

HOT TOPICS In Water & Waste Water



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The Synergies of Mixing

Mixing

- pH adjustment down requires medium to high speed
- pH adjustment up requires medium to high speed
- Coagulation – rapid, high speed mixing
- Flocculation – slow, steady mixing

Mixing

Buffers are your worst enemy in pH adjust

- Alkaline buffers
- Normal buffers

Mixing

Alkaline buffers

- Phosphates
- Silicates
- Amines
- Carbonates
- Borates

Mixing

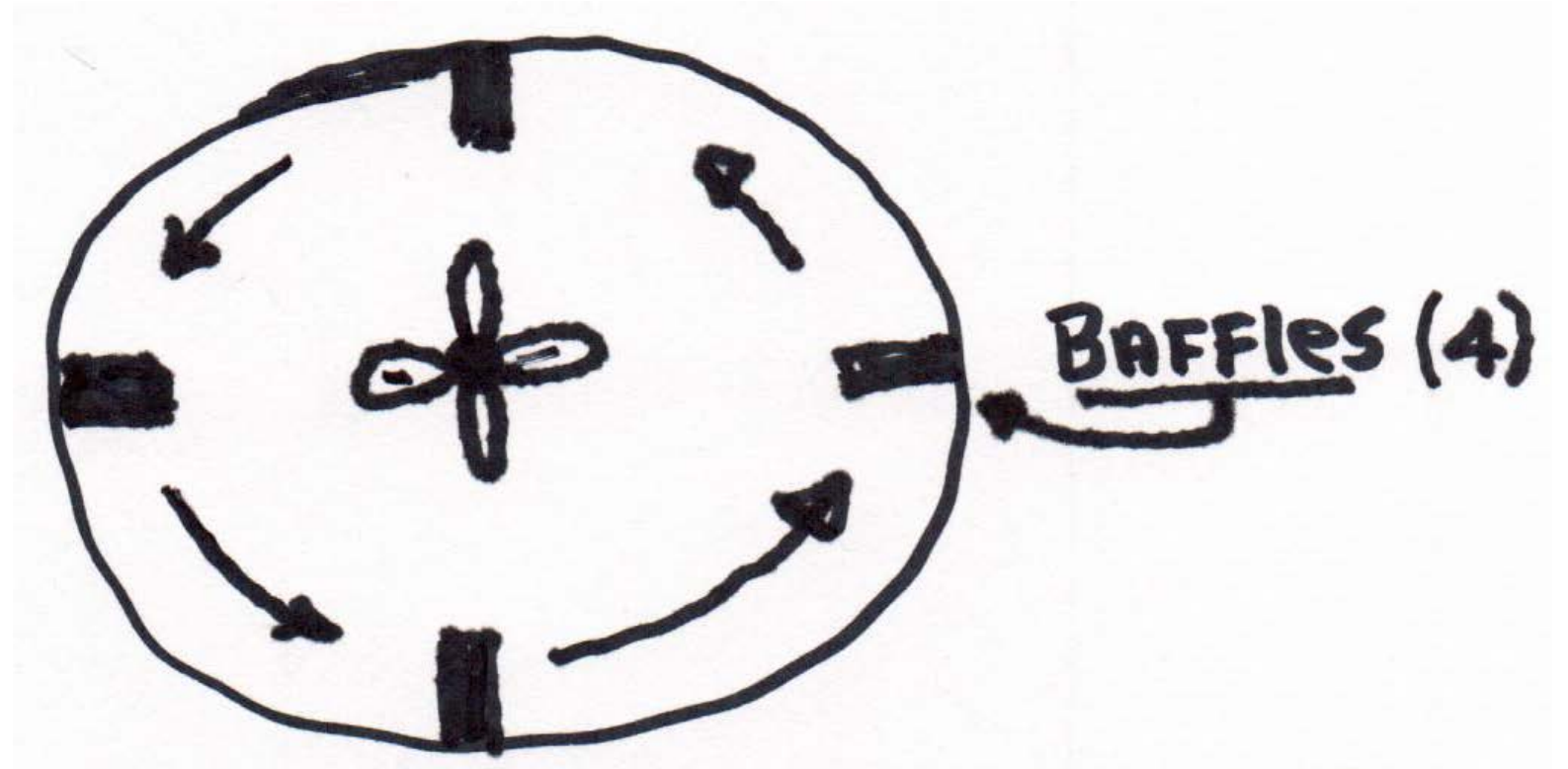
Normal buffers

- Boric Acid
- Citric Acid
- Phosphoric Acid

Mixers to Consider

Baffled tanks

➤ No more round tanks!



