

Management of Stormwater Runoff in Vermont

Program and Policy Options



Prepared for the Vermont General Assembly
Pursuant to Act 114 of the 2000 Legislative Session

Prepared by the
Vermont Agency of Natural Resources
Department of Environmental Conservation
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Enhanced Stormwater Program Development Executive Summary

- During the 1999/2000 legislative session, Act #114, ‘An Act Relating to Preventing Watercourses From Flooding’ was passed into law. This action served to substantially modify 10 V.S.A. §1264 (Appendix A), the section of statute which describes the management of stormwater in Vermont. Act #114 required the Department to report to several committees of the Vermont General Assembly on the proposal to develop an enhanced stormwater program for Vermont.
- The Agency of Natural Resources, Department of Environmental Conservation (DEC) hired a nationally recognized consultant on stormwater, the Center for Watershed Protection (CWP), to prepare a new, state-of-the-art program for control of stormwater in Vermont. The contract with the CWP was drafted on June 6, 2000 and received final approval on July 5, 2000. DEC convened a State government steering committee to meet regularly with the CWP and review and comment on the development of technical recommendations for a new stormwater management program.
- The following report contains several sections, and when taken collectively, describe a program for comprehensively managing stormwater throughout the State. Elements of the proposed program are described in the first several chapters, including discussions of several critical concepts such as stormwater utilities and certification/privatization of some of the stormwater permitting process. The technical basis for the program, and the proposed stormwater control measures, are described in the Technical Support Document (TSD), Appendix C. The TSD is not a final product, but rather the basis for the writing of a Vermont Stormwater Management Handbook scheduled to be completed by the CWP in the summer of 2001.
- As a result of this process, the CWP produced the Technical Support Document (Appendix C), which was released for public review on November 21, 2000. This document outlines and presents the technical basis for recommended changes to the State’s stormwater management program. The document was formally presented to the public at a meeting held in Montpelier on December 12, 2000. The period for public comment was closed on January 8, 2000. A substantial number of detailed comments, on all sides of the issue were received (Appendix D). A responsiveness summary for many of these comments was subsequently developed, and is presented as Appendix E.
- The new proposed procedures, as described in the TSD, would determine necessary control measures based upon the receiving water’s sensitivity to stormwater discharges in five categories; direct water quality impacts, channel protection, groundwater recharge, moderate flooding events, and extreme flood events.
- Separate standards would be employed for both the construction of new impervious

areas, and for the redevelopment of existing impervious surfaces.

- When site design techniques are employed to minimize the amount of off-site runoff, reductions in the size of required structural treatments will be possible
- DEC has met with various groups to present the Technical Support Document and specific details on programmatic issues for their consideration. These groups include the Vermont Water Resources Board, the Vermont Ski Areas Association, Vermont League of Cities and Towns, Conservation Law Foundation, Vermont Natural Resources Council, National Wildlife Federation and the Vermont Association of Consulting Engineers.
- The responsibility for stormwater management within DEC was assigned to the Water Quality Division in August 2000. A new program supervisor was hired in September. Recently, three positions were transferred into the newly designated Stormwater Management Section,. The positions were reclassified through the State personnel system, recruited and have successfully hired individuals into them.
- As a result of the technical support document, we have developed better design elements and criteria for selective use in our existing stormwater program.
- The development and presentation of the TSD has triggered a substantial increase in the awareness surrounding stormwater issues. This has jump-started our information and education efforts.
- We are currently continuing to work on a cooperative basis with several large communities to explore possibilities for the more comprehensive management of stormwater at the local level.
- Through the addition of staff to the program, and through other proposed changes, the typical permit review time will be reduced from the current standard of 150 days to less than 90 days.

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Overview

During the 1999/2000 legislative session, Act number 114, ‘An Act Relating to Preventing Watercourses From Flooding’ was enacted into law. This substantially modified 10 V.S.A. §1264 (Appendix A), the section of statute which describes the management of stormwater in Vermont. The following excerpts from that section describe the apparent intent of the Act (emphasis added):

*The general assembly finds that the **management of stormwater runoff is necessary** to reduce stream channel instability, pollution, siltation, sedimentation and local flooding, all of which have adverse impacts on the water and land resources of the state.*

*The general assembly **intends**, by enactment of this section, **to reduce the adverse effects of stormwater runoff.***

*The general assembly determines that **this intent may best be attained by a process that:***

assures broad participation;

focuses upon the prevention of pollution;

relies on structural treatment only when necessary;

establishes and maintains accountability;

tailors strategies to the region and the locale;

assures an adequate funding source;

builds broadbased programs;

provides for the evaluation and appropriate evolution of programs;

is consistent with the federal Clean Water Act and the state water quality standards;

accords appropriate recognition to the importance of community benefits that accompany an effective stormwater runoff management program.

- **Stormwater, what is it and why is it a problem?**

According to the State of Vermont 2000 Water Quality Assessment 305(B) Report, the leading causes of surface water impairments, in descending order of impact includes siltation/sedimentation, nutrient transport, thermal modifications, organic enrichment and associated dissolved oxygen depletion, pathogens, flow alterations, habitat alterations, turbidity, and metals. Siltation/sedimentation sources can result from stream bank destabilization, erosion from land conversions, the associated reductions in perviousness of the land, and the flushing of stormwater into ditches and culverts from roadways. Nutrient input to Vermont’s rivers and lakes of phosphorus and nitrogen load occurs from all sources of stormwater including yard wastes, use of lawn fertilizers, and stream-channel erosion.

Thermal modifications are created as stormwater runoff from heated impervious surfaces such as rooftops and parking lots increase stream temperatures, as well as, the loss of streamside vegetation due to excessive stormwater runoff. The influx of nutrients, especially phosphorus, cause algae blooms which then result in decreased dissolved oxygen in waterways. Pathogens enter surface water in the form of animal waste and also as overflows from combined sewer systems. Alterations in river bottom types result from sedimentation and siltation, affecting macro-invertebrate and fish habitats. An increase in the suspended solid concentration in streams and rivers, as rates of sedimentation and siltation increase, can act to clog fish gills. Finally, metals input occurs as wash-off of air pollution particulate matter, as well as runoff over disturbed land, parking lots, highways, and industrial surfaces.

The newly modified version of 10 V.S.A. §1264 specifically defines both what is considered to be stormwater runoff, and the general goals of a plan to manage it:

The term "stormwater runoff," as used in this section, means precipitation that does not infiltrate into the soil, including material dissolved or suspended in it, but does not include discharges from undisturbed natural terrain or wastes from combined sewer overflows.

