

Environmental
Project Chemical
Treatment :)

Overview

- X Plans for Test Kits
- X Goals for Parameters
- X Choice of Coagulant
- X Packaging and Delivery
- X Fill out Spreadsheet :)
- X Feedback



Our Constituents!

Per 5-gallon bucket (2):

- x 4.5 Gallons of tap water
- x 8.0 oz of Folgers Classic Roast Ground Coffee
- x $\frac{1}{4}$ cup of Gatorade Thirst Quencher Fruit Punch Powder
- x 5.5 oz Campbell's Tomato Juice
- x 1 18.4 oz box of Betty Crocker Milk Chocolate Brownie Mix
- x 3-cups Quaker Quick 1-minute Oats



Potential Chemical Analysis Plan

1. Tiny test kits will be designed by our team :)
2. Main focus will be on pH and turbidity
 - a. Each individual will test a different combo of our chosen coagulant/pH neutralizer
3. Test kits will be sent out!
4. What the test kits will contain:
 - a. Scaled down version of our 5 gallon mix
 - b. Cheap alternative to lab equipment
 - i. Litmus test? Eyeballing?
 - c. Measuring and mixing materials



Overall Goals for Our Wastewater

Parameters	Goal
pH	Between 7.0-7.5
Turbidity (NTU)	Below 15 NTU
Electrical Conductivity ($\mu\text{S}/\text{cm}$)	As low as possible
Dissolved Oxygen (%)	100
Volume (gallon)	9



Goals for the Test Kit

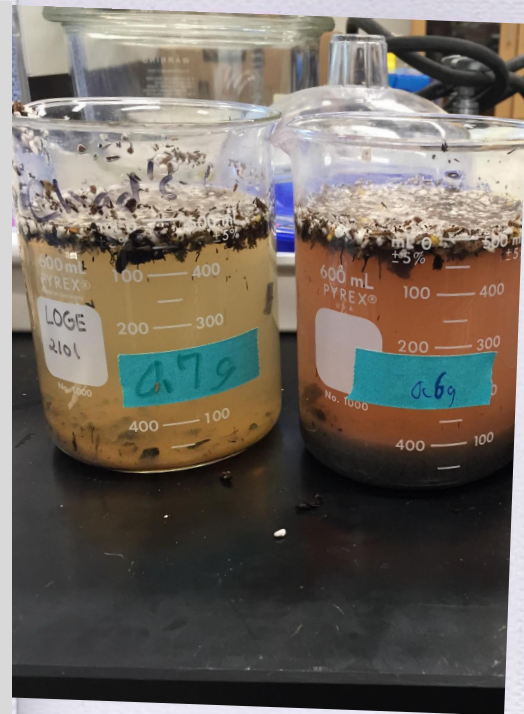
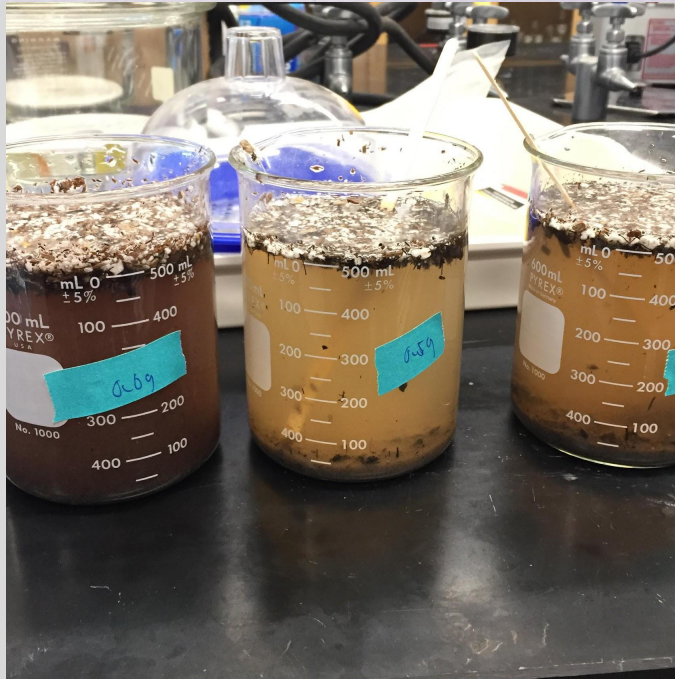
- X Cost-effective
- X Portable
- X Disposability
 - X Constituents and nasty water should be easily disposable and Environmentally friendly
- X Can test both pH and turbidity



How Parameters were Lowered in Previous Years

- x **Pickling lime and Alum!**
 - x Low in costs
 - x Lowers Turbidity and neutralizes pH (will go more into depth in future meetings)
 - x Wildly used in treatment plants
- x **Past design (2018-2019):**
 - x Optimum dosage: 6.65g alum and 3.85g pickling lime. Base?





