoff.

Increase Organic Content of Soils: When constructing many of the LID vegetated techniques, such as filtration Best Management Practices (BMP), a quality topsoil can optimize pollutant removal. In this case, the soil bed should consist of organic content as described in the relevant filtration BMP. This highly organic layer traps contaminants, absorbs more runoff and provides a medium for biological activity that helps break down pollutants. Planting soil provides a healthy growing medium for vegetation by encouraging strong root growth. In addition, microbes found in healthy soils transform nutrients for plant growth. Compost or other organic amendments can be added at the site preparation level, typically by the truckload. It is also available for little or no cost from many community leaf compost programs. For rain gardens and bioretention areas, organic content can also be valuable in absorbing and retaining moisture for plant life, filtering pollutants, and providing an active layer for microorganisms to reside and reproduce. A healthy microorganism population is key to the decomposition of many pollutants, whether in the home rain garden or in a parking lot.

- Avoid Pesticides/Herbicides: Healthy soil is alive with microorganisms that decompose and inactivate pollutants, but these may be killed by excessive chemicals. Although the soil microorganisms are not typically the target of these chemicals, many of them may fall victim to the use of pesticides. Additionally, insect species that prey on pests are also killed by pesticides. Since the predatory species tend to have slower reproduction than the pest species, a natural defense against insect pests may be lost.

LID TECHNIQUES

Many LID techniques rely on infiltration, retention, and evapotranspiration of stormwater to reduce runoff. When infiltration is not a possibility, the initial planning techniques described above should be the primary focus, followed by the use of small disconnected underdrained systems that rely on soil and vegetation to retain runoff. Examples of LID measures and techniques are shown on Table 1.

- Filters (Bioretention Cells and Rain gardens): Bioretention areas or rain gardens are built with a specific soil filter media (containing organic material and planted with vegetation that can handle wet and dry conditions) that will reduce the volume of runoff through absorption and evapotranspiration. A slight depression allows the ponding of stormwater as it filtrates through the soil media and into the groundwater or to an underdrain for surface discharge.
- Infiltration: Infiltration reduces runoff and mimics the natural hydrologic cycle by redirecting water into the ground rather than to a piped system. Runoff can be reduced by using smaller infiltration basins that fit into the natural landscape.
- Buffers: Vegetated buffers use soils and vegetation to remove pollutants from stormwater. Buffers can be used as a stormwater BMP for small developments by minimizing the amount of runoff generated through infiltration and evapotranspiration. Filter strips are typically used as pretreatment devices for bioretention cells and other infiltration practices.
- Collection Cisterns: In a commercial setting, the collection of rain runoff can be put to use in the building to off-set the cost of water supply. Cisterns can be located either above or below ground, and in out-of-the-way places that can easily be incorporated into a site design. Commercially available systems are typically constructed of high-density plastics and can include pumps and filtration devices. Rain barrels are inexpensive, effective, and easily maintainable when used in residential applications to capture roof runoff for later watering of lawns and gardens.
- Vegetated Rooftops: Vegetated rooftops provide three primary benefits: attenuation of stormwater runoff and peak flows, reductions of the heat island effects with an increase in building insulation, and a longer life expectancy for the base roof material. The stormwater benefit is that the smaller more common storm events are absorbed, which minimizes peak runoff and the net volume of runoff typically produced by roofs.

- ✓ Porous Pavement: Porous pavement is a permeable surface (pervious asphalt, concrete or pavers), a granular base, and subbase materials which allow the penetration of runoff into the underlying soils. The efficiency of pavement alternative systems depends on whether the pavement is designed to store and infiltrate most runoff, or only limited volumes of runoff (e.g., "first-flush") with the remainder discharged to a storm drainage system or overland flow. Maintenance is essential for long-term use and effectiveness. Pavement alternatives vary in load bearing capacities but generally can be designed for low traffic areas such as sidewalks, parking lots, overflow parking and residential roads. It is important to choose a material appropriate for the desired use (light, moderate or heavy use).
- ✓ Other Techniques: LID is about creativity. Multiple practices can be implemented and adapted into various sites and situations. However, they are mostly dependent upon the layout of the development and the disconnection of its individual elements.

