

Welcome

to the **Flight 93 Treatment Tour**

OSMRE Appalachian Region Technology Transfer (ARTT) Event at the Flight 93 Memorial



Enhanced
Solids Fe removal
& Passive Mn removal
at Circumneutral pH

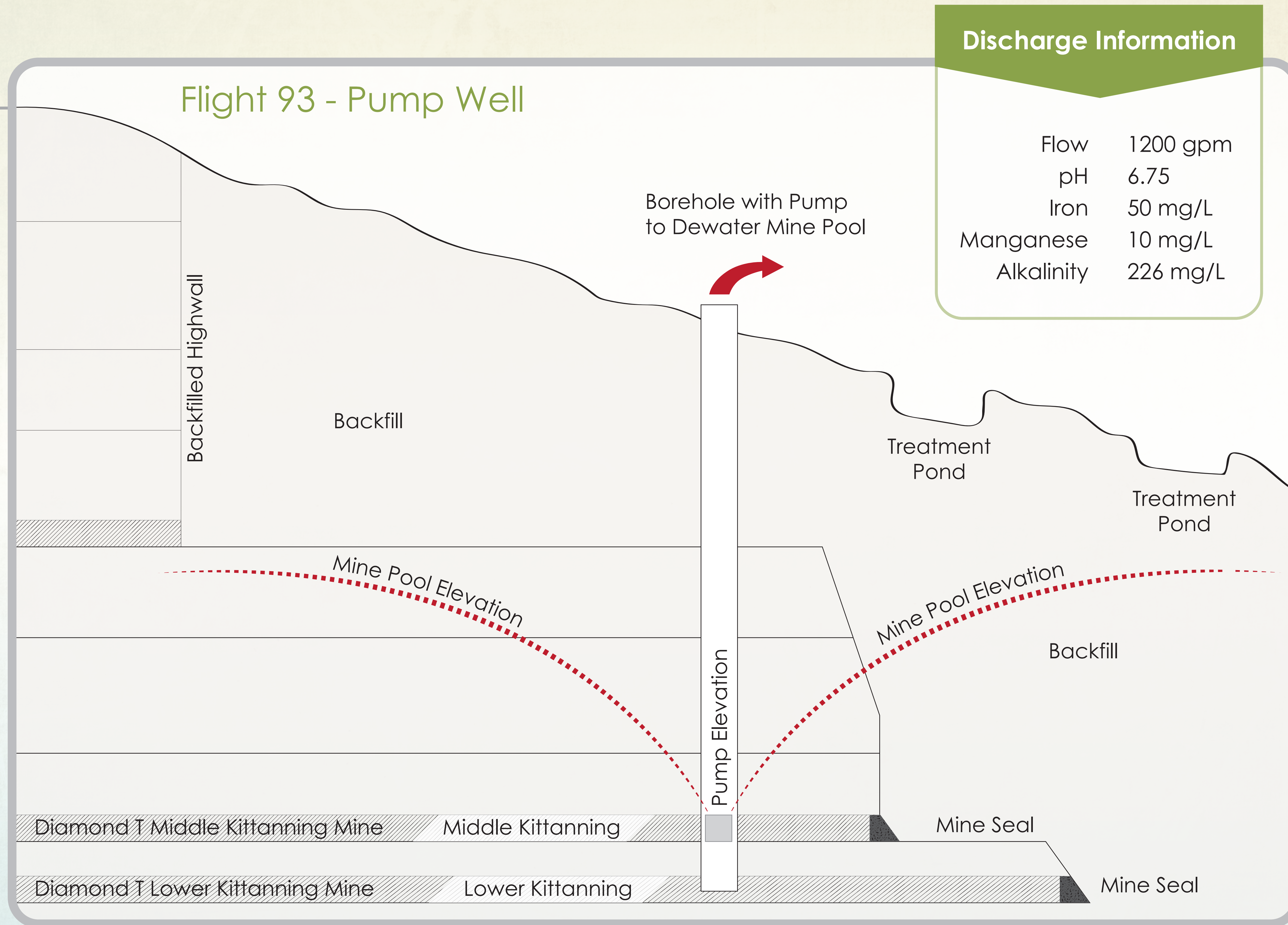
U.S. Department of the Interior
Office of Surface Mining Reclamation and Enforcement



