

**TOWN OF WOLFEBORO
PLANNING BOARD
March 5, 2019
MINUTES**

Members Present: Kathy Barnard, Chairman, Vaune Dugan, Vice-Chairman, Brad Harriman, Selectmen's Representative Mike Hodder, Peter Goodwin, Susan Repplier, John Thurston Members.

Members Absent: Dave Alessandroni, Alternate.

Staff Present: Matt Sullivan, Director of Planning and Development, Cathleen LaPierre, Recording Secretary.

Chairman Barnard opened the meeting at 7:00 PM at the Wolfeboro Town Hall Great Hall.

I. Introduction of Board Members

Chairman Barnard introduced the members of the Planning Board and Staff.

II. Scheduled Appointments / Public Hearings / Public Forum

Norris Harriman and Rob West

Agent: Randy Tetreault LLS, CWS

Site Plan Review; Four-Bay Garage

Tax Map #176-20, Case #2019-06

Kathy Barnard stated she received an abutter notice as Vice Chairman of the Eastern Lakes Region Housing Collation who is an abutter to the Harriman property and asked if there were any objections should she continue.

There were no objections.

Brad Harriman recused himself.

Peter Goodwin noted he is a patron of Accidents Happen and asked if there were any objections to him continuing.

There were no objections.

Randy Tetreault stated the intent is to construct a one 40'x80', 4-bay garage building and reconfigure the site. He noted the business received a Use Variance and Dimensional Variance. The Use Variance is for potential expansion and 1 or 2 bays to be used as auto repair not just auto body. The Dimensional Variance involves the side setback towards the town property, being a residential zone has a 25' setback. The Variance does not give a number, the sketch provided shows 10' minimum. Therefore, we have kept to the sketch provided to the ZBA which was discussed at TRC. A letter of approval for expanded use was received today. There will be 17 parking spaces to meet the requirement and per discussion no increase encroachment of parking spaces into the front setback area. No additional signage is proposed but might add to the existing sign as was discussed with the ZBA. A dumpster will be used for solid waste disposal. No retail sales will occur.

Mike Hodder inquired if there is an ADA compliant parking space.

Randy Tetreault confirmed yes.

Mike Hodder asked if there is a letter or certificate showing it is ADA compliant.

Randy Tetreault replied that was something Matt Sullivan put in the planner review and Scott Lawler will supply.

Mike Hodder referred to the planner review regarding the 13' isle connecting the site as a one-way direction with parallel parking and stated confirmation is needed that *only* one-way use of this access is intended.

Matt Sullivan stated the applicant has since proposed this will be used as employee access only, although it won't be one-way, the applicant will put up signage that indicates its employee use only and this should be added to the conditions of approval.

Mike Hodder inquired about the septic system and it being evaluated.

Matt Sullivan noted the concern was raised late in the review process and stated the facilities aren't changing on site. The existing bathroom will remain, but one could assume the demand for the bathroom may increase if the use expands, the codes officer and septic reviewer are being consulted about the need to install a new septic system, a decision has not yet been made. However, this conversation can occur subsequent to the building permitting phase and believe the Planning Board does not need to review.

Randy Tetreault noted the site has town water and existing septic system for the standard size tank and stone pipe leach field. There are no showers, dishwashers etc., mostly the existing bathroom on existing system.

John Thurston asked how old the septic system is.

Randy Tetreault replied approximately 2-25 years old. Only a sink and toilet exist now, and the only question standing is how many use it.

John Thurston asked what a reasonable solution for a design would be.

Randy Tetreault replied possibly a 2-bedroom system but whether it's needed or not is to be determined.

Vaune Dugan questioned the construction details and where they apply.

Randy Tetreault responded he will let Scott Lawler come forward and discuss.

Kathy Barnard asked Matt Sullivan if he was comfortable with the parking and front setback.

Matt Sullivan stated he is comfortable with the revised plan.

Kathy Barnard asked if there were any conditions on the ZBA variance.

Matt Sullivan confirmed there were 8 conditions, 2 were unique 1) certification of the building footings, and 2) retail sales of gas are prohibited.

Kathy Barnard asked if the variance was just for the encroachment.

Matt Sullivan stated there were a few variances granted 1) for the use expansion 2) for the setback encroachment and 3) for the signage.

