

# YOUR WATER FILTER CANNOT REMOVE SALT. THIS CAN.

A dark tray, a clear sheet, and a jar turn salt water into drinking water on sunlight alone, for about 10 dollars.

Salt is not a speck you can strain out. It dissolves into charged pieces that travel wrapped inside the water itself, so it slips straight through the holes in a squeeze filter or a big gravity filter. A solar still does not strain anything. It lifts the water off as vapor, one molecule at a time, and everything else stays in the pan. Salt, lead, arsenic, nitrate, bacteria, viruses, and cysts do not evaporate at these temperatures.

## THE HONEST NUMBERS

**2 to 3 liters**

What one square meter of cover makes on a good sunny day. That is about one resting adult's drinking water, not a household's.

**9 liters**

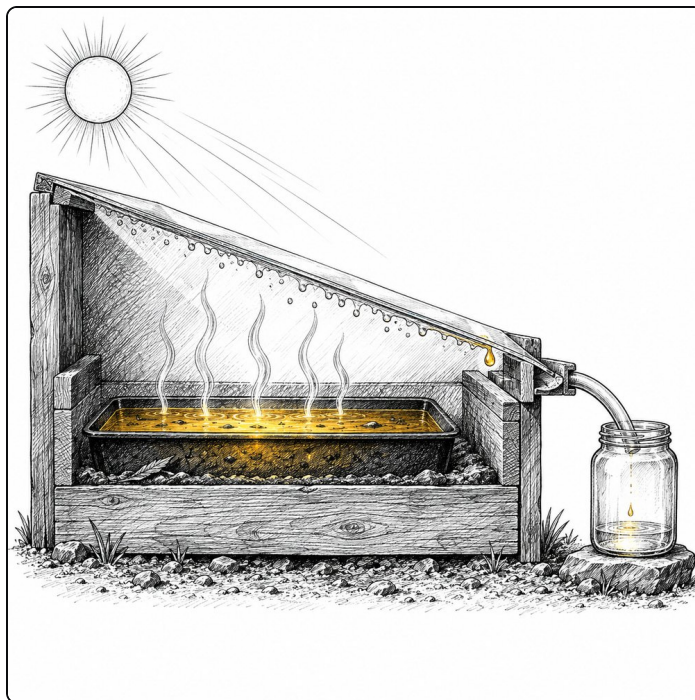
The hard ceiling per square meter per day if every bit of sunlight went into evaporation. Nothing in a simple one stage build beats it.

**1 gallon**

What the CDC says to store per person per day, about 4 liters, roughly half of it for drinking.

**99.5%**

What university extension guidance says a properly run distiller removes, up to that much of what is in the water. Yours is a box in the yard, so boil what you collect.



Vapor rises, hits the cool cover, and runs downhill to the jar. The salt never leaves the tray.

A square meter is a cover a little over three feet on each side. Gray day, a fraction of that. Northern winter, close to nothing. Anyone promising infinite water off a small pan is selling you something.

## NEVER PUT THIS WATER IN A STILL

- Anything that might hold fuel, solvent, paint thinner, or windshield washer fluid. Those evaporate as easily as water or easier, ride up with the vapor, and land in your jar. A still can hand you back something worse than you poured in.
- Radiator water and gas station runoff. Swimming pool water, because pool chemistry makes its own volatile compounds.
- Flood water. It is the water most likely to be carrying fuel or oil, and clear and odorless proves nothing.
- Urine. The ammonia in it comes over with the vapor. Find another source.

**The good list:** seawater, brackish creek water, pond and lake water, and muddy well water, as long as you know what is upstream of it. Strain the big stuff out through a cloth first.

# TRAY, COVER, CATCH, SEAL

Four jobs. The tray soaks up sun, the cover condenses the vapor, the catch collects the drips, and the seal keeps the vapor in.

## about 10 dollars

**The whole backyard build.** A shallow pan, a black liner rated for hot food contact, a clear cover, a length of food safe hose, and a clean covered jar. Skip spray paint; you do not know what it does sitting in hot water all day.

## the cover

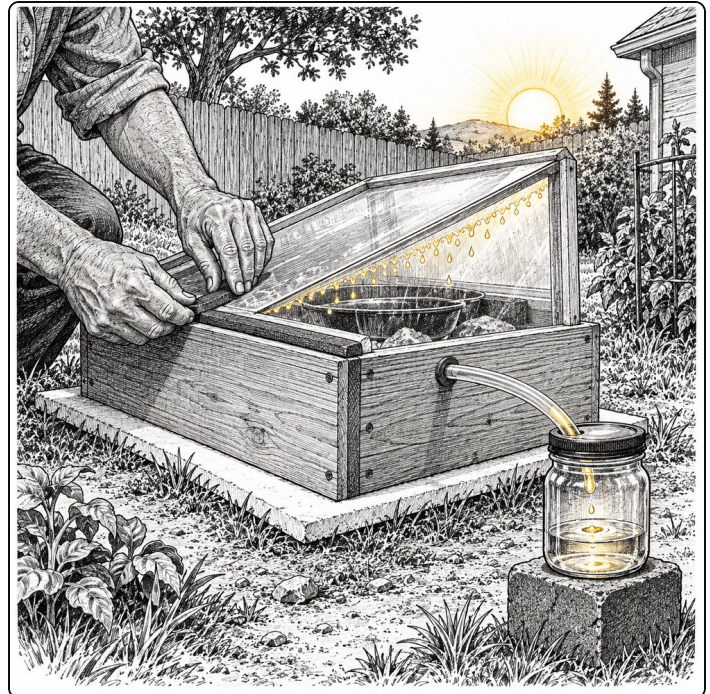
**Plain uncoated glass** or a clear plastic rated for food contact, pulled drum tight. Never a tarp, nothing recycled, nothing chemically treated. Construction and greenhouse film are not made for this.

