

PUBLIC BEACH INSPECTION PROGRAM

PUBLIC HEALTH ISSUE:

Potential health risks from swimming in lakes, rivers and coastal waters are present in every watershed. The N.H. Department of Environmental Services (DES) understands the health risks and tests the water at the state's beaches to ensure swimmers are not exposed to disease causing pathogens or blue-green algae scums. Pathogens can enter the water whenever sewage enters the water.

The Beaches Environmental Assessment and Coastal Health (BEACH) Act amends the Clean Water Act to reduce the risk of disease to users of the nation's recreational waters. The NH DES Beach Program works to notify the public of the potential exposure to disease-causing microorganisms in recreation waters.

ROLE OF THE HEALTH OFFICER:

- Discuss impact of beach advisories and lake warnings with concerned citizens.
- Encourage all persons to avoid contact with water at contaminated beaches during beach advisories.
- Be aware of local actions to reduce fecal contamination of water bodies such as reducing nutrient loading from lawn fertilization, failing septic systems, and contamination from domestic animal feces.
- Collaborate with the NH Department of Environmental Services to alert citizens to beach advisories.

Notification of a beach advisory is announced by the New Hampshire Department of Environmental Services through direct contact with beach managers, posting an advisory on the DES webpage (www4.des.state.nh.us/WaterShed_BeachMaps/WaterShed_BeachMaps.aspx), email notification to those who have registered for "Beach Advisories" at the e-news webpage (www.des.nh.gov/media/enews/index.htm), and posting on the Beach Twitter page (www.twitter.com/NHDES_Beaches).

Notification of a lake warning for cyanobacteria is announced by the New Hampshire Department of Environmental Services through press releases to media outlets in the state, posting a warning on the DES webpage (www4.des.state.nh.us/WaterShed_BeachMaps/WaterShed_BeachMaps.aspx), and posts on the Beach Twitter page (www.twitter.com/NHDES_Beaches).

Health officers are also apprised of all advisories. Once direct contact is made with the beach manager who will post advisory signs at the beach, DES staff gives notification to the town

health officer. A voice message or email notification should be sufficient to advise the health officer of the situation.

BEACH WATER SAMPLES:

Fecal Indicator Bacteria

Indicator organisms, which are a natural component of the intestines of warm-blooded animals, are used to measure changes in water quality and the potential presence of hard-to-detect disease-causing organisms also called pathogens. Indicator organisms provide evidence of the presence of a potential disease-causing organism that survives under similar physical, chemical, and biological conditions. Indicator organisms are easy to detect using simple laboratory tests; results are available within 24 hours. They generally are not present in unpolluted waters and appear in concentrations that can be correlated with the extent of contamination. The die-off rate is similar to the die-off rate of the pathogens of concern. *E. coli* is the indicator organism for freshwater beaches. Enterococci, spherical bacteria often grouped in chains resembling a string of beads, are the indicator organisms for marine beaches.

When disease-causing organisms are present at swimming areas, they pose certain health risks. The possibility exists that any person who ingests or has contact with contaminated water may become ill. Symptoms associated with an illness depend upon the organism present. These organisms, including bacteria, protozoan, and viruses, can cause a variety of illnesses.

	Pathogens	Illness	Symptoms
Bacteria	<i>Escherichia coli</i>	Gastroenteritis	Vomiting, diarrhea, death in susceptible populations
	<i>Salmonella typhi</i>	Typhoid fever	High fever, diarrhea, ulceration of the small intestine
	<i>Vibrio cholerae</i>	Cholera	Extremely heavy diarrhea, dehydration
Protozoans	<i>Cryptosporidium</i>	Cryptosporidiosis	Diarrhea
	<i>Giardia lamblia</i>	Giardiasis	Mild to severe diarrhea
	<i>Entamoeba histolytica</i>	Amoebic dysentery	Prolonged diarrhea with bleeding, abscesses of the liver and small intestine
Viruses	Hepatitis A and E	Infectious hepatitis	Jaundice, fever
	Caliciviruses (Norwalk and Sappro like viruses)	Gastroenteritis	Vomiting, diarrhea
	Adenovirus	Respiratory disease	Eye infections, diarrhea

Cyanobacteria

An increase of nutrients to a waterbody is part of the aging process of lakes known as eutrophication. An increase of phosphorus in combination with increased sunlight and warmer water temperatures often accelerates the production of cyanobacteria (blue-green algae) growth in the lake. Biologists are most concerned when cyanobacteria scums wash up on public beaches.