*(b) The secretary shall prepare **a plan for the management of collected stormwater runoff found by the department to be deleterious to receiving waters**. The plan shall recognize that the runoff of stormwater is different from the discharge of sanitary and industrial wastes because of the influence of natural events of stormwater runoff, the variations in characteristics of those runoffs, and the increased stream flows and natural degradation of the receiving water quality at the time of discharge. The plan shall be **cost effective and designed to minimize any adverse impact** of stormwater runoff to waters of the state.*

- **How does the DEC currently manage stormwater?**

The State's existing stormwater management program is located within the Wastewater Management Division of the Department of Environmental Conservation (DEC). The current permit requirements for stormwater discharges are specified by the "Stormwater Management Procedures", which became effective in December, 1997. These procedures replaced and updated the previous version which was in existence since 1987.

The stated purpose of these procedures is to:

- *Define those discharges of stormwater runoff which are required to obtain a stormwater discharge permit; and*
- *Define those treatment and control requirements designed to minimize the adverse impacts of stormwater runoff, taking into account that stormwater runoff is inherently different from sanitary and industrial wastewater; and*

- *To manage stormwater discharges in a manner that meets the requirements of the Vermont Water Quality Standards and 10 V.S.A. Section 1264.*

The existing program requires a stormwater permit for sites with 2 acres of impervious surface in large watersheds or 1 acre of impervious surface in small watersheds. The program currently issues approximately 80 stormwater permits per year. These permits are currently issued as individual discharge permits, with renewal required every five years. There is currently a 150 day maximum performance standard for a final permit determination. At present, staff from the WWMD have increased the overall time they spend on stormwater permitting from approximately 0.5 FTE to a current estimate of 1.5 FTE per year.

- **What are the problems with the existing stormwater management program?**

There are several problems with the way the DEC currently manages stormwater discharges. The major programmatic problem is created by the nature of the five-year permit renewal cycle that is currently required for individual discharge permits by 10 V.S.A. §1263. Due to the large number of stormwater permits which are issued each year, the program soon creates a backlog of expired permits, while striving to keep pace with new permit requests. This creates increasingly long turn-around times for permit reviews, and a lack of personnel for conducting compliance monitoring, or evaluating watershed-wide solutions for stormwater impaired receiving waters.

The technical criteria for evaluating receiving water impacts and for control and management of stormwater need updating. Municipalities and other State agencies need to become more involved in the local management of stormwater problems due to the diverse location and individual nature of the impacts.

- **What changes are being proposed in the way DEC manages stormwater?**

In response to the problems which have been identified, and to the new mandates provided in 10 V.S.A. §1264, the DEC proposes several major changes in the way in which stormwater is managed. A new, enhanced stormwater management program has been established in the Water Quality Division. This change will improve coordination with related programs such as the wetlands, non-point source, and watershed planning programs which are presently managed by the Water Quality Division. Staffing for the program has been increased to 4 FTE. The FY02 budget includes two more FTE and \$110,000 for contracts to reduce the permit backlog. These changes will decrease the amount of time required for a typical permit review from the existing standard of 150 days to less than 90 days.

A Technical Support Document which describes recommended changes in the technical analysis of receiving waters and in the specific design requirements of stormwater control techniques has been prepared by a nationally recognized consulting firm. In addition,

recommended changes in permitting applicability have been made by the consultants. DEC plans to draft new permitting rules which will incorporate some of these concepts, and several other important changes in the way stormwater permitting is conducted.

A practical solution to ease much of the unnecessary administrative burden would involve a transition toward requirements which will be based in general permits, in lieu of individual permitting of stormwater discharges, for smaller sites requiring guidance. One of the principal requirements specified in the general permit will be the need for certification of the design of new stormwater treatment systems, consistent with the new standards, by a registered professional engineer or other appropriately licenced professional. An independent audit of a percentage of the systems that are actually constructed in each year will ensure compliance with the design and construction standards. Compliance or legal follow-ups, where necessary, will be initiated by the DEC. An annual certification of proper operation and maintenance of the stormwater system will also be required to comply with the terms of the general permit.

A second major initiative in the new stormwater rules will be the use of stormwater utilities in urban and urbanizing areas. These are analogous to existing municipal utilities such as wastewater and water supply. The municipality would become responsible for the necessary control of stormwater runoff within its boundaries, and would apportion the costs associated with these control activities back to users based upon a discharge surrogate, such as square footage of impervious area. Residential land uses would be charged a flat fee. Successful utilities reflect decisions and concerns of the public process leading to the utility's establishment as well as provide the public with a tangible product in return for their contribution. The USEPA Phase II stormwater regulations, to be effective in March 2003, will require designated municipalities such as Burlington, South Burlington, and Winooski, to implement comprehensive programs to effectively address stormwater management.

The DEC would retain the typical review model of consultant design and State review for several permit categories. These include large area developments and large re-developments, and the master plans for correcting currently impaired receiving waters.

As a result of these, and other proposed program changes, the typical permit processing time would be reduced from the existing standard of 150 days to less than 90 days.

- **How does the newly proposed program address each of the specific requirements which were established in the revised §1264 ?**

(1) Indicate that the primary goals of the state program will be to assure compliance with the Vermont water quality standards and to maintain after development, as nearly as possible, the predevelopment runoff characteristics.

The newly proposed technical standards for the evaluation of stormwater discharges incorporate five unified sizing criteria which must be considered in the design. They include provisions for water quality protection, channel protection, groundwater recharge, 10 year return period flooding and extreme, 100 year flood protection. These criteria are more fully discussed in Chapter 2 of Appendix C.

(2) Allow for differences in hydrologic characteristics in different parts of the state.

A rainfall frequency analysis was conducted for seven locations throughout the State, and the results of this analysis are discussed in Chapter 2 of Appendix C. Receiving water-specific techniques are used throughout the technical support document, and will be incorporated into the final stormwater control manuals.

(3) Incorporate stormwater management into the basin planning process conducted under section 1253 of this title.

All new basin planning efforts which are being conducted under section 1153 will specifically include stormwater impact analysis, management and planning.

(4) Assure consistency with applicable requirements of the federal Clean Water Act.

The new program will be responsible for implementation of several aspects of the Clean Water Act, including the new USEPA Phase II requirements for small municipalities with municipal separate storm sewer systems, and for construction erosion control on disturbed sites greater than 1 acre in size. Specific details on these requirements are more fully discussed in Chapter 4 and Chapter 5.

(5) Address stormwater management in new development and redevelopment.

Specific performance standards have been discussed and proposed for both new construction and for re-development projects. These requirements are described in Chapter 1 of Appendix C.

(6) Control stormwater runoff from construction sites and other land disturbing activities.

USEPA requirements will require NPDES permits be issued for construction erosion control at all sites which disturb more than 1 acre, effective March, 2003. The VTDEC will continue to provide Act 250 testimony for erosion control guidance at sites with disturbed areas less than 1 acre.

(7) Indicate that water quality mitigation practices may be required for any redevelopment of previously developed sites, even when pre-redevelopment runoff characteristics are proposed to be maintained.

Specific requirements for runoff control from re-developed sites are discussed in Chapter 1 of Appendix C, but are currently proposed to generally require a 20% reduction in runoff from pre-redevelopment conditions.