Mixers to Consider

Serpentine mixers

- aka Serpentine micro mixer
- aka Serpentine micro channel



Mixers to Consider

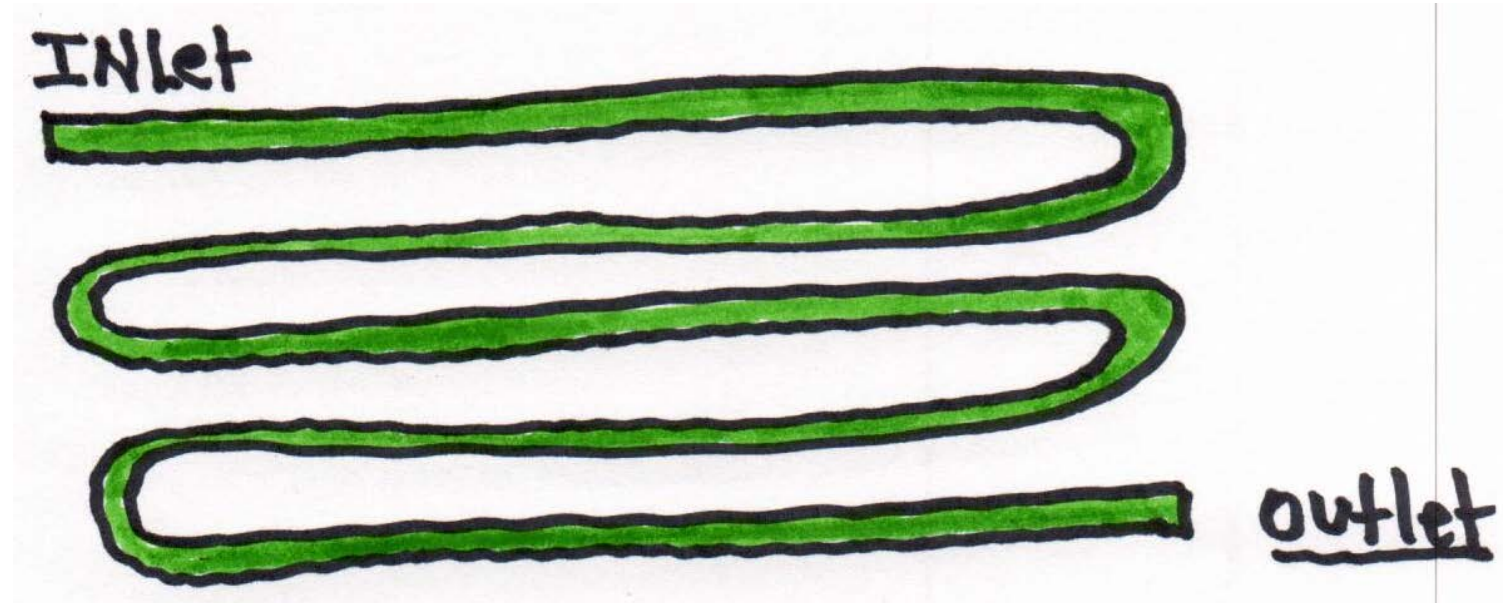
You can make your own temporary system

