CHAPTER 4

# Sanitation & Hygiene

New here? Ready, Set, Ready is a 10-minute starting point: an honest assessment, one gap closed for real, then a map for using the rest of this site. Once something's actually happened, Surviving picks up where this chapter leaves off, organized by chronology instead of category. Curious how Tier, Stage, and Phase relate? See the Glossary.

## Why This Category Comes Second

The priority ranking behind this manual puts Sanitation & Hygiene second for a specific reason: disease, not the disaster itself, is historically the leading cause of death in the days and weeks that follow. Contaminated water and unmanaged human waste turn a survivable event into a cholera or dysentery outbreak. Water and food keep people alive long enough to matter; this chapter keeps the household from poisoning itself with its own waste while everything else is going wrong around it.

As in every chapter here, each tier adds to the one before it rather than replacing it: the bucket-toilet habit from Tier 2 remains the daily routine even after Tier 3 composting comes online, and Tier 1's hygiene basics never stop mattering just because the household has moved on to a harder problem.

### Stored vs. Produced

The same stored-versus-produced shift that runs through this manual's other chapters applies here too. Tier 1 is Stored: using hygiene supplies already on hand while toilets and taps still work. Tier 3 is Produced: sewer service isn't coming back, and waste handling shifts to safely closing the loop rather than just containing it. Tier 2 is the transition: the toilet stops flushing reliably and containment becomes the household's own responsibility, but it's still largely working from stored supplies, not yet running a self-sustaining system. Tier 4 is Produced at community scale. This chapter's companion, Medical Care, runs the same four-tier structure for treating injury and illness; the two are meant to be read side by side, since most of what actually kills people after a disaster is a sanitation failure that becomes a medical one.

# Tier 1: Short-to-Medium Term (Hours – 14 Days)

*Goal: Stored: using what's already on hand. Maintain hygiene while municipal water/sewer service is temporarily disrupted, and prevent a short outage from turning into a disease problem.*

Tier 1 assumes toilets and taps still physically exist but may not be reliable. The goal is simple: don't let a power or water outage turn into a stomach illness because hygiene habits slipped.

## Skills to Build

- **Hygiene with Limited Water:** Practice sponge-bathing technique (a damp cloth and a small basin of water, working from cleanest areas to dirtiest) so it's not the first time you're doing it when water is actually scarce. Keep brushing twice a day even on minimal water: the mechanical brushing itself, not the toothpaste, does most of the plaque-prevention work, and baking soda is a genuine substitute once the toothpaste supply runs out; see the Bathroom & Hygiene skill guide for the full technique.
- **Waste Containment:** Double-bag household garbage, twist-tie it closed, and store it away from living space and any water source until removal is possible. This alone prevents most of the pest and odor problems that come with a short outage. See <a href="/skills/household-trash-and-pet-waste-disposal/">Household Trash & Pet Waste Disposal</a> for the full technique once removal isn't coming soon.

▸ GO DEEPER

The **Sanitation & Hygiene Addendum** builds these into real, tested competency.

For the hands-on how-to:

Bathroom & Hygiene Without Running Water | Household Trash & Pet Waste Disposal | Death, Burial & Body Disposition | Composting Toilets: Humanure, Vermicomposting & Incineration | Soap Making: Lye & Oils | Greywater Disposal Basics

## Tech & Equipment

- **NOAA Weather Radio:** Battery or hand-crank, to monitor boil-water notices, often the first official signal that water contamination is a risk.

### Materials & Supplies

| Item | Quantity / Spec | Notes |
|---|---|---|
| Hygiene | Soap, toothpaste, feminine hygiene products, hand sanitizer, baby wipes | Hand hygiene is the single cheapest disease-prevention tool in this entire chapter. |
| Sanitation | Heavy-duty contractor bags (3–6 mil), twist ties, moist towelettes, toilet paper | 14-day supply. Thicker mil rating resists tearing under weight. |

### Quick Checklist

- [ ] Hygiene practice reviewed with limited-water technique (sponge-bathing, brushing without wasting water)
- [ ] Household garbage double-bagged, twist-tied, and stored away from living space and water sources
- [ ] Hygiene supplies stocked in 14-day quantities
- [ ] Contractor bags, twist ties, and 14-day toilet paper supply on hand
- [ ] NOAA weather radio (battery or hand-crank) in kit

## Tier 2: Extended (2 Weeks – 3 Months)

***Goal:*** *The stored-to-produced transition, skills change but supplies are still largely stored. Manage human waste without sewer systems and prevent epidemics (cholera, dysentery) in a static environment.*

Tier 2 begins when the toilet no longer flushes reliably. Waste management moves from a convenience problem to the single largest disease-prevention task in the household.