(8) Specify minimum requirements for inspection and maintenance of stormwater management practices.

The detailed requirements for inspections and operation and maintenance of stormwater treatment systems will be specified in the final general permits that are developed subsequent to the administrative rules. However, the importance of proper O&M is readily acknowledged, and discussed in the technical support document (Appendix C)

(9) Promote detection and elimination of improper or illegal connections and discharges.

Specific language for these requirements will be included as part of Phase II NPDES permits, individual discharge permits and general permits authorized under the new stormwater rules.

(10) Promote implementation of pollution prevention during the conduct of municipal operations.

Specific language for these requirements will be included as part of Phase II NPDES permits, individual discharge permits and general permits authorized under the new stormwater rules.

(11) Provide for a design manual that includes technical guidance for the management of stormwater runoff.

The second phase of our contract with the Center for Watershed Protection calls for the development of a two-volume manual to specify the analysis and design of stormwater management systems. This manual will be based on the concepts discussed in the Technical Support Document (Appendix C).

(12) Encourage municipal governments to utilize existing regulatory and planning authority to implement improved stormwater management by providing technical assistance, training, research and coordination with respect to stormwater management technology, and by preparing and distributing a model local stormwater management ordinance.

A significant component of our proposed program is to encourage municipalities, particularly those covered under NPDES Phase II, to establish stormwater utilities for the comprehensive management of stormwater at the local level. This concept is more fully discussed in Chapter 3.

(13) Promote public education and participation among citizens and municipalities about cost-effective and innovative measures to reduce stormwater discharges to the waters of the state.

The DEC is currently funding a New England Interstate employee to conduct public education and to develop grassroots participation in stormwater management programs among interested municipalities. This is also a specific requirement for communities which will be covered under Phase II of the NPDES program to implement on a local level.

- **Summary**

There are several significant program development issues which remain to be solved. There is considerable debate over many aspects of the newly proposed program, and an enormous amount of technical information to be considered, in a relatively short time-frame.

The DEC will continue to act quickly to comply with the time-frame which is contained in the revised statute. A collaborative process will be started immediately to achieve the greatest amount of consensus possible on the new rules, aid in the development of the technical guidance manuals, and to increase efforts in information and education to inform the general public about the impacts of stormwater runoff.

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Introduction

Stormwater runoff, which is defined as precipitation that does not infiltrate into the ground, causes extensive damage to both private property and public infrastructures, and adversely affects water quality throughout the State. As urbanization, and the development of raw land proceeds, the amount of impervious cover increases, and so do the potential problems associated with stormwater runoff. These problems can be categorized into two main components: the increased volume and rate of flow of the water draining from impervious surfaces, and the loading of pollutants which are directly washed off these impervious surfaces and carried into the receiving waters.

This report, prepared in response to Act No.114 of the 1999/2000 legislative session, presents technical evaluation criteria and recommended design techniques for the control of stormwater runoff, and discusses seven major issues involved with the creation of a new, enhanced stormwater management program by the Department of Environmental Conservation. These issues include discussions on new development of impervious surfaces, discharges to currently impaired waters, upcoming Federal requirements for more comprehensive stormwater permitting and other similar programmatic concerns. In keeping with the intent of the legislation, specific rules for the creation of the new program have not yet been drafted for presentation at this time, however that process is now poised to begin, using the issues presented herein as a starting point.

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Issue 1: Permits for New Development and Re-development



There are several options available to increase the efficiency in permit processing for both new construction and redevelopment of existing impervious surfaces, while simultaneously maintaining the necessary quality assurance and environmental protection.

Stormwater permits are currently issued by the Vermont Department of Environmental Conservation (VTDEC) as five-year, individual permits. The permitting process involves a system evaluation and design being prepared by a consultant, the permit application is supplied to DEC staff, and a 150 day maximum review time is triggered. The existing stormwater management section currently evaluates approximately 80 permit applications per year. The threshold for needing a stormwater permit is currently set for new projects which would create over 2 acres of new impervious surface in larger watersheds, and 1 acre of new impervious surface in relatively small watersheds. A current proposal which was recommended in the Technical Support Document (Appendix C), is to lower this trigger threshold to 1 acre on an absolute basis, and as low as 5000 ft² in certain cases. Although there are currently no permits required for redevelopment of existing impervious areas, there is a proposal for the new program to include a criterion to achieve a 20% reduction in pre-redevelopment runoff rates. Obviously, implementation of new proposals such as these would greatly increase the number of permits which would need to be reviewed.

In developing the new program, several options have been considered for their relative effectiveness in how to make this process more efficient, particularly given both the probable reduction in the jurisdictional threshold for permitting, and the more sophisticated and time-consuming designs which are being proposed for stormwater management systems. There are four conceptual models for program administration which are being considered:

- **Central office review (Current system)**

The existing process was described above. However, to successfully continue to review permits under this system, while simultaneously increasing the flow of permits, a significant increase in the number of staff available for permit review would be required. If we continue to issue permits for stormwater discharges as five-year individual permits, this process would only become more cumbersome and inefficient over time as the total number of permits requiring re-issuance increases.

- **Regional staff for stormwater and erosion control review**

This system would be similar to that described above, with the primary change being where the staff would be physically located. It would function similar to the regional wastewater disposal/on-site system review process that currently exists. The majority of the permit review staff would be located in regional offices, however the process would function in a similar manner to that previously described. In addition to conducting stormwater treatment facility review, they would also be responsible for conducting erosion control reviews as well. While regionalization of permitting staff would solve some timing and logistical concerns which surround central office permitting, the program would suffer from the same long-term concerns as mentioned above.

- **Municipal delegation**

The concept of municipal delegation involves transferring the responsibility for evaluation and permitting of stormwater facilities down to municipalities. It is felt that this is a valuable tool, and will in fact promote this concept in concert with the creation of stormwater utilities in several of the larger municipalities, its definitely not a universal solution. There are many towns across the State that would neither want this new responsibility, nor be readily capable of administering the program. Therefore, another complimentary method of permitting is necessary for those towns where delegation is not viable.

- **Professional Engineer certification**

The concept of semi-privatization, or professional engineer certification, involves the filing of a certification, by an appropriately licensed professional engineer, of a stormwater management systems final design and construction. This certification would serve to fulfill the major requirement of a statewide general permit for new construction, and no individual permit review would take place at the State level. This system would be efficient, eliminating project delays and the need for a large administrative overhead, and if properly administered, would result in similar designs to those achieved under the other models.

The DEC recommends that a new, enhanced stormwater permitting program rely primarily on semi-privatization of the permitting process, through certification by professional engineers or other appropriately licensed professionals. A general permit would specify this type of certification process for most projects, from the smallest covered by the proposed rule, up to very large projects. It is anticipated that new projects which would create greater than 5 acres of impervious surface would continue to receive a typical permit review, with subsequent individual permits. However, the new model for most projects would use the general permit to outline specific requirements to be followed during the process.

