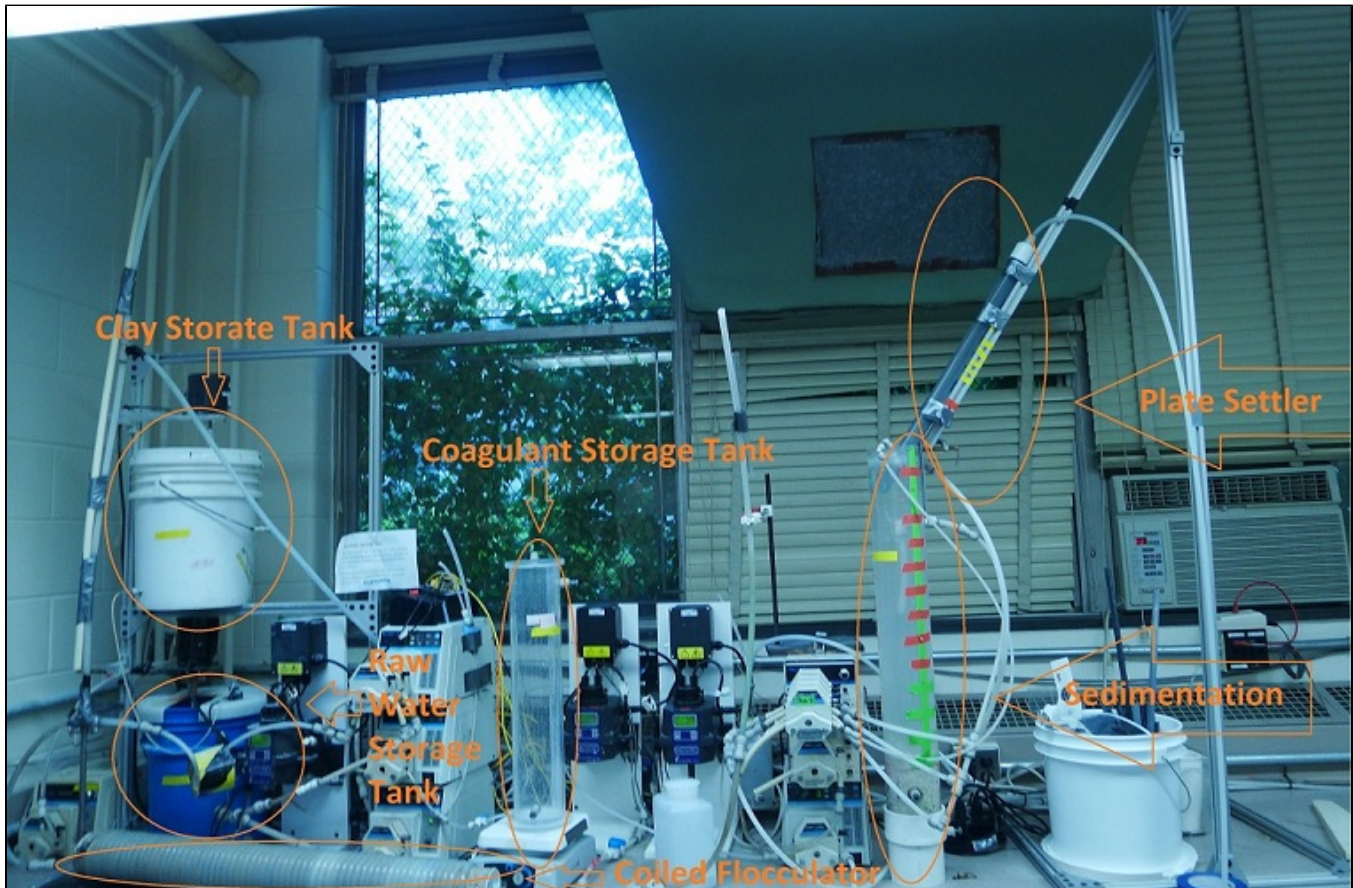


Plate Settler Capture Velocity

Plate Settler Capture Velocity

Plate settler plays an important role in reducing turbidity in AguaClara Water Treatment Method. And plate settler capture velocity is a critical parameter for design, since it determines the efficiency of capturing flocs. We mainly do the research on the impact of plate settler capture velocity on the performance of a sedimentation tank containing a floc blanket, by making use of apparatus in the lab (shown as follows) to simulate the water treatment process of AguaClara. We observe the effluent turbidity and obtain the removal efficiency under different raw water turbidity and alum dose, and try to find the best solution which actual operation of AguaClara Plant can refer and apply.



Current & Future Research

Current Research

Now we conduct a series of experiments over a range of capture velocity, which is 0.05mm/s, 0.075mm/s, 0.1mm/s, 0.125mm/s, 0.15mm/s, 0.2mm/s and 0.3mm/s. The suggested process is shown in tabular form,

Parameter to vary	Parameter range
raw water turbidity (changes after cycle of coagulant dosages)	5 NTU, 500 NTU, 50 NTU (done in this order because the first two are harder to treat)
coagulant dose (changes after cycle of capture velocities)	$0.5 \frac{mg}{L}$, $1 \frac{mg}{L}$, $1.5 \frac{mg}{L}$, $2 \frac{mg}{L}$, $3 \frac{mg}{L}$ of Al (abort the series if the residual turbidity is less than 0.5 NTU?)*
capture velocity (changes most frequently)	$0.05 \frac{mm}{s}$, $0.075 \frac{mm}{s}$, $0.1 \frac{mm}{s}$, $0.125 \frac{mm}{s}$, $0.15 \frac{mm}{s}$, $0.2 \frac{mm}{s}$, $0.3 \frac{mm}{s}$

As indicated in the challenge, we firstly run the cycles of varying capture velocities and coagulant dose set as above under two extreme conditions:raw water turbidity as low as 5 NTU and as high as 500 NTU. Then we observe the removal efficiency of turbidity to test the treatment capacity of the system.

We also run the system under a raw water turbidity of 50 NTU, which is comparatively close to the influence in the actual AguaClara plants. By analyzing the data collected, we can offer some valuable suggestions to AguaClara Plant, which can make it run more effectively and economically. We also change the alum dose and take its impact on the performance into consideration. Thus we can suggest the most favorable coagulant dose used in the reality.

Future Research

Limited by time, we haven't done enough research on the impact of different coagulant types on the performance. Different coagulant such as PACl may be used in the future research. Thus the most suitable coagulant can be recommended for the actual water treatment plants.

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Documents

	Challenge s	Tasks	Teach-In	Presentatio n	Final Report
Fall '11					 

Past Research

None.