



A Citizen's Guide to Understanding Stormwater



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After the Storm

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What is stormwater runoff?



Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

Why is stormwater runoff a problem?



Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

The effects of pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.



- ◆ Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- ◆ Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- ◆ Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- ◆ Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- ◆ Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.



◆ Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.



Stormwater Pollution Solutions

Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.



- ◆ Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- ◆ Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- ◆ Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- ◆ Cover piles of dirt or mulch being used in landscaping projects.

Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.



- ◆ Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- ◆ Don't dispose of household hazardous waste in sinks or toilets.

Auto care

Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.



- ◆ Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- ◆ Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.



- ◆ When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.



Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.



Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

Commercial

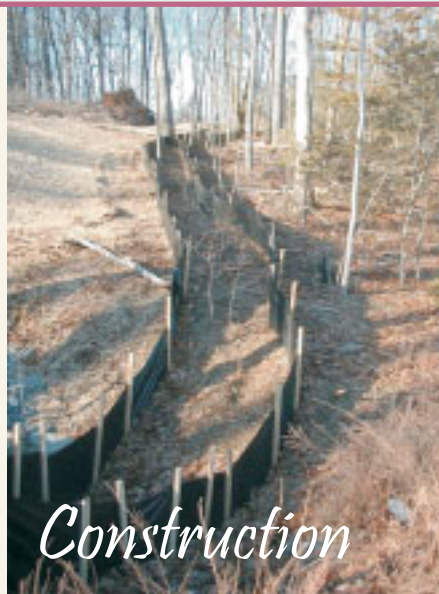
Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- ◆ Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- ◆ Cover grease storage and dumpsters and keep them clean to avoid leaks.
- ◆ Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- ◆ Divert stormwater away from disturbed or exposed areas of the construction site.
- ◆ Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- ◆ Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.

Construction



Agriculture

Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

- ◆ Keep livestock away from streambanks and provide them a water source away from waterbodies.
- ◆ Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- ◆ Vegetate riparian areas along waterways.
- ◆ Rotate animal grazing to prevent soil erosion in fields.
- ◆ Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.



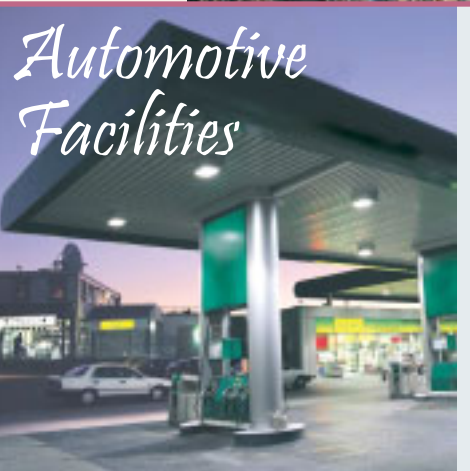
Forestry

Improperly managed logging operations can result in erosion and sedimentation.

- ◆ Conduct preharvest planning to prevent erosion and lower costs.
- ◆ Use logging methods and equipment that minimize soil disturbance.
- ◆ Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- ◆ Construct stream crossings so that they minimize erosion and physical changes to streams.
- ◆ Expedite revegetation of cleared areas.



Automotive Facilities



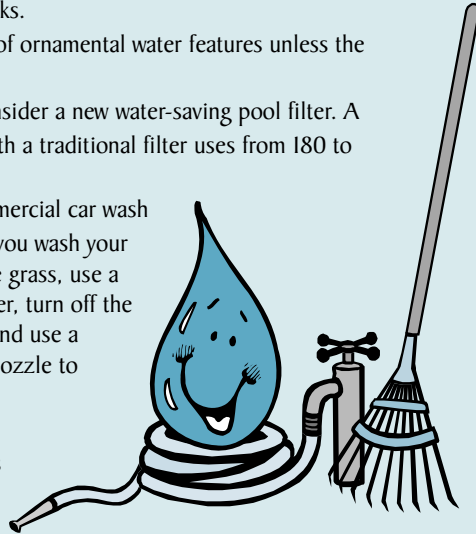
Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- ◆ Clean up spills immediately and properly dispose of cleanup materials.
- ◆ Provide cover over fueling stations and design or retrofit facilities for spill containment.
- ◆ Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- ◆ Install and maintain oil/water separators.