An engineer, knowledgeable in the practices of stormwater management, would file a notice of intent (NOI), with the Town and the State, 30 days prior to construction and after completion of the project analysis and the system design. Appeals of this intent could be triggered by interested parties during this time period. Absent any such appeals, construction would be completed and a notice of completion (NOC) would be filed with the State. This final notice would include a certification by the engineer, that the system was designed and constructed according to technical specifications contained in the State's new stormwater design manual.

This manual is proposed to be fairly prescriptive in nature, with clear and innovative site design credits, and if project designs are completed in general conformance with these

specifications, water quality will be protected. A system for innovative designs and operation of systems will be established when certified by the engineer and followed by system monitoring. The filing of the NOC with the State will trigger an annual requirement for filing with the DEC of an annual operating fee, and a certification of operation and maintenance (COM), by the project owner and their consultant, with the DEC. Compliance with this annual requirement will be necessary to receive continuing coverage under the general permit conditions. It is anticipated that these general permits will be issued for an extended period of time, perhaps 20 years. They would contain re-opener clauses that could be triggered upon a change in the technical criteria.

An important component of this system, to ensure compliance and evaluate the effectiveness of treatment systems which are being constructed, will be a system of environmental audits. Through its staff or by contract, the VTDEC will conduct independent audits of the design, construction and operation of a certain percentage of systems built within each year. If problems are identified upon the completion of these inspections, the consulting firm hired to conduct these audits will be responsible for supporting the necessary follow-up actions when needed, to ensure that any deficient system designs are corrected, and that the proper parties are held accountable.

The VTDEC feels that this type of general permit system would work well for several reasons, it allows the private sector to rapidly adjust and respond to seasonal and annual fluctuations in permit numbers, it provides more control of the permitting time frame to the individual project developer, and it is an administratively efficient system which will allow State resources to better concentrate on compliance monitoring, large-scale construction projects and review of projects in impaired receiving waters.

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Issue 2: Stormwater Discharge Permits and Compliance with Vermont Water Quality Standards - Permitting in Impaired Waters



“Impaired waters” are State waters that are not currently meeting the Vermont Water Quality Standards (WQS). Permitting of both new and existing development presents unique challenges in these watersheds.

Stormwater discharges differ significantly from industrial and municipal waste water discharges. The state statute authorizing the enhanced stormwater program requires the Agency to take this fact into account:

“The plan shall recognize that the runoff of stormwater is different from the discharge of sanitary and industrial wastes because of the influence of natural events of stormwater runoff, the variations in characteristics of those runoffs, and the increased stream flows and natural degradation of the receiving water quality at the time of discharge.”¹

The differences between stormwater discharges and industrial municipal waste water discharges which affect water quality are summarized in Table 1.

Table 1. Characteristics Affecting Water Quality

Industrial and Municipal Waste Discharges	Storm Water Discharges
Discharge flows and pollutant concentrations can be managed in treatment facilities.	Discharges are highly variable and unpredictable in terms of both flow and pollutant concentrations.
Water quality is affected primarily by discharge quality (i.e., pollutants conveyed to the receiving water).	Water quality is affected not only by the quality of the discharge but also by its quantity (e.g., erosion and loss of habitat due to changes in the amount and velocity of the flow)
Site considerations are not normally a major limiting factor.	Depending on site characteristics, water quality impacts may be more related to physical effects (e.g. stream bank erosion, streambed scouring, extreme temperature variations, sediment smothering) than to the type and amount of pollutants present in the discharge. Site constraints limit changing stormwater controls.

¹10 V.S.A. 1264(b)

Industrial and Municipal Waste Discharges	Storm Water Discharges
Predictive modeling of pollutant impacts on water quality is relatively simple and inexpensive.	Modeling the hydrological impact of wet weather flows is possible but expensive. Modeling the impacts of runoff quality and quantity on pollutant loads in receiving waters is generally both expensive and inaccurate.

As a result of these differences, stormwater discharges and industrial and municipal waste discharges have been regulated differently. The water quality impacts of industrial and municipal waste discharges are regulated by pollutant “effluent limitations” which are included in permits. Pollutant effluent limitations must be at least as stringent as those required by federal effluent guidelines for various types of discharge. If effluent limitations based on the federal guidelines are not sufficient to guarantee that state water quality standards will be met then more restrictive, water quality-based water quality based effluent limitations are included in the permit. In the event that multiple waste discharges are contributing to a violation of water quality standards, the Agency adopts a “wasteload allocation” for the stream which sets new permit effluent limits for all dischargers.

In contrast, stormwater is regulated by primarily through the use of Best Management Practices (“BMPs”). BMPs for stormwater control include flow controls, sedimentation and pollutant removal measures, and operation and maintenance requirements to manage runoff.(WQS) in addition to meeting other federal and state requirements. Stormwater permit requirements are as follows:

- National (“Phase I”) requirements establish BMPs for major industrial, municipal stormwater collection systems and construction sites.
- National (“Phase II”) requirements set out BMPs which will be required for medium sized municipalities by December 2002.
- The Agency’s 1997 Stormwater Management Procedures require BMPs for stormwater discharges from projects with greater than two acres of impervious surface (one acre in certain sensitive areas).

Applicants who comply with required BMPs are presumed to be in compliance with Vermont Water Quality Standards WQS Applicants are allowed to submit information documenting that alternative approaches will also meet WQS. Similarly, other affected parties may provide information that the BMPs are inadequate to meet WQS.

EPA has adopted the same approach for determining stormwater compliance with

waster quality standards²:

“Due to the nature of storm water discharges, and the typical lack of information on which to base numeric water quality-based effluent limitations (expressed as concentration and mass), EPA will use an interim permitting approach for NPDES storm water permits.

The interim permitting approach uses best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards.”

Receiving waters which do not meet WQS are know as “impaired waters”. The Agency uses the BMP approach when issuing or reissuing permits for stormwater discharges to both impaired and non-impaired waters. Permits for non-impaired waters include a qualification. The qualification is that the permit may be amended before the end of its usual five year term to require enhanced stormwater management if a watershed-wide study determines that the new controls, in conjunction with new controls on other discharges, will abate the ambient WQS violation. Thus, applicants for permits to impaired waters have the choice of putting on more advanced controls now or waiting to see if they will be required to invest in additional controls in the future. Some applicants are likely to conclude that costs will be lower by managing storm water more stringently or treating some of a neighbor’s stormwater now rather than waiting until later.

In the next few years, DEC will be undertaking in-depth studies of each impaired waterway to identify all of the sources contributing to the WQS violation. Dischargers contributing significantly to the impairment will have to invest in upgrading their stormwater management controls.

