What You'll Find in Water

1. How clean is my drinking water?

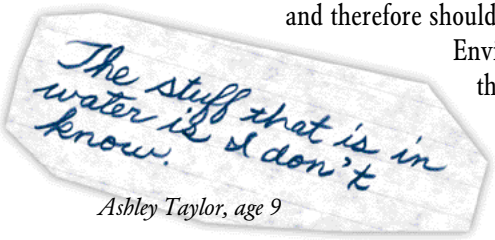
Every public water system customer in Texas should receive a copy of the Drinking Water Quality Report or Consumer Confidence Report once a year. Your water supplier should mail this document to you automatically. If you have not received a copy call your local water supplier, and they should provide you with one. The Drinking Water Quality Report has information on the source of drinking water for your area, what body of water they take the water from, a detailed report on the quality of your water, and any violations the water system has had. If you are unable to obtain a copy of this report from your water supplier, call the Texas Commission on Environmental Quality (TCEQ) 512-239-1626.

Public water systems are required to use a multi-barrier system to protect drinking water. The combination of barriers is intended to ensure that all contaminants are caught and eliminated from the water system. In general all water being treated for drinking purposes in Texas will go through five barriers, or stages of treatment:

1. Pre-treatment (addition of chlorine)
2. Addition of chemicals to sink sludge (solid materials) to the bottom
3. Skimming the clean water off the top
4. Passage of the water through settling basins to allow any remaining small solids to be removed from the water
5. Distribution to filters

2. I get my water from a well. How clean is this water?

Generally speaking groundwater sources, like wells, are less susceptible to pollution, and therefore should be cleaner than surface water sources. The Environmental Protection Agency (EPA) recommends that well water users have their wells tested yearly for nitrate and bacteria levels. If you suspect that your well might be contaminated with pesticides, radon or some other pollutant, test more often. Tests run in the range of $10.



Ashley Taylor, age 9

3. Who sets the standards for the amount of pollutants in my water?

The EPA sets standards for drinking water. These are known as the Federal Drinking Water Standards. The TCEQ is responsible for enforcing these and any other additional standards.

4. How clean is my bath water?

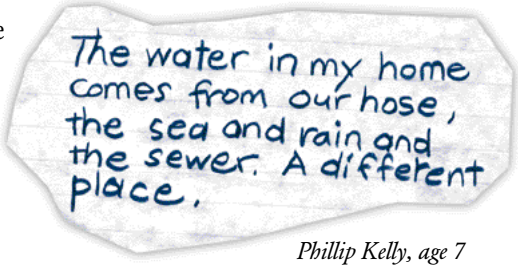
It is the same quality as the water that comes out of all faucets in your home. That means it is potable, i.e. safe to drink. That is, until you take a bath in it.

5. If the pipes in my home are old and gross, how clean is my water?

The State of Texas requires that chlorine residual be present in your water when it comes out of your pipes into your home or yard. This means that even though your water may pass through old, dirty pipes, the chlorine will act as a disinfectant, keeping the water clean and drinkable.

6.Why is my water sometimes a rusty color?

That rusty color you are seeing is actually caused by old, rusty pipes. To treat the problem simply let your water run for a few seconds until the rusty color is gone. Keep in mind that hot water tends to make water appear rusty more often than cold water because hot water is more corrosive. If the problem is really bad call your local water supplier and have them check it out. They will be able to tell you whether these pipes are indeed causing the rusty color, and whether they need to be replaced.



Phillip Kelly, age 7

7. If water comes from lakes, streams and rivers, how does all that junk get out of it?

Water from lakes, streams, rivers and other sources will come into a drinking water treatment plant where it is treated in the multi-barrier system described in question 1. This includes adding chemicals to sink sludge to the bottom, skimming the clean water off the top, passing it through settling basins, and finally through various filters.

8. What is hard water?

Water is considered to be hard, as defined by the EPA, when it contains a large amount of dissolved minerals, such as salts containing calcium or magnesium. Hard water is not a health hazard, and you will usually find groundwater to be harder than surface water.

9. How do I know if my water is hard?

Hard water will make it difficult to lather up with soap. Your skin may feel dry after showering, and you'll need more laundry detergent to wash your clothes. Some cities, like Austin, automatically soften their municipality's drinking water supply by adding lime to a pH factor of around 10, followed by a treatment process of adding CO_2 gas to bring the Ph level down to 9.5.

10. Why do some people have hard water?

If you live in Central Texas, your water tends to be hard because we have limestone aquifers that contain an abundant supply of calcium. Magnesium is another chemical found in water that can cause hardness.

