



The University of Vermont

**STORMWATER MANAGEMENT
PROGRAM**

GENERAL PERMIT 3-9018

**FOR STORMWATER DISCHARGES FROM SMALL MUNICIPAL
SEPARATE STORM SEWER SYSTEMS**

**Prepared by:
Krebs & Lansing
Consulting Engineers, Inc.
164 Main Street
Colchester, Vermont 05446
(802) 878-0375**

January 23, 2019

Table of Contents

<u>Introduction</u>	3
<u>Permit Coverage</u>	3
<u>Eligible Discharges</u>	3
<u>Stormwater System</u>	3
<u>Stormwater Best Management Practices</u>	4
<u>Minimum Control Measures</u>	5
<u>MM#1: Public Education and Outreach on Stormwater Impacts</u>	5
<u>MM#2: Public Involvement and Participation</u>	6
<u>MM#3: Illicit Discharge Detection and Elimination</u>	6
<u>MM#4: Construction Site Stormwater Runoff Control</u>	8
<u>MM#5: Post Construction Stormwater Management for New Development and Redevelopment</u>	9
<u>MM#6: Pollution Prevention and Good Housekeeping for Municipal Operations</u>	11
<u>Promotion of Riparian Buffers and Setbacks</u>	13
<u>Total Maximum Daily Load (TMDL) Implementation</u>	13
<u>Flow Restoration Plans</u>	13
<u>Centennial Brook</u>	13
<u>North Campus Stormwater Treatment Facility</u>	13
<u>Main Street Stormwater Treatment Facility</u>	14
<u>UVM Physical Plant Recycling Area Drainage Improvements</u>	14
<u>Potash Brook</u>	14
<u>Englesby Brook</u>	15
<u>Sunderland Brook</u>	15
<u>Lake Champlain Phosphorus TMDL</u>	15
<u>Phosphorus Control Plan</u>	15
<u>Annual Reporting</u>	17
<u>Appendix A – CCMS4 Agreement</u>	
<u>Appendix B – Plans</u>	
<u>Appendix C – Annual Reporting Spreadsheet</u>	
<u>Appendix D – UVM Stormwater Responsibility Table</u>	
<u>Appendix E – Centennial Brook Flow Restoration Plan</u>	
<u>Appendix F – Potash Brook Flow Restoration Plan</u>	
<u>Appendix G – MS4 Incorporated State Issued Stormwater Permits</u>	
<u>Appendix H – UVM MS4 STPs</u>	

Introduction

The University of Vermont (UVM) is designated a non-traditional Municipal Separate Storm Sewer System (MS4) by the State of Vermont and is therefore subject to the Vermont Pollutant Discharge Elimination System (VPDES) General Permit 3-9014 (2018). Through this Stormwater Management Program (SWMP), the University of Vermont is establishing a framework to implement practices and procedures to manage stormwater runoff and improve water quality.

Permit Coverage

The University of Vermont first applied for coverage under General Permit #3-9014 on March 10, 2003 for the first 5-year term (2003-2007). The Application was revised and resubmitted on May 9, 2003 after receiving comments from the State of Vermont Agency of Natural Resources. On September 11, 2003 the State of Vermont acknowledged, by letter, the University's Stormwater Management Program complies with the terms and conditions of the General Permit. They further indicated that the University's MS4 discharges are eligible for continued coverage under the terms and conditions of the General Permit.

On February 22, 2008, the University of Vermont prepared an application for coverage under General Permit #3-9014 for the second 5-year term (2008-2012). Additional information was provided on March 3, 2008 as requested by the State of Vermont.

On June 3, 2013, the University of Vermont prepared an application for coverage under General Permit #3-9014 for a third 5-year term (2013-2017). The application was deemed complete and effective on October 1, 2013.

Stormwater System

The University of Vermont's Main Campus is approximately 459 acres and is located in two different municipalities and in four different stream watersheds. The campus is in both Burlington and South Burlington, and is split between the Centennial Brook, Englesby Brook, Potash Brook and Winooski River watersheds. Ultimately, these four watersheds discharge to Lake Champlain. The University of Vermont also owns properties outside of Main Campus that also have stormwater collection systems. Both Fort Ethan Allen and Colchester Business Park discharge to Sunderland Brook and then to Lake Champlain. The Bioresearch Facility and Forestry Service Complex both drain to Potash Brook. Campus watershed maps are provided in Appendix B for each portion of UVM's Campus.

The University is in a unique position as a non-traditional MS4 within the Phase II General Permit. The majority of the University is located in the City of Burlington, which is an MS4 permittee, and the remaining portion of campus is located in South Burlington, which is also an MS4 permittee. The University has been and will continue to coordinate with both municipalities regarding project development and Phase II General Permit conditions.

