

SEAPAC.SANITATION

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WHEN THE GROUND SHAKES SEPTIC AND SEWER LINES BREAK



Portland Metro 5 County Area Population Is 2.4 Million People

- Sue Mohnkern, emergency preparedness program supervisor at Washington County Public Health in Hillsboro, Oregon
- "The average person poops about half a pound a day...."



Portland Metro 5 County Area Population Is 2.4 Million People

- "Half a pound a day times 2.4 million people per day is a lot of poop that's not going anywhere when our sewer systems are broken....We don't want cholera, typhoid, hepatitis A and diarrheal illnesses to come back and be the catastrophe after the catastrophe."



Sanitation After A Disaster

- How will you dispose of pee and poo after a disaster, when there might not be any working toilets?
- **Pee volume** is almost 10 times more than the poo volume
- Pee is clean, unless the person is real sick with a urinary tract infection or has some bloody urine
- Pee can be discarded easily
- Pee is what causes a terrible smell if not disposed of properly



Sanitation After A Disaster

- You produce about 4-10 ounces of poo per day
- Poo has **pathogens** and must be disposed of carefully
- 5 gallon bucket will last about 1 week for 2 people, when just being filled with their poo material



Lessons Learned From Christchurch, New Zealand

- About 50,000 people in Christchurch had to quickly come up with a way to safely manage their human waste after an earthquake destroyed their sewer system for months
- One method that worked was to separate the pee from the poo by using two separate buckets (about 5 gallon size)
- Small children who can not easily go into two separate buckets would just use the poo bucket



Bucket With Toilet Lid Or Improvised Padding



Portable Pop-Up Privacy Tent For Outdoor Toilet Use



Ad Hoc Toilet Shelter That Would Work In The Rain

- You can use a regular camping/picnic pop-up shelter roof and then attach tarps to the sides for rain protection and privacy screening
- Remember this is a big safety issue for women, be prompt in getting the shelters set up soon after a disaster
- Having a safe place for women and elderly to toilet was an issue after the 2011 Japanese earthquake



The Twin-Bucket Emergency Toilet

- Not mixing urine and feces is the safest way to **manage** human waste in an emergency
- Because the poo is the smaller volume of waste and has the pathogens, separating it out and disposing of poo by itself is much easier
- Pee and poo mixed together is a lot of volume to get rid of safely, much easier to dispose of 10 times less volume of waste that has the pathogens



Pee Bucket Use

- After each use, cover tightly with a lid till ready to be disposed of
- In rural and suburban areas you can sprinkle the pee over an area of land away from people who might be tent camping outside
- Try to avoid local park “open spaces” which will probably be used as emergency tent camps
- In the city, you may be able to pour the pee down a functioning street drain



Poo Bucket Use

- Put a small amount of carbon based material in the bottom of the bucket first, perhaps some coir
- Used toilet paper goes into the poo bucket
- Diapers and sanitary napkins go into the trash, not the poo bucket
- Plan to use a handful or two of some type of carbon based “cover material” after each use of the poo bucket, and do not put on an air tight lid, let air get to the contents so they can dry out



Poo Bucket Carbon Based Material

- Chemical free, absorbent, carbon (organic) based material is best
- Untreated sawdust
- Shredded paper
- Cardboard pieces
- Dry leaves, dry grass clippings, nothing that is wet
- Dry soil



Cleaning The Poo Bucket

- Plan to wear gloves if you have some
- Use your toilet brush and some water
- Could use some bleach water from a spray bottle
- Dispose of the waste water carefully



Storing Your Twin Bucket Emergency Toilet

- Items you can store in your 5 gallon bucket **before** a disaster happens
- You can place rolls of toilet paper wrapped in Ziploc bags
- Prepare a bag of sawdust or have some bricks of coir



Storing Your Twin Bucket Emergency Toilet

- Put a small dirt trowel for getting more carbon material when your sawdust runs out
- Put foaming soap hand sanitizer
- Put a toilet bowl brush and nitrile gloves



Septic System Users And Their Poo Bucket

- Households on a septic system may not have enough water available to simply pour water into the flush toilet and keep using it (system must still be intact)
- Do not plan to put any “cover material” in your bucket if you’re going to just be dumping it into the septic tank by exposing the tank lid. The extra organic material can foul up your septic system
- A single bucket could be used and then dumped as needed



Is My Septic System Intact?

