

Foam Filtration

Location: B63

Goal

Provision of safe drinking water for communities smaller than 1000 people is particularly challenging because the per capita costs associated with a full AguaClara plant increase as the community size decreases. Thus we are looking for more cost effective surface water treatment systems that could be applied for flow rates that are less than about 1 L/s. In India we are using a combination of the dose controller and SRSF to create a low cost treatment system that can treat low turbidity water. We anticipate that the SRSF is limited to treating water with a turbidity lower than about 5-10 NTU. In Honduras it is common for water sources to be too turbid in the rainy season to be adequately treated by a SRSF. The reticulated foam filtration system invented by the AguaClara team at Cornell could be a solution to the problem of small communities with turbid water.

Reticulated foam filters have a very high porosity and thus they have a high solids loading capacity. The high porosity also makes it possible to use a higher filtration velocity than can be used with sand.

Design decisions

Work with APP to select the community, determine the population and required flow rate. Determine how many filters will be working in parallel and what materials will be used to construct the filter bodies. The filter bodies could be PVC pipe, concrete culverts, or square columns built using brick and mortar.

The challenge is to design a 1 L/s foam filtration plant that includes

1. chemical dosing (using a half size CDC)
2. flow rate measurement (using an LFOM)
3. coagulant contact chamber to reduce loss of coagulant to pipe walls
4. 2 or more foam filters operating in parallel
5. the ability to turn off one filter while the other filters continue functioning
6. the ability to filter to waste if the effluent quality isn't acceptable
7. design to accommodate the variable head loss in each of the filters
8. improved design for cleaning the filters
9. improved method to obtain cylindrical foam pieces or alternatively build square filter columns
10. Elegant mounting system

The InterAmerican Development Bank has opened up its rural water money to NGO's and thus APP can potentially be executing 10 million lempiras worth of IADB projects at a time. Could be an expanding need for a technology to treat turbid water for small villages.

Work with Drew Hart at Agua Para el Pueblo in Honduras to choose a community and:

Deliverables on the January trip to Honduras

- Install the foam filtration plant
- Operate the filter using the dose controller to add coagulant and test performance through full operating cycles.