Since Lake Champlain is the source of water for both the Champlain Water District and the City of Burlington, the University must review and coordinate the General Permit requirements to minimize conflicts. The goals of this MS4 with regards to preventing or controlling stormwater runoff are consistent with the general principles of the Champlain Water District and City of Burlington (Water Supply Division of Public Works) Source Water Protection Plans. By establishing stormwater facilities at

major outfalls, the University is treating and detaining the majority of its urbanized Main Campus. The treatment component of the facilities reduce sediment and nutrient loading of downstream water bodies, and detention of post-development flows help reduce stream bank erosion.

Stormwater Best Management Practices

The University of Vermont has five large stormwater detention facilities to treat and detain stormwater:

- North Campus (87.3-acre watershed)
 - East Campus (82.6-acre watershed)
 - Southwest Campus (53.4-acre watershed)
 - Main Street Facility (26.9-acre watershed)
 - Colchester Business Park (16 acres)
- a. The North Campus Facility drains lands of the UVM Medical Center, City of Burlington (East Avenue), private properties along East Avenue and the University of Vermont. In 2001 the North Campus Facility was upgraded to comply with what came to be the “2002 Vermont Stormwater Manual”. By complying with the design standards in the manual, it is presumed the structural BMP is achieving an 80% suspended solids removal and 40% phosphorus removal.

- b. The East Campus Facility drains lands of the UVM Medical Center, the Double Tree by Hilton (Formerly Sheraton Hotel), private properties along East Avenue and the University of Vermont. The original detention facility was originally designed under the 1987 procedures (10-year, 24-hour storm event). On April 11, 2002 the University retrofitted the outlet structure on the detention facility to more closely comply to the 1997 procedures (2-year, 24-hour storm event).

In 2004, the University, through its stormwater consultant, Krebs & Lansing Consulting Engineers, redesigned and reconstructed the East Campus Stormwater Facility to comply with the 2002 State of Vermont Stormwater Manual.

- c. The Southwest Campus Stormwater Facility drains lands of the City of Burlington (South Prospect Street), Burlington Country Club and the University of Vermont. The original detention basins were designed and constructed in 1991 in accordance with the 1987 procedures (10-year, 24-hour storm event). In May of 1999 the University modified the outlet structure to more closely comply to the 1997 procedures (2-year, 24-hour storm).

In 2006, the University designed and constructed an upgrade to the Southwest Campus Stormwater Facilities to comply with the 2002 State Stormwater Manual. Manual.

- d. The Main Street Facility was constructed by VTrans to mitigate impacts from the Main Street Project. The University has not only accepted this facility on its land but has agreed to maintain the stormwater basin. The basin was designed by the engineering firm of Dufresne-Henry Consulting Engineers (now Stantec).
- e. The Colchester Business Park Facility is a pre-existing stormwater pond constructed with the Colchester Business Park in the 1980’s. The University owns Lot #1, and Lots #3 and #4. The stormwater system was originally designed by Hamlin Engineers. Refer to General Operational Stormwater Discharge Permit 3307-9010.

The University has acknowledged that the proper design and construction of these BMPs is only part of the solution. For these facilities to properly operate, they must be frequently inspected and maintained. The University's Physical Plant Department (PPD) has previously done an admirable job of maintaining these facilities by completing trash rack cleanouts and comprehensive sediment removal operations on forebays and/or micropools.

Minimum Control Measures

UVM, as a designated non-traditional MS4, must develop, implement, and enforce the six minimum control measures (MM) identified below. These measures provide guidance for reducing the discharge of pollutants to the maximum extent practicable (MEP) in order to protect water quality.

1. Public Education and Outreach on Stormwater Impacts
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management for New Development and Redevelopment
6. Pollution Prevention and Good Housekeeping for Operations

Annual reporting of these Minimum Control Measures will be tracked and update in Appendix C.

MM#1: Public Education and Outreach on Stormwater Impacts

In order to comply with Minimum Measure 1, Public Education and Outreach on Stormwater Impacts, the University of Vermont must implement a public education program that distributes educational materials to the community. In order to meet this requirement, UVM will take the following steps:

- Maintain a website with locally relevant stormwater information.
 - *Rationale:* Permittee websites are often the place where residents/users first go to obtain information on stormwater issues. Provision of basic information on such websites will help form a strong initial form of engagement to site visitors.
 - *Measurable Goal:* UVM will maintain basic information about stormwater on a dedicated page within its website which describes its stormwater related programming and includes links for visitors to learn more. The permittee will track the annual number of visits to this page.
- Maintain a program to identify opportunities and provide technical assistance on Low Impact BMPs.
 - *Rationale:* There are several organizations and agencies operating in the Chittenden County MS4 region. By providing such links, the visitor can figure out which entity is best suited to provide technical assistance.
 - *Measurable Goal:* UVM will provide links on a dedicated stormwater page within its website with links to relevant non-profits and government resource sites which can provide technical assistance.
- Participate in a regional stormwater education strategy or develop an MS4 specific program.
 - *Rationale:* Support of the campaign will educate the general public in the MS4 area about key storm water quality issues by using TV, radio, online media placements/advertising to drive viewers to the www.rethinkrunoff.org website
 - *Measurable Goal:* UVM will participate in and provide financial support for operation of the regional Rethink Runoff campaign consisting generally of periodic advertising

throughout each year supplemented by a survey of residents every 5 years to track reported behavior with regards to residential stormwater BMPs. Via an annual report provided by the Chittenden County RPC's subcontractor, MS4s will document the annual number of site visits to www.rethinkrunoff.org as well as provide other metrics.

MM#2: Public Involvement and Participation

- Participate in a regional stormwater public involvement and participation strategy or develop an MS4 specific program.
 - *Rationale:* Through support of the Stream Team, the regional campaign's "action arm", UVM will support the engagement of local residents in the MS4 area via outreach events and via hands-on participation events.
 - *Measurable Goal:* UVM will participate in and provide financial support for operation of the Rethink Runoff Stream Team consisting generally of both outreach and hands-on participation events in various MS4 towns on a rotating annual basis. Via an annual report provided by the Chittenden County RPC's subcontractor, MS4s will document on an annual basis the number of participants and/or persons contacted by outreach events and hands-on activities through the Rethink Runoff Stream Team.

MM#3: Illicit Discharge Detection and Elimination

- Develop and maintain a GIS or AutoCAD map of the storm sewers in the regulated MS4 showing all outfalls. Document how the storm sewer map will be maintained and improved, the source of the information, and the plan to verify the outfall locations with field surveys.
 - *Rationale:* A campus wide storm sewer map will help to identify the extent of the stormwater collection system for annual maintenance tracking. The mapping will also highlight the stormwater outfalls for dry weather illicit detection and any potential building sources.
 - *Measurable Goal:* UVM previously created a comprehensive AutoCAD based Utility Master Plan map. The mapping shows the stormwater outfalls, stormwater collection structures, piping and building services. The mapping continues to be updated as new projects are completed and refined as existing utilities are discovered either during construction or during site specific topographic survey work.
 - Versions of the mapping may be available, in pdf format, upon request through UVM Campus Planning Services.
- Develop ordinance or policy prohibiting non-stormwater discharges and implement enforcement procedures.
 - *Rationale:* Section 2.2 of the 2018 MS4 General Permit outlines a list of eligible discharges. Creating a policy that includes this list will educate users as to what may be discharged to the stormwater collection system. It will also highlight that any non-stormwater discharge is illegal and subject to enforcement.
 - *Measurable Goal:* The list of Eligible Discharges will be included as part of the VOSHA 10-hour training for new UVM Physical Plant Department staff. The number of newly trained staff members will be tracked and reported annually.
 - *Measurable Goal:* The University will document and report the number of illicit discharges each year and will provide a report identifying the nature and corrective action taken for each.

- Develop and implement a plan to detect and address non-stormwater discharges.
 - *Rationale:* Existing illicit discharges, which can be difficult to identify, may exist within the stormwater collection system. Identification, and ultimately, elimination of any illicit building connection is an important goal for water quality improvement and protection.
 - *Measurable Goal:* The University has previously conducted dry weather stormwater outfall and system inspections within the North, East, Southwest, and Trinity Campus Watersheds. Dry weather illicit discharge monitoring will continue to be evaluated, in a rotating basis annually, between the following UVM watersheds: Trinity Campus, North Campus Watershed, East Campus Watershed, Southwest Campus Watershed, Main Street Watershed, the Colchester Business Park, and the Potash Brook Watershed properties.
 - All records of illicit discharge monitoring information shall include:
 - The date, exact place, and time of sampling or measurements;
 - The names(s) of the individual(s) who performed the sampling or measurements;
 - The date(s) analyses were performed;
 - The names of the individuals who performed the analyses;
 - The analytical techniques or methods used; and
 - The results of such analyses
- Inform the public on the dangers of illegal discharges. Coordinate with MM#1 and MM#6.
 - *Rationale:* Educating the public about the dangers of illicit discharges will hopefully prevent the unnecessary spilling or discharging of chemicals or pollutants into streams and waterways. The Regional Stormwater Education Program has many stakeholders and combines resources to expand public education and outreach.
 - *Measurable Goal:* The Regional Stormwater Education Program efforts will continually promote public awareness and reduce ignorant illicit discharges.
 - *Measurable Goal:* Continue to install “No Dumping” tags on new catch basin grates as they are installed by new construction projects. The UVM standard catch basin detail will be updated to require that the tags be installed on the catch basins as a project requirement. The number of installed tags will be identified annually.
- Maintain a log to monitor the status of illicit discharge activities.
 - *Rationale:* A log will help to track what portions of the existing stormwater collection system have been monitored, what issues, if any, have been discovered, and the corrective actions taken to remedy any deficiencies.
 - *Measurable Goal:* As part of the annual dry weather monitoring, the following actions shall be measured and logged:
 - Number of outfalls inspected
 - Number of dry-weather samples taken
 - Feet of stormwater collection system measured
 - Discharges detected
 - Discharges corrected