- If the system appears intact and is accepting input
- Remove the septic tank inspection cover and note the effluent tank level, too low = a leak, too high means not flowing, just right is at the level of the outflow pipe
- This inspection can help determine if your septic system is still working ok after an earthquake



Is My Septic System Intact?

- If adequate access to water, and the septic system is totally a gravity feed system without use of an electric pump (Assuming grid is down), you can manually flush the toilet. This is the preferred method from a safety and hygiene point of view
- Add water directly to the toilet bowl to start the flush siphon **or** put water in the tank and flush the toilet
- If it is yellow, let it mellow...if it is brown, flush it down is a general rule during emergencies



Directly Adding Human Waste To Your Gravity Feed Septic System

- Some septic tank lids are very heavy...be careful
- If you are adding waste directly to the tank...you want to be adding to the inlet side, not the outlet side
- Do not leave the lid off of the tank, a safety issue



Directly Adding Human Waste To Your Gravity Feed Septic System

- Removing and replacing the lid could cause damage to the septic tank lid?
- You could perhaps add waste through the clean out that connects to the inlet pipe before the tank...could be messier



Use Your Wheelie/Compost Bin For Poo

Put a layer of sticks on the bottom of your compost bin to create a void, then cover with some absorbent material...to help keep the bottom of your wheelie bin/compost bin dry

Put some sticks vertically in the middle of the bin, or use a pipe(s) with holes drilled (cordless drill time here), this will provide some ventilation to help dry out the material in the center

As you dump your poo material, the bin bottom will stay drier, and the material has a chance to dry some with the vertical vent pipe/sticks



Waste Management Yard Waste Bin



How Many Gallons Does Your Wheelie/Compost Bin Hold?

- Clark County, Washington Waste Management yard waste bin holds 96 gallons
- Online reference says 2 people can use a 5 gallon bucket for 1 week for poo
- Family of four would have somewhere to put their poo for about 2 months using the 96 gallon wheelie bin
- Remember to leave room for ventilation in the center



Another Method Is To Dig A Pit Latrine

- Plan to locate the latrine 10' away from your property line and 10' away from your house, and 100' away from a water source for your ~2' wide hole you will be digging
- Digging down 4' is best, but at least 2', if you see water stop digging
- Cover each "use" with some dirt you already dug up
- When the hole is still 1' deep, consider the latrine full and cover with dirt at least 1' deep (mark the spot for treatment later during the recovery phase)
- Human waste and toilet paper should be all that is in the hole



You Have A Wheelie Bin(s) And A Place To Dig A Hole

- You have wheelie bin(s) used for collection of poo and then need to dump the wheelie bin
- You have room to dig a hole that is 10' away from the property line, 10' away from your house, and 100' from a water source
- You could then decide to dig and then dump the contents of the wheelie bin and cover the last 1' of the hole with dirt
- The wheelie bin might be used by several households and fill up faster? They can be rolled to the dump site?



The Government Will Just Supply Us With Porta Potties Till Things Get Fixed? Right?

- Limited supply could not possibly meet the demand, you are on your own
- The few that would be available can fill up quickly and need to be “serviced” several times a day with high demand
- Some people would be required to walk quite a distance to reach one, then wait in line, then get inside to find it smelly and unclean from high use



Online References

- <https://www.portlandoregon.gov/pbem/article/394125>
- Note...Wheelie bin example size in this next article is **65 gallons**
<https://www.portlandoregon.gov/pbem/article/447707>
- <https://preparednessmama.com/wp-content/uploads/2013/09/RELIEVE-emergency-compost-toilet-booklet.pdf>
- https://docs.google.com/document/d/1Pt4W2ul_nfBeES0-al38SFGN9_5-rCDcV45lbfvligA/edit
- <http://www.clallam.net/HHS/documents/SewerMar15.pdf>



