TOWN OF CARRBORO
STORMWATER ADVISORY COMMISSION

AGENDA

September 10th, 2020; 6:30 pm
Remote Meeting

Time	**Item**	**Presenter**
6:30 pm	Administrative Matters: Call to order, approval of July minutes	Chair, all
6:35 pm	Public comment (if any)	Chair, all
6:40 pm	Staff report a. New Stormwater Administrator b. Summer stormwater activities c. Homeowners Manual d. Fall schedule	Staff, all
7:55 pm	Announcements and adjourn	Chair

Citizens (other than Commission members) should email stormwater@townofcarrboro.org to receive an invitation to view the meeting. If you wish to make public comment, at the time of public comment, the speakers will be allowed to remotely enter the meeting one-by-one to comment. Please send any written statement or materials to the same email provided above. Requests to remotely attend the meeting shall be made within 24 hours of the meeting start time. The requester should also specify if they wish to make any comments in the email. All written statement and materials will be forwarded to the Commission members.

TOWN OF CARRBORO

STORMWATER ADVISORY COMMISSION – SUMMARY

Remote Meeting on July 9, 2020, 6:30 pm (Zoom)

Commission Members		Applicants	Staff
John Cox (vice-chair)	Jeanette O'Connor (chair)	Satya Kallepalli	Randy Dodd
Robert Dickson	Michael Paul		Heather Holley
Jacquelyn Gist (Council Liaison; absent)	Lauren Joca (absent)		

Administrative Matters

The SWAC approved the June minutes (unanimous vote).

Development Review

The SWAC provided concept comments for two projects. For the Arts Center concept plan, the SWAC provided recommends related to: protecting riparian buffers and the stream; insuring diffuse flow through the buffer; appropriate selection and siting of SCMs for the project; and on site and downstream flooding concerns. For the Morgan Commons project, the SWAC recommended a more innovative and truly mixed use design and a clearer and more comprehensive plan for stormwater management that is responsive to water quality treatment in general and regulatory requirements specifically. Approaches like green roofs, cisterns, bioretention, a smaller impervious footprint including an exception from presumptive parking requirements, and maximizing retention of natural vegetation should be explored as well.

Adjourn

The meeting was adjourned at 8:45 pm.

Homeowner's Watershed and Stormwater Handbook

A Homeowner's Guide to Carrboro's Watersheds, Creeks, and Stormwater Management

September 2020

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INTRODUCTION

This handbook provides information on local watersheds, an overview of why and how stormwater is managed in the Town of Carrboro and a description of roles and responsibilities of private property owners and the Town. Our goal is to help you understand the collective impact individual activities have on the larger watershed and its aquatic ecosystems.

Drainage and flooding problems in and around your home can be costly and damaging, and runoff from your lot may also inadvertently create flooding and drainage problems for your neighbors.

The guidelines in this handbook can remedy many of the problems you may encounter and help you create residential landscapes that are friendlier to our local creeks and watersheds. If you have an unusual problem or specific question that isn't addressed, reach out to the Town stormwater staff at **https://www.townofcarrboro.org/287/Stormwater** or stormwater@townofcarrboro.org. See Appendix 2 for more detailed contact information.

Several summary points in what follows are:

1) Residential lots exist within a nested series of watersheds. Since Carrboro's land use is predominately residential, area creeks and our community's ability to be resilient in a time of more frequent and intense storm depend on homeowners and residents.
2) Carrboro regulates stormwater within its jurisdiction and is regulated by state and federal agencies.
3) Drainage, flooding and floodplains, runoff, stormwater, creeks, watersheds, buffers, drainage easements, and other terms are interrelated but not synonymous.
4) This manual includes answers to the most frequent questions and requests the Town receives from residents and property owners.

Carrboro's Stormwater Mission Statement

Our mission is to ensure water quality, manage the volume of stormwater runoff, protect and restore local and downstream surface waters, and support resilience and quality of life and place and related to rainfall and runoff.

Stormwater Terminology

When we talk about stormwater, we tend to use a number of technical terms. Here are definitions to help explain some of the most common stormwater terms.

[Alphabetical list of stormwater/watershed related keywords and their definitions. I have a large list I'm curating in excel for this section. If you want to ensure certain words/phrases are included please insert them here. HH]

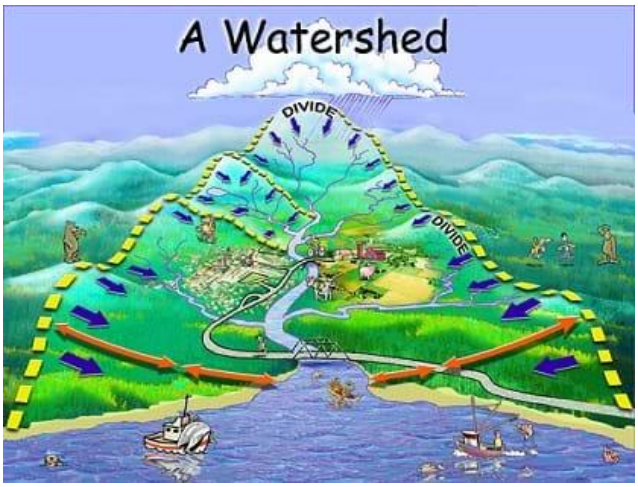
WATERSHEDS

What Is a Watershed?

A watershed is all the land, surface water (lakes, streams, reservoirs, and wetlands) and underlying groundwater that drains to a given point. The word "watershed" is used interchangeably with “drainage basin” or “catchment”. A watershed can be as small as a few square feet or large enough to encompass all the land that drains into major rivers and then into an estuary, bay, or the ocean. (Figure 1). For example, the water quality of Jordan Lake is directly related to all the streams that flow into it.

Commented [EC1]: Add a sentence explaining that watersheds can be “nesting” – i.e. Morgan Creek watershed is part of Jordan Lake watershed, which is part of Cape Fear watershed, etc.

Figure 1 What Is a Watershed



(Source: http://www.clarkcountynv.gov/water-quality/Pages/KidsCorner.aspx)

The streamflow and water quality of the surface waters, and sometimes groundwater, are affected by what is happening, human-induced or not, in the watershed area.

You can follow the flow of water from its origins upstream. Just as a tree’s structure has leaves to twigs to branches to trunks, creeks functional similarly with tributaries joining together to form larger tributaries. The smallest streams, without any tributaries, are known as first order streams. When two first order streams join together, they form a second order stream, and so forth. In Carrboro, our largest creek, Morgan Creek, is a second order stream.