MM#4: Construction Site Stormwater Runoff Control

- Develop and implement procedures to ensure that construction activities undertaken by the MS4 are properly permitted.
 - *Rationale:* There are often many construction projects taking place across campus, especially during the summer. All earth disturbing projects need to consider erosion prevention and sediment control designs to ensure that the potential for off-site sediment transport is minimized. Project Managers need to be aware of the local and state permitting requirements for construction activities.
 - *Measurable Goal:* UVM Campus Planning Services will continue to have an annual meeting, typically in January, with all project managers from Facilities Design and Construction and the Physical Plant Department to outline construction projects planned for the current year. Project Managers will be made aware of the permitting responsibilities for each construction activity.
- Review existing policies to determine effectiveness, consistency with state standards; Amend for consistency with state standards.
 - *Rationale:* Continued monitoring of State and local standards and practices not only ensures standards are met but also promotes the education of new strategies and better construction site stormwater designs.
 - *Measurable Goal:* By following the State and/or local municipality Construction Stormwater Permit Standards, UVM must evaluate all disturbances across UVM's Main Campus as part of the "Risk" evaluation. Almost every project on campus, large and small, is subject to either a General or Individual State Permit or a City of Burlington or South Burlington local permit. This ensures that site specific erosion prevention and sediment control plans are developed for each construction project and minimizes the potential for sediment transport to the stormwater system.
- Develop and implement ordinance that regulates earth disturbance <1ac.
 - *Rationale:* A large number of projects do not reach the 1-acre Construction General Permit trigger. The location of projects and the aggregate disturbance from a number of non-jurisdictional projects can have an adverse impact on the State's waterways.
 - *Measurable Goal:* Either due to its jurisdiction as a Common Plan of Development, or due to the local municipality MS4 requirements, almost every earth disturbing project is subject to erosion prevention and sediment control regulation. One area that can be addressed is related to building projects that do not specifically require earth disturbance but involve the use of lift trucks to access the building exterior. UVM will include, in the front end of their bid documents, stabilization and sediment control best management practice specifications that must be implemented if inadvertent earth disturbance is generated by construction vehicle movements or activities. The number of earth disturbing projects will be identified annually.

MM#5: Post Construction Stormwater Management for New Development and Redevelopment

- Review existing policies to determine effectiveness, consistency with state standards, opportunities for LID, and opportunities for changes to street and parking requirements; Amend for consistency with state standards.
 - *Rationale:* Stormwater treatment and the effectiveness of accepted practices is constantly being studied at the federal, state and local levels. The goal is to increase pollutant removal efficiencies as well as the number of available stormwater Best Management Practice options through monitoring, studies, and with advances in technology. The EPA, in conjunction with the State of Vermont Watershed Management Division, is continually developing standards and approved BMPs that will ultimately improve water quality. Continued review and education of state standards ensures that regulations are met, and treatment designs are consistent with current practices.
 - *Measurable Goal:* UVM regularly meets with the City of Burlington Stormwater Program staff and attends the Chittenden County Regional Planning Commission's Clean Water Advisory Committee (CWAC) meetings and MS4 Subcommittee Meetings to discuss stormwater projects, regulations, goals, education, outreach, etc. For many years UVM has also contracted with a stormwater consultant for project permitting, guidance, and to follow the development of stormwater regulations and policies. UVM will continue to follow these avenues to remain educated and informed about stormwater standards, practices, and regulations.
- Develop and implement procedures to identify projects that disturb >1ac but do not require a state post-construction permit.
 - *Rationale:* This will ensure that stormwater treatment and runoff reduction opportunities are captured even for projects that may not otherwise meet jurisdictional requirements.
 - *Measurable Goal:* Either due to its jurisdiction as a Common Plan of Development, or due to the local municipality MS4 requirements, almost every project that expands impervious is subject to a State post-construction stormwater permit or a local stormwater permit dictated by their MS4 ordinances or policies. UVM will continue to obtain state or local post-construction stormwater permits for all jurisdictional projects. The number of new projects that disturb greater than 1 acre but do not require a state post-construction permit will be reported annually.
- Adopt an ordinance or policy that requires projects that disturb >1ac to utilize a combination of structural, non-structural, and low impact BMPs and ensure long-term maintenance.
 - *Rationale:* State of Vermont post construction stormwater permit jurisdiction is based solely on impervious area. Therefore, potential low impact BMPs or other runoff reduction opportunities may be missed with non-jurisdictional projects.
 - *Measurable Goal:* Either due to its jurisdiction as a Common Plan of Development, or due to the local municipality MS4 requirements, almost every project that expands impervious is subject to a State post-construction stormwater permit or a local stormwater permit governed by their MS4 ordinances or policies. UVM will continue to comply with state or local post-construction stormwater permits for all jurisdictional projects. UVM Physical Plant Department has a standard specification for ground restoration. Update the UVM Grounds Restoration specification to align with the State of