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Table 1 – LID Measures and Techniques*

LID Measure	Example Technique	Design
Minimize site clearing	<ul style="list-style-type: none"> • Promote compact development on the site • Place parking underneath or inside structures • Avoid developing in areas with high-permeable soils to retain natural infiltration • Align development layout with conservation of sensitive areas 	
Protect natural drainage system	<ul style="list-style-type: none"> ✓ Maintain a minimum 25 foot buffer on all natural water resources including intermittent channels ✓ Do not divert stormwater from its natural sub-watershed 	
Minimize the decrease in time of concentration	<ul style="list-style-type: none"> ✓ Break up or disconnect the flow of runoff over impervious surfaces ✓ Sheet flow over pavement that is less than 100 feet 	
Minimize impervious area or the effect of impervious area	<ul style="list-style-type: none"> ✓ Build vertically with multi story buildings and parking garages ✓ More than 25% of pavement area (overflow) in pervious pavement. All pedestrian walkways are pavers or pervious pavement. Runoff from paved surfaces should be directed to stabilized, vegetated areas ✓ Disperse LID techniques throughout development and incorporate into the landscaping ✓ Infiltrate as much roof runoff as standards allow <p>Minimize the use of paved areas (sidewalks, driveways and streets)</p> <p>Minimize the use of hardscaped areas.</p>	<p>Design practices developed at the planning phase that will help mitigate environmental impacts. Ideally, these are cost-effective and environmentally friendly.</p>

Table 1 – LID Measures and Techniques*		
LID Measure	Example Technique	Design
Minimize soil compaction	<ul style="list-style-type: none"> · Minimize the construction window and target the development area · Rototilling all areas to be revegetated 	<p>Design practices developed at the planning phase that will help mitigate environmental impacts. Ideally, these are cost-effective and environmentally friendly.</p>
Minimize lawns and maximize landscaping that encourages runoff retention	<ul style="list-style-type: none"> · Low maintenance Maine native plants · No invasive plants · Limit the use of pesticides and biocides · Fertilizer application only during initial planting and repair of damaged areas. 	
Provide vegetated open-channel conveyance systems	<ul style="list-style-type: none"> · Evaluate road gutters and roof gutters to determine effective means to direct runoff to treatment BMPs · Level spreaders to buffers where possible · Underdrained swales 	
Rainwater is stored for later reuse for the building or landscape	Rain Collection Cisterns	
Stormwater Quality Treatment and Retention Requirements	Buffers	
	Infiltration (basins, trenches, dry wells, etc.)	
	Underdrained grass filters	
	Underdrained filter bioretention	
	Roofline filtration	
	Roof Greening	
	Pervious Pavement	

*LID measures, example techniques and design practices in this table are intended to be illustrative and shall be taken into consideration where applicable, practicable and allowable pursuant to applicable land use planning and development requirements.

Attachment 2

Background and Notes for Future Adopters

The performance standards contained in this document were developed to assist municipalities in addressing the 2022 General Permit for Stormwater Discharges to Municipal Separate Storm Sewer Systems (MS4s), which applies to 30 municipalities in Maine.

An Ordinance Committee and Technical Expert Panel reviewed the elements contained in this document. A white paper describing the rationale for the content of this Model Ordinance is a companion to this document.

Text in black in this document reflects elements that the Authors, and Technical Expert Panel agreed were important for implementation of Low Impact Development in most Maine developments. During comment and reviews, it became apparent that not all elements will be appropriate for implementation in all MS4 municipalities. Therefore, the full Ordinance Committee was polled to assess what elements should be removed from this Model Ordinance, and any elements with a 2/3 majority of votes (one vote per municipality) to remove were removed or made to be optional. Even the resulting recommendations provided in black text may not be consistent with some municipal policies, strategies, or Comprehensive Plans.

Municipalities that elect to adopt elements of this model ordinance should review its contents, determine if any elements are inconsistent with existing municipal policies, strategies, or Comprehensive Plans.

On or before 9/1/2022, each permittee must submit to MDEP a Model Low Impact Development Ordinance for stormwater management on new and redevelopment sites in accordance with the General Permit for their community.

Maine DEP will post the model ordinance for public comments and approve it, with or without modifications, on or before 11/1/2022.