- A series of 90° angles with pipe compatible with your waste stream

Mixers to Consider

Custom created Serpentine

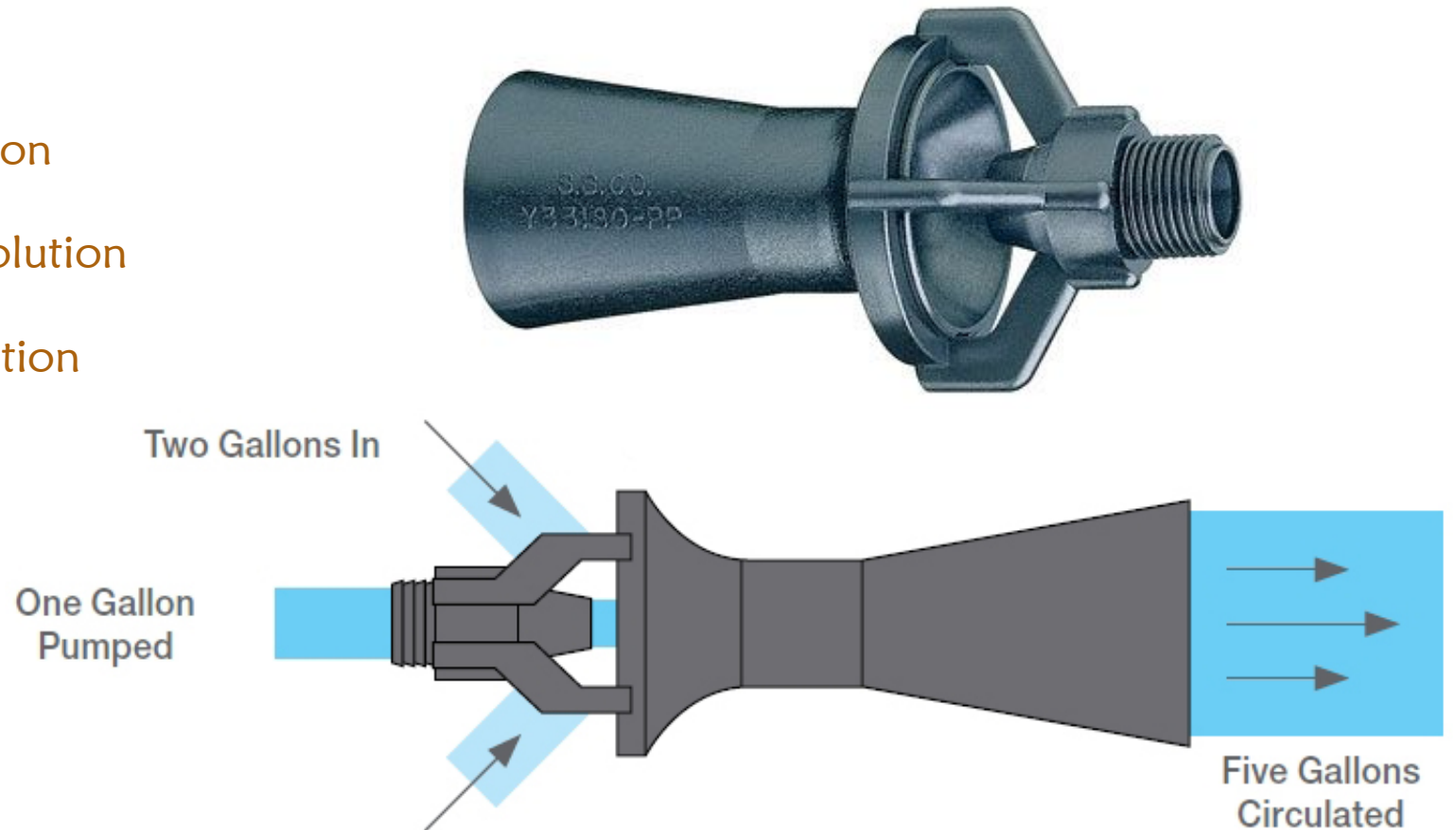
- 90° angles
- Interior diameter sized to handle flow



