NC Source Water Collaborative - Source Water Protection Award Program, 2022

Nomination: Haywood Waterways Association, Haywood County Septic System Repair Program

Project Description

Failing septic systems cause significant water quality issues. In the most serious failures, raw blackwater and graywater flow on the ground surface or subsurface directly to a nearby waterway. In less severe situations, that wastewater can accumulate on the ground surface and then be flushed to the nearest waterbody the next rainfall. Once in a waterbody, the impacts can extend far downstream, and those can compound if other water quality issues are present. Another possible contamination pathway is the underground movement of wastewater that could infiltrate rural wells, though this issue is not well-understood.

Haywood Waterways and the Haywood County Environmental Health Department (EHD) have collaborated on repairing failing septic systems since 2006. Our two criteria for prioritizing projects are severity of issue and proximity to a waterway. If a tiebreaker is needed, we prioritize low and very low-income households to help those families stay in their homes.

Ongoing grants from the Pigeon River Fund and NC 319 Program (21 total grants, $655,000) have enabled the repair of 135 systems. According to EHD, each repair eliminates as much as 360 gallons of untreated wastewater and associated bacteria, pathogens, nutrients, and chemicals from flushing into local waterways each day, that's over 48,000 gallons per day for the 135 repairs. The repairs provide long term benefits that can last more than 30 years for a properly maintained system.

The repairs protect the natural, recreational, economic and human health/well-being values of our community's waterways, particularly for the towns of Canton, Clyde, and Maggie Valley. These towns have WS-III classified drinking water supplies, which could be impacted by failing systems. To date, over 30 of the repairs have occurred in those watersheds.

For our program, grants pay 75% of the total repair cost; the average 75% cost is $4,800. These funds have been matched with $270,000 from the homeowners and $189,000 from EHD through technical support and repair coordination ($1,400/repair).

Our program includes several education activities to increase citizen's awareness of the issue as well as solutions. Activities include press releases, public presentations, special publications (Stewardship Begins in Our Backyards, A Landowner's Guide to Protecting Our Land and Streams and Pocket Guide to Septic Systems), and an All About Septics public workshop.

We also monitor waterways throughout the county to help identify problem areas and help guide the allocation of our financial and technical resources. We evaluate fecal coliform concentrations and then use microbial source tracking techniques to identify if the source is human, livestock, or other animal (Table 1).

This project expands the highly successful watershed restoration efforts begun in the Richland Creek Watershed. Multiple repairs made in the Hyatt Creek tributary helped lead to that stream being removed from the state list of impaired waterways. Ongoing repairs in other areas of Richland Creek are helping to decrease bacteria levels, which will ultimately lead to that stream being delisted for fecal coliforms.

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Nomination Supporting Materials

This project addresses strategies for nonpoint source and bacteria pollution abatement in Haywood Waterways' Watershed Action Plans for the Pigeon River, Richland Creek, Fines Creek, and Beaverdam Creek, as well as the NC Division of Water Resources' French Broad Basinwide Plan (2011).

French Broad Basinwide Plan (2011)

- General Basinwide Recommendation: A greater emphasis on the maintenance of wastewater collection systems is needed to reduce fecal coliform bacteria in streams statewide. Support for detecting and repairing damaged and aging collection systems should be made a higher priority.
- Richland Creek specific recommendation: Reduce fecal coliform bacteria in Richland Creek Watershed

Press Releases

Financial Help for Septic Repairs

Haywood Waterways Association has funding available to help homeowners fix failing septic systems. The funds will pay 75% to 100% of the total repair costs. Eligibility is determined by severity of failure, proximity to a waterway, and financial need. Haywood Waterways has partnered with the Haywood County Environmental Health Department to help homeowners determine if they qualify and then lead them through the process of finding contractors and making sure the repair has been done correctly.

