

Harmful Algae Blooms: **A TOOL KIT FOR KANSAS LOCAL** **HEALTH DEPARTMENTS**



**WHEN IN DOUBT
STAY OUT**

www.kdheks.gov/algae-illness/index.htm

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Healthy Kansans living in safe and sustainable environments

March 26, 2015

This document has been developed as a resource for local health departments to assist with HAB response in their communities.

Children are at highest risk for HAB related illness.



INTRODUCTION

Goals:

- Support local health department's response to HAB
- Provide a guide for reporting of HAB cases
- Assist local health departments with information of where to go when HAB questions are presented



Tool Kit Components

- What is a HAB? Pg 4
● This section was developed to provide general information about Harmful Algae Blooms.
- HAB Season Pg 4
● Knowing when HAB most commonly occur can assist local health departments meet the needs of the public.
- Health Effects Pg 5
● This section includes a straightforward description of common symptoms associated with blue-green algae exposure and may be used as a guide to determine if contact with a HAB occurred.
- Reporting Human and Animal Illness Pg 6
● This form, available on the HAB web page, is used to report human illness or death that may be related to exposure to blue-green algae. HAB events also affect pets and KDHE has an online reporting form for illness or death of animals.
- Role and Response of KDHE Pg 7
● This section provides information regarding KDHE monitoring efforts and the determination of lake status reports.
- How to Avoid HAB Exposure Pg 8
● Illness can be avoided using these tips and recommendations.
- Who to Contact with HAB Questions Pg 9
● Key contact information regarding health issues is included in this section.
- KDHE HAB Guidance Document Pg 10
● The KDHE HAB policy information regarding monitoring, lake status level, procedures and expectations of KDHE staff and partners.
- SIGNAGE Pg 14
● Examples of signs to be used when posting status levels at lakes.
- Jar Test Pg 15
● Step by step instructions on how to see if a privately owned water body may have a HAB.
- Additional Resources Pg 20
● Other websites and references available online for further information regarding HAB's.

What is a Harmful Algae Bloom or HAB?

Cyanobacteria, also known as blue-green algae, are present in Kansas waters and, under certain conditions; HAB will produce toxins that pose a health risk to people and animals. Blooms are an emerging public health issue in Kansas. In 2011, Kansas experienced a number of HAB involving 39 reported water bodies and in 2012, 40 water bodies were sampled for HAB's, in 2013 there were 24 water bodies, and in 2014 – there were 28. In the following document the terms public lakes and public water bodies are used interchangeably.



Historically, numerous human illness and dog deaths were reported. Recently, with an increased awareness of HAB's, fewer human illnesses and dog deaths have been reported.

Large accumulations of blue-green algae or HABs can release toxins and contribute to human and animal health problems, however, not all blooms produce toxins. Visible blooms may be harmless, and harmful blooms may not be obvious to the untrained observer. Cyanotoxins are a diverse group of chemical substances that are categorized by their specific toxic effects. Depending on the cyanobacteria genera, water conditions, and other factors, specific toxins produced include: neurotoxins (affecting the nervous system), hepatoxins (affecting the liver), dermatotoxins (affecting the skin) and lipopolysaccharides (chemicals that can affect the gastrointestinal system). These toxins are mostly released to the water as the bacteria are stressed or die. Both humans and animals can experience illness from exposure to these toxins during recreational activities and other water uses.

HABs and their toxins in freshwaters have been implicated in human and animal illness in at least 36 states in the United States. The greatest risk of adverse human health effects appears after exposure to activities such as swimming and skiing. Adverse health effects can vary and are dependent upon the type of toxin and route of exposure. Contact with high concentrations of HAB, independent of the level of toxins, may also cause adverse health effects. The most common complaints after recreational exposure include vomiting, diarrhea, skin rashes, eye irritation and respiratory symptoms.

There is no specific antidote available. Treatment is aimed at early detection, control of symptoms and supportive care. Diagnosis in humans is usually based on clinical signs and symptoms, a history of exposure within a reasonable time to waters with a confirmed HAB event, and the absence of another cause of illness.