Scott Lawler reiterated what Randy Tetreault discussed regarding parking and paving. The storm water management designed will collect storm water from the rear of the building in a stone drip edge which will direct to water to a basin to control it. There will be building mounted lights, 2 on the front, 2 smaller lights on doorways and the existing spot light will be removed and replaced with down shielded lights, all lights will be dark-sky compliant. Diagrams are included along with a picture of what the lights looks like.

Kathy Barnard asked if the lights will be on all night.

Rob West confirmed the lights come on at night and turn off in the day.

Vaune Dugan asked to identify where the details on the detail sheet are applied; drip edge, gravel, and pavement.

Scott Lawler replied the stone drip edge will be installed on the rear of building, and it's been grated so one end is slightly elevated, he referred to the map and indicated where gravel and paving will occur.

Peter Goodwin asked about semipermeable pavement.

Scott Lawler replied the site is too small to warrant such and the maintenance would be high. The soils are also not good in this particular area and would not recommend.

Mike Hodder thanked applicant and agent for complying with the voluntary guidelines.

John Thurston asked if the gray area was sloped.

Scott Lawler confirmed it's sloped.

Matt Sullivan questioned which point of analysis is increasing in flow.

Scott Lawler replied it's just a slight adjustment in the gravel area.

Matt Sullivan stated he would not recommend site security but would recommend our engineer do a final inspection on the site and not hold financial security.

It was moved by Mike Hodder and seconded by Vaune Dugan to accept the application as complete. All members voted in favor. The motion passed. 6-0.

Kathy Barnard opened the public hearing for comments.

Matt Sullivan questioned the spaces shown as parallel on the back of the lot, if the parking is feasible.

Rob West confirmed it works.

Kathy Barnard asked if 1 handicap parking space is enough.

Scott Lawler replied the ADA requires up to 1 parking space for 25 parking stalls, we are at 17; therefore, 1 is adequate.

John Thurston asked if it was van accessible.

Scott Lawler confirmed yes.

Matt Sullivan read the following 8 conditions of approval and noted 4 additional conditions:

1. The following plans, as amended to the date of this approval are incorporated into the approval:

Plan 1.Cover Sheet, Accidents Happen Autobody., Owner: Norris B. Harriman, P.O. 148, Wolfeboro, NH; Applicant: Accidents Happen Autobody, 55 Pine Hill Road, Wolfeboro, NH, 03894, Tax Map 176 Lot 020 prepared by Norway Plains Associates, Inc., 2 Continental Boulevard, Rochester, NH 03867. Dated January 2019

Plan 2.Existing Features, Accidents Happen Autobody., Owner: Norris B. Harriman, P.O. 148, Wolfeboro, NH; Applicant: Accidents Happen Autobody, 55 Pine Hill Road, Wolfeboro, NH, 03894, Tax Map 176 Lot 020 prepared by Norway Plains Associates, Inc., 2 Continental Boulevard, Rochester, NH 03867. Dated January 2019

Plan 3.Overall Site Plan, Accidents Happen Autobody., Owner: Norris B. Harriman, P.O. 148, Wolfeboro, NH; Applicant: Accidents Happen Autobody, 55 Pine Hill Road, Wolfeboro, NH, 03894, Tax Map 176 Lot 020 prepared by Norway Plains Associates, Inc., 2 Continental Boulevard, Rochester, NH 03867. Dated January 2019

Plan 4. Site Layout Plan, Accidents Happen Autobody., Owner: Norris B. Harriman, P.O. 148, Wolfeboro, NH; Applicant: Accidents Happen Autobody, 55 Pine Hill Road, Wolfeboro, NH, 03894, Tax Map 176 Lot 020 prepared by Norway Plains Associates, Inc., 2 Continental Boulevard, Rochester, NH 03867. Dated January 2019

Plan 5. Grading and Drainage Plan, Accidents Happen Autobody., Owner: Norris B. Harriman, P.O. 148, Wolfeboro, NH; Applicant: Accidents Happen Autobody, 55 Pine Hill Road, Wolfeboro, NH, 03894, Tax Map 176 Lot 020 prepared by Norway Plains Associates, Inc., 2 Continental Boulevard, Rochester, NH 03867. Dated January 2019

