

California CyanoHAB Network



A Workgroup of the California
Water Quality Monitoring Council

Purpose

- ▶ Update the Water Quality Monitoring Council on the CCHAB Workgroup's efforts
 - ▶ Solicit input from the Council on work products the CCHAB Network is developing
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The CCHAB Network Timeline

- ▶ 2006 – The Statewide Blue–Green Algae Working Group
- ▶ 2007 – Draft Blue–Green Algae Voluntary Guidance Document (updated 2010)
 - Thresholds based on WHO guidelines
- ▶ 2012 – OEHHA’s Toxicological Summary and Suggested Action Levels to Reduce Potential Adverse Health Effects of Six Cyanotoxins

The CCHAB Network Timeline

- ▶ December 2014 – CCHAB Network met and agreed to update the Voluntary Guidance Document
 - Formed a Guidance Update Subcommittee
 - ▶ February 2015 – Joined the Water Quality Monitoring Council
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The CCHAB Network Timeline

- ▶ January 2016 – Present updated components of the Voluntary Guidance Document to the CCHAB Network
 - ▶ February 2016 – Present the updates to the Water Quality Monitoring Council
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2010 Draft Voluntary Statewide Guidance for Blue-Green Algae Blooms

- ▶ Can be found at:

- <http://www.cdph.ca.gov/HealthInfo/environhealth/water/Documents/BGA/BGAdraftvoluntarystatewideguidance-07-09-2010.pdf>

- ▶ Purpose

- To provide guidance to local, state, and tribal regulators to protect people, pets, and livestock from the effects of toxic cyanobacteria in non-marine water bodies in the state of California.

2015/2016 Guidance Update Subcommittee

- ▶ Volunteers from the CCHAB Network
 - Tribes (Karuk and Yurok Tribes)
 - Local Environmental Health (Humboldt County)
 - Cities (Santa Cruz & Watsonville)
 - Local Irrigation District (Solano)
 - Water Managers (PacifiCorp)
 - Researchers (SCCWRP & Aquatic–Ecosystem Sciences)
 - Water Boards (State & Regional)
 - Office of Environmental Health Hazard Assessment
 - California Department of Public Health
 - U.S. EPA
 - California Department of Fish and Wildlife

Guidance Document Updates

- ▶ Certain portions of the Guidance Document were updated first.
 - Triggers
 - Signage
 - Decision Tree
- A Narrative was added to help describe the steps in the Decision Tree.

Voluntary Guidance Document

- ▶ These are only portions of a larger document
 - ▶ Short Term Goals
 - Bring these parts to the full CCHAB Network
 - Present these to the California Water Quality Monitoring Council for review and comment on February 23, 2016
 - Make them available to the public before the next bloom season
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Voluntary Guidance Document