The Agency has recently received criticism for relying on stormwater BMPs in issuing or reissuing stormwater permits for discharges to impaired receiving waters and a few permits issued by the DEC have been appealed to the Water Resources Board. The basic concern is that BMPs are not 100% effective in reducing flows or preventing pollutants in stormwater discharges and, therefore, DEC is allowing poor quality water to be made worse. It has been suggested that no stormwater permits should be issued or reissued until waters meet WQS or at least until all discharges contributing to the impairment are under order to fix the problem.

In light of these concerns the Agency will be reviewing its policy for issuing or

² U.S. EPA Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits. The policy was adopted by E.P.A. on August 1, 1996. Notice of the policy was provided in the Federal Register at 61 FR 43761.

reissuing stormwater permits for discharges to impaired waters. Over the next few months, Vermont DEC will be holding discussions with stakeholders to discuss techniques for restoration of impaired waters. Until the a change in policy is announced, the Agency will continue to require new or expanded stormwater dischargers to impaired waters to utilize BMPs with the warning that additional controls may be required.

Based on recent studies of impaired waters, a cost-effective, watershed-based approach to restoring waters impaired by stormwater is likely to result in specifically-tailored BMPs for a number discharges, no treatment for other discharges, instream structures to provide some level of treatment for an aggregate of upstream drainages and a watershed-wide education outreach program. The DEC is currently in the process of creating mechanisms to develop and implement such a solution for impaired waters.

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Issue 3: Stormwater Utilities



Stormwater utilities can be created in urban areas to assume responsibility for treatment of stormwater runoff, analogous to existing municipal utilities such as wastewater and water supply. The creation of these utilities is a necessary component of an effective Statewide strategy for controlling stormwater runoff.

The amendments which were made to 10 V.S.A. §1264 by Act #114 specify that the new state stormwater program should encourage “municipal governments to utilize existing regulatory and planning authority to implement improved stormwater management by providing technical assistance, training, research and coordination with respect to stormwater management technology, and by preparing and distributing a model local stormwater management ordinance”. Section 4407 has also been amended to read: “Stormwater management and control. Any municipality may adopt zoning and subdivision regulations as necessary to implement stormwater management and control consistent with the program developed by the secretary of natural resources pursuant to 10 V.S.A. § 1264.” Finally, the State of Vermont combined sewer overflow (CSO) separation policy mandates removal of stormwater from combined sewers. These three directives encourage the state to transfer stormwater management to the entity that can best solve stormwater and combined sanitary-stormwater problems: the local municipality. The concept of a stormwater utility, which could provide a stable, long term source of funding for municipal stormwater management in Vermont, is nationally becoming the solution for addressing stormwater problems.

Development of a municipal stormwater utility involves 6 principal issues: legal issues, community outreach and public involvement, funding, utility management, fee assessment and rate setting.

- **Legal**

Municipal stormwater utilities are usually established by ordinance by local governments. In Vermont no municipalities have yet established a Stormwater utility. Although stormwater utilities are rare in the northeast, it is anticipated that as a consequence of the EPA Phase II stormwater rule, utilities will become much more common nationwide. Under Vermont Statute, Title 24, Chapter 87 municipalities are allowed to establish “special assessment districts” for stormwater management; taxes to support the district appear to be restricted to the property tax. Under Vermont statute Title 20, Chapter 17 municipalities are allowed to establish special tax or fire districts for managing sewers, taxes to support the district also appear to be restricted to the property tax.

- **Community Outreach and Public Involvement**

According to the literature utilities that have succeeded have incorporated decisions and concerns of the public process leading to the utility’s establishment as well as provided the public with a tangible product in return for their contribution. Early public education and outreach is essential for public acceptance of a utility although there are several different strategies to accomplish an outreach program. Education and outreach after utility establishment will enhance the effectiveness of any stormwater pollution abatement program. A well informed public is an involved public, and equates to a public less inclined to appeal for adjustments and exemptions from the utility.

The EPA Phase II stormwater rule (see Issue 4: EPA Phase II - MS4 Municipalities), effective in March 2003, requires designated towns to implement an enhanced public process for decisions affecting stormwater and to implement an educational program for nonstructural stormwater best management practices and pollution prevention. Education/outreach can be accomplished by using existing municipal staff, hiring new staff, cooperating with neighboring communities in a regional effort, or by private contract. In general 2.5% of an annual utility budget is spent on an organized public information and education effort

- **Funding**

Statutory or rule changes may need to be made to enable interested municipalities access to start-up funding for creation of stormwater utilities. One idea is to change rules or statutes to allow access to State revolving loan funds (SRF). These low-interest loans have typically been restricted to sanitary-wastewater treatment projects. However, given the analogous nature of this problem and the municipally implemented solutions, it seems appropriate to enable access to this funding. Additional monies may need to be committed to this funding source, in order to provide sufficient resources for the anticipated number of start-up facilities. User fees to establish a utility may not be sufficient for start up and could be supplemented with grants (e.g. EPA Section 319, TEA-21, Municipal Planning Grants), bonds or loans.

- **Management**

The 1996 national survey of 100 utilities showed that 32% are combined with the municipal DPW, 16% are part of the wastewater utility and 49% are organized separately. Keeping the utility as a separate entity minimizes conflict and resource shortages but may be more expensive. Management of a utility can be divided into operations and maintenance (O&M), capital improvement projects (CIP) and administration. Maintenance of private stormwater systems are generally the responsibility of the landowner unless city maintenance is approved by the municipal selectboard. Although not essential a comprehensive plan of action which evaluates the current situation, sets priorities and estimates future costs can help with public acceptance of the utility and will contribute to a better definition of the actual cost of a program

- **Assessment**

The preferred and most equitable method for assessing a stormwater fee is based on an individual tax parcel's contribution of stormwater. Since we cannot "meter" flow from each parcel the best but not always feasible method is the percent impervious cover of a parcel. Fee schedules should take into consideration: (1) fairness of assessment vs. ease of implementation, (2) differences in land use, and (3) flat rate vs. rate calculated as a function of a tax parcel's contribution of stormwater. Analyses show a flat rate is relatively fair for residential land uses and a calculated fee based on impervious cover works best for non-residential land uses. However, a flat fee eliminates any incentive to reduce stormwater runoff from a parcel. The inclusion of a fixed charge in a calculated fee structure ensures a minimum revenue base and can be considered to cover the stormwater contribution from public lands such as road systems.

The 1996 utility survey showed that only 26% of the utilities gave credits for reducing stormwater volume and only 11% gave credit for water quality improvements. In Vermont, existing state, municipal and regional planning commission mapping data and tax parcel databases, particularly in the urban areas of the state, could allow for the relatively easy measurement of impervious cover. It is important to keep in mind that if the public understands the assessment method and perceives it as fair there is less likelihood of opposition to the rate and future rate increases

- **Rate setting**

Setting of rates should reflect (1) the cost of running an effective program and (2) the political reality of establishing a new fee. The rate may reflect the funds needed to implement only a portion of the program when other funding sources are available. Annual program costs are estimated to be 15-25\$/acre for basic administration, engineering and reactive maintenance, and 100\$/acre for a more comprehensive program including capitol improvement projects. Utilities which have succeeded have started with a reasonable rate and raised those rates with little public response as long as the changes were not extreme. In rate setting the public should have a means to review and influence the rate such as through a Citizen Advisory Panel.

