



# GREAT WATER HEALTHY LAKES

## CHOOSE TAP | SPARTANBURG WATER

### It's easy to take nature for granted.

In fact, if we counted the number of times each day that we actually came into contact with our natural environment, perspectives might change for the better—especially among those who disrupt the wonder of our waterways and beautiful outdoor spaces with trash and other things that are “un-natural.” None of this belongs in Mother Nature’s backyard.

Or yours.

At Spartanburg Water, we know that you engage with nature because you either live on or near Lake Bowen or Lake Blalock, or you consider them your second home: a place to relax and enjoy all that our watershed has to offer.

This latest edition of our newsletter is meant to provide you with some additional perspective from our very own watershed team and drinking water treatment experts. As we care for these lakes, we’re ensuring the health, safety and quality of our community’s drinking water.

### Swirls & Bubbles:

#### OXYGENATION TECHNOLOGY BREATHES NEW LIFE INTO DRINKING WATER

More than two years ago, you may remember an algae bloom in our lakes. These algae created a couple of safe and completely natural—but unpleasant—byproducts: MIB, or Methyl-Isoborneol, as well as Geosmin. In fact, like many other utilities across the country, we experienced record levels of both, and the water—to many of our customers throughout Spartanburg County—quite frankly, tasted and smelled funny.

But, for us, that was no laughing matter.

Although algae are a natural part of the ecosystem of the lake, it is important that nutrients (decaying plant matter, stormwater runoff, pet waste and fertilizers) be reduced or prevented from entering the water. But sometimes Mother Nature needs a helping hand in restoring vitality and life to an aquatic ecosystem. This can be accomplished in a variety of ways, and Spartanburg Water has made significant

investments to protect our watershed that supplies our drinking water.

These investments—to the tune of more than \$22 million—will yield results that support the health of our lakes and the balance of our ecosystem for years to come. But our success depends on a renewed commitment to protect our precious natural resources and limit pollution into our lakes. Remember, small acts equal great impacts.

One example of our proactive strategy to help Mother Nature is called Oxygenation—an innovative approach to breathe life back into Lake Bowen and Municipal Reservoir No. 1 (our original reservoir that opened in 1926).

Here’s how it works: A new piping system increases the oxygen level in the water, one of our first steps in the continuing strategy to combat algae that create taste-and-odor causing compounds, like Methyl-Isoborneol (MIB), and Geosmin. None of this is visible; however, you may have noticed the “swirls and bubbles” on Lake Bowen this past

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# Pick Up Sticks (and leaves):

CONSIDER COMPOSTING OR MULCHING BUT NEVER THROW YARD DEBRIS INTO THE LAKE



It's a fact of life when you live in an outdoor environment: Leaves, sticks and grass clippings can present a challenge. And this is certainly true in properties adjacent to our drinking water reservoirs. Many of our neighbors on Lake Bowen and Lake Blalock have tried different strategies for dealing with leaves, trimmings and fallen branches. Remember the days when the best practice for dealing with yard waste was bagging it up and having it hauled to the landfill or some other non-descript location?

Others consider throwing this in our reservoirs. Why not? Leaves, sticks and grass are natural, right?

Even seemingly harmless leaves and sticks can cause some pretty serious water quality concerns, if you ask our team. The results might surprise you.

Did you know that decomposing leaves, twigs and yard debris can not only contribute to algal blooms and water quality concerns related to taste & odor

but they can—and do—deplete the oxygen our drinking water supply reservoirs which can potentially lead to issues with aquatic habitat, including the fish that live in the lakes. Never throw or blow yard waste into our lakes. There are better options that help protect both landfill space and our precious drinking water supply:

- **If you bag grass clippings**, consider using them as mulch in order to retain soil moisture and keep weeds down. Leaves can also be excellent mulch. Use them to protect plantings over the winter. Re-use leaves, wood chips, and grass clippings to retain soil moisture, reduce weed growth, and reduce the potential for soil erosion.
- **Consider composting**. An abundance of fall leaves and twigs may prompt many people to consider establishing a composting strategy to deal with yard debris. A small composting enclosure can accept a surprising amount of yard debris for recycling throughout the growing season.

- **Send leave and sticks to bed**. The overall benefits of planting beds allow areas to recycle their own leaves and twigs but may also allow additional yard debris from other areas as well. This also reduces the amount of lawn which will, in turn, reduce the amount of yard clippings to deal with. Alternative ground layer plants (ground cover, flowers, and native plantings) are all options that may be considered to allow hard wastes to disappear quickly if they are used in these planting beds. The decomposing natural yard debris, in turn, benefit plantings because of their organic fertilizer value, enhancement of soil moisture and ability to keep weeds at bay.
- **Direct downspouts into planting beds, rain barrels or other vegetated areas** – This will help reduce run-off from downspouts which are known to contribute to pollutants to lakes and streams. Re-use the water on your yard rather than letting it run off.

Also, when you take down your tree this holiday season, please don't throw it in the lake. While many believe that this is healthy for the lake and provides additional fish habitat, the disposal of Christmas trees into the lakes is another opportunity to feed the lake with more nutrients. These nutrients can result in algal growth that can make your drinking water taste or smell funny. For more information on proper tree disposal, please visit your local county or city recycling center.

The disposal of yard debris through burning or other methods within the Spartanburg Water owned buffer is prohibited and may result in pollution of the water supply or additional damage to the buffer.

# Meagan Roy and James West:

## MEET OUR NEWEST WATERSHED SPECIALISTS

Spartanburg Water is pleased to welcome two new Watershed Management Specialists to our team. Meagan Roy and James West recently joined us and have a shared enthusiasm for protecting our precious drinking water supply.

Meagan obtained both a Bachelors Degree from Auburn University in Wildlife Biology and a Masters Degree in Fisheries. She has served as both a graduate teaching assistant and a graduate research assistant along with various other research opportunities abroad in South Africa and Swaziland where she honed many of her conservation

and ecological skills. Meagan grew up in Spartanburg where she attended Byrnes High School and also served the Spartanburg Science Center as a Camp Counselor and General Assistant.

James obtained a Bachelors Degree in Biology from USC Spartanburg and has held a number of environmental and regulatory positions during his 26 year professional career. Through the years, James has held positions with the SC Department of Health and Environmental Control (SCDHEC) as an Environmental Health Manager, the Environmental

Protection Agency (EPA) as an Environmental Scientist, and the City of Spartanburg as a tree specialist during a temporary grant assignment funded by the US Forest Service.

Please be sure to stop by our office and welcome Meagan and James to their new role, and to the community!



# Don't Forget A Doggie Bag:

## THE LAKE DOESN'T WANT YOUR LEFTOVERS

Pet waste, especially from our canine friends, is easy to leave behind on a beautiful walk around the lake, or even in our own yards. Did you know that left on streets, curbs and even on yards pet waste can be carried by stormwater to our creeks, lakes and drinking water supply? Do your part and pick up after your pets. Scoop it, bag it and trash it, even in your own yard. Take a doggie bag with you.

Tip: Save those leftover plastic bags from the grocery store, and tie one in a knot on your pooch's leash. Or you can even buy "designer" puppy poop bags in a wide variety of colors and styles. But whatever you use, just make sure you take it with you

and properly dispose of it in the trash or in a compost pile. That's a much better way to make use of your friend's leftovers. Our watershed team and your community—not to mention Mother Nature—will thank you.



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year. That's the oxygenation system doing its job to create a healthier lake. Those bubbles contain pure oxygen, as well as treatment compounds that support greater fish habitat and, most important, support the reduction of these problematic algae species.

Oxygenation works to restore balance to the ecosystem by reducing phosphorus levels and by reducing the oxygen-depleted areas of the reservoir's deep pools near the dam where algal growth can occur. The oxygenation system is designed to deliver a constant feed of oxygen as well as iron and aluminum-based water treatment products through strategically placed piping systems along the bottom of the lake.

Algae blooms typically grow as the result of prolonged hot, dry weather and high levels of nutrients, including phosphorus and nitrogen present in the watershed runoff during rain events. We know that the central drivers of algal growth are these nutrient loadings and the absence of oxygen. The oxygenation system is an additional tool in the preventative strategies needed to cut MIB off at its actual source—the algae that create it.

When you see the "swirls and bubbles," you know that Mother Nature is getting a helping hand, and the lake is taking a deep breath of pure liquid oxygen.

This technology is valuable in our efforts to prevent the growth of problematic algae. But we need your help to keep the watershed clean. There are many ways that we can all work together to prevent runoff into our lakes. From cleaning up after our pets to using less fertilizer on our lawns, we can also support Mother Nature by being a good neighbor.

And that helps us all breathe easier, not to mention helping our water taste the best that it can. For us, and for generations to come.



## Did You Know?

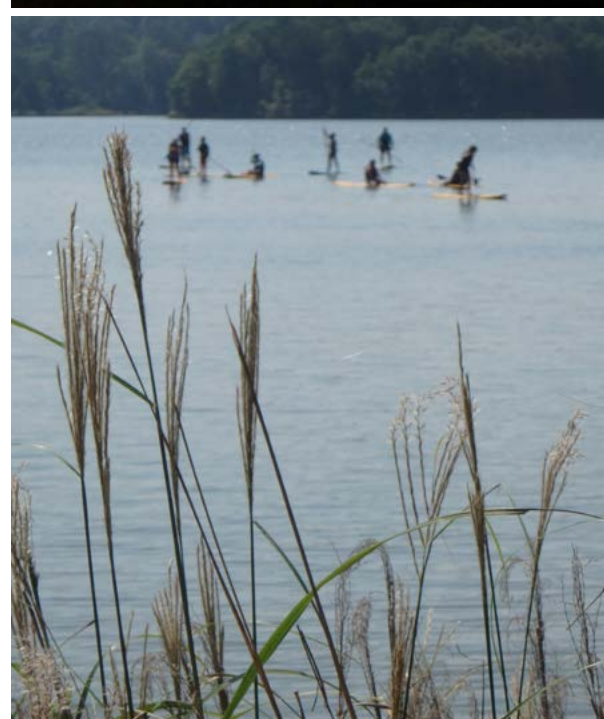
### IRRIGATION PERMITS

Did you know that overwatering your lawn is an unhealthy practice for the root systems of your turf grasses and may be especially problematic for the water quality of our drinking water supply? Overwatering leads to run-off which in turn may result in pollutants and harmful nutrients being picked up as the runoff travels across the ground. If this run-off reaches our precious drinking water supply it may result in water quality concerns. You should stop watering if you see any run-off or “ponding” in your yard; these are signs that the soil has absorbed all the water it can hold.

Irrigation from Lake Bowen or Lake Blalock is only allowed

by annual permits issued by Spartanburg Water. The fee for an irrigation permit is \$115, with an annual renewal fee of \$40. For new irrigation systems, customers will be required to install an irrigation system electrical disconnect safety switch. An “Electric Indemnity Agreement” must be executed before a new irrigation permit will be issued. Irrigation permits expire on Dec. 31 of each calendar year.

***For more information on irrigation permit, please visit our website at [spartanburgwater.org](http://spartanburgwater.org) or give our Watershed Management Specialists a call at (864) 592-2240 for Lake Bowen or (864) 578-5442 for Lake Blalock.***





# GREAT WATER HEALTHY LAKES

## CHOOSE TAP | SPARTANBURG WATER

If you are interested in joining the growing number of citizens that are guardians of our water supply, here are a couple of things you can do in the Spartanburg Water buffer through proper permitting:

- Enhance the riparian buffer adjacent to a water body by planning, and implementing a native species planting plan that helps filter out contaminants that could cause drinking water quality issues;
- Plan and install a rain garden to filter contaminants from more concentrated stormwater runoff.