All Carrboro residents live in a watershed that flows to a local creek, and all of the runoff from your home, yard and neighborhood flows to that creek.

What Is a Water Supply Watershed?

Carrboro is part of three Water Supply Watersheds: University Lake, Cane Creek and Jordan Lake. A Water Supply Watershed defines an area's best-use (drinking water) supply to be protected by specific water quality standards.

The University Lake Watershed is one of two water supply watersheds for Carrboro, Chapel Hill, and UNC. (Cane Creek, located further west, is the other.) University Lake is fed by several streams that comprise the upper Morgan Creek watershed. Its water is pumped to the OWASA water treatment plant in Carrboro and then distributed. Figure 2 shows the Water Supply Watersheds in Orange County.

The Jordan Lake Watershed is a Water Supply Watershed (Figure 3) for several other communities. All of Carrboro drains into this much larger watershed that comprises the headwaters of the Cape Fear River Basin. It's a regional water resource providing flood protection, water supply, and recreational benefits to people; and habitat for many aquatic and terrestrial species.

Figure 2: Orange County Watersheds *(may update)*

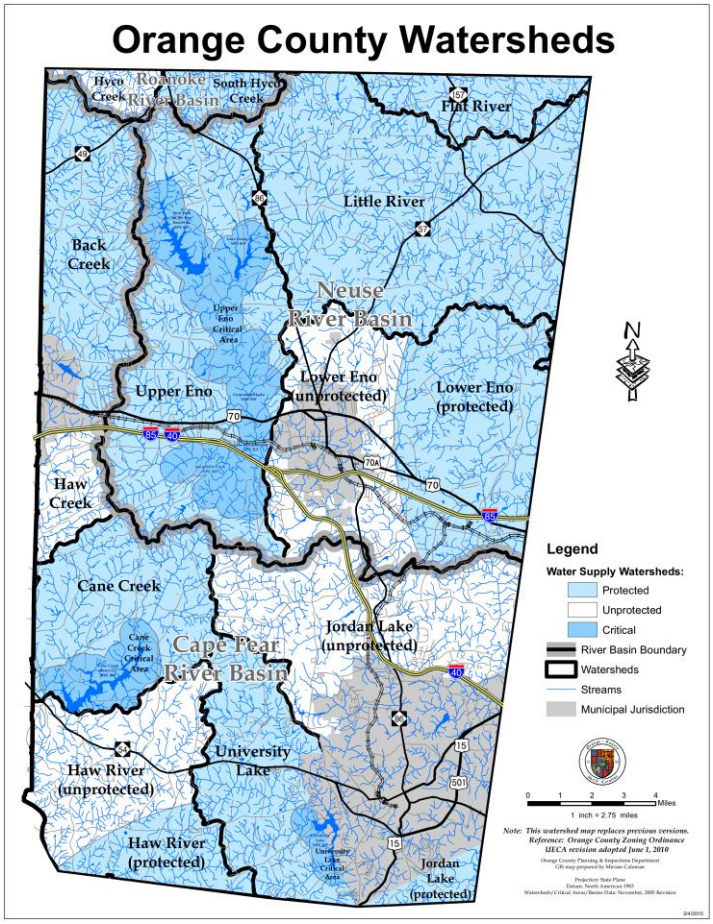
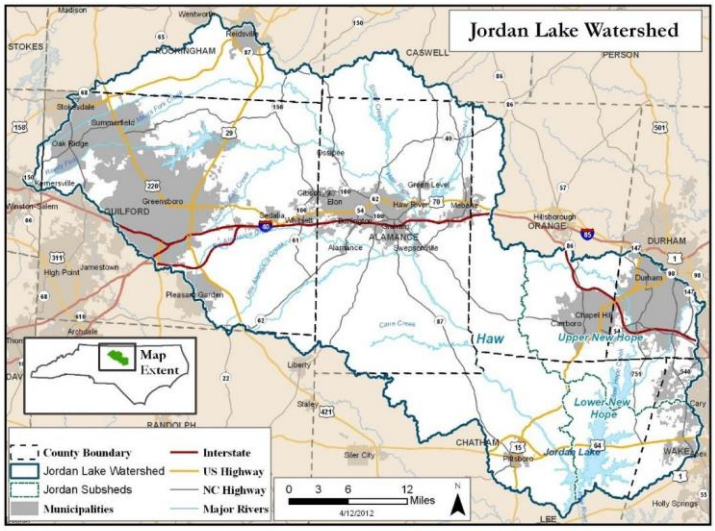


Figure 3 Jordan Lake Watershed



What Watershed Do I Live In?

[Planning on adding at least one new high quality local watershed map]

We are located near the headwaters of three larger watersheds:

1. The Haw River watershed to our south and west
2. The New Hope Creek watershed to our north and east
3. The Booker Creek watershed to our east in Chapel Hill joins Bolin Creek to form Little Creek

Every Carrboro stream and its tributaries has its own watershed. These streams include Morgan Creek and Bolin Creek, and tributaries such as Toms Creek, Jones Creek, Buckhorn Branch, Jolly Branch, Dry Gulch, and Tanbark Branch. (Figures 4-5). New Hope Creek, Little Creek, and Morgan Creek all come together at the upper end of Jordan Lake.

Bolin Creek has been listed as an impaired waterbody by the State and EPA since the early 2000s. Local, state and EPA government partners created the Bolin Creek Watershed Restoration Team to develop and execute a strategy for improving water quality and creek conditions.

