



3-2010

Town of New Durham Stormwater Management & Erosion Control Project

Town of Durham

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**Town of New Durham Stormwater Management and Erosion Control Project
PREP Community Technical Assistance Program
Final Project Report – March 2010**

Summary

Appledore Engineering worked with the New Durham Planning Board to develop a stormwater management and erosion control ordinance and to adopt complimentary improvements to the town's site plan review and subdivision regulations.

Overview

In 2008, the Town of New Durham's Planning Board applied for assistance through Round 3 of the Piscataqua Region Estuaries Partnership Estuaries Project's (PREP's) Community Technical Assistance Program. Appledore Engineering (AEI) was selected as the technical assistance provider for the project. The UNH Stormwater Center provided a free presentation to the Planning Board on general stormwater management and water quality issues in order to provide all of the Board members with a common understanding of the issues involved and justification for clear stormwater management performance standards. AEI met with the Planning Board to help them decide if the town wanted to develop a stormwater management ordinance, update their site plan and subdivision regulatory provisions for stormwater management, or both. Eventually, the town decided to pursue both. Over the course of the project, AEI worked with the Board on several draft versions of the new ordinance and regulations and amended them based on input from a public hearing on the issue.

The stormwater management zoning ordinance was passed by town voters on 3/9/2010 by an approximately 2:1 margin. The Planning Board subsequently adopted the recommended complimentary improvements to the town's site plan review and subdivision regulations.

Attachments

- AEI Memo 1: Review of New Durham's Existing Stormwater Regulations
- AEI Memo: New Durham Regulations Requiring Update
- Final Adopted 2010 Stormwater Management and Erosion Control Ordinance Warrant Article

This project was supported through PREP's Community Technical Assistance Program, with funding from the US Environmental Protection Agency through an agreement with the University of New Hampshire.

April 15, 2009

Mr. David Allen
Land Use Administrator
Town of New Durham
4 Main Street
New Durham, New Hampshire 03855

Re: CTAP Grant Program – Piscataqua Region Estuaries Partnership
Stormwater Regulations
New Durham, New Hampshire
AEI/2391

Dear David:

Appledore Engineering is pleased to provide you with this letter that details our review and findings of the Town of New Durham Regulations (as they relate to Stormwater Management) and our recommendation of the implementation of a New Stormwater Ordinance.

To familiarize ourselves with the current Town of New Durham requirements, we have reviewed the following regulations:

- Town of New Durham Subdivision Regulations (Amended February 2, 2008 with a history of amendments up to February 3, 2009) – Including the Town of New Durham Roadway-Related Subdivision Regulations (Amended November 8, 2006)
- Town of New Durham Zoning and Land Use Ordinance (Recodified March 11, 2008)
- Town of New Durham Site Plan Review Regulations (Revised June 30, 2008)

The intent of this report is to outline the current regulatory provisions already in place and determine how they relate to the State of New Hampshire's Department of Environmental Services Model Stormwater Ordinance and the town's desire to minimize environmental impacts, promote low impact, low maintenance and sustainable design.

With the increase in development and the alteration of existing surfaces comes the potential for adverse impacts on the water quality and downstream resources including the increase of the post-development stormwater runoff, decrease the groundwater recharge and non-point source pollution. A Stormwater Management Ordinance should include provisions that address the impervious coverage, best management practices, post-development peak flow rates, total runoff volume, water quality, recharge to groundwater and land uses with higher potential pollutant loads. It should also indicate the thresholds in which the regulations should apply and the operation and maintenance requirements of the systems once they are constructed.

With development and land disturbance also comes the need to address erosion and sedimentation control both during and after construction. Stormwater Management includes planning and designing systems to prevent erosion and sedimentation. The design, method, planning and inspection/recording procedures to control erosion and sedimentation, is recommended to be included as part of the Stormwater Management Ordinance.

The following chart summarizes the components of a Stormwater Management Ordinance, the regulations that are currently in place and the NHDES Model Ordinance Recommendation.