Then MS4 communities must adopt an ordinance that is at least as stringent as the required elements of the model ordinance by 6/30/2024.

Because municipal ordinances are structured differently, with varying thresholds for development review, submittal requirements, and performance standards, this Model Ordinance does not contain complete language for each section. Instead, it is anticipated the municipalities will embed the required elements in their own Subdivision and Site Plan Ordinances or Regulations. Municipalities may need to adjust some text to be consistent with their own ordinance language.

Instructions to Adopters are contained in bounded text boxes at each section.

Optional elements incorporating Maine Climate Council Recommendations or recommendations from other sources is shown in blue in italics. Municipalities may or may not incorporate these elements as they wish.

Some standard ordinance language is shown in green, also in italics. Municipalities may modify this to conform to their own ordinances and procedures.

Maine Model Ordinance for Low Impact Development Strategies

Final Draft 6/5/2022



Credits: This model ordinance was prepared by SMPDC, CCSWCD, and Integrated Environmental Engineering, Inc. under award CZM NA20NOS4190064 to the Maine Coastal Program from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of NOAA or the Department of Commerce.

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Section 1 Purpose

The Purpose of this Ordinance is to protect, maintain and enhance the public health, safety and general welfare by establishing minimum requirements and procedures to minimize the adverse effects of development and redevelopment on the environment.

Section 2 Definitions

Note to Future Adopters: Review your Subdivision and Site Plan definitions for inclusion of the following definitions:

Buffers – Means all three kinds of buffers listed below unless a subset of the three is specifically called out:

- **Stormwater Vegetative Buffer** – a buffer constructed in accordance with Appendix F in Chapter 500 for the purposes of providing pollutant removal.
- **Shoreland Zoning Setback Buffer** – A buffer required by the municipal Shoreland Zoning Ordinance to protect a water of the State.
- **General Buffer** – a buffer required by the municipal ordinances to provide screening to parcels or developments from light, noise, other parcels, rubbish areas, or other areas.

Climate Resilient Northeast Native Vegetation – Means plants identified as native to the Northeast as identified by the Northeast Regional Invasive Species & Climate Change (RISCC) Network or a Maine Licensed Landscape Architect.

Common Plan of Development or Sale - Means a “subdivision” as defined in Title 30-A M.R.S. §§ 4401 *et seq.* (the Maine Subdivision statute) and in _____ of the Municipality’s code of ordinances.

Note: Common Plan of Dev. Or Sale is same definition as MS4 General Permit.

§§ 4401.4 "Subdivision" means the division of a tract or parcel of land into 3 or more lots within any 5-year period that begins on or after September 23, 1971. This definition applies whether the division is accomplished by sale, lease, development, buildings or otherwise. The term "subdivision" also includes the division of a new structure or structures on a tract or parcel of land into 3 or more dwelling units within a 5-year period, the construction or placement of 3 or more dwelling units on a single tract or parcel of land and the division of an existing structure or structures previously used for commercial or industrial use into 3 or more dwelling units within a 5-year period.

Construction Activity – Means any activity on a Site that results in Disturbed Area.

Disturbed Area - Means all land areas of a Site that are stripped, graded, grubbed, filled, or excavated at any time during the site preparation or removing vegetation for, or construction of, a Site. Cutting of trees, without grubbing, stump removal, disturbance, or exposure of soil is not considered Disturbed Area. Disturbed Area does not include routine maintenance but does include redevelopment and new Impervious Areas. "Routine maintenance" is maintenance performed to maintain the original line and grade, hydraulic capacity, and original purpose of the facility. Paving impervious gravel surfaces provided that an applicant or permittee can prove the original line and grade and hydraulic capacity shall be maintained and original purpose of the gravel surface remains the same is considered routine maintenance. Replacement of a building is not considered routine maintenance of the building and is therefore considered Disturbed Area.

Note: Disturbed Area definition is from the MS4 General Permit plus addition of the last sentence to ensure that redevelopment sites removing buildings take into account that area as Disturbed Area.

General Permit – Means the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4) approved October 15, 2020 and modified November 23, 2021 and any amendment or renewal thereof.