Plan 6. Construction Details, Accidents Happen Autobody., Owner: Norris B. Harriman, P.O. 148, Wolfeboro, NH; Applicant: Accidents Happen Autobody, 55 Pine Hill Road, Wolfeboro, NH, 03894, Tax Map 176 Lot 020 prepared by Norway Plains Associates, Inc., 2 Continental Boulevard, Rochester, NH 03867. Dated January 2019

Plan 7. Lighting Plan, Accidents Happen Autobody., Owner: Norris B. Harriman, P.O. 148, Wolfeboro, NH; Applicant: Accidents Happen Autobody, 55 Pine Hill Road, Wolfeboro, NH, 03894, Tax Map 176 Lot 020 prepared by Norway Plains Associates, Inc., 2 Continental Boulevard, Rochester, NH 03867. Dated January 2019

Plan 8. Building Elevations, Accidents Happen Autobody., Owner: Norris B. Harriman, P.O. 148, Wolfeboro, NH; Applicant: Accidents Happen Autobody, 55 Pine Hill Road, Wolfeboro, NH, 03894, Tax Map 176 Lot 020 prepared by Norway Plains Associates, Inc., 2 Continental Boulevard, Rochester, NH 03867. Dated January 2019

2. The applicant shall be responsible for the payment of all recording fees.
3. All final plans to be originally stamped by a Certified Wetlands Scientist, Licensed Land Surveyor, and Professional Engineer.
4. All of the documentation submitted in the application package by the applicant and any requirements imposed by other agencies are part of this approval unless otherwise updated, revised, clarified in some manner, or superseded in full or in part. In the case of conflicting information between documents, the most recent documentation and this notice herein shall generally be determining.
5. The approval is subject to the receipt of all federal, state, and local permits including NHDOT Driveway Permit Approval
6. The drainage report shall be stamped by a Professional Engineer.
7. Minimum building height information shall be removed from the planset and replaced with maximum building height information.
8. Installation of erosion control measures and inspection by the Town prior to any construction activities.
9. The applicant's engineer shall submit a letter certifying compliance with the American's With Disabilities Act.
10. Signage to be added to the plan and installed indicating the access to Beck Drive is for employee use only.
11. Construction observation agreement to be signed with the town for one final inspection with the towns engineer or their designee.
12. Final plan set reflect the removal of the 2 parking spaces adjacent to 109A.

John Thurston stated he would like to have a discussion on whether a plan should be on file for the septic system if it's 25 years old.

Mike Hodder stated the Planner mentioned there will be a review by the codes officer and asked if that wouldn't be enough.

Matt Sullivan stated it's reasonable for the Board to add a condition requiring a design be done if necessary, based on the age of the septic.

Mike Hodder questioned if the Board should write the condition so there is a condition upon a finding by the code officer and asked if by doing so whether it would impose additional cost upon them.

Matt Sullivan responded it's possible that would impose additional cost.

John Thurston noted he wanted his concern for the age of the septic system on record.

Matt Sullivan stated it will be determined relatively soon as it's being looked at currently.

Peter Goodwin pointed out there is a property adjacent and if needed a new system could be added.

Randy Tetreault stated according to record that sized system qualifies based on what the business is using it for.

Mike Hodder noted the importance to follow the system and not place an additional condition.

There being no comments or questions from the public, Kathy Barnard closed the public hearing.

It was moved by Mike Hodder and seconded by Kathy Barnard to approve the application with the 12 conditions for Norris Harriman and Rob West, Site Plan Review, Tax Map #176-20, Case #2019-06. All members voted in favor. The motion passed. 6-0.

Sonja Kinzmaier

Agent: Peter Cooperdock C.W.S.

Special Use Permit

Tax Map #243-060, Case #2019-05

Brad Harriman returned.

Matt Sullivan noted Peter Cooperdock just received his planner review, has not seen it prior to now and will cover everything in his comments.

Peter Cooperdock stated the property is located at 9 Fairway Drive, abuts the golf course, is 1 of 25 lots, is just shy of an acre, on a cul-de-sac with 75' frontage and street channel down the center of the lot with associated wetland areas. There is need to cross wetland, this site went before the Planning Board for a Special Use Permit back in 2004 and was denied. This was due to the house being larger and the setback from the wetland was 50' now it's 30' and can now get a building more comfortably into the area proposed. The purpose of tonight's meeting is for the wetland impact and impact to the buffer zone. The Wetland Bureau issued a permit for this crossing, a 24" culvert is proposed with headwalls over the intermittent stream, the lot is serviced by town water and sewer which will (along with the electric) be located underground to the house. The direct wetland impact is 400 sq. ft. while the permanent buffer impact is 2,820 sq. ft. The grass strip outlined adjacent to the driveway will assist with further runoff.