The average repair costs $6,300. Through this program the average homeowner would be responsible for $2,100, thus saving over $4,000. To date, the program has helped 135 homeowners and prevented as much as 48,000 gallons of untreated human waste from getting into Haywood County streams each day. While funding is available for any homeowner in Haywood County, the partners are focusing on the Richland Creek watershed, including Raccoon and Ratcliff Cove creeks, because of very high bacteria counts.

Septic systems are efficient but must be maintained for proper treatment of wastewater from toilets, washing machines, dishwashers, and showers. If not, failures can occur and if the system is near a river, stream, or lake, untreated wastewater can make its way into the waterway causing risks to human health and the environment.

Homeowners can recognize if their septic system is failing by foul odors outside or in the house, slow drainage in sinks and toilets, soggy soil, liquid waste on the surface of the drain field, or excessive grass growth around the system. Failures can be caused by a variety of reasons; two of the most common are excessive water usage and improper maintenance. If a homeowner uses too much water, this can cause the system to overflow because wastewater can't properly seep into the drain field.

If you think you have a problem or want more information, contact Haywood Waterways Association at 828-476-4667 or info@haywoodwaterways.org, or the Haywood County Environmental Health Department at 828-452-6675. Funding for this program is available through the NC DEQ Section 319 Grant Program and Pigeon River Fund of the Community Foundation of Western North Carolina.

Animal Waste Degrades Streams

Fecal coliform bacteria are found in warm-blooded animals like humans, pets and livestock, and are necessary for digestion. They are generally not harmful but when found in waterways they indicate the possible presence of disease-causing bacteria and viruses that can also be found in animal waste. These can cause illnesses such as gastroenteritis, ear infections, typhoid, dysentery, hepatitis A, and cholera. Every year swimming areas across the nation are shut down due to high fecal coliform concentrations.
Bacteria gets into streams primarily from failing septic systems, broken sewer lines, runoff from livestock operations, and pet waste.

Simple actions to reduce contamination include:

1. Maintain septic systems: An average household should pump their system every 3 to 5 years. Don't dispose oil, grease, pesticides, chemicals, paints, feminine hygiene products, and excess food waste into the septic; only flush septic-safe toilet paper and human waste. Signs of a failing system include water ponding over the system, smell of wastewater, lines of darker and greener grass along the drain field, and slow flow or sewage backing up into the house.
2. Fence livestock out of waterways: When livestock are allowed access to streams, they directly deposit digestive waste into streams and cause significant stream bank erosion. Fencing along with an alternative water source on land greatly reduces these impacts.
3. Pick up after pet: Pet waste left on the lawn or sidewalk can wash into a nearby stream. Flush pet waste or dispose bagged pet waste in the garbage.
4. Maintain healthy streamside vegetation: Avoid mowing to the edge of waterways, instead plant shrubs and trees with deep and extensive root systems. Vegetative buffers filter animal waste, fertilizers, and sediment before they enter a waterway. They also stabilize eroding streambanks; provide shade to keep streams cool, and provide wildlife habitat.

For septic system assistance, contact the Haywood Environmental Health Department (828-452-6682). Financial assistance may also be available through Haywood Waterways Association's septic repair program (828-476-4667, info@haywoodwaterways.org).

For livestock and fencing assistance call the Haywood Soil and Water Conservation District at 828-452-2741. For a list of native plants suitable for streamside habitats call the Soil and Water District or Haywood County Cooperative Extension office at 828-456-3575.

Operation Medicine Drop

The effects of the national opioid epidemic are seen in all states including North Carolina. There is a large increase of 350% of deaths caused by drug overdose in our state since the year 1999. The incorrect disposal of prescription drug abuse is causing these substances to make their way into our streams and rivers.

Opioids and antibiotics along with other chemicals like detergent, synthetic hormones, sunscreen, insect repellent are what's known as pharmaceutical and personal care products; or PPCP's for short. When they leak into water systems by way of flushing and dumping they contaminate and damage the wildlife in the water. These chemicals are known to cause growth defects in wildlife such as frogs and fish. The effects of humans are being studied but may be linked to the cause of tumors, cancer and developmental growth defects.