High Intensity Soil Survey – Means a Class A survey defined by the March 2009 Guidelines for Maine Certified Soil Scientist for Soil Identification and Mapping, prepared by the Maine Association of Professional Soil Scientists

High Permeability Soils – Means hydrologic soil groups A or B as determined by on-site soil testing by a certified soil scientist using a High Intensity Soil Survey.

Impervious Area - Means the total area of a Parcel covered with a low-permeability material that is highly resistant to infiltration by water, such as asphalt, concrete, or rooftop, and areas such as gravel roads and unpaved parking areas that will be compacted through design or use to reduce their permeability. Common Impervious Areas include, but are not limited to, rooftops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and macadam or other surfaces which similarly impede the natural infiltration of stormwater. Pervious pavement, pervious pavers, pervious concrete, and under drained artificial turf fields are all considered impervious. For the purpose of determining whether a Site exceeds the Impervious Surface thresholds requiring conformance to LID performance standards, the municipality may exclude these from calculation of Impervious Area if these are designed to be infiltration Stormwater Treatment Measures.

Note: this definition is the same as Chapter 500 definition of Impervious Area except Chapter 500 has a sentence at the end was removed, saying that the DEP can exclude Pervious pavement from calculation of Impervious Area was modified.

Low Impact Development (LID) - Means a broad approach to site planning that preserves natural resources, processes, and habitat, defines what portions of the site are suitable for development and then utilizes Stormwater Treatment Measures to manage runoff from the proposed developed

impervious areas. In LID, Stormwater Treatment Measures using natural processes such as vegetated buffers are given preference over constructed treatment Stormwater Treatment Measures. The goals of LID are to minimize the environmental impacts of the development.

Maine Licensed Landscape Architect – Means a person who has an active Landscape Architects license from the Maine Board of Licensure for Architects, Landscape Architects, and Interior Designers.

Maine Native Vegetation – Means vegetation including grass seed mixtures, identified as native to Maine from lists maintained by: US Department of Agriculture Hardiness Zones by the Maine Cooperative Extension, Wild Seed Project, Regional Soil and Water Conservation District, Maine YardScaping Program, or a Maine Licensed Landscape Architect.

Municipal Separate Storm Sewer Systems (MS4) - Means a conveyance or system of conveyances designed or used for collecting or conveying stormwater (other than a publicly owned treatment works (POTW), as defined at 40 CFR 122.2, or a combined sewer), including, but not limited to, roads with drainage systems, municipal roads, catch basins, curbs, gutters, ditches, human-made channels or storm drains owned or operated by any municipality, sewer or sewage district, Maine Department of Transportation (MDOT), Maine Turnpike Authority (MTA), State agency or Federal agency or other public entity that Discharges to Waters of the State other than groundwater.

Municipality – Means the City/Town of _____.

Parcel – Means the same as "Tract or parcel of land" as defined at 30 M.R.S. §4401.6 *et seq.* (or alternately, the municipality may reference their own definition of parcel).

§4401.6 Tract or Parcel of land means all contiguous land in the same ownership, except that lands located on opposite sides of a public or private road are considered each a separate tract or parcel of land unless the road was established by the owner of land on both sides of the road after September 22, 1971.

Permitting Authority - Means the Code Enforcement Officer, Building Inspector, Planning Board, or other official or body authorized by State law or the Municipality's ordinances to approve development or redevelopment of Sites.

Protected Natural Resource - Means coastal sand dunes, coastal wetlands, significant wildlife habitat, fragile mountain areas, freshwater wetlands, community public water system primary protection areas, great ponds, or rivers, streams or brooks as defined in the *Natural Resources Protection Act* at 38 M.R.S. §480-B.

Regulated Small MS4 - Means any Small MS4 authorized by the most recent, in-force MS4 General Permit or the general permits for the Discharge of stormwater from MDOT and MTA Small MS4s or state or federally owned or operated Small MS4s including all those located partially or entirely within an Urbanized Area.

Runoff – Means the part of precipitation from rain or melting ice and snow that flows across a surface as sheet flow, shallow concentrated flow or in drainage ways.

Rural Areas – Areas designated as follows on the municipal zoning map: _____

Small MS4 - Means any MS4 that is not already covered by the Phase I MS4 stormwater program including municipally owned or operated storm sewer systems, state, or federally owned systems, such as colleges, universities, prisons, military bases and facilities, and transportation entities such as MDOT and MTA road systems and facilities. See also 40 CFR 122.26(b)(16).