11. How do authorities treat hard water?

Since it's a very expensive process to treat hard water, and because it does not pose a health hazard, many cities choose not to treat it. Some cities, like Austin, however, do soften the water by adding lime.

12. What is black water?

In Texas, we define it as the wastewater from toilets and sinks.

13. What is grey water?

Grey water is not the same thing as black water. In Texas, it refers to the wastewater from residential appliances or fixtures other than toilets and kitchen sinks.

14. What is recycled water?

Recycled water is water that has been treated for reuse. This water can be used for industrial uses, landscaping, and other non-consumptive uses.

15. What is sludge?

Sludge is the solid material remaining after the wastewater treatment process (this is different from the sludge that is chemically separated from the water early in the treatment process). Some municipalities use sludge as fertilizer, such as the Dillo Dirt program in Austin.

WATER WORDS OF THE WISE

"Throughout the history of literature, the guy who poisons the well has been the worst of all villains..."

– Author unknown

"The frog does not drink up the pond in which he lives."

– American Indian Saying

"When the well is dry, we know the worth of water."

– Ben Franklin

"We forget that the water cycle and the life cycle are one."

– Jacques Cousteau

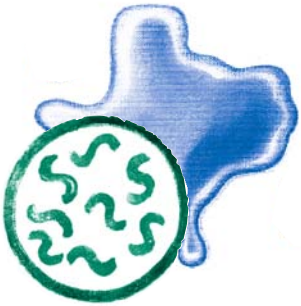
"Children of a culture born in a water-rich environment, we have never learned how important water is to us."

– William Ashworth

16. I live in the city, but plan on retiring to the country. What do I need to know about what might be in my private well water?

A general complaint by families using well water is the abundance of minerals. Some people find it necessary to take steps to reduce the mineral content of their well water (i.e. water softener).

Why water matters to you and the environment



1. How does water affect my health?

You need water in order to live. Without it, we would dehydrate and die fairly quickly. Two-thirds of our body mass is water. If your local water source is poor it will affect not only your health, but that of every other living organism in your area and downstream of it. According to EPA, for instance, water with high concentrations of lead can cause serious damage to the brain, kidneys, nervous system, and red blood cells. The quantity and quality of water can have a direct effect on your health.

2. How susceptible is my water to contamination?

This is where it is really helpful to know the SOURCE of your drinking water. If your water supply is surface water, try to determine what the potential sources of pollution are upstream from your water supply. Pollution sources can be non-point sources, meaning the pollution may come from many sources rather than one identifiable source. Examples of non-point sources are pesticides, herbicides, leaky septic systems, animal waste, oil, and grease. Point source pollution comes from a single, identifiable source, and can include factories, confined animal feeding operations, and oil and gas production.

If your water supply is groundwater, try to determine whether there are pollution sources on the surface that might be transmitted into the underground water source when it rains through sinkholes, abandoned but unplugged oil and gas wells, seepage through sand soils, or other means. In portions of the Edwards Aquifer region, where water flows directly from the surface into the aquifer very quickly, special efforts have been made to restrict certain actions on the surface that might result in pollution of this underground water source. In other aquifers the movement of contaminants into and through the aquifer may be much slower. In almost all cases, however, once an aquifer is contaminated it is difficult, if not impossible, to clean it up, and the cost of cleaning it up is astronomical.

In regard to how susceptible our water is in Texas to potential terrorists attacks, the Texas Commission on Environmental Quality (TCEQ) says that it is working with the EPA, water utilities, and water-related interest groups to share information and ensure that water systems assess any vulnerabilities and take whatever preventative measures they can.

3. Is it safe to drink hard water?

Yes. It is not a health hazard, and you will likely find groundwater to be harder than surface water. (See questions 8, 9, 10, and 11 in section two for more information.)

4. How can I make my water softer?

You could use a water softener, but these tend to increase the amount of lead and copper in your water. Soft water is also a common cause of corrosion. This corrosion causes a reaction between the water and the lead pipes or solder, which can allow lead to get into your pipes.

5. What causes water from the tap to smell sometimes?

Cross-contamination, algae, methane, fish, chlorine, musty leaves, seasonal turnovers in bodies of water, and lots of other things can cause funny smells in your water. If you get your water from surface sources, the odd smell could be caused by an organic source like an algae bloom. If it is persistent you should call your water supplier first, not a plumber. If they are unresponsive, then call your regional TCEQ office. To find your regional TCEQ office, log on to http://www.tceq.state.tx.us/admin/directory/region/reglist.html

WELL WATER FOCUS

But, I use private well water. Shouldn't I get a water filter and softener?