### Skills to Build

- **Waste Management:** Build and run a bucket toilet (single-bucket, emptied and covered after each use, or twin-bucket for a rotating fill/rest cycle). Every use gets a scoop of cover material: this is the single habit that controls both odor and disease risk. Plan for the 14-day toilet paper supply above running out on a longer disruption too: a portable bidet bottle (a few ounces of stored water per use) or reusable cloth wipes, washed as their own separate hot load, both

stretch that stock; see the Bathroom & Hygiene skill guide for the full how-to and the safety details that actually matter.

- **Alkaline (Lime) Treatment:** A real, fast-acting pathogen-kill method, not just containment: hydrated lime (calcium hydroxide) raises bucket-toilet contents above pH 12, which destroys the bacteria and viruses responsible for most disaster-related outbreaks (E. coli reduced below detection within an hour at pH above 11) within about 2 hours, versus the 12-month wait Tier 3 humanure composting requires. This is real emergency-sanitation practice, the same method aid organizations use to treat pit-latrine sludge and disaster-response wastewater, not a home remedy. Hydrated lime is caustic: wear gloves, a mask, and eye protection, and keep it away from kids and pets the same way you'd treat any corrosive chemical.

- **Vector Control:** Flies, mosquitoes, and rodents are mechanical disease carriers, not just a nuisance: proper refuse sanitation alone does roughly 90% of the job of fly control and 65% of rat control, so a well-run bucket toilet and sealed trash containers are already most of the work. Empty or remove anything that collects standing water after rain, buckets, tarps, old containers, since that's exactly where mosquitoes breed; a single container of standing water left for a week is enough. Rodent-proof food storage and trash the same way you'd pest-proof against any other scavenger.

- **Water Testing:** Use test strips to check any water source for fecal contamination before it's used for drinking, cooking, or wound cleaning; cross-reference the Water chapter's Tier 2 filtration guidance. See the Water Testing skill guide for real field-expedient bacteria tests (no lab, no mail required) and their honest limits.

- **Drying Out After Flooding:** Mold can start growing on a wet surface within 24 to 48 hours, a real deadline, not a rough guideline: open doors and windows, run fans, and keep indoor humidity under 50% to dry a wet space out inside that window. If a space genuinely can't be dried within 24 to 48 hours, treat it as an active mold problem rather than hoping it dried in time. Any surface actually touched by floodwater needs real disinfecting, not the lighter dish-sanitizing dilution elsewhere in this chapter: 3/4 cup regular bleach (or 1/2 cup concentrated) per gallon of water, kept wet for at least 2 minutes, then rinsed and dried, with real PPE, gloves, goggles, an N95, used for structural re-entry. Discard anything porous, carpet included, that was actually submerged in floodwater; it can't be fully disinfected.

- **Menstrual Hygiene Without Resupply:** A reusable menstrual cup or washable cloth pads (the same wash-as-a-separate-hot-load protocol covered in the Bathroom & Hygiene skill guide) remove the resupply dependency entirely. If disposable products are being rationed, never extend a single tampon past its intended wear time to stretch a limited supply.

▸ GO DEEPER

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## Tech & Equipment

- **Bucket Toilet System:** 5-gallon buckets with tight-sealing lids and a snap-on toilet-seat attachment. Set up as twin-bucket if you're planning to feed the contents into Tier 3 composting later; it's much easier to build that habit from the start than switch systems mid-emergency.
- **Compost Additives:** Bulk sawdust, cat litter, or agricultural lime as cover material; controls odor and begins the composting process immediately. This is a light dusting for odor, not the same as the treatment-dose hydrated lime below; don't assume the cover material alone is disinfecting anything.
- **Hydrated Lime (Treatment-Grade):** A separate, higher-strength product from the agricultural lime used as cover material: roughly 1-2 cups of hydrated lime per 5-gallon bucket, stirred in and held for at least 2 hours before disposal, is the real dose behind the Alkaline Treatment skill above. Buy it specifically for this purpose and store it separately labeled from cover-material lime so the two don't get confused under pressure.