Significant and Essential Wildlife Habitats – Means the areas identified as Significant or Essential Habitats of endangered or threatened species as identified by the Maine Department of Inland Fisheries and Wildlife either on the Beginning with Habitat viewer or in consultation with the Maine Department of Inland Fisheries and Wildlife.

Site - Means the portion of a Parcel or Common Plan of Development, which is proposed for Construction Activity including open space, Stormwater Treatment Measures, and Disturbed Area, subject to this Ordinance.

Stream Crossing - Means the mechanism by which any road, sidewalk or other structural feature of a Site will cross, or pass over or through a Water of the State which has a stream bank full width of 6 feet or less.

Stream Crossing designed in accordance with Maine Stream Smart Principles – Means a Stream Crossing designed by a Maine Professional Engineer who has completed the Maine Audubon Society Stream Smart Workshops (Parts I and II), which includes the standards recommended by that program’s stream span, elevation, slope and skew and substrate to promote passage of fish and other organisms and to limit road-damaging flows from extreme weather.

Stormwater Treatment Measure – Means a stormwater management system or innovative treatment measure as described in Maine DEP Chapter 500 4.c.(3) Types of treatment measures allowed. These measures include wet ponds, vegetated soil filters, infiltration, buffers, or innovative treatment measures. For purposes of this Ordinance these are cumulatively referred to as Stormwater Treatment Measures, or individually referred to as Stormwater Treatment Wet Pond, Stormwater Treatment Vegetated Soil Filter, Stormwater Treatment Infiltration Measure, Stormwater Treatment Buffer, or Stormwater Treatment Innovative Measure.

Suburban Areas – Means areas designated as follows on the municipal zoning map: _____

Time of Concentration – Means the same as “Time of concentration” defined in Maine DEP Chapter 500.

Urban Areas – Means areas designated as follows on the municipal zoning map: _____

Urbanized Area - Means the area of the Municipality so defined by the inclusive sum of

the 2000 decennial census and the 2010 decennial census by the U.S. Census Bureau.

Waters of the State – See 38 M.R.S. §361-A (7).

Section 3 Applicability

Note to Future Adopters: Thresholds may be updated by inserting the applicability thresholds into applicability sections for Site Plan and Subdivisions. If a municipality has a table of Land Uses, identifying when certain types of reviews are required, a line item should be added specifying that disturbance of one or more acres requires Site Plan review in either all Zones (optional) or in the Urbanized Area of the municipality.

The LID Performance Standards contained in Section 7 apply to any Site initially applying for a permit from the municipality after 6/30/2024, with stormwater discharges to the Regulated Small MS4 within the Municipality's Urbanized Area, that results in:

- a. Construction Activity with Disturbed Area of one or more acres of land, or
- b. Construction Activity with Disturbed Area that is less than one acre of land if the Construction Activity creating Disturbed Area less than one acre of land is part of a larger Common Plan of Development or Sale that as approved or amended would create Disturbed Area of one acre or more, or
- c. *20,000 square feet or more of new Impervious Area in the watershed of an Urban Impaired Stream, or*
- d. *5,000 square feet or more new Impervious Area regardless of total Disturbed Area.*

Section 4 Procedure

Note to Future Adopters: No procedure is provided for this Model Ordinance because municipalities will rely on their existing Subdivision and Site Plan procedures for review and approval.

Section 5 Submission Requirements

Note to Future Adopters: Ensure the following elements are contained in your Subdivision and Site Plan submission lists where applicable.

