Water Treatment Technology Selection Guide (WTTSG)

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Background

★ Water Treatment Technology Selection Guide

★ Plant Cost Calculator

★ Integrate into a single web application

★ Give most appropriate recommendations possible

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Technology Comparisons

★ FIME

★ Package plants

★ Direct Filtration

★ Kiosks

★ Filters

★ AguaClara plants

★ How to present data clearly and effectively?

Technology Comparisons

	Treatment Option	Water Turbidity (NTU)	Cost	Ease of Installation	Frequency of Component Failure / Maintenance Requirement	Energy Cost	Contaminant Removal
Centralized Options	AguaClara	Unknow	Low	Hard	Low	Low	1
	Package Plants	<100	Low	Easy	High	High	1, 2
	Direct Filtration	5 to 15	Low	Unknow	Low	Low	1, 2
	Multistage Filtration (FIME)	<150	High	Easy	Medium	Low	1, 2, 3
Non-Centralized Options	Membrane Filter Kiosks	< 200	Low	Easy	Medium	Low	1, 2, 4, 5
	Remote Kiosks	Unknow	Low	Easy	Low	Low	Unknow
	Biosand Filters	< 50	Low	Hard	Low	Low	1, 4
	Reverse Osmosis Filters	<1	High	Easy	High	High	1, 2, 3, 4, 6

Options and Parameters

Relevant Changes Were Made:

★ Treatment option civil works eliminated (poorly ranked in almost all categories)

★ Direct filtration added

★ Category 'quality of treated water' was replaced by the parameter 'water turbidity'

★ 'Contaminant removal' category added

Plant Cost Calculator

Estimating water treatment cost: User inputs

- Per capita demand
- Population growth
- Initial population
- Plant adequacy
- Dose Coagulant
- Cost Coagulant

- Dose Chlorine
- Cost Chlorine
- Monthly Wage
- No. Employees
- Purity of calcium hypochlorite

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Plant Cost Calculator

Total monthly cost for operation and maintenance:

★ building energy

★ cost coagulant

★ cost chlorine

★ wages expense

★ maintenance material requirement

Total plant cost = Capital cost + monthly operating costs + monthly maintenance costs

Plant Cost Calculator

Curve Fitting with Linear Regression:
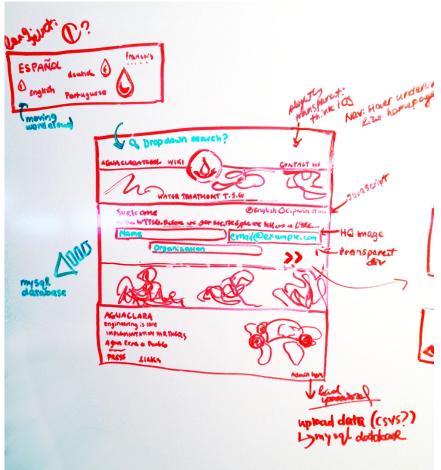
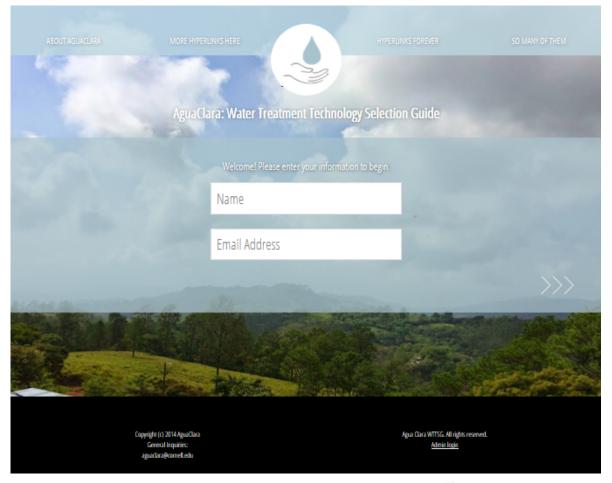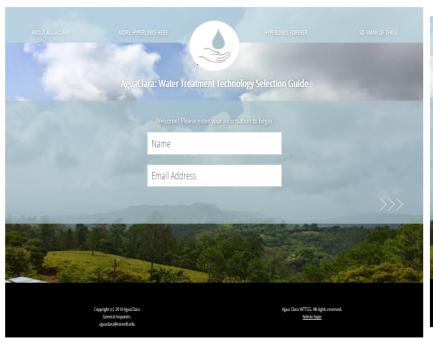Flow rate vs. Capital cost/Flow rate

$$C = 61077*f^{-.599}$$

Implementation

Implementation

Implementation

Implementation

Implementation

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Which of these best approximates the dirtiest your water gets?

25 NTUs

What substances or chemicals are present in the water? Check all that apply.

☑ Particles and Organic Material
☑ Fluoride
☐ Nitrate
☐ Uranium
☐ Arsenic
☑ Microbes
☐ Radium

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How many operators will your plant have?
What are their monthly wages?

3          $5000.00

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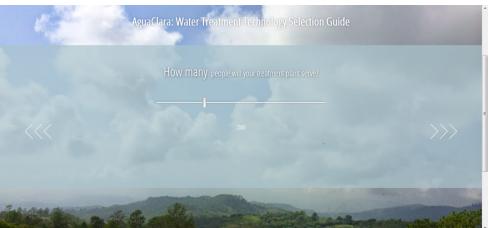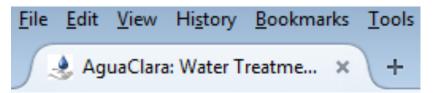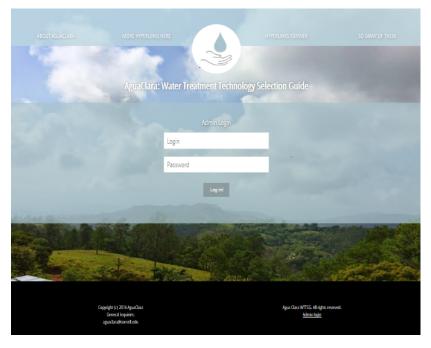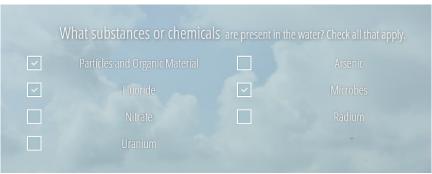Environmental Engineering

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Implementation

★ Data passing

★ Autofilled forms

★ Interacting with database

Future Work

★ Dynamic results page

★ MySQL functionality

★ Automatic regression

★ Language translation

★ Deploy site!

Any Questions?