Several cyanobacterial species produce toxins (cyanotoxins) that can cause both acute and chronic problems in humans. However, there have been no documented cases of cyanotoxin-related illnesses in New Hampshire. Acute effects, such as skin and mucous membrane irritations, can occur after short term exposure with water containing these toxins. Chronic effects, such as liver, kidney, and central nervous system damage, can occur over a period of time from ingestion of water containing large amounts of toxins. Some individuals are at greater risk of injury due to these toxins, including children and immuno-compromised individuals. Domestic animals and livestock are also at risk of illness or death if large amounts of toxin-producing cyanobacteria are ingested.

In the event that a person or animal has come in contact with water contaminated by cyanobacteria, he or she may experience one or more of the following symptoms: headaches, nausea, diarrhea, abdominal pain, vomiting, and itchy, irritated eyes and skin.

Sampling Protocol

Public Beach Inspection Program personnel monitor and sample approximately 170 public bathing beaches on lakes, rivers, and impoundments on a monthly basis from mid-June through Labor Day. From Memorial Day to Labor Day, 16 coastal and estuarine beaches are inspected on a weekly or bi-weekly basis. DES Beach Inspectors collect two bacteria samples from beaches less than 100 feet long and three bacteria samples from beaches 100 feet long or longer. Water from inland freshwater beaches is tested for *E. coli* bacteria and water from coastal saltwater beaches are tested for Enterococci.

DES collects cyanobacteria scum samples if observed when a beach is visited during its regularly scheduled day throughout the swimming season. If a suspected cyanobacteria bloom is reported to DES, lakes and beaches are inspected and sampled within 24 hours. Samples that are positively identified as toxin-producing cyanobacteria species will be further analyzed for toxins.

E. coli Bacteria Standards

Water samples are collected from freshwater beaches each weekday from mid-June to Labor Day. *E. coli* samples are processed and analyzed in 24 hours. If one sample at a freshwater beach exceeds the state standard of 88 counts of *E. coli* per 100 milliliters (mL) of water by 70 counts or if two samples exceed the state standard of 88 counts, a beach advisory is issued. If

only one sample at a freshwater beach exceeds the state standard of 88 counts of *E. coli* per 100 milliliters (mL) of water by less than 70 counts, the beach is sampled again but an advisory is not issued. Freshwater beaches are sampled on the business day following the initial high sample result.

Enterococci Bacteria Standards

If one sample at a marine beach exceeds the state standard of 104 counts of Enterococci per 100 milliliters (mL) of water by 70 counts or if two samples exceed the state standard of 104 counts, a beach advisory is issued. If only one sample at a marine beach exceeds the state standard of 104 counts of Enterococci per 100 milliliters (mL) of water by less than 70 counts, the beach is sampled again but an advisory is not issued. Marine beaches are sampled on the day following the initial high sample result.

Cyanobacteria Standards

If a potential toxin-producing cyanobacterial scum is present at the beach and cell dominance is greater than 50 percent of a sample, a beach advisory is issued. DES works cooperatively with the town or beach manager to post these advisories. Beaches under a cyanobacteria advisory are sampled weekly until the cyanobacteria presence returns to less than 50 percent of a sample.