5.1 Site Narrative

The applicant shall provide a Site narrative describing:

- *the overall approach to stormwater management at the site*
- *a listing of Stormwater Treatment Measures that will be in use and which will be maintained privately and which will be offered to the municipality for operation*
- *how they have prioritized protection of the sensitive areas from disturbance as required in Section _____,*
- *a rationale for any exceptions from performance standards (see Sections 7 and 11)*

5.2 Site Contacts and Qualifications

The applicant shall provide contact information (i.e., name, company if applicable, phone number, physical address, and email address) as described below:

- Maine Licensed Landscape Architect
- Maine Certified Soil Scientist
- Maine Professional Engineer

5.3 Plan Content

The Site Plans shall consist of a graphic representation of the Site at a scale no smaller than 1 inch = 100 feet showing:

- Waters of the State and their associated Shoreland Protection areas
- Protected Natural Resources
- Predevelopment drainage areas, pathways and associated Time of Concentration
- High Permeability Soils
- Maine Native and Climate-Resilient Northeastern Native Vegetation in General Buffer areas and Shoreland Zoning Buffer areas
- Significant and Essential Wildlife Habitats
- Limits of disturbance
- Post-development drainage areas, pathways and associated Time of Concentration
- Locations of snow storage areas
- Stormwater Treatment Measures to be used

5.4 Submittals related to Infiltration Performance Standard

The LID Performance Standards for Infiltration require the following submittals:

- Information required by Chapter 500 Section (7)(D)(5)(c) Infiltration Submittals including a plan for use of de-icing materials, pesticides and fertilizers within the drainage area of any infiltration Stormwater Treatment Measures.
- Locations of any Uncontrolled Hazardous Substance Sites, Voluntary Response Action Program sites, RCRA Corrective Action sites, or Petroleum Remediation sites on or adjacent to the Site.

Section 6 Approval Standards

Note to Future Adopters: The following text is suggested for inclusion in Findings of Fact to reflect that the LID Performance Standards have been reviewed and adhered to by the applicant. Note that this text is a simple paraphrasing of the intent of the Performance Standards.

The following criteria shall be used by the Permitting Authority in reviewing applications for site plan/subdivision review and shall serve as minimum requirements for approval of the Site application:

- *The Site protects sensitive areas, provides on-site volume control, provides treatment of stormwater, and minimizes impervious areas*

Section 7 Performance Standards

Note to Future Adopters: Review the following elements for addition to your Subdivision and Site Plan Performance Standards under existing Stormwater Management Standards or create a new Performance Standard titled: Low Impact Development.

To show conformance to the MS4 General Permit Requirements, we have included information about which LID Measure from Table 1 Appendix F of the 2022 MS4 General Permit the performance standard addresses. To assist municipalities in applying these performance standards, we have identified whether the standard should apply to Rural, Urban or Suburban Areas.

Regarding Maintenance of Stormwater Treatment Measures, MS4 communities maintain a Post-Construction Runoff Control Ordinance which automatically covers any Stormwater Treatment Measures required under the LID performance standards. Therefore, no Maintenance requirements are contained here. Non-MS4 communities implementing these LID strategies should also adopt the Post Construction Maintenance Ordinance.

Performance Standard	LID Measure(s) addressed (shown only for informational purposes)	Where Standard Applies within Urbanized Area
<p>Prioritize the protection of the following sensitive areas as listed below (highest priority listed first) by not disturbing land in these areas:</p> <ul style="list-style-type: none"> i. Waters of the State and associated shoreland protection areas. ii. Protected Natural Resources iii. Predevelopment drainage pathways iv. High Permeability Soils 	<ol style="list-style-type: none"> 1. Minimize Site Clearing 2. Protect natural drainage system 4. Minimize Impervious Area 5. Minimize Effect of Impervious Area 	<p>Rural, Suburban and Urban</p>