Typically, HAB issues arise in May or June and continue through October. It coincides with the longest periods of light and warmest water temperatures. Summer and fall includes three holidays which include high numbers of visitors to public recreational water bodies:

● Memorial Day

● Independence Day

● Labor Day

Health Effects: Exposure and Clinical Presentation

Route of Exposure	Signs and Symptoms	Time to symptom onset	Differential Diagnosis
Hepatotoxins: Swallowing water contaminated with cyanobacteria or toxins	Elevated ALT Gastroenteritis Acute hepatitis Kidney toxicity Malaise Headache	Minutes to hours	Other hepatotoxin poisoning, other microbial infections/toxins
Neurotoxins: Swallowing water contaminated with cyanobacteria or toxins	Tremor Diarrhea Motor weakness Respiratory paralysis vomiting	Minutes to hours	Pesticide poisoning, other toxic poisoning
Dermatotoxins: Skin contact with water contaminated with cyanobacteria or toxins or contact with animals contaminated with cyanobacteria	Itchy Skin Red Skin Hives Skin Blistering (including lips) Allergic Reactions	Minutes to hours	Other dermal allergens. Non-allergic urticaria, photosensitivity reactions
Inhaling aerosolized droplets contaminated with cyanobacteria or toxins	Sore Throat Congestion Cough Wheezing Upper respiratory irritation Rhinitis Possible allergic reaction	Unknown, but likely an acute reaction	Other airborne allergens, upper respiratory infection, flu

Reporting HAB-Related Human Illness

Use the Kansas Department of Health and Environment Human Algae Illness Reporting form to report a human illness that may be related to blue-green algae. The form is found online by going to <http://www.kdheks.gov/algae-illness/index.htm>

In order to protect the health of all Kansas residents and visitors, KDHE encourages all health care providers with knowledge of a confirmed, probable, or suspect case of HAB-related illness to report this information to the agency. Cases can be reported via the Internet (<http://www.kdheks.gov/algae-illness/index.htm>), by telephone (877-427-7317), or by email (epihotline@kdheks.gov).

Reporting HAB-related Animal Illness

Reports of suspected domestic animal illness associated with exposure to HAB are reported to KDHE using the online reporting form. Animals often serve as sentinels for human illness. The Kansas Department of Health and Environment requests a report of any suspect, probable, or confirmed case of blue-green algae poisoning in animals be made to the Epi Hotline or the online reporting form or email. The online form is located on the agency's website at www.kdheks.gov/algae-illness/index.htm. Local health departments receiving reports from veterinarians can also contact the KDHE Epi Hotline at 877-427-7317 or by email at epihotline@kdheks.gov.

Role of Kansas Department of Health and Environment

The KDHE does not routinely monitor all water bodies in the state for HABs but responds to all HAB-related complaints submitted to the agency. Based on test results of public water body samples, KDHE will recommend whether a lake should be under a Watch or a Warning status. In rare cases where HAB represent an extreme threat to the health of the public, KDHE may recommend the closure of a lake.



Sample bottles ready for counting



Staff completing analysis on sample

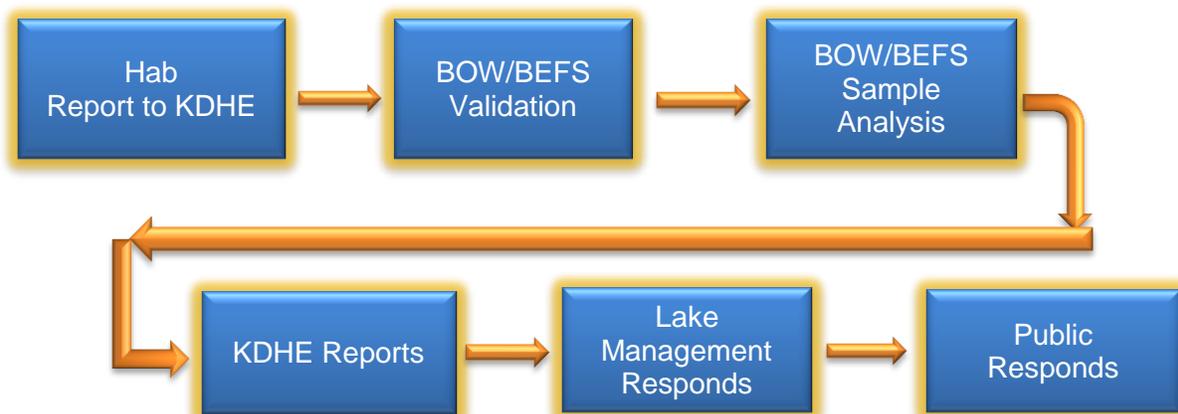
KDHE Response to HAB Reports

- Suspected HAB in a public recreational lake is reported to KDHE
- KDHE contacts lake management and coordinates sample collection
- Samples are collected at predetermined locations identified as “most frequently used points of public access”
- Samples are transported to KDHE central office for enumeration and analysis
- Public health threat is assessed
- Proper response is issued