Figure 4: Morgan Creek Watershed

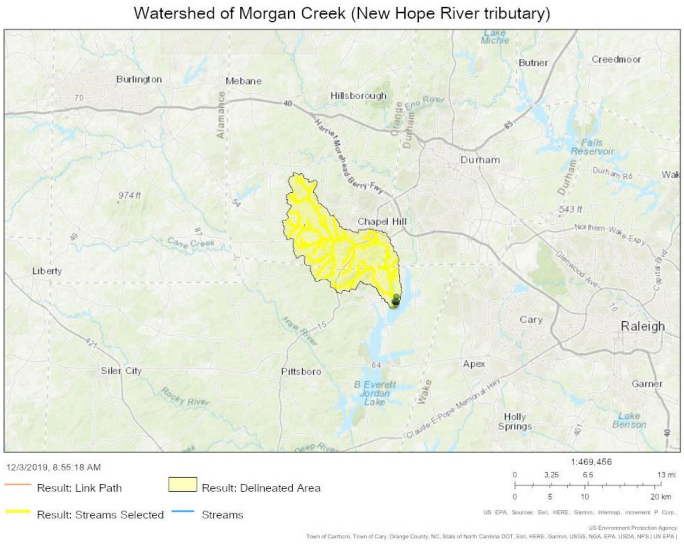
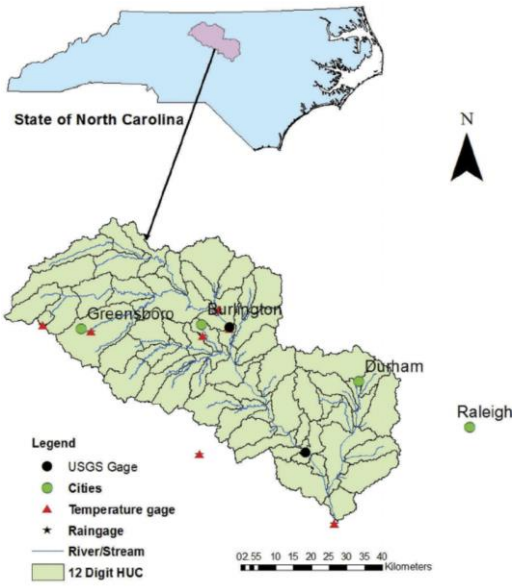


Figure 5: Carrboro's Local Watersheds

[Insert Map]

Figure 6: Our Watersheds within the Larger Cape Fear River Basin



Coordinate system : NAD 1983 UTM 17 N

http://ncwatershednetwork.org/nc-watershed-management-mapping-tools/your-watershed/

STREAMS AND CREEKS

What Is a Stream?

A stream or creek is a body of water with surface water flowing within the bed and banks of a channel. Flow is controlled by surface and subsurface inputs, which can vary widely seasonally and between periods of rainfall. There are three types of streams:

- **Perennial** streams, the largest type, have water flowing year-round
- **Intermittent** streams experience seasonal flows
- **Ephemeral** streams flow only during and immediately after rain events

Who Regulates Streams?

Ephemeral streams are the only type of creek solely regulated by the Town.

All intermittent and perennial streams are regulated under federal law and administered by both the **Army Corps of Engineers** and the State **Department of Environmental Quality**. The water quality is protected by the Clean Water Act as administered by the **EPA** and the State. Stream floodplains are regulated by **FEMA** with support from the State and Town.

The riparian area adjacent to streams is also regulated by the State and implemented through the Town to protect Jordan Lake. The EPA and the State regulate the water quality of Jordan Lake and its entire watershed, including the amount of nitrogen and phosphorus entering each of the creeks that feeds the lake. The Jordan Lake Rules were in development for a number of years before being adopted in 2007, and have since been undergoing further review.

Why Are Streams Regulated?

This question could be answered from a legal perspective, which would get into about 70 years of legislation and regulations! But the simple answer is that streams are regulated because prior to regulation, waterways were severely polluted. This interfered with the water cycle, and contributed to flooding, sediment build-up, erosion and run-off. These impacts have an adverse effect on people, plants and animals – the entire ecosystem.

Commented [mL2]: let's not assume everyone knows what this is. please include an illustration.

How Do I Care for a Stream on My Property?

Though the stream water flow through your property and the larger creek or watershed is regulated by government entities, **the care of the creek bed and channel is your responsibility as the property owner.** Second, residents should know that the streams and related buffers are regulated by federal, state, and local governments, as discussed above and below.

Commented [EC3]: Reword rather than take out.

The most common care concern for property owners is woody debris, the trunks, limbs and branches in a waterway. Larger accumulations are referred to as large woody debris (LWD).

Under normal conditions, LWD is a natural and important part of aquatic ecosystems and is not a problem. It provides food and cover for fish and insects that become food for larger animals, and it creates pools that are desirable habitats. LWD also offers erosion control and adds physical structure to banks and channel bottoms. In many cases, LWD can and should be left alone.

However, when too much woody debris accumulates it can collect trash, alter how water flows, and present an obstacle for recreational enjoyment. When LWD disrupts flow patterns, increases erosion, poses a hazard or blocks structures such as culverts or bridges, property owners should:

- Determine if you need a permit to do the work. You don't need a permit to manage floating debris and logs that aren't embedded in the stream bottom or banks. Felling trees along a creek bank or removing embedded debris may require a permit from the NC Department of Environmental Quality and the Army Corps of Engineers. The Town's Stormwater Team can help you determine what approvals you need.
- Minimize disturbance of the surrounding habitat areas.
- Remove just enough debris to address the issue or concern and maintain the benefits provided.
- Utilize the debris to benefit the stream, including re-orienting the wood or anchoring it to the bank or within the channel.
- Move debris high enough and far enough away from the channel so it won't reenter with high flows.
- Be mindful of surrounding habitat and minimize disturbance of these areas while conducting needed maintenance.

STREAM BUFFERS

What Is a Stream Buffer?

A stream buffer is the undeveloped area parallel and adjacent to a stream that protects and enhances water quality. An effective stream buffer has abundant native woody vegetation that helps diffuse runoff from upstream so as much water as possible can soak into the soil. This lowers the likelihood of gullying, stream channel impacts, and downstream flooding. Buffers should experience minimal disturbance from transportation or utility corridors, structures, grading, or other human uses that compromise the ability of the buffer to serve its purpose.

How Do I Know if I Have a Stream Buffer on My Property?

The best way to identify a regulated stream buffer is to visit the Town's online GIS at http://www.ci.carrboro.nc.us/142/Geographic-Information-Systems. Click on the "Development Constraints" layer to see the buffers. Note that the data shown in the GIS do not represent surveyed data, and are therefore an approximation, and may need to be field verified. Stormwater and/or Planning staff are available to field questions. Contact information is available in Appendix 2 and at this link.

How do I Maintain a Stream Buffer on My Property?

Vegetative yard debris like bucked and or split logs, grass clippings, collected leaf piles, garden trimmings, etc., should not be stored within stream buffers. This material can clog culverts and impact water quality. Naturally occurring downed trees and vegetative debris should be left to complete the natural decomposition cycle. More technical advice on streams and buffers is available from the Stormwater Division of Public Works upon request. Contact the Stormwater Division at Stormwater@townofcarrboro.org for more information or to arrange a visit.

What Is Allowed and Prohibited Within a Stream Buffer?

