



# Single-Stage Water Filter with Dual Sand Media Sizes

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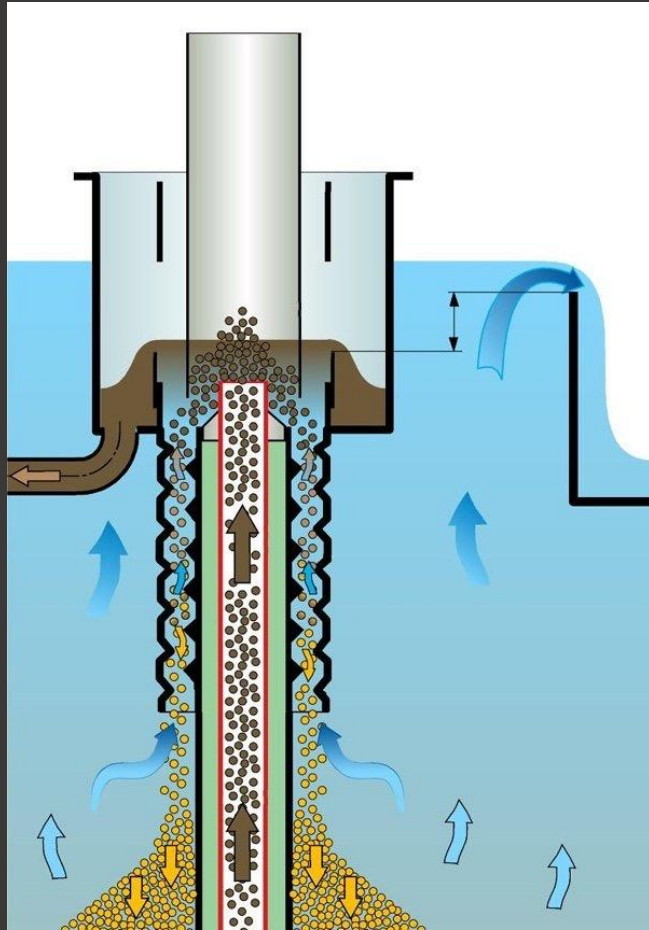
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Sustainable Agricultural Systems – Clean Water Group