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at Circumneutral pH

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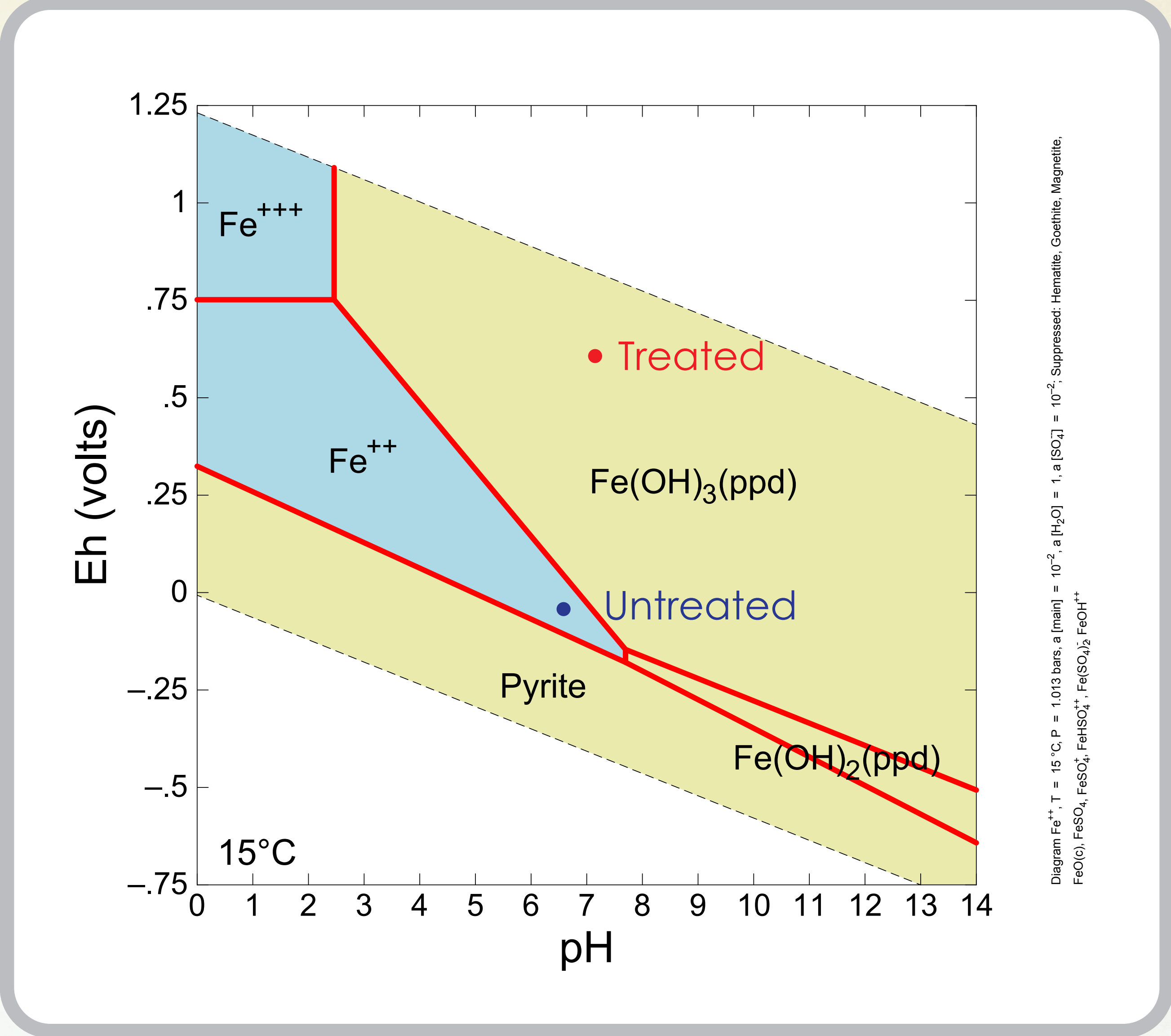