Kathy Barnard inquired about the variance.

Peter Cooperdock replied it was granted a zoning variance, it did go to ZBA because of the wetland and the stream channel as it would be impossible to comply with the front setback.

Kathy Barnard asked to touch on construction maintenance methods to avoid detrimental impact to the wetlands.

Peter Cooperdock replied there are multiple components, there is erosion control set up and the 3 types outlined on the plan include: the buffer area, which will be maintained as is, the building itself will be constructed with drip line trenches, and the grass strip along the roadway will protect it as well.

Kathy Barnard asked if there were comments from the Conservation Commission.

Peter Cooperdock responded yes, back in April 2, 2018, same list of concerns as listed and addressed on the wetlands permit.

Kathy Barnard replied this memo received was March 4th.

Peter Cooperdock clarified it's the same the April 2nd list and offered to go through the comments.

Matt Sullivan added the wetlands permit review from the state goes through the Conservations Comments, they did make comparable comments and suggested going through the comments.

Peter Cooperdock stated the survey should be removed, no drainage calculation has been done as they are not needed due to the size of the culvert.

Peter Goodwin asked if there is a culvert underneath the driveway.

Peter Cooperdock replied yes, it's proposed.

Matt Sullivan questioned if the 18" culvert is functioning properly.

Peter Cooperdock replied he has seen no evidence is it not, but it is 30 years old.

John Thurston asked if this lot was ever considered a common lot for that subdivision.

Peter Cooperdock replied no it is not and provided a copy of the subdivision and deed for the lot.

Vaune Dugan asked if there is a line to show where erosion control is.

Peter Cooperdock replied it is the S-S line.

Mike Hodder questioned the S meaning.

Peter Cooperdock stated it stands for silt fence.

Mike Hodder noted the importance of clear abbreviations as its difficult to follow.

Vaune Dugan asked why the stream wasn't crossed as its narrowest point, then come in on the strip along lot line to the west, cross the stream directly, then go down the green out of the buffer area right at the door to the garage to avoid backing into the garage. Less wetlands buffer would be crossed if done in a S as opposed to a C.

Peter Cooperdock stated he couldn't disagree, but have not done the calculations, the design was based on the original design and made it work where the wetland application was approved.

Vaune Dugan noted it would be less impacting if done this way.

Mike Hodder referenced 175-10 B-2 and noted Peter Cooperdock is now are stating there might be an alternative proposal that might be less detrimental.

Peter Cooperdock stated he couldn't disagree until he did the calculation; however, there might not be less impact and is happy to explore.

Kathy Barnard asked if he would like to continue on with the Conservations Comments.

Peter Goodwin noted his concern for silt control.

Peter Cooperdock stated he is attempting to design a house with best possible erosion control.

Kathy Barnard asked if he was willing to look at another alternative.

Peter Cooperdock replied yes.

Kathy Barnard asked if the Board could accept the application as complete.

Matt Sullivan replied acceptance of the application as complete does not say that it must meet the criteria in 175-10; therefore, the Board could accept the application as complete.

Mike Hodder asked if the applicant could submit an amended application.

Matt Sullivan replied yes and suggested it be clear that he/she are continuing on a specific reason which is that an alternative design proposal has been discussed.

Kathy Barnard noted all the issues need to be addressed.

Matt Sullivan stated the NHDES wetland permit would also need to be amended and recommended a continuance of a month.

Peter Cooperdock asked if that would be needed before the hearing.

Mat Sullivan stated it is up to the Board and could be a condition of approval.

Peter Goodwin stated the suggested way to have the crossing on that shorter sections may have more impact the wetland because of the width of the driveway and other spaces. That Crossing is not wide enough.

Mike Hodder stated that may be the case, but it hasn't been looked at and asked Peter Cooperdock to pay close attention to the ordinance. He noted alternative locations were not addressed.

John Thurston questioned a trench drain.

Peter Cooperdock stated an alternative is to put gutters on the building.

Matt Sullivan suggested another alternative involves placing under drain with an outlet to a rain garden.

Vaune Dugan stated the other thing not showing is driveway grade; it's not indicated. It would be good to know where the retaining wall is.