EVEN WITH THE CHILL, SPRING IS IN THE AIR:

## Plan now for a beautiful garden

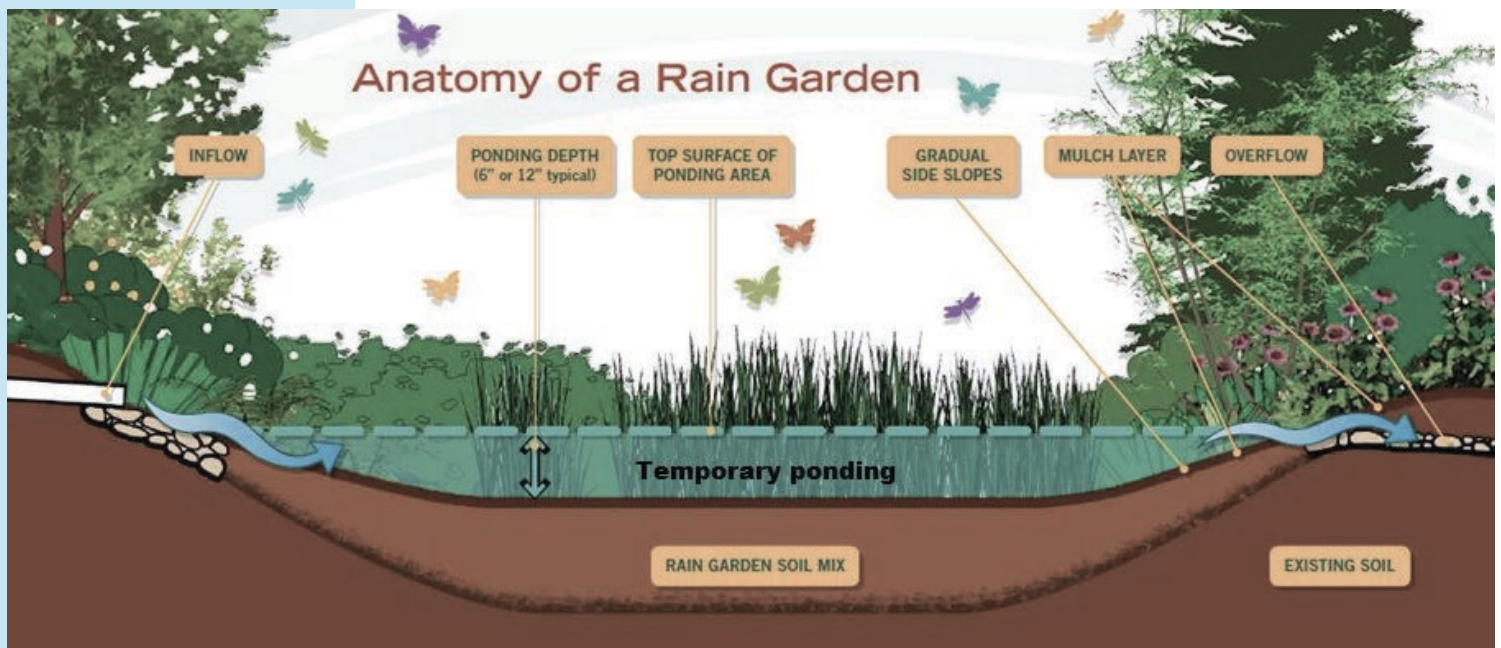
As thoughts turn to warmer days to come, visions of springtime initiatives start to bloom. But have you given any thought to projects that not only add beauty to the natural landscape but also serve the purpose of protecting water quality as well? Even with a chill still in the air, it's still not too early to make plans for your springtime plantings. With a greater focus on watershed protection in local schools in Spartanburg County, neighborhoods and individual property owners have been inquiring with greater frequency and interest on how they can implement projects that are both appealing to the eye and serve a greater purpose of protecting our most precious natural resource: clean water.

A riparian buffer is a vegetated area, or buffer strip, near a stream, usually forested, which helps shade and partially protect the stream from the impact of adjacent land uses. It plays a key role in increasing water quality in associated streams,

and lakes, thus providing environmental benefits. Spartanburg Water owns a riparian buffer around each of its water supply lakes. These buffers are an integral part of protecting water quality by helping to filter out certain contaminants that might otherwise reach the lake, as well as holding the soil in place to mitigate potential erosion concerns. Having the buffers vegetated with native plant, tree and shrub species provides not only a means to remove excessive nutrients (such as decaying plant matter, pet waste and fertilizers), it makes the buffer less susceptible to drought conditions that might otherwise impact plantings that are not native to South Carolina.

Another way you can help guard our communities drinking water supply is to utilize rain gardens. Rain gardens can complement the protection

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## Preventing Erosion: THERE'S PLENTY OF NEW GROUND TO COVER

The buffer that is managed by Spartanburg Water around Lake Bowen and Lake Blalock serve as a tool to protect water quality for the approximately 200,000 people that we supply drinking water to each day, property owners around the lakes can provide additional protection to our community by ensuring that they are mindful of issues around their neighborhood or individual yards that might impact water quality. Sediment run-off due to soil erosion is one of the biggest challenges that water utilities such as Spartanburg Water face. Not only does muddy water make water treatment



more challenging, it makes the cost of that treatment much more expensive for the community that we serve. In addition, the introduction of sediments into our lakes can reduce water storage volume and have a negative effect on the fish and wildlife that call this ecosystem home.

While the potential for soil erosion can be more pronounced in larger disturbed areas such as construction sites that have not employed appropriate stormwater controls, one such issue that we are occasionally challenged with are erosion-prone areas around the lakes. Smaller issues can become magnified when soil areas are disturbed, leaving exposed ground with little to no root mass available to hold the soil. As you may know, relatively small soil erosion issues can become much bigger problems if they go unchecked.

Should erosion issues arise on your property adjacent to the buffer around the lake, we ask that you consider various methods

such as native plantings, soil stabilization or other environmentally friendly techniques to conserve the soil and provide protection to our community's drinking water source. Establishing ground cover through a variety of plantings will help dissipate the energy from heavy rainfall and will help establish the necessary deep root systems that can better hold soil in place. In some instances, erosion fabric, strategically placed stone and other best management practices for controlling erosion may need to be employed on either a temporary or permanent basis. Rain gardens are especially effective where drainage swales already exist on your property.

Healthy lakes equal great drinking water quality. But we need you to help us protect our community's water resources. On behalf of our community and the natural resources that we are trying to protect, we thank you for your stewardship as we work together to ensure that our drinking water supply is protected for future generations.

# Hazardous Household Waste Disposal in Spartanburg County

For nearly a decade, Spartanburg County residents have recycled more than 320 tons of toxic, hazardous, corrosive, and acidic materials from homes during Annual Household Hazardous Waste (HHW) Collection Day events. This year's event will be held on Saturday, March 24th from 9 a.m. to 2 p.m. in the parking lot of the Spartanburg County Administrative Services Building at 366 N. Church St. in Spartanburg. Spartanburg County is one of only a few counties in the state to offer a free annual HHW collection event to its residents.

Spartanburg County Citizens are encouraged to take advantage of this opportunity to properly dispose of unwanted household waste items in order to protect both the health of their families as well as the health of our lakes and water supply. Unwanted household chemicals (including prescription medication), should never

be flushed down the toilet or poured down a drain or onto the ground. Pouring chemicals down the drain/toilet may disrupt your septic system or, if you are tied to a sewer service, may contaminate the treatment process for which conventional biological wastewater treatment facilities may not be designed to remove. Always make responsible and informed choices when disposing of hazardous household waste items.



## The following items are considered Household Hazardous Waste:

- Herbicides and Pesticides
- Mercury
- Aerosols
- Brake Fluid
- Corrosives
- Flammable Solids and Liquids
- Solvents and Degreasers
- Pool Chemicals
- Propane Tanks
- Paint and Paint Thinner
- Batteries
- Fluorescent Bulbs
- This event does not accept electronic waste (e-waste), explosives, asbestos, radioactive materials, or commercial wastes. However, e-waste is currently accepted at four of the county's recycling collection centers daily.

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provided by a vegetated buffer by focusing stormwater through a drainage area that is enhanced by natural plantings. Rain gardens are typically designed to



slow the water down and allow the water to absorb into the ground over a broader area so that it may be used by plants within the garden area. This helps mitigate the amount of nutrients that might otherwise reach our water supply lakes and cause issues such as algae blooms, which can lead to taste and odor challenges in our drinking water supply. The slowing of stormwater and addition of rooted plants within a drainage area also help prevent soil erosion. Just like natural vegetation in our riparian buffers, rain gardens are most effective when native plant species are utilized in their construction. Native plants are typically more tolerant to our climate in upstate South Carolina and have become acclimated to our typical soil and rainfall amounts. A good mixture of several different plantings ensures diversity under varying conditions and also supports a strong root zone that tends to hold the soil in place. If you are considering plantings within the buffer area, please contact our Watershed Specialists for any questions regarding the required permitting process.

# Did You Know?

## BOAT PERMIT REQUIREMENTS

Did you know that all recreational boating access through Spartanburg Water property requires a permit? Most folks that live or have grown up in the Spartanburg Community are aware of the recreational value of Lake Bowen and Lake Blalock. While the primary purpose of the lakes is to provide drinking water supply for the community, there are many opportunities for fishing, boating, and general recreation. Spartanburg Water advocates for safe boating on Lake Bowen & Lake Blalock. We develop and implement policies and procedures for the utilization and protection of our reservoirs, and natural resources. We are committed to the safety of the public.

So, what kind of permit do you need and what are the requirements? There are a number of rules and regulations related to boating and recreation on Lake Bowen and Lake Blalock. For the most recent set of Policies and Procedures for the Use of Water Supply Reservoirs please visit our website at [spartanburgwater.org/lakes](http://spartanburgwater.org/lakes).

In general, recreational boating permits for each lake are broken down into various categories, primarily related to the type and the registered nameplate horsepower of the motor. Please note that in order to obtain a permit (for other than non-powered vessels), you must provide proof of title/registration for the watercraft. All first time registrants are required to have their boats inspected at either of our lake wardens' offices before a permit may be issued.

If you are wishing to renew your permit, renewal letters will be mailed out the second week of March. You may simply review the letter to ensure all information is correct, sign, and return the letter with a check with the appropriate amount listed. If you are wishing to pick up your permit in person, please stop by one of our wardens' offices during normal office hours. Our Lake Bowen office is located at 8515 Highway 9, Inman, SC 29349, and our Lake Blalock office is located at 1925 Sandy Ford Road, Chesnee, SC 29323. We look forward to seeing you and wish you all a safe and happy boating season!

### UPDATE: MARINE STRUCTURES

Spartanburg Water has updated the rules for docks that were made effective in May 2017. Anyone pursuing a Marine Structure (including, but not limited to, "C" docks) on Lake Bowen or Lake Blalock can find detailed guidelines at [spartanburgwater.org/marine\\_structure\\_guidance](http://spartanburgwater.org/marine_structure_guidance). We encourage anyone interested in learning more to visit our webpage or speak with our watershed staff. Guidance may continue to be updated periodically.