## Materials & Supplies

| Item | Quantity / Spec | Notes |
|---|---|---|
| Waste cover material | 5+ gal / person | Sawdust, peat moss, or kitty litter; used at every bucket-toilet visit. |
| Hydrated lime | 5-10 lbs, stored separately from cover material | Treatment-grade, for actual pathogen kill (1-2 cups per 5-gal bucket, 2+ hour hold), not the light dusting used for odor control. |
| Disinfectants | Unscented bleach, several gallons | Surface cleaning and, per the Water chapter, backup water treatment. |
| Feminine care | Reusable cloth pads or menstrual cups | Reduces both waste volume and resupply dependency. |

WARNING

### What Actually Destroys Pathogens (and What Doesn't)

Disease, not the disaster itself, is the leading killer in the aftermath, and that's overwhelmingly a waste-management failure, so it's worth being precise about what actually works. Validated methods, backed by real dosing and real research: proper double-bagging plus cover material (contains, doesn't destroy, but blocks the fecal-oral route that matters most), hydrated lime at the dose above held 2+ hours (destroys bacteria and viruses fast), and 12+ months of true humanure aging (destroys essentially everything given enough time). What people mistakenly trust as equivalent and isn't: a light dusting of ordinary cover-material lime or cat litter (controls odor, does nothing to pathogens at that concentration), an improvised backyard burn that never reaches a sustained high temperature throughout (leaves cool pockets where hardy organisms survive), and standard chemical disinfectants like bleach or ozone against certain resistant pathogens (some parasites, notably the toxoplasmosis parasite in cat waste covered in the pet chapter, survive these entirely). When a method depends on reaching a specific temperature, pH, or time, verify it's actually reaching that number, don't assume good intentions are the same as a controlled process.

### Northern Utah Note

Site any bucket-toilet disposal or future compost pile well away from wells, canals, and any water source you're relying on for Tier 2 filtration. Contamination of your own water supply from your own waste system is a real and preventable failure mode.

WARNING

**Never Stretch a Tampon Past Its Wear Time to Ration Supply**

Toxic shock syndrome is rare but genuinely dangerous, and the length of time a tampon has been left in is the single most consistent factor across real cases: 8 hours is the real limit, not a conservative suggestion. Symptoms can look like a mild viral illness at first, then progress to high fever, low blood pressure, and organ failure within a day or two. Rationing a limited supply by extending wear time is exactly the mistake that raises this risk; switch to a reusable cup, cloth pads, or a lower-absorbency product changed on schedule instead of stretching a disposable one.

### Quick Checklist

- [ ] Bucket toilet system built and in daily use, cover material applied every time
- [ ] Hydrated lime (treatment-grade) on hand and dosing understood, separate from cover-material lime
- [ ] Standing water eliminated around the property; trash and food storage rodent-proofed
- [ ] Water testing strips used on every new source before use
- [ ] Reusable menstrual supplies (cup or washable pads) on hand, not just a disposable stockpile
- [ ] Waste/compost site located away from all water sources
- [ ] Practiced: dried out a wet or flooded space within the 24-48 hour mold-growth window at least once

## Tier 3: Permanent (Indefinite)

***Goal:*** *Produced: safely closing the loop on human waste rather than just containing it. Long-term waste management without any modern supply chain.*

Tier 3 assumes sewer service is not coming back for the foreseeable future. Waste handling shifts from containment to actually destroying pathogens and, where possible, producing something usable out of the other end of the process.

### Skills to Build

- **Humanure Composting:** Safely converting human waste to usable soil amendment using the method popularized by Joseph Jenkins: a carbon cover material at every addition, and a minimum aging period of 12 months, ideally longer, and always at least a full year, before the finished compost goes anywhere near food crops. Skipping the aging period is the single most common and most dangerous mistake with this method. See the Composting Toilets skill guide for the actual carbon-to-nitrogen ratio and pathogen die-off science behind this.

- **Pyrolysis / Biochar (Advanced):** A faster alternative to the 12-month aging method: purpose-built pyrolysis equipment (a sealed retort that heats waste to 300–700°F or more without oxygen) destroys essentially all pathogens in hours rather than a year, and produces biochar, a genuinely useful soil amendment. This is a real, actively used sanitation technology, not a fringe idea, but it depends entirely on the equipment reaching and holding that temperature throughout the load. A backyard burn barrel or an improvised biochar rig doesn't reliably do that; cooler pockets can leave hardy pathogens (like Ascaris eggs) alive. Treat this as a real upgrade path once you own or build equipment that actually verifies sustained temperature, not a shortcut around the aging method with what you already have. See the Composting Toilets skill guide's pyrolysis section for the real temperature range and why a retort has to stay sealed.