OTHER OUTDOOR WATER WASTERS TO WATCH

- Do not hose down your driveway or sidewalk; use a broom instead and save hundreds of gallons of drinkable water.
- Check all hoses, connectors and spigots regularly. Replace or add washers if you find leaks.
- Avoid the installation of ornamental water features unless the water is recycled.
- If you have a pool, consider a new water-saving pool filter. A single backflushing with a traditional filter uses from 180 to 250 gallons of water.
- Consider using a commercial car wash that recycles water. If you wash your own car, park it on the grass, use a bucket with soapy water, turn off the water while soaping, and use a hose with a pressure nozzle to decrease rinsing time.
- Avoid purchasing recreational water toys that require a constant stream of water.



AT WORK AND AROUND TOWN

BE ACTIVE

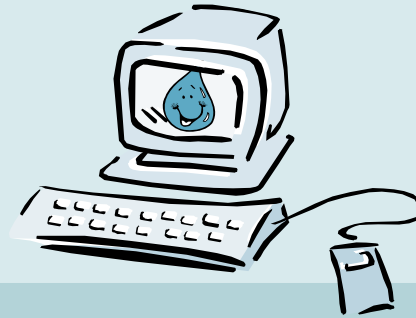
- Encourage your employer to promote water conservation at the workplace. Suggest that water conservation tips be put in the employee orientation manual and training program.
- Support projects that will lead to an increased use of reclaimed wastewater for irrigation and other uses.
- Promote water conservation in community newsletters, on bulletin boards and by example.
- Patronize businesses that practice and promote water conservation.
- Report all significant water losses (broken pipes, open hydrants, misdirected sprinklers, abandoned or free-flowing wells, etc.) to the property owner, local authorities or your water management district.
- Encourage your school system and local government to promote a water conservation ethic among school children and adults.



YOU'RE IN CONTROL

- Try to do one thing each day to save water. Don't worry if the savings are minimal. Every drop counts. And every person can make a difference.
- Be aware of and follow all water conservation and water shortage rules and restrictions that may be in effect in your area.
- Make sure your children are aware of the need to conserve water.

For more information on water efficiency and conservation, contact the National Small Flows Clearinghouse at (800) 624-8301 or www.nsfc.wvu.edu



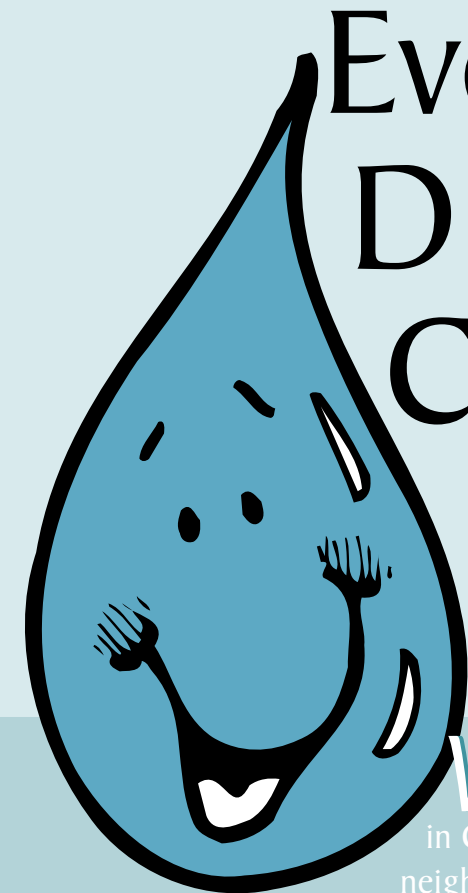
To take a Water Awareness Test to see how you measure up, log-on to www.getwise.org/wwise/test.html

For more information or to get additional copies contact:
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Office of Environmental Management
60 Executive Park South
Atlanta, GA 30329
(404) 679-4940
www.dca.state.ga.us



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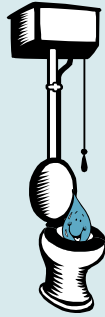
Every Drop Counts



Water is a precious resource in Georgia and its neighboring states.