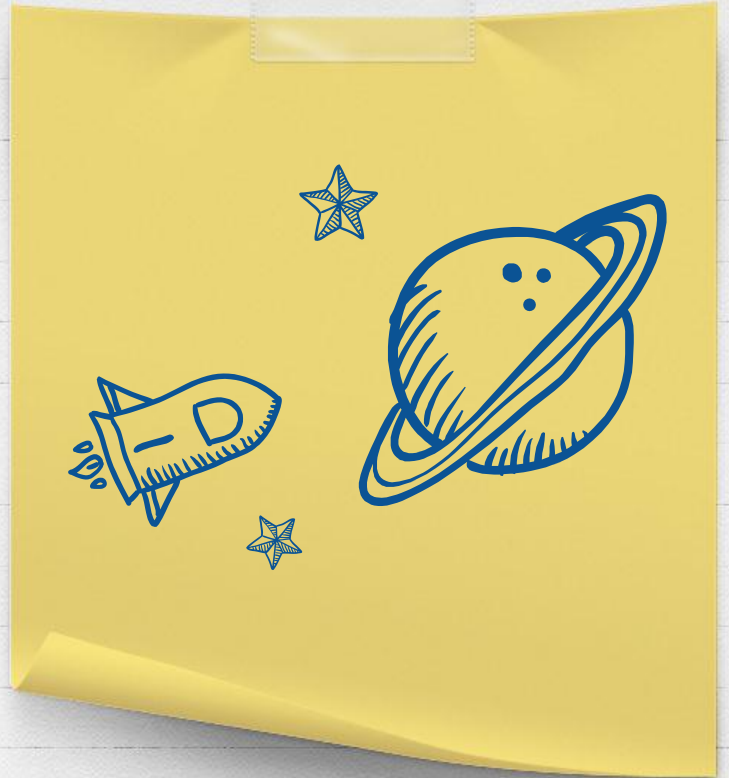
We will find the best combination to make the cleanest water!

Calculations on Spreadsheet

Scaling down 5-gallon mix!

Other Items for the Kit!

- x Measuring cups, tablespoons, teaspoons, etc...
- x Plastic beakers?
- x Mixing utensil?
- x Strainer for disposal?
- x What will hold the constituents through travel?
- x What would you like to receive?
 - x We could get tubes to collect water from a local pond instead of Tap Water



Delivery!

- X Are you guys okay with me knowing your addresses LOL
- X Can send out a google form.
- X Or you can contact me at (510) 358-1580 :)
- X I will test the kit before sending it out !



Hello! What are Y'all Interested In Doing?

- x Learning about the lab equipment that you would have been using (ex. turbidimeter)?
- x Testing different coagulants?
- x Focus more on the chemistry? (ex. Chemical reactions in mix)
- x Finding a way to dispose of the nasty water in your own homes in the a very not nasty way
- x I want to make sure this isn't boring :(



Chemical Treatment

Pretreatment Process!

Parameters We Measure!

- x pH
- x Turbidity
- x Electrical Conductivity (EC)
- x Dissolved Oxygen (DO)
- x Volume



pH

- x **What does pH tell us?**
 - x Measures how acidic ($\text{pH} < 7$) and basic ($\text{pH} > 7$) the water is!
- x **What do we used to measure pH?**
 - x pH probe on an Ultrameter III 9PKT
 - x litmus tests
- x **What causes pH?**
 - x Acids and bases!
 - x ex. Lemon juice or soap



Electrical Conductivity

x What does EC tell us?