▶ Long Term Goals

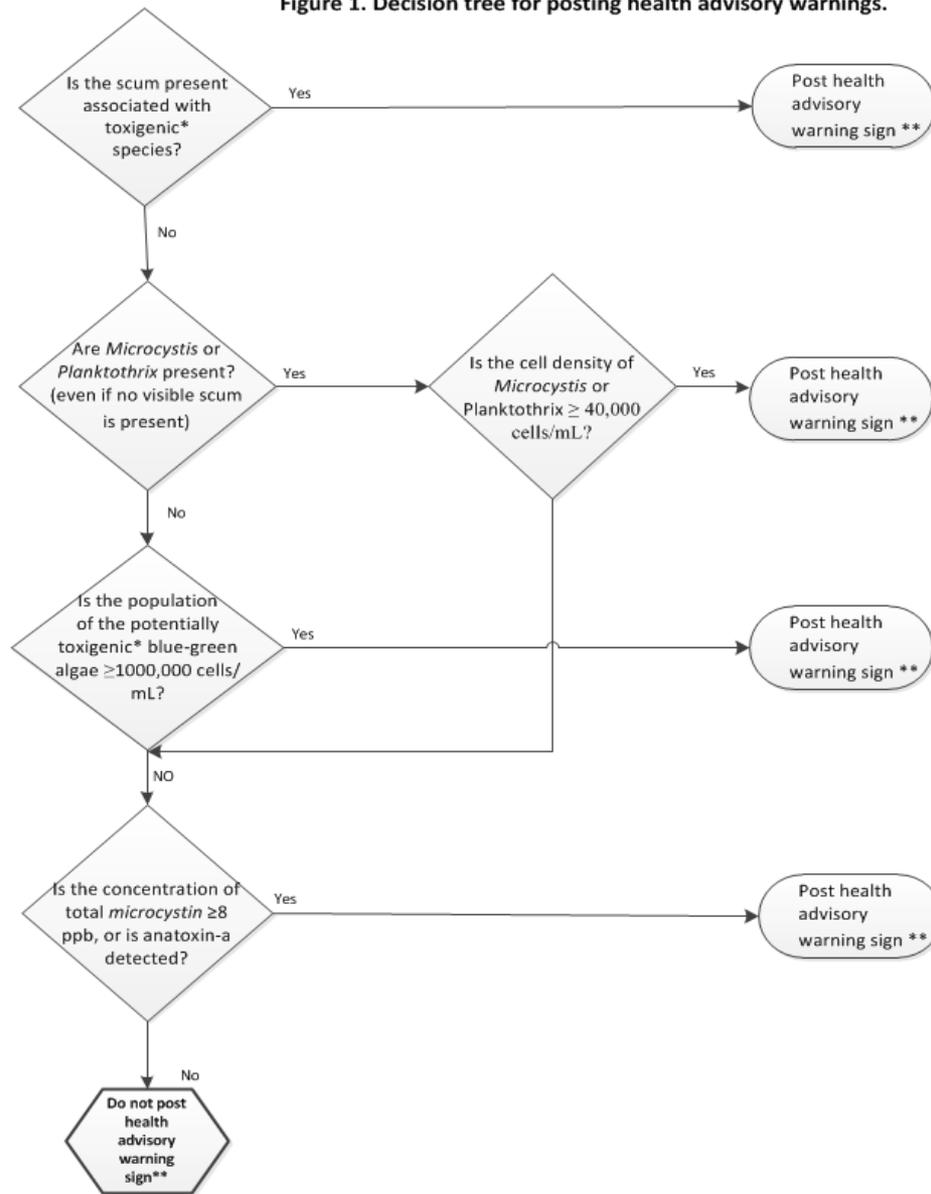
- Continue working on other portions of the Voluntary Guidance Document
 - Incorporate changes as needed in the 2016 revision process
 - Update the entire Voluntary Guidance Document
 - Develop a web portal to help make the information more readily available.
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Decision Tree Goals

- ▶ Provide clear direction for decision makers
 - ▶ Provide processes to help protect the public
 - ▶ Allow for varied local circumstances
 - ▶ *Keep it Simple!*
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Figure 1. Decision tree for posting health advisory warnings.