Vermont's Post Construction Soil Depth and Quality Standard outlined in the 2017 Stormwater Management Manual.

- Develop and implement procedures for inspecting projects subject to the MS4's ordinance.
 - *Rationale:* An important aspect of a Storm Water Management Program is the inspection and maintenance of existing stormwater practices. Pollutant removal efficiencies decrease if stormwater systems and treatment practices are not maintained and allowed to degrade.
 - *Measurable Goal:* Create a list of stormwater treatment practices (STP) located on UVM MS4 properties. This list will be included in Appendix H of this document and will be updated annually.
 - *Measurable Goal:* Each spring, after snow melt, and prior to June 15th, every UVM stormwater treatment practice shall be inspected and an annual report shall be maintained. This includes observation of eroded areas and areas of poor vegetative growth.
 - *Measurable Goal:* UVM will continue to contract with Hartigan, P&P Septic or equivalent, to clean the sumps of at least 50% of the existing catch basins, storm manholes, and detention tanks annually. A report will be maintained identifying which catch basins are cleaned each year. Storm structure shall be cleaned when the sediment level reaches half the depth of the available sump.
 - *Measurable Goal:* Stormwater ponds are inspected frequently throughout the year. They will continue to be inspected annually in the spring, prior to June 15th. Forebays and micropools will be observed to determine the depth of sediment accumulation. Sediment will be removed when the level reaches half the design depth of the permanent pool.
- Develop and implement procedures to ensure that development activities undertaken by the MS4 are properly permitted.
 - *Rationale:* Projects that are not properly permitted are a violation of water quality standards and can be subject to fines and potentially costly remediation efforts.
 - *Measurable Goal:* For many years UVM has also contracted with a stormwater consultant for project permitting, guidance, and to ensure that development activities are properly permitted. UVM will continue this consulting approach throughout the year. UVM Campus Planning Services will also continue to organize and lead an annual meeting, typically in January, with the consultant and all project managers from Facilities Design and Construction and the Physical Plant Department. The meeting will outline current and future planned development projects to discuss stormwater permitting requirements.
- Provide plans, policies, and procedures as part of SWMP.
 - *Rationale:* A well prepared Stormwater Management Program identifies the stormwater collection system, all stormwater treatment practice, outfalls, impervious areas, watersheds, specific policies, and inspection and maintenance procedures. This information, when documented in one location, helps to ensure that the goals of the plan are identifiable and therefore successfully followed even if the responsible staff members change.
 - *Measurable Goal:* UVM will continue to update this Stormwater Management Program documentation as part of the annual MS4 report that is due April 1st each year.