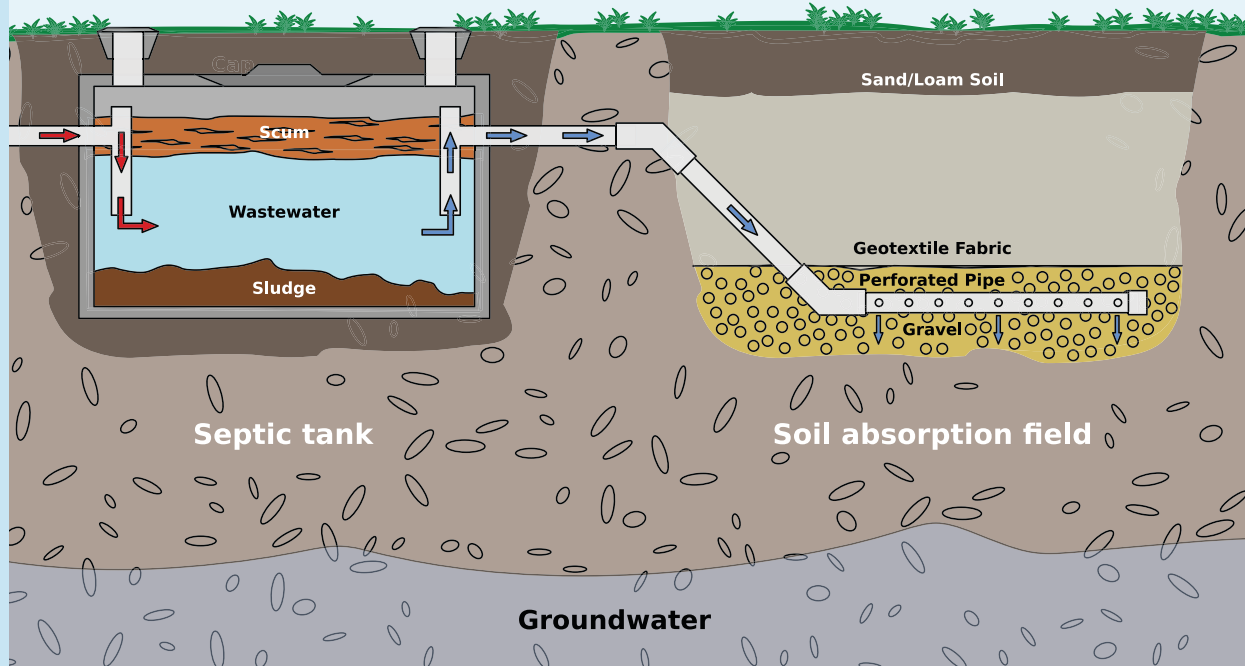


# GREAT WATER HEALTHY LAKES

## CHOOSE TAP | SPARTANBURG WATER

### Dock Safety Begins with Maintenance

Please check your dock for loose boards or other maintenance needs before the busy recreation season starts. Dock maintenance of all types requires a permit before the work is started. What are the guidelines for repairing and maintaining docks? Please stop by the Lake Warden's office at Lake Bowen or Blalock to pick up the information or access online at [spartanburgwater.org](http://spartanburgwater.org).



### Failure Is Not An Option:

#### SEPTIC SYSTEM MAINTENANCE PROTECTS THE ENVIRONMENT

How well does your septic system function? Unfortunately, this is not a question most people consider until there is septic system failure.

Unfortunately, this is an "out of sight, out of mind" issue. You can flush the toilet, run the shower, drain the tub. And that means everything must be good, right? Not always.

A septic system must be maintained. Your tank is only a component of a much larger design. The septic tank is typically a 1,000 gallon concrete box in the ground roughly 5' – 10' from where the 3" or 4" pipe leaves the home. Its purpose is to trap the solids, grease and oil you send down the plumbing. Attached to the end of the tank is a septic drain field. Most of the drain fields in our area are currently designed with 100' long 3' wide trenches per bedroom. Therefore, most three-bedroom houses have 300' of drain line,

4 bedrooms equals 400', etc. Depending on the available space and site topography, the 300' of drain lines could be two lines or as many as eight.

The 1,000-gallon tank can become full of water within it two weeks of use. However, once it fills up, the tank will function as a pass-through device. If 100 gallons is sent through the plumbing, 100 gallons is pushed out of the tank and into the drain lines. Once in the drain line, it seeps gradually into the soil below. The bacteria in the soil devour the bacteria and nutrients. When the water eventually reaches the water table, it has been freed from all pollutant concerns. When operating correctly it's a very natural and effective means of septic water dispersal and treatment.

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QUESTIONS: (864) 592-2240 / [spartanburgwater.org/healthylakes](http://spartanburgwater.org/healthylakes) / USE HASHTAG: #healthylakes



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### SOUNDS SIMPLE ENOUGH. SO WHAT'S THE BIG DEAL? HERE ARE SOME ISSUES THAT ARE COMMON TO DRAIN FIELDS:

- **The septic drain field was undersized** during the permitting process. Your yard needed 120' per bedroom due to prevalence of rock and heavy clay but the inspector incorrectly allowed 80' per bedroom based on a sandy clay loam in the area he augured during the initial site inspection.
- **The system was installed under saturated soil conditions** and the clay sidewalls and drain line bottom were smeared shut during the digging. Instead of percolating, the drain lines act like a bathtub with a nearly plugged drain.
- **Line connection pipes were collapsed accidentally** by contractors using heavy equipment (track hoes, trucks, loaders). The new system might then allow for one saturated line but the lower two lines remain completely dry and inaccessible.
- **Clogs occur at either end of the septic tank due to misuse of the plumbing.** It's not a trash can! The system is not designed to handle anything other than solids, toilet paper and very limited amounts of oil and

grease. This includes food scraps. Garbage disposals hurt the function of the septic tank.

- **Leaking toilets** can saturate any drain field. A slow drip adds up to hundreds of gallons before you know it.
- **Failure to pump out a tank.** The sludge on bottom and the scum layer on top of the water grow within a tank and eventually reduce its holding capacity and corresponding holding time. This problem will lead to solids, grease and oil entering the drain field. Drain lines don't percolate well when clogged with solids, grease and oil. By the way, additives do not work well because the septic tank lacks sufficient oxygen. Save your money.
- **Tree roots don't help drain lines.** Yes in the growing season they will "drink" from the drain field; but during the winter the roots just takes space the water could otherwise go. Think of a bathtub partially filled with the children's toys. Not much room is left for you.
- **The tree roots can follow the water** back to the connection line pipes. Instead of a 3' wide trench, the roots are squeezing into a 3 or 4" connection pipe. This condition

is similar to the collapsed pipes described earlier. The flow is reduced or stopped, and thus entire lines become inaccessible.

- **Grading of the surface** (removal of soil) too close to the drainlines. You don't want to give the water an easy path to the surface.
- **Driveways, garages, pools or home additions** on top of or in the vicinity of the drainlines. Remember this area of your property is off limits to construction of any sort.

### SO WHAT SHOULD I DO TO BE A CONSCIENTIOUS OWNER OF A SEPTIC SYSTEM?

- Get a copy of your septic permit issued by SC DHEC by contacting the Spartanburg County Health Department. It helps to know what you've got and where.
- Remove your garbage disposal from the kitchen sink.
- Don't flush anything beyond what is necessary. That means no baby wipes, hygiene products, excessive grease, etc. The septic tank will not break down these products.
- Fix leaking toilets.
- Get the septic tank pumped every five to 10 years depending upon number of people in the home. More people using the system means it should be pumped more frequently.
- Don't plant trees around the septic tank or near the connection lines.
- Leave some room on your property for a repair job. All drain fields under



consistent use will eventually need repair.

**REMEMBER: the lake's buffer cannot be the answer.**

- Don't install "septic pits" as an easy fix. The soil must be able to accept the water. If the pit is already in the water table, it's a direct path for contamination.

What does a failing system look like?

This one seems easy, right? It means your toilet won't flush and your tub won't drain properly. It often introduces a foul odor into your home. Or it could be ponding over the tank or a section of the drain lines. This too would be associated with odors. But your neighbor may complain even before you notice.

What if the system is failing below the surface? The lines could be so saturated and the upper water table so near the ground surface that the septic water is never "cleaned." These contaminated perched water tables then seep to lower points. Septic systems are a known contributor of pollutants (fecal coliform bacteria, Nitrogen, Ammonia, etc.) to creeks, rivers and lakes. Yes, it is possible to contaminate a local drinking water source without even knowing your drain field is the culprit.

Make sure repairs to your drain field are handled by a SC DHEC-licensed septic system installer. If you have a failing septic system and don't know exactly where the Spartanburg Water property begins, please contact one of the lake offices for assistance.

### **FOR ASSISTANCE IN ANSWERING YOUR SEPTIC QUESTIONS, PLEASE CONSULT THESE RESOURCES BELOW:**

- South Carolina Department of Environmental Health and Control: [scdhec.gov/HomeAndEnvironment/YourHomeEnvironmentalandSafetyConcerns/SepticTanks/](http://scdhec.gov/HomeAndEnvironment/YourHomeEnvironmentalandSafetyConcerns/SepticTanks/)
- Environmental Protection Agency: [epa.gov/septic/assisting-families-and-protecting-public-health-proper-septic-system-maintenance](http://epa.gov/septic/assisting-families-and-protecting-public-health-proper-septic-system-maintenance)

## Hexastylis naniflora:

### HELP US PROTECT AND PRESERVE A THREATENED SPECIES

Hexastylis naniflora: It's not a phrase that comes up in everyday conversation. But, as a lakeside resident, you've probably encountered this evergreen plant, with heart-shaped leaves, on everyday basis. According to the U.S. Fish and Wildlife Service, it's considered a threatened species, and we need your help to protect it.

It's also known as a dwarf heartleaf. One of the largest known populations grows around Lake Blalock, the drinking water reservoir and around its tributaries. As a lakeside resident, it's important for you to be able to identify the plant so that you can participate in our efforts to preserve it for the benefit of our natural ecosystem.



Hexastylis naniflora is an evergreen plant, with heart-shaped, leathery, dark green leaves. The stalks are long and thin, originating from an underground root. The plant's flowering period is from mid-February to late June. Its jug-shaped flowers are typically less than a half-inch long, buried in leaf litter and difficult to find. They are usually beige to dark brown, but can be slightly green or purple. The floral parts of Hexastylis (Greek, meaning "six styles") are arranged in multiples of sixes. Plants receiving sunlight in early spring will have the most flowers.

According to research over the last 20 years, Hexastylis naniflora is located in only a few counties in the upper Piedmont of North Carolina and South Carolina. Timber harvesting, urbanization, conversion from woodlands to pasture, reservoir construction, pond construction, and insecticide use are threatening the remaining populations.

Remember: the uses of herbicides or pesticides are prohibited in the buffer and that no clearing can be done in the buffer zone around the lake, which is the property of Spartanburg Water. Thank you for being our partner in protecting our precious natural resources.

# A Growing Problem:

## OVER-FERTILIZATION YIELDS CHALLENGES FOR LONG-TERM HEALTH OF DRINKING WATER RESERVOIRS



Although fertilizers can make an impact on your lawn or garden, they can also wreak havoc on our natural environment—and that means our drinking water.

**Over-fertilization is a common problem, and what you use on your lawn and garden can leach into ground water or contaminate our drinking water reservoirs and rivers.**

Test your soil before applying fertilizers and avoid using fertilizers near surface waters. Select the proper season to apply fertilizers: incorrect timing may encourage weeds or stress grasses. Do not apply pesticides or fertilizers before or during rain due to the strong likelihood of runoff. Calibrate your applicator before applying pesticides or fertilizers. As equipment ages, annual adjustments may be needed.

Fertilizers can be classified as organic or inorganic. Inorganic fertilizers present nutrients as simple charged atoms or molecules. These dissolve readily in water and are immediately available to plants, while organic fertilizers are more complex and require more time to be taken in by plants. Therefore, they are best-suited for use on the land around our lakes, as they minimize the potential for water contamination. Even so, both types of fertilizer can result in environmental degradation when too much is applied.