<p>v. Maine Native and Climate-Resilient Northeastern Native Vegetation in General Buffer areas and Shoreland Zoning Setback Buffer areas</p> <p>vi. Significant and Essential Wildlife Habitats</p> <p>Note that the applicant will need to provide a description in their narrative of how they have prioritized these areas for protection from disturbance. These areas may be counted toward the open space requirements.</p> <p>Exception: Removal of Maine Native and Climate-Resilient Northeastern Native Vegetation that is diseased or in poor condition is allowed.</p>		
<p>Construction documents shall depict limits of disturbance. Limits of disturbance shall be established on-site prior to disturbance using flagging, fencing, signs or other means to provide a clear indication.</p>	<p>1. Minimize Site Clearing</p>	<p>Rural, Suburban and Urban</p>
<p>Rural new developments shall preserve at least 40% of the development as open space and Suburban new developments shall preserve 25% of the development as open space.</p>	<p>1. Minimize Site Clearing 4. Minimize Impervious Area 7. Minimize lawns and maximize landscaping that encourages runoff retention.</p>	<p>Rural and Suburban</p>
<p>Stream Crossings for Waters of the State shall use Maine Stream Smart Principles to preserve natural pre-development drainage pathways.</p> <p>Exception: Stream crossings over portions of streams that are artificially channelized are not subject to this standard.</p>	<p>2. Protect natural drainage system 3. Minimize decrease in time of concentration</p>	<p>Rural, Suburban and Urban</p>
<p>Rural and Suburban developments shall preserve the natural pre-development drainage pathways on site by using the natural flow patterns and pathways for the post-construction drainage system.</p> <p>Exceptions are allowed if the Time of Concentration for predevelopment drainage pathways is the same as for post development drainage pathway.</p> <p>Exception: The applicant may submit an “alternative analysis” which demonstrates that this performance standard is impracticable.</p>	<p>2. Protect natural drainage system 3. Minimize decrease in time of concentration</p>	<p>Rural and Suburban</p>
<p>Sites that disturb one acre of land or more shall include Stormwater Treatment Measures in accordance with</p>	<p>2. Protect natural drainage system</p>	<p>Rural, Suburban and Urban</p>

<p>Maine DEP Chapter 500 Section 4.C General Standards 4.C.(2) Treatment requirements, 4.C.(3) Treatment Measures, and 4.D Phosphorus standard (for lake watersheds only) and additionally:</p> <ul style="list-style-type: none"> • Individual Stormwater Treatment Measure may not treat more than 1-acre of impervious cover • Vegetation used in Stormwater Treatment Measures shall be Maine Native or Climate-Resilient Northeastern Native Vegetation • <p>Note that although Chapter 500 General Standards and Phosphorus standard have higher thresholds for developed and impervious area, these standards apply to sites within the urbanized area of the municipality at a lower threshold.</p>	<p>5. Minimize Effect of Impervious Area 10. Stormwater Quality Treatment and Retention Requirements</p>	
<p>Provide volume control on-site (through infiltration or storage) in accordance with the following:</p> <ul style="list-style-type: none"> • Volume to be controlled= (total area of impervious cover after development – total area that existed before development) x Rd • Where Rd is the groundwater recharge depth based on the USDA/NRCDS hydrologic soil group as follows: Rd = 0.40 inches or rain for type A soils, 0.25 inches of rain for type B soils, 0.10 inches of rain for type C soils and 0 for type D soils • Restrictions and requirements identified in Sections D(2) through D(4) of Appendix D Infiltration basins, drywells, and subsurface fluid distribution systems; of Chapter 500 apply. <p>Exception: For sites in Rural and Suburban areas where infiltration will disrupt the preservation of the predevelopment drainage pathways, an exception from the infiltration standard will be allowed.</p> <p>Exception: If any Uncontrolled Hazardous Substance Sites, Voluntary Response Action Program sites, RCRA Corrective Action sites, or Petroleum Remediation sites are on or adjacent to the Site, the Site does not need to meet the volume control standard.</p>	<p>5. Minimize Effect of Impervious Area</p>	<p>Rural, Suburban and Urban</p>
<p>Minimize Impervious Area and the Effect of Impervious Area from road runoff:</p> <ul style="list-style-type: none"> • Dead-end streets shall be no longer than 1000 feet (rural and suburban areas). 	<p>4. Minimize Impervious Area 5. Minimize Effect of Impervious Area</p>	<p>Rural, Suburban and Urban</p>