STOP #1

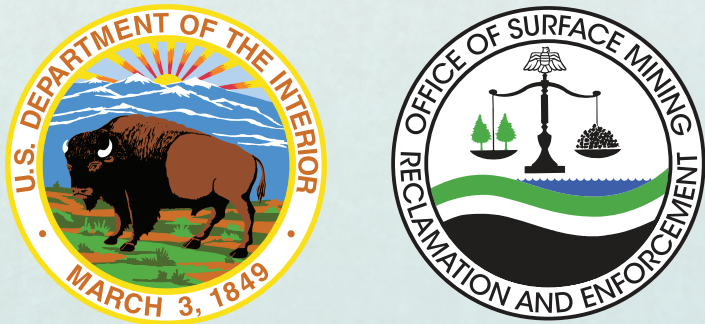


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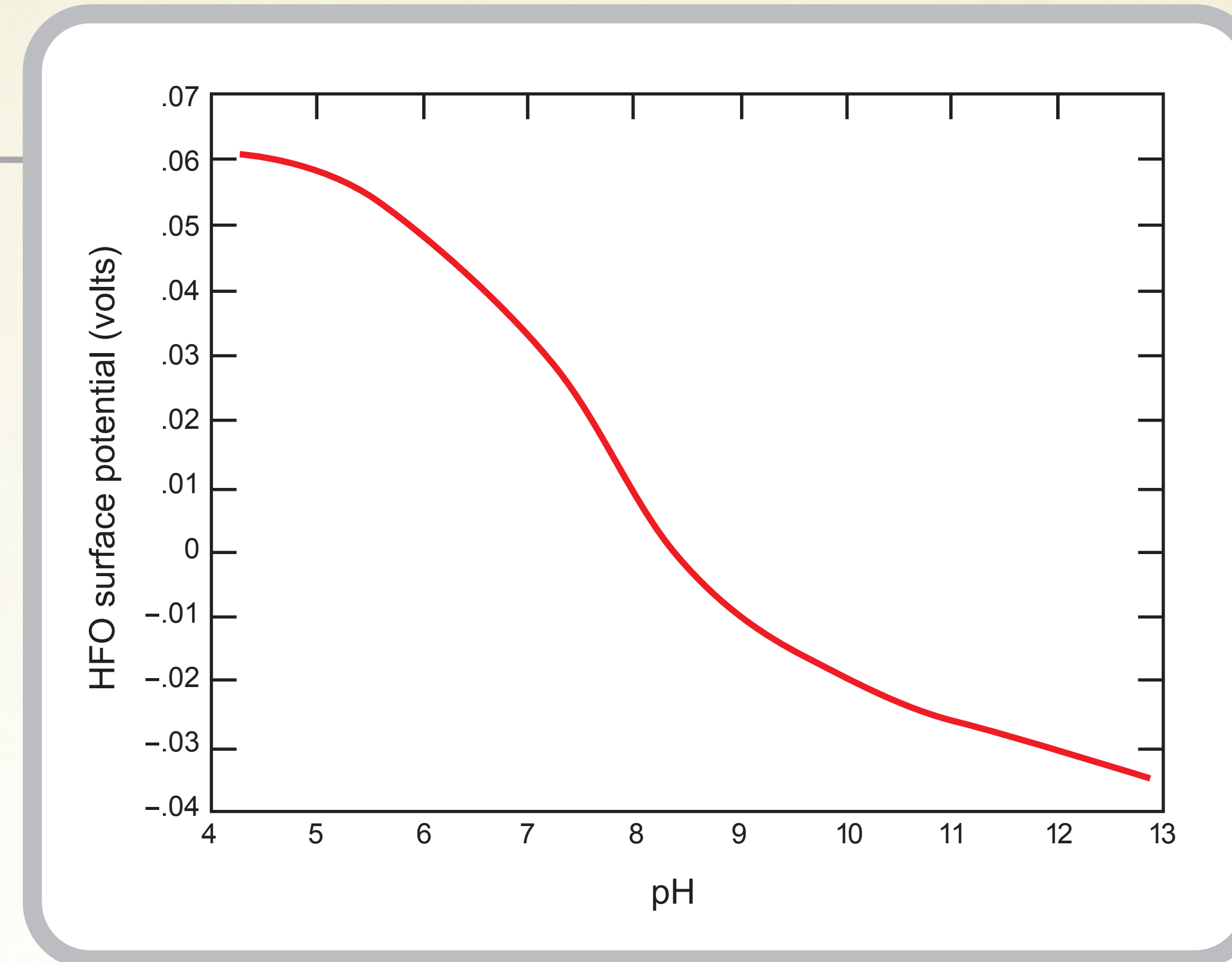
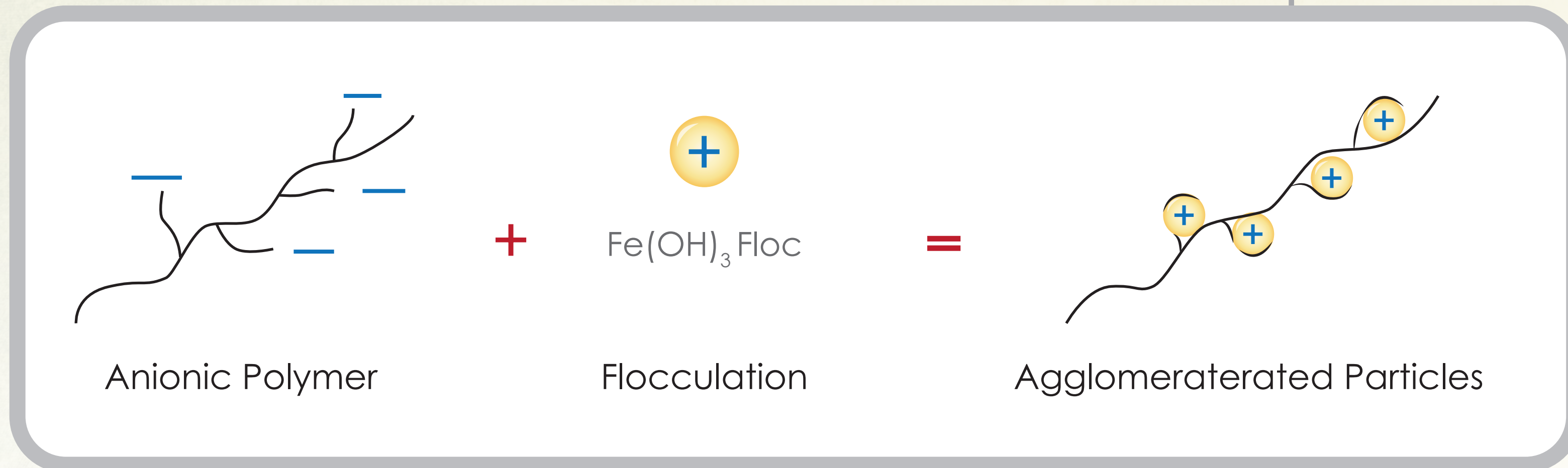