Mixing

Tank mixing eductors

- Greatly improve tank circulation
- Can move large volumes of solution
- Can circulate 5-gallons of solution for every 1 gallon pumped



Mixing

Tank mixing eductors – glass reinforced polypropylene

- Far superior than air agitation
- Can be used in process tanks as well

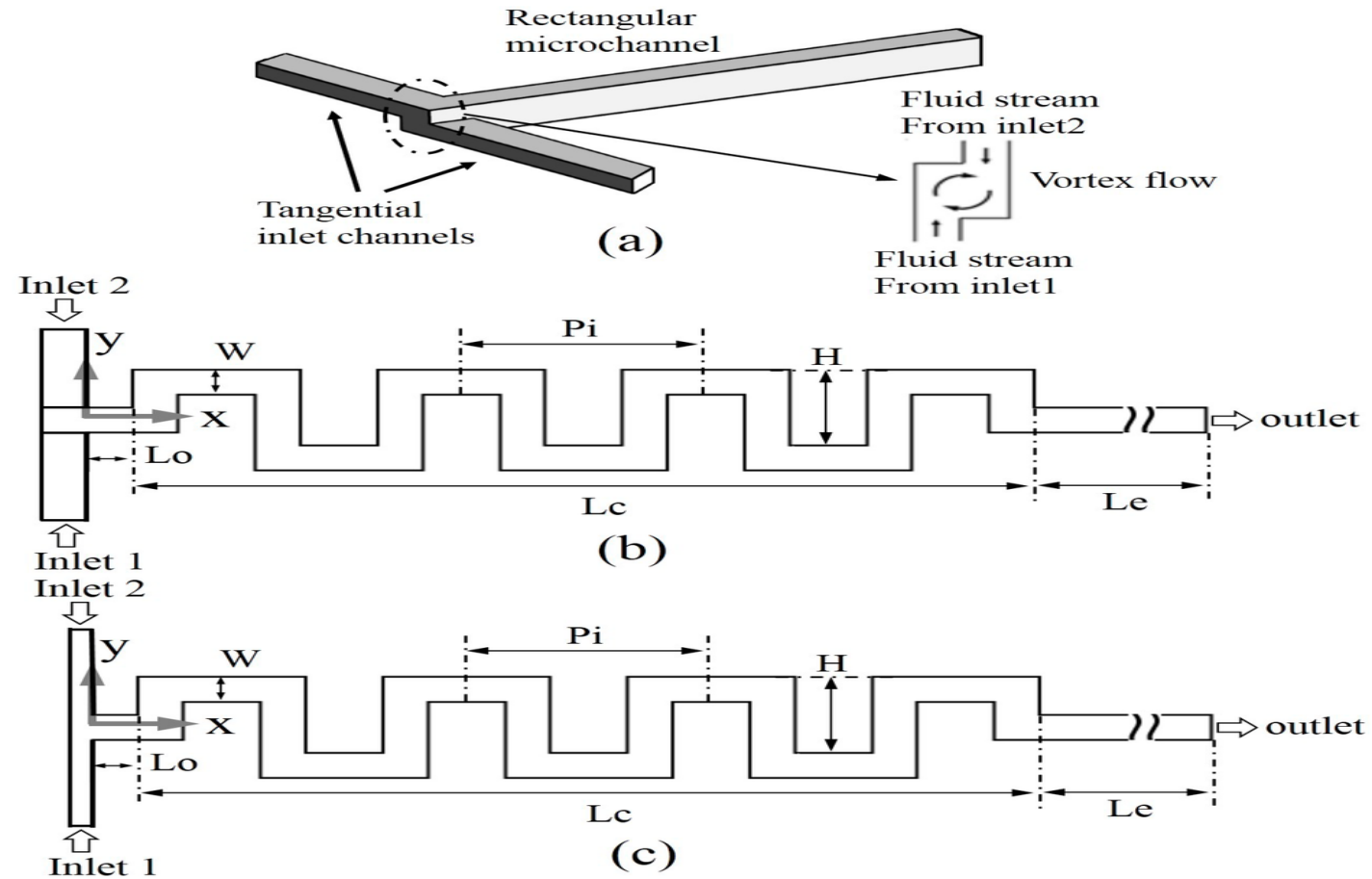


Mixing

Static inline mixers

- Designed to blend chemistry 100%
- Stainless steel, PVC, PVDF, others
- Inexpensive and simple
- Can handle any viscosity
- Excellent for make down of polymers
- Can come with injection ports

Mixing



Mixing

Heavy duty mixers