KDHE’s response to a HAB event involves four bureaus including: Epidemiology (BEPHI), Environmental Field Services (BEFS), Water (BOW), and the Office of Public Information. The collection, analysis, and reporting of just a single sample may require the efforts of more than 10 staff.

KDHE performs sampling of recreational water bodies for cyanobacteria once a complaint is validated. Water samples are then analyzed to quantify cells and toxins. Most of the toxins require specialized testing. KDHE has the capability to test for microcystin toxin and to quantify and identify the type of cyanobacteria present. Once a HAB has been properly identified in a Kansas public lake, KDHE will recommend to the lake’s management that the lake be placed under either a Public Health Watch or Public Health Warning, using scientifically based guidelines (included below).

KDHE coordinates the collection and analysis of samples from public water bodies and when necessary issues appropriate public health messages to better inform the public. KDHE will respond to HAB-related complaints involving specific types of water bodies, including reservoirs, community lakes, state fishing lakes and/or are waters managed or owned by federal, state, county or municipal authorities. Privately owned ponds may be tested for a small fee by the Kansas State University. For more information please contact the Epi Hotline at 877-427-7317 or epihotline@kdheks.gov.



How to Avoid HAB Exposure

- 🌿 **Do not** swim, water ski, or boat in areas where the water is discolored or where visible foam or scum from algae is on the water
- 🌿 If you do swim in water that might have a HAB, rinse off with clean water as soon as possible
- 🌿 **Do not** let pets or livestock swim in or drink from areas where the water is discolored or where visible foam or scum from algae is in the water
- 🌿 **Do not** let dogs or pets walk along beaches with dried algae
- 🌿 If pets (especially dogs) swim in scummy water, rinse them off immediately– do not let them lick the algae and toxins off their fur
- 🌿 **Do not** irrigate lawns or golf courses with pond water that looks scummy or smells bad
- 🌿 Respect any water body watches/warnings/closures announced by the Kansas Department of Health and Environment and watch for signs posted by lake management.

HAB and Health Impacts

The first signs of microcystin poisoning in animals usually occurs within 30 minutes of exposure and include vomiting and diarrhea. This is followed by progressively worsening signs of liver failure such as anorexia, lethargy and depression. Blood values of liver enzymes are typically high. Jaundice, abdominal swelling and tenderness in the abdominal area may also be observed. Dogs should not be allowed near the shore where decaying algae may be visible as the algae may stick to their feet. It takes a very small quantity and should dogs lick their paws, they could ingest enough toxin to cause death. Horses, cattle and donkeys are also susceptible to toxins and should not drink water from ponds or lakes with cyanobacteria.

Saphira
– the
Happy
Pappy
says
this
lake is
a go.



Clean fish with fresh, potable water.
Discard the entrails and eat ONLY the fillet
for fish caught in lakes with HABs.

KDHE CONTACTS

- Dr. Farah Ahmed PH: 785/296-6426
Environmental Health Officer
Email: fahmed@kdheks.gov
HAB Related Human Illness Questions
- Epi Hotline PH: 877/427-7317
Epi email: epihotline@kdheks.gov
Human Illness Reporting Form Questions
- Dr. Ingrid Garrison PH: 785/296-2501
State Public Health Veterinarian
Email: igarrison@kdheks.gov
Animal Illness Questions
- Epi Hotline PH: 877/427-7317
Epi Email: epihotline@kdheks.gov
HABs Animal Illness Reporting Form Questions
- After Hours Lake Status Hotline PH: 785-296-1664
- Technical or sampling questions PH: 785-296-1664



Good water quality promotes a good fishery for safe family fun

KDHE HAB Guidance Document

The Kansas Department of Health and Environment Secretary developed the HAB Guidance Document and supports communication efforts to prevent or reduce the incidence of HAB-related illnesses and to communicate the symptomology of algal toxin exposure.