The Town enforces Water Quality Buffers as part of the Land Use Ordinance, Article XVI, Section 15-269.5, which outlines allowed and regulated activities. *If a particular activity or use is not included, it is prohibited.*

The following is not intended to specifically interpret or substitute for these provisions, but provides generalizations about managing vegetation in the buffer. Vegetation management within the Water Quality Buffer is allowable in these situations:

- Conducting emergency fire control measures provided that the buffer is restored
- Mowing and harvesting of plant products in Zone 2 only
- Planting vegetation to enhance the riparian buffer
- Pruning forest vegetation without compromising the health and function of the forest vegetation
- Removing individual trees which are dead, diseased, or damaged; are in danger of causing damage to dwellings, other structures or human life; or are imminently endangering the stability of the streambank
- Taking out poison ivy and other invasive exotic vegetation as defined in Smith, Cherri L., 1998 Exotic Plant Guidelines. DENR, Division of Parks and Recreation. Raleigh, N.C. Guideline # 30, or a more recent version or alternative reference approved by the NC EMC.

Learn more about the role of stream buffers and how to restore or enhance them from the Town's Land Use Ordinance 15-269.

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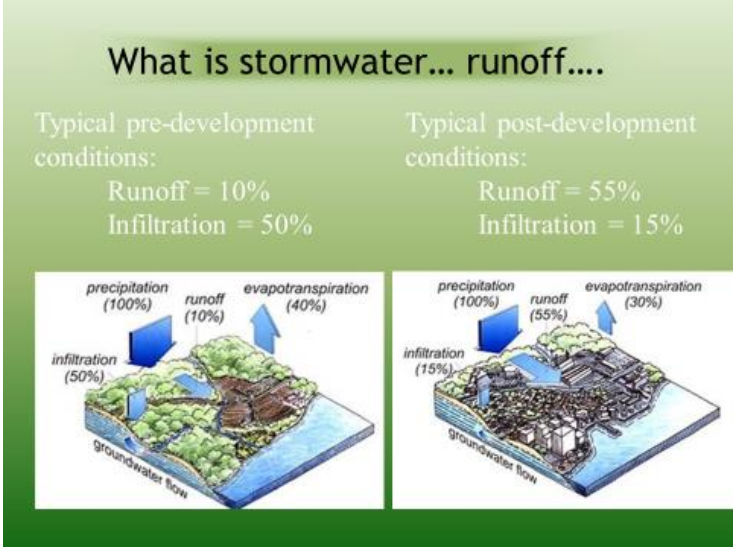
STORMWATER

What Is Stormwater?

For the purposes of our discussion here, stormwater is water running off the land in an urban environment. In a natural landscape without development, a very high percentage of precipitation is absorbed into the ground, taken up by plants, or returned to the atmosphere through evaporation. This gives needed water to flora and animals, and replenishes surface and groundwater reserves. In a developed urban landscape, more precipitation falls onto impervious surfaces that don't absorb water--such as roads, sidewalks, rooftops, parking lots, or construction sites. As a result, the falling water is swept across these surfaces as runoff.

Figure 7 depicts the changes for a highly developed landscape such as an urban core or downtown. The change isn't as great in less densely developed residential areas, but the general pattern is similar.

Figure 7 The Impact of Urbanization on Stormwater Runoff *(replace?)*



How Can Stormwater Runoff Be a Problem?

In a natural system, plants act as filters that clean pollution as the water percolates into the ground. Without these natural filters, water flows across the ground, picking up pollutants and carrying them into local creeks, lakes and rivers, before eventually making its way into the ocean. This is called stormwater runoff.

Most runoff from older development is conveyed directly to nearby streams, rivers, or other water bodies without treatment. Runoff from newer developments requires treatment via Stormwater Control Measures (SCMs) before entering streams. The more common types of pollutants that affect streams in Carrboro are:

- Pet Waste
- Automotive Fluids
- Yard Waste
- Fertilizer, Herbicides and Pesticides
- Trash and Litter

These pollutants can affect the water where we swim and play and get our drinking water. They also impact other species that live in and rely on creeks and other bodies of water. Runoff can also cause:

Commented [mL5]: Link to related detailed sections elsewhere in document

Commented [mL6]: Link to sections that address these topics in more detail

- Erosion and sedimentation by sweeping away and displacing soil
- Localized flooding when storm drains take on too much water
- Degradation of stream channels and reduced replenishment of groundwater

By working together, we can positively impact our water and keep it clean for everyone and all species to enjoy.

What Are the Components of the Stormwater Infrastructure in Carrboro? Who is Responsible for Taking Care of it?

Carrboro's stormwater infrastructure supports two main functions:

Stormwater conveyance refers to the network of above- and below-ground infrastructure that collects and moves runoff from its upstream origins until it reaches a stream. This includes ditches, swales, inlets (in yards, parking lots, along curbs), catch basins, junction boxes, and pipes, including culverts. [ADD INFOGRAPHIC?]

Stormwater treatment refers to the management of runoff to decrease both stormwater quantity and quality impacts using stormwater control measures **(SCMs)**. Some SCMs are specifically designed for flood mitigation, for infiltration or filtration, or reuse of rainfall. Others are multifunctional and can be integrated into a landscape for non-stormwater related benefits.

Carrboro relies on guidance from the State for the approved types and design of SCMs, including:

- Rain Gardens (aka, "bioretention")
- Stormwater Wetlands
- Wet and Dry Ponds
- Permeable Pavement
- Rainwater Harvesting with Cisterns
- Level Spreaders
- Underground Systems
- Green Roofs

SCMs are most often built in conjunction with new development, but in some circumstances have been "retrofitted" into older developments. Once constructed, stormwater infrastructure requires on-going maintenance to ensure it continues to perform as intended. Maintenance of storage or flood mitigation SCMs typically includes removing accumulated sediment and debris, routine mowing, and minor repairs to mechanical appurtenances. Management of SCMs that provide additional water quality benefits can be more complex, and requires more intensive vegetation management, inspection and maintenance of flow control features, and restoration or replacement of filter media.

Town staff are involved in the management of stormwater conveyance and treatment infrastructure.

Public Stormwater Infrastructure

In Carrboro, almost all public stormwater facilities are the responsibility of the Town's Public Works Department and/or the NCDOT for state-owned and -maintained roads. The system is regularly inspected by both organizations. In Public Works, staff from the Landscaping and Grounds, Solid Waste, Streets, Engineering, and Stormwater Divisions are involved.

The majority of our public infrastructure is for conveyance. Recently, the Town has been pursuing treatment projects. The Town's design manual guides new projects, including the handling of large storm events; older development predates the design manual.

Private Stormwater Infrastructure

Private landowners are responsible for maintaining vegetation and driveway pipes, and clearing debris to ensure ditches and swales do not become obstructed. The two principal types of private stormwater infrastructure in Carrboro are residential and commercial.

