

# Are Phosphates Really a Problem in Swimming Pools?

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The subject of phosphates can create controversy and lots of lively discussions at the distributor counter. Some will tell you that high levels of phosphate can lead to water quality issues such as resistant algae growth, others state that it really doesn't matter if there are phosphates in the pool if you keep all your chemical levels right. So, what's the truth?

### Phosphates defined

Phosphates are biological building blocks that are formed when phosphoric acid comes in contact with certain metals. Most of the natural sources are found in rivers, lakes and oceans or mined rock. (The United States is one of the largest producers of phosphate from mining.) Phosphates are omnipresent in our world. They can be found in detergents, hair care products, fertilizers and even soda pop. Many of the foods we eat contain phosphate which is a primary nutrient for muscle growth. There are many ways phosphate can enter pool water. The two biggest sources of phosphates in pools come from metal

sequestering products that contain phosphoric or phosphonic acid. One of the biggest sources of phosphate can be the tap water supplied by your local municipality.

### Phosphates in fill water and other hidden sources

That's right the water that you use to fill the pool can be a substantial source of phosphates. The U.S. Environmental Protection Agency (EPA) has mandated that drinking water municipalities must follow an anti-corrosion process. This is to prevent contamination of drinking water from the corrosion of older lead-based pipes. The EPA recommends phosphate buffers be used such as zinc ortho-phosphate.

When the drinking water supply facility adds the zinc phosphate the result will be very high levels of ortho-phosphate coming from the tap. There have been some reported cases of phosphate from the tap testing 1000 parts per billion (ppb). It is important to understand that phosphates exist

in many different forms. There are combined forms such as polyphosphates or sodium phosphate. These compounds are used in many of the cleaning agents and chemicals that we use in pools. Many of the new buffered non-fuming acids that are being sold contain sodium phosphate.

Continued use of these types of acid can lead to excessive build-up of phosphate levels. There are even some binding agents for chlorine tablets that contain phosphate compounds.

### Phosphate in Pool Water

What happens when

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## Annual Financial Planning

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losses.  
 • Investigate whether it makes sense to use appreciated securities to make charitable donations or support lower-income family members.

### Update Your Financial Emergency Plan

A sizable emergency fund is helpful if you run into a financial rainy day; be sure you have socked away adequate resources. While you're at it, look at your broader emergency plan as a whole.

• If you don't have three to six months' worth of expenses tucked away, building your emergency savings should be a top priority.

• Invest in insurance: Are you covered for a temporary disability, for example?

• Make sure you have a financial and medical power of attorney in place.

### Look Ahead to Future Savings

As you move into the fall, think about where else you could be saving money to fully fund your emergency savings and put aside more for the future. Consider whether you should:

- Refinance your mortgage.
- Rethink your car insurance.
- Lower your food bill.
- Utilize Flex Spending or Health Savings Accounts.
- Cut the cable TV cord.
- Curb your energy bill.
- Divert your paycheck to savings, by contributing more to retirement accounts or funneling money directly from your paycheck to an emergency savings account.

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# Pool Safely's Top 10 Tips to stay safer around the pool or spa

1. Learn how to swim and teach your child how to swim.
2. Install a four-foot or taller fence around the entire perimeter of the pool and use self-closing and self-latching gates; ask your neighbors to do the same at their pools.
3. Never leave a child unattended in or near a pool or spa and always watch your children closely around all bodies of water.
4. Designate a Water Watcher to supervise children in the pool or spa. This person should not be reading, texting, using a smart phone or be otherwise distracted. Adults can take turns being a Water Watcher.
5. If a child is missing, look for him or her in the pool or spa first.
6. Keep children away from pool drains, pipes and other open-

- ings to avoid entrapments.
7. Ensure any public pool and spa you use has drain covers that comply with federal safety requirements, and, if you do not know, ask the pool manager if the facility complies with the "VGB Act."
8. Learn how to perform CPR on children and adults, and update those skills regularly.