PURPOSE:

Protecting the environment as well as public health, safety and welfare is the mission of KDHE. Harmful Algal Blooms (HAB) present unique difficulties in health risk assessment determination. This guidance document considers health and environmental risks as well as the economic impact on resources within KDHE. The basis for this policy is the epidemiologic study of HAB data collected by KDHE in Kansas and the analysis of established scientific and medical research including studies conducted by the World Health Organization (WHO).

DISCUSSION:

Cyanobacteria, also known as blue-green algae, can produce toxins in Kansas lakes and have been implicated in human and animal illness. The threat to health is related to the prevalence of cyanotoxins and cyanobacteria cell concentrations in recreational waters and corresponding contact with, or accidental ingestion of, the cyanobacterial cells or cyanotoxins. Small children are most susceptible to the toxins. Actual acute exposures have demonstrated that there is a higher incidence of illness among children that suggest risk calculations based on data from adults or animal studies may not be sufficient to protect children. The most common complaints after recreational exposure to cyanobacteria and associated toxins include vomiting, diarrhea, skin rashes, eye irritation and respiratory symptoms. As the concentration of cyanobacterial cells increases the probability of adverse health effects also increases.

PROCEDURES:

KDHE samples recreational bodies of water for cyanobacteria once alerted to a potential bloom. KDHE has the capability to test for microcystin toxin and to quantify and identify the type of cyanobacteria present. When HAB has been properly identified in a Kansas public lake, KDHE may recommend a Public Health Watch or Public Health Warning, dependent on the level of risk associated with HAB as determined through water sampling and testing. The issuing of a Public Health Watch or Public Health Warning is based on the concentration of microcystin toxin or cyanobacteria cell counts.

ACTION:

The primary distinctions between a Public Health Watch and a Public Health Warning are:

- a. the level of risk that needs to be communicated to the public; and
- b. recommended actions to the governing authority of the affected body of water to discourage exposure.

Implementation of appropriate measures to restrict exposure will be the responsibility of the governing authority of the affected body of water. If the governing authority chooses to close the body of water, KDHE provides examples of Watch, Warning or Closure signs.

Public Health Watch:

The Public Health Watch discourages people from having full body contact with water (e.g., swimming, skiing, etc.) or allowing pets to drink or swim in the water, however boating and fishing are permitted. If fish are caught during a Public Health Watch, the fish should be properly cleaned and have internal organs removed before eating. If water from the lake is used for irrigation, people should avoid the spray, thoroughly wash fruits or vegetables in clean water and not allow livestock to drink irrigation water. In addition, the Health Alert Network will send a message to local health departments, physicians, veterinarians and hospitals providing them an advance copy of a media release. Updates to the KDHE website and to the phone message indicating lakes under a Public Health Watch or Warning are completed weekly and the public is encouraged to report adverse health effects associated with cyanobacterial toxin poisoning. Public water suppliers with intakes in the water body affected are also notified.

A Public Health Watch will be issued when the microcystin toxin concentration is detectable at a concentration of 4 µg/L to < 20 µg/L **OR** cyanobacteria cell counts are 80,000 cells/mL to <250,000 cells/mL. A Public Health Watch includes posting of signs at beaches, marinas, boat ramps, and other points of entry into the body of water. The Public Health Watch indicates that harmful algae are present and that the body of water may be unsafe for people and animals.

A Public Health Watch will remain in effect until cell counts and toxin levels drop below these guidelines: <80,000 cells/mL at all sites **AND** <4 µg/L at all sites at which time the Public Health Watch will be lifted.