**There are two basic ways to test one's soil:** purchasing a do-it-yourself kit, or employing a soil lab to conduct a complete soil test. With a do-it-yourself kit, you can perform a basic pH test to measure the soil's acidity, alkalinity and the major nutrient contents. However, this kind of approach only gives the most basic look at the contents of your soil. For a thorough, accurate read of your soil's contents, you are best-suited to get a professional analysis. In addition to the pH level, a soil lab's test will tell you your soil's nutrient content so that you can determine what kind of fertilizer—and how much—you need to apply. A lab test can also identify local problems and recommendations for the appropriate types and amounts of fertilizers to apply in order to address these issues.

When collecting soils for a professional analysis, it is best to collect a representative sample of your soil, so get separate sections from areas with different textures, colors and plant growth. Soils used for establishing grass or turf should be sampled to a depth of six inches; turf grass, a depth of three inches; and trees and shrubs, to 12 inches.

Once you have the results of your soil test, it is time to apply them to your lawn care. Fertilizer recommendations are based on

the amount of nutrient to apply per given area, with lawn and turf recommendations typically given in pounds per 1,000 sq. feet. A "complete" fertilizer is one that contains all three primary nutrients (nitrogen, phosphorus, and potassium). These are often convenient to use, but are hard to find in a ratio that matches the exact amount required by a soil test. In the instance you have to choose a nutrient of focus, always try to match the nitrogen load required. No more than 1 pound per 1,000 square feet should ever be applied at any time—greater rates can burn the grass and result in leaching through the soil and out of the plant zone, resulting in excessive nutrient input into our lakes. Contrary to popular belief, late summer and early fall—not springtime—are the best times of the year to fertilize lawns. One other thing to consider with fertilizer application is the spreader itself—if your spreader is not properly calibrated, you can unintentionally over-fertilize your lawn.

**Safe, high-quality drinking water is only one of the goals we must address as stewards of our natural resources—we must also consider all of the factors affecting our surrounding environments.** Responsible application of fertilizers—from soil testing to spreader calibration to the actual application itself—plays an enormous role in the maintenance of a happy, healthy drinking water and recreational community. As we move into the heat of summer and temperatures rise, be aware of your fertilization and irrigation practices, as well as your restrictions.

**No fertilizer application is allowed below the 827' MSL (Mean Sea Level) contour at Lake Bowen, or below the 720' MSL contour at Lake Blalock.** Never fertilize right before a rain or a heavy watering, and always be mindful of the total amount and nutrient load of the fertilizer you are applying. Armed with the proper knowledge, you can not only have a happy, healthy lawn, but can be a part of a community working toward maintaining a happy, healthy watershed!



# GREAT WATER HEALTHY LAKES

## CHOOSE TAP | SPARTANBURG WATER

### How Does Your Garden Grow?

#### SOIL TESTING AND FERTILIZER USE GO HAND-IN-HAND



### An Introduction to Fertilizers and Soil Testing

- Test your soil before applying fertilizers. Over-fertilization is a common problem, and can leach into ground water or contaminate rivers or lakes.
- Avoid using fertilizers near surface waters.
- Use slow-release fertilizers on areas where the potential for water contamination is high, such as sandy soils, steep slopes, compacted soils, and edges of water bodies.
- Select the proper season to apply fertilizers: incorrect timing may encourage weeds or stress grasses.
- Do not apply pesticides or fertilizers before or during rain due to the strong likelihood of runoff.
- Calibrate your applicator before applying pesticides or fertilizers. As equipment ages, annual adjustments may be needed.

As temperatures rise, be aware of your fertilization and irrigation practices. Each and every one of us is tasked with protecting the natural environment—especially those of us in the Pacolet River Watershed.

And while safe, high-quality drinking water is our top priority, we must also consider all of the factors affecting our surrounding environments. The responsible application of fertilizers—from soil testing to spreader calibration to the actual application itself—plays an enormous role in the maintenance of a happy, healthy drinking water and recreational community.

#### WHAT ARE FERTILIZERS?

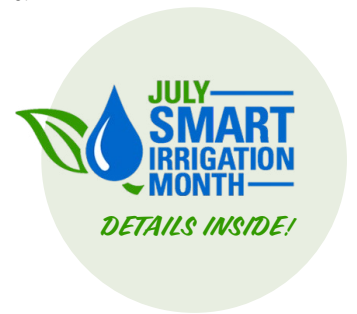
Fertilizers can be classified as organic or inorganic. Inorganic fertilizers present nutrients as simple charged atoms or molecules. These dissolve readily in water and are immediately available to plants, while organic fertilizers are more complex and require more time to be taken in by plants. Therefore, they are best-suited for use on the land around our lakes, as they minimize the potential for water contamination. Even so, both types of fertilizer can result in environmental degradation when applied in excess.



Fertilizers are also separated by “grades” which represent the percent composition of the three primary plant nutrients:

- nitrogen (N)
- phosphorus (P)
- potassium (K)

These, in combination with “micronutrients” such as zinc, are necessary for plant growth. However, excessive input of these elements combined with certain environmental factors (hot weather, drought conditions) can cause eutrophic conditions and algal blooms in our creeks, streams, and lakes. Increased algae creates taste and odor problems throughout the watershed. Testing your soil to determine optimal nutrient loads prior to application of fertilizers can greatly reduce the excessive input of nutrients into our water bodies.



#### WHAT IS SOIL TESTING, AND WHY IS IT IMPORTANT?

A soil test will indicate the pH level (acidity/alkalinity) and nutrient content of the soil. Too much of one nutrient or too little of another can impact not only your grass and landscaped plants, but the surrounding ground and surface water as well. Similarly, a pH beyond the suitable range will result in plants being unable to take in any nutrients at all, regardless of the content within the soil.

There are two basic ways to test one’s soil: 1) Purchasing a do-it-yourself kit (you can perform a basic pH test to measure the soil’s acidity,

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# Smart Irrigation:

## DELIVER THE RIGHT AMOUNT OF WATER, AT THE RIGHT TIME

Each July, Spartanburg Water participates in a public awareness campaign known as “Smart Irrigation Month.” The tools and tips that are shared through this effort can provide benefits to you and your neighbors throughout the entire year.

Summer is synonymous with green lawns and vibrant vegetation, and everyone wants to have a beautiful yard and lakefront. Ultimately, the goal of Spartanburg Water for Lake Bowen and Lake Blalock is to facilitate the most efficient use of our water resources and ensure enough water for all Spartanburg Water customers, regardless of their location in the watershed. Achievement of this goal begins at home, with the lakes themselves, and with the proper mindset and arsenal of information, it is possible

to achieve this in a manner that is helpful to both your gardens and the lakes they surround.

With hundreds of existing irrigation pumps located on Lake Bowen and Lake Blalock, irrigation has the potential to have a large impact on both water quality and quantity in the reservoirs that serve as our drinking water supply—enough to fill nearly 20 Olympic size swimming pools!

That’s a considerable amount of water for our reservoirs to lose, and such a drastic loss can affect the ecology of the lakes and surrounding streams, not to mention the availability of water for intake, treatment and distribution efforts. For this reason, Spartanburg Water regulates the withdrawal of water directly from the reservoirs through our Irrigation Plan.

With the proper permit, a lake resident can utilize water from Lake Bowen or Lake Blalock to maintain lawns and vegetation on their property. All permitted irrigation systems around the lake are for residential use only, and are limited to a total coverage area of one acre in size. The hydraulic loading rate cannot exceed one inch per acre per day, and irrigation must be suspended during rainfall and turned off if there is an occurrence of runoff.

Even with regulated lake-based irrigation systems, however, there are additional ways to save water and practice smart irrigation. All irrigation throughout the South Pacolet watershed affects our drinking water—either from direct withdrawals through permitted lakeside irrigation systems or public drinking water-based systems by non-lake residents. As we move into summer and potential drought conditions, we all must consider water conservation and its role in water quality.

Irrigation water can make up over a quarter of residential water use, so water reductions can be an opportunity for considerable savings. In hot, dry conditions the temptation to irrigate every day to the maximum amount is ever-present. But excessive irrigation

### WHY PRACTICE ‘SMART IRRIGATION?’

- Saves money on your utility bill.
- Nurtures green spaces that deliver real environmental benefits.
- Protects your community’s water supply for generations to come.
- Minimizes overwatering while keeping your lawn beautiful and healthy.
- Put every drop of water to work by minimizing evaporation and waste.
- It makes maintaining your yard easy and convenient.

in dry conditions actually results in the loss of a considerable amount of water through evaporation.

Smart irrigation starts well before the pump. You can step back and determine your approximate water needs. How much water are you currently using? How much water does your lawn actually need? Are you already withdrawing the maximum daily allotment of water from the lake? And, if so, are there areas that could use less water? These are all questions that can assist in helping you to identify the actual amount of water you need to take out of your neighboring lake. Just because you are allowed a maximum withdrawal from the reservoirs does not necessarily mean you are obligated to meet that maximum every time you water.

Alternatives to lake-based irrigation such as rain barrels allow for additional water supplies that are not dependent on lakes. A strategically-placed rain barrel can collect precipitation that can then be redistributed for irrigation purposes, and can also assist in stormwater reduction by collecting water that would otherwise pool and flow downhill toward the reservoirs.

Over-watering can cause as much harm to grass and vegetation as drought conditions, and can increase surface runoff and nutrient and sediment loading into the lake, as well. Additionally, for lake-side irrigation systems, excessive watering can result in a larger-than-ideal load of water that is withdrawn from our drinking water reservoirs.

## PRACTICING SMART IRRIGATION

No matter what type of irrigation system is in place, there are a few simple steps that you can take to prevent waste and facilitate smart irrigation.

- **Don't water in the rain:** Precipitation is already saturating the surrounding area, so additional input from irrigation will simply pond on top of the soil and serve as a liquid conduit for any fertilizers or chemicals directly into the drinking water source. Check for leaks. A broken sprinkler head or leaking line can drastically reduce the efficiency of an irrigation system by causing water loss from specific zones, resulting in coverage issues and lowered pressure.

- **Consider a systematic approach:** Test the frequency of your irrigation—most lawns do not need daily watering. Experiment with alternating days, or even skipping one or two days in between the current watering schedule to test the resilience of the lawn.
- **Irrigate in short cycles:** You'll use less water than with a single extended application. This allows the water to completely soak into the ground will and reduce your overall watering time while still getting your plants the appropriate amount of water. Cycling gives water time

to completely absorb into the ground and limits run-off into the lake.

- **Smart irrigation is timely irrigation:** Water in the morning, which prevents excessive loss of water from evaporation. Placement of sprinkler heads and other dispensary units is also important when designing an irrigation system: installing or setting up a sprinkler too close to impervious surfaces—for example, cement or stone sitting areas and pathways—will cause poor distribution of water to areas that need it, resulting in excessive waste of drinking water reserves.

## CONTINUED >>>

alkalinity, and occasionally the major nutrient contents. However, this only gives the most basic look at the contents of your soil), or 2) employing

a soil lab to conduct a complete soil test. For a thorough, accurate read of your soil's contents, you are best-suited to get a professional analysis. In addition to the pH level, a soil lab's test will tell you your soil's nutrient content so that you can determine what kind of fertilizer—and how much—you need to apply. A lab test can also identify local problems and recommendations for the appropriate types and amounts of fertilizers.

More often than not you will need to send a sample by mail. When collecting soils for a professional analysis, it is best to collect a representative sample of your soil, so get separate sections from areas with different textures, colors and plant growth. Soils used for establishing grass or turf should be sampled to a depth of six inches; turf grass, a depth of three inches; and trees and shrubs, to twelve inches.