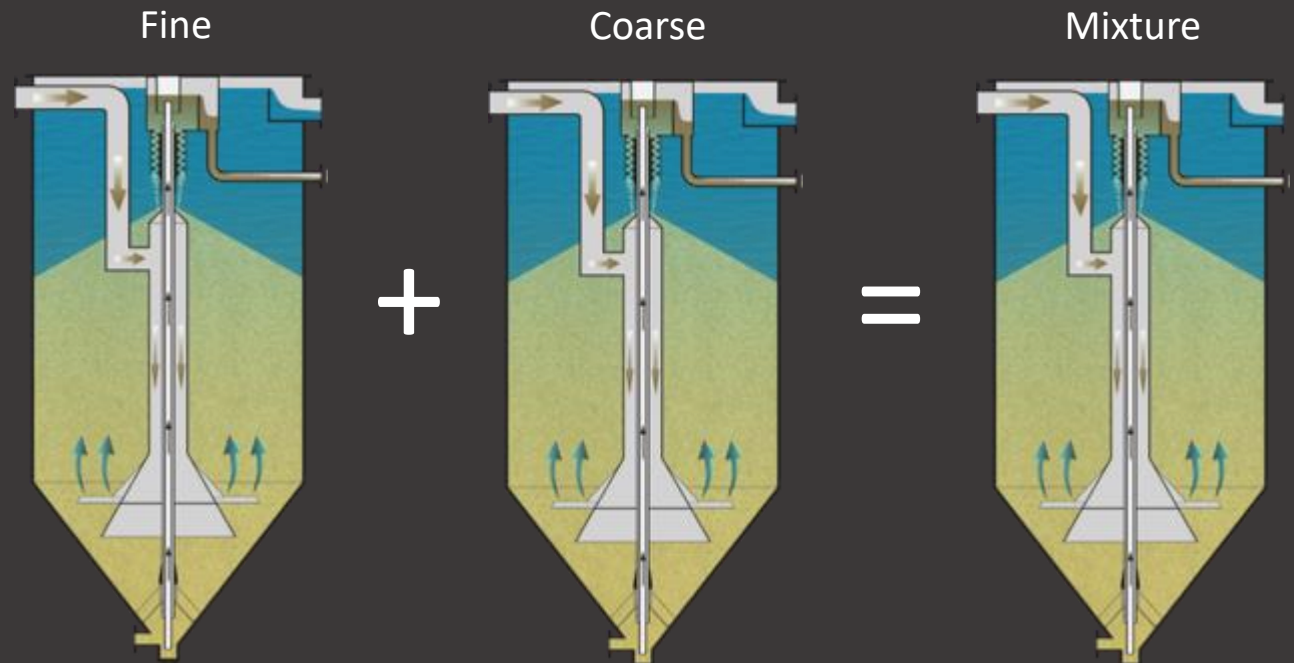
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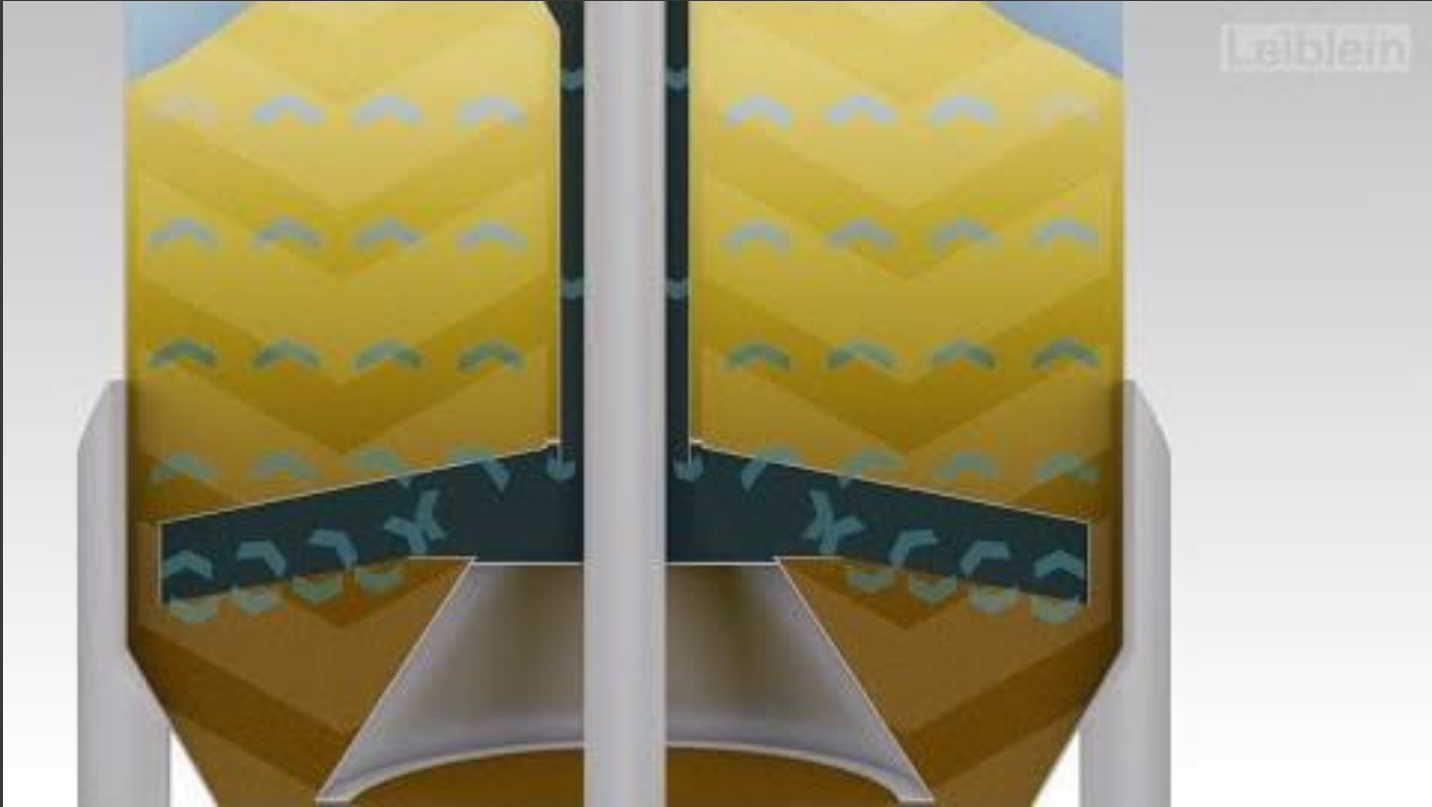
# Objective



