

Plate Settler Spacing

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Abstract

The floc roll up as a failure mechanism in plate settlers has been proven by the plate settler team using kaolin/alum flocs. The density of flocs made primarily from natural organic matter, NOM, may be significantly lower than the density of kaolin/alum flocs and thus they may be much more vulnerable to floc roll up. This hypothesis can be tested by repeating several experiments using humic acid instead of kaolin in the raw water. The most extreme case is a raw water that is colored with organic matter, but has no suspended inorganic matter. It may be prudent to use NOM flocs as the critical case to ensure that floc roll up is never a failure mechanism in AguaClara facilities. After testing the floc roll up response of NOM flocs it will be possible to assess the feasibility of further reduction in spacing between plate settlers.

Students 2

Skills fluid mechanics, process controller, data analysis

1 Raw Water Composition

Currently, the raw water entering the system is mixed with the concentrated kaolin clay. The combination of the two ensures that the influent turbidity is at 100 NTU. Yet, it was suggested that that team might switch from using clay to experimenting with natural organic matter (NOM) to simulate field conditions for the water treatment plants. The most extreme case to evaluate is the case of NOM without any inorganic particulate matter.

2 Floc Blanket

Presently, the team uses a floc blanket – a system of suspended flocs - in its operations. However, most of the AguaClara water treatment plants do not currently have floc blankets. Therefore, to mimic these conditions, the team could test the performance of the plate settlers without the floc blanket. The absence of floc blanket should change the particle distribution entering the tube settlers and consequently will affect the performance.

3 Coagulant Type

We are using alum as our coagulant to facilitate the creation of flocs. Another option for the choice of coagulant would be PACl (polyaluminium chloride). PACl is currently used as a flocculant in a several water treatment plants in Honduras. It is not known if the coagulant type has a significant effect on the density of the resulting flocs.