Stormwater Ordinance Component	Existing Ordinance/ Regulation (See notes)	Existing Requirement(s)	NHDES Model Ordinance Recommendations (Relative Components)
Impervious Coverage / Best Management Practices	<ul style="list-style-type: none"> ZLO: VIII.E.1.b. ZLO: IX.C.1 ZLO: XI.F.1 ZLO: XI.F.2 ZLO: XI.F.3 ZLO: XII.E.1 	<ul style="list-style-type: none"> No more than 20% of the lot area, including building, shall be covered by all impervious surfaces. ¹ Not more than 20% of a lot shall be covered by impervious surfaces. ^{1a} Residential development within the conservation focus area shall not exceed one (1) dwelling unit per five (5) acres. For parcels where 50% or less of the land is within the CFA, no more than 10% total land within the CFA may be developed. For parcels which are entirely within the CFA, no more than 30% of the total land may be developed. {This section covers use and disturbance limits, stormwater management and erosion and sedimentation control plan requirements for the Steep Slope Overlay District}. 	<ul style="list-style-type: none"> Maximum <i>Effective</i> Impervious Coverage shall not exceed 10%. The use of non-traditional and/or non-structural BMP Technologies shall be selected to accommodate the unique hydraulic and geologic conditions of the site. Control discharges to surface waters within a water supply intake protection area and water supply well. BMP's shall be designed to convey a minimum design storm event without overtopping or causing damage to the stormwater management facility.
Buffers/Setbacks	<ul style="list-style-type: none"> ZLO: IV.C.2 ZLO: V.C, 1&2 ZLO: VIII.E.2.h ZLO: XI.G.4 ZLO: XI.G.5 	<ul style="list-style-type: none"> 75' building setback to any water body or river course. Minimum 25' to 75' buffers with steep slope adjustments. Minimum of 50% of the total shore frontage must be preserved in a natural state in accordance with the CSPA. ² Contiguous forested land shall be protected to include a minimum 100' wide contiguous naturally vegetated corridor along all side and rear property lines. First order and higher perennial streams shall have a 100' continuous natural no-disturb buffer. 	<ul style="list-style-type: none"> Provide a minimum 50' no disturb vegetated buffer to existing surface waters, wetlands and natural drainage swales.
Post-Development Peak Flow Rates	<ul style="list-style-type: none"> ZLO: XI.G.8 RRSR: 19 SPRR: IX.C.1 	<ul style="list-style-type: none"> A stormwater management plan shall be prepared by a professional engineer. The plan shall show specific methods that will be used to manage the quantity and provide water quality treatment of stormwater for the entire site. ³ All streets shall be provided with adequate drainage facilities (culverts and ditches) to allow for the removal of storm water and prevent flooding of the pavement and erosion of adjacent surfaces. Construction of such facilities shall be in accordance with "New Hampshire Standard Specifications", Section 603, 604 and 605 as amended, hereby incorporated into these regulations by reference. No water from adjacent lots shall be allowed to run across street surfaces, but shall be directed into ditches and culverted underground in a culvert of a size recommended by the town's Road Agent and approved by the Planning Board. Standing water in ditches or culverts shall not be permitted. All developments shall make adequate provision for storm water disposal facilities which shall be designed and stamped by a registered engineer Storm water drainage systems shall be constructed within specified easements to convey storm water to existing water courses or existing storm drains. If the storm water drainage system created any addition flow over to other properties, the developers shall obtain easements therefore from the owners of said properties. {This section continues with additional references relating to the expectation of stormwater management.} 	<ul style="list-style-type: none"> The two (2) year 24 hr post-development peak flow rate shall be (a) < or = to 50% of two (2) year 24 hr storm pre-development flow rate or (b) < or = to the one (1) year 24 hr storm pre-development peak flow rate. Post-development Peak rates shall be = or < then pre-development Rates for the 10 and 50-year 24 hr events.
Total Runoff Volume	<ul style="list-style-type: none"> ZLO: XI.G.8 	<ul style="list-style-type: none"> A stormwater management plan shall be prepared by a professional engineer. The plan shall show specific methods that will be used to manage the quantity and provide water quality treatment of stormwater for the entire site. ³ 	<ul style="list-style-type: none"> The post-development runoff volume shall be equal to 90-100 % of the pre-development total runoff volume for the 2, 10 and 50-year 24 hr storm events.
Water Quality	<ul style="list-style-type: none"> ZLO: XI.G.8 	<ul style="list-style-type: none"> A stormwater management plan shall be prepared by a professional engineer. The plan shall show specific methods that will be used to manage the quantity and provide water quality treatment of stormwater for the entire site. ³ 	<ul style="list-style-type: none"> If more than 35% of the total area of the site will be disturbed or the site will have greater than 10% effective impervious cover, then the stormwater management system should remove 80% of the average annual load of TSS, floatables, greases and oils after the site is developed. Remove 40% of phosphorus.

Notes:

SPRR = Site Plan Review Regulations
CFA = Conservation Focus Area

RRSR = Roadway- Related Subdivision Regulations
CSPA = Comprehensive Shoreland Protection Act

ZLO – Zoning and Land Use Ordinance

Recharge to Ground Water	<ul style="list-style-type: none"> ZLO: XI.G.8 	<ul style="list-style-type: none"> A stormwater management plan shall be stamped and prepared by a professional engineer. The plan shall show specific methods that will be used to manage the quantity and provide water quality treatment of stormwater for the entire site.³ 	<ul style="list-style-type: none"> For all areas covered by impervious coverage, the total volume of recharge should be calculated as (The Total Impervious Coverage) x (Groundwater Recharge Depth). Prior to being recharged, the runoff shall be pre-treated.
Land Uses with Higher Potential Pollutant Loads			<ul style="list-style-type: none"> Land uses as defined by NHDES that have the potential to contribute higher pollutant loads to stormwater shall be required to demonstrate through implementation of BMPs and a Stormwater Pollution and Prevention Plan that they are no longer considered a high-load area or are prohibited from infiltration (restrictions and additional requirements are recommended).
Operation and Maintenance			<ul style="list-style-type: none"> All stormwater management systems shall have an Operations and Maintenance (O&M) Plan to ensure that the systems function as designed.
Erosion and Sedimentation Control	<ul style="list-style-type: none"> ZLO: V.H.2 ZLO: VIII.G ZLO: XI.G.9 ZLO: XII.E.1 RRSR: 18 	<ul style="list-style-type: none"> S&E control required for Riparian Buffer Zone.⁴ S&E control required for Shorefront Conservation Area.⁴ An Erosion and Sedimentation Control Plan shall be prepared and stamped by a professional engineer.⁵ {This section covers multiple use and disturbance limits, stormwater management and Erosion and Sedimentation Control Plan requirements for the Steep Slope Overlay District}. Erosion shall be controlled by placing mulch on matting on all surfaces disturbed by construction of the road and on all other surfaces where there is danger of eroded material being carried to the roadway area. 	<ul style="list-style-type: none"> Erosion and Sediment Control shall apply to land disturbance, development and redevelopment where the disturbance exceeds 20,000 sf or occurs in critical areas.