- Design a sand particle-based filter that can maintain 75% or greater segregation of fine and coarse sand particles in a single-stage process
  - Fine ~ 0.85 mm (0.033 in)
  - Coarse ~ 1.05 mm (0.041 in)
- Passive process (minimal moving parts, energy efficient)

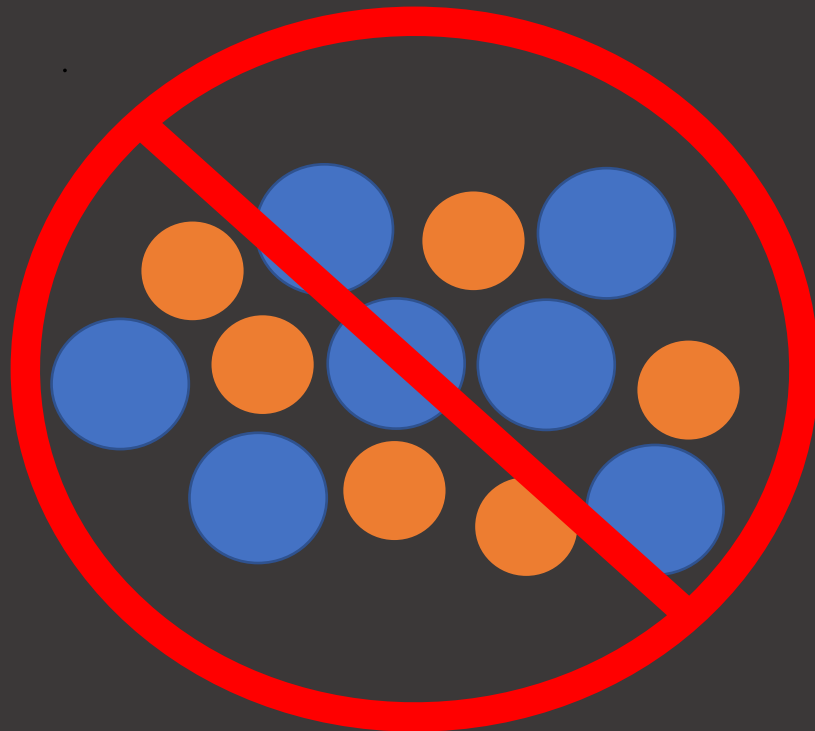


# Video: Continuous Sand Based Water Filtration Process



# Documentation

- Elutriation: Process of separating particles based on size, shape, and density
- Sand Gradation: Classification of particles based on particle size