2010 Decision Tree

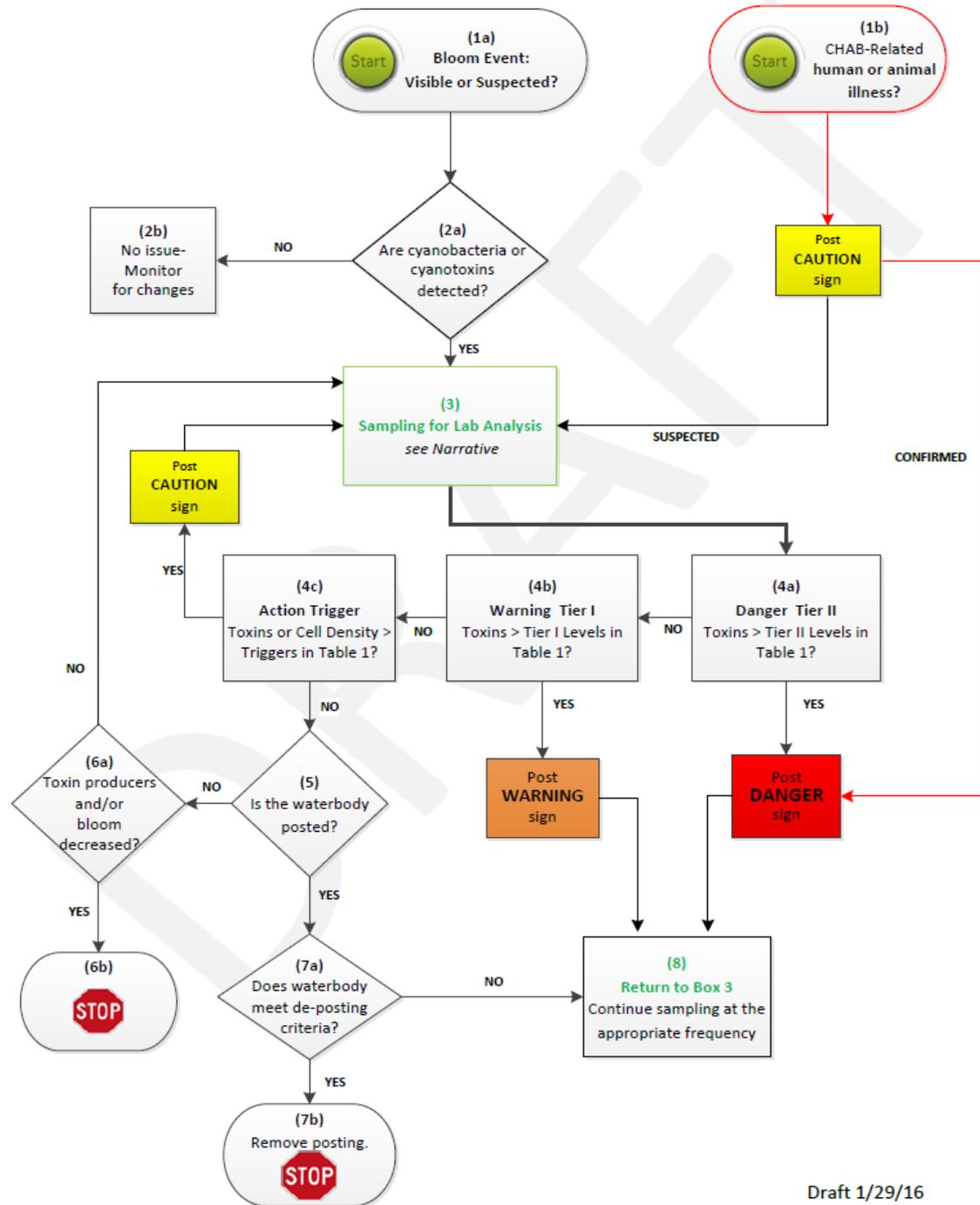


*Potentially toxic blue-green algae that have been detected in California include those of the genera *Anabaena*, *Microcystis*, *Aphanizomenon*, *Planktothrix*, and *Gloetrichia*.

Additional blue-green algae that are known to be potentially toxic may be added to this lists.

** See Appendix 2 for examples of Health Advisory warning signs

2016 Decision Tree



Narrative

- ▶ Provides explanation of the steps in the Decision Tree
 - ▶ Not intended to provide comprehensive details of each subject
 - ▶ Comprehensive information will be available in other documents
 - Full Draft Voluntary Guidance
 - SWAMP field and laboratory SOPs
 - Web Portal
- 