The design and construction of these facilities is the responsibility of the developer; Town staff review and approve plans and construction. Long-term operation and maintenance is the responsibility of the property owner, including homeowner's associations.

Commercial developments (including businesses, shopping centers, apartments, and condominiums) are subject to similar stormwater management regulations. Stormwater facilities remain the property and responsibility of the commercial landowner or manager.

Public Works staff is initiating an inspection program for commercial, and residential Stormwater Control Measures that have been permitted by the Town.

What Is the Town of Carrboro's Responsibilities?

The Town holds a National Pollution Discharge Elimination System / Municipal Separate Storm Sewer System permit that requires comprehensive stormwater management to reduce pollutants in runoff to the maximum extent possible. The permit is required by EPA under the Clean Water Act, and is administered in North Carolina by the state Department of Environmental Quality. Under the permit, the Town must implement the following minimum measures: [hyperlink the list items]

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Controls
- Post-Construction Site Runoff Controls

- Pollution Prevention and Good Housekeeping for Municipal Operations

Public Education and Outreach

An informed and engaged community is crucial to the success of our overall Stormwater Program. The Town's public education activities include:

- Creating and updating the Town's stormwater webpages.
- Creating and distributing informational brochures and documents.
- Staffing booths and tables at public events.
- Leading educational programs at Carrboro schools and other events.
- Publishing a staff-curated newsletter and social media posts.

You can request a Stormwater staff presentation at your event or meeting! See Appendix 2 for contact information.

Public Involvement and Participation

The public contributes valuable input and assistance to our stormwater management program. We encourage residents to get involved by:

- Attending public meetings of the resident-led Stormwater Advisory Commission (SWAC) on the second Thursday of each month (See Appendix 2 for more information about the SWAC).
- Participating in grassroots, community- and Town-organized clean-ups and networking.
- Labeling storm drains.
- Adopting creeks and/or watershed.

If you wish to get involved, please contact us as shown in Appendix 2.

Illicit Discharge Detection and Elimination

The EPA defines an illicit discharge as, "any discharge into a storm drain system that is not composed entirely of stormwater." This means anything other than the water that falls from the sky. The most prevalent pollutants included in illicit discharges are: hazardous household products, yard care products, fertilizers, pet waste, car soaps and automotive fluids.

To identify, confirm and manage illicit discharges, the Town:

- Maintains a map inventory of the Town's stormwater conveyance system.
- Enforces an ordinance prohibiting non-stormwater discharges into the stormwater conveyance and streams (Town Code Sections 5-32 and 5-33).
- Conducts stream walks and outfall inspections to look for discharges.

- Delivers educational outreach for staff and the public on illegal discharges and improper disposal of waste.
- Staffs a hotline for reporting Stormwater violations and issues.

Please be cautious about what washes off of your property and notify your local stormwater hotline if you suspect any illicit discharge in your area. They are illegal and can directly affect you.

For more information, please contact us; see Appendix 2 for contact information.

Construction Site Runoff Controls

The Town's construction site runoff controls are handled by the Orange County Erosion Control Division. If you have any questions regarding the program, contact that office at 919-245-2586 or visit their website at this link.

Commented [EC7]: We should probably still explain what these are.

Post-Construction Site Runoff Controls

Runoff from areas under development can significantly affect nearby bodies of water. Many studies indicate that prior planning and design for the peak flow, volume mitigation and minimization of pollutants in post-construction stormwater discharges is the most cost-effective approach to stormwater quality management.

There are two substantial impacts of post-construction runoff:

Increased type and quantity of pollutants in stormwater runoff. As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to lakes, ponds, and streams. From there, they enter the food chain through small aquatic life, eventually entering the tissues of fish and humans.

Increased volume of water. Impervious surfaces, such as parking lots, driveways, and rooftops, interrupt the natural cycle of water's gradual percolation through vegetation and soil. Instead, water collects on surfaces such as rooftops, asphalt and concrete and is routed to drainage systems. Large volumes of runoff quickly flow to the nearest receiving water and cause streambank scouring, downstream flooding, loss of aquatic life and property damage.

The Town Land Use Ordinance, Section 15-263.1 (available at this link) requires the implementation of post-construction run off controls and the Stormwater Division performs inspections to ensure that property owners are providing appropriate long-term maintenance of these controls.

Pollution Prevention and Good Housekeeping for Municipal Operations

To ensure our municipal operations minimize contamination of stormwater runoff, the Town has implemented -- and is inspecting and maintaining -- control measures to reduce or eliminate discharge of pollutants from roads, parking lots, and maintenance yards. Our controls and sites are reviewed regularly to determine if additional measures need to be taken. We also train staff to perform their duties with pollution prevention and good housekeeping in mind.

What Is the Stormwater Utility Fee?

The Town's stormwater fee generates dedicated revenue to the Utility and Stormwater Program. It applies to non-exempt properties (almost all properties with at least 500 square feet of impervious surface) and is based on the amount of impervious surface, a common practice in North Carolina and beyond. More information on the fees and rate structure is available at this link.

What does this fee pay for?

The Stormwater utility fee supports:

Utility Administration – developing and implementing program service delivery, stormwater-related data management, regulatory tracking and annual reporting, issuing notice of violations, contract and grant administration, staffing the Stormwater Advisory Commission, and program integration with Town administrative activities (e.g., operating budget and CIP).

Infrastructure Services – maintenance and improvements of the Town-owned stormwater system (including inlets, catch basins, pipes, ditches, and SCMs); street sweeping; and design and construction of public stormwater infrastructure (including "green" infrastructure) projects, stormwater retrofits, and restoration projects on Town-maintained land.

Strategic Planning – review of new development proposals and construction, updating of the Land Use Ordinance, and other support for Planning activities.

Stormwater Community Services – education, outreach and technical advice; creating public participation opportunities; coordinating with the Clean Water Education Partnership (CWEP); assisting with federal flood mitigation grant applications; and supporting the development and implementation of a residential assistance program.

Field Services – inspections of SCMs issued under a Town land use permit or owned by the Town, illicit discharge detection and elimination activities, stream determinations, and stream monitoring.

What Can I Do to Limit My Impact on Stormwater Runoff?

Landscaping Practices

Pesticides and Herbicides

[Content under development]

Leaf litter and Landscaping Debris

Because the Town of Carrboro's streams and creeks feed into the Jordan Lake Watershed and the University Lake Watershed, we are regulated to limit the nutrients allowed into the water supply.