➤ Always get variable speed option

Mixing

Heavy duty mixers

- Direct drive mixers – for dissolving powders
- Gear drive mixers – polymer and viscous chemicals
- Low speed – for shear sensitive chemistry

Mixing

Heavy duty mixers

- Single propeller mixers
 - needed for liquid depth equal to the drum or tank diameter



Mixing

Heavy duty mixers

- Dual propeller mixers
 - needed for liquid depth greater or equal to 1.5 times the tank diameter



Mixing

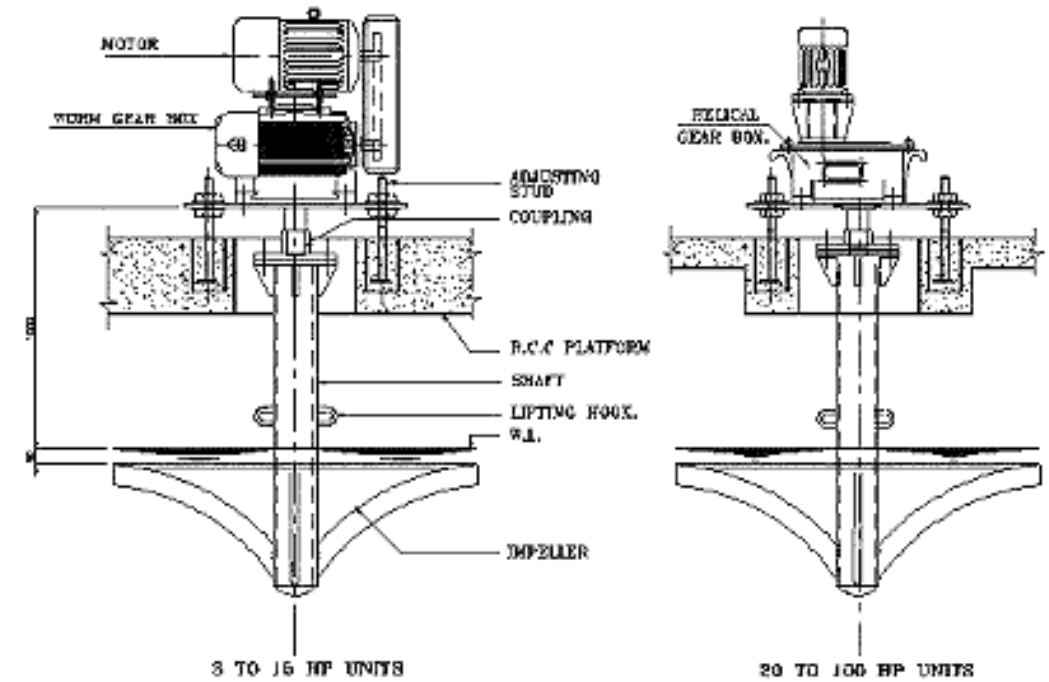
Surface aerators

- Excellent oxygen transfer
- High mixing efficiency
- Lagoons, activated sludge, oxidation ditch