The state of North Carolina Division of Water Resources is working on their research to further protect sources of drinking water, recreational use, as well as ground and surface water. Once PPCP's enter the ecosystem they take an extended period of time to break down and sometimes never completely breakdown.

North Carolina created Operation Medicine Drop to help people properly dispose of medications and prescription drugs. A series of official locations all over the state have designated boxes to drop off old and unused medications. Since the program began it has collected 15 to 20 million doses of medicine. They can be accessed 24/7 for anonymous drop off to help people easily and discreetly make sure they don't end up in our water. If the medicine can't be taken to a drop off location an alternative disposal method is to place the medication in a baggie with an inedible but biodegradable substance. For example, coffee grounds, cat litter or plain dirt and discarded in the household garbage.

Operation Medicine Drop locations in Haywood County
- Canton Police Department – 58 Park St.
- Clyde Police Department – 8437 Carolina Blvd.
- Waynesville Police Department – 9 S. Main St. (behind the station on Church Street)

All About Septics

Haywood Waterways Association and the Haywood County Environmental Health Department are hosting a workshop about septic systems. The event is Monday, April 29, 12:00 PM to 2:00 PM at the Haywood County Agricultural Service Center, 589 Raccoon Road, Waynesville.

Septic systems are efficient but must be maintained for proper treatment of wastewater from toilets, washing machines, dishwashers, and showers. If not, failures can occur and if the system is near a river, stream, or lake, untreated wastewater can make its way into the waterway causing risks to human health and the environment.

Staff will be on hand to discuss everything there is to know about septic systems - how they work, what are the common problems, what are the solutions, and what financial help is available for homeowners having problems. There will be a septic tank on site for participants to see how it does all the work. RSVP at 828-476-4667 or info@haywoodwaterways.org.

Haywood Waterways Association is a 501(c)(3) member-based nonprofit organization working to protect and improve surface water quality in Haywood County. They sponsor events throughout the year. More information can be found at www.haywoodwaterways.org or by contacting the organization at 828-476-4667 or info@haywoodwaterways.org.

Keep Pet Waste Out of Waterways (social media)

Owning a dog has shown to improve our health by providing companionship, encouraging exercise, and reducing high blood and stress. We take our dogs everywhere these days - cafés and restaurants, hiking trails, dog parks, or simply walking the streets. According to the American Pet Products Association there are 89.7 million dogs in the US. That's a lot of poop!

Unfortunately, dog waste can pollute rivers, streams, and lakes even if you don't live near a waterway. Stormwater runoff carries pet waste into drainage ditches and stormdrains where it is then dumped, untreated, into the nearest waterway. Dog waste contains bacteria, viruses, and parasites that can harm humans. When present in large quantities, pet waste can even make waterways unfit for human contact. Once in a waterway, pet waste can travel long distances and pollute a large area.

To help reduce pet waste pollution in our waterways:

- Bag It & Trash It! Use a plastic bag to remove the waste and dispose of it in the trash. That's a good use for leftover bread bags. They even make biodegradable bags.
- Flush It! Flush it down your toilet, but not the bag please.
- Bury It! Purchase an in-ground pet waste digester for the backyard. Ask your local pet supplier where you can purchase one.
- Don't Plant It! Do NOT put cat or dog waste in to your composting bin or pile. It can leach bacteria, viruses, pathogens, and diseases into the soil.
- Don't Dump It! Do NOT put pet waste, or anything, in stormdrains.

We can all enjoy the company of our dog and keep the environment healthy if we remember to pick up after our pet. Reducing water pollution isn't just a one person task it's a community effort.

Water Quality Data

NC 205(j) Program grant: Determining the Extent and Causes of Bacteria Contamination in the Pigeon River Watershed (2021)

Table 1. Fecal coliform bacteria and Microbial Source Tracking data (average and range).