Advisory Protocol

The Beach Program contacts the beach manager as soon as an advisory for high bacteria is issued. The contact person for each beach varies from town to town. Some contacts are health officers, others are recreation directors, and still others are administrative assistants to the board of selectmen. The contact list was created from the information provided to DES when a beach manager confirms Beach Program participation. The entity that pays for the samples is the entity that we contact when an advisory is posted. The DES rules require the beach owner to post the appropriate sign in a visible location. The town/beach managers may use their own discretion to actively close a beach to the public. They may place barriers at the entrances or post signs indicating the closure. The municipality must notify the Beach Program of their intentions to close a particular beach.

Advisory Announcements

After the beach manager is contacted, the following updates are made for public notification. Advisories are updated in real time on the DES Beach Program site at: www4.des.state.nh.us/WaterShed_BeachMaps/WaterShed_BeachMaps.aspx. If a beach is not listed on that site, the results from the most recent sample were below the state standards. Anyone can sign up for E-News updates at www.des.nh.gov/media/enews/index.htm. An email is sent out no more than once a day when advisories are added or removed. The DES Beach Program Twitter Feed www.twitter.com/NHDES_Beaches is also updated in real time.

State Law on Designated Beaches

The following sections of Env-Wq 1100 Public Bathing Places pertain to designated beach and flow-through bathing areas.

Env-Wq 1102.14 “Designated beach”

A public bathing place that comprises an area on a water body and associated buildings and equipment, intended or used for bathing, swimming, or other primary water contact purposes. The term includes, but is not limited to, beaches or other swimming areas at hotels, motels, health facilities, water parks, condominium complexes, apartment complexes, youth recreation camps, public parks, and recreational campgrounds or camping parks as defined in RSA 216-I:1, VII. The term does not include any area on a water body which serves 3 or fewer living units and which is used only by the residents of the living units and their guests.

Env-Wq 1102.20 “Flow-through Bathing Place”

A public bathing place which has been formed by damming all portions of a surface water, in which circulation depends on the flow of water, whether pumped or gravity-fed.

Env-Wq 1104.02 Supervision

(e) A designated beach or flow-through bathing place shall be monitored by a lifeguard or operator at the discretion of the owner of said bathing place. In the absence of a lifeguard or operator, the owner must post a sign at all access points notifying patrons of the absence of a lifeguard or operator, as applicable.

Env-Wq 1104.03 Safety

(b) The owner of a common interest bathing place, designated beach, or flow-through bathing place, at the owner’s discretion, post conspicuously-displayed signs informing patrons of any safety rules developed by the owner.

(d) The owner of a common interest bathing place, designated beach, or flow-through bathing place shall ensure that:

1. A telephone or radio capable of reaching emergency services is located within 200 feet of the water; or
2. If a telephone or radio capable of reaching emergency services is not located within 200 feet of the water, then a sign is posted informing patrons of the location of the nearest public telephone or radio capable of reaching emergency services.

Env-Wq 1104.04 Emergency Rescue Equipment

(c) The owner of a designated beach shall:

1. Provide emergency rescue equipment such as a rescue board, rescue tube or ring, or other emergency rescue equipment deemed appropriate by the owner; or
2. Prominently post at least one sign that clearly states that no emergency rescue equipment is available.

Env-Wq 1105.04 Toilets

(b) The owner of a common interest bathing place, designated beach, or flow-through bathing place shall provide toilet's at the owner's discretion, subject to the following:

1. If one or more portable or chemical toilets are to be used, they shall be installed in such a way that they can not be tipped over; and
2. The toilets shall be within 200 feet of the water, provided however that if toilets cannot be installed within 200 feet of the water due to unique topography, the toilets shall be placed as close to the water as practicable.

Env-Wq 1105.05 Trash Receptacles

(b) The owner of a designated beach wherein patrons are responsible for carrying out their own trash shall provide enclosed trash receptacles in all dressing rooms and toilet areas.

More information on the beach program and current advisories can be found at the DES website www.des.nh.gov under "Beach Inspection Program" on the A to Z list.

For more information on beach water quality:

<p>New Hampshire Department of Environmental Services Biology Section, Water Division 29 Hazen Drive, P.O. Box 95 Concord, NH 03302-0095 www.des.nh.gov (603) 271-0698</p>
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