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Issue 4: USEPA Phase II Regulations - MS4 Municipalities



Municipal separate storm sewer systems (MS4s), which are designated by population density, will be required by U. S. EPA Phase II regulations to provide a plan by March 2003 to implement comprehensive programs to effectively address stormwater management by achieving compliance with six minimum stormwater management measures.

In November 1999 the USEPA issued new stormwater regulations for the census-defined metropolitan areas of less than 100,000 people, called the Phase II Stormwater Rule. In Vermont four municipalities with a municipal storm separated storm sewer system (MS4) were automatically designated to come into compliance with this rule. These communities are Burlington, South Burlington, Winooski and Essex Junction. Five additional municipalities are subject to this rule pending year 2000 census data and ANR's determination that water quality is impaired, based on the Clean Water Act's 303(d) list, in these communities. These towns are Rutland, Essex, Williston, Colchester and Shelburne. It appears likely that they will be designated as subject to the Phase II rule given demographic trends and the presence of 15 impaired water bodies within these town boundaries. Designated towns must submit to ANR by March 2003 a permit application showing how they intend to achieve compliance for six minimum measures. This permit has a life span of five years. With the exception of Rutland, eight of the nine towns are located geographically together which presents several unique opportunities for cooperation, cost sharing, watershed planning and general permitting.

The Phase II Stormwater Rule was developed through a process of national stakeholder participation and represents a cost-effective approach toward addressing the problems caused by urban and suburban stormwater runoff to the nation's waters. There are six minimum measures required of each designated municipality under the Rule. These measures are: (1) Public Education and Outreach, (2) Public Participation/Involvement, (3) Illicit Discharge Detection and Elimination, (4) Construction Site Runoff Control, (5) Post-Construction Runoff Control and, (6) Pollution Prevention/Good Housekeeping.

In Vermont, since the late 1970's, stormwater discharges from new development and erosion control practices have been regulated by the state on a site by site basis. The state is currently considering major revisions to the stormwater and erosion regulations. When implemented these regulations would be considered sufficient to allow the municipalities to "reference by rule" these regulations in order to meet minimum measures (4) Construction Site Runoff Control, and (5) Post-Construction Runoff Control.

Two of the required minimum measures, (1) Public Education and Outreach and (2) Public Participation/Involvement can be implemented on either a town wide or a watershed basis. Towns may choose to meet these measures by working individually or by cooperating with neighboring towns. Because watersheds often cross town boundaries, inter-municipal cooperation, information sharing and resource pooling will be encouraged. It is highly likely that these measures could be more successful and implemented in a more cost effective manner if municipalities cooperated on a watershed level.

The minimum measures (3) Illicit Discharge Detection and Elimination and (6) Pollution Prevention/Good Housekeeping require that the designated communities enhance any existing effort to keep wastewater out of stormwater systems and implement pollution prevention facility plans to minimize stormwater contamination at municipal industrial

facilities such as city garages and wastewater treatment plants. Training of employees is also a critical element of these measures.

At the present time many of the designated municipalities already carry out actions or activities that would be considered proof of compliance for several of the minimum measures. In fact some of these activities could be considered exemplary or significant as a state or regional demonstration of compliance with the Phase II measures³. Some examples of these actions are: watershed planning districts (S. Burlington), watershed restoration plans (Burlington), urban hotspot (toxic) best management plans (Winooski), and storm drain flushing de-chlorination (Essex Junction).

However these activities and actions are often dependent on one time municipal board or committee commitments and often on one time funding decisions. They do not reflect a programmatic or long term commitment by the municipality. ANR has supported these activities financially and with technical support and guidance. Since 1997, the Phase II communities have been specifically encouraged to take advantage of Clean Water Act, Section 319 funds. These funds will not be available to the communities for activities associated with the Phase II permit after March 2003. The concept of a stormwater utility which could provide a stable long term source of funding is nationally becoming a solution for addressing stormwater problems. The Town of Colchester, utilizing a Section 319 grant, is currently investigating the creation of a stormwater management program. However, concerns about Act 60 and existing high sewer/water bills, and the necessity of increasing staff resources may stifle a selectboard's enthusiasm for any new fees.

As a result of the passage of Act 114 and the amendments to § 1264 (b)(12) and Sec. 4. 24 V.S.A. § 4407(20) there is a great deal of interest by the state in delegating stormwater permitting authority to municipalities. Delegation would require that municipalities develop stormwater management programs that meet or exceed ANR requirements. Several designated Phase II communities already do manage stormwater runoff from new development although the criteria and municipal oversight vary considerably, may or may not be codified, and in general is not as comprehensive as the proposed new state stormwater guidelines. The best example of an existing municipal stormwater management plan is the Bartlett Brook Watershed Protection Overlay District in South Burlington. The City contracts with a private consultant to review new development for flooding impacts caused by stormwater runoff and to make recommendations. The Design Review Board then decides whether to implement those recommendations or not. A fee is assessed to the developer for the cost of the stormwater review.

³ H.316 and its amendments to §1264 *Stormwater Management* specify that the new statewide stormwater program includes the six minimum measures of the Phase II rule.

In order for the proposed new state stormwater program to be as cost effective as possible and be successful in minimizing adverse impacts to water quality, it is important that the credits and incentives package of the new state stormwater guidelines be implemented and strengthened to the maximum extent possible. The incentives package in part relies on good municipal water quality-based zoning: for example, a credit is given when stormwater is effectively treated by a minimum 50 foot stream buffer zone. The incentives package also relies on flexibility in the application of public works standards: for example stormwater treatment volumes can be reduced by reducing impervious cover such as parking spaces and road widths and eliminating catch basins and curbs where drainage and soils allow. ANR should work with the Phase II municipalities to encourage the maximum effectiveness of the stormwater credit system.

In addition to addressing stormwater runoff from MS4s, the Phase II rule will also require that a stormwater pollution prevention plan be created for the following facilities statewide if they have a stormwater point discharge and have not shown that all industrial activities and materials are protected from exposure to rainfall:

- all public works facilities in towns with populations exceeding 10,000 persons
- wastewater treatment plants in excess of 1 million/gal/day
- municipal industrial facilities

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Issue 5: Pervious Land-Use Changes



Conversions in land usage, which reduce the perviousness of the land cover type, can result in increased rates of stormwater runoff. The increased rate and volume of runoff can then have adverse environmental consequences such as stream channel enlargement, decreased groundwater recharge, and increased contributions of pollutants.