# Requirements

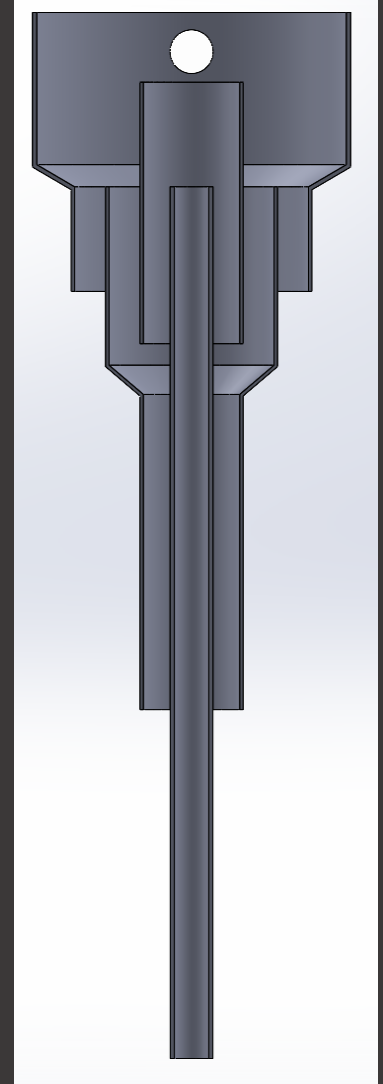
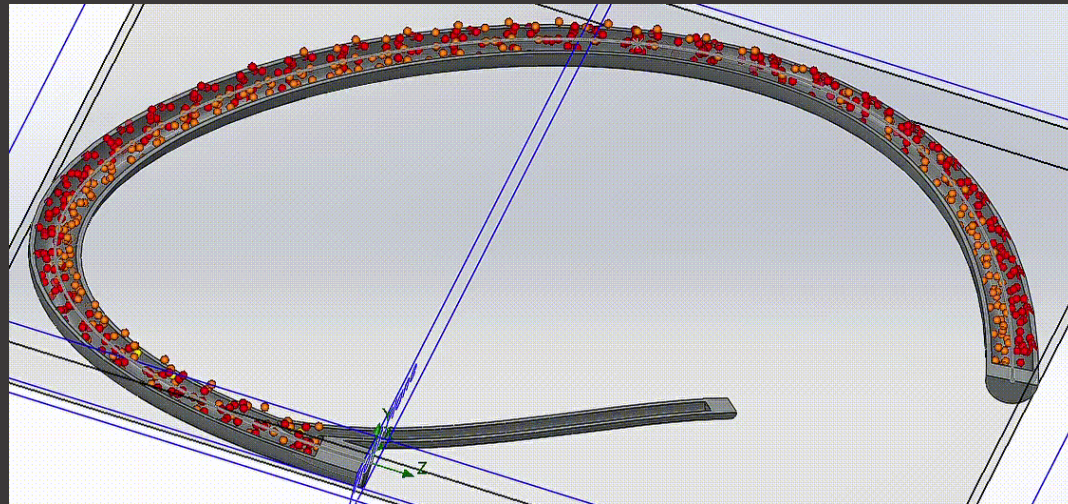
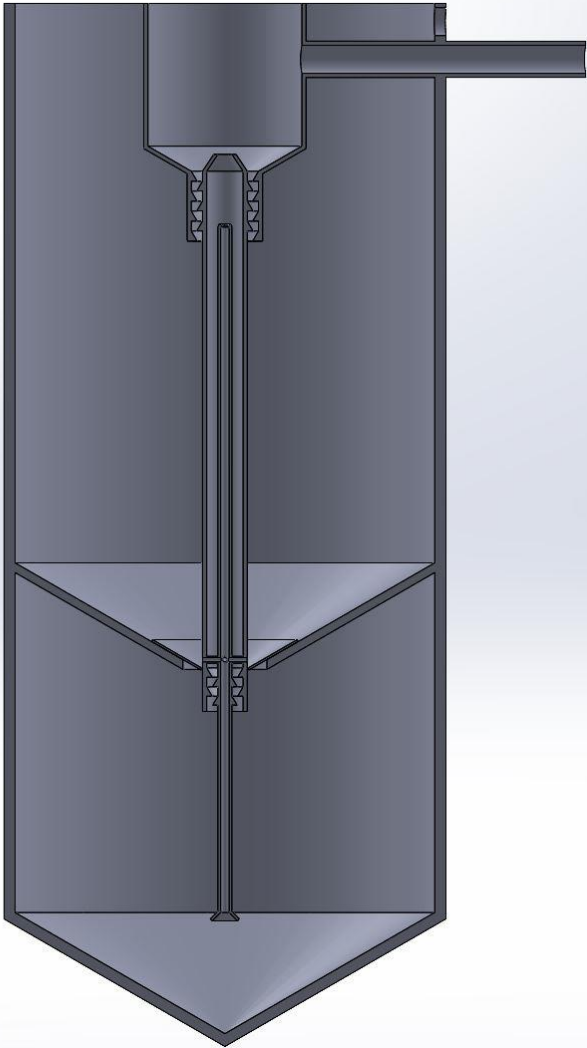
- Passive Operation
- Runs Continuously
- Low Maintenance
- Minimum Upflow Rate of 6.8 L/min (1.8 gal/min)
- Durability: 5 years
- Sand Filtration Cycle: ~18 times/day





# Development

- Hand sketches
- CAD models
- Small-scale 3D printed models



# Completion Plan

## Upcoming Milestones:

- Complete testing of at least the first prototype design – Nov. 20, 2020

