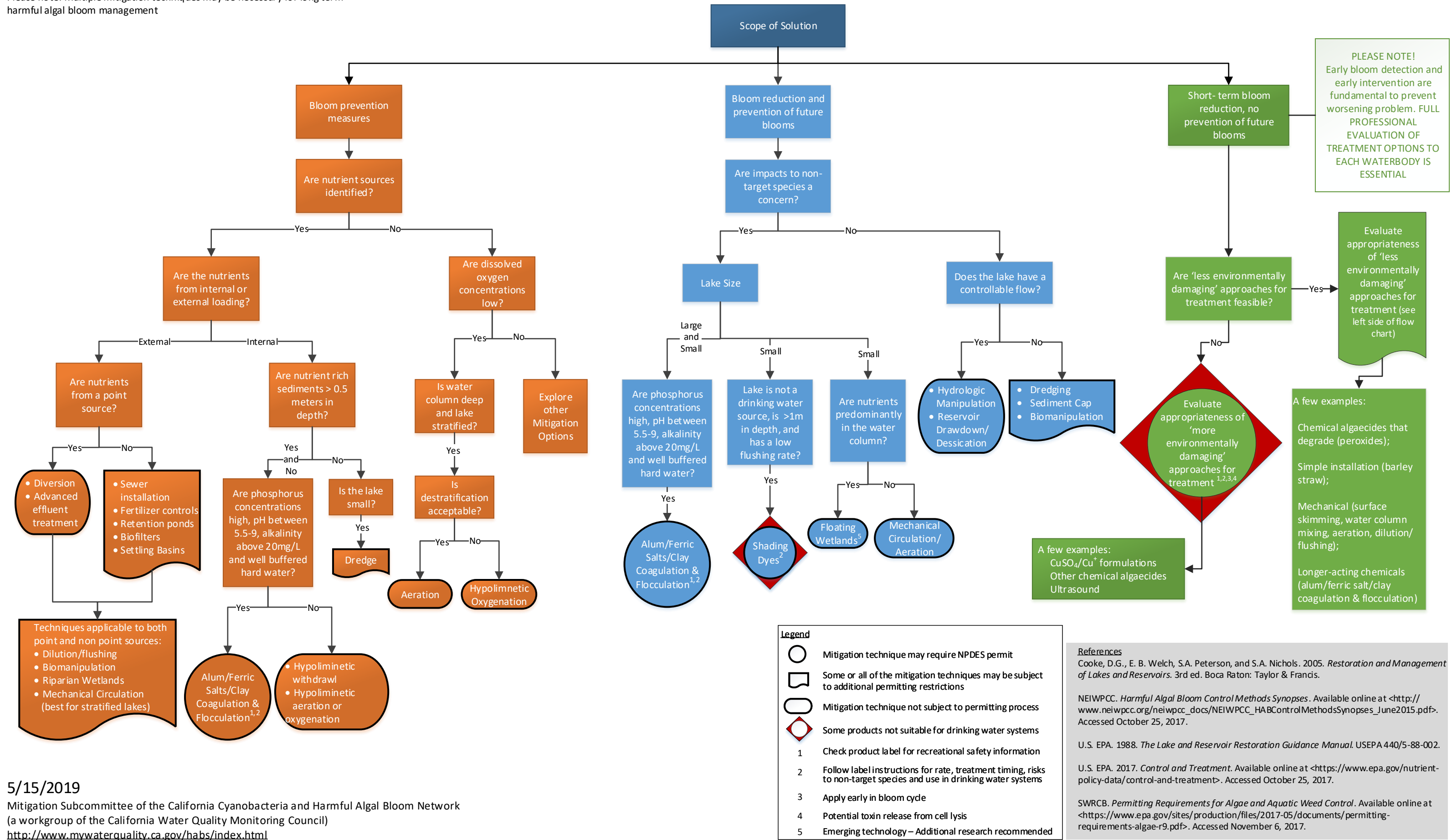


DISCLAIMER:
Mitigation techniques presented on this page do not constitute a recommendation or endorsement by California EPA.

Algae Mitigation Technique Selection Process for Lakes

For control of cyanobacteria and harmful algal blooms
(selection of mitigation measures should be based on at least one year of monitoring data)

Please note: Multiple mitigation techniques may be necessary for long term harmful algal bloom management



PLEASE NOTE!
Early bloom detection and early intervention are fundamental to prevent worsening problem. FULL PROFESSIONAL EVALUATION OF TREATMENT OPTIONS TO EACH WATERBODY IS ESSENTIAL

Evaluate appropriateness of 'less environmentally damaging' approaches for treatment (see left side of flow chart)

A few examples:
Chemical algaecides that degrade (peroxides);
Simple installation (barley straw);
Mechanical (surface skimming, water column mixing, aeration, dilution/flushing);
Longer-acting chemicals (alum/ferric salt/clay coagulation & flocculation)

A few examples:
CuSO₄/Cu⁺ formulations
Other chemical algaecides
Ultrasound

- Legend**
- Mitigation technique may require NPDES permit
 - Some or all of the mitigation techniques may be subject to additional permitting restrictions
 - Mitigation technique not subject to permitting process
 - Some products not suitable for drinking water systems
- 1 Check product label for recreational safety information
 - 2 Follow label instructions for rate, treatment timing, risks to non-target species and use in drinking water systems
 - 3 Apply early in bloom cycle
 - 4 Potential toxin release from cell lysis
 - 5 Emerging technology – Additional research recommended

References

Cooke, D.G., E. B. Welch, S.A. Peterson, and S.A. Nichols. 2005. *Restoration and Management of Lakes and Reservoirs*. 3rd ed. Boca Raton: Taylor & Francis.

NEIWPCC. *Harmful Algal Bloom Control Methods Synopses*. Available online at <http://www.neiwpcc.org/neiwpcc_docs/NEIWPCC_HABControlMethodsSynopses_June2015.pdf>. Accessed October 25, 2017.

U.S. EPA. 1988. *The Lake and Reservoir Restoration Guidance Manual*. USEPA 440/5-88-002.

U.S. EPA. 2017. *Control and Treatment*. Available online at <<https://www.epa.gov/nutrient-policy-data/control-and-treatment>>. Accessed October 25, 2017.

SWRCB. *Permitting Requirements for Algae and Aquatic Weed Control*. Available online at <<https://www.epa.gov/sites/production/files/2017-05/documents/permitting-requirements-algae-r9.pdf>>. Accessed November 6, 2017.