Start –

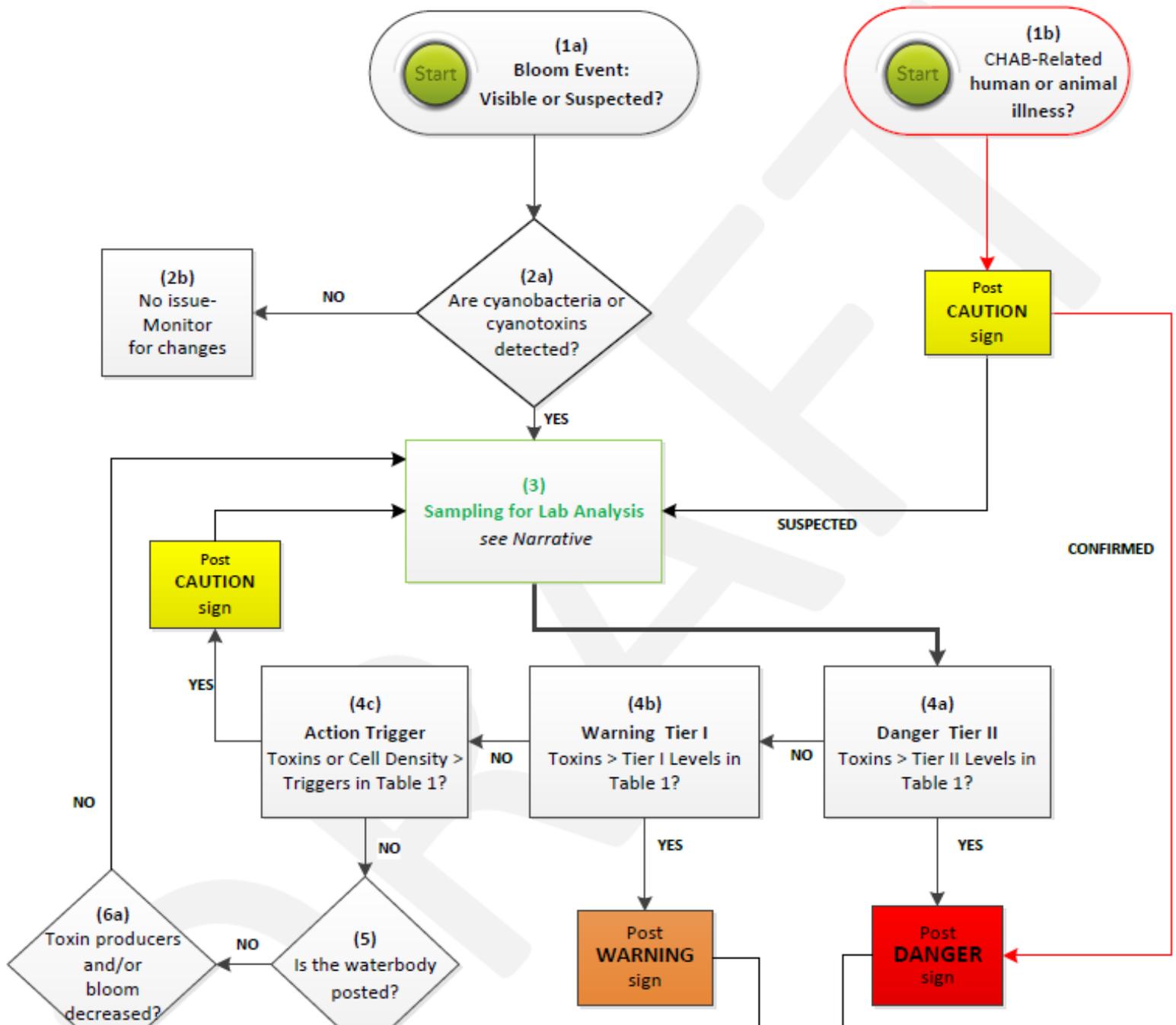


▶ Box 1A

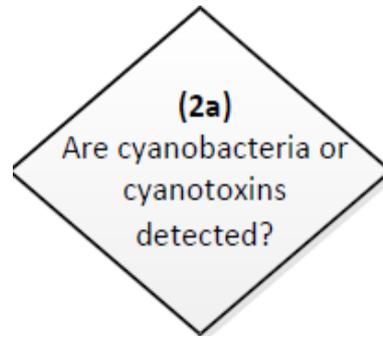
- For visible or suspected bloom event
 - Visible suggestion
 - Measured chemical factors
 - Satellite imaging
 - Historic evidence