Footnotes:

- ¹ This requirement is in the Shorefront Conservation Area which extends 300' inland from the normal high water level on all lakes and ponds over ten (10) acres, however it is under Section E, titled Residential Development with Waterfront Access, which requires all residential development with water frontage or with rights of access to water frontage to meet this requirement.
- ^a This is a requirement of the Aquifer Protection District, which applies to those areas defined as those areas in town that fall into the County listing of Potential Unconsolidated Aquifers by soils. Areas delineated as Potential Aquifers by soil type are shown on a map on file in the office of the Planning Board.
- ² The CPSA has been since amended. Overall statement of "as amended" should be added as specific calculations and standards regarding the 50% are now required.
- ³ This regulation relates to only the development within the Conservation Focus Area. The Stormwater Management Plan is to be prepared and stamped by a professional engineer (it does not indicate that the engineer should to be licensed in the State of New Hampshire. The plan shall incorporate best management practices as recommended in the "Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire" as well as considerations for recommendation in "Innovative Stormwater Treatment Technologies: Best Management Practices Manual" by the NHDES and NHEP and "Best Management Practices to Control Non-point Source Pollution: A guide for Citizens and Town Officials" by NHDES.
- ⁴ The requirements regarding the preparation and implementation of the Erosion and Sedimentation Control Plan in the Riparian Buffer Zone are different from those required in the Shorefront Conservation Area.
- ⁵ This requirement applies to only the disturbance within the Conservation Focus Area. For all disturbance associated with the application and Erosion and Sedimentation Control Plan and a Grading Plan for the project site shall be prepared and stamped by a professional engineer (it does not indicate that the engineer should be licensed in the State of New Hampshire). The plans will show specific methods that will be used to control soil erosion and sedimentation, soil disturbance and removal, grading and stormwater collection. These plans shall provide for temporary protection measures during construction and permanent protection measures in the post- development condition. These plans shall incorporate best management practices as recommended in the "Best Management Practices to Control Non-point Source Pollution: A Guide for Citizens and Town Officials" by NHDES and the "Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire" by NHDES.

Notes:

SPRR = Site Plan Review Regulations
CFA = Conservation Focus Area

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CSPA = Comprehensive Shoreland Protection Act

ZLO – Zoning and Land Use Ordinance

Overall the Town of New Durham has incorporated many regulations that serve to protect the natural resources, promote safety and overall smart development. As we move forward in writing a Stormwater Ordinance it will be important to have an overall understanding of minimum requirements and thresholds, overlay/district requirements and which development scenarios are technically unregulated and how additional regulations can further protect the town's natural resources.

Appledore Engineering recommends based on the NHDES model ordinance recommendations and review that at the April 21st Planning Board meeting we discuss the following:

- The individual overlay/district areas and the overlap of jurisdiction.
- The criteria and thresholds that the Board would be comfortable with that should be established for development to require a Stormwater Management and Erosion and Sediment Control Plan.

We recommend including within the Site Plan review regulations the following:

Statement of Purpose: To protect, maintain and enhance the public health, safety, environment and general welfare by establishing minimum requirements and procedures to control the adverse affects of increased post-development stormwater runoff, decreased groundwater recharge and non-point source pollution associated with new development and redevelopment.

Applicability: All developments disturbing greater than 10,000 sf of area or creating 5,000 sf of new impervious area (excluding single/duplex residential roof area) or as required by other sections of this regulation, the Town of New Durham Subdivision Regulations or the Zoning and Land Use Ordinance, shall submit a permanent (post construction) Stormwater Management and Erosion and Sediment Control Plan, which shall be prepared by a licensed New Hampshire professional engineer and shall address and comply with the requirements set within the Stormwater Management Ordinance and as specified by the Planning Board.

- The minimum components required for a Stormwater Management Plan including the minimum design requirements for pre/post development flows, water quality designs that incorporate best management practices including low impact design and the requirement of an Operation and Maintenance Plan.

We recommend including within the Stormwater Ordinance the following:

A Stormwater and Management Plan shall include (beyond the already established impervious limits, setbacks etc.):

- ⇒ Drainage Calculations including, drainage paths, time of concentration, soil cover and pre-development and post-developments peak flows.
 - The two (2) year 24 hour post-development peak flow rate shall be (a) less than or equal to 50% of the two-year 24 hr storm pre-development flow rate or (b) less than or equal to the one-year 24 hour storm pre-development peak flow rate.
 - Post-development peak rates shall be equal to or less than the pre-development rates for the 10-year and 50-year 24 hour events.
 - Best Management Practices shall be designed to convey the 50-year, 24 hour storm event.
 - Emergency spillways and down slope drainage facilities shall have capacity to accommodate a 100-year, 24 hour storm event.
 - Roadway and driveway crossings over streams shall meet the following design criteria to accommodate high flows, minimize erosion and support aquatic habitat and wildlife passage:
 - + Natural stream bottoms.
 - + Sized for 1.2 times bank-full stream width.
 - + Passageways under roads shall be designed to maintain water velocity at a variety of flows that is comparable to flows in upstream and downstream segments of the natural stream.

(Additional language should be added to allow the Planning Board the authority to require additional requirements as it relates to culvert/crossing designs when culverts/crossing intersects contiguous wetlands or upland areas that have been determined to connect wildlife. The board may require the assistance of a wildlife biologist to make this determination)

- The post-development total runoff volumes shall be equal to 90-110 percent of the pre-development total runoff volume (2-year, 10-year, 25-year and 50-year storm event).
- ⇒ Total Impervious Area Calculations
 - Continue with impervious thresholds as required per district/overlay area. Although the NHDES model suggests that the effective impervious cover to be no more than 10% of this site area, this requirement would be most effective on large commercial development, which does not appear abundant in the Town of New Durham.