John Thurston stated his concern is at some point you might have a buyer with a wet basement.

Peter Cooperdock suggested adding some finished grades with an outlet and possibly raise the house up to help.

It was moved by Mike Hodder and seconded by John Thurston to accept the application as complete. All members voted in favor. The motion passed. 7-0.

Kathy Barnard opened the public hearing for comments.

Russell MacCabe an abutter to the project, is concerned for the rain that will run across Fairway Drive as it will flood. He questioned if the town will repair the end of the pipe that is currently rusted. He is concerned for the trees and rocks that get in and potentially jam up the headwall.

Dan Coons stated the stream contains water for 9 months of the year, the 18" culvert that is currently under the road is undersized resulting in back up and causing it to pass over the road instead of through it. Also resulting in issues upstream.

Matt Sullivan stated in anticipation of the meeting to be held he will find out what the appropriate size of the culvert would be and if it's already being under sized in future plans going forward.

John Thurston asked Dan Coons would it be beneficial to cross the wetland instead of the stream.

Dan Coons replied he couldn't say without seeing it in the spring.

Mike Hodder questioned if the Conservation Commission could take a second look at it when the timing is right.

Matt Sullivan stated yes that would be appropriate.

Vaune Dugan stated she would like to see grading on the next plan.

Peter Cooperdock requested a continuance.

Matt Sullivan stated a month from now the meeting would be the April 2, 2019 at 7pm here in the Great Hall.

It was moved by Mike Hodder and seconded by Vaune Dugan to continue the application to April 2, 2019 for Sonja Kinzmaier, Special Use Permit, Tax Map #243-60, Case #2019-05. All members voted in favor. The motion passed. 7-0.

Matt Sullivan stated there will not be a second notice sent out.

There being no comments or questions from the public, Kathy Barnard closed the public hearing.

III. Public Comment

N/A

IV. Action Items

N/A

V. Communications & Miscellaneous

Distribution of Draft Master Plan Chapters

Matt Sullivan noted all the chapters are very different and feel it's a nice feature and well done.

Mike Hodder asked if there was still time to make changes.

Matt Sullivan confirmed yes.

Cyanobacteria

John Thurston presented information to the Board regarding Cyanobacteria, see attached.

NHDOT/Public Works Crosswalk Letters

Matt Sullivan stated Dave Ford wanted to inform folks of the 3 crosswalks adjacent to the Write Museum. DOT is interested in consolidating them into one crosswalk and having a rapid flashing beacon. He noted being resistant to that approach due to the businesses in that area and parking lots and are pushing DOT not to consolidate.

John Thurston asked where the 3 are located.

Matt Sullivan replied the 3 are located at the Write Museum, between Blacksmith and Seabird and also along the railroad track. The proposed is to bring it to where the railroad crosses and eliminate the other 2 and the concern is folks will still cross in those locations.

Mike Hodder asked if there are laws.

Matt Sullivan stated they have ultimate authority and asked Brad Harriman to comment.

Brad Harriman confirmed DOT has the final say on location of all cross walks and have a certain criteria they adhere to but hope they will take all input into consideration.

Kathy Barnard questioned who originally approved the cross walks.

Brad Harriman replied sometimes they can be grandfathered in, they've always been there but we are taking new standards and forcing them in there.

Chamber of Commerce Letter

Mike Hodder referenced the 2nd paragraph of the letter and stated he was not as taken as others might have been as the Board described why this wasn't approved/recommended and thought it was understood by COC Members. The letter suggests this is still an issue. He suggested the COC present to the Board areas of town they feel are most suitable for future businesses that are not currently zoned for future business or have some zoning issue in their mind and provide reasons as to why they feel those areas are appropriate for future businesses. And what the Board could or couldn't do to change the zoning through warrant articles to accommodate those locations. This would help all to work together on this project.

Kathy Barnard stated this has been discussed for the work program.

Matt Sullivan confirmed, the Future Land Use chapter might shed some light on where the Board could go. Filter Bed is not off the table, but simply those properties were not properly considered in the proposal.

Kathy Barnard stated at the end of the petition warrant article she mentioned the Board would think about looking at that area because there is some redevelopment taking place.

Mike Hodder stated given the low turnout the Board might want to first reach out to the residents in the area.

Matt Sullivan suggested individually inviting residents.