Many families that get their water from private wells recommend water filters and softeners. The Long family in Wimberley, Texas remembers what it is like without these:

"Without these we'd be running our fingers down our skin and having them stick to us because of the hard mineral deposits, and, seeing the 'crud' left on our clean drinking glasses. However, I have noticed that the salt used in the water softener does seem to steadily eat away at our bathtub faucets, requiring me to replace them more often than I ordinarily would need to."

– Wes Long, Wimberley

6. Are water filters really necessary for drinking and showering?

If your area has an approved water system, then they are not necessary. If you want to get a water filter, check to make sure that is approved by the National Sanitation Foundation.

7. Boats and jet skis dump a lot of gasoline and oil into rivers and lakes. How does this affect my drinking water?

The engines in many boats and jet skis dump about 30 percent of their unburned oil and gasoline into the water. These watercraft are using 2-stroke engines. This poses a potential water pollution problem. For instance, an average two-hour ride on a jet ski with a 2-stroke engine dumps 2.5 gallons of unburned gas and oil into the water. Some drinking water lakes (like the Colorado) have banned motorboats and jet skis because of this concern. Gasoline has harmful chemicals like MTBE and benzene in it. Make sure and check your annual Drinking Water Quality Report, sent to you by your water supplier, to see if there have been violations in your area.

Consumers should be aware, however, that some manufacturers like American Honda and Mercury Marine now offer a cleaner alternative in a 4-stroke engine.

8. How does water affect my pocketbook?

Water is going to affect your pocketbook whether you are paying a water bill or getting your water for free from your private well. The impact on your pocketbook will differ according to your situation.

For those paying a water bill (i.e. on a public water system):

Generally, water is not priced to encourage conservation. Ideally, there would be a low rate for the minimum amount of water needed, and then the rates would increase in graduated steps from there. That means if you don't use much water, or you practice water conservation, you would pay less. The converse would be true as well. If you used excessive amounts of water then you would pay more. You would pay the base rate until a certain amount is used, and then you would be billed at a higher rate for the remaining water used. This is referred to as a tiered water rate structure or "conservation rate structure". If we do not have a tiered system, then there is no pocketbook incentive to conserve water.

A tiered water rate structure is becoming more common, though, and consumers should know that the tiered approach may be different for each water supplier. To find out if your water supplier bills you based upon a tiered approach, simply contact them and ask.

For those getting water from a private well:

You can expect to get your actual water for free, but there are still substantial costs. Even if a well was already in place when you moved in, a family of four should expect to eventually spend thousands in maintenance and replacement costs. To drill a new hole the costs are $10-12 per foot for drilling at least 800 feet. Add $200 for an 1100-gallon holding tank, $500 for a pump, and $1400 for labor, and that adds up to a grand total somewhere between $10,100 and$11,700. After that, you can expect to spend $25 every six weeks for salt for the water softener, and $30 a year for replacement filters. Compare that cost for a family of four using approximately 4200 gallons of well water a month to $720 per year for a family of four that uses the same amount and gets their water from a public water system.

9. Who decides how much water costs, and how do they do this?

Most water users are served by a municipally owned water system that sets its own rates. This means that your local government sets your water rates. Eighty percent of water users in Texas are served by a municipally owned water utility.

Privately owned utilities may set their own rates as well. However, if 10% of their customers protest the rate change, the utility then has to go before the TCEQ to get their rate changes approved. This means that TCEQ has regulatory oversight on this kind of rate change.

10. I live in an apartment. How am I charged for the water I use?

This can be done in one of four ways. The tenant can have an individual account with the water utility. The apartment can be "all bills paid," which means that your water costs are rolled into your rent. These first two examples are pretty rare. Apartment dwellers are more commonly charged for their water by submetering, or allocation. Submetering

determines your actual water usage; the landlord then pays the bill for the whole building and bills you for your portion according to your submeter. Allocation is the more controversial of the two methods. There is one meter on the whole building and the landlord allocates the bill to the renters based on square footage of their apartments and other factors. The landlord should deduct some from every tenant's bill for grounds upkeep and swimming pools, etc. This last method does not encourage conservation. For instance, if your neighbor uses lots of water, and you, on the other hand try to use it wisely, your respective bills do not reflect this.

11. How does water affect my family?

Water affects just about every aspect of your family's life– health, wealth, and quality of life. You need it to live. Without it, we would dehydrate and eventually die. Our bodies are two-thirds water. Under drought conditions, crop production is down, which drives food prices up, and this affects your pocketbook, and availability of the food you and your family want and need. Beyond your health and wealth, Texas families enjoy many water recreational activities: fishing, boating, swimming, skiing, sailing, kayaking/canoeing, inner tubing, rafting, and just plain "hanging out at the beach." In fact, fishing, swimming, and boating are among the top ten outdoor recreational activities important to Texans, according to the Texas Parks & Wildlife Department. Water quantity can affect all these activities.