- ⇒ Low Impact Design Considerations and Alternatives
 - The applicant shall be required to provide nontraditional and/nonstructural stormwater management measures, including the disconnection of impervious surfaces, Low Impact Design (LID) techniques and use practices that intercept, treat and infiltrate runoff from developed areas distributed throughout the site (i.e. bioretention, infiltration dividers or islands, rain gardens and/or plant filters) . Applicants shall demonstrate why the use of nontraditional and/or nonstructural approaches are not possible before proposing to use tradition, structural management measures.
- ⇒ Recharge to Groundwater/Land Uses with Higher Pollutant Loads
 - Adopt with minor revisions the NHDES model ordinance section for water quality. This section addresses requirements and calculation methods. (See attached sample language.)
 - Adopt the NHDES model ordinance section for land uses with higher pollutant loads. This section addresses additional requirements and practices. (See attached sample language.)
- ⇒ Operation and Maintenance Plan
 - All stormwater management systems shall have an Operation and Maintenance (O&M) Plan to ensure that systems function as designed. This plan shall be reviewed and approved as part of the review of the proposed management system and its execution considered a condition of approval. The plans shall identify:
 - + System owner
 - + Party responsible for operation and maintenance and if applicable implementation of the Stormwater Pollution and Prevention Plan (SWPPP)
 - + A schedule for inspection and maintenance
 - + A checklist to be used during each inspection
 - + The description of routine and non-routine maintenance tasks to be undertaken
 - + A plan showing the location of the systems covered under the plan
 - + A certification signed by the owner indicating they understand the requirements of the plan

- The minimum components required for an Erosion and Sedimentation Control Plan:

We recommend including within the Stormwater Ordinance the following:

An Erosion and Sediment Control Plan shall include (in addition to the requirements already established):

- ⇒ Inspections, procedures and frequency
 - ⇒ Documentation of inspections
 - ⇒ Phasing of development and land disturbance
 - Minimizing the area of disturbed soil
 - Control of water on site by use of immediate seeding and mulching or the application of sod as well as the use of structural measures including silt fences, check dams, mulch filter socks, etc.
 - ⇒ The stormwater management process
- Procedural requirements for adoption of the Stormwater Management Ordinance.
 - The rewording or reworking sections of the existing regulations require that the applicant shall prepare plans using reference documents. (For example, multiple sections within the current regulations reference guidance documents that may contradict or have different thresholds than the final stormwater ordinance.)

Upon the Board's review of this letter and our discussion at the next Planning Board meeting, Appledore will be able to prepare a draft Stormwater Ordinance that continues the Town of New Durham's desire for protection of its resources. We look forward to meeting with and discussing our findings in more detail.

Yours truly,



Bradlee Mezquita, P.E. LEED AP.
Vice President

Enclosure

BM/maa
(2391-001 (letter).doc)

May 15, 2009

Mr. David Allen
Land Use Administrator
Town of New Durham
4 Main Street
New Durham, New Hampshire 03855

Re: CTAP Grant Program – Piscataqua Region Estuaries Partnership
Stormwater Regulations
New Durham, New Hampshire
AEI/2391

Dear David:

Below you will find a list that contains the sections of the existing Town of New Durham Regulations that would be affected by the draft Stormwater and Erosion and Sediment Control Ordinance that was sent yesterday via email. For your information we have also indicated sections in which there are potential formatting errors and reference citations that would easily be modified with any future updates of the existing regulations.

Town of New Durham Subdivision Regulations (amended February 2, 2008 with a history of amendments up to February 3, 2009) – Including the Town of New Durham Roadway-Related Subdivision Regulations (amended November 8, 2006)

- Page 9, Section 19: add “as amended” to New Hampshire Standard Specification reference and add close quotation marks to reference.

•

Town of New Durham Zoning and Land Use Ordinance (Recodified March 11, 2008)

- Page 15, Section V – Footnote 2: update reference
- Page 17, Section V – C.1.c: update reference
- Page 19, Section V – H.1: Tables 1A and 2 as identified are Table V-I and Table V-II
- Page 20, Section V – H.2.a.b: update reference or add “as amended”
- Page 40, Section VIII – E.h: update reference or add “as amended”
- Page 41, Section VIII – G.1: update section to reference new Stormwater and Erosion and Sediment Control Ordinance
- Page 44, Section X – A.2: remove question mark
- Page 47, Section X – G: remove the 4 from “Poorly Drained Soils include” and renumber 5-8 as 1-4 and update reference or ad as amended
- Page 52, Section XI – G.8 and G.9: update section to reference new Stormwater and Erosion and Sediment Control Ordinance
- Page 56, Section XII – E.1: update reference and reference new Stormwater and Erosion and Sediment Control Ordinance
- Page 58, Section XII – F.3, F.4 and F.5: reference new Stormwater and Erosion and Sediment Control Ordinance

Town of New Durham Site Plan Review Regulations (Revised June 30, 2008)

- Page 15, Section IX – C.1, 2: reference new Stormwater and Erosion and Sediment Control Ordinance
- Page 23, Section X – B.2.a: change “he” to “the”

CTAP Grant Program – Piscataqua Region Estuaries Partnership
Stormwater Regulations
New Durham, New Hampshire
AEI/2391
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We also recommend that the definitions with the Zoning and Land Use Ordinance, the Site Plan Regulations and the proposed Stormwater and Erosion and Sediment Control Ordinance be consolidate into one section or reviewed to determine overlap and necessity.

Upon the Board's review of this letter and the draft ordinance we look forward to any comments and/or concerns. If you have any questions or concerns, please do not hesitate to call.

Yours truly,



Bradlee Mezquita, P.E., LEED AP
Vice President

BM/maa
(2391-002 (letter).doc)

Enclosure

XIII. STORMWATER MANAGEMENT AND EROSION CONTROL ORDINANCE

A. PURPOSE

To protect, maintain and enhance the public health, safety, environment, and general welfare by establishing minimum requirements and procedures to control the adverse affects of increased stormwater runoff, decreased groundwater recharge, and non-point source pollution.