Stormwater from impervious surfaces such as parking lots or highways is not the only source of pollution nor cause of instability in Vermont's waters. Land use changes from forested to non-forested uses can greatly impact the public waters if not properly constructed and maintained.

Sediment loading to Vermont waters is a critical water quality issue due to elevated turbidity levels during storm events and reduced substrate quality due to sedimentation. Substrate quality is key to the support of benthic organisms (bottom dwellers), such as insects and salamanders, and to fish reproductive success. Trout eggs are deposited and incubate in the interstitial spaces in streambed gravels, and sediment carried to the stream can fill these spaces and smother the eggs, as well as insects which reside in the gravels. Stormwater is the medium that dislodges soil particles from the land and carries them to streams. Deforestation of watersheds and other land disturbances significantly changes the amount of runoff and the overall rate of erosion and sediment transport to streams. Reduction in forest cover can also elevate the magnitude of flood peaks, resulting in channel scour and habitat degradation.

Large-scale watershed or land disturbance has a number of different adverse consequences, including changes in stream channel cross section and form (widening, deepening, aggrading, and braiding) as the stream responds to the demands of carrying higher flows; decreases in groundwater recharge and related declines in stream base flows; and increased pollutant discharges. Increases in stormwater runoff from land use changes can increase peak stream flows aggravating floods and threatening culverts, bridges, roads and other structures.

As part of its assessment of stormwater policy issues, the Department commissioned a study that resulted in a September 1999 report, *Watershed Hydrology Protection and Flood Mitigation Project, Phase II - Technical Analysis, Stream Geomorphic Assessment*. This study involved the collection of empirical data specific to Vermont streams to look at long term responses of our streams to watershed urbanization. Essentially, it was an effort to validate that the phenomena observed in other geographic and climatic areas of the country occur here as well. Using a study approach employed in prior studies of this nature, the investigators compared historical cross sectional data from eight urbanizing sub-watersheds across Vermont to new survey data collected as part of this study.

The investigators found that Vermont streams react similarly to streams in other geographic areas. The data was used to develop a predictive model that relates channel enlargement to the percentage of impervious cover in the watershed above the point of interest. In completing the assessment, the investigators recognized that the conversion of forested areas to other *pervious* surface uses, such as meadow or cropland, have an intermediate hydrologic impact between forested and totally impervious. For the purposes of the model, the sub-watershed's pervious surface uses were converted into an *equivalent percentage impervious*.

The changes in channel dimensions due to land use changes are not, of course, instantaneous. Researchers refer to the time interval required for a channel to reach its final stable form as the *relaxation period*. This period can be several decades long or longer.

The eight Vermont streams studied were small watersheds varying from 0.5 square mile to 24 square miles in area. For the watersheds that have seen significant development, the average stream channel enlargement was estimated at 25%. The model suggested that these streams ultimately will be, on average, about half again as large as they were when the watersheds were fully forested. For alluvial streams, the measured tendency was found to be that channels begin to lose their stable form when the total basin impervious area exceeds about 2% and actively adjust form when the equivalent impervious area exceeds about 8%. (*Watershed Hydrology Protection and Flood Mitigation Project, Phase II - Technical Analysis, Stream Geomorphic Assessment*, p. 3-3 to 3-11)

Given the expected impacts on stream ecology and the societal consequences of conversion of land use conversions from a forested condition, the Department has concluded that multiple approaches must be taken to address large scale pervious area conversions in susceptible watersheds. To date, only a select few development projects have been analyzed by the Department in Act 250 to determine if restrictions are necessary to address hydrologic and sediment yield impacts on the receiving waters. The conventional hydrologic models used by the discharge permit program in processing stormwater permit applications have been used, such as the NRCS's TR-20 and TR-55. Several projects have been analyzed using the Universal Soil Loss Equation, model used to estimate the magnitude of potential erosion during construction and after site stabilization.

The Department will develop screening criteria to determine under what circumstances proposed changes to fewer pervious land uses should be reviewed for hydrologic impacts. Considerations will include identified downstream impairments, the ratio of land use conversion area to receiving stream watershed area, existing and historical watershed land use, site soils permeability and cover, downstream flooding potential, and receiving water erodibility. The results of this analysis will be used in Agency review of proposed projects as a part of existing regulatory activities.

The Department plans to use the following tools to address stormwater impacts from land use conversions:

- **Basin planning:** The Department will assess stormwater issues in its basin planning effort. Classification and typing will define the management and use goals for the waterbody. The plan will then identify existing quality and future threats to the water quality related to stormwater.
- **Town plans:** The Department will advise towns on districting issues to promote growth centers and buildout in appropriate areas and with appropriate stormwater controls.

- **Act 250:** The Department will use the stormwater technical support document and continue to participate in Act 250 on stormwater related issues, particularly on projects that involve substantial conversion of forested areas. For ski resorts, the Department has worked collaboratively with the resorts and environmental groups on planning protocols for lift and trail expansion, and those protocols consider hydrologic and erosional issues. The Department will encourage ski resorts and other developers with similar stream impacts to produce water quality management plans for use in managing land uses and monitoring water quality in susceptible watersheds.
- **Stream buffers:** The Agency streambank and lakeshore vegetation (“buffer”) procedure is being revised. Buffers will continue to be emphasized to promote infiltration and treatment values, as well as other non-stormwater functions. Buffer protection will also be considered in the development of guidelines for design of stormwater facilities to assure conflicts between facility siting and buffer protection does not occur.

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Issue 6: Control of Stormwater Runoff From Construction Sites



Control of erosion and stormwater runoff during land-clearing and construction activities is critical to the protection of water quality in receiving waters. U. S. EPA Phase II regulations will require all construction activities which will disturb over 1 acre to obtain an NPDES permit from the DEC

As discussed in Issue 5: Pervious Land Use Changes, sediment discharges to waterbodies is a critical stormwater issue. The Department, through the Vermont Geological Survey, developed a guidance document for erosion and sediment control related to construction activities (*Vermont Handbook for Soil Erosion and Sediment Control on Construction Sites*, Vermont Geological Survey, 1982, rev. 1987). This document is frequently used by developers and their consultants for project planning and responses to Criterion 4⁴ of Act 250.

The United States Environmental Protection Agency (USEPA) , under Phase II of their National Pollutant Discharge Elimination System (NPDES) stormwater regulations will require all construction activities which will disturb over 1 acre, to obtain an NPDES permit. This requirement will usually be met with a statewide general permit, which will specify typical erosion control measures to be used. Large construction projects may require an individual discharge permit. The Phase II regulations will become effective on March 2003.

The Department routinely reviews Act 250 applications for adequacy of the erosion control plans and stream buffer protection. The Department also provides general assistance to the public and other state agencies in erosion control and stream protection planning.