STOP #1

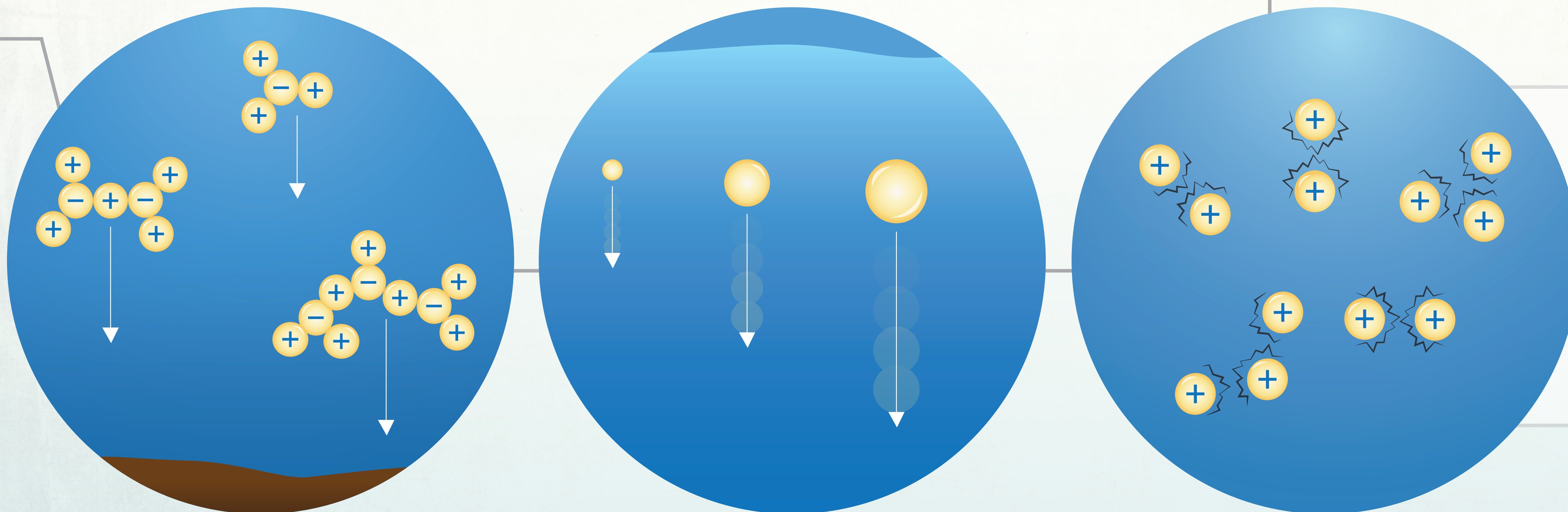


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(Illustration captions from left to right)

Flocculants provide the negatively charged particles that attract the positively charged iron particles.

Stokes Law - larger particles settle faster.

Colloidal particles, clay sized and smaller, remain suspended. When the surface potentials are high, repulsion is strong, and particles do not collide.

STOP #2



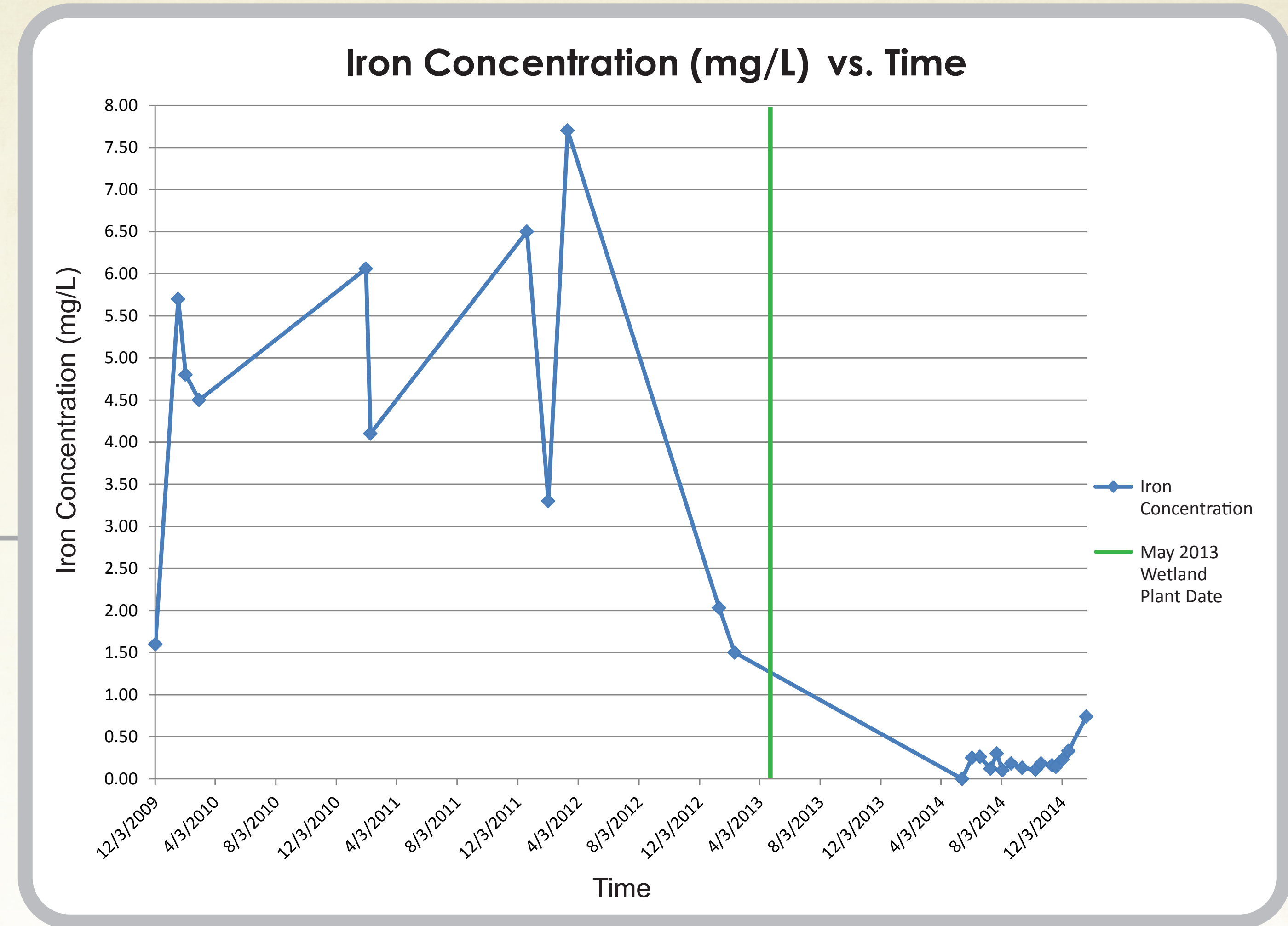
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Wetland Sizing Criteria and Facts