Growing populations and ongoing drought are squeezing our water resources dry, causing natural habitat degradation and impacting our everyday use of water. We have no choice but to pay more attention to how we are using water, and how we may be wasting it. We must bridge the gap between our understanding of how important water is to our survival and what we can do to ensure that we have an adequate supply of clean water for years to come. Inside is a list of many simple ways we can take action and conserve water, both inside and outside our homes.

WATCHING WATER WASTERS IN THE KITCHEN AND BATHROOM



THE TOILET

- Check for toilet leaks by adding food coloring to the tank. If the toilet is leaking, color will appear in the bowl within 30 minutes. Check the toilet for worn out, corroded, or bent parts. Consider purchasing LowFlow toilets that can reduce indoor water use by 20%.
- Avoid flushing the toilet unnecessarily. Dispose of tissues, insects and other similar waste in the trash rather than the toilet.

THE SHOWER/BATH

- Replace your showerhead with an ultra low-flow version, saving up to 2.5 gallons per minute.
- Take shorter showers. Try a "Navy" shower: get wet, turn off the water, soap and scrub, then turn the water on to rinse.
- In the shower, instead of increasing the hot or cold water flow to adjust the water temperature, try decreasing the flow to achieve a comfortable water temperature.
- Use the minimum amount of water needed for a bath by closing the drain first and filling the tub only 1/3 full. The initial burst of cold water can be warmed by adding hot water later.
- Don't let the water run while shaving, washing your face, or brushing your teeth.



THE KITCHEN



- Minimize the use of kitchen sink disposals; they require a lot of water to operate properly. Start a compost pile as an alternate method of disposing of food waste.
- Store drinking water in the refrigerator rather than letting the tap run to get a cool glass of water.
- Do not use running water to thaw meat or other frozen foods. Defrost them overnight in the refrigerator.

WASHING DISHES

- When washing dishes by hand, fill one sink or basin with soapy water. Quickly rinse under a slow stream of water from the faucet. Use the dirty water to run your sink disposal if necessary.

- Fully load automatic dishwashers; they use the same amount of water no matter how much is in them.
- Buy dishwashers with water and energy saving options.



OTHER WATER WASTERS IN YOUR HOME

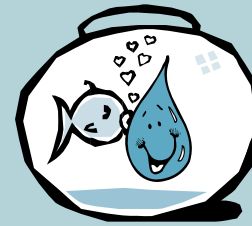
APPLIANCES



- Unlike your dishwasher, the amount of water your washing machine uses is adjustable; adjust according to the load size.
- Look for water saving washing machines and buy them. Horizontal loading machines use less water than top-loading machines.
- Install a hot water recirculation device. By recirculating water that would otherwise go down the drain, you can save 2-3 gallons of water for each shower taken or 16,500 gallons a year per household. This may mean average annual savings of \$50 on your water bill and \$40 on your energy bill.
- Never install a water-to-air heat pump or air-conditioning system. Air-to-air models are just as efficient and do not waste water.
- Install water-softening systems only when necessary. Save water and salt by running the minimum amount of regenerations necessary to maintain water softness. Turn softeners off while on vacation.

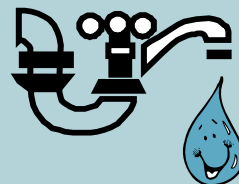
DIVERT FROM THE DRAIN

- Never put water down the drain when there may be another use for it such as watering a plant or garden, or cleaning.
- Reuse fish tank water on your household plants-it makes nice fertilizer too.