Site	Fecal coliform Avg. Colonies/ 100 ml (range)	MST Human gene copies/ml (range)	MST cow/sheep/ deer/horse gene copies/ml (range)	MST Cow/sheep gene copies/ml (range)
Beaverdam Creek - Upper	1,515 (727 - 2,700)	ND-L (<4.7 – 32)	VL-L (5.6 – 92)	L-H (75 – 3,220)
Beaverdam Creek - Lower	383 (250 - 560)	VL-L (3.4 – 18.4)	VL (0.3 – 1.8)	L (20 – 50)
Connor Mill Branch	1,147 (440 - 2,400)	VL – L (2.9 – 82.5)	VL-L (1.8 – 11.9)	L-M (20 – 292)
Crabtree Creek - Upper	1,458 (791 - 2,500)	VL-L (2.3 – 12.8)	VL-L (2.1 – 46.9)	M-H (188 – 2,440)
Crabtree Creek - Lower	1,264 (682 - 2,300)	L (24.2 – 50.7)	L (19.3 – 71.7)	M-H (207 – 2,500)
Fines Creek - Upper	938 (164 - 2,200)	L-M (79.1 – 158)	VL-M (0.3 – 116)	L-H (41.9 – 1,260)
Fines Creek - Lower	388 (200 - 745)	VL-M (8.8 – 218)	VL (1.5 – 3.6)	L-M (15.6 – 149)
Hominy Creek	1,133 (400 - 2100)	L-M (59 – 144)	VL-L (7.3 – 56.3)	M (257 – 753)
Jonathan Creek - Upper	65 (32 - 121)	VL-M (2.9 – 196)	VL (0.3 – 1)	V-L (0.4 – 29.7)
Jonathan Creek - Mid	148 (84 - 260)	L-M (29 – 111)	VL (1.2 – 2.5)	L (13.9 – 34.8)
Jonathan Creek - Lower	797 (600 - 991)	VL-M (2.9 - 119)	VL-M (6 – 212)	L-M (26.8 – 849)
Pigeon River, East Fork - Upper	52 (25 - 86)	ND-L (<4.70 – 13.3)	VL (0.1 – 1.8)	VL- M (5.3 – 166)
Pigeon River, East Fork – Lower	237 (40 - 360)	ND-L (<4.70 – 9)	ND-VL (<6.1 – 0.6)	ND-M (5.7 – 231)
Pigeon River, West Fork	81 (62 - 92)	ND-L (<4.70 – 52.7)	ND-VL (<4.7 – 1.1)	ND-VL (<4.70 – 9)
Poison Cove Creek	444 (350 - 582)	L-M (12.4 – 211)	VL-L (3.7 – 67.4)	M-H (243 – 4,960)
Rush Fork Creek	1,831 (79 - 5300)	ND <4.7	VL-L (0.2 – 119)	VL – H (6.7 – 1,590)

H = High, E+03; M = Medium, E+02; L = Low, E+01; VL = Very low, E -01 to E+00; ND = Not detectible

Photos

Installing septic tank

Installing septic field drain lines

Publications

Stewardship Guide for Homeowners
http://haywoodwaterways.org/wp-content/uploads/2018/02/StewardshipGd.pdf

Is Your Septic System Failing You?

Signs of a failing septic system:

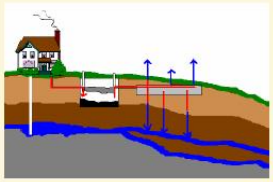
1. Pooling water or muddy soil around your septic system or basement.
2. Toilet or sinks backup when you flush or do laundry.
3. Bright green strips over drain field.
4. Odor.

If you think your system is failing, call a professional immediately! Failing septic systems can release harmful bacteria and viruses. If not fixed untreated sewage could find its way into well water or rivers, lakes, and streams.