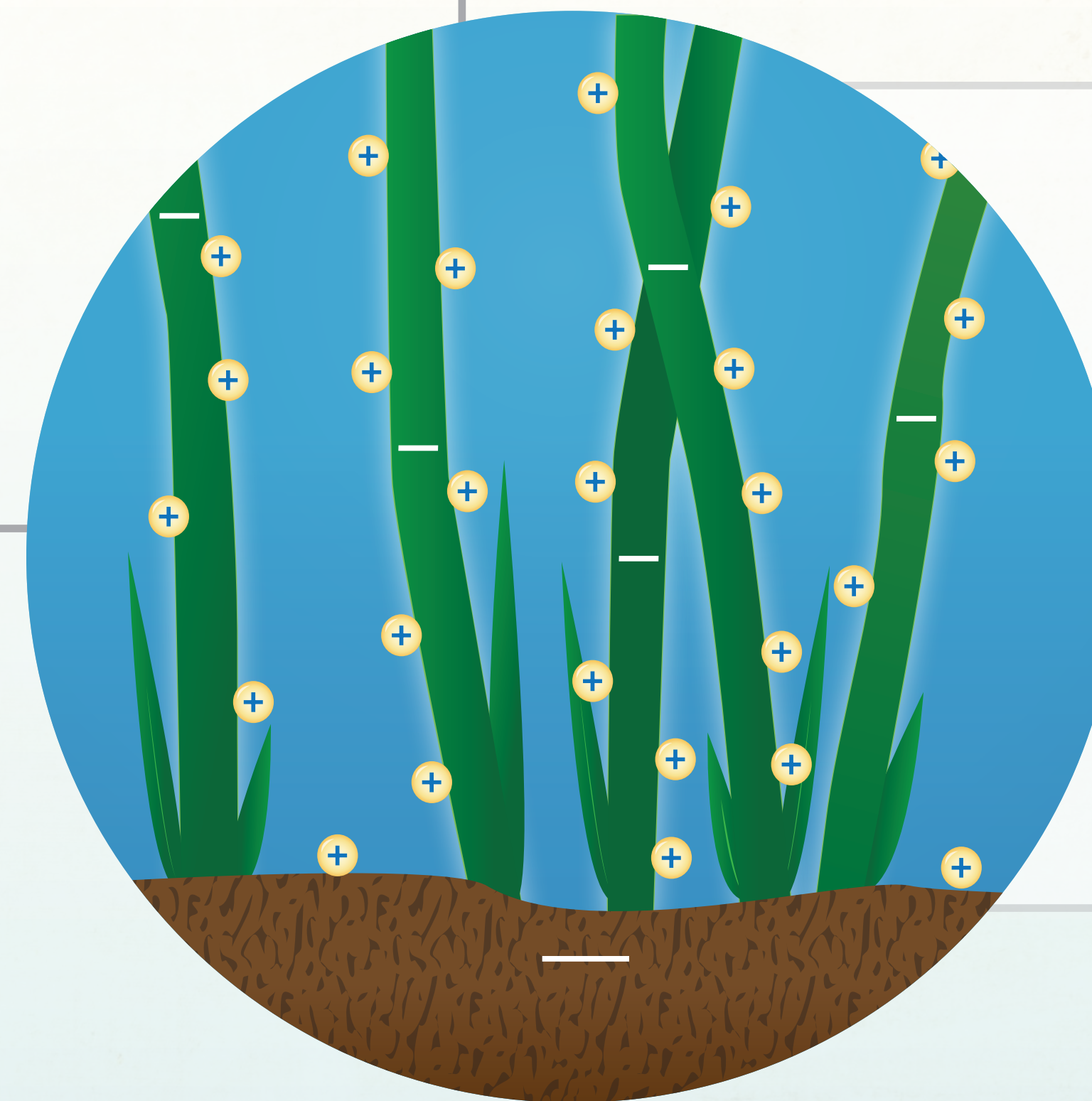
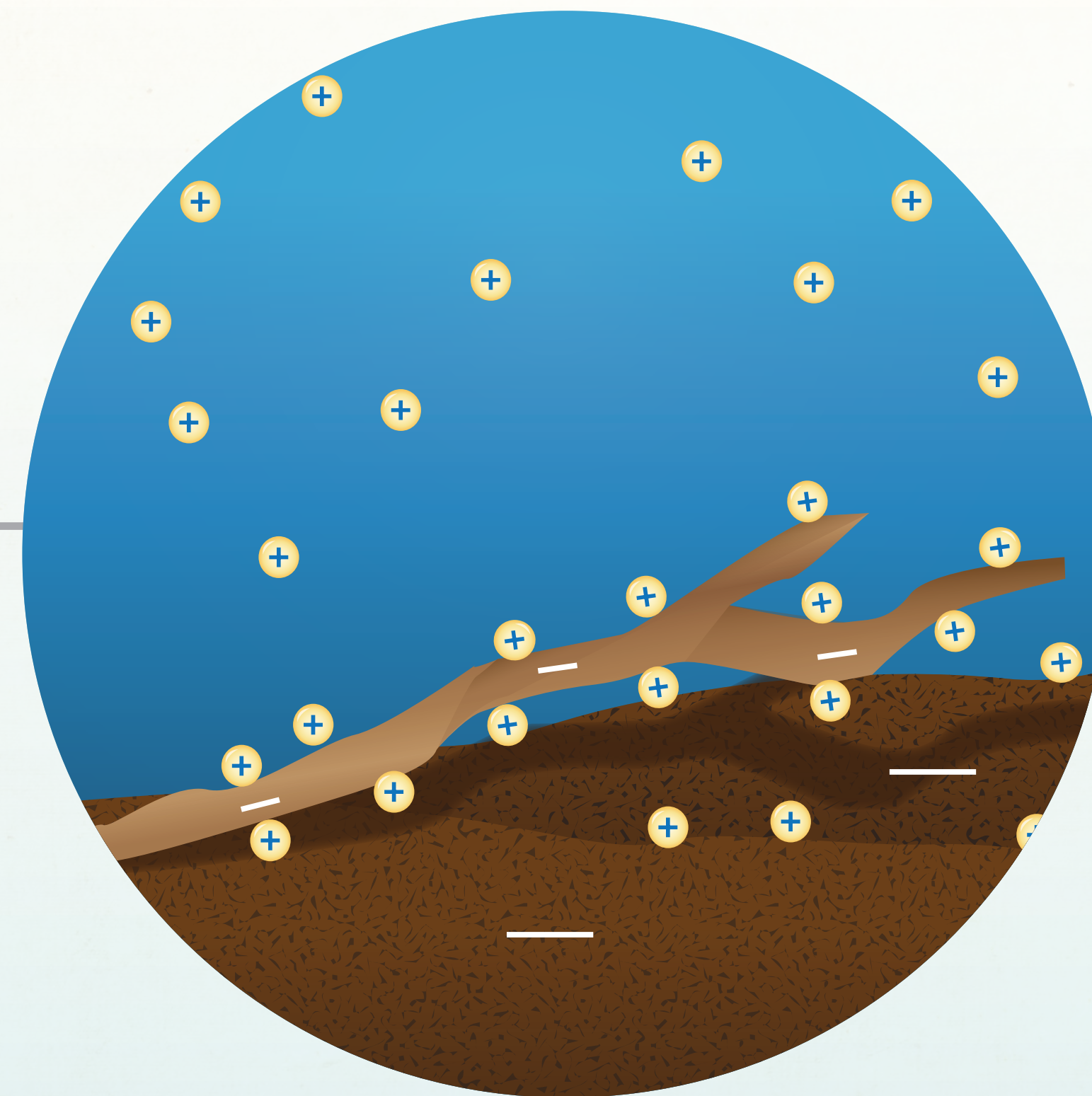
