

# Water

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# Water, Fresh and Otherwise

Over the years we have constantly revised and updated the way we handle water in camp. We're not there yet, but it's getting better every year!

## Water Usage

In 2024 we used 2305 gallons of fresh water in camp (6.2 gallons per camper per day) as follows:

1000  
600  
454  
251

We generated at least 1000 gallons of grey water from the kitchen, and I'm estimating 600 gallons of grey and black water in the gayflower (we had no way of measuring that).

## Fresh Water Sources

Where does fresh water come in from?

1. The build team RV has a tank that holds about 176 gallons. We usually fill that in Reno at the GSR RV Resort (where we stay for one night before driving up.) Sierra Site Services can also fill this for a flat rate of \$180.
2. The Gayflower, as of 2024, has seven IBC tanks for a total of 1990 gallons
  1. Three in front hold 330 gallons each
  2. Four in back hold 250 gallons each
  3. The tanks in back need to be replaced because they stink of their previous fruit juice contents
  4. They can be filled in [Gerlach](#) or Empire for about 50 cents a gallon. **Don't fill up in Empire** - that water tastes like sulphur, it smells of rotten eggs, and people don't like to drink it or even shower with it. The official water from the Gerlach General Improvement District is good.
3. We can rent a 500 gallon tank from Sierra Site Services for \$1397 including OSS fees which comes filled, with a pump and a 15' hose. Additional fills are \$2 cash per gallon. Water tastes great and service is amazing.

# Grey Water Disposal

Where does grey water go?

1. The build team RV has a grey water tank that holds about 75 gallons. We usually dump that in Reno at the GSR RV Resort (where we stay for one night.)
  1. This tank needs to be emptied a couple of times during the burn. In 2024 we figured out a method to hand pump it out to the Gayflower. You can theoretically flag down "RV Pumpout" trucks at the event but I didn't see any of those in 2024.
2. The Gayflower has five 250 gallon grey water tanks. In 2024 they were almost completely filled up.
3. We can rent a 250 gallon tank from Sierra Site Services for an additional \$250 and they will charge \$375 each time to pump it out.

# Black Water Disposal

If you flush the toilets in the Gayflower, it goes into the Gayflower's five 250 gallon black water tanks. In 2024 they were approximately half full.

# Vendors

Sierra Site Services

Office: 888-458-8777

Mobile: 530-957-5049 Contact there is Michelle Haley <[michelle@sierrasiteservices.com](mailto:michelle@sierrasiteservices.com)> and they have an office on playa.

# Moving Water in Camp

As of 2024, we don't quite have the water system fully dialed in, but we've learned a lot over the years and it feels like we are close to a painless water solution on playa. A part of that involves getting fresh water from the tanks where it's used, and grey water to the tanks where it can be collected or removed from playa.

## Fresh Water Well Pumps

We have a few of the [Harbor Freight 1HP Well Pump](#). ([Manual](#)) These pumps seem to work really well, and they have their own bladder so that the pump doesn't have to flip on and off frequently shortening it's life. Basically, they will maintain pressure in a pressurized water system, like the flower or the Kitchen Fort, or even when attached to a hose.



This is what Sierra Site Services delivers attached to their fresh water tank.

It is also what we use in the Gayflower for the fresh water system. And we have a new backup in a box in the Gayflower.

**Pro Tip:** When delivered, our pump was not primed. To prime it, you have to open a little nut and pour in some water until it overflows. We did this using a plastic bag with the corner cut off.

**Pro Tip:** Do not run this kind of pump dry for more than 10 seconds.

**Pro Tip:** The tank must be pressurized to 23 psi which can be done with a bicycle pump.

Only ever use this kind of tank for potable water.

## Sewer Pumps

We bought two of the [Harbor Freight 3/4 HP Submersible Sump Pumps](#) ([Manual](#))



These were intended to move grey water around camp quickly, say, from

the kitchen to the aavflower. They pump water into a thick red 2" hose that looks like this:



We have a bunch of those hoses - probably 150 feet worth.