Public Health Warning:

A Public Health Warning is issued when microcystin toxin concentrations are ≥ 20 $\mu\text{g/L}$ to $2,000$ $\mu\text{g/L}$ **OR** cyanobacterial counts are $\geq 250,000$ cells/mL to $\leq 10,000,000$ cells/mL. A Public Warning may also be issued if there is documentation of visible cyanobacterial scum present. A Warning indicates that harmful algae are present and that the body of water is unsafe for people and pets. A Warning includes all of the actions of a Public Health Watch and in addition, all contact with water should be restricted including prohibitions on swimming, water skiing, and other activities that involve direct contact with the affected water. A media release will be issued when on a Warning status as well as the website and phone message updated on a weekly basis. Public water suppliers with intakes in the water body affected are notified in the event of a Warning. Bodies of water placed under a Public Health Watch are tested by KDHE on a specific schedule. Bodies of water placed under a Public Health Warning will also be tested by KDHE on a predetermined schedule. The Public Health Warning will remain in effect until the cyanobacterial concentrations are $< 250,000$ cells/mL at all sampling sites for at least one week **AND** concentrations of microcystin toxins are < 20 $\mu\text{g/L}$ for two consecutive weeks at all sampling sites. When both these terms are met, the lake status may drop to a Public Health Watch listing.

Lake Closure:

In rare instances, KDHE may recommend closure of a lake due to extreme circumstances. Even if people are not in the water, they can still be affected by the toxins of a bloom, especially when the size of the bloom is this large. When the blooms become "matted" and are on that water/surface interface, the cells dry out, break open and the toxins become airborne and may be carried on the wind. Actions taken by KDHE and lake management follow the procedures in the Public Health Warning category but will include closing lands adjacent to the lake (e.g., approximately 100 ft. from the shoreline) to prevent this exposure. A lake wide Closure will be issued when microcystin toxicity levels are $> 2,000$ $\mu\text{g/L}$ **OR** cell counts are $> 10,000,000$ cells/mL. The decision to close any public use lake is made by the lake manager.

A Lake Closure will remain in effect until there is $< 10,000,000$ cells/mL at all sites for one week **AND** microcystin toxicity levels are $< 2,000$ $\mu\text{g/L}$ for one week.

Lake Status for HAB's
Cell Count and Toxin levels

Condition of lake	Alert Level	Recommendations
Microcystin toxicity at <4 µg/L <u>AND</u> Cell count of <80,000 cells/ml	None – Lake clear	None
Microcystin toxicity at ≥4 µg/L to <20 µg/L <u>OR</u> Cell count of 80,000 cells/ml to <250,000 cells/ml	Lake will be placed on a Public Health <u>WATCH</u>	»Post signage »Notify health dept., doctors, vets, health providers. »Post on website » No media release. »Notify public water suppliers
Microcystin toxicity at ≥20 µg/L to 2,000 µg/L <u>OR</u> Cell count of ≥250,000 cells/ml to ≤10,000,000 cells/ml	Lake will be placed on a Public Health <u>WARNING</u>	»Post signage » Restrict direct contact with water. »Notify health dept., doctors, vets, health providers, etc. »Post on website »Issue media release. »Notify public water suppliers
Microcystin toxicity at >2,000 µg/L <u>OR</u> Cell count of >10,000,000 cells/ml	Lake is <u>CLOSED</u>	» Recommend entire lake area including adjacent land (e.g., approximately 100 ft. from shoreline) be closed to public. » Post signage »Notify health dept., doctors, vets, health providers., etc. »Post on website »Issue media release. »Notify public water suppliers

SIGNAGE

WATCH SIGNAGE

WATCH

Harmful Algae May Be Present

Blue-Green Algae May Be Harmful To Humans & Animals



Keep Pets & Livestock Away From The Water

- Use caution when contacting lake water and wash with clean water afterward
- Avoid areas of algae accumulation
- Don't let people/pets eat dried algae or drink untreated lake water
- Clean fish well and discard guts

In case of harmful algae contact, call doctor/veterinarian if people/animals have nausea, vomiting, diarrhea, rash, irritated eyes, seizures, breathing problems or other unexplained illness



For more information: Scan this code or visit kdheks.gov/algae-illness

Report new algae-blooms to Kansas Department of Health and Environment:
www.kdheks.gov/algae-illness or call 785-296-1664

Report possible algae-bloom illness to Kansas Department of Health and Environment:
www.kdheks.gov/algae-illness or call 877-427-7317

Posted by: _____
Posted on: _____

Kansas Dept. of Health and Environment 1000 SW Jackson, Topeka, Kansas 66612, 785-296-1500 www.kdheks.gov

WARNING SIGNAGE

WARNING

Harmful Algae Present

People & Animals May Get Sick



Avoid Water Contact Such As Swimming & Wading



Avoid Water Skiing or Jet Skiing



Keep Pets & Livestock Away From Water

- Avoid areas of algae accumulation
- Clean fish well and discard guts
- Don't let people/pets eat dried algae or drink untreated lake water
- If people/pets contact lake water- wash with clean water as soon as possible