Under the new stormwater initiative, the Department intends to continue its active participation in Act 250. Projects are reviewed weekly by an interagency review team, which includes three representatives from the Water Division, one of which is an erosion specialist. Because the stormwater permitting functions of the Department are being transferred to the Water Quality Division, the erosion control specialist will be able to better coordinate with the person responsible for stormwater permitting. The existing guidance document, for erosion and sediment control will be updated. The Department does not propose to regulate earth-disturbing activities that involve less than one acre. Act 250 would be expected to pick up major projects, including many of the commercial projects involving less than one acre of disturbance.

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⁴*Subdivision or development will not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result.*

Issue 7: Existing Permit Backlog



The existing method of stormwater discharge permitting is based on a five-year individual permit cycle. There is a current backlog of approximately 1000 expired stormwater permits which have not been reissued, but will be addressed through a multi-phased plan.

There is currently a backlog of between 800 and 1000 individual, expired, stormwater permits which have not yet been re-issued. This permit backlog exists for several reasons, however it is primarily due to the five-year permit life for which they were originally issued over the past fifteen years. Existing state statute (10 V.S.A. §1263) specifies a maximum permit period of 5 years for an individual discharge permit. Since these stormwater permits were issued as individual discharge permits, they required review and re-issuance every five years. Due to staff workload constraints they were never re-issued. This list of expired permits grows longer each quarter, as more permits come up for renewal and new permits are added to the inventory.

The existing set of expired permits contains two primary categories, those permits which submitted applications for renewal within the requisite five-year time period of the original permit, and those which have never re-applied. Under current statute and rule, those permittee's who did file for re-issuance are grandfathered under their existing permit conditions until a new permit is issued. Those who did not reapply are considered to be illegal discharges, without any permit.

Due to staffing constraints, very little site inspection or compliance monitoring has been conducted on existing permitted systems. As a result, some permitted systems were never built, and many were not built to permit requirements. The performance of many of these existing systems suffers from a lack of maintenance. Few of these systems would meet the design criteria which have been proposed for the new, enhanced program (Appendix C). Furthermore, many of these existing systems discharge to receiving waters which are currently listed on the State's 303(d) list of impaired waters.

Finally, the current ownership and even location of these existing systems is often in doubt. Permits were issued to individual developers, who may have subsequently sold properties which were served by the permitted stormwater systems. However, in many cases the permits have never been properly transferred to the new owners. There is considerable concern on the part of individual permit holders as to the changes which may be required as part of a re-permitting effort. As previously mentioned, these systems are often landscape intensive, and many sites might not readily accommodate significant changes without considerable costs to the permit holder. There are also many cases where system users are not even aware of their ownership or responsibilities regarding these long forgotten systems.

The five-year permit design life make's good sense for technology dependent discharges such as municipal wastewater treatment facilities. However, most stormwater treatment systems are landscaped into site designs, and cannot readily be modified to comply with the new design standards. Due to their relatively simple designs, with proper annual maintenance, these facilities will last indefinitely. Other sections of this report will detail how the new stormwater program proposes to avoid this situation in the future, namely long-term general permits, privatization of the permitting process and delegation to municipalities through stormwater utilities. To address the existing backlog, we propose a three tiered

process which will be primarily implemented through contracts with private engineering/ consulting firms. The DEC has requested in their current budget, a \$110,000 per year special allocation to be devoted to eliminating this permit backlog. We currently anticipate that this will require at least three years to accomplish.

The first phase of the permit backlog elimination process will be to identify, locate and survey all systems with currently expired permits. This will involve extensive searches through public records of permits issued over the last fifteen years, as well as individual field visits to physically map and locate these facilities, as well as to conduct a cursory evaluation of their design and operating efficiency and their perceived impacts upon the receiving water.

Upon completion of this initial phase, systems will be evaluated and grouped based upon several factors; including whether or not they are located in impaired watersheds, and whether or not they are considered a grandfathered system as defined above. Facilities will be further prioritized according to their relative impact on receiving waters.

There will certainly be a need for considerable flexibility when considering the extent of retrofit design which is necessary for each individual facility. Factors which will need to be considered will include; the amount of land which is available for constructing an enhanced system, the extent of impact to the receiving water, and whether a facility is part of a comprehensive watershed-wide plan to correct a currently impaired receiving water. Recommendations will be made relative to these factors by the consultant, and will then be implemented through a schedule contained in a new permit for the facility, issued by the DEC.

It is realized that there will be many logistical, financial and physical hurdles to overcome to be successful in re-permitting these existing discharges. Many of these expired permits seem to exist in the more urban areas of the State, which coincidentally comprise many of the impaired watersheds as well. A major component for success of this new program may rest in the successful implementation of stormwater utilities for many of these urban areas. While the implementation of these utilities is more fully discussed elsewhere in this report, the basic concept is for a municipality to forge cooperative solutions between dischargers, developing offset opportunities for new dischargers, and assuming responsibility for correcting currently impaired waters. These locally based solutions, often involving municipal infrastructure conduits such as curbed streets and roadside ditches, will probably be necessary to overcome the many challenges present in dealing with the permit backlog.

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Recommendations

- A process which works with all of the interested groups and citizens should be developed to reach a greater consensus on the significant issues. The DEC has received a very large number of insightful comments, on all sides of the issue (Appendix D) and it will be important to address these issues with everyone who has given us comments.
- Major divergent issues that need to be better resolved to meet current ANR goals before rulemaking begins. One example is balancing the desire for smart growth, including concentrated growth centers and urban in-fill with concerns over currently impaired urban receiving waters. A second example would be the minimum size impervious area which would be regulated under these new rules, and how any increase in regulatory jurisdiction can be managed effectively and efficiently.
- The DEC will convene a stakeholder committee to be comprised of designated representatives of groups from all sides of the issue. Use the stakeholder committee process to better define specific program elements, and to attempt to develop a better consensus on program goals and rules.
- The DEC will immediately begin the collaborative process for the development of draft stormwater management rules, and continue this process over the next three months. The DEC will also use this opportunity to further develop the information and education component of the process. There are several major new initiatives that we are attempting to integrate into this new program, including privatization of the permitting process and development of municipal stormwater utilities. It is critically important that we involve all interested parties as fully as possible in the process.
- As required by Act 114, the DEC will submit proposed rules to the Secretary of State and enter into the formal rulemaking process by July 1, 2001.

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Appendices

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Appendix A: 10 V. S. A. § 1264. Stormwater Management, Effective May 19, 2000

Appendix B: Stormwater Management Procedures, Effective December 15, 1997

Appendix C: The Vermont Stormwater Management Handbook: Technical Support Document, Public Review Draft, November 21, 2000. Prepared By: The Center for Watershed Protection, Ellicott City, MD

Appendix D: January 8, 2001 Comments to the Technical Support Document Public Review Draft

Appendix E: Center For Watershed Protection Response to Questions on the Vermont Stormwater Management Handbook: Technical Support Document, Public Review Draft