

KidneyLoop Flint Edition: Clean Water for Every Home

Open Source | CC0 License | DIY Water Filtration for Heavy Metals

Overview

KidneyLoop is a DIY water filtration loop that recirculates water through mechanical, UV-C, and optional activated carbon filters. This edition is specially tailored for Flint, Michigan, where lead and heavy metals remain a concern in household water. With a simple loop between two barrels, this system helps remove particles, sterilize bacteria, and reduce harmful contaminants using safe, off-the-shelf parts.

System Goals

- Affordable: ~\$150-250 per home
- Scalable: Build one for every house
- Effective: Filters particles and sterilizes pathogens
- Upgradable: Add activated carbon filters to reduce lead, chlorine, and fluoride
- DIY-Friendly: Drill, plug, and go

Core Components

- 2 x 55-gallon food-grade barrels or totes
- 2 x 12V DC water pumps (~240 L/hr)
- 2 x Micron filters (0.1 micron, reusable)
- 1 x UV-C inline sterilizer (12W or higher)
- Optional: Activated carbon block filter for lead/chlorine
- 1/4 inch ID food-grade tubing + barbed fittings
- Power: 12V battery or solar panel

How It Works

Water is drawn from the "dirty" barrel through a:

1. Micron filter (removes dirt, rust, debris)
2. UV-C sterilizer (kills bacteria and viruses)
3. Activated carbon filter (removes metals and chemicals)
4. Into the "clean" barrel

Then it recirculates: A return pump sends the water back to the dirty barrel for another pass. Three or more loops improve clarity and safety. The longer it runs, the cleaner the water.

Heavy Metal Removal

Activated carbon filters are effective for:

- Lead (Pb)
- Copper (Cu)
- Chlorine (Cl)
- Volatile Organic Compounds (VOCs)

For best results:

- Add a carbon block filter before the UV light.
- Replace filters every 6-12 months (depending on use and contamination).
- Test water with strips/meters regularly.

Care Instructions

- Rinse and clean filters every few weeks.
- Keep the UV-C unit dry - do not submerge.

- Drain the system when freezing is possible.
- Use gloves when handling filters.

How to Build It

1. Drill inlet/outlet holes on both barrels.
2. Insert barbed hose fittings with gaskets or bulkheads.
3. Connect the first pump to draw water through the filters and into the clean barrel.
4. Connect the second pump to return it.
5. Power the pumps and UV-C unit via battery or 12V solar.

Total Estimated Cost

- Barrels: \$20-40 each (local or reused)
- Pumps: \$10-20 each
- Filters: \$15-25 each
- UV-C: \$60
- Tubing & fittings: \$15
- Optional carbon filter: \$20
- Total: ~\$150-250

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GitHub: github.com/YOUR_REPO_HERE

Contact: YOUR_EMAIL

Together, we fix the water ourselves.