In case of harmful algae contact, call doctor/veterinarian if people/animals have nausea, vomiting, diarrhea, rash, irritated eyes, seizures, breathing problems or other unexplained illness



For more information: Scan this code or visit kdheks.gov/algae-illness

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LAKE CLOSURE SIGNS

DANGER

LAKE CLOSED

Harmful Algae Present

People & Animals May Get Sick



KEEP OUT OF LAKE

In case of harmful algae contact, call doctor/veterinarian if people/animals have nausea, vomiting, diarrhea, rash, irritated eyes, seizures, breathing problems or other unexplained illness



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Report new algae-blooms to Kansas Department of Health and Environment:
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Posted by: _____
Posted on: _____

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DANGER

BEACH CLOSED

Harmful Algae Present

People & Animals May Get Sick



STAY OFF BEACH

In case of harmful algae contact, call doctor/veterinarian if people/animals have nausea, vomiting, diarrhea, rash, irritated eyes, seizures, breathing problems or other unexplained illness



For more information: Scan this code or visit kdheks.gov/algae-illness

Report new algae-blooms to Kansas Department of Health and Environment:
www.kdheks.gov/algae-illness or call 785-296-1664

Report possible algae-bloom illness to Kansas Department of Health and Environment:
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Posted by: _____
Posted on: _____

Kansas Dept. of Health and Environment 1000 SW Jackson, Topeka, Kansas 66612, 785-296-1500 www.kdheks.gov

The Jar and Stick Tests

Option for testing your pond:

There are a couple simple tests a pond owner can do, at no cost, to determine if a green pond even has a blue-green algae community, or if any algal material visible at the water surface is a blue-green surface scum.

NOTE: No test is 100% perfect, and that includes the jar test for blue-greens. The test relies on the buoyancy adaptation of most free-floating (planktonic) blue-green algae. In Kansas, bloom complaints are overwhelmingly the result of the forms that are buoyant. However, there is a small possibility (<2%) that the algae in your particular test happen to be non-buoyant species for blue-greens, resulting in a false negative test. Likewise, some swimming forms of non-blue-green algae (like Euglenoids) may form a surface layer during a jar test, resulting in a false positive. Fortunately, most Euglena blooms will be reddish in color rather than green, allowing for their identification. Although the jar test does provide a quick and inexpensive way to confirm whether you have a blue-green community in your lake, it does not tell you what species are present, nor does it tell you whether they are actually producing toxins. Be aware, however, that just having blue-green algae present does not mean your pond is automatically hazardous. Many lakes and ponds in Kansas typically have blue-green algae in them. Hazardous conditions occur when the amount of blue-green algae is large, and composed of species capable of generating toxins. For that information, a microscopic examination of the water, combined with a chemical test for toxins, would be required for a more complete picture.

The Kansas Department of Health and Environment only tests samples from public water bodies. Kansas State University will assist you with issues regarding private water bodies. If you are conducting one or both of these tests on your private farm pond or lake and you determine that you do have a blue-green bloom occurring in your pond, you may obtain further assistance by going to this website:

http://www.kdheks.gov/algae-illness/private_waters.htm



Mycrocystis colony



Anabaena strands



Aphanizomenon strands

THE JAR TEST PROCEDURE

Purpose

Look out over the pond and see if the water looks very green. To decide whether the “green” is blue-green algae in the pond, or just an overabundance of some of the more beneficial types of planktonic algae, a simple test can be conducted called the “**jar test**.” Follow this step by step process to make an initial assessment of the pond in question.

Materials

- Clear jar (pint to quart size) – A Mason (canning) jar or a store bought pickle jar with the label removed works well.
- Rubber or latex gloves.

Procedure

1. Find an appropriate clear glass jar with a screw top lid.
2. For safety reasons, use rubber or latex gloves to collect a sample of water from the pond in question to prevent skin exposure.
3. Collect the water just below the surface of the water.
 - a. **DO NOT** collect sample directly from the surface, but collect just under the surface to avoid collecting just the scum on the top layer of the water.
4. Fill the jar about $\frac{3}{4}$ of the way full with the pond water. (See Photo 1.)