- **Vermicomposting (Worm-Assisted):** Composting worms, kept in a dedicated bin fed by a urine-diverting toilet, digest solids far faster than passive aging and cut disease-indicator organisms dramatically (real field data shows roughly 99% reductions). This is genuine, actively used sanitation technology, not a novelty, but it's a pretreatment step, not a finish line: the reduced material still needs the same off-site disposal or further aging as any other partially treated waste, treat a vermicomposting bin as cutting your workload, not skipping the safety requirement. See the Composting Toilets skill guide for worm species and bin setup.

- **Incinerating Toilet (Equipment Option):** A commercial off-grid toilet that burns waste to sterile ash after each use rather than batch-treating it later: the most sterile of the equipment options here, and the simplest to use correctly, but it depends on a steady fuel or electricity supply to run, which is a real planning cost this book's Energy & Heat chapter should factor into any Tier 3 power budget. See the Composting Toilets skill guide for current real-world unit and per-use operating costs.

- **Soap Making:** Producing soap from fat and lye is what makes a household's hygiene supply genuinely self-sustaining once stocked soap runs out, rather than just a bigger stockpile with the same expiration date. The fat-to-lye ratio has to be calculated for the specific fat used, not guessed: too much lye leaves a harsh, skin-irritating bar, too little leaves a soft one that spoils. See the Soap Making skill guide for the real chemistry, the lye-safety practice that isn't optional, and how to make lye itself from wood ash once buying it isn't an option either.

▸ GO DEEPER

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## Materials & Supplies

| Item | Quantity / Spec | Notes |
|---|---|---|
| Soap-making supplies | Lye, fats/oils, essential oils | Produces an effectively unlimited hygiene supply once the skill is established; see the Soap Making skill guide. |

### Northern Utah Note

If hunting is part of your Food Tier 3 plan, proper field-dressing hygiene (clean tools, avoiding gut contents, prompt cooling of meat) is itself a disease-prevention skill that belongs in this chapter as much as that one.

WARNING

### Pyrolysis Isn't a Backyard-Fire Shortcut

Pathogen destruction in pyrolysis depends on sustained, even, oxygen-limited heat, something a sealed retort with a thermometer delivers and an open burn or improvised barrel setup can’t reliably guarantee. If you’re building or buying pyrolysis equipment for humanure, verify it holds temperature throughout the load, not just at one hot spot, before trusting the output near food crops. Until then, the 12-month aging method above is the proven, equipment-free default. This same distinction matters for pet waste: dog and cat waste carries pathogens (roundworms, and in cats, Toxoplasma) that ordinary home composting doesn’t kill, so it still needs the dedicated, non-food-adjacent disposal covered in the Household Trash & Pet Waste Disposal skill guide, verified pyrolysis aside.

## Quick Checklist

- [ ] Humanure system running with a minimum 12-month aging cycle enforced before use on crops (or verified pyrolysis equipment as a faster alternative)
- [ ] Soap-making supplies and skill established for an ongoing hygiene supply
- [ ] Practiced: field-dressing hygiene reviewed if hunting is part of the household's food plan

## Tier 4: Sustainable Community

***Goal:*** *Produced, at community scale. Build a community waste-management and hygiene system that doesn't depend on any single household's supplies.*

In Tier 3, all of this household's waste-management capability lives in whatever one household built and maintains: a single lost site or forgotten rule can contaminate a shared water source. Tier 4 spreads that capability, and its rules, across a neighborhood.

Start with the actual failure mode, not a vague sense that "more sanitation capacity" is good: a neighborhood on municipal sewer has a different real risk (a treatment plant or lift-station failure takes out everyone at once) than one already on individual septic (each household's tank is independent, but nobody's practiced running it without power to the pump, if it has one). Disaster-relief organizations sizing displacement camps use a hard ratio worth borrowing directly: no more than 20 people per toilet as the real target, up to 50 acceptable only in the first acute days, not as a standing plan. Ask concretely how many households would actually use a shared facility, and whether the neighborhood already has enough individual septic capacity that a from-scratch shared system is solving a problem that doesn't actually exist here.