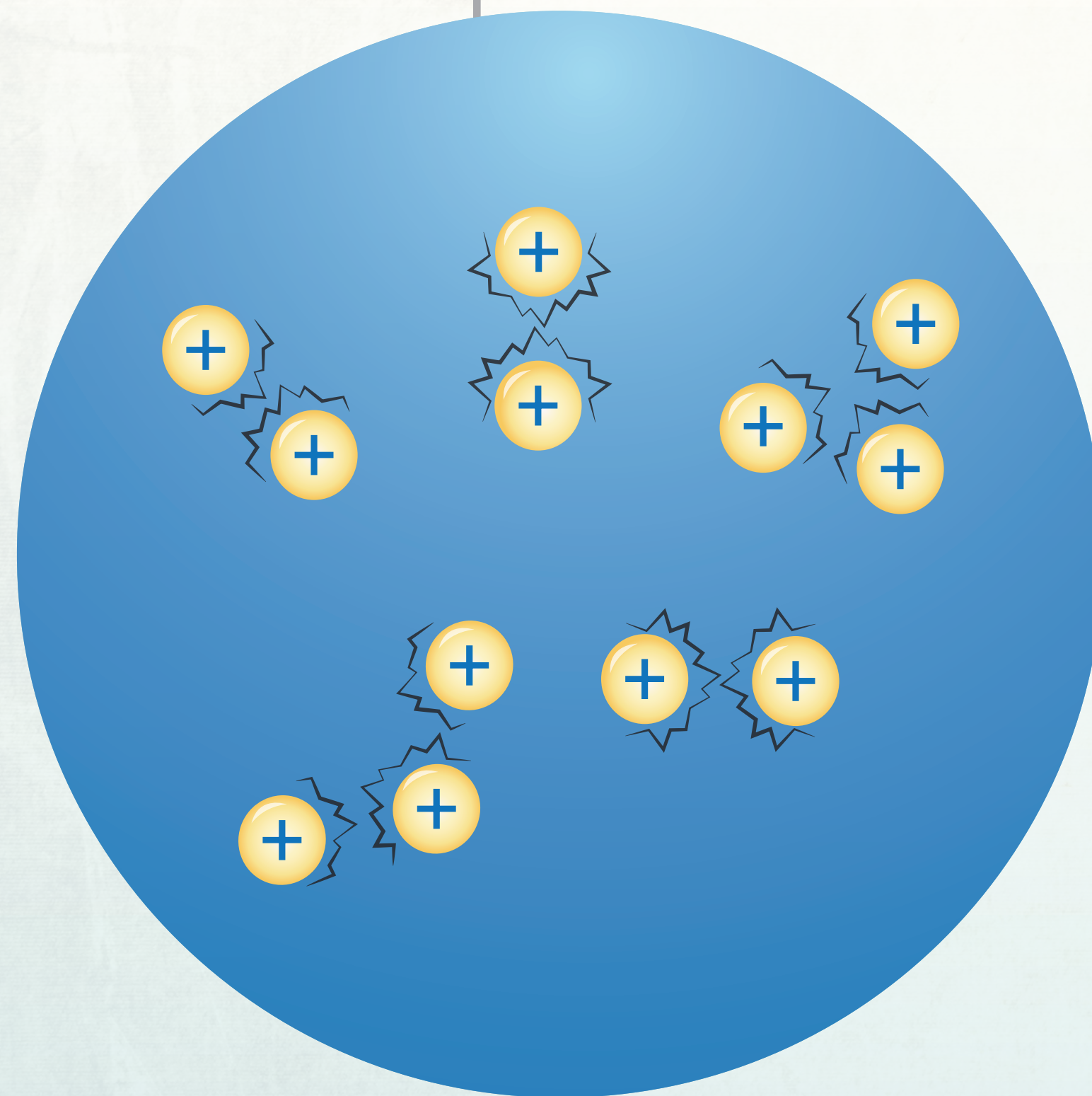
The wetland is 1.2 acres.