▶ Box 1B

- Suspected human or animal illness or death
- Confirmed human or animal illness or death



Box 2a



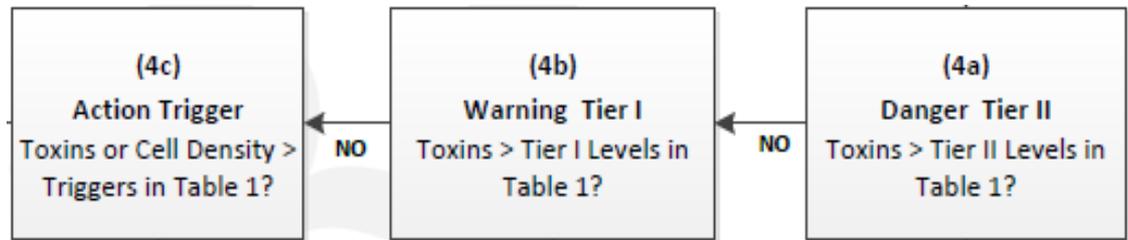
- ▶ Optional step
- ▶ Focuses on field methods
 - Lists methods to detect cyanobacteria
- ▶ Field test kits have limitations
 - Useful for presence or absence
 - Not recommended to determine toxin level

Box 3 –

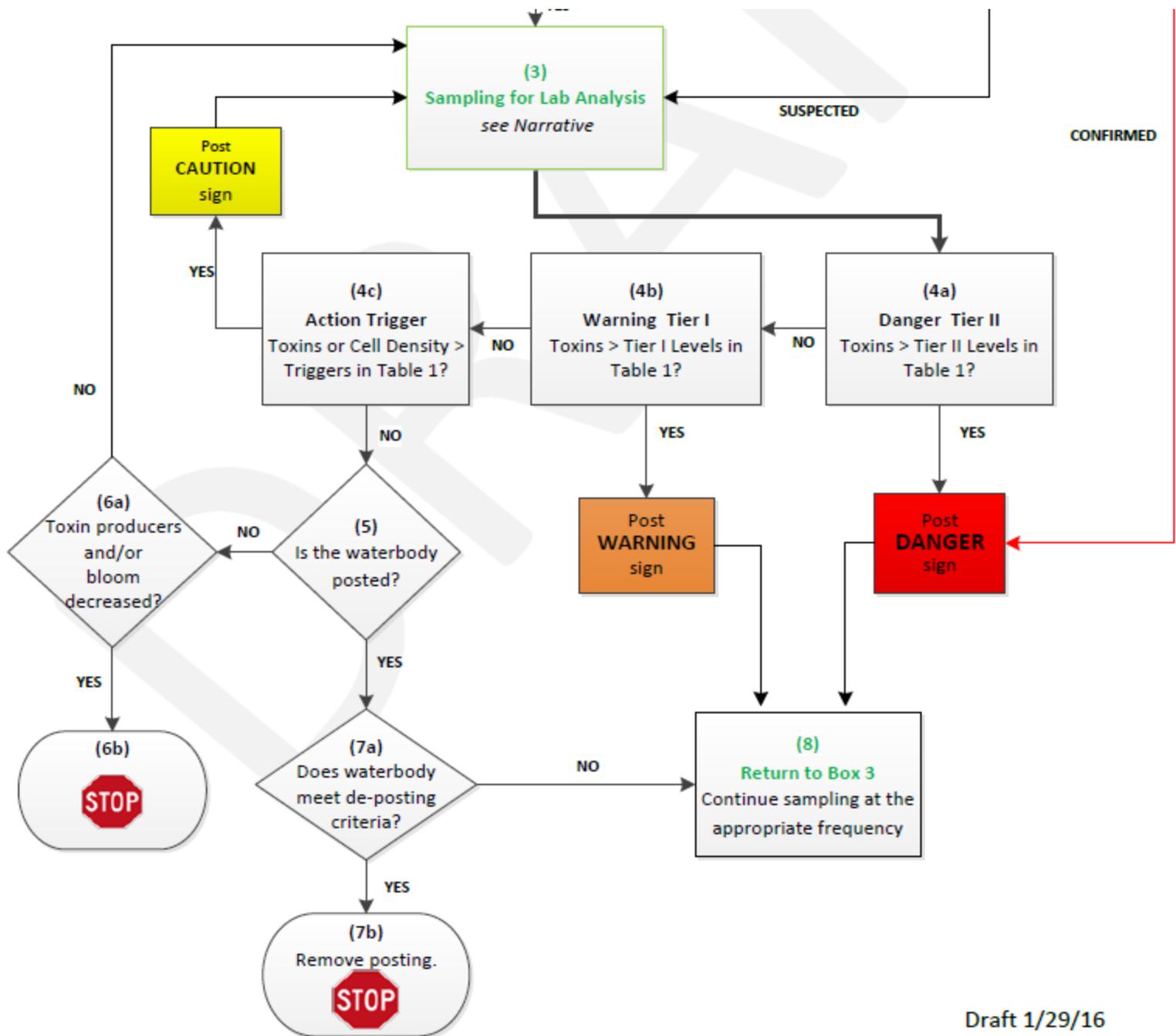
(3)
Sampling for Lab Analysis
see Narrative