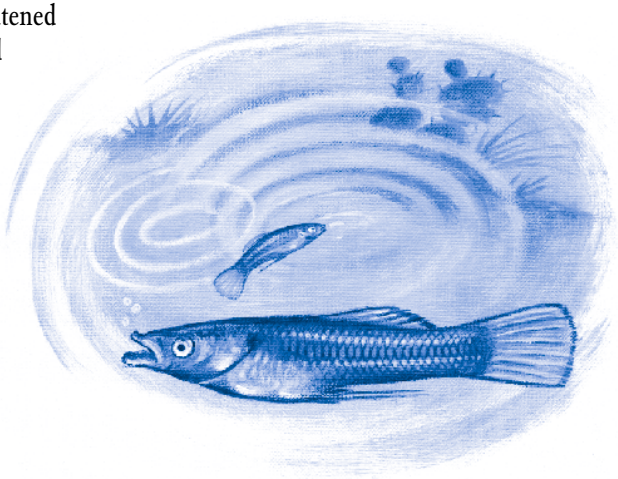
12. How does water affect fish and other wildlife? What are the environmental implications?

Fish and other wildlife need water to survive, just like all living organisms – plants, animals, and microorganisms alike. More importantly, wildlife needs water in sufficient quality and quantity. Everything in nature is connected, and should be considered as a system. For instance, if we received inadequate rain, certain plants would die or their overall numbers would decline. As a result, plant-eating animals that depend on that particular plant would be affected, as would the omnivores and carnivores that depend on that plant-eating animal for survival. When drought is combined with human impact, like mining aquifers without adequate conservation precautions, water quantity and quality problems are compounded.

In West Texas, the number of desert spring fishes like the Comanche Spring Pupfish, Leon Springs Pupfish, Pecos Gambusia, and Big Bend Gambusia are declining. One reason for their decrease includes habitat loss from declining spring flows. Human impact appears to be taking its toll as more water is being pumped from aquifers than being replaced by rainfall. West Texas sees an average rainfall of 8 inches a year compared to East Texas that gets 56 inches annually. In addition, surface waters are being diverted from aquifer recharge zones, the area where the impermeable layer of rock on top of the confined aquifer reaches the surface for rainfall, stream water, and other water sources to enter. These recharge zones can be miles away from parts of the confined aquifer.

According to Linda Campbell, author of "Endangered and Threatened Animals of Texas," this continued mining of the aquifers could eventually cause the demise of spring systems throughout West Texas, and with them the extinction of a whole array of unique fishes, aquatic plants, and animals. If aquatic life cannot be sustained this could very well be an indication that our water quality and quantity are in jeopardy.

(See question 3, general questions and question 1, section one for more information on aquifers, and question 10 for more information on springs.)



The Pecos Gambusia is a desert spring fish in decline due to loss of habitat as water is pumped from West Texas springs.

13. How much water does wildlife need anyway?

It is important to remember that prior to humans coming along the wildlife had ALL the water. Fortunately there is enough water for them to share with us. As humans use more and more water there WILL BE LESS fish and wildlife. It is not just a factor of how much water there is, it is a factor of when the water is there. Many species respond to changes in flow levels and timing in order to reproduce. There are studies underway that attempt to show how much water wildlife need. If you'd like to help on this conservation issue, contact the Lone Star Chapter Sierra Club, 512-477-1729, or visit the Texas Living Waters Project website at <http://www.texaswatermatters.org> for more information.

14. How clean is the "polluted" water from my home once it is discharged into rivers and streams?

This depends on what kind of water system you are on and where you live. Cities tend to have wastewater treatment plants. The quality of the effluent--treated wastewater-- varies city by city. However, wastewater is never treated completely, and we always rely on the river, stream, or body of water that the effluent is released into to finish the job of cleaning it. This is why it is so important to have healthy stream and river systems.

Some regions in Texas, for example the Upper Rio Grande and Far West Texas areas, have particular concerns regarding their water quality being affected by wastewater discharge. For instance, testing by the EPA and the TCEQ have revealed increased levels in undesirable nutrients and fecal coliform bacteria in the Rio Grande river stemming from untreated wastewater flows from Ciudad Juarez, Mexico.

15. How much water does my city use?

Use the table below to see how your county compared with Texas' other 253 counties. If your county is not listed, you can download a county profile from http://www.texasep.org.

Note: One acre-foot is about the size of a football field covered with one foot of water, which is equal to 325,851 gallons.