John Thurston suggested the COC attend when an applicant is coming forward and speak to their behalf upon doing research.

The 25th Annual Spring Planning and Zoning Conference will be held on Saturday, June 1, 2019

Matt Sullivan highly recommends this conference to both new members, those who have a year or maybe 10 years as it's always beneficial to hear what the current zoning and planning issue are in the state of NH.

Kathy Barnard asked if there is an agenda.

Matt Sullivan stated not as of yet; possibly later in March or April.

Capital Improvements Committee

Matt Sullivan stated he will be posting a notice looking for one other member to join the Capital Improvements committee and folks will see notice in the paper and online. He asked if anyone has someone in mind to please advise. He also spoke with the business administrator at the school, asked for recommendation and will have a name to speak with to include the school in the CIP.

VI. Work Session

N/A

VII. New Business

Rezoning Committee Discussion/Consideration of Appointment

Matt Sullivan stated he'd like a smaller committee to work on some of the zoning issues before the Board i.e. parking and lighting standards, landscaping and smaller zoning changes. No decision is needed tonight but believe this approach would work well. In line with Mike Hodder's recommendation he suggested possibly a member of the Planning Board, a Zoning Board member, and 2 staff members.

Mike Hodder suggested Matt Sullivan, Planning Board Chair and member, ZBA Chair Fred Tedeschi or other member to know where zoning breaks, Terry Tavares who maintains the data base and Corey Ryder.

Matt Sullivan asked if the Board would like to bring forward a motion.

It was moved by Mike Hodder and seconded by John Thurston to appoint a Zoning Committee to be comprised of a Planning Board Chair, Zoning Board Chair, Planning Board Member, Director of Planning and Development, and Code Enforcement Officer. All members voted. The motion passed. 7-0.

Discussion of Public Hearing for Adoption of Landscaping Standards to Site Plan Review Regulations

Matt Sullivan stated there is a zoning change before the voters to remove the existing landscaping standards from the zoning ordinance and replace them in the site plan review regulations. The second step has not been completed and would like the Board to schedule a public hearing with appropriate notice to adopt existing landscaping standards into site plan review regulations. He noted there might be changes, but once they go into the site plan review regulations the Board can make changes at a later time.

John Thurston stated there isn't an issue adopting these and making changes later as there are some needed adjustments.

Kathy Barnard asked when the public hearing will occur.

Matt Sullivan replied April 2nd in order to meet the deadlines.

VIII. Approval of Minutes

February 19, 2019

Corrections: page 7, paragraph 20, strike Ripwater and replace with Drinkwater on all accounts.

All pages referencing Rick Segar, strike Segar and replace with Sager

It was moved by Mike Hodder and seconded by Peter Goodwin to approve the February 19, 2019 Wolfeboro Planning Board minutes as submitted. All members voted in favor. The motion passed. 7-0.

IX. Planning Board Subcommittee Reports

N/A

It was moved by Kathy Barnard and seconded by Vaune Dugan to adjourn the March 5, 2019 Wolfeboro Planning Board meeting. All members voted in favor. The motion passed.

There being no further business, the meeting adjourned at 9:15 PM.

Respectfully Submitted,

Cathleen LaPierre

Cathy LaPierre

*****Please note these minutes are subject to amendments and approval at a later date. *****



<https://hgic.clemson.edu/>

CYANOBACTERIA: UNDERSTANDING BLUE-GREEN ALGAE'S IMPACT ON OUR SHARED WATERWAYS

Factsheet | HGIC 1858 | Published: Aug 26, 2015

In August 2014, news outlets across the country reverberated with the shocking story that a large harmful algal bloom in Lake Erie had produced a dangerous toxin (microcystin) that threatened the drinking water supply for over 500,000 people in the Toledo, Ohio area (Zimmer, 2014). The occurrence of this type of algal bloom, called cyanobacteria or blue-green algae, is not an isolated event. Cyanobacteria have impacted much of our South Carolina surface waters and some water systems as well. With the frequency of these harmful algal blooms increasing across the nation, South Carolina residents can take action to prevent harmful algal blooms and protect our shared waterways.