B. AUTHORITY

The provisions of this Article are adopted pursuant to RSA 674:16, Grant of Power, RSA 674:17, Purposes of Zoning Ordinance, and RSA 674:21, Innovative Land Use Controls.

C. APPLICABILITY

1. This ordinance applies to all property owners for
 - a) All new disturbances of the land on existing lots on slopes greater than 30%, and
 - b) All new disturbances of the land greater than 500 square feet on slopes of 30% or less and greater than 15%; and
 - c) All new disturbances of the land greater than 2000 square feet on slopes of 15% or less
2. A disturbance of the land means anytime that soil, sand, gravel, or rocks are exposed by human activities such as clearing of trees or vegetation, grading, blasting, or excavation.
3. The following activities and projects are excluded from the definition of disturbances of the land:
 - a) Reseeding or repair of an existing lawn in which the topography of the site is not significantly altered and the existing runoff patterns remain unchanged.
 - b) Repair or replacement in kind of a septic system in which the topography of the site is not significantly altered and the existing runoff patterns remain unchanged.

STORMWATER MANAGEMENT ORDINANCE

- c) Projects limited to subsurface explorations needed to assist in the design of a project including but not limited to test boring, test pits, observation wells, soil surveys, and other site characterization work.
 - d) Utility projects that meet all of the following conditions:
 - (1) The project is limited to trench excavation for installing, replacing, or repairing utilities, such as sewer, septic, water, closed drainage systems, gas pipes, or telephone or cable wires (that is not part of a larger project that would require a permit under this ordinance);
 - (2) The project is done by or at the direction of the entity with responsibility for maintaining the lines for which the work is being done, including the homeowner if he or she is the responsible party
 - (3) The trench is closed at both ends so no water can escape the trench if there is a storm.
 - e) An asphalt maintenance project that meets all of the following conditions:
 - (1) The project is limited to replacement of the existing asphalt surface to its existing grade;
 - (2) The project is limited to the footprint of the existing surface;
 - (3) There is no change in the existing drainage system; and
 - (4) If course gravels or other materials forming the base under the asphalt are removed, they are replaced within 72 hours.
 - f) Agricultural or forestry operations as defined by RSA 21:34-a.
 - g) All exempt activities shall be completed in accordance with the relevant Best Management Practices.¹
4. Levels of Disturbance: There are two levels of disturbance defined by the size and slope of the area disturbed. The levels are:
- a) Incidental Disturbance:
 - (1) Defined as any disturbance that is
 - (a) Greater than 2000 square feet and less than or equal to 12,000 square feet on slopes of 15% or less; and is
 - (b) 25% or less of the total lot area, and is
 - (c) 5,000 square feet or less of new impervious area.
 - (2) Management of Incidental Disturbances
 - (a) Incidental disturbances shall require a Permit by Notification;
 - (b) The application for a Permit by Notification shall be submitted to the Code Enforcement Officer at least 10 working days in advance of the commencement of work;

¹ E.g., *"Best Management Practices for Forestry: Protecting New Hampshire's Water Quality"* (2005, as amended) by the University of New Hampshire Cooperative Extension; and *"Manual of Best Management Practices for Agriculture in New Hampshire"* (2002, as amended) distributed by the NH Department of Agriculture, Division of Regulatory Services.

STORMWATER MANAGEMENT ORDINANCE

- (c) The application shall demonstrate the plans for storm water management during and after the disturbance; and
 - (d) Shall become a valid permit if not revised by the Code Enforcement Officer within 7 working days of submission; and
 - (e) Shall give permission to the Code Enforcement Officer to inspect the storm water management systems during and after completion;
- b) Non-Incidental Disturbance:
- (1) Defined as any disturbance that is
 - (a) Greater than 500 square feet and less than or equal to 6,000 square feet on slopes greater than 30%² or
 - (b) Greater than 2,000 square feet and less than or equal to 12,000 square feet on slopes greater than 25% and less than or equal to 30%³, or
 - (c) Greater than 2,000 square feet on slopes greater than 15% and less than or equal to 25%; or
 - (d) Greater than 12,000 square feet on slopes less than or equal to 15%; or
 - (e) More than 25% of the total lot area, or
 - (f) Will result in more than 5,000 square feet of new impervious area,
 - (2) Management of Non Incidental Disturbances
 - (a) Non Incidental Disturbances shall require a Stormwater Conditional Use Permit issued by the Planning Board or the Code Enforcement Officer
 - (b) The Planning Board shall establish by regulation the factors that determine if the Conditional Use Permit may be granted by the Code Enforcement Officer, or shall be granted by the Planning Board.

D. GENERAL REQUIREMENTS FOR ALL DISTURBANCES

1. The total overall impervious cover shall not exceed 20% of a site or 30% of a site if the amount of impervious surface greater than 20% is disconnected from the offsite storm water drainage network.
2. More restrictive limitations on impervious surface in other sections of this Ordinance, the Town of New Durham Subdivision Regulations or the Zoning and Land Use Ordinance may apply.

² . Disturbances of more than 6,000 square feet are prohibited on slopes greater than 30% by the Steep Slopes Ordinance.