MAINTENANCE

- Verify that your home is leak free, because many homes have hidden water leaks. Read your water meter before and after a two-hour period when no water is being used. If the meter does not read exactly the same, there is a leak.
- Repair dripping faucets by replacing washers. If your faucet is dripping at the rate of one drop per second, you can expect to waste 2,700 gallons per year.
- Retrofit all wasteful household faucets by installing aerators with flow restrictors.
- Insulate your water pipes. You'll get hot water faster and avoid wasting water.



- Check your pump. If you have a well at your home, listen to see if the pump turns on and off while the water is not in use. If it does, you have a leak.

OUTDOOR WATER WASTERS TO WATCH



WATERING THE LAWN

- Don't over-water your lawn. As a general rule, lawns only need watering every 5 to 7 days in the summer. A hearty rain eliminates the need for watering for as long as two weeks.
- Water lawns during early morning hours when temperatures and wind speed are the lowest. This reduces losses from evaporation.
- Don't water your street, driveway or sidewalk. Position your sprinklers so that your water lands on the lawn and shrubs and not the paved areas.
- Install sprinklers that are the most water-efficient for each use such as micro and drip irrigation and soaker hoses.
- Regularly check sprinkler systems and timing devices to be sure they are operating properly. Teach your family how to shut off automatic systems so they can turn them off when storms are approaching.
- Do not leave sprinklers or hoses unattended. Your garden hose can pour out 600 gallons or more in only a few hours. Use a kitchen timer to remind yourself to turn the water off.

LAWN CARE

- Raise your lawn mower blade to at least three inches. A lawn cut higher encourages grass roots to grow deeper, shades the root system and holds soil moisture better than closely-clipped lawns.
- Avoid overfertilizing your lawn. The application of fertilizers increases the need for water and is a source of water pollution.



LANDSCAPING

- Mulch to retain moisture in the soil. Mulching also helps to control weeds that compete with plants for water.
- Plant native and/or drought-tolerant grasses, ground covers, shrubs and trees. Check with your local nursery for advice. Group plants together based on similar water needs.
- Minimize the grass areas in your yard because less grass means less water.
- Buy a rain gauge to determine how much rain or irrigation your yard has received.

Cooking grease is the Number One cause of sewer backups in homes.

Why is cooking grease a problem?

When you pour cooking grease down your drains, it may build up, block your pipes, and cause rancid odors or messy, costly sewage backups in your home.

It can also clog sewer lines. In fact, grease is the leading cause of dry weather sewer overflows, which are a potential threat to our health, homes and environment.

Don't believe the old wives' tale about running hot water after pouring grease down the drain. It doesn't work. The grease eventually cools, then congeals and coats pipes. When enough grease builds up, it can block your plumbing, WRC sewer lines, and even pumps (customer grinder pumps or WRC sewer system pumps).

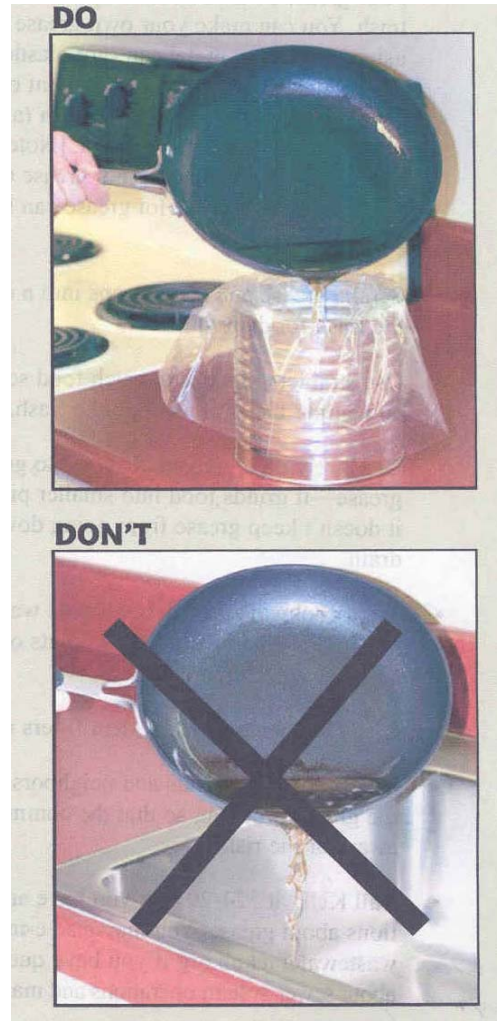
Where is grease produced?