There are two problems with this method of pumping grey water. The first is that the sump pump is meant to sit in a bucket that fills up with grey water causing the ball to float which turns on the pump. That means it never pumps the bottom  $n$  inches of water which can be a lot depending on the size of the bucket you put it in. The second is that those 2" hoses fill up with grey water and once the bucket is empty, they stay filled up with grey water... there is no way to cause the pump to push out the remaining contents all the way to wherever you're going. This means there is a manual step, after pumping grey water, involving walking the red hose from the source to the destination to gravity-force out all the water.

ided by Sierra is low-slung and looks like this:



With this tank, it's not a big problem to hand-caress the grey water from

the hose into the tank. However, if you are trying to move grey water up to the Gayflower, where the tanks are probably 5' off the ground, it's not so easy.

For the last mile, we have these little Water Bug Style Pumps:



That can be completely submersed in water and it will suck up virtually everything and pump it up through a narrow hose, which gets the last little bits of water up and out. It's slow, though, compared to the big sewer pumps.

**IN SHORT** we still don't have a great way to move grey water from the Kitchen Fort to either the Gayflower or a Sierra Grey Water Tank. It's just a bit of a manual messy process. This is something we will continue to work on for 2025.

# The Kitchen Fort Water System

The kitchen fort, delivered in 2023, is a marvel in camp automation, allowing us to bring a commercial-quality working kitchen to playa and start using it without any setup. However, we're still learning about the best way to hook it up to water.

## Fresh Water

There are two separately plumbed fresh water systems: one for sinks and one for the ice maker.

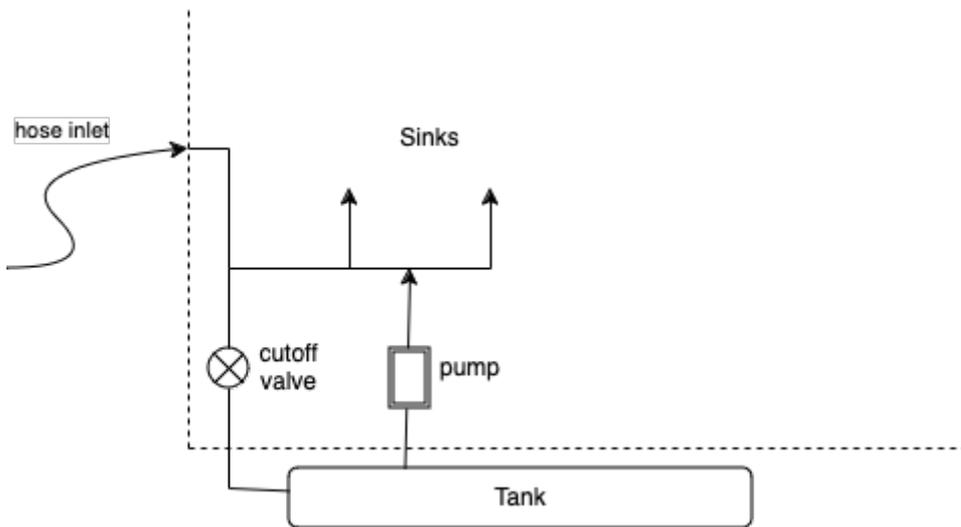
Each system has:

- a hose attachment outside for connecting water to the system
- two tanks per system under the bottom of the trailer to store water
- a little Shur-Flo pump inside the trailer that can pump water up from the tanks to pressurize the system
- a shut off valve inside the trailer that connects or disconnects the tanks and pump

In 2023 and 2024, our idea was to fill the water tanks every time they ran out of water. We thought this was a nice idea because it got the water team involved every once in a while and avoided the risk of the kitchen using up all of our camp water by mistake.

Besides the obvious inconvenience of filling the tanks again and again, the other problem with this system is that there is no way to see when the water tanks fill up, other than the fact that they just start spilling on the ground.

For 2025, I'd like to try disconnecting the food fort's water tanks and pumps, and just providing pressurized water to the kitchen at all times. This can be done by connecting hoses to both the sink and ice water inlets and turning off the shut off valves that let water get down into the tanks. We would also unplug the two fresh water pumps inside the kitchen.



## Ice Maker

The ice maker system is just like the fresh water system, with its own tanks and pump and shut off valve. In 2023 and 2024 we were underwhelmed by the amount of ice this system could produce (it was nothing close to what it should have been able to produce based on specs) and overwhelmed by the amount of cleanish water that it dumped on the ground through an open spout under the trailer as a part of its too-frequent "clean" cycle. In 2025 we want to give it one last chance by keeping it connected to pressurized water so it never runs out of water to see what it can produce.