³ Disturbances of more than 12,000 square feet are prohibited on slopes between 25% and 30% by the Steep Slopes Ordinance

STORMWATER MANAGEMENT ORDINANCE

3. Impervious cover may be disconnected from the storm water drainage network, through such techniques as infiltration, sheet flow over a pervious area, or other techniques approved in the Conditional Use Permit⁴
4. Stormwater management systems shall not discharge directly to surface waters, subsurface, or groundwater within 100 feet of a surface water; or within a water supply intake protection area; or as restricted by other sections of this Ordinance, the Town of New Durham Subdivision Regulations or the Zoning and Land Use Ordinance without meeting the requirements of this ordinance.
5. Stormwater management systems whose contributing area is 1) greater than one-half acre; or 2) less than or equal to one-half acre but includes high load use areas as defined by regulation; shall not discharge within the setback area established in the regulations for a water supply well

E. STORMWATER MANAGEMENT DURING DISTURBANCE OR CONSTRUCTION

Erosion and sedimentation control plans shall be required to describe the nature and purpose of the land disturbing activity, the amount of grading involved, description of soils, topography, vegetation, drainage patterns and the specific methods that will be used to control soil erosion and sedimentation, soil disturbance and removal, grading and the storm water collection systems. Erosion and Sedimentation Control Plans shall not conflict with minimum N.H. Department of Environmental Services requirements for Alteration of Terrain or other environmental permits required.

F. PERMANENT STORMWATER MANAGEMENT GOALS

1. Stormwater Runoff: At a point immediately downstream from the project site the post-development peak flow rate from the site and the off-site contributing area shall not exceed the pre-development peak flow rate at that point.
2. The treatment plan shall be designed according to the regulations to convey the design storm event without overtopping or causing damage to the storm water management facility and downstream areas.
3. Water Quality: Stormwater management systems shall be designed to:
 - a) Remove a minimum of 80 percent of the average annual load of total suspended solids (TSS), floatables, greases, and oils after the site is developed

⁴ For acceptable techniques see (Innovative Land Use Planning Techniques: A handbook for Sustainable Development 2008 or as amended, available in the Land Use Library)

- b) Manage the increase in the levels of Nitrogen and Phosphorus due to the proposed development of Non Incidental Disturbances. The applicant shall provide the necessary calculations that prove to the Planning Board that the appropriate Best Management Practices have been provided and that any increase in Nitrogen and Phosphorus loading that can not be accepted by the downstream water body has been mitigated. Calculations shall be provided as required by the Planning Board Regulations.
4. Recharge to Groundwater: The annual average post-development groundwater recharge volume (GRV) for each hydrologic soil group shall be similar to the predevelopment condition.

G. DESIGN REQUIREMENTS

1. Incidental disturbances: Storm water management systems shall be designed to meet the storm water management goals of Section F. The Planning Board shall establish by regulation limited requirements for that purpose. Such requirements shall be significantly less extensive than those required for Non Incidental Disturbances.
2. Non Incidental Disturbances: The Planning Board, in Consultation with the Building Inspector, shall establish by regulation the requirements for storm water management for Non Incidental Disturbances to meet the storm water management goals of Section F.
3. All development activity must comply with the following provisions to reduce and properly manage storm water post-construction:
 - a) Best Management Practices (BMP) techniques as identified in the following publications shall be used to meet the storm water management goals in Section F:
 - (1) Innovative Land Use Planning Techniques: A handbook for Sustainable Development 2008 or as amended.
 - (2) Department of Environmental Services Stormwater Manuals three volume set as amended.
 - b) Stormwater management practices shall be selected to accommodate the unique hydrologic and geologic conditions of the site.
 - c) The use of storm water management measures, including site design approaches to reduce runoff rates, volumes, and pollutant loads, are preferred and shall be implemented to the maximum extent practical. Such techniques include, but are not limited to,
 - (1) Minimization and/or disconnection of impervious surfaces;
 - (2) Development design that reduces the rate and volume of runoff;
 - (3) Restoration or enhancement of natural areas such as riparian areas, wetlands, and forests; and

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- (4) Use of practices that intercept, treat, and infiltrate runoff from developed areas distributed throughout the site (e.g. bioretention, infiltration dividers or islands, or planters and rain gardens).
- d) Applicants shall demonstrate why use of nontraditional and/or nonstructural approaches such as those described in 1-4 above are not possible before proposing to use traditional, structural storm water management measures (e.g., storm water ponds, vegetated swales).
- e) The applicant shall demonstrate how the proposed control(s) will comply with the requirements of this ordinance. The applicant must provide design calculations and other back-up materials necessary.
- f) At the discretion of the planning board, storm water management systems shall incorporate designs that allow for shutdown and containment in the event of an emergency spill or other unexpected contamination event.
- g) Stormwater management systems shall be designed to protect Natural Hydrologic Features and Functions as established in Regulation. Priority shall be given to maintaining existing surface waters and systems, including but not limited to, perennial and intermittent streams, wetlands, vernal pools, and natural swales. The below requirements are established as a minimums and greater restrictions may be required by other sections of this Ordinance, the Town of New Durham Subdivision Regulations, the Zoning and Land Use Ordinance or State Regulations based on the location of the development site.
 - (1) Existing site hydrology shall not be modified so as to disrupt on-site and adjacent surface waters. The applicant must provide evidence that this standard can be achieved and maintained over time.
 - (2) Existing surface waters, including lakes, ponds, rivers, perennial and intermittent streams, wetlands, vernal pools, as regulated within the Town of New Durham Zoning Ordinance, shall be protected by a minimum 25 foot no disturbance, vegetated buffer. The Planning Board with the consent of the Conservation Commission may reduce the minimum buffer requirement on slopes less than 15% if the applicant can demonstrate that the disturbance within the buffer is in conjunction with improving storm water quality or the construction of a storm water management system and the intent of this Ordinance is met.
 - (3) Structures related to BMP techniques shall not be located within 50 feet of steep banks (greater than 15 percent slope).
 - (4) Where roadway or driveway crossings of surface waters cannot be eliminated, disturbance to the surface water shall be minimized, hydrologic flows shall be maintained, there shall be no direct discharge of runoff from the roadway to the surface water, and the area shall be revegetated post-construction.