WARNING

**A Shared System Can Cross Into Regulated Territory Without Anyone Deciding It Should**

Many states, Utah among them, draw a separate regulatory line for larger or multi-dwelling onsite wastewater systems distinct from a single-household septic system; once a design crosses that flow threshold it requires engineered design and ongoing inspection by a certified professional, not a private handshake agreement. Utah's Underground Injection Control review for these systems begins at 5,000 gallons per day; check your own state's exact cutoff, and the difference between a basic onsite system and a "large underground wastewater disposal system" in its own rules, before assuming an informal shared system stays small enough to avoid it.

## Skills to Build

- **Neighborhood Waste Siting:** Plan bucket-toilet and composting sites at a neighborhood scale, sited well away from any shared or individual water source, with clear rules about who maintains what.
- **Crowded-Conditions Hygiene:** Lice and scabies spread easily wherever people are sharing close quarters, bedding, or clothing for an extended period, a real risk once a neighborhood is sheltering displaced households together. Scabies symptoms can take 4 to 8 weeks to appear after a first exposure, so someone can spread it before anyone knows it's there. Treat every household member and close contact at the same time, not just the person with visible symptoms, and wash clothing and bedding in water hot enough to kill both lice and scabies mites, 122°F for 10 minutes, the same hot-wash standard already established elsewhere in this chapter, not a special exception.
- **Handling a Death in the Community:** The common fear, that a body left unburied spreads an epidemic, is largely a myth the World Health Organization and Red Cross have specifically pushed back on: a person who died from trauma, drowning, or the disaster itself doesn't generally carry organisms that pose a public-health risk, and survivors are actually more likely to spread disease than the deceased are. The real exception is a death from a communicable disease already spreading through the community, cholera among them, where standard precautions do matter. What actually matters in every case: document identity, location, and circumstances before burial if at all possible, since undocumented mass burial is what causes lasting harm, to grieving families and to any later legal or insurance process, not a disease outbreak. Coordinate through whatever community structure this tier has already established rather than improvising alone. See the Death, Burial & Body Disposition skill guide for the actual legal paperwork, body preservation without embalming, and the real, state- and county-dependent rules around burial on private land.

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## Tech & Equipment

- **Communal Composting Site:** A properly sited, correctly sized humanure composting operation serving multiple households, with an enforced aging period before any output is used.

## Materials & Supplies

| Item | Quantity / Spec | Notes |
|---|---|---|
| Community sanitation reserve | Bulk cover material, hydrated lime, contractor bags | Sized for the neighborhood, not one household; access rules agreed in advance. |
| Trained waste-system stewards | Names, skills, and availability | Kept simple and current; more than one person needs to know how the community's system actually works. |

### Northern Utah Note

Utah counties run Community Emergency Response Team (CERT) training, a free, existing framework for exactly this kind of distributed skill-building. Plugging into (or starting) a neighborhood CERT group is a faster path to Tier 4 than building a parallel system from scratch.

## Quick Checklist

- [ ] Community waste/composting site sited and rules agreed
- [ ] Crowded-shelter hygiene plan (lice/scabies) agreed on before displaced households are sheltered together
- [ ] Community protocol for handling a death agreed on before it’s needed
- [ ] Community sanitation reserve and trained-steward roster established
- [ ] Local shared-system flow threshold (UIC review in Utah, 5,000 gal/day) checked before assuming an informal system stays exempt
- [ ] Practiced: a CERT training or equivalent community drill completed

## At a Glance: Sanitation & Hygiene Across All Tiers

A single-page reference for planning purposes. This does not replace the detailed guidance above; use it to see how the plan scales, not as a standalone checklist.

| Tier | Mode | Duration | Waste/Hygiene Plan | Key Skill |
|---|---|---|---|---|
| Tier 1 | Stored | Hours – 14 days | Existing toilets/taps, careful hygiene | Limited-water hygiene, waste containment |
| Tier 2 | Transition | 2 weeks – 3 months | Bucket toilets, hydrated-lime treatment | Vector control, water testing |
| Tier 3 | Produced | Indefinite | Humanure composting (12+ mo. aging, or verified pyrolysis) | Soap-making, self-sustaining hygiene supply |
| Tier 4 | Produced | Sustainable community | Neighborhood waste infrastructure | Distributed stewardship, shared siting rules |