URBAN COUNTY	Total Water Use in 1997 (Acre-Feet) + Rank
Bexar (San Antonio, Kirby)	304,864 (16)
Cameron (Brownsville, Harlingen, San Benito, Port Isabel)	328,210 (13)
Dallas (Dallas, Irving)	495,381 (3)
Ector (Odessa, Penwell)	39,242 (77)
El Paso (El Paso, San Elizario, Anthony, Socorro)	266,931 (20)
Galveston (Galveston, Texas City)	96,100 (42)
Harris (Houston, Pasadena, Waller)	882,270 (1)
Jefferson (Beaumont, Port Arthur)	359,588 (10)
Lubbock (Lubbock, Shallowater)	274,803 (19)
Midland (Midland, Greenwood, Spaberry)	63,214 (59)
Potter (Amarillo, Ady)	62,251 (56)
Tarrant (Ft. Worth, Arlington)	283,626 (17)
Travis (Austin, Manor, Lakeway)	151,119 (32)

Original source: Texas Water Development Board, County Summary Historical Water Use.

16. How much water is lost due to leaky pipes in the water distribution system of public water suppliers?

The American Water Works Association recommends a goal of no more than 10 percent loss through leakage but some water supply systems lose as much as 20% or more of their water through leaks in their pipes. San Antonio has realized tremendous water savings by fixing their water infrastructure. Most people would be appalled to learn how much treated water is lost everyday due to leakage in public water systems.

17. How do droughts affect me and my water supply?

The most common way for residential water users to be affected by droughts is through water rationing. During a drought water supplies are low and water rationing helps to preserve the water we have on hand. Water rationing measures include decreasing the frequency of lawn and garden watering, washing cars less often, and filling swimming pools less frequently.

Water demand tends to increase during dry periods because lawns and gardens are stressed and it is usually quite hot with Texas summer temperatures often rising above 100 degrees. With no rainfall to replenish streams, rivers, lakes, and aquifers, water processing and distribution systems often cannot handle the increased demand during these times.

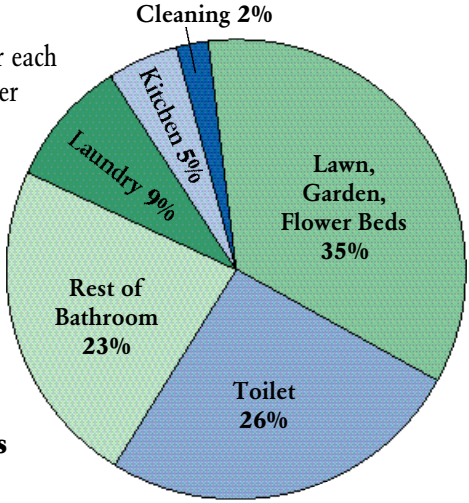
WELL WATER FOCUS

Families, like the Longs in Wimberley, Texas, experience first hand the effect of multiple Texas droughts and increased water demands from growing rural populations.

"Even if you get a downpour, you use water in the house, and you're still pumping water out of the ground at the same rate. Often there doesn't seem to be a direct correlation. What we do notice, though, is that more folks are moving in, drilling well holes deeper and deeper (800 ft vs. 580 ft.), and the pumping time is less. I think it's increased use. When we moved here in '85 we had some drought conditions as bad if not worse than now. Yet the guy who lived here before didn't have a big elaborate tank. And then here we are, pumping deeper and with less pumping time, down to one and half minutes." – Wes Long, Wimberley

18. How much water do I consume per day? How much water is OK to use per day?

Americans, on average, use 60 gallons of water each day. By taking some measures to conserve water you can easily reduce your consumption by 30 percent For instance, install a low-flow showerhead and a water-efficient toilet, choose a car wash that recycles water, water your lawn in the early morning or evening, plant water-saving plants, and cover your pool or spa to reduce evaporation. [Source: Edwards Aquifer Authority]



Source: *Texas Environmental Almanac*, Second Edition

19. Why do we have water restrictions during the summer?

Water restrictions are generally due to treatment capacity. There is usually a huge spike in water use during the summer in Texas. This is largely due to people watering their lawns and gardens during the hot, dry summer. Water treatment plants cannot keep up with this huge additional demand. Shouldn't we just build more water treatment plants, then? The answer is no. It costs a huge amount of money to add additional treatment facilities just to cover increased demand for a few months. This is also the time of the year when we do not need to be taking additional water out of our rivers and streams. Fish and wildlife are generally the most stressed at this time of the year (just like us) and they need what little water is available in our rivers and streams. It just makes sense to cut back during times of additional use…your yard will survive too.