The wetland design was based on 1,200 gallon-per-minute to remove 5.0 mg/L of Iron.

Sizing methodology was an Iron removal rate of 7 grams of Fe/m²/day.



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(Illustration captions from left to right)

Colloidal particles, clay sized and smaller, remain suspended. When the surface potentials are high, repulsion is strong, and particles do not collide.

The finest particles within the ponds are only removed if they touch the bottom or any debris lying on the bottom.

Particles collect on vegetation surfaces in wetlands resulting in total iron effluent concentrations of less than 1.0 mg/L.

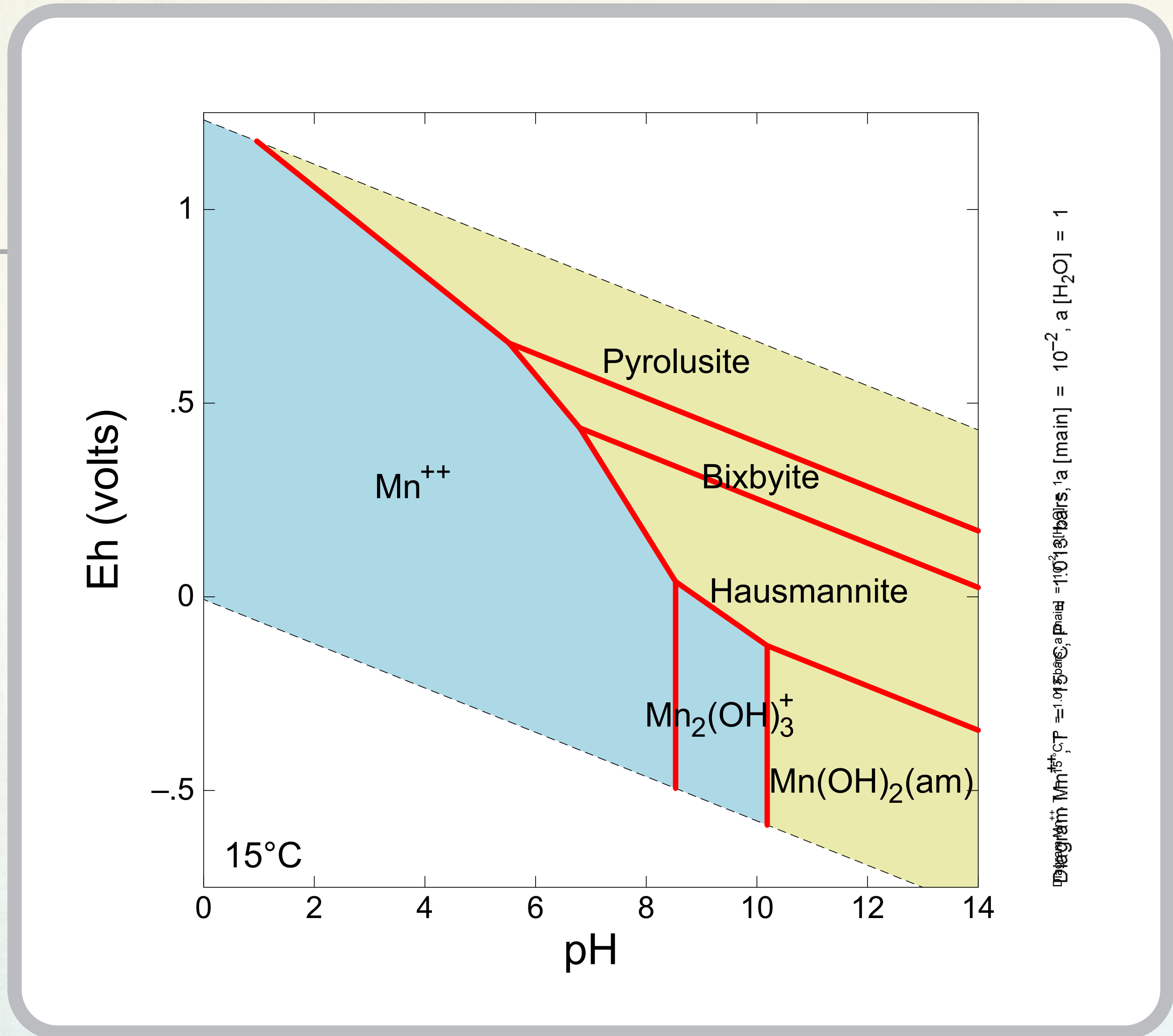
STOP #3



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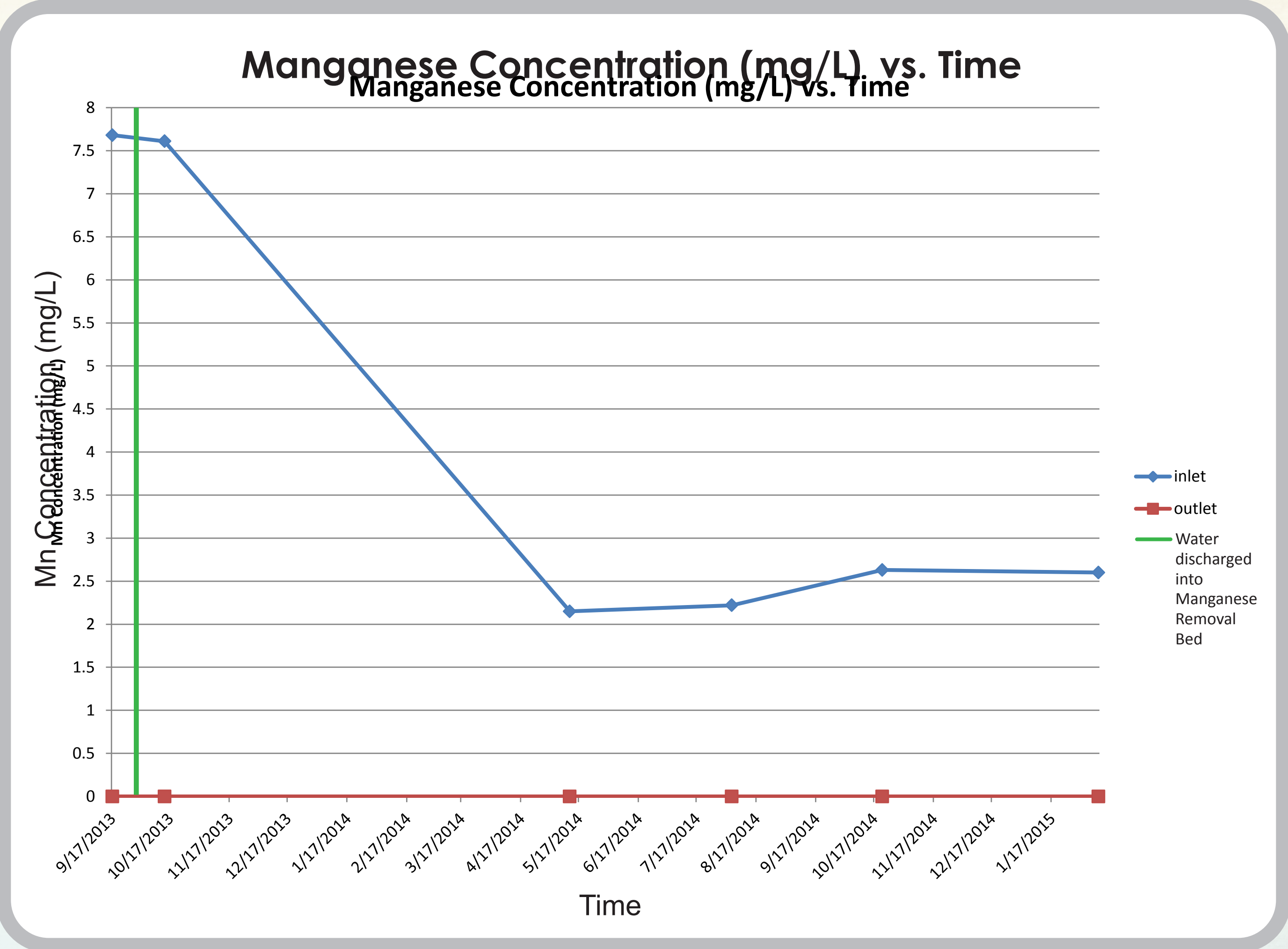
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Limestone Bed Sizing Criteria and Facts

Limestone bed designed to remove 10 mg/L of Mn at 60 gpm.

Sizing criteria = 2 day retention time.



STOP #5