## Grey Water

There are grey water tanks under the kitchen which probably need to be emptied daily. The waste spout of these tanks is only a few inches above the ground so we still haven't figured out a great way to move this grey water into the Gayflower or into a Sierra tank, other than manually pumping it around.

One option to explore for 2025 is putting a Sierra tank right next to the kitchen and constructing a simple hose that goes from the kitchen grey tank to the Sierra grey tank inlet. We didn't have the right plumbing parts to attempt this in 2024. We probably need a Valterra T01-0094VP or Valterra T01-0091VP which can convert to the grey water outlet to a standard hose.

# 2025 Water Plan

This is just the outline of how I think we can do water in 2025, based on everything I remember from 2024.

## Gayflower

The Gayflower can basically be treated as it's own unit unconnected to anything else:

- Water in the Gayflower is for showers and toilets
- Grey and Black tanks in the Gayflower are for the showers and toilets

If we can replace the smelly old IBC tanks in the Gayflower and get clean water from Gerlach, we should also use the Gayflower water through a hose as camper canteen filling water.

## Food Fort

For 2025 we'll run the Food Fort directly off of Sierra Site Services fresh and grey tanks.

- For fresh water, we'll order a 500 gallon tank and pre-order another refill for a total of 1000 gallons.
  - We'll have their pump directly connected to the two kitchen inlets (sink and ice) and we will bypass the food fort fresh tanks completely. Essentially the kitchen will be permanently connected to fresh water and pressurized from the SSS pump.
- For grey water, we'll order a 250 gallon tank and pre-order daily pump-outs.
  - We'll put their grey water tank right below the food fort and directly open the food fort's grey tank into it. This will require a small adapter for the outlet, and might also require that we install some kind of sump pump.

As a backup plan if we don't like the taste of the Gayflower water again, we can get fresh water for canteens/drinking water from the SSS tank, too, but this is more expensive.

## Layout

This allows the Gayflower to be placed anywhere, but the Food Fort needs to be placed close to the SSS tanks and thus near the street or fire lane.

- If we find ourselves generating grey water from the kitchen faster than SSS pumps it out, we can use the kitchen's own grey water tanks for 100 gallons of overflow. Otherwise we will have to hopscotch water over to the Gayflower black water tank which will have some extra room.
- If we run out of SSS water we can bring a hose over from the Gayflower
- If the Gayflower runs out of water for showers or toilets, or the grey/black tanks fill up, we stop having showers and toilets.

## 2026 And Beyond

1. Let's get some inline water meters to better judge how much water we're using
2. Ultimately I'd like to get the SSS usage down to zero and rely solely on the Gayflower. It's way cheaper that way.

# 2025 Gayflower Wish List



## Introduction

After two years in operation we have a wish list for some improvements and repairs that could be made to the Gayflower. These would have to be done in Empire, NV in the spring.

Priority	Project	Status
5 Urgent	<b>Fix Leaks Around Fresh Water Pump</b> The main green fresh water pump has a few little drips. There is a second leak on the thin brass fitting where water goes off to the swamp cooler.	
5 Urgent	<b>Replace IBC Totes With New</b> The four IBC totes in the back were used for fruit juice concentrate and cause the water to smell poorly. One of the three IBC totes in the front (the rearmost one) has a broken shutoff valve.	
5 Urgent	<b>Seal Waste Line at Second Urinal</b> We haven't been able to use the second urinal because the waste line leaks.	
3 Medium	<b>Leaks around sink bases</b>	
5 Urgent	<b>Leak in Grey Water Connecting Hoses</b> The one we noticed was probably the rearmost, passenger-side grey water holding tank.	

Priority	Project	Status
4 Important	<p><b>Steel Support For IBC Totes in Back</b></p> <p>Weld in place a steel structure to support the weight of the water tanks in back</p>	
4 Important	<p><b>Bathtub / Secondary Containment for Grey / Black Water Tanks</b></p> <p>There is an interesting problem that if the grey or black water tanks leak or the hoses connecting them come apart, the contents go onto the playa. At the very least it seems like it should be possible to shut off any single waste water tank at the fitting in case the leak is downstream of that. Maybe then there could be a way to pump its contents into another tank?</p>	
4 Important	<p><b>Level Indicators for Waste Water Tanks</b></p> <p>Apparently there are already sensors connected to the grey and black water tanks to measure the level, but they are not hooked up to anything that can be used to read their output.</p>	