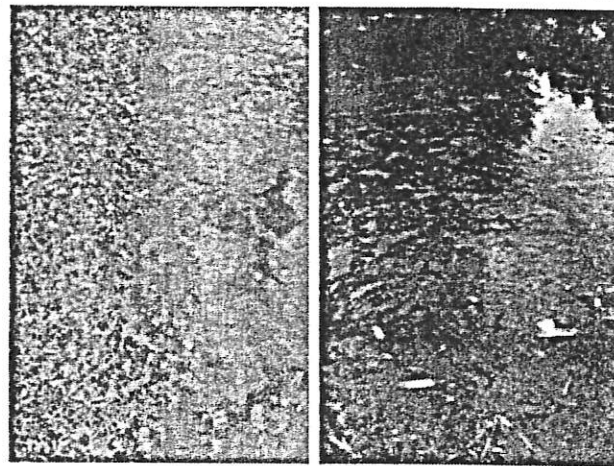


Figure 1. Cyanobacteria blooms often have a telltale bright bluish or green coloration, giving them the name "blue-green algae". Dense blooms may resemble what looks like paint on the water's surface, as seen in the photo on the right. Photos courtesy Hillary Repik.

What are cyanobacteria/blue-green algae?

Cyanobacteria, sometimes referred to as blue-green algae, share characteristics with both algae and bacteria. Cyanobacteria are closely related to true bacteria, but perform photosynthesis like algae to gain or fix energy, and in turn, produce oxygen. Cyanobacteria are among the oldest organisms on earth and occur in diverse habitats, including both soil and water. In water, cyanobacteria are naturally present in small numbers in slow-moving fresh or brackish water bodies. However, when waterways become enriched with nutrients, naturally or due to human-related activities, this is called eutrophication. This increased concentration of nitrates and phosphates can lead to rapid and explosive growth of cyanobacteria. This rapid growth is called a bloom. Cyanobacteria blooms will typically occur on the surface of a waterbody and vary in color, often looking bright green to blue-green, and may be dense enough to resemble paint on the water's surface (see Figure 1).

All algal blooms have the potential to negatively affect the health of a waterway through the depletion of available oxygen in water for aquatic and marine life. Low dissolved oxygen

levels can lead to fish kills; when this condition persists, the result is "dead zones," where oxygen in water is so low that aquatic life is suffocated and very little life exists.

Cyanobacteria blooms have been labeled "harmful algal blooms" because they can release toxins into waterways as cyanobacteria cells die and breakdown. Of the 2,000 species of cyanobacteria that have been identified, more than forty of these have the potential to release toxins, called cyanotoxins, into the environment (Percival et al., 2014).

- These cyanotoxins can impact human and animal nervous systems and liver, irritate skin, cause gastrointestinal issues and contribute to the development of tumors.
- Human and animal exposure to cyanotoxins can occur through accidental ingestion, direct contact or inhalation.
- Documented cases of cyanotoxin poisonings and illness in animals and humans date back to the mid-1800s, with the frequency of occurrence increasing (Carmichael, 2001).
- The increased incidence of harmful algal blooms not only impacts human and animal health, but can also impact recreation, access to clean drinking water as seen in Toledo, Ohio, fishing and shellfishing, our economy, and ultimately our quality of life (CAST, 2014).

Why are cyanobacteria blooms happening in South Carolina?

Cyanobacteria blooms may occur under low flow, warm temperature, adequate light and sufficient nutrient conditions. Our community can play a significant role in introducing nutrients to our ponds, lakes, streams, and rivers. If not managed, nutrients carried in runoff from residential and agricultural activities can be transported to the nearest waterway, contributing to cyanobacteria growth. Runoff from landscaping and lawn care activities may have been the cause of eutrophication in a series of South Carolina coastal stormwater ponds that resulted in over 200 harmful algal blooms between 2001-2005, with cyanobacteria being the most abundant species present in the ponds studied (Lewitus et al., 2008).

Blooms like these are not limited to our South Carolina stormwater ponds, and can occur on agricultural ponds, in rivers and streams, reservoirs, and elsewhere. Farmers have lost valuable livestock to harmful algal blooms in agricultural ponds (Hanie et al., 2014).