Mixing

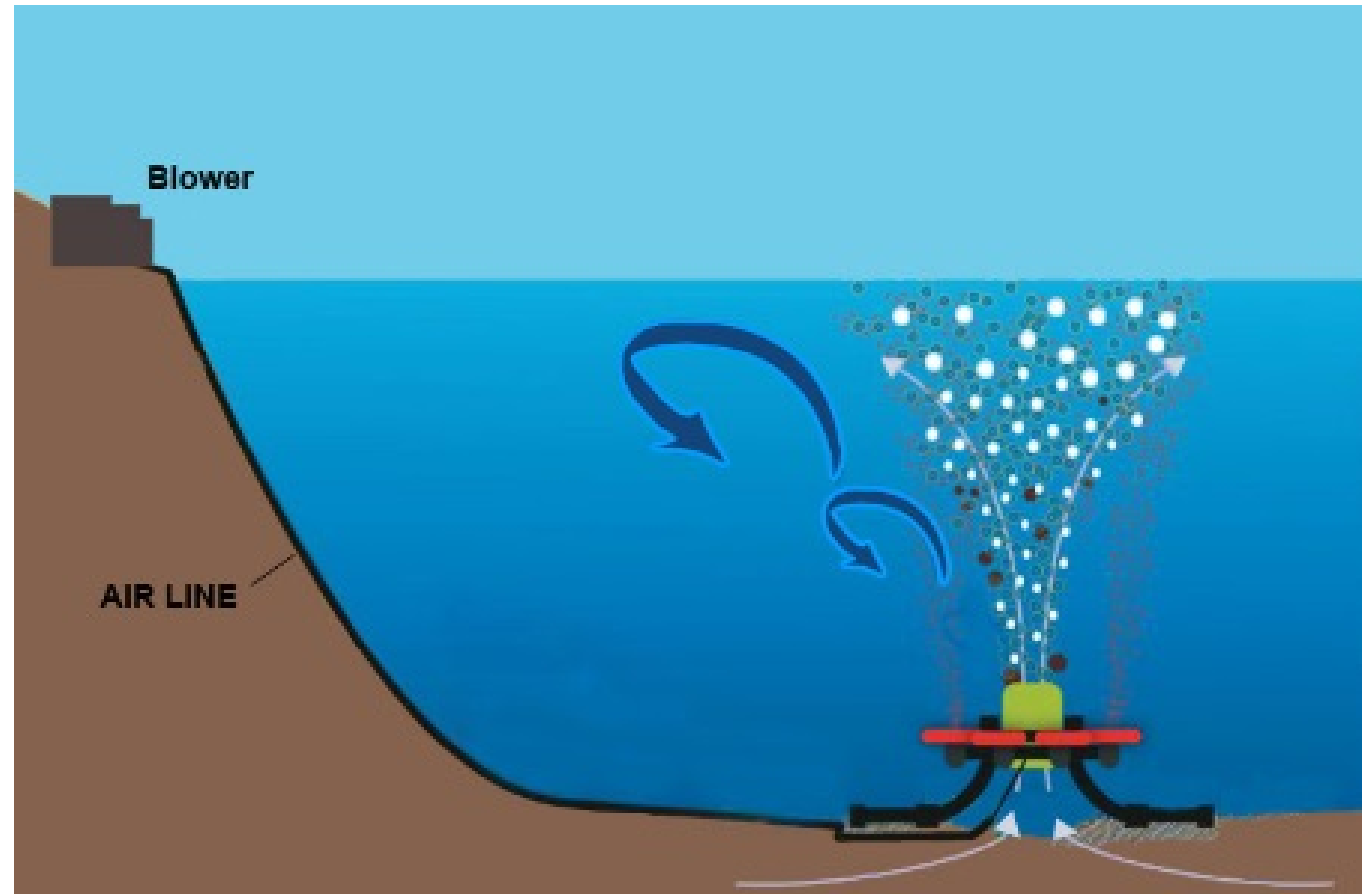
Surface aerators



Mixing

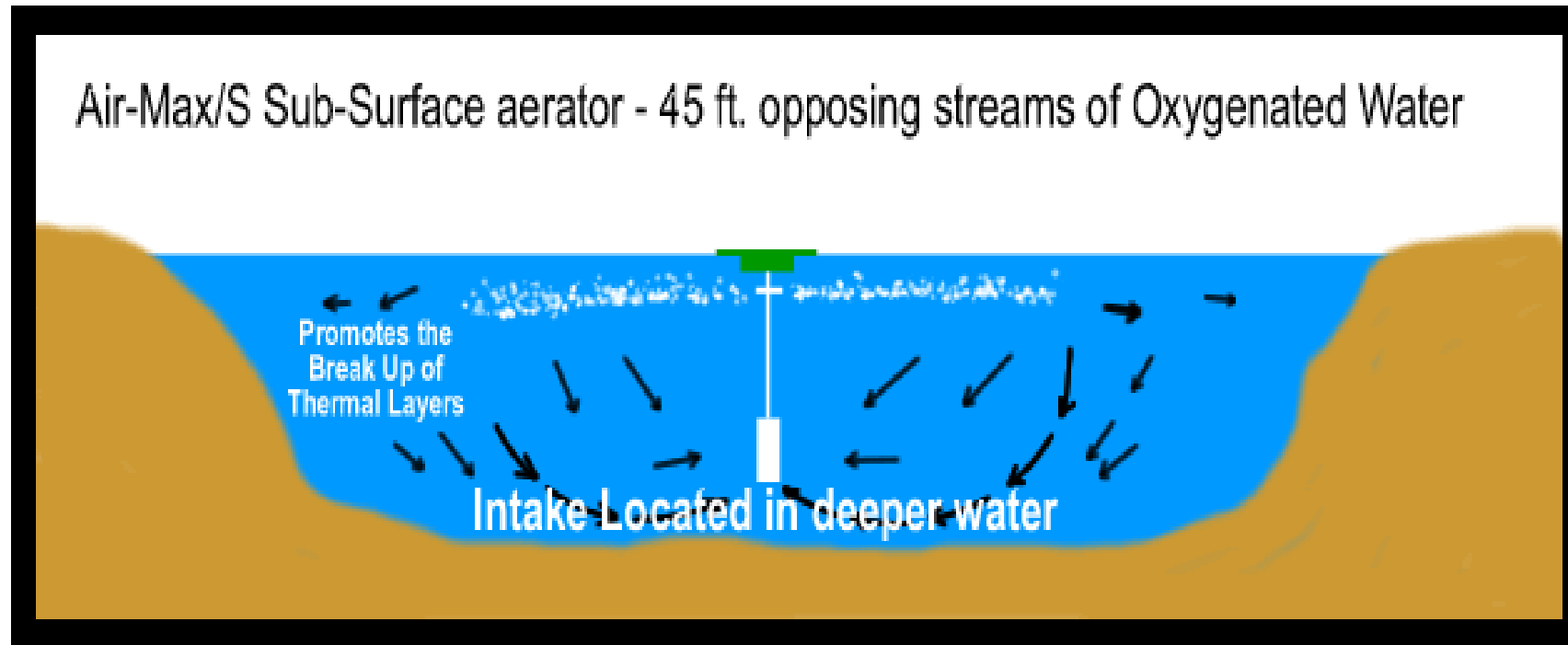
Subsurface aerators

- Waste water treatment
- Supplemental aeration
- Mixing below surface
- No pumps are required



Mixing

Subsurface aerators



Mixing

What could the color of the water in your lagoon or pond tell you?

- Yellow or Light Green – low pH and DO
- Black or Gray – anaerobic condition imminent
- Dark Green – high pH or high DO



Mixing

What could the color of the water in your lagoon or pond tell you?

- Milky – overload or septic
- Pink – sulfur bacteria, red algae, daphnia blooms
- Tan or Light Brown – good conditions

Mixing

I have an updated list of chelators for all here today

Questions?