- ▶ Sampling and laboratory analysis
- ▶ Sampling design considerations
- ▶ Not intended to be Comprehensive
 - Comprehensive information will be an appendix of the Voluntary Guidance Document
- ▶ SWAMP program

Boxes 4a, 4b, & 4c



- ▶ Boxes correspond to Trigger Levels listed in Table 1
- ▶ Trigger Levels lead to posting recommendations
 - Post Danger Signs
 - Post Warning Signs
 - Post Caution Signs



Signs

- ▶ **CAUTION** – for use when Action Trigger levels are exceeded or while sample collection and analysis are being conducted
 - ▶ **WARNING** – for use when Tier I Trigger levels are exceeded
 - ▶ **DANGER** – for use when Tier II Trigger levels are exceeded or when an illness or death due to cyanotoxin has been confirmed
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CAUTION

**Harmful algae may be present in these waters.
For your family's safety:**



DO NOT SWIM OR WADE
near algae or scum



DO NOT let pets or livestock go into or drink the water, or eat scum on the shoreline.



KEEP CHILDREN AWAY
from algae in the water or on the shore.



For fish caught here, **THROW AWAY GUTS AND CLEAN FILLETS** with tap water or bottled water before cooking.



DO NOT drink this water or use it for cooking.



DO NOT eat shellfish from these waters.

Call your doctor or veterinarian if you or your pet get sick after going in the water.

For more information, contact:

WARNING

Toxins from algae in these waters can harm people and kill pets and livestock



NO SWIMMING



STAY AWAY from scum, and cloudy or discolored water.



DO NOT use these waters for drinking or cooking. Boiling or filtering will not make the water safe.



DO NOT let pets or livestock go into or drink the water, or go near the scum.



DO NOT eat shellfish from these waters.



For fish caught here, **THROW AWAY GUTS AND CLEAN FILLETS** with tap water or bottled water before cooking.

For people, the toxins can cause:

- Skin rashes, eye irritation
- Diarrhea, vomiting

For animals, the toxins can cause:

- Diarrhea, vomiting
- Convulsions and death

Call your doctor or veterinarian if you or your pet get sick after going in the water.

For more information, contact:

DANGER

Toxins from algae in these waters can harm people and kill pets and livestock



STAY OUT OF THE WATER UNTIL FURTHER NOTICE. Do not touch scum in the water or on shoreline.



DO NOT let pets or livestock drink or go into the water or go near the scum.



DO NOT eat fish or shellfish from these waters.



DO NOT use these waters for drinking or cooking. Boiling or filtering will not make the water safe.

For people, the toxins can cause:

- Skin rashes, eye irritation
- Diarrhea, vomiting

For animals, the toxins can cause:

- Diarrhea, vomiting
- Convulsions and death

Call your doctor or veterinarian if you or your pet get sick after going in the water.

