

Richmond WWTP - Chlorine decay in ditch enroute to the Cub River

6/10/2014

These calculations modify the chronic chlorine effluent limits calculated in the attached wasteload allocation

Decay Considerations - Chlorine

Original Concentration 0.875 mg/l TRC C_0 What the original concentration needs to be in order to get a .475 at the Cub
 Decay Coefficient -20.0 per day k pretty conservative rate
 Stream Velocity 1.0 ft per sec v

d	$t=d/v$	$C_t=C_0 \cdot e^{(k \cdot t)}$	
Distance(mi)	time - days	Conc(t) mg/l	
0.25	0.015	0.64475	
0.5	0.031	0.47500	<= concentration after 1/2 mile decay (this is the chronic WLA effluent limit)
1	0.061	0.25781	
2	0.122	0.07594	
3	0.183	0.02237	
4	0.244	0.00659	
5	0.306	0.00194	
6	0.367	0.00057	
7	0.428	0.00017	
8	0.489	0.00005	
9	0.550	0.00001	
10	0.611	0.00000	
11	0.672	0.00000	

standard
 .019 acute
 .011 chronic