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# SAVE OUR LAKE

# Vote NO on STM ARTICLE

Cyanobacteria are highly toxic to humans & pets

Why is our lake experiencing cyanobacteria blooms now (not in the 1990s)?

Phosphorus (**P**) levels are increasing in lake water & sediment

P fuels cyanobacteria growth; more P leads to blooms

Climate change (warming lake water) also promotes blooms, but is not under our control

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## To reduce P that fuels cyanobacteria we need a 2-pronged approach*

1) Reduce external P flowing into lake

2) Reduce sediment-bound P release during summer

* *2025 MA Guide to Algae and Aquatic Plant Management*

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## P flows into lake at inflows & during storms

LMAC is addressing P inflow

2024: Nutrient barrier installed to reduce P inflow into South Cove

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## LMAC is addressing P inflow

2024 DPW project reduced runoff from boat launch parking lot

Future Plans: Reduce Veteran's Memorial Beach lot, Capen Hill & Lake Ave runoff (grant submitted)

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## Reducing P inflow alone will not reduce cyanobacteria blooms if P is released from sediment in summer *

P is released from sediment when*:

1) Lake sediment contains high levels of iron-bound P

2) Oxygen levels are very low in sediment

* *2025 MA Guide to Algae and Aquatic Plant Management*

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## Deep Hole sediment has high levels of iron-bound P

| Phosphorus bound to | mg/kg |
| --- | --- |
| Iron | 1.26 |
| Organics | 0.62 |
| Calcium | 0.24 |
| Aluminum | 0.53 |
| TOTAL | 2.65 |

Deep Hole: Central deep area of lake

**Problem:**
**Iron *releases P* when oxygen levels fall**

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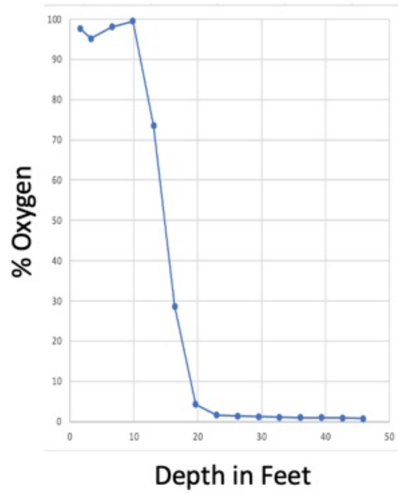
## Oxygen levels fall very low in Deep Hole in summer

July 2023

**Iron-bound P is released when oxygen levels are very low**

**P release + very warm water fuels Cyanobacteria Blooms**

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## Alum treatment reduces sediment-bound P release & cyanobacteria blooms

- Alum is an aluminum salt
- Alum forms a solid in lake water, settles to lake bottom & binds P
- Alum binds P year-round even in the absence of oxygen

Oxygen or no oxygen conditions:
P is bound & inactivated
cyanobacteria blooms reduced

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## Alum treatment is safe

- Little aluminum remains in water (most will blanket the bottom of Deep Hole)
- Levels in water shortly after treatment designed to be less than the aluminum drinking water standard, and less than the levels in human breast milk, infant formula, many baby foods & common foods
- The amount of aluminum absorbed through skin is trivial (0.0005 – 0.01% of a low level)

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## Alum is the MA Gold Standard treatment for blocking sediment-

Alum reduces cyanobacteria blooms in most lakes where high iron-bound P and low oxygen are documented

Particularly effective in deep stratified lakes like ours when these conditions are met:
1) P load is more than 20% of total P load
2) The sediment becomes anoxic during summer
3) There is a large amount of iron-bound phosphorus in the sediment
**All 3 conditions exist in deep hole of our lake!**

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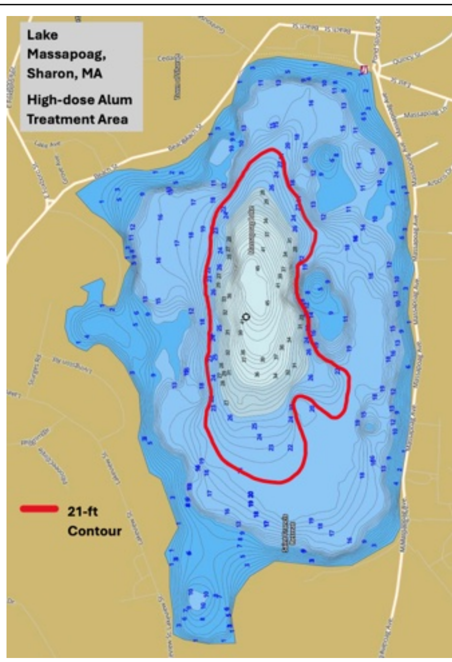
Alum Treatment is contracted for June 2 - 20 in lake area where low oxygen & high iron-bound P were documented

Premier contractor, Solitude Lake Management is highly-experienced




## VOTE NO on STM article

Petitioner claims fixes to Massapoag Ave alone were responsible for 1990s lake improvements but another well-documented effective strategy was also implemented in the 1990s:

- Our Conservation Administrator began letting warm water out of the lake during heat waves
- Petitioner has **NO DATA** on which improvement helped the lake

**Allow LMAC to follow 2025 guidelines, not base projects on 1990s knowledge & lake conditions**