

March 16, 2018

Policy: Guidelines for Addressing Harmful Algal Blooms in Lake Mitchell

1. PURPOSE.

The purpose is to protect the public's health and safety. Harmful Algal Blooms (HAB) present unique difficulties in health risk assessment determination. This policy considers health and environmental risks as well as the economic impact on Lake Mitchell. The basis for this policy is the epidemiologic, scientific and medical research conducted by the EPA and World Health Organization (WHO).

2. DISCUSSION.

Cyanobacteria, also known as blue-green algae, can produce toxins in recreational waters and have been implicated in human and animal illness in South Dakota. The threat to health is related to the prevalence of cyanotoxins and cyanobacterial cell concentrations in recreational water and corresponding contact with or accidental ingestion of the cyanobacteria cells or cyanotoxins. During a HAB, those most at risk when exposed are small children. 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. Other susceptible sub-populations include those with compromised immune systems. Even though the effects of microcystin on persons with weakened immune systems are not yet fully understood, there is enough information to raise concern. 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.

3. PROCEDURES.

Mitchell Parks and Recreation (P&R) performs sampling of Sandy Beach, Public Beach and the Campground swimming areas for E.coli on a weekly basis from Memorial Day through Labor Day. P&R will perform chlorophyll and microcystin testing at Sandy Beach, Public Beach and from the middle of the lake on a weekly basis once algal blooms are present until the end of August or algal blooms end. Cyanobacteria will be captured weekly through microcystin or chlorophyll-a testing. The issuing of a Public Health Watch or Public Health Warning is based on the concentration of microcystin toxin or chlorophyll-a testing.

4. 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 discourage exposure.

Implementation of appropriate measures to restrict exposure will be the responsibility of Mitchell Parks and Recreation.

A Public Health Watch will be issued when the microcystin toxin concentration is detectable at a concentration of $4 \mu\text{g/L}$ to less than $20 \mu\text{g/L}$ or chlorophyll-a concentration of $10 \mu\text{g/L}$ to less than $50 \mu\text{g/L}$. A Public Health Watch includes posting of signs at 15 main access points around the lake. The Public Health Watch will indicate that harmful algae have been detected. The Public Health Watch will state that the body of water may be unsafe for people and animals, discourage people from contacting areas of the lake with a visible bloom, and that people should avoid spray from lake water. The Public Health Watch will also describe the symptoms of cyanobacterial poisoning, what to do in case of exposure to a cyanobacteria bloom, and who to call in case of illness potentially associated with exposure. The Public Health Watch shall also include a disclaimer statement that all lake users choosing to have contact with the lake assume the risk of harmful exposure.

A Public Health Warning will be issued when microcystin toxin concentrations are greater than or equal to $20 \mu\text{g/L}$ to less than $2,000 \mu\text{g/L}$ in one testing location or chlorophyll-a concentration greater or equal to $50 \mu\text{g/L}$ to less than $5,000 \mu\text{g/L}$ in all testing locations. A Public Health Warning may also be issued if there is verified documentation of a visible, pervasive cyanobacterial scum present. A Public Health Warning includes all of the actions under a Public Health Watch except it shall also state that harmful toxin concentrations are present in elevated levels and discourage people from having contact with the body of water entirely. A media release will be issued to the public under a Public Health Warning.

If microcystin toxin concentrations exceed $2,000 \mu\text{g/L}$ or chlorophyll concentrations are greater than $5,000 \mu\text{g/L}$, then it is recommended that all public beaches and accesses to the lake be closed until concentrations fall below such threshold. Picnic, camping, and other public land activities adjacent to affected waters be discouraged and undertaken at one's own risk.



Condition	Alert Level	Recommendation
Microcystin <4 µ g/L Chlorophyll-a <10 µ g/L E.coli <235 cfu per 100 mL	None	None
Microcystin >4 µ g/L to <20 µ g/L Chlorophyll-a >10 µ g/L to <50 µ g/L	Public Health Watch	<ul style="list-style-type: none"> •Post Public Health Watch •Discourage direct contact with the affected portion of the body of water (stay away from visible algal blooms)
Microcystin >20 µ g/L to <2,000 µ g/L Chlorophyll-a >50 µ g/L to <5,000 µ g/L	Public Health Warning	<ul style="list-style-type: none"> •Post Public Health Warning Signage •Discourage direct contact with the affected body of water (Entire Lake)
Microcystin >2,000 µ g/L Chlorophyll-a >5,000 µ g/L E.coli >235 cfu per 100 mL	Recommended Lake Closure	<ul style="list-style-type: none"> •Recommend that all public beaches and accesses to the lake be closed •For E.coli, closure of the affected beach only