Urban leaf litter can concentrate into the streams and creeks significantly raising the nutrient load (by up to 80 %[*]). This decreases water quality and can be detrimental the aquatic life. Leaves also can clog or block drains and pipes, leading to flooding, excessive standing water, damage to system components, safety issues, and threats to properties.

Commented [mL8]: Couldn't find this footnote

The Town provides roadside leaf collection to limit the nutrients that reach creeks and Jordan Lake. The leaves are composted at our Public Waste Facility and the resulting composted material is available free to the public. For more information on our compost program you can visit: https://townofcarrboro.org/2230/Yard-Waste-Loose-Leaf-Collection. Property owners can compost at home and adopt green landscaping techniques to further reduce leaf litter.

[Landscaping Debris Collection content under development]

Residents interested in alternative lawn, vegetation, and landscaping options on private property for environmental and stormwater benefits should reach out to the Town's Environmental Planner or Stormwater staff for more information-see Appendix 2 for contact details.

Pet Waste

Pet waste is a serious problem for the health of our waterways because it can contain pathogens such as bacteria, viruses, and parasitic worms that transmit disease to humans. In Carrboro stormwater does not pass through a sanitary sewer treatment facility. Anything on or in the ground may eventually end up in nearby streams, rivers and lakes. When high levels of bacteria are found in a body of water, fishing and shellfish harvesting must be restricted. Fecal matter also contains nutrients that cause weeds and algae to grow more rapidly than normal, changing the balance of the ecosystem.

You limit pet waste's impact on stormwater and our streams when you:

- **Pick up after your pet.** Whether at home or out and about, pet waste needs to be scooped. Long handled "pooper scoopers" make it easy to pick up after your dog without bending over. Bring plastic bags with you when you walk your dog. A map of public pet waste stations is available at [map under development]. Wherever you scoop, double-bag the waste, tie the bags securely and toss in the trash.
- **Double-bag kitty litter.** Cat waste is an issue, too, so double-bag the litter, tie the bags closed and place in the garbage.
- **Avoid flushing pet waste down the toilet.** Septic systems and wastewater treatment plants are not designed to treat dog or cat waste.
- **Compost pet waste with great care.** The disease-causing organisms in pet waste are *not* killed by backyard composting.

- **Watch What You Feed Your Pet.** The type of food affects the quantity of pet waste you must deal with. Consult your vet if you have any questions.

For more information on pet waste and its effect on stormwater please see visit https://www.townofcarrboro.org/2312/Pet-Waste or contact us as shown in Appendix 2.

Pools and Spas

Wastewater from the draining and maintenance of swimming pools and spas is against the law because it can be a significant source of pollution harmful to the environment and hazardous to public health. Common pollutants associated with pool and spa draining include chlorine, bromine, copper, salt, hydrogen peroxide, and acids.

Pool and Spa Maintenance

Plastering, grouting, guniting, acid washing and other activities generate wastewater that cannot be discharged into the storm drain system. Do not wash out equipment and tools used for maintenance work in an area that discharges to the storm drain system. You may also collect and store the wastewater and contact an environmental waste company regarding treatment and disposal. Contact OWASA regarding their rules for disposal into the sanitary sewer system.

Filtering Backwash

Discharge filter backwash onto a landscaped area, not into the storm drain system, and put filter material and collected debris in the trash. Rinse filters over your lawn or landscaped area. This allows for clean, dechlorinated water to re-enter our local water systems without damaging our drinking water supply or impacting the ecosystem surrounding Carrboro.

Pool and Spa Draining
Clean, dechlorinated water may be drained to your yard or landscaped area if and only if:

- It does not cause flooding or other nuisance conditions on adjacent properties (notify your neighbors first)
- You drain at a rate slow enough to prevent erosion to an area that allows the water to percolate into the ground and not discharge into the storm drain system, ditch or creek.

This may be difficult to do because most properties are designed to drain off site. If discharge into a storm drain or water conveyance is needed, contact the Carrboro Stormwater Division for guidance in advance of work.

Vehicle Maintenance

[Content under development]

Reduce Waste

[Content under development]

Reduce Runoff

[Content under development]

Home Maintenance

[Content under development]

Volunteering and Clean Ups

[Content under development]

FLOODING AND FLOODPLAIN MANAGEMENT

The land next to creeks is called the floodplain. Carrboro has been involved in floodplain-related efforts since 1976, when the Town joined the National Flood Insurance Program. Your best first point of contact for floodplain management questions and concerns is the Planning Department.

Historically, residents along Toms Creek have been the most impacted by flooding and Town staff has helped several property owners apply for federal flood mitigation grants. The Town has also held public meetings, completed neighborhood walkabouts, and most recently, contracted with the Center for Neighborhood Technology to complete a study, with the Toms Creek

watershed as a focus area, to guide a future residential assistance program. (The final report is available at http://www.townofcarrboro.org/DocumentCenter/View/7487/RainReady-Final-Report).

Since its inception in 2017, Carrboro's Stormwater Program has supported our community's resilience to the increasing frequency and intensity of storms. The Utility is making progress despite constraints related to private property rights, grandfather clauses, previous binding decisions, other legal and jurisdictional issues, and limited capital reserves and capacity.

Appendix 1 provides additional flood related information and resources.

EASEMENTS

An easement allows property owners to grant use of some amount of their land to others while retaining ownership and full access to the area. There is generally a prohibition on building in or blocking the easement. Easements are recorded with the Register of Deeds. There are 3 types of easements in Carrboro:

Public Easements for stormwater include drainage easements that allow the Town to maintain stormwater infrastructure on private property. They are granted and recorded to the Town of Carrboro.

Utility Easements are designated for overhead electric, telephone and television lines; and underground electric, water, sewer, telephone, and cable lines. The property owner may maintain the easement area but may limit use dependent on the easement holder's requirements. For more information on utility easements please see the following websites:

Duke Energy Easements:
https://www.duke-energy.com/community/trees-and-rights-of-way/what-is-a-right-of-way

Dominion Energy Easements:
https://www.dominionenergy.com/company/safety/public-safety/right-of-way-use

Piedmont Electric Easements:
https://pemc.coop/about-my-co-op/right-of-way/

OWASA
[Insert website info, site currently under construction]

Private Easements are restricted to and benefit a limited number of persons or a specific person. Examples are the right to use a driveway to access land, an HOA-owned drainage easement, or an access point to perform repairs or maintenance to a private stormwater infrastructure.