Photo 1 - Initial Sample

5. Wipe off any scum that may be on the outside of the jar.
6. Screw the lid onto the jar.
7. Place the jar in a cold refrigerator and leave it completely undisturbed overnight.

8. The next day, **carefully** remove the jar from the refrigerator and look to see where the algae have accumulated.
 - a. **IT IS VERY IMPORTANT**, that you do not shake or agitate the jar in any way. If you do, this will mix the algae into the water again and you will not get test results that are useable.

9. If the algae are all settled out near the bottom of the jar, then that is a likely indication that the lake does not have a lot of blue-green algae growing in it. (See arrow on Photo 2.)



Photo 2 – No Blue-greens

10. If the algae have formed a green ring around the top of the water in the jar, or just seem to be collected at the air/water divide, there is a strong possibility that the pond does have a blue-green algae community present. (See arrow on Photo 3.)



Photo 3 – Yes Blue-Greens

THE STICK TEST PROCEDURE

Purpose

Look out over the pond and see if a mat of green material is floating on the surface. Is it blue-green algae forming a surface scum, or is it a mat of floating filamentous green algae (often called “fisherman’s moss” and “string” algae)? A simple test to determine what the material might be is called the “stick test.”

Materials

- Sturdy stick – Make sure it is long enough to reach into the water without getting algae on your hands.
- Rubber or latex gloves

Procedure

1. Find a sturdy stick.
2. Put rubber or latex gloves on before attempting to retrieve a sample of the green material from the pond to prevent skin exposure.
3. Thrust the stick into the surface mat and slowly lift out of the water.
 - a. Make sure you do not fall into the water while attempting to retrieve material.
4. Look at the end of the stick to see what came out of the water.
 - a. If the stick comes out looking like it has been thrust into a can of paint, the mat on the pond is likely to be a blue-green algae scum.
 - b. If the stick pulls out strands that look like green hair or threads, the mat on the pond is likely filamentous green algae. (Although filamentous green algae can be a nuisance when over-abundant, they do not pose a danger to your health.)(See Photo 1.)



Photo 1 - Filamentous algae

Note: The stick test can fail when a particular type of blue-green algae is present. This type of algae is called *Lyngbya wollei*. This species of blue-green algae can form tough filamentous mats that float to the surface, similar to the mats formed by harmless filamentous green algae. However, *Lyngbya wollei* typically will have a very putrid sewage-like odor which filamentous green algae do not. *Lyngbya wollei* mats also will often release a purple pigment in the water around them, which is something filamentous algae do not do. (See Photo 2.)



Photo 2 - *Lyngbya wollei*

More Information

Kansas Department of Health and Environment (KDHE) Bureau of Water Harmful Algal Bloom website www.kdheks.gov/algae-illness/index.htm

Kansas Department of Health and Environment (KDHE) Bureau of Epidemiology and Public Health Informatics Harmful Algal Bloom website www.kdheks.gov/algae-illness/index.htm

Centers for Disease Control and Prevention:

<http://www.cdc.gov/hab/cyanobacteria/pdfs/facts.pdf> Facts about Cyanobacteria and Cyanobacterial Harmful Algal Blooms. A factsheet developed by the following: Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Environmental Health and Division of Environmental Hazards and Health Effects.

U.S. Environmental Protection Agency (EPA) International Symposium on Cyanobacterial Harmful Algal Blooms (ISOC-HAB)
www.epa.gov/cyano_habs_symposium/monograph.html

World Health Organization, Toxic cyanobacteria in water: A guide to their public health consequences, monitoring and management
http://www.who.int/water_sanitation_health/resourcesquality/toxicyanbact/en/index.

Ohio Department of Health, visit the ODH HAS program Web site:
www.odh.ohio.gov/odhPrograms/eh/hlth_as/Hlth_As2.aspx

Photos courtesy of: Front cover – Diana Lehmann; pg 2 – Ella by Jake Crotts; pg 2 – algae photo – Diana Lehmann; pg. 6 – Diana Lehmann; pg 8 – Saphira owned by Diana Lehmann; pg. 8 Mike Smith with fish by Jake Crotts; pg 9 – Smith/Crotts family photo; unless otherwise specified – algae photos were taken by Diana Lehmann, KDHE.