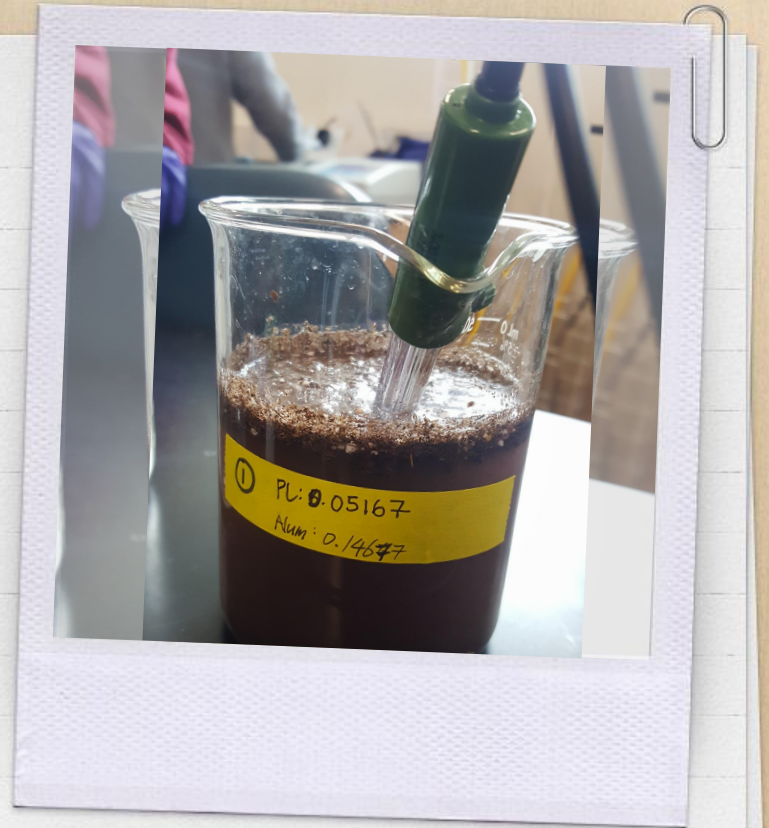
- x Measures ion mobility in the water. EC is proportional to the concentration of conductive ions in the water

x What do we used to measure EC?

- x The EC probe (Ultrapen PT1) on an Ultrameter III 9PKT

x What causes EC?

- x Cations and anions! salts.



Turbidity

- x **What does turbidity tell us?**
 - X Measures the cloudiness or haziness of our water!
- x **What do we used to measure turbidity?**
 - X HACH 2100AN Turbidimeter
- x **What causes turbidity?**
 - X Large amounts of tiny suspended particles that scatter light!
 - X ex. From clay



Dissolved Oxygen (DO)

x What does DO tell us?

- x The amount of oxygen that is dissolved in the water
- X Important for living organism!

x What do we used to measure DO?

- x YSI 5100
- x HACH DO Test Kit

x What causes DO?

- x Aeration through the physical treatment process (ex. holes)



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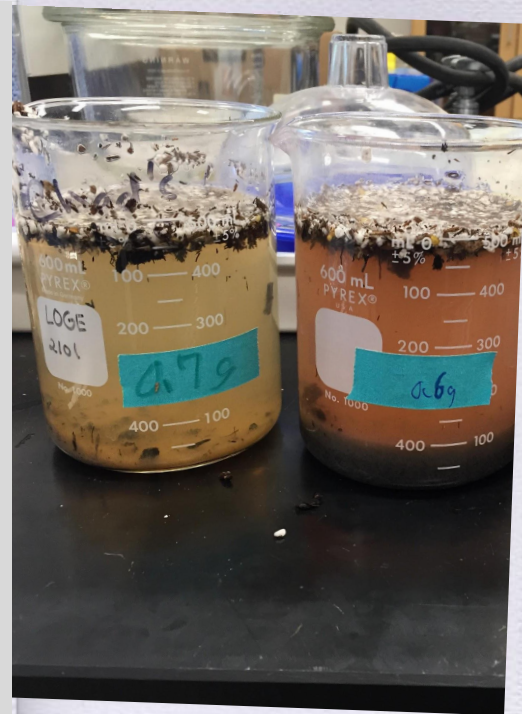
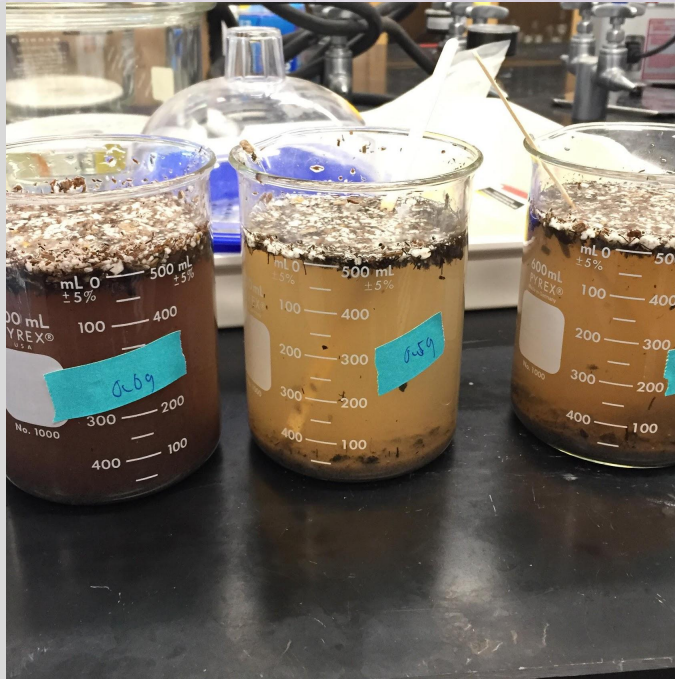
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