HAYWOOD WATERWAYS ASSOCIATION INC

P. O. Box 389
Waynesville, NC 28786
www.haywoodwaterways.org

Don't Ignore Your Septic System



FACT:

One fourth of US homes have septic systems. Each day these septic systems process over 4 billion gallons of waste into the ground.

Tips for keeping your septic system in tip top shape:

1. **Pump**—Septic systems should be pumped every three years.
2. **Limit Water**— reduce the amount of water use in the home.
3. **Don't Dump**—keep the following items out of the sink: gasoline, oil, pesticides, antifreeze, paint, cooking oil, cooking grease, coffee grounds, or other toxic chemicals that could harm the biological process taking place in the septic tank.
4. **Don't Flush**—keep these items out of the toilet: feminine hygiene products, diapers, cotton swabs, cigarette butts, condoms, cat litter, paper towels or any other items which could clog the septic system.

Corrective Action

Use a local *septic tank pump hauler* to periodically pump the tank and clean the effluent filter. Check the Yellow Pages or contact the Environmental Health Department for a certified contractors list. For more serious repairs, free consultation is available from the Health Department.

Estimated Septic Tank Inspection and Pumping Frequency in Years

Tank Size (gals)	Number of People Using the System				
	1	2	4	6	8
900	11	5	2	1	<1
1,000	12	6	3	2	1
1,250	16	8	3	2	1
1,500	19	9	4	3	2

Source: Adapted from "Estimated Septic Tank Pumping Frequency," by Karen Mancl, 1984. *Journal of Environmental Engineering*. Volume 110.

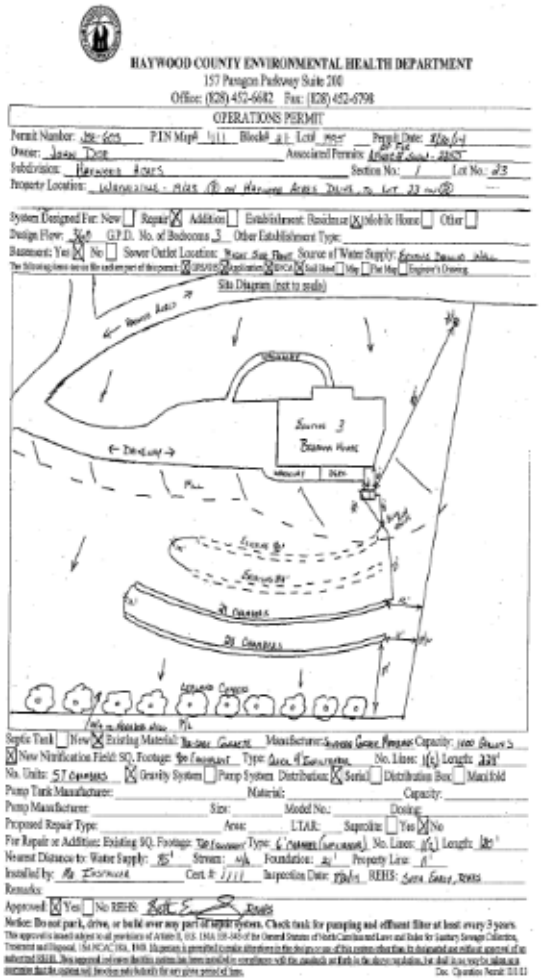
Contacts

Haywood County Environmental Health Department: assists with identifying the system, diagnosing issues, and providing any permits required at NO COST.
157 Paragon Parkway, Suite 200, Clyde, NC 28721; 828-452-6682

Haywood Waterways Association: encourages protection of the surface waters of Haywood County and provides financial support to repair failing septic systems.
PO Box 389, Waynesville, NC 28786; 828-476-4667; info@haywoodwaterways.org

Working to Protect and Improve Our Water Resources for Everyone

Example Permit: Identify and Protect Septic System and Repair Areas



HAYWOOD COUNTY ENVIRONMENTAL HEALTH DEPARTMENT
157 Paragon Parkway Suite 200
Office: (828) 452-6682 Fax: (828) 452-6798

OPERATIONS PERMIT

Site Diagram (not to scale)

It's Crystal Clear and Starts Right Here…Our Water

JOIN US…
BE A WATER QUALITY STEWARD.