MM#6: Pollution Prevention and Good Housekeeping for Municipal Operations

- List the operations covered by the program, including park and open space maintenance, fleet and building maintenance, new construction land disturbances, and stormwater system maintenance.
 - *Rationale:* It is important to identify what daily University related operations have the potential to impact stormwater and water quality. Maintenance responsibilities and budgeting requirements can then be clearly designated by campus department.
 - *Measurable Goal:* The UVM Physical Plant Department is responsible for all campus operations. We will create a document that identifies specific Physical Plant Department divisions responsible for maintenance of stormwater treatment practices, stormwater collection systems, grounds, salt management, illicit discharge monitoring, stormwater inspections, and stormwater permitting. This document will be incorporated in Appendix D of this Program.
- Conduct stormwater training for staff.
 - *Rationale:* Relevant staff members need to be trained so that Non-Stormwater discharges can be identified, inspections are completed regularly, deficiencies are correctly identified, and the design and operation of the stormwater system needs to be understood so that maintenance is completed properly.
 - *Measurable Goal:* UVM has been operating and maintaining the stormwater system for many years and the existing staff that address stormwater are trained. New Physical Plant Department staff members who are assigned to address components of the stormwater collection system will be trained by existing trained staff. New and existing staff members who are assigned responsibilities related to inspection of the stormwater treatment practices shall conduct a site walk around campus with the UVM Stormwater Consultant for education and training of the stormwater practices around campus. The number of employees that are trained each year will be tracked as part of the annual report.
- Implement controls for reducing or eliminating the discharge of pollutants from the MS4.
 - *Rationale:* Ultimately, one of the main goals of a Stormwater Management Program is to reduce discharge of pollutants and improve water quality.
 - *Measurable Goal:* UVM has constructed a number of stormwater treatment practices and as new projects are developed new treatment practices will be designed and constructed. Below is a list of measurable goals that will be included in the annual report:
 - Number of new standard treatment practices (STP) constructed
 - Number of existing STPs retrofitted
 - Number of INDS permits transferred to the MS4 Permit
 - Number of STPs inspected
 - Number of inspections performed on maintenance facilities, paint shops, salt sheds and storage facilities
 - Number of catch basins, storm manholes, and underground detention tanks cleaned or lbs. of sediment removed
 - Street sweeping documentation
 - Frequency of leaf litter/organic waste collection

- Develop and implement procedures for proper disposal of wastes.
 - *Rationale:* Properly operating STPs collect sediment which needs to be disposed of during maintenance. It is important that a disposal procedure is in place so that the high concentration of sediment and pollutants are removed and do not reach the streams and waterways.
 - *Measurable Goal:* UVM currently contracts with Hartigan Wastewater Services to clean the sumps of catch basins and storm manholes. As part of the contract Hartigan is responsible for the proper disposal of the waste material. Hartigan provides a report identifying the catch basins that are cleaned. The results of this report will be included in the Annual Reporting Spreadsheet found in Appendix C.
 - *Measurable Goal:* When cleaning of stormwater ponds are required, UVM contracts with a site excavation contractor. The contract requires the Contractor to remove the material from campus and dispose of it in a State approved off-site disposal area. The Annual Report (Appendix C) will be updated when stormwater treatment ponds are cleaned.
- Prohibit use of phosphorus containing fertilizers on facility operations unless warranted by a soil test; submit copy of test.
 - *Rationale:* Phosphorus content can be present in the soil. If the phosphorus content is already optimum, or even excessive, for promoting vegetative growth, additional phosphorus in fertilizer can runoff and adversely affect water quality. Lake Champlain is already phosphorus impaired.
 - *Measurable Goal:* UVM's use of fertilizers are in alignment with State regulations. The Physical Plant Soil & Seeding Specifications will be updated to specify that only phosphorus free fertilizers be used unless a soil test identifies that fertilizer containing phosphorus is warranted for optimum vegetative growth.
- Participate in the Agency's Municipal Compliance Assistance Program (or other audit program) for municipal garages.
 - *Rationale:* UVM is a Non-Traditional MS4 and does not have any municipal garages on campus.
 - *Measurable Goal:* This goal does not apply.
- List town owned or operated industrial facilities that are subject to the MSGP.
 - *Rationale:* Facilities that are subject to a Multi-Sector General Permit have specific stormwater regulations and reporting requirements that must be followed. These facilities are operated differently than typical stormwater treatment practices.
 - *Measurable Goal:* Review UVM properties to identify if any Multi Sector General Permits exist and identify them in the Stormwater Management Program documentation.
- Provide a copy of the operation and maintenance program.
 - *Rationale:* A stormwater operation and maintenance program ensures that both short-term and long-term stormwater requirements and objectives are identified and followed. This ensures that maintenance requirements are followed, permit dates are met, stormwater infrastructure costs are planned and budgeted, and system users are properly educated.
 - *Measurable Goal:* Annual updates to this Stormwater Management Program will be submitted to identify stormwater improvements and maintenance measures completed throughout the previous year.

Promotion of Riparian Buffers and Setbacks

- UVM will abide by applicable zoning regulations in South Burlington and Burlington on Centennial Brook and Potash Brook. There are two UVM Natural Areas: East Woods and Centennial Woods that are located on the above two streams. Management of the Natural Areas is consistent with providing a protected stream buffer for these lands.

Total Maximum Daily Load (TMDL) Implementation

Flow Restoration Plans

The University of Vermont has been collaborating with the City of Burlington, City of South Burlington, Town of Essex and VTrans on the Flow Restoration Plans (FRP). The University of Vermont participated in the following flow restoration plans: Centennial Brook, Englesby Brook, Potash Brook, Bartlett Brook and Sunderland Brook.