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- (5) Stream and wetland crossings shall be eliminated whenever possible. When necessary, stream and wetland crossings shall comply with design standards identified in the University of New Hampshire Stream Crossing Guidelines May 2009, as amended to minimize impacts to flow and animal passage.
 - h) Pre-Treatment Requirements
 - (1) All runoff from any source (with the exception of non-metal roofs) must be pretreated prior to its entrance into the groundwater recharge device to remove materials that would clog the soils receiving the recharge water.
 - (2) Pretreatment devices shall be designed to capture the anticipated pollutants and be designed and located to be easily accessible to facilitate inspection and maintenance.
 - i) Sizing and design of Infiltration/recharge BMPs shall be established by regulation based on criteria in the NHDES Stormwater Manual
 - j) Requirements for Parking Areas shall be as established by Regulation.
 - k) Requirement for Land Uses with Higher Potential Pollutant Loads shall be as established by Regulation.
4. Redevelopment or Reuse
- a) Redevelopment or reuse of previously developed sites must meet the storm water management standards set forth herein to the maximum extent possible as approved by the planning board. To make this determination the applicant shall provide sufficient materials to show the improvements of the redevelopment plan and the benefits of redevelopment as compared to the existing condition with respect to storm water.
 - b) Redevelopment or reuse activities shall not infiltrate storm water through materials or soils containing regulated or hazardous substances.
 - c) Redevelopment or reuse of a site shall not involve uses or activities considered “high-load uses” as defined in regulation, unless the requirements under Section G.3.j. are met.
5. Easements
- a) Where a site is traversed by or requires construction of a watercourse or drainage way, an easement of adequate width shall be required for such purpose. The easement shall be recorded and provided to the Land Use Department for submission to the Strafford County Registry of deed, and for the Town records.
 - b) There shall be at least a ten foot wide maintenance easement path for surface storm water management components. For systems using

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underground pipes, if a maintenance easement is determined necessary the width shall vary based on the depth of the pipe.

6. Performance Bond
 - a) To ensure that proposed storm water management controls are installed as approved, a performance bond shall be provided as a condition of approval in an amount determined by the planning board.
 - b) To ensure that storm water management controls function properly, a performance bond shall be required, as a condition of approval, which may be held after final certificate of occupancy, is issued.
7. Acceptance of Changes Required by State or Federal Regulators
 - a) If a plan approved by the New Durham Planning Board is changed in order to meet requirements for an Alteration of Terrain or other state or federal Environmental Permit the applicant shall submit the changes to the Planning Board. No further action by the New Durham Planning board is required.

H. OPERATION AND MAINTENANCE PLAN

All storm water management systems for Incidental and Non Incidental Disturbances shall have an Operations and Maintenance plan to ensure that systems function as designed. This plan shall be reviewed and approved as part of the review of the proposed permanent storm water management system. Fulfillment of the Operations and Management plan shall be a condition of approval of a subdivision or site plan.

If the storm water management system is not dedicated to the city/town pursuant to a perpetual offer of dedication, the Planning Board may require an applicant to establish a homeowners association or similar entity to maintain the storm water management system.

For uses and activities under Section G, the Operations and Maintenance plan shall include implementation of the Stormwater Pollution Prevention Plan (SWPPP).

1. The Planning Board shall establish requirements by regulation for the contents of the Operations and Maintenance Plan that will ensure continued and effective operation of the system.
2. Recording
 - a) The owner shall provide covenants for filing with the registry of deeds in a form satisfactory to the planning board, which provide that the obligations of the maintenance plan run with the land.

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- b) The owner shall file with the registry of deeds such legal instruments as are necessary to allow the city/town or its designee to inspect or maintain the storm water management systems for compliance with the O&M plan
3. Modifications
 - a) The owner shall keep the O&M plan current, including making modifications to the O&M plan as necessary to ensure that BMPs continue to operate as designed and approved.
 - b) Proposed modifications of O&M plans including, but not limited to, changes in inspection frequency, maintenance schedule, or maintenance activity along with appropriate documentation, shall be submitted to the planning board for review and approval within thirty days of change.
 - c) The owner must notify the planning board within 30 days of a change in owner or party responsible for implementing the plan.
 - d) The planning board may, in its discretion, require increased or approve decreased frequency of inspection or maintenance or a change in maintenance activity. For a reduced frequency of inspection or maintenance, the owner shall demonstrate that such changes will not compromise the long-term function of the storm water management system.
 - e) The planning board shall notify the owner of acceptance of the modified plan or request additional information within 60 days of receipt of proposed modifications. No notification from the planning board at the end of 60 days shall constitute acceptance of the plan modification. The currently approved plan shall remain in effect until notification of approval has been issued, or the 60 day period has lapsed.
 4. Record Keeping

Parties responsible for the operation and maintenance of a storm water management system shall keep records of the installation, maintenance, and repairs to the system, and shall retain records for at least five years.

