

Slow Sand Water Filter Guide

How it Works: The slow sand water filter can provide safe drinking water through a natural process. A species of microorganisms colonize the sand within a time period of 5-20 days (depending on climate, geography, and on-site filter placement). These organisms feed off all bacteria that pass through the sand. So, any bacteria transported by the water that passes through the sand will be eliminated by the microorganisms. This includes E-coli and other pathogens, even those found in animal and human excrement; things that are commonplace in the Camarones River.

Materials List: the following is a list of materials used to construct the filter at your house. If any of the parts break/go missing, or if others in the community desire to build a filter, this list will provide all the components needed. Keep in mind this is one design and there are many other ways to approach filter construction, but, the design used for the filters at your house was the cheapest and most affective. All of the materials (except for the fabric) were purchased at Zurita in Pedernales but any Ferreteria in the area should be able to provide the materials.

- 1 55 gallon plastic barrel with top (a 30 gallon barrel can be used but nothing smaller than that as the sand needs to be in a great enough amount to filter bad bacteria properly)
- 15m² of synthetic material (fabric was used, bed sheets will also work but they are more expensive.
- Automatica
- Pump (electric)
- Electric Plug
- Teflon Tape
- 2 ½ inch braces
- 1 Faucet
- 1 inch water intake house cap
- Connectors for hose – 3 ½ inch connectors, 2 1 inch connectors
- 2 seals (1/2 inch)
- String – to tie the synthetic material to the outside of the barrel
- Gravel (enough to fill up to 10 cm at the bottom of the barrel)
- Sand (enough for at least 50 cm in the barrel – about 3 full sacos full)
- Electric wire – length will need to be determined considering the layout of the site but it should be enough to connect from the pump, to the automatic (on the filter), and eventually to the plug in the house.
- Hose – the length will need to be determined considering the layout of the site but it should be long enough to be drawn from the river, to the filter, and into a home or other desire location.
 - The majority will need to be ½ inch.
 - 5m of 1 inch hose for connecting the pump and placing it in the river.

Notes on construction: the tank needs to have a ½ inch outtake hole 5cm from the bottom and one ½ inch hole about 10 cm near the top. Both holes will be on the sides and this is where the ½ seals will be placed. Fill the tank with the gravel. Place the synthetic material on top of the gravel and line the tank with it, tying it with the string on the outside. Make sure it is very secure. Add the sand. Drill small holes in the lid and string wire through the lid to secure the automatica on the top of the tank. Have a slightly larger hole in the middle of the tank to bring a string through for the automatic. If you are working with a pump, go down to the river and use the 5m of 1 inch hose and connect the pump and place the other end into the river. Use a rock to place it in a secure location. This hose will need to be full of water initially for the pump to start working properly. Use the electric wire to connect the pump to the automatica, and finally to the plug in the house.

Cleaning instructions: In the dry season, the filter needs to be cleaned once every 6 months. In the rainy season, it will need to be cleaned every month. Cleaning the filter is easy, take a machete and scrape off the top 2 inches of sediment. After 10 cleanings, more sand will need to be added to the top to allow for enough sand to be present throughout the entire filter. Here are some recommended times for cleaning, just do it on the first of each of these months. Nov, Dec, Jan, Feb, Mar, Apr Nov, etc...

Other maintenance: the electric water pump provides the most problems in terms of maintenance. The most common reasons the pump won't work is if there is air in the hose or in the connectors. There are two ways to fix this: tighten the large bolt on the pump, this may need to be done once a week. If the pump is still not providing water to the filter, there is air in the hose somewhere and water will need to be added throughout the hose to get the air out. Typically, water will need to be added all throughout the entire hose.

Safety/Security: the largest safety concern associated with the filter is not the filter itself, but the electric wire needed for the water pump. It is recommended to burying it so it is not exposed to the elements (children, weather, animals, etc.). The hose doesn't need to be buried (although it can be), but it is best to take wooden stakes and secure the hose to the ground along a safe path. If the hose is tied down every 5-10 m, it will provide for better water flow. The security and prevention of theft of the water pump is another concern. It is recommended to have it tied or locked down to a box or nearby tree.