Once you have the results of your soil test, it is time to apply them to your lawn care. Contrary to popular belief, late summer and early fall—not springtime—are the best times of the year to fertilize lawns. Application during these time periods results in a longer growing season and greater energy reserves, and can eliminate the need for additional applications later in less-optimal times. Additionally, fertilizers should never be applied just before or after a rainstorm, or on frozen ground—high levels of precipitation and low absorption rates can exponentially increase leaching and runoff into our lakes.

One other thing to consider—if your spreader is not properly calibrated, you can unintentionally over-fertilize your lawn. No matter what type of spreader you use, each is going to be different from the others. Always calibrate your spreaders separately and for each product you use. All spreaders will come with basic guidelines for calibration, and additional information is available online.

Armed with the proper knowledge, you can not only have a happy, healthy lawn, but can be a part of a community working toward maintaining a happy, healthy watershed!

**REMEMBER:** No fertilizer application is allowed below the 827' MSL contour at Lake Bowen, or below the 720' MSL contour at Lake Blalock. Always be mindful of the total amount and nutrient load of the fertilizer you are applying.

# Testing the Waters:

## THE IMPORTANCE OF SAMPLING

It's a common question that many have asked members of our team: How often does Spartanburg Water test for water quality? The answer: A lot! In fact, in 2017, Spartanburg Water's laboratory and watershed team collected nearly 2,300 samples from more than 90 specific locations within the watershed. Those samples were used by our laboratory team to perform approximately 77,000 analyses.

By taking samples, the lakes themselves provide us with the clues we need to keep not only the ecosystem in balance, but also our treatment process. Our Drinking Water Treatment team relies on these sample to make the adjustments necessary to provide excellent quality water to our customers.

With assistance from researchers at Clemson University and a team of ecosystem experts, Spartanburg Water continues to study the effects—and causes—of algae growth in drinking water reservoirs. The knowledge that Spartanburg Water has gained has allowed our staff at the water treatment facilities time to respond to the arrival of common but undesirable species, like Geosmin and Methyl Isoborneol,

which both cause an earthy taste in our drinking water.

Historically, for Spartanburg Water, Geosmin has been the taste-and-odor compound most prevalent in the source water that was detectable in the highest levels in the spring and the fall, when the lakes are "turning over." Our award-winning filter plants are equipped with a carbon feed system that has proven effective in the removal of this compound, along with its associated earthy taste and odor.

As we continue to further evaluate the superior quality of the water in our lakes, we also look towards better characterizing and understanding the water quality from the multiple streams and tributaries that drain into our water supply reservoirs from other areas within the watershed. Our monitoring and data collection continues year-round, but we particularly focus on the months of March through October when the water temperature is supportive of an increase in the algae population.

Our assessments include algae identification and enumeration

using a FlowCAM® (Fluid Imaging Technologies), concentration of five taste and odor compounds with an emphasis on Geosmin and MIB. In addition to our own SCDHEC-certified lab that processes a number of water quality samples, we also use several certified third-party labs which have the capability to run advanced analysis on water samples, and enhance our overall monitoring and analysis strategy.

In addition to the algal monitoring, we collect a wide range of water quality information from our analysis to better characterize the health of our lakes. This data allows us to optimize both our water treatment strategies at the treatment facilities as well as the water supply reservoirs themselves. In addition, we review a wide variety of data collected by state regulatory agencies (such as SCDHEC) related to our source water quality. This monitoring includes drinking water source monitoring in our lakes for potential contaminants that are not currently regulated. The results of the monitoring are included in our annual Water Quality Report that is available online at [spartanburgwater.org](http://spartanburgwater.org).

**BY THE NUMBERS:** In 2017, Spartanburg Water's laboratory and watershed team collected nearly 2,300 samples from more than 90 specific locations within the watershed. Those samples were used by our laboratory team to perform approximately 77,000 analyses.

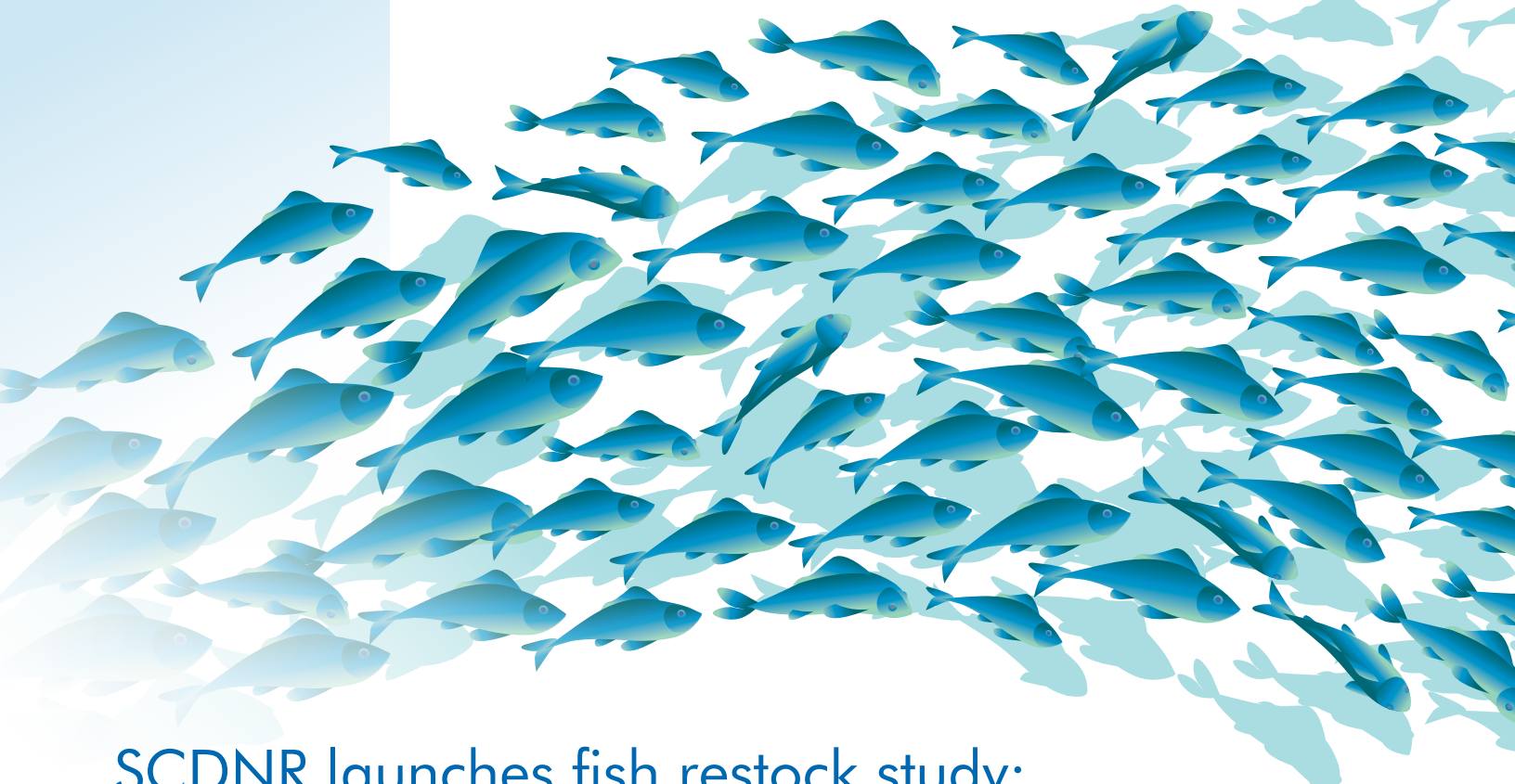






# GREAT WATER HEALTHY LAKES

CHOOSE TAP | SPARTANBURG WATER



## SCDNR launches fish restock study:

RESEARCHERS WILL USE SAMPLES, INFO GATHERED TO DETERMINE NEXT STEPS

A study to determine the need for a potential fish restocking effort on two of Spartanburg Water’s reservoirs began this month.

During the week of September 10th, officials with the South Carolina Department of Natural Resources conducted the first phase of an assessment on Lake Bowen and Municipal Reservoir #1. A team of biologists was collecting samples that will help the agency calculate a restocking rate following a major fish loss that occurred on both reservoirs last May.

The primary gamefish population most affected by the fish loss included the bluegill and redear varieties of sunfish, more commonly known as bream.

“The idea behind the sampling will be to determine the relative abundance of gamefish, with focus on species and sizes most impacted by the fish loss,” according to a statement from SCDNR. “This sampling should give us some idea of stocking rate needed.”

Samples were collected by a process known as “electrofishing,” which injects a minor electrical charge into the water that temporarily stuns fish so that they can be collected and safely returned to the water with little stress or injury. Electrofishing is the safest and most effective method for these kinds of assessments.

“As this process continues, we’re committed to sharing information about the partnership and keeping our community informed about what they might see as we get closer to a potential fish restock,” Ken Tuck, Spartanburg Water’s Director of Water Treatment said.

In August, officials from both Spartanburg Water and SCDNR met to discuss improved communication efforts and explore new partnership opportunities, including the proposed restocking effort.

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# GREAT WATER HEALTHY LAKES

## CHOOSE TAP | SPARTANBURG WATER

### Lake Alert:

#### LAND SALE REPORTS ARE FALSE

A small number of our customers have called to ask us about a rumor that Spartanburg Water has orchestrated the sale of an unspecified tract of land to an outside entity without the public’s knowledge—in fact, we’ve heard reports that an environmental group—and even a local fish camp—have either bought or sold property in transactions behind closed doors. **These claims are false and have no basis in fact.**

To be clear, Spartanburg Water is not selling any property around any of our reservoirs, nor have we purchased any additional property.

Spartanburg Water’s number-one priority continues to be the fulfillment of our mission to provide quality water in a reliable manner. Reliance on facts allows us to address this issue and get back to the business at hand: Ensuring the delivery of safe, quality water to more than 200,000 people.

### Drawdown:

#### LAKE LEVELS LOWERED THIS WINTER

While a drawdown of the lake is not an annual process, our watershed management team does lower the levels when necessary in our reservoirs. We last organized a “maintenance” drawdown between December 2014 and February 2015. We also recently dropped both Lake Bowen and Lake Blalock for a short time before Hurricane Florence and Hurricane Michael. In both of these instances, South Carolina Department of Health and Environmental Control Dam Safety Program officials requested that dam owners in South Carolina start lowering lake levels several days ahead of the storms. This was further supported by the governor’s office in preparation for significant rainfall in the state during this time.

Our schedule is to begin this project in early December. This process will require the lower level to remain in place until the end of February, providing our watershed management staff and you, as property owners, an opportunity to examine the shoreline and perform other routine maintenance. A lot of different variables may cause lake level fluctuations during the

drawdown period, the most significant being heavy rainfall. This may result in a longer time to reach our target drawdown level and, if wet weather patterns persist, may actually prevent us from reaching or sustaining these lower levels.

While we don’t expect this project to have any drastic impact on normal recreation activities like fishing, there may be areas of the lake that may be harder to navigate during the drawdown. Our staff will be posting signs to alert boaters of the potential hazards of using their watercraft while the lake is at a lower level. As always, we encourage safety. Please speak with a lake warden to ensure that your plans don’t include taking your boat into a portion of the lake that may be difficult to navigate in the months of December, January and February.

Homeowners may benefit from the lower levels, which provide perfect conditions to survey

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**DID YOU KNOW THE  
SOUTH CAROLINA  
DEPARTMENT OF  
NATURAL RESOURCES  
OPERATES SIX  
FISH HATCHERIES  
THROUGHOUT THE  
STATE?**

Fish hatcheries play a vital role in the management of our state's fishery resources. The mission of the SCDNR fish hatchery program is to propagate those species of fish in sizes required to accomplish fishery management objectives as recommended by the biological staff and approved by administrative personnel. This helps ensure that our fishery resources are enjoyed by many generations to come.