The traditional MS4s have gathered and submitted the FRP narrative including model runs and possible best management practices. This document supplements and clarifies the University's involvement and financial commitments in the Flow Restoration Plans.

The MS4 General Permit (3-9014), subpart IV.C.1 required that a Flow Restoration Plan be submitted to the Agency of Natural Resources by October 1, 2016. The FRP serves all MS4s as a planning tool in the respective impaired waterways.

Centennial Brook (See Appendix E)

Since the University of Vermont has been proactive in establishing Best Management Practices (BMP), their future obligation for capturing untreated/undetained runoff is limited. UVM currently treats/detains over 95% of its impervious surfaces in the Centennial Brook Watershed. With the BMPs proposed in the FRP, this increases to 97.4%. It is commendable that 97.4% of UVM's impervious would be fully treated and detained in accordance with the current State Stormwater Regulations.

The University is participating in three improvements through the Centennial Brook FRP; The North Campus Stormwater Treatment Facility Upgrade, the Main Street Stormwater Treatment Upgrade and a small drainage improvement at the UVM Physical Plant recycling area located behind Centennial Baseball Field.

- i) North Campus Stormwater Treatment Facility (see attached schematic plan - sheet SP-1 dated 9/20/2016 in Appendix B South Burlington ID CB0019. Construction estimated to be completed between 2021 and 2026.

The North Campus watershed drains approximately 84 acres of University of Vermont and the City of Burlington. The University had offered the use of the North Campus Stormwater Facility under two conditions;

- 1) There is sufficient capacity for UVM to expand the pond to facilitate full build out of UVM Campus.
- 2) The entity using the UVM pond (City of Burlington) would have financial obligations toward the construction and maintenance. The City and University will negotiate the

terms for use of the pond at a later date. The University of Vermont will have complete discretion regarding all terms of any agreement.

- ii) Main Street Stormwater Treatment Facility (see attached schematic plan - sheet SP-2 dated 9/27/2016 in Appendix B). Retrofit M5A (Retrofit 24 on Sheraton/UVM property not accepted). Construction estimated to be completed between 2021 and 2026.

The Main Street Stormwater Treatment Facility currently drains approximately 27 acres of land owned by the University of Vermont, the City of South Burlington and the City of Burlington. The University had offered the use of the Main Street Stormwater Facility under two conditions;

- 1) There is sufficient capacity for UVM to expand the pond to facilitate full build out of UVM Campus.
 - 2) The entity(s) using the UVM pond (City of South Burlington and City of Burlington) would have financial obligations toward the construction and maintenance. The City of South Burlington, the City of Burlington and UVM will negotiate the terms for use of the pond at a later date. The University of Vermont will have complete discretion regarding all terms of any agreement.
- iii) UVM Physical Plant recycling area drainage improvements (Completed April 2017)
(See sheet SP-2 dated 9/19/2016 in Appendix B)
Approximate ¼ acre gravel recycling yard that previously drained untreated to Centennial Brook. UVM extended the stormwater collection infrastructure to capture the flows from this area and direct them to the North Campus Stormwater Treatment Facility.

The initial model runs prepared by Horsley Whitten for the Centennial FRP included four other BMPs on UVM properties. These were located in future building land banks or other areas that were not acceptable to UVM. Many of these BMPs were established to treat non-UVM properties. The proposed retrofits include:

- Retrofit 24 Sheraton.
- Retrofit 17 Jug-Handle.
- Retrofit M1A (CB 0005) Centennial Court.
- Retrofit M7B Case Parkway (on UVM property).

The above listed items are not included in the FRP. In the Memo from Emily Schelley (Stormwater Management Program, VTDEC) dated August 23, 2017 in Appendix E, DEC removed the four BMPs from the Centennial Brook BMPDSS model. The revised flow restoration plan model run for Centennial Brook achieved a 51.9% reduction in high flow when compared to the base period. This represents a slightly higher reduction in flow even with the removal of the four practices on UVM property when other watershed changes are considered.

Potash Brook (See Appendix F)

The University of Vermont has limited properties subject to MS4 in the Potash Brook watershed. Most of the properties are agricultural in nature. The two non-agricultural properties include Bio-Research Facility at 720 Spear Street and Aiken Forestry Research Center at 705 Spear Street. There are just over five acres of impervious on these properties. The FRP proposed specific upgrades at both of these

facilities, and while UVM is committed to providing stormwater improvements, the BMPs proposed would impact future building sites.

The University anticipates designing, permitting and constructing improvements in 2019 and 2020 for both the Aiken Forestry Research Center (PB0084 and PB0085 in Appendix F) and Bio-Research (PB0083 in Appendix F) properties.