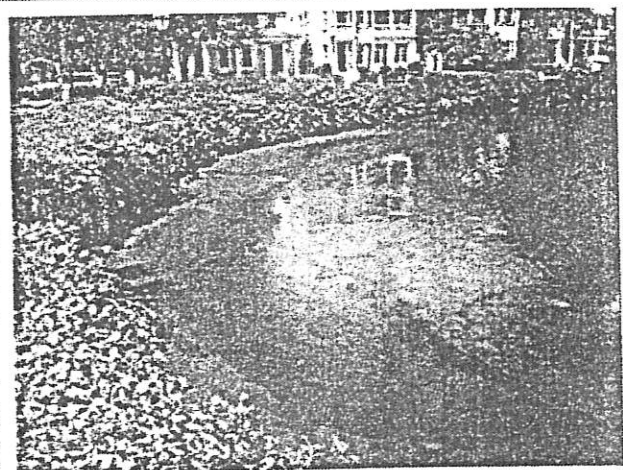


Figure 2. Nutrients in runoff contributed to a cyanobacteria bloom in a community stormwater pond. This pond ultimately drained to a nearby tidal creek. How could this bloom have impacted the surrounding community and downstream creek? What actions could this community have taken to help prevent the bloom from occurring?

Photo courtesy Sara Pachota.

To understand why harmful algal blooms are occurring and to be better prepared to manage and prevent future occurrences, individuals should be proactive by reporting blooms, as well as taking action to manage runoff from your yard, farm or pond.

In case of a bloom, what should I do?

- While chemical treatments are available to help control the presence of cyanobacteria following a bloom, these treatments may not reduce the overall level of toxin that has been released in the water (Greenfield et al., 2014). If you think a harmful algal bloom has occurred in your pond system or nearby waterway, contact the South Carolina Department of Health and Environmental Control and South Carolina Algal Ecology Laboratory as soon as possible.
- Avoid contact with water and do not swim, boat or fish in the area. Use caution when walking along shorelines. Keep an eye on all pets and livestock and prevent them from drinking or accessing the water.
- It is important to avoid exposure to harmful algal blooms. If you have been exposed to water where a bloom has occurred, shower or bathe as soon as possible and contact your healthcare professional. Symptoms of initial exposure can appear flu or allergy-like.
- If a bloom occurs in your stormwater pond, you should also alert your homeowners association and/or neighborhood. In general, because stormwater ponds are used to help treat stormwater runoff, it is a good rule of thumb to implement a "No Swimming" policy in your pond at all times.

How can I prevent cyanobacteria blooms from occurring?

We can all play a part in minimizing nutrient runoff to our waterways and the occurrence of cyanobacteria and other harmful algal blooms. Whether in your yard or at your farm, consider the following tips in your nutrient management plan:

- Be sure to properly dispose of pet waste in your yard or on the sidewalk. Bag and trash waste for pickup or consider installing a pet waste digester.
- If you own livestock, limit access to waterways by using exclusion fencing. Install a pump system to move water from your pond to water troughs
- Whether you're a home gardener or farmer, it's important to be mindful of your fertilizer applications. Have a soil test performed and follow directions for application. Store fertilizers properly, keeping under cover and sealed. When possible, maintain a no-fertilizer zone along shorelines, to decrease the likelihood that fertilizers will be transported with runoff to the nearest waterbody.
- If you own a septic tank system, have your system inspected and pumped if needed every three to five years. Be mindful of what you put down the drain, limiting solids and kitchen fats and grease.
- If you live along a waterway, establish a buffer of native plants, trees and grasses to help reduce, slow and filter runoff before it reaches the water. To achieve maximum benefits, try to maintain as wide a buffer as possible. Use the Clemson publication, *Life at the Water's Edge*, for assistance in designing, planting and maintaining your buffer (*Life at the Water's Edge*, by Dr. Lin Roth, 2004).

- If you have turfgrass in your yard, be mindful of grass clippings. For proper disposal, leave clippings in place to return beneficial nitrogen back to the lawn. You can also try composting clippings in your yard or through your community pick-up service. Don't blow clippings into the waterway, street, ditch or storm drain. Visit the Home and Garden Information Center website for more tips on lawn and garden maintenance.
- If you own a stormwater pond, keep up with regular inspection and maintenance to identify issues before they become a serious problem. Use Carolina Clear's website to access inspection and maintenance forms and other pond management resources to assist you in maintaining a healthy and functioning pond system.
- Share this information with family, friends and your local community. Help prevent cyanobacteria and other harmful algal blooms by discussing ways each yard owner can manage nutrients in runoff. Through our joined community effort, we can make a difference in protecting waterways for today and future generations of South Carolinians.

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