## Fish Restocking:

### MORE THAN 500K FISH RELEASED THROUGH NEW PARTNERSHIP WITH SCDNR

Approximately 267,800 fish have been restocked in Lake Bowen (85,000 bluegill and 182,800 red eared sunfish) and approximately 268,000 red eared sunfish have been stocked in Municipal Reservoir #1 this fall. This brings the total fish stocked this fall to around 535,800 between the two lakes. We anticipate that SCDNR will continue with stocking efforts in the spring of Spring 2019 with a focus on largemouth bass.

Spartanburg Water's reservoirs provide a clean, safe water supply to a population of more than 200,000 people but they also are home to a number of aquatic species, including typical gamefish found in southeastern freshwaters. In May 2018 approximately 200,000 fish were lost after an algacide application was used to control taste and odor causing algae in Lake Bowen and Municipal Reservoir #1.

The South Carolina Department of Natural Resources and Spartanburg Water have developed the final arrangements of a partnership that will ensure the proper investments necessary to ensure the drinking water reservoirs are

appropriately managed and allow us to continue providing quality recreational opportunities for the public while and protecting our community's precious natural resources.

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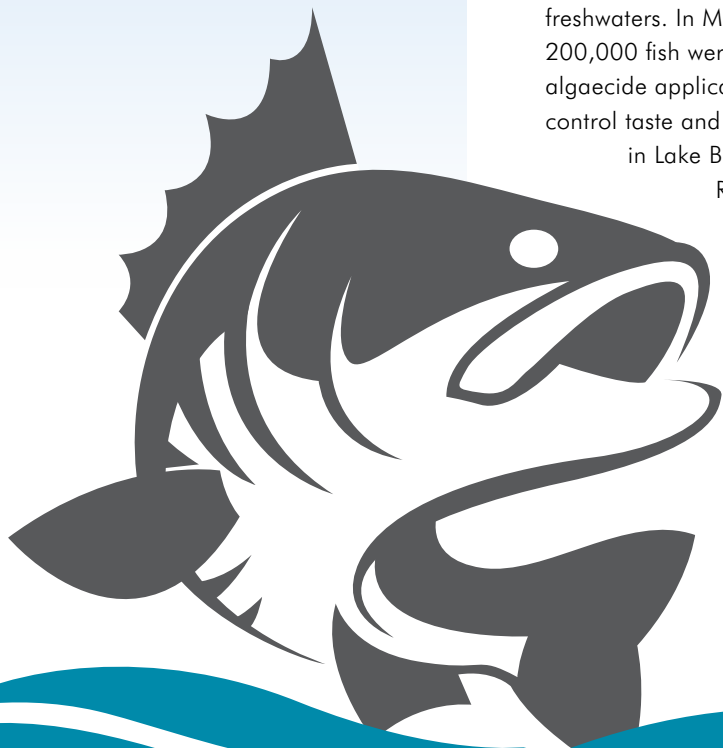
This partnership furthers the commitment between SCDNR and Spartanburg Water to improve communications and establish processes to reduce the chance of future fish mortalities when algacide applications are made.

Spartanburg Water will provide the replacement cost of the fish lost last May, as well as any SCDNR staff time in the management of the fish loss investigation, at a total of \$110,357.08.

SCDNR will use the above-mentioned monies to fund a research study to assess restocking needs and those efforts on Lake Bowen and Municipal Reservoir #1. SCDNR will also use the monies to restock the two lakes with the appropriate species, size and quantity as the study determines.

SCDNR began a fish restocking study this fall.

During this assessment phase, SCDNR staff are evaluating a variety of factors to determine how many fish will be added to the lakes, in addition to a timeline.





## Land Access Agreement

In response to a high-volume of stakeholder feedback and input from adjacent landowners, Spartanburg Water has made a number of improvements to the permitting process, including the introduction of the Land Access Agreement—a universal agreement that protects and preserves your rights as a property owner on both Lake Bowen and Lake Blalock.

Because our lakes are the drinking water reservoirs for the community, there are rules and regulations that we must have in place to protect water quality. However, many of you and your neighbors shared a number of questions and concerns about how information is recorded, not to mention the efficiency of the permitting process itself.

### FAST FACTS

- The LAA serves as a primary land use agreement between Spartanburg Water and the adjoining landowners.
- It establishes an agreement between Spartanburg Water and the adjoining landowner that provides access to recreation and enjoyment of SWS's property below the MSL 827' or 720' contour lines.
- The LAA establishes the procedures for the adjoining landowner to apply for permits for docks, boat lifts and other items that enhance the landowner's enjoyment of the lake.
- The LAA is required of every landowner with property adjoining the MSL 827' or 720' contour line, regardless of whether or not they are applying for permits to place other improvements below the applicable contour.
- It is not transferable to subsequent landowners (a new agreement would be required of every subsequent landowner).
- It requires a named party for the agreement, regardless of the use of an LLC
- It is attached to the adjoining landowners chain of title
- It can be revoked by Spartanburg Water if the landowner is non-compliant with the rules and policies governing the lakes.

### CONTINUED...

erosion and perform shoreline maintenance projects, including the construction or repair of docks, shoreline stabilization structures, and walkways. Spartanburg Water is providing advance notice of the drawdown to allow you the appropriate time needed to consider and schedule any maintenance or upgrades to lakefront property, including those that may require obtaining permits. Adjacent property owners are reminded that maintenance activities may not include pushing yard debris or any other material into the lake. In addition, no fires are allowed around the shoreline of the lake on property that Spartanburg Water owns.

Other than minor maintenance as defined by Spartanburg Water, permits are required for any work that falls below the 827' contour line for Lake Bowen or below the 720' contour line for Lake Blalock. We encourage you to make permit applications now to ensure adequate time for them to be processed and issued by our watershed management team and lake staff. Assess your needs and start planning now—do not delay in submitting a permit if you plan to perform work during the drawdown period.

Although it is not required, we recommend that any boats be removed from the water during the drawdown. Please call either our Lake Bowen office at (864) 592-2240 or Lake Blalock office at (864) 578-5442 if you have specific questions regarding watercraft on the lake.

It is expected that the lake level will fluctuate during the drawdown period due to projected weather patterns during the December–February period being wetter than normal. As property owners consider and begin to implement permitted projects, it is recommended that weather forecasts be monitored on a regular basis, especially when planning key shoreline work.

If you are interested in a project on Spartanburg Water property this winter during the lake drawdown period, we encourage you to contact the lake warden's office quickly to ensure that your questions can be answered and the required permits are issued for your project. Additional information on the lake drawdown project is available at [www.spartanburgwater.org](http://www.spartanburgwater.org).

# Press Pause:

## PROGRAM UNDERWAY TO PROVIDE AUTHORIZATIONS FOR EXISTING STRUCTURES BELOW CONTOUR LINE

Spartanburg Water recently launched its “Press Pause” program to provide adjacent landowners the opportunity to gain authorization for any existing improvements below the 827’ contour line around Lake Bowen.

Running from October 1, 2018 to December 1, 2019, the program offers participating property owners the chance to register to keep all of their **existing structures** and improvements in place. Landowners may request to “Press Pause” and establish a baseline of permits for all existing improvements below the 827’ Spartanburg Water property line. This baseline adds to any existing permits—such as dock replacements, boat lifts, and seawalls—and offers the chance to permit or license established structures that would not necessarily be approved under existing policies and procedures.

With the submission of a Press Pause application, adjacent property owners are eligible to receive an authorization from Spartanburg Water for all existing improvements in good condition. This includes semi-permanent or permanent structures, as well as playground equipment, beaches, and fire rings.

Upon registration, applicants submit those structures they wish to index. Spartanburg Water staff members create an inventory on-site of all structures and improvements, and ensure that all eligible structures and improvements are included in the Press Pause process. Once issued, the license or permit places the existing structure in the adjacent property owner’s name and allows the continued existing of said structure on Spartanburg Water property. Provided the structures and improvements remain in good condition, they will be able to remain in place for as long as the property owner desires to keep them.

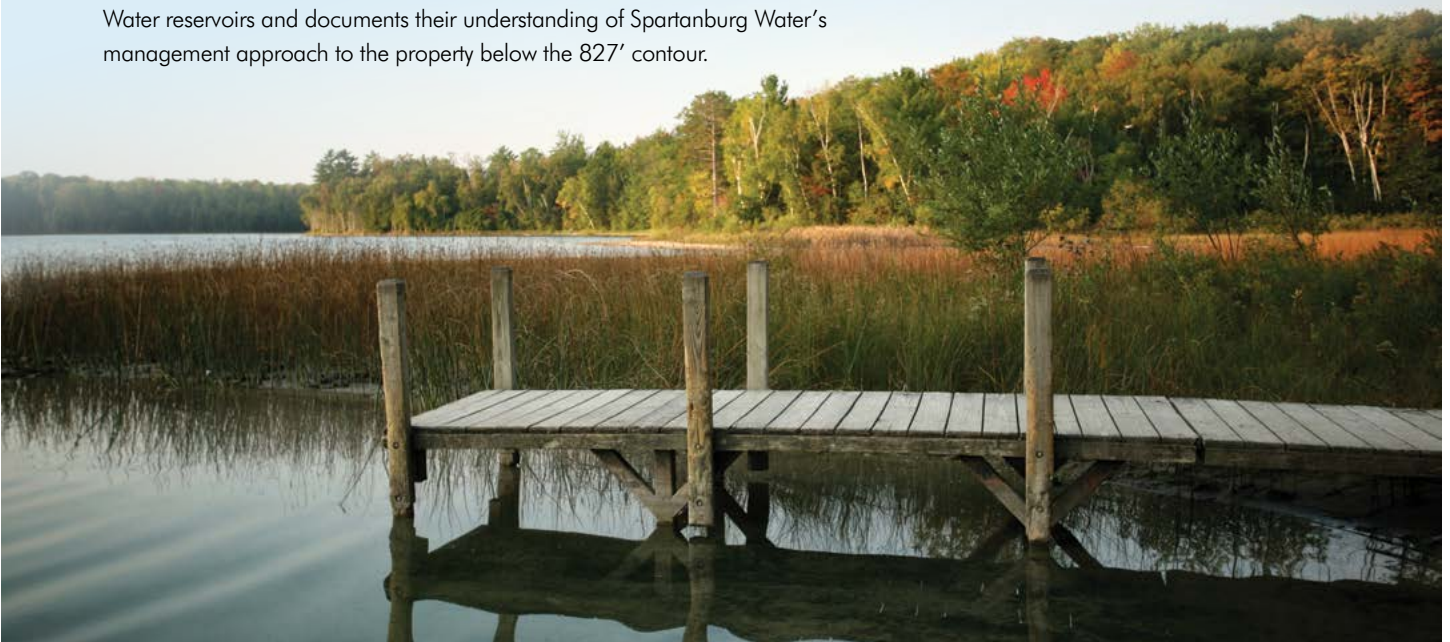
Property owners participating in Press Pause will be required to pay any associated fees for their permits and licenses. These are the same as existing permit fees, and may be found at [spartanburgwater.org/](http://spartanburgwater.org/). **Press Pause applicants who register prior to March 31, 2019 will receive 25 percent off of all relevant permits and/or licenses.**

In order to establish the mutual rights and obligations of Spartanburg Water and adjacent property owners regarding use of Lake Bowen and Lake Blalock, participating property owners will also be required to complete a Land Access Agreement upon issuance of their Press Pause permits and licenses. This document is required of all individuals seeking permits around Spartanburg Water reservoirs and documents their understanding of Spartanburg Water’s management approach to the property below the 827’ contour.