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## Phosphates

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phosphates end up in the pool water? Some say that phosphates aren't a problem in a well-maintained pool. Others claim they are THE determining factor of an algae outbreak. The truth is somewhere in between. It is important to understand how phosphate can make maintenance of the pool a real problem. Phosphate is one of the prime ingredients in fertilizer. We use fertilizer to help plants grow and algae is a plant. There are three main ingredients that algae need to grow. Nitrates, CO2 and phosphates. Of these, the only one we can effectively control and remove is phosphate. Scientifically phosphate is categorized as a growth limiting nutrient. What that means is that the growth of algae is limited if it can't obtain phosphate...even if there is nitrate and CO2 present. So those that say phosphates are not a concern if the water is balanced and chlorinated may be correct. However, an event such as a pool party, wind storm or even just excessive heat in the presence of high phosphate could lead to a quick and resistant algae bloom. With higher levels of phosphates, algae have more fuel to grow and turn a pool green quickly with the strong nutrient phosphate within the cells, the algae will be much more difficult to kill using chlorine and algicide.

### Phosphate and Salt Chlorine Generators

Well maintained pools may also see an increased chlorine demand from high phosphate levels. While they do not directly reduce chlorine, phosphates are the prime nutrient for the transition of algae from the spore to the blooming form. As this process occurs more chlorine is needed to fight the growth of the algae, even though it is not visible as a bloom. This is also what causes the need for an increased output of free chlorine from salt chlorine generators.

Whether a salt chlorine generator system or a regular pool phosphate levels should be kept below 500 ppb. Ideally 200 ppb. At the level of 500 ppb there will be a definite interference with salt chlorine generators to produce enough free available chlorine (FAC). When phosphate levels reach 1000 ppbs in any pool an increased chlorine demand could be observed. At extreme levels over 5,000 ppb water quality will be seriously reduced.

As stated, earlier phosphate can be present in many combined forms. In pool water all combined forms of phosphate will end up as orthophosphates or what is called free phosphates. When we test for phosphate in the pool industry, we are testing for ortho or free phosphates. Free ortho phosphates are the only form that algae can utilize as a nutrient.

Phosphate should be tested before algae are present and man-

aged to prevent poor water quality and sudden algae outbreaks. When dealing with a green swamp pool the algae should be first killed by super-chlorinating with liquid chlorine. An algicide may be used as well to help the killing process. Several days after algae has been eradicated from the pool then a phosphate test should be done. Based on the level of phosphate a removal treatment may be needed. Since algae consumes phosphates as a nutrient when a pool is overrun most of the phosphate will be in the plant. Trying to test for or remove phosphates in a green pool will not work. When the algae die off it will then release the phosphate back into the water. This characteristic of algae is why many pools experience resistant algae. In other words, the algae are killed with chlorine and algicide and then more algae return within a few weeks even in a well-maintained pool. This is because the original kill released more growth nutrient into the pool water. This is the vital reason phosphates should be tested for and removed after dealing with an algae kill.

Phosphates can be tested for and are measured in PPB. When testing for phosphates the chlorine level should not be higher than 5 ppb. Higher levels of chlorine will bleach out the test and give a false low reading. When phosphate levels are extreme at 5,000 ppb a dilution test is recommended. In reagent test a ten times dilution is recommended. This is accomplished by adding nine parts of distilled water to one part of pool water. This mix is tested, and the result is multiplied times ten. In many cases phosphate levels can be extremely high and a dilution test can reveal if a phosphate remover can be used or if some draining and dilution would be better. There is lots of written scientific proof on how phosphate is nutrient pollutant to our water ways and is also being found in our fill water. So, it isn't a matter of whether phosphate is in pool water or not it is really a matter of what is the source and how much is there. For his reason source tap water should be tested regularly for phosphate spikes. Also, it best to use non-phosphate-based metal removers such as EDTA or a polymer-based formula.

Proactive phosphate removal is best and can be practiced weekly, monthly or even seasonally depending on the levels. The most important factor is managing and keeping levels near the 200-ppb level. There are phosphate removers at different strengths available that can handle everything from 10,000 ppb to 500 ppb. If a pool has a level over 10,000 ppb a concentrated product should be used. Once the levels are below 500 ppb a less concentrated maintenance formula can be used weekly to keep levels near ideal.



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