## the checker

**A cheap dissolved solids meter.** The only way to know salt is not getting through. Your tongue tells you nothing that matters, because the things that hurt you have no flavor.

## BUILD STEPS

- 1 Line a shallow pan with the black hot food contact liner. Dark soaks up sunlight instead of bouncing it away.
- 2 Pour the bad water in about an inch deep. A thin layer heats fast; a deep one sits there cold.
- 3 Build a shallow box for the tray with one wall taller than the other, so the cover lies at a slope of about 20 degrees.
- 4 Leave a hand's width of air between the water and the cover.
- 5 Point the low edge toward the south so the cover faces the sun's path.
- 6 Fit the catch along the inside of the low wall: a length of gutter or a split piece of tubing. It sits below the drip line but above the water.
- 7 Run a food safe hose downhill through a hole in the wall into a clean covered jar outside, raised off the dirt.
- 8 Seal around the hose. Foam weatherstrip where the cover meets the box, weights along the edges. Every gap is vapor escaping.
- 9 Set the whole box on a scrap of foam board. Heat that leaks out the bottom never lifts any water.



Low edge south, catch under the drip line, hose out to a covered jar.

## BEFORE YOU DRINK ANY OF IT

- ☐ Run the first full day and pour that jar out. A new build off gasses into whatever it makes. Housekeeping, not a safety test.
- ☐ Check the output with the dissolved solids meter. If salt is getting through, that jar goes back in the tray. Hunt for splashes of raw water, a leak, or a drip line sitting over the water instead of the gutter.
- ☐ Boil what you collect for one minute before drinking, three minutes above about 6,500 feet. The still does the job boiling cannot, and boiling does the job the still cannot promise.
- ☐ The leftover in the tray is concentrated brine. Do not put it on the garden.

# WHY IT WORKS, AND WHERE IT STOPS

Sunlight sets the ceiling. More area is the easy lever; insulation, a tighter seal, and shallower water buy real output too.

## THE ARITHMETIC

**6,000 Wh**

Sunlight landing on one square meter of ground on a strong clear day.

**660 Wh**

Heat it takes to turn one liter of water into vapor at the temperature a still actually runs.

**1/4 to 1/3**

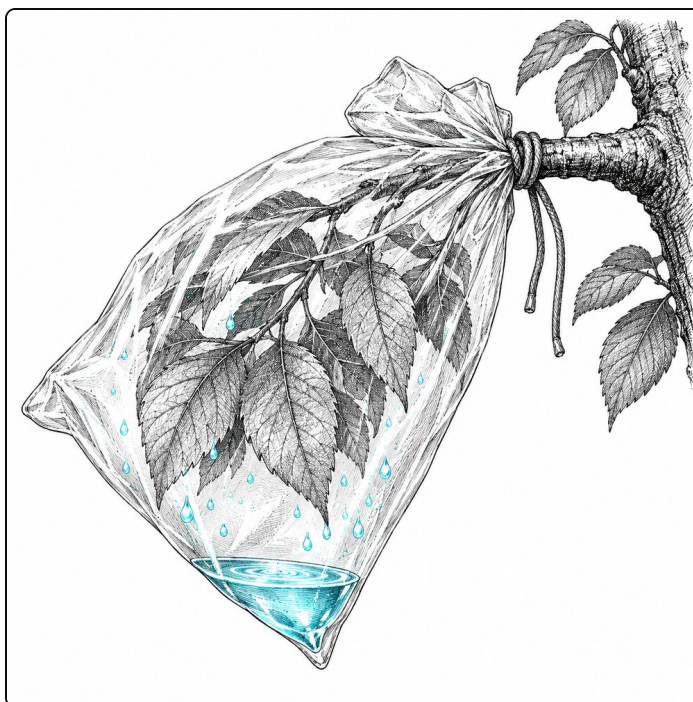
What a real still captures of the 9 liter ceiling, because heat leaks out the sides and some light bounces off the cover. So call it 2 to 3 liters.

## WHY NOT JUST BOIL IT

Boiling is the right move for germs, and it is faster. But boil salt water and the water leaves as steam while the salt stays in the pot. You end up with less water that is saltier than before. A still does the same evaporation and catches the steam instead of losing it to the ceiling. Catching the steam is the entire difference.

## THE PIT STILL THE BOOKS DRAW

A hole, a cup, a sheet, a rock. In real testing it gives back a third of a liter to two thirds of a liter across a whole day, and small traps have come in near half a cup. A 2025 wilderness medicine paper called the digging a bad trade. A clear bag tied over a leafy branch catches what the tree breathes out, a spoonful on a bad day up to nearly a liter off a young tree. Only bag a plant you can positively identify as nontoxic, never one that has been sprayed. Oleander and yew hand you back poison. Treat it for germs. And a bag has nothing to give you if what you hold is a bucket of seawater. Bag a branch in the field with no water at all; build the tray when the water around you is undrinkable.



Same plastic, no digging. A living branch does the pumping.

## LINES YOU DO NOT CROSS

- ☐ Do not drink seawater, not once. Your kidneys spend more water flushing the salt than the seawater gave you, so it dries you out faster than drinking nothing.
- ☐ Do not drink urine, and do not distill it.
- ☐ A still fixes salt, metals, and germs. It does not fix fuel or solvent, and no amount of sunshine changes that.
- ☐ Already short on water and hot out? Get in the shade before you build anything. Heat roughly doubles what your body needs in a day.
- ☐ Rinse and scrub the tray, the underside of the cover, the hose, and the jar before every run. A still that sat idle in the heat grows things you cannot see.
- ☐ Distilled water has almost no minerals, which is why it tastes dull. Fine for an emergency, not the only water you drink for years.

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