

Stormwater Introduction

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- University of New Hampshire Stormwater Center
- City of South Burlington Stormwater Services

What is stormwater runoff?

Stormwater runoff is water resulting from rainfall that does not get absorbed by the surfaces it touches and can be observed flowing over yards, streets, buildings, parking lots, and other surfaces when it rains. Stormwater can be seen flowing down the sides of roads during a heavy rainstorm. All properties with impervious surfaces (e.g., roof, driveway, sidewalk, etc.) generate stormwater runoff. Stormwater runoff flows across the land or in more developed areas into a stormwater system which often consists of storm drains (aka catch basins), pipes, and ditches. Sometimes these systems also include green treatment infrastructure like rain gardens, infiltration swales, etc. Stormwater is ultimately conveyed to our local streams, rivers, ponds, and lakes – sometimes with treatment, but often time simply by direct conveyance without treatment.

Why do we care about stormwater control and treatment?

Water Quality: One of the greatest threats to water quality nationwide begins with a storm. Rain washes over the landscape, picking up pesticides, fertilizer, sediment, oil, road salt, heavy metals, trash, toxic chemicals, and disease-causing microbes. Eventually, runoff carries this blend of pollutants—known as nonpoint source pollution—into streams, creeks, estuaries, and coastal harbors where it degrades water quality and threatens human health. In northwestern Vermont, most stormwater is not treated before it empties into streams, rivers, and lakes. The sediment and pollutants in the water are carried downstream and eventually make their way into Lake Champlain. Stormwater runoff, and the pollutants it contains, affects the health of our streams and Lake Champlain, compromising public resources that many of us cherish.

Flooding & Erosion: Beyond water pollution, unmanaged stormwater also causes erosion, flooding, and unstable streambanks. Excessive volumes of stormwater runoff can create significant erosion. Rushing water wears away streambanks, roadsides, and drainage paths, and can deposit sediment in unwanted places. Runoff can also form new tributaries that run through lawns, dirt roads, driveways, and green space. When stormwater does not drain properly it can result in soggy lawns, flooded streets, and wet basements.

Unmanaged stormwater runoff causes: 1) increased economic costs to residents; 2) negative effects on human health and well-being; 3) loss of species diversity and ecosystem function in the watershed.

Is stormwater runoff a problem in Hinesburg?

Yes – both now and potentially more so in the future! In the village growth area, as we encourage and welcome more development, much of the natural ground surface is replaced with buildings, pavement, and other impervious areas. These surfaces do not allow rainfall to soak into the ground, as do many natural surfaces, and thus the volume of stormwater runoff flowing in ditches, through culverts, and into our receiving streams and rivers (e.g., LaPlatte

River) increases. In many cases, the existing natural and man-made stormwater systems do not have the capacity to adequately drain the volume of stormwater runoff that continues to increase with every new development. With increased runoff, many portions of the system become inadequate to handle the additional drainage, the system becomes inundated, and flooding results.

As noted above, negative impacts accrue both in terms of flooding and water quality. We see this problem in rural areas of Hinesburg as well, especially where past development has not properly dealt with stormwater control and treatment. The Lake Iroquois Association has been working with the Town to deal with just this sort of problem. See the photos on the last page for dramatic evidence of stormwater runoff problems with direct impacts to the lake.

Doesn't the State of Vermont regulate stormwater?

Yes and no. The State of Vermont does require stormwater permits, but not for every project. In fact, most new development in Hinesburg is small enough that it doesn't trigger the need for any State stormwater permit. Generally speaking the trigger is one acre of disturbance or impervious surface. If a project disturbs one acre or more, then a Construction Permit is needed, which simply requires basic erosion control measures during construction. That's good, but it doesn't have anything to do with long term stormwater control after construction is complete. If a project results in one acre or more of impervious surface, then a State Stormwater Permit is needed, and a full review of both construction-related erosion control measures AND permanent stormwater control is conducted. The majority of development projects in Hinesburg create less than one acre of impervious surface, which means no State stormwater permit review. Add up all those small projects over time, and the cumulative stormwater runoff impacts and consequences can be severe. Hence the need to deal with stormwater as part of our Town-level development review process.

What is LID, and is it part of solution?

Low Impact Development (LID) practices are a set of site development techniques designed to reduce the amount of stormwater runoff and associated pollutants leaving a site. LID practices reduce the impact of development on natural water resources by mimicking existing drainage patterns and retaining stormwater runoff onsite, commonly allowing for infiltration of precipitation into the underlying soil media. Successful implementation of LID strategies will reduce the total volume and peak flow rates of stormwater runoff generated at a site. It can also reduce the need for traditional stormwater treatment facilities (e.g. detention ponds). LID practices are typically small in scale and dispersed throughout a development site to provide treatment near the area of runoff generation.

Rather than relying on traditional stormwater management practices that are costly to construct and often consume valuable land, LID practices reduce the total amount of stormwater generated, thereby promoting hydrologic characteristics similar to pre-development conditions. Terms such as green infrastructure, conservation design, and sustainable stormwater management are often used synonymously with LID practices. All of these concepts support the use of small-scale, localized facilities that often incorporate the use of vegetation, open space and other natural processes to provide for infiltration and subsequent stormwater volume, flow rate and pollutant loading reductions.



Sediment laden water from Dynamite Hill Road and from 1943 Pond Road driveway flow across Pond Road just south of Wilson driveway above culvert during the short rain Saturday afternoon (9/8/12)



Sediment laden drainage into Lake Iroquois on 1/27/2010 – coming from Pond Road