<ul style="list-style-type: none"> • Dead-end roads shall be constructed to provide a hammerhead (when less than 200 feet), or a tear drop cul-de-sac turn-around with a center that is vegetated, used for open space, and/or a Stormwater Treatment Measure as described below (rural and suburban areas). • Cul-de-sac roads shall be constructed with the center island used for Stormwater Treatment Measures or vegetation unless type A or B soils are present in the center, in which case this area should be used to promote natural infiltration on-site. • At least 70% of Roadway runoff shall be directed into a Stormwater Treatment Measure 		
<p>Minimize Impervious Area from parking areas:</p> <ol style="list-style-type: none"> Commercial parking space size shall be a maximum 9-foot width and an 18-foot length with an allowance for reduction in length at a 1 to 1 ratio for available overhang (1 foot reduction allowed if 1 foot overhang possible). Compact car parking standards 9-foot x 16-foot space Parking lot travel aisles shall be a maximum of 22 feet wide. Parking volume requirements shall be based on reasonable parking needs instead of peak use, and maximum parking limits should be established for appropriate areas. Establish maximum parking requirements at current minimum standards. Reductions in parking volume requirements should consider presence of transit routes within ¼ mile, existing on-road parking, and transportation/parking demand management plan for Sites over a certain size. <p><i>Optional: (not fully developed as part of this ordinance) Establish "In Lieu of" Parking programs with the following components:</i></p> <ul style="list-style-type: none"> • <i>Fee in lieu of parking</i> • <i>Car-share-in-lieu of parking</i> • <i>Transit-in-lieu</i> • <i>Bike/pedestrian infrastructure improvements</i> <p><i>Note that the in-lieu program may optionally be tied to incentives, such as density or height bonuses.</i></p>	<p>4. Minimize Impervious Area</p>	<p>Rural, Suburban and Urban</p>

<p>Establish shared parking provisions</p> <p>Require garages/under above building where appropriate, optionally tied to a density or height bonus</p>		
<p>Runoff from on-site roofs, sidewalks, and peak-use overflow parking runoff shall be directed into Stormwater Treatment Buffers or Stormwater Treatment Infiltration Measures.</p>	<p>5. Minimize Effect of Impervious Area</p>	<p>Rural, Suburban and Urban</p>
<p>Construction equipment movement, laydown areas and parking shall be restricted to the disturbed area.</p> <p>Areas to be vegetated shall be tilled and the soils amended with organic matter as needed based on the results of soil tests.</p>	<p>6. Minimize Soil Compaction</p>	<p>Rural, Suburban and Urban</p>
<p>Snow storage areas shall be depicted on site plans.</p> <p>The location of snow storage areas in Stormwater Treatment Measures and Shoreland Zoning Setback Buffers shall be prohibited.</p>	<p>5. Minimize Effect of Impervious Area</p>	<p>Rural, Suburban and Urban</p>
<p><i>Optional Standard: Require the implementation of precipitation storage (e.g., cisterns or rain barrels) for later reuse for landscaping.</i></p>	<p>9. Rainwater Capture and Reuse</p>	<p>Rural, Suburban and Urban</p>

Note to Future Adopters: By embedding the performance standards into Site Plan and Subdivision Performance Standard, those enforcement provisions, Severability and Conflicts and Waivers provisions will automatically cover the LID Performance Standards. No additional Enforcement requirements need apply, so those provisions have not been included here.

Section 8 Enforcement

Section 9 Severability and Conflicts

Section 10 Waivers

Section 11 Exceptions

Some exceptions are allowed from the Performance Standards listed in Section 7 provided the applicant provides a narrative rationale justifying the exception and the municipality accepts the rationale and grants the exception.

Additionally, Notwithstanding other provisions in municipal ordinances or state law, requirements to plant “Climate-Resilient Maine Native Vegetation”, “Maine Native Plants” or “Climate Resilient Northeast Native Vegetation” shall not be construed as a restriction on the rights of individuals to engage in agricultural practices that are legally protected by the Maine Agriculture Protection Act and the “Right to Food” provision in the Maine Constitution (Constitution, Art. I, §25).

Section 11 Authority

The Municipality enacts the LID Model Ordinance Strategies Provisions pursuant to 30-A M.R.S. §§3001 et seq. (municipal home rule ordinance authority), 38 M.R.S. §413 (the Wastewater Discharge Law), 33 USC §§1251 et seq. (the Clean Water Act), and 40 CFR Part 122 (US Environmental Protection Agency’s regulations governing the National Pollution Discharge Elimination System (NPDES)). The Maine Department of Environmental Protection, through its promulgation of the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems has listed the Municipality as having a Regulated Small MS4; under this General Permit, listing as a Regulated Small MS4 necessitates enactment of elements of this Ordinance as part of the Municipality’s stormwater management program in order to satisfy the minimum control measures for Post Construction Stormwater Management in New Development and Redevelopment.