I. ENFORCEMENT

If the designated enforcement official for the Town of New Durham determines that the responsible party has failed to implement the Operations and Maintenance plan, the municipality is authorized to:

1. Assume responsibility for the implementation of the Operations and Maintenance Plan; and
2. To secure reimbursement for associated expenses from the responsible party, including, if necessary, placing a lien on the subject property; and

3. To utilize equitable remedies, including injunction to implement the Operations and Maintenance Plan.

J. APPLICATION REQUIREMENTS

1. All developments subject to the incidental and non incidental disturbance requirements of this ordinance shall submit a permanent (post construction) Stormwater Management and Erosion and Sediment Control Plan, which shall be prepared by a licensed New Hampshire professional engineer and shall address and comply with the requirements set within this Stormwater Management Ordinance and regulations as specified by the Planning Board.
2. Pre- and Post-Development Flow: The applicant shall provide pre- and post-development peak flow rates and total runoff volumes. The Planning Board may provide exemptions to following standards of this ordinance for projects that directly discharge to a stream, water body, estuary, or tidal water and where the applicant has provided off-site drainage calculations.
3. The Planning Board shall list in the Subdivision Regulations and the Site Plan Regulations the items that must be submitted as part of an application for a Stormwater Management and Erosion Control Permit.

4. Engineering Review

a) Fee

The applicant upon request shall submit a fee to be held in escrow, to cover the cost of outside engineering review of the proposed storm water management and erosion and sedimentation control plan if determined necessary by the Planning Board.

b) Additional copies

Additional Copies of all plans, engineering studies, and additional information as requested by the planning board describing the proposed permanent post-construction storm water management system shall be provided as necessary to allow for a thorough outside engineering review

K. DEFINITIONS

1. Best Management Practice (BMP): Structural, non-structural and managerial techniques that are recognized to be the most effective and practical means to prevent and/or reduce increases in storm water volumes and flows, reduce point source and non-point source pollution, and promote storm water quality and protection of the environment.

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2. Curve Number (CN): A numerical representation used to describe the storm water runoff potential for a given drainage area based on land use, soil group, and soil moisture, derived as specified by the U.S. Department of Agriculture, Natural Resources Conservation Service (USDA/NRCS).
3. Developer: A person who undertakes or proposes to undertake land disturbance activities.
4. Development: For the purposes of this article, development refers to alterations to the landscape that create, expand, or change the location of impervious surfaces or alters the natural drainage of a site.
5. Disconnected Impervious Cover: Impervious cover that does not contribute directly to storm water runoff from a site, but directs storm water runoff to on-site pervious cover to infiltrate into the soil or be filtered by overland flow so that the net rate and volume of storm water runoff from the disconnected impervious cover is not greater than the rate and volume from undisturbed cover of equal area.
6. Drainage Area: Means a geographic area within which storm water, sediments, or dissolved materials drain to a particular receiving water body or to a particular point along a receiving water body.
7. Erosion: The detachment and movement of soil, rock, or rock fragments by water, wind, ice, or gravity.
8. Impervious Cover: A structure or land surface with a low capacity for infiltration, including but not limited to pavement, roofs, roadways, and compacted soils, that has a Curve Number of 98 or greater.
9. Infiltration: The process by which water enters the soil profile (seeps into the soil).
10. Land Disturbance or Land Disturbing Activity: For the purposes of this Article, refers to any exposed soil resulting from activities such as clearing of trees or vegetation, grading, blasting, and excavation.
11. Owner: A person with a legal or equitable interest in a property.
12. Pervious Cover: A land surface with a high capacity for infiltration.
13. Recharge: The amount of water from precipitation that infiltrates into the ground and is not evaporated or transpired.
14. Redevelopment: The reuse of a site or structure with existing man-made land alterations. A site is considered a redevelopment if it has 35 percent or more of existing impervious surface, calculated by dividing the total existing impervious surface by the size of the parcel and convert to a percentage.

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15. Regulated Substance: A “regulated substance” as defined in Env-Ws 421.03(f) or successor rule, Env-Wq 401.03(h).
16. Sediment: Solid material, mineral or organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, or gravity as a product of erosion.
17. Sensitive Area: For the purpose this Article include lakes, ponds, perennial and intermittent streams, vernal pools, wetlands, and highly erodible soils.
18. Sheet flow: Runoff that flows or is directed to flow across a relatively broad area at a depth of less than 0.1 feet for a maximum distance of 100 feet in such a way that velocity is minimized.
19. Site: The lot or lots on upon which development is to occur or has occurred.
20. Stormwater: Water resulting from precipitation (including rain and snow) that runs off the land’s surface, is transmitted to the subsurface, or is captured by separate storm sewers or other drainage facility.
21. Stormwater Runoff: Water flow on the surface of the ground or in storm sewers, resulting from precipitation.
22. Stormwater Management System Owner: the owner of the property, unless other legally binding agreements are established.
23. Total Impervious Cover: The sum of Disconnected Impervious Cover plus Effective Impervious Cover.
24. Undisturbed Cover: A natural land surface whose permeability has not been altered by human activity.
25. Vegetation: Is defined to include a tree, plant, shrub, vine, or other form of plant growth.
26. Wellhead Protection Area: As defined in RSA 485-C:2, XVIII, the surface and subsurface area surrounding a water well or well field, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or well field.

L. AUTHORIZATION TO ISSUE A CONDITIONAL USE PERMIT

1. Grant of Authority: Authority is hereby granted to the planning board, as allowed under RSA 674:21 II, to
 - a) Issue a Conditional use permit; and
 - b) To delegate permit granting authority for specific categories of applications

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2. The authority of the Board or a delegated agent to issue a Conditional Use Permit includes the authority to allow variations from the requirements and restrictions set forth in this section; provided the development design and proposed stormwater management approach satisfy the following conditions:
 - a) Such modifications are consistent with the general purpose and standards of this section and shall not be detrimental to public health, safety or welfare;
 - b) The modified design plan and storm water management approach shall satisfy all state and/or federal permit requirements, as applicable.

This ordinance was heard at first public hearing on January 5, 2010.

This ordinance was heard at second public hearing on January 19, 2010. No substantive changes were made.

This Planning Board voted unanimously to place this ordinance on the Town Ballot on January 19, 2010.

_____ Catherine Orlowicz, Chair