Restaurants, condominiums, apartment buildings, homes, schools, churches, food-processing plants, shopping malls, hospitals, hotels, and many more establishments all produce grease.

Grease is a by-product of cooking and is found in things like:

- Meat fats
- Lard
- Cooking oil
- Shortening
- Butter
- Food scraps
- Baking goods
- Sauces
- Dairy products
- Margarine

The easiest way to prevent grease-related sewage overflows is to keep cooking grease out of the sewer system.



Never pour grease down sink drains or other drains. Scrape grease and food scraps from all cookware and dishes into a can or the trash for disposal.

What problems are caused by grease?

- Clogged drains or toilets.
- Sewage backups into your home.
- Sewer overflows in neighborhood parks, yards and streets.
- Rancid odors.
- Expensive cleanup, repair and replacement of damaged property. (Often paid by you, the homeowner.)
- Potential contact with bacteria and viruses that can cause illness.
- Higher operating and maintenance costs, potentially resulting in higher sewer bills for you.

What Restaurant and Building Owners need to know about grease traps or interceptors

Restaurants, large buildings (such as apartment complexes) and other commercial establishments may have grease traps or interceptors that keep grease out of the sewer system. For a grease trap or interceptor to work correctly, it must be properly:

- Designed (sized and manufactured to handle the amount that is expected)
- Installed (level, vented, etc.)
- Maintained (cleaned and serviced on a frequent basis).

Solids should never be put into grease traps or interceptors. Routine, often daily, maintenance of grease traps and interceptors is needed to ensure that they properly reduce or prevent blockages.

Be cautious of chemicals and additives (including soaps and detergents) that claim to dissolve grease. Some of these additives simply pass grease down pipes where it can clog the sewer lines in another area.

How homeowners can help protect their plumbing and our environment:

- Never pour grease down sinks, toilets, or any drains.
- Scrape grease and food scraps into a can or the trash for disposal.
- **Please use caution when pouring hot grease or wait for it to cool slightly. Hot grease can burn skin.**
- Use strainers in sinks to catch food scraps, and empty the strainers into the trash.
- Don't rely on a garbage disposal to get rid of grease—it grinds food into smaller pieces, but it doesn't keep grease from going down the drain.
- Wipe or scrape cookware and dishes well before washing. Commercial additives in detergents only dissolve grease temporarily.
- Clean kitchen exhaust system filters routinely.
- Talk with your friends and neighbors about the grease problem, so that the community is aware of the risk.
- Call WRC at: 248-858-1128 with any questions about grease, or sewer system operations and maintenance.
- Call WRC at: 248-858-1040 with any questions about commercial grease trap installation and maintenance.

What can you do?

Can your grease. Dispose of grease in a way that is good for your plumbing.

A metal coffee can with a plastic lid or empty metal soup or vegetable cans make great grease cans. Line your can with disposable heat-resistant oven bags. Throw the liners away (after grease cools) and reuse the can.

Avoid costly repairs. Following these guidelines will help avoid costly plumbing repairs associated with clogged pipes, drains or other plumbing and avoid potential fines, penalties or invoices for damage to sewer system laterals or pumps.

Safety Tip

If you have a grease-related sewer backup, avoid direct contact or wash thoroughly with soap and water. The Centers for Disease Control and Prevention (CDC) says skin contact isn't a serious health risk, but swallowing bacteria or a virus may cause illness. Always wash your hands before preparing or eating food, after using the bathroom (or helping another as a caregiver), and after touching objects exposed to a backup.

For more information, see www.bt.cdc.gov/disasters/floods/sanitation.asp.

CAN YOUR GREASE!

Protect your plumbing



and the environment