For more information, contact:

2016 Updates

- ▶ Use a multi-tiered approach to risk management



- ▶ Focus on toxin levels
 - Cell counts are less reliable
- ▶ Incorporate OEHHA's 2012 Risk Assessment

Table 1. CyanoHAB Trigger Levels for Human Health

	Caution Action Trigger	Warning TIER 1	Danger TIER 2
<i>Primary Triggers</i> ^a			
Total Microcystins ^b	0.8 µg/L	6 µg/L	20 µg/L
Anatoxin-a	Detection ^c	20 µg/L	90 µg/L
Cylindrospermopsin	1 µg/L	4 µg/L	17 µg/L
<i>Secondary Triggers</i>			
Cell Density	4,000 cells/mL	--	--
Site Specific Indicators	Blooms, scums, mats	--	--

Cyanotoxin Triggers for Action

	2010		2016	
Toxin	Conc. (µg/L)	Public health action	Conc. (µg/L)	Public health action
MC	≥8	Advisory sign	0.8*	Caution sign
			6	Warning sign
			20	Danger sign
ANA-a	detect	Advisory sign	detect	Caution sign
			20	Warning sign
			90*	Danger sign
CYN	–	–	1	Caution sign
	–	–	4*	Warning sign
	–	–	17	Danger sign

* OEHHA action level for protection of human health

OEHHA Action Levels

- For ongoing, repeated **exposures over weeks to years**
- **Animal study** → MC dose where adverse impacts begin to appear (**POD**)
- **Uncertainty Factors:**
 - Animals → humans
 - Average → sensitive human
 - Incomplete data
- **Safe Dose in Humans: $POD \div UF$**

OEHHA Action Levels

- **Exposure estimate**
 - Child swimming in recreational waters
5 hrs each day
- **Action Level:**
 - Safe Dose in Humans
 - Exposure to Recreational Water
 - *Cyanotoxin Concentration in Water*
- **Conservative Assumptions**

Microcystin

Basis	Trigger (µg/L)	POD (µg/kg-d)	Total UF	Exposure	Study / Endpoint
CAUTION: OEHHA's Action Level	0.8	6.4	1 000	5 hrs/day (250 ml)	Heinze 1999 / Liver Impacts
WARNING: Modified OEHHA AL	6	6.4	300	2 hrs/day (100 ml)	Heinze 1999 / Liver Impacts
DANGER: Risk Management	20	--	--	--	--

Anatoxin-a

Basis	Trigger ($\mu\text{g}/\text{L}$)	POD ($\mu\text{g}/\text{kg}$ -d)	Total UF	Exposure	Study / Endpoint
CAUTION: Precautionary Approach	Detect	--	--	--	--
WARNING: OHA's Guideline	20	100	1000	2 hrs/day (100 ml)	Fawell et al. 1999 / Neurotox
DANGER: OEHHA's Action Level	90	2,500	1000	5 hrs/day (250 ml)	Fawell et al. 1999 / Neurotox

Cylindrospermopsin

Basis	Trigger (µg/L)	POD (µg/kg -d)	Total UF	Exposure	Study / Endpoint
CAUTION: Precautionary Approach	1	--	--	--	--
WARNING: OEHHA's Action Level	4	33	1000	5 hrs/day (250 ml)	Humpage & Falconer 2003 / Kidney Impacts
DANGER: Modified OEHHA AL	17	33	600	2 hrs/day (100 ml)	Humpage & Falconer 2003 / Kidney Impacts

Next Steps

- ▶ Continue to take Suggestions for improvement
- ▶ Posting on the CCHAB webpage at:
[www.MyWaterQuality.ca.gov/
monitoring_council/cyanohab_network](http://www.MyWaterQuality.ca.gov/monitoring_council/cyanohab_network)
- ▶ Work with the CCHAB Network to update the remainder of the Voluntary Guidance Document
- ▶ Work with the CCHAB Network to develop the CCHAB Network Web Portal

Upcoming events

- April 13, 2016 – Next CCHAB Network Meeting



Questions and Comments



For questions contact:

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