Septic System Pocket Guide

Many homeowner's rely on a septic system for treatment of household wastewater from baths, kitchens and laundry rooms. This wastewater may contain disease causing germs and other pollutants that must be treated and disposed of underground to protect human health and the environment.

With proper use and periodic maintenance the septic system will safely treat and dispose of waste for many years. This guide provides strategies for long term use, tips for proper care and what routine maintenance is needed.

Don't Flush

Solids: coffee grounds, dental floss, kitty litter, tampons, cigarette butts, condoms, paper towels, disposable diapers, sanitary napkins

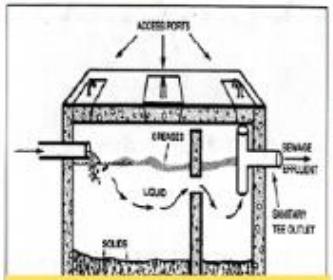
Scum: grease, fats, oils, and limit use of the garbage disposal

Chemicals: paints, varnishes, cleaners, pesticides, drain openers, oils

These items destroy beneficial bacteria

HAYWOOD WATERWAYS ASSOCIATION INC

The septic system consists of a septic tank, a drain field and the soil under the drain field. The septic tank is typically 1,000 gallons and made of concrete that provides storage and initial wastewater treatment. The tank has two compartments that separate the solids from the effluent. The drain field delivers the effluent from the tank to the soil absorption field located beneath the drain field. The soil continues to treat the effluent and removes disease causing germs and other pollutants before regenerating the water table. The repair area, identified on the permit, is reserved for future septic repair.



The septic tank stores and separates effluent before entering the drain field.
North Carolina Cooperative Extension Service *SOIL FACTS: Septic Systems and Maintainance*

Any waste water produced in the house is required to be plumbed into the septic system. Straight pipes from washer machines, sinks and showers must be connected to the main plumbing of the house.

Protecting the System

To provide the best care for the septic system, first locate and identify the septic tank, drain field and repair area. Then make sure all surface water is diverted away from those areas. It is important to not cause any land disturbing activities on or around the septic areas, including parking automobiles and other heavy equipment, or constructing a garage, home additions, pool, driveway, or other structure. These may damage the system and require a costly repair or even complete replacement.

The drain field must be installed level and on contour with the landscape.

Signs of a Potential Problem

A septic system is typically designed to treat 120 gals of wastewater per bedroom per day. Here are several signs that the system is not working properly:

- Slow flow at the house drain or backing up in the plumbing (indicates a clogged or full system),
- Water surfacing around the septic tank or drain field (indicates a cracked tank or full system),
- Smell of wastewater (indicates a leak),
- Lines of darker, greener grass along the drain field (indicates drain field reaching treatment capacity), and
- A nearby pipe leading to a ditch or creek that only flows when the laundry, shower, and/or sinks are used.

Water surfacing above the drain field is a sign of failing septic system.

Care and Maintenance

The septic system is designed to last 20 to 30 years. Proper care and routine maintenance may extend its life and save money. There are several actions every homeowner can do to protect and extend the systems life.

1. Conserve water; excess water will overload the system, cause improper treatment, and even cause wastewater to surface on the ground. Use "low-flow" shower and sink faucet heads and toilet, periodically check for leaks or drips, space out laundry (one load a day instead of five on the weekend), and insulate water lines so faucets don't need to drip during the harsh winter months.
2. Limit or restrict the use of garbage disposals which can clog the drain field.
3. Have the septic system inspected as required on the permit and pumped on a regular basis (see table on reverse).
4. Divert all surface water including gutters, away from septic area.