## HOW TO ‘PRESS PAUSE’

To apply for the Press Pause program, interested property owners may contact Spartanburg Water staff in person at the Lake Bowen office, call **864-580-2095** to register by phone, email [presspause@spartanburgwater.org](mailto:presspause@spartanburgwater.org), or register online at [spartanburgwater.org/pause](http://spartanburgwater.org/pause). This one-time program is open to every adjacent property owner living around Lake Bowen with property abutting the 827’ MSL contour.

The program is entirely voluntary, but is an excellent opportunity for all property owners with structures below the 827’ contour to get all of these improvements approved, permitted or licensed, and placed under your name.



# MIB Returns—but not for long:

## ALGAECIDE SUCCESS FOLLOWING IMPROVEMENTS IN STRATEGY, APPROACH

Methyl-Isoborneol, also known as MIB, is a pesky but familiar character that Spartanburg Water's team has gotten to know quite well over the past few years. Many will remember MIB as the culprit of taste-and-odor challenges that lasted for nearly six months in 2015. While harmless, this algae byproduct can produce an earthy, musty smell and flavor in drinking water.

Since that time three years ago, Spartanburg Water has made significant strides in advancing our algae-reduction strategy, investing more than \$20 million in new technologies that help reduce the impact of algae blooms that produce MIB and other species that can also grow in drinking water reservoirs, like Geosmin.

In late June, our lab began noticing a distressing trend: MIB was beginning to spike at higher-than-expected levels, based on the sampling locations that our team was monitoring.

Since 2016, following the installation of an oxygenation system—a cutting-edge invention that delivers a constant feed of oxygen through a strategically placed piping system along the bottom of the lake—Spartanburg Water had been successful in warding off any major spikes in MIB.

But, with the added power of new technology that allows our team to get a better diagnostic view at the watershed, the water quality experts in our lab verified the challenge before us: By the last week of June, MIB was registering at nearly 130 parts per trillion in Lake Bowen, and also seemed to be migrating into Municipal Reservoir—close to the R.B. Simms Water Treatment Facility.

Not every person can detect MIB, but those with sensitive taste buds can begin to taste and smell it in their water at about 15 parts per trillion.

“We knew that we had to act—fast,” said Ken Tuck, Director of Water Treatment.

But what caused the sudden spike? In water bodies, algae blooms that create taste-and-odor producers—like MIB—typically grow as the result of a combination of factors: prolonged hot weather, a lack of rain and high levels of nutrients, including phosphorus and nitrogen, in the watershed runoff.

“The oxygenation system being deployed is a best-practice in the preventative strategies needed to cut MIB off at its actual source—the algae that create it,” Tuck said. “But it’s only one tool in our toolbox.”

The next step: Algaecide—and, specifically, Algimycin: a familiar medicine that helped Spartanburg Water combat its first bout with MIB in 2015. It was prescribed by Dr. John Rodgers, a professor at the Clemson School of Agriculture. Understandably, even when armed with solid research and expert advice, Spartanburg Water was cautious—especially following an unexpected fish loss in May that coincided with the use of Current, a different algaecide that is a best practice tool in the treatment of Geosmin.

Trained and licensed applicators began their work before dawn on July 12 and 13, treating portions of Lake Bowen with a very low dose of Algimycin. The company performing the applications, Aqua Services, continued their work on Municipal Reservoir Number One on July 27.

The result? The algaecide worked: By the end of July, sample results indicated that MIB was “not detectable” in either reservoir. And, according to Tuck, there have been no recurrences of the taste-and-odor producer for the remainder of the summer months.

“This algaecide has been thoroughly tested for safety for non-target species such as fish. The concentration and prescription that I developed for Spartanburg Water’s use are not toxic to fish.”

But, like any other medicine, Dr. Rogers said, it must be administered by a trained professional.

“Those warning labels for algaecide can be scary because they highlight the risks from encountering the undiluted form of the product,” he said. “Even warning labels for over-the-counter medicine can be frightening when you read them. I’ve been doing this work for many years, and our team stands behind the safety of the algaecides that we use.”

Water quality and safety are the number one factors in determining the best algae-reduction methods, Tuck said.

“We want our customers and the entire community of people who enjoy the lake and rely on it for drinking water to know that it is safe,” he said. “Our goal is reliability—because that’s what our mission challenges us to do: Be reliable. This method, and this product, are widely used across the country in the reduction of taste-and-odor-causing algae because they work, and they work well.”

The challenges associated with ecosystem balance—and lake management—are not unique to Spartanburg Water, Dr. Rodgers said. Recent reports of algae blooms have underscored the importance of studying the underlying causes for the frequency with which they’re occurring across the country.

“This is targeted algae management,” he said. “To take what we’ve learned

so that the people of Spartanburg and this region can have the quality drinking water that they've become accustomed to. Spartanburg Water is doing an amazing job with managing their water resources."

But, Tuck said, the utility learns from its mistakes.

"The loss of fish in May inspired us to learn from that challenge," he said.

"We didn't expect it, and we will stop at nothing to make sure it never happens

again. Can we make improvements? Yes, and I'm very encouraged by the success of the algae reduction work in July. The improvements we made are working, and we'll build onto that success and keep moving forward."

### HOW MUCH ALGAECIDE DOES SPARTANBURG WATER USE IN THE RESERVOIRS? IS IT SAFE?

Algaecide is safe to deploy in the treatment of algae in drinking water reservoirs and is specifically designed for that purpose, according to the Environmental Protection Agency, which regulates its use.

The active ingredient in algaecide applications is copper, but at an extremely low amount.

For drinking water reservoirs, the applied metallic copper must not exceed 1 ppm (part per million). One part per million is the equivalent of:

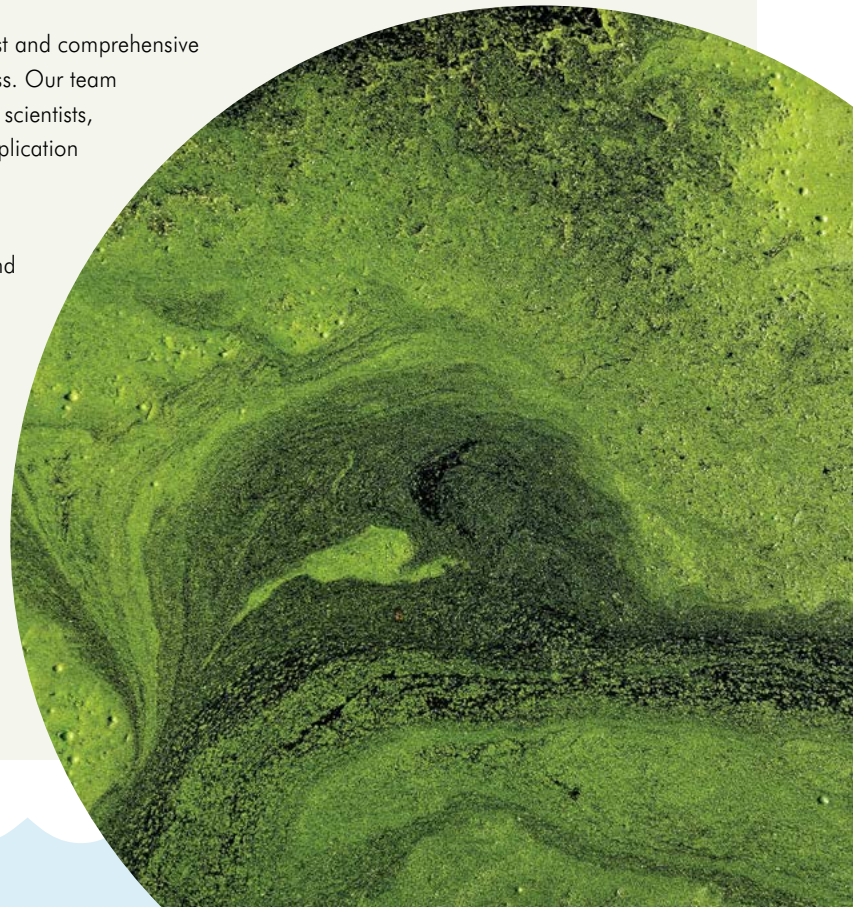
- A single granule of sugar in 263 sugar cubes
- A single piano key among 11,363 pianos
- A single second in 11 ½ days
- A single kernel in 1,250 ears of corn

All algaecide applications in 2018 have been made in low-dose concentrations well below the maximum allowance of copper. To learn more and see the data, visit [spartanburgwater.org/datapoints](http://spartanburgwater.org/datapoints).

### WHAT IMPROVEMENTS HAVE BEEN MADE IN THE ALGAECIDE APPLICATION PROCESS?

When dealing with algae in a drinking water reservoir, a robust and comprehensive monitoring strategy is the key to detection, strategy and success. Our team employed a refined management strategy, in consultation with scientists, experts and watershed specialists, to perform an algaecide application in July.

- We identified taste-and-odor producers and locations and focused on those locations to determine the best method and approach for algaecide applications
- We organized lakes into management sections based on water quality factors
- We monitored weather for optimum application conditions
- We examined water quality parameters in advance of any algaecide use
- We targeted specific algae and taste-and-odor producers at the lowest effective concentration of algaecide







# Pause for Relief:

## RESET PERIOD OFFERS CHANCE TO PERMIT STRUCTURES BELOW SPARTANBURG WATER'S PROPERTY LINE

Have you ever just wanted to hit the pause button when you needed a little more time to take care of something important? Now you have the opportunity to do just that when it comes to any structures that are on Spartanburg Water's property. All you have to do is call our staff and say this simple phrase: "Let's Press Pause."

The Pause Program is scheduled to begin October 1, 2018, and continue through December 1, 2019. During this 14-month period, adjacent property owners may request to "Press Pause" and establish a baseline of permits for the improvements below the 827' Spartanburg Water property line. Our staff will work with each property owner to review and establish a baseline of permits, licenses and/or agreements. All existing improvements, semi-permanent or permanent structures, as of October 1, 2018, in good condition, will receive an authorization from Spartanburg Water.

This one-time program is open to every adjacent property owner living around Lake Bowen with property abutting the 827' MSL contour and applies to currently constructed and existing permanent or semi-permanent structures located below the 827' MSL contour, on Spartanburg Water property (as of July 31, 2018).

During the "Pause" timeframe from October 1, 2018 through December 1, 2019 (14 months), adjacent landowners may request a review of Spartanburg Water files to ensure that all permits, licenses and agreements have been filed and reflect the current owner. Once an adjacent homeowner requests a "Pause Review", the staff will review the records directly with the property owner and the Spartanburg Water staff will issue permits for all existing improvements, semi-permanent or permanent structures

located below the 827 property line. The adjacent homeowner will be responsible for paying all applicable fees associated with additional permits, licenses and agreements that are issued during this period.

So, what's the bottom line? During the "pause," Spartanburg Water will issue the appropriate paperwork to bring all properties up to date and establish a baseline for future improvements.

If you don't know if your property has an encroachment or lacks a permit in the current homeowner's name for an existing dock and other structures, please let us know you want to participate in this

program. We will check our files and let you know what is necessary and provide you with the application. A call to the Watershed Staff at 864-598-2240 or an email that includes your name, address and a phone number to reach you will also work. Please send those to: [jonmorgan@spartanburgwater.org](mailto:jonmorgan@spartanburgwater.org) or visit [spartanburgwater.org/pause](http://spartanburgwater.org/pause) to learn more.

**Note:** All planned or future investments below the 827' MSL contour will be subject to the rules and regulations in place at the time they are identified.