You can find out if there is an easement on your property by doing a plat/deed search with the Orange County Register of Deeds in person at the Orange County Courthouse (228 Churton St.

in Hillsborough) or online at https://rod.orangecountync.gov/orangenc/. Once you have determined the holder of the easement please contact them for direction on what is allowable.

The Town of Carrboro <u>does not</u> have municipal authority or jurisdiction to undertake any work on private property, unless an easement has been offered to and accepted by the Town. This includes, but is not limited to private drainage easements and private drainage structures.

APPENDIX 1: FLOODING RELATED FAQS AND RESOURCES

What can I do to be prepared for flood events?

Use the My RainReady online tool to assess your property and get recommendations/options tailored to your conditions.

Investigate if you qualify for FEMA programs, i.e.: The National Flood Insurance Program, Hazard Mitigation Assistance, etc. (https://www.fema.gov/)

Review FEMA's:

"Homeowner's Guide to Retrofitting" (https://www.fema.gov/media-library-data/1404148604102-f210b5e43aba0fb393443fe7ae9cd953/FEMA_P-312.pdf)

"Reducing Damage from Localized Flooding" (https://www.fema.gov/media-library-data/20130726-1446-20490-0539/FEMA511-complete.pdf)

"How to Prepare for a Flood" (https://www.fema.gov/media-library-data/1409002852888-3c5d1f64f12df02aa801901cc7c311ca/how_to_prepare_flood_033014_508.pdf)

Review EPA's "Soak Up the Rain" campaign for information and how-to guides for residents (https://www.epa.gov/soakuptherain)

Know your flood risks (https://flood.nc.gov/ncflood/)

Plan ahead for disasters, see https://www.ready.gov/ for guidance on preparing your family and home.

Sign up to receive alerts from Carrboro (https://townofcarrboro.org/list.aspx) and Orange County (https://member.everbridge.net/index/453003085611768#/signup)

View stream gauges and sign up to receive alerts on the Flood Inundation Mapping and Alert Network (https://fiman.nc.gov/)

Review the Flood Risk Information System (https://fris.nc.gov/fris/)

USGS Water Alert sign up (https://maps.waterdata.usgs.gov/mapper/wateralert/)

View Town floodplain map (http://gis.ci.carrboro.nc.us/Carrboro/Floodplain/)

View Town flooding event map (http://gis.ci.carrboro.nc.us/Carrboro/FloodEvents/

What can I do to decrease flooding and drainage problems?

There are several things you can do to help prevent or minimize drainage problems:

Clear the gutters on your house. Blockages can cause runoff to pond in your yard, or cause damage to your home. Similarly, keep the roadside ditch/swale and any inlets free from obstructions.

Consider property and landscaping alterations that decrease runoff and increase infiltration, such as: rain gardens, rainwater harvesting, permeable hardscaping, soil amendments, restoration of stream buffers, impervious disconnection, etc.

Rake or remove leaves, branches, roadside litter, weeds or any material that can block drains, swales, and culverts. Vegetative debris is a primary cause of storm drain problems.

Keep the floodplain on your property clear of grass clippings, leaf piles, other vegetative debris, tires, toys, yard items, branches, signs, etc. that can be carried by water flows and block culverts.

Check the path of water flow in the floodplain during a storm and, once it's safe to do so, remove any debris from that area. This helps prevent materials from causing blockages.

Call Public Works at 919-918-7425 about assistance for issues in the public right of way or defects in or around the public drainage system such as broken concrete, holes in the ground over pipes or around structures, and severe erosion. Keep the area easily accessible in case repairs or maintenance is required.

Do not place sheds or other structures or fill in drainage easements, stream buffers, or floodplains without first getting permission from the Town.

Identify drainage impacts to nearby properties before starting improvements on your property. Installing or extending downspouts and constructing raised driveways, fences and landscape beds can block the natural flow of runoff, create standing water and have other impacts on your neighbor's property.

What kind of public oversight does the Stormwater Utility have?

In addition to oversight from the Town Council and the Town Manager and Public Works Director, Carrboro has established a Stormwater Advisory Commission (SWAC) that provides this function.

How can I stay informed about stormwater?

- View stormwater updates, information, links, and data on the Town's Stormwater webpages (https://townofcarrboro.org/287/Stormwater)
- Follow Stormwater Advisory Commission meetings, currently scheduled for the second Thursday of each month.
- The Stormwater Utility presents a monthly report to the Town Council. Check the Council agendas for these reports. https://www.townofcarrboro.org/248/Town-Council

- Sign up for the Town's Newsletter and Newsflashes at https://townofcarrboro.org/list.aspx.
- Follow the Town of Carrboro and Carrboro Stormwater on Social Media:
    - Instagram: @townofcarrborostormwater, @townofcarrbro
    - Facebook: @CarrboroTownGov
    - Twitter: @CarrboroTownGov

How can I provide input?

- Report Flooding Events (https://tocgis.ci.carrboro.nc.us/Carrboro/FloodReport/)
- Request Stormwater Services or Report Illicit Discharges (https://townofcarrboro.org/FormCenter/Public-Works-Department-23/Stormwater-Service-Request-134) or 919-913-2999 or stormwater@townofcarrboro.org
- Apply to become a member of the Stormwater Advisory Commission
- Contact Town's Stormwater Staff at stormwater@townofcarrboro.org or 919-918-7435

Links to additional information

Rate Structure Study: http://www.townofcarrboro.org/1138/Draft-Stormwater-Utility-Rate-Structure

Carrboro Stormwater homepage: http://www.townofcarrboro.org/287/Stormwater

Carrboro Stormwater Utility page: http://www.townofcarrboro.org/1136/Stormwater-Utility

Stormwater Advisory Commission page: http://www.townofcarrboro.org/1119/Stormwater-Advisory-Commission

Report flooding problems: http://gis.ci.carrboro.nc.us/Carrboro/FloodReport/

NC Floodplain mapping: http://fris.nc.gov/fris/Home.aspx?ST=NC

Carrboro Online GIS: http://www.townofcarrboro.org/142/Geographic-Information-Systems

APPENDIX 2: TOWN STAFF CONTACTS

To report a stormwater issue please call **919-913-2999**, email stormwater@townofcarrbor.org, and/or use the online form at https://townofcarrboro.org/FormCenter/Public-Works-Department-23/Stormwater-Service-Request-134 or scan the QR Code above.