Englesby Brook

The southern end of the main UVM Campus drains to Englesby Brook. The University proactively constructed two stormwater ponds in full compliance with the state stormwater regulations. The combined watershed is approx. 53 acres. See sheet WS-1 dated 12/07/2018 in Appendix B for existing UVM watersheds.

The stormwater computer model runs completed for the Englesby FRP indicate the University stormwater ponds *exceed* the required detention for compliance with the FRP goals. There are no changes required to the ponds or UVM financial obligations in Englesby watershed.

Sunderland Brook

The University participated in the Sunderland Brook FRP with the Town of Essex. The University sold the student housing complex (County Apartments) and currently only owns some commercial buildings at the east end of the Fort Ethan Allen Complex.

The FRP did not identify UVM as a jurisdictional MS4 within the Sunderland Brook watershed and UVM is not included as a contributing MS4 to the Sunderland Brook TMDL.

Financial Statement

Under the current budgeting process, the University would establish project funds to fulfill the University's obligation. We would endeavor to pursue federal and state stormwater grant opportunities.

In summary, the University's Stormwater Management Program is in conformance with the recommendations of the Lake Champlain TMDL. Not only are they currently implementing Best Management Practices to reduce phosphorus loading of the lake but the implementation of this Stormwater Management Program will further reduce phosphorus.

Lake Champlain Phosphorus TMDL

Phosphorus Control Plan

- The University will develop and implement a Phosphorus Control Plan (PCP), that will achieve the level of phosphorus reduction equivalent to the target for developed land consistent with the Lake Champlain TMDLs. The percent reduction targets for UVM properties in each Lake Segment are as follows:
 - Main Lake - 20.2% (Winooski River (Trinity Campus & Colchester Avenue WS)), Centennial Brook (North Campus, East Campus and Main Street Watersheds)
 - Shelburne Bay 20.2% (Potash Brook Watershed)
 - Burlington Bay 24.2% (Englesby Brook (Southwest Campus Watershed))

- The Phosphorus Control Plan may include reductions calculated based on:
 - Street sweeping and catch basin cleaning practices
 - Implementation of stormwater treatment practice upgrades or retrofits to treat existing impervious after the adoption of the 2002 Vermont State Stormwater Manual
 - Implementation of stormwater treatment practices after July 1, 2010, on developed lands that are not subject to the state’s operational stormwater permit

- The following conditions apply when calculating phosphorus reductions for application towards the PCP targets:
 - a) Where the PCP includes phosphorus reductions from UVM developed lands that are otherwise subject to an operational stormwater permit that requires an upgrade of the stormwater treatment system pursuant to the Department’s regulations, including 3-acre sites, the PCP will be designed to achieve, in aggregate, a level of phosphorus reduction equivalent to the lake segment target as applied to the UVM owned developed land.
 - b) Where a PCP includes non-municipally-owned developed lands that are subject to an operational stormwater permit that does not otherwise require an upgrade of the stormwater system pursuant to the Department’s regulations, the management of stormwater from these lands is creditable towards the phosphorus reduction target.
 - c) The PCP may include a component to address a reduction of future growth discharges of phosphorus from developed lands. The future growth component shall track the amount of development, and the level of stormwater management achieved by local ordinances or regulations, on future development. Future development is any development after July 1, 2010 that is not subject to a state operational permit.

- Schedule of Compliance
 - April 1, 2019 - Submit the first Annual PCP Report
 - April 1, 2020 - Submit the Annual PCP Report
 - April 1, 2021 - Complete the Phosphorus Control Plan (PCP) and submit it to the Secretary - Submit the Annual PCP Report
 - April 1, 2022 and every year thereafter - Submit Annual PCP Report
 - No later than June 17, 2036 - Complete full implementation of the approved PCP

- Pursuant to the compliance schedule, UVM will submit a report every April 1st on the development and implementation of the PCP. The reports will address actions taken to implement all PCP components, including:
 - Extent of street sweeping and catch basin cleaning;
 - Extent of stormwater BMP implementation;
 - An estimate of the extent of remaining items requiring completion,
 - An assessment of the ability to meet outstanding schedule items; and
 - A written statement, signed by a designer acceptable to the Secretary, that any structural BMP built or implemented within the preceding six-month period was constructed in compliance with the approved plans.

Annual Reporting

On, or prior to, April 1st each year, UVM will submit a report to the Vermont Agency of Natural Resources Watershed Management Division with an update of the University's stormwater efforts. The report will identify the following:

- Measurable outcome reporting (Refer to Appendix C);
- Status of compliance with permit conditions;
- A summary of stormwater activities planned during the next reporting cycle; and
- Proposed changes to the Stormwater Management Program.