### WHAT ITEMS ARE INCLUDED IN THE "LET'S PRESS PAUSE?"

- Sea walls, in good condition
- Docks, in good condition
- Sitting areas
- Planters
- Boat ramps, in good condition
- Playground equipment and structures
- Fire Pit Structures\*
- Walkways
- Occupied residences
- Decks
- Garages
- outbuildings
- Retaining Walls
- Benches
- Lawn furniture
- Picnic tables
- Flagpoles

- Beaches
- Recirculating fountains
- Fences, in good condition
- \* Portable Fire Pits will be eligible for permitting in a program similar to irrigation permits, which will be introduced in the Spring of 2019.

### INCENTIVE: GET A 25% DISCOUNT ON PAPERWORK FEES WHEN YOU PAUSE

To spread out the workload on the Spartanburg Water staff, adjacent property owners will be encouraged to sign up early for the program through an incentive program that will provide a 25% discount on any fees for additional permits, licenses or agreements identified below the 827' Contour Line. This early sign up period will be from October 1, 2018 through March 30, 2019.

# The 827' Contour Line, Explained:

## SOME FREQUENTLY ASKED QUESTIONS ABOUT SPARTANBURG WATER'S SHORELINE

### WHAT IS THE 827' MSL CONTOUR LINE?

- It is the elevation above Mean Sea Level (MSL) that constitutes the property line for Spartanburg Water around the entire circumference of Lake Bowen.
- The Lake Bowen reservoir was created in 1960 to be a drinking water source for the Spartanburg community. Between 1958 and 1961, Spartanburg Water System purchased property along the South Pacolet River up to the 827' MSL contour line.
- Many people are familiar with establishing a property boundary through meets and bounds, but using a MSL elevation is a more common method when bodies of water and flood levels are identified.

### WHY DOES IT MOVE?

- Unless the physical condition of the land changes, either through erosion or grading, the original property line for Spartanburg Water at Lake Bowen does not move. The 827' MSL contour was established by professional survey at the time Spartanburg Water purchased the parcels of property that makes up Lake Bowen (circa 1958-1961). This was accomplished using the "Sea Level Datum of 1929," the standard for all surveys during that time period.

### WHAT IS THE "DATUM OF 1929" AND WHAT DOES IT MEAN TO ME?

#### Sea Level Datum of 1929 (from Wikipedia)

- The Sea Level Datum of 1929 was the vertical control datum established for vertical control surveying in the United States of America by the General Adjustment of 1929. The datum was used to measure elevation (altitude) above, and depression (depth) below mean sea level (MSL).
- Since the Sea Level Datum of 1929 was a hybrid model, it was not a pure model of mean sea level, the geoid, or any other equipotential surface. Therefore, it was renamed the National Geodetic Vertical Datum of 1929 (NGVD 29) in 1973. NGVD 29 was superseded by the North American Vertical Datum of 1988 (NAVD 88), based upon an equipotential definition and a readjustment, although many cities and U.S. Army Corps of Engineers projects with established data continued to use the older datum.
- The 827' MSL contour line serves as the property line for Spartanburg Water-owned property, which was plotted using the Sea Level Datum of 1929. This was the Datum used by Spartanburg Water to acquire/purchase all of the original property that was purchased around Lake Bowen (circa 1958 – 1961). Additionally,

the Sea Level Datum of 1929 would be used as the basis for determining the location of the Spartanburg Water property line today.

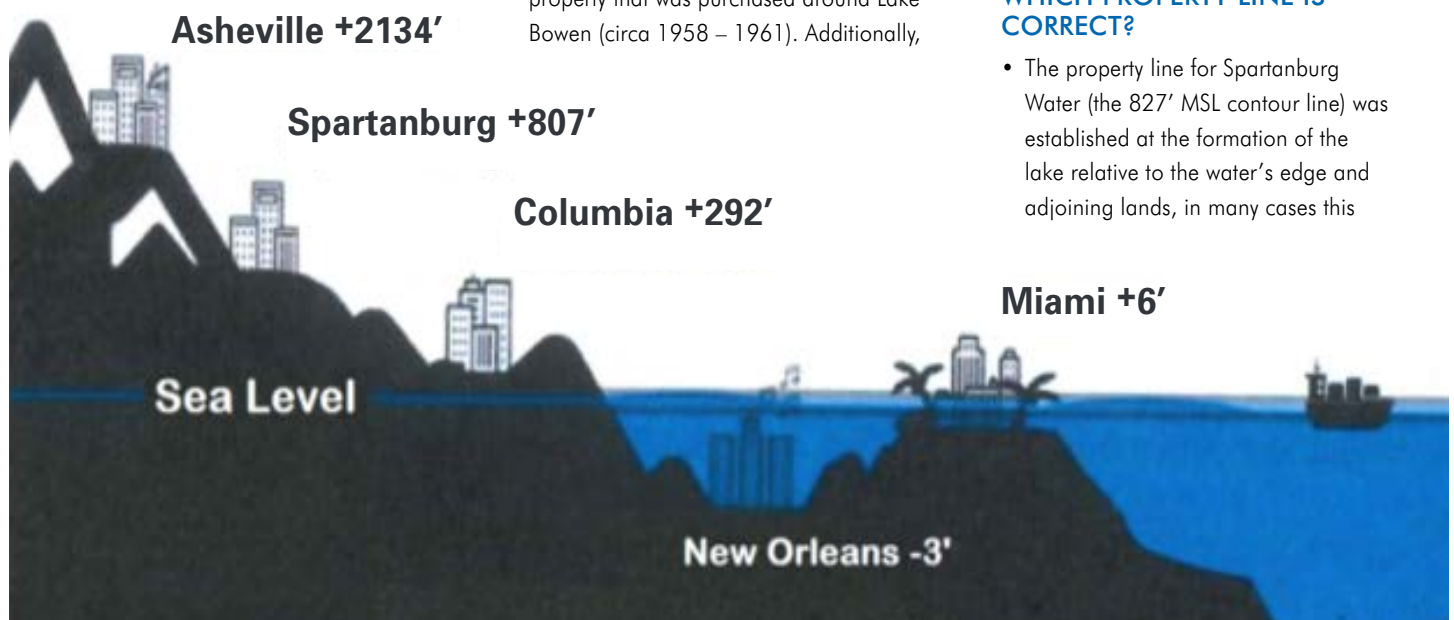
- When using the Sea Level Datum of 1929 as the basis for establishing the 827' MSL contour line, the property line for Spartanburg Water does not move unless the surface of the land has been altered by mechanical excavation or large-scale erosion.

### HAVEN'T THERE BEEN CHANGES AND MODIFICATIONS TO SURVEYING DATUM SINCE 1958?

- The Sea Level Datum of 1929 was renamed the National Geodetic Vertical Datum of 1929 (NGVD 29) in 1973, it was superseded by the North American Vertical Datum of 1988 (NGVD 88). However, when determining the location of a property boundary that was established prior to the NGVD 88 it is critical that the datum used in the original land transfer be used. Using only the NGVD 88 datum to determine the 827' MSL contour line as it was established in 1958, could lead to erroneous findings.

### MY DEED AND PLAT SHOW A PROPERTY LINE OTHER THAN THE MSL 827' CONTOUR LINE. WHICH PROPERTY LINE IS CORRECT?

- The property line for Spartanburg Water (the 827' MSL contour line) was established at the formation of the lake relative to the water's edge and adjoining lands, in many cases this





was completed prior to the creation of the adjoining residential lots. In some instances surveyors working specifically for an adjoining landowner will identify a property line connecting the lower lot property pins to create a lower (lake side) property line. If the plat with a lower property line is in conflict with the 827' MSL, the 827' MSL will prevail as the property line for Spartanburg Water, even if the other plat is recorded on public record. Spartanburg Water has original documentation that demonstrates the formation of the 827' MSL contour line as the boundary for Spartanburg Water.

- In the event you as an adjoining landowner have a need to survey your property, it is critical to make sure the independent surveyor locates and confirms the accurate location of the 827' MSL contour line using the NGVD 29 datum. Relying on the accuracy of existing data (historical plats and deed descriptions) or using the NAVD 88 datum may lead to errors and an inaccurate survey.

### **WHAT IF MY HOUSE OR A PORTION OF MY HOUSE IS BELOW THE 827' MSL CONTOUR LINE?**

- When someone places anything on property they do not own, it is viewed as an encroachment. Spartanburg Water addresses all encroachments when they are identified. To address existing residential structure encroachments, Spartanburg Water has created an Encroachment Agreement. This agreement when executed by both Spartanburg Water and the adjoining landowner gives the landowner an easement that allows the encroachment to remain in place "as-is." The adjoining landowner can maintain, repair and enjoy continued access to the encroachment.
- However, Spartanburg Water will not allow additional construction or renovations that increases the size of the encroachment in any way.

### **CONTINUED >>>**

"This is a great step forward in the renewal of our watershed, and the renewal of a great partnership," said Sue G. Schneider, Spartanburg Water's Chief Executive Officer. "The challenges we've faced have renewed our commitment to be a good partner, and to focus on the great opportunities before us."

### **MORE ON FISH RESTOCKING STRATEGY FROM ROSS SELF, SCDNR FISHERIES CHIEF**

"Following the release of the May 14-15, 2018 Lake Bowen and Municipal Reservoir #1 fish kill report by the South Carolina Department of Natural Resources (DNR), DNR and Spartanburg Water have initiated a series of meetings intended to ensure communications are improved and processes are established to reduce the chance of future fish mortalities associated with herbicide applications.

"Spartanburg Water has already implemented modifications to their herbicide application methods following the May 14-15 event and have successfully employed these new methods to apply herbicide with no additional fish losses.

"DNR is in the process of developing an evaluation protocol to assess the current condition of fish populations in Lake Bowen and Municipal Reservoir #1.

"The results of this assessment will be used to determine what restocking efforts are appropriate.

"Spartanburg Water and DNR will continue to work together to ensure the lakes are managed appropriately and continue to provide quality recreational opportunities for the public, while protecting our natural resources."

# Changes for the better:

## LISTENING, LEARNING AND THE PATH FORWARD

If there's one thing that we can all agree on, it's this: Change is hard. Spartanburg Water is dealing with difficult changes in the ecosystem, and those changes have challenged us to improve the way that we communicate with you, and all of our stakeholders.

Beyond the creation of this newsletter, our team has also made a commitment to provide more frequent updates about any lake management activities that may have an impact on you and your neighbors. Through the additional feedback that we've collected during the past few months, we launched a series of informational meetings that allowed us to start a new dialogue that will help us work together to protect water quality, ensure safety on the lakes, and recognize the important role that you play in the protection of the ecosystem.

These meetings have also lead to more changes—but the good kind. Our team took your questions, feedback and recommendations and used them to make improvements to our permitting process.

We heard you, loud and clear. You wanted a permitting process that was easy to follow and understand. These are the changes we made:

- Simplified Application Process: now, you only have to file one application—regardless of the number of permits requested.
- The permit application turnaround time has been reduced, in most cases, to less than two weeks.
- Our Private Structure Permit has been replaced with a simplified Land Access Permit. This standardizes the process for both Lake Bowen and Lake Blalock property owners.
- Dock maintenance that involves minor components of the structure can be performed without a permit but will require a Marine Structure Notification Form to be submitted. Examples of minor components includes the following: resurfacing of the dock, walkways, handrail installation, maintaining cables or floats, etc.
- Emergency dock repair that requires immediate mitigation may be done in advance of notification.
- Property owners, with permitted docks, desiring to add an unattached Personal-Watercraft Lift or Boat Lift will not be required to submit a drawing by a professional engineer. However, an application for permit is required for approval prior to installation.
- Only property owners of a Type "C" dock desiring to make any changes to the structural portion, including the installation of an attached Personal-Watercraft Lift or Boat Lift, will be required to submit an approved stamped drawing.

These changes were made through a partnership with you. Please get in touch with our team if you have any questions.