Stormwater Staff

https://www.townofcarrboro.org/287/Stormwater

Division email address: stormwater@townofcarrboro.org

Stormwater Utility Manager	Randy Dodd	rdodd@townofcarrboro.org	919-918-7341
Stormwater Specialist	Heather Holley	hholley@townofcarrboro.org	919-918-7426
Stormwater Administrator	Emily Cochran	ecochran@townofcarrboro.org	919-918-7435

Other Public Works Staff

https://www.townofcarrboro.org/123/Public-Works

Public Works Director	Joe Guckavan	jguckavan@townofcarrboro.org	919-918-7425
Asst. to the Public Works Director	Kristen Benoit	kbenoit@townofcarrboro.org	919-918-7428
Public Works Superintendent	Daniel Snipes	dsnipes@townofcarrboro.org	919-918-7432
Public Works Administrative Assistant	Lakisha White-Kelly	lwhite-kelly@townofcarrboro.org	919-918-7425
Capital Projects Manager	Ben Schmadeke	bschmadeke@townofcarrboro.org	919-918-7424
Engineer	Khadijah Hassan	khassan@townofcarrboro.org	919-918-7436
Solid Waste Supervisor	Chris Clark	cclark@townofcarrboro.org	919-918-7433

Landscaping/Grounds Supervisor	Bobby Horton	bhorton@townofcarrboro.org	919-918-7431
Streets Supervisor	Dillon Dispennette	ddispennette@townofcarrboro.org	919-918-7434

Planning and Zoning Staff

https://www.townofcarrboro.org/133/Planning-Zoning-Inspections

Planning Director	Trish McGuire	pmcguire@townofcarrboro.org	919-918-7327
Permit Technician	Dorian McLean	dmclean@townofcarrboro.org	919-918-7336
Code Enforcement Supervisor	Rick Wade	rwade@townofcarrboro.org	919-918-7339
Planning Administrator	Tina Moon	cmoon@townofcarrboro.org	919-918-7325
Development Review Administrator	Marty Roupe	mroupe@townofcarrboro.org	919-918-7333
Zoning Specialist	James Thomas	jthomas@townofcarrboro.org	919-918-7335
Zoning Specialist	Vacant		

Other Town Staff

Communications Manager	Catherine Lazorko	clazorko@townofcarrboro.org	919-918-7314
Facilities Administrator	Wendell Rodgers	wrodgers@townofcarrboro.org	919-918-7371
Recreation Administrator	Charles Harrington	charrington@townofcarrboro.org	919-918-7377

APPENDIX 3: STORMWATER ADVISORY COMMISSION

The Town Code (Section 3-24.15) presents the purpose of the Carrboro Stormwater Advisory Commission to: investigate and advise the Town Council on policies, ordinances, best management practices, ordinance provisions, and administrative procedures regarding stormwater management; review the Town's Stormwater Management Program and Plan, stormwater compliance activities, and other stormwater related plans and reports, and make recommendations to prioritize or adjust activities; investigate and provide recommendations regarding stormwater runoff for new development and re-development projects; and fulfill the Town's requirements under its NPDES Phase II stormwater permit for citizens' input of stormwater management activities.

The Commission is formed of seven citizen volunteers appointed by the Town Council. The Commission meets monthly. All meetings are open public meetings. Agendas are advertised and minutes are kept to document the Commission's deliberations. Seats on the Commission are advertised and filled annually.

APPENDIX 4: REFERENCE

The full Town's Ordinances can be found online at https://nc-carrboro.civicplus.com/139/Carrboro-Town-Code.

Ordinances Sited in this Manual

Section 5-32. Illicit Discharges Prohibited.

(a) No person may discharge or cause to be discharged, or allow to be discharged from property under such person's control, any pollutant directly or indirectly into the storm sewer system or into surface waters. (1) A direct discharge occurs when a pollutant is discharged within the physical limits of the storm sewer system or within the banks of a stream or inside the mean high-water level of a pond or lake. (2) An indirect discharge occurs when a pollutant is discharged outside the physical limits of the storm sewer system or outside the banks of a stream or beyond the mean high water level of a pond or lake but takes place in such a manner or location that the pollutant is carried into the storm sewer system or surface water in some way other than by action of the wind or stormwater. By way of illustration without limitation, an indirect discharge would occur if water from a commercial car wash is discharged onto the area where the cars are washed and allowed to drain into a public street. (3) An indirect discharge also occurs when a pollutant is discharged (i) outside the physical limits of the storm sewer system or outside the banks of a stream or beyond the mean high water level of a pond or lake, but (ii) with the specific intent that the pollutant be disposed of by being carried (by the wind or stormwater or otherwise) into the storm sewer system or a surface water, and (iii) the pollutant or some part or portion thereof does reach the storm sewer system or surface water. By way of illustration without limitation, dumping used oil near the edge of a stream with the intent that the next rain carry the oil into the stream constitutes an indirect discharge within the meaning of this subsection. (b) Notwithstanding the other provisions of this article, the following shall not be regarded as constituting an illicit discharge: (1) Water line or hydrant flushing; (2) Landscape or garden irrigation or lawn watering; (3) Diverted stream flows; (4) Rising ground waters; (5) Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)); (6) Uncontaminated pumped ground water; (7) Discharges from potable water sources; (8) Foundation drains; (9) Air conditioning condensation; (10) Springs; (11) Water from crawl space pumps; 5-26 (12) Footing drains; (13) Individual residential car washing or charity car washing; (14) Flows from riparian habitats and wetlands; (15) Dechlorinated swimming pool discharges; (16) Street wash water; (17) Flows from fighting fires (18) Other non-stormwater discharges for which a valid NPDES discharge permit has been approved and issued by the State of North Carolina.

Section 5-33. Illicit Connections Prohibited

(a) No person may cause, suffer, or permit on property under such person's control any illicit connection to the storm sewer system, including without limitation connections of drains or lines that convey sewage, process wastewater, wastewater from washing machines, wash water from commercial vehicle washing or steam cleaning, or water from indoor sinks or floor drains. (b) Subject to subsection (c), if, on the effective date of this article, an illicit connection as defined in

this article exists, then such situation shall not be considered a violation of this article until ninety (90) days after the town mails by first class mail written notice to the owner (according to the most recent property records) of the property where the condition exists, informing such owner of the nature of the violation and what must be done to correct it. (c) The ninety day grace period provided for in subsection (b) of this section shall not apply if the administrator concludes that an illicit connection: (1) Is likely to result in the discharge of hazardous materials or otherwise pose an immediate threat to health or safety, or is likely to result in immediate injury to real or personal property, natural resources, wildlife, or habitat; or (2) Was made in violation of any applicable statute, regulation, or ordinance.

RESOURCES FOR MORE INFORMATION

[Content under development, will include links to websites for more information]