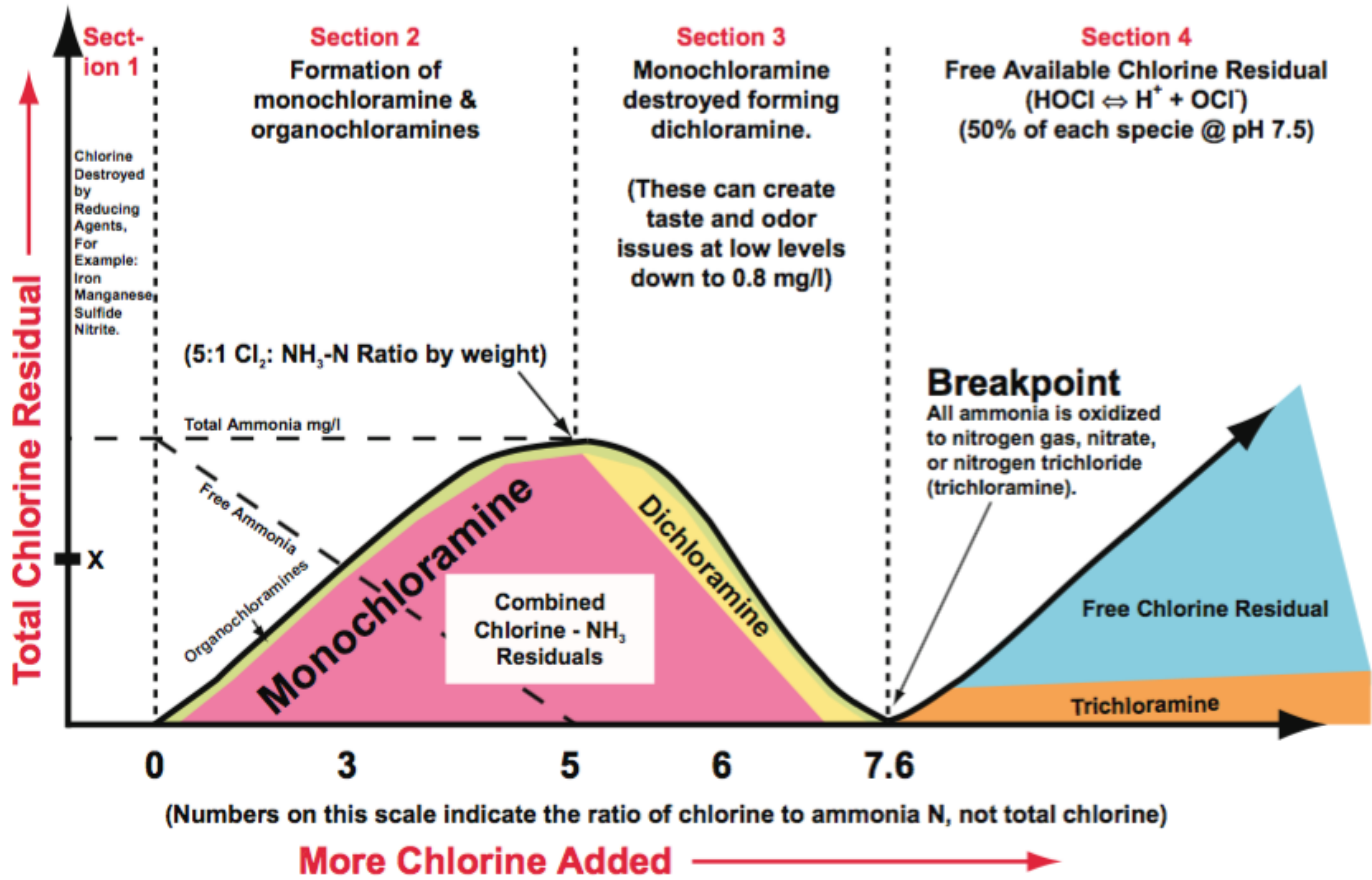


Medora Corporation

Breakpoint Chlorination Curve

GridBee and SolarBee mixing is thorough enough to allow the mixer to be used for breakpoint chlorination of potable water storage reservoirs. The rate of the reactions shown below depends to a large degree on temperature, pH, contact time, and ratio of chlorine to ammonia. Both chlorinated water and chloraminated water can be taken through breakpoint. Each city has their own unique breakpoint curve for their water at various temperatures and different conditions.



At "X" mg/l of total chlorine residual:

- (1) If the free chlorine is equal to the total chlorine, then Section 4 of the curve above describes the condition of water.
- (2) If the free chlorine is less than the total chlorine and there is free ammonia, then Section 2 applies (mostly monochloramine, no odor).
- (3) If the free chlorine is less than the total chlorine and there is no free ammonia, then Section 3 applies (some monochloramine and dichloramine).

Note the "free ammonia" line; free ammonia can nitrify. In chloraminated systems, ammonia is added at the correct ratio at the plant. Leaving the plant, you can have excess ammonia. Also, as time goes on, autodecomposition of the chloramine forms free ammonia.

Typical goal for city using chlorine: A minimum 1.0 mg/l free chlorine or 1.5 mg/l combined chlorine. Typical goal for city using chloramine: 1.5 mg/l monochloramine, ratio 4:1.