

The most important part and yet sometimes least considered part of the carwash industry is good old water. There is no flashing lights, moving parts, glamorous features to the water treatment equipment, and as such is sometimes the last thing considered when developing a good design. Con-Serv Manufacturing has dedicated its 30 years in operation to this underappreciated element and how it can best be utilized in a professional Carwash.

There are several items to consider when developing a good design for the treatment and recovery of water. The following list is just some of the things to consider when designing the total water treatment options for the carwash.

- Flows and Pressures
- Impact fees
- Water usage & costs
- Sewer costs
- Equipment feed water requirements
- Maintenance
- Quality components
- Fresh water make up
- Personal preference
- Local competition
- Community perception
- Equipment costs

As mentioned the above is a partial list, and I am sure that anybody that owns a carwash or services carwashes would no doubt come up with several more concerns that they have encountered. The purpose of this article is to make the reader aware of the choices they can make as they develop their plan for a successful car wash business.

The attached process flow diagram represents the options available for the carwash owner. Although not all is necessary depending on the above factors, this diagram represents all the possible choices and reasons the equipment might be utilized. Many times only a few of these products are required for an installation. Certain factors like cost or location may dictate the equipment required.

1. **Ozone:**

Ozone has been successfully used in the carwash Industry for several years. Its outstanding color and odor removal characteristics offered solutions for water with high concentrates of dyes and odors caused from hydrogen sulfide buildup. Incorporating ozone into reclaim destroys all bacteria cultures, both good and bad. In addition, ozone quickly separates emulsified oils, greases, and wax, which congeal and float to the surface of the holding tanks as organic sludge matter. The challenge now is to incorporate bacteria to degrade the organic matter without the ozone killing the beneficial organisms.

There are different types of Ozone systems on the market. Ozone generators can be fed with ambient air or with an oxygen generator. The difference is that with an oxygen concentrator the ozone is far more concentrated, therefore enhancing the performance of the ozone.

2. **Biological Treatment:**

Bacteria are the universe's little housekeepers. The primary design of bacteria is to degrade various types of organic matter in a multiplicity of environments. It is estimated that less than 5 percent of all forms of bacteria are pathogens (disease-causing) and that the other 95 percent are beneficial organisms just trying to make a living degrading whatever it is that they degrade best. For our purposes, we will be discussing environmental bacterial applications that target waste components most readily found in commercial and industrial vehicle wash water.

The microbiology of a wash system is simple. Dirty water has bacterial loads that come with the territory. Everyone knows that. Folks also know that certain bacteria are the cause of hydrogen sulfide odor; that's why ozone is a popular alternative. The critical component here is that indigenous bacteria (that's bacteria that end up in a wash-water stream by default coming in with the dirt) is a hodgepodge of various types of colonies that almost always fail to provide any significant advantage. In fact, the result of the incomplete degradation of petroleum, dirt, surfactants, and other water contaminants is what causes the hydrogen sulfide odor in the first place. That's why operators use ozone to kill bacteria and get rid of the hydrogen sulfide odor. But as most operators know,

killing all bacteria in a wash system isn't such a good idea either, because there's no biological activity going on and therefore no cleaning of the water. A properly designed pit treatment system therefore utilizes both technologies to provide an optimum solution to pit performance and maintenance.

3. **Recirculation:**

The re-circulation of the water in the pits during slow days or during periods the carwash is closed minimizes odor and other problems associated with the contaminants as the system idles. These systems can be set up to run intermittently or continuously depending on need.

4. **Mechanical Filtration:**

After the settling and pretreatment process from the pit a mechanical filtration process is utilized to reduce the residual sediment down to a manageable size to prevent damage to the car, or carwash equipment. By preventing particles larger than 25 microns into the process, issues like clogged nozzles are prevented. Self Cleaning filter technology is ideal for busy or unattended locations, or for those who want less maintenance and better results from their recovery system. Using a 25 micron absolute stainless steel filter ensures that removal of all particles larger than a single white blood cell will be removed from the reclaim stream. Since the filter cleans itself, there is no need for expensive downtime to change filters.

5. **Ultra-Filtration:**

Ultra-filtration is relatively new to the vehicle washing industry. This system is ideal for low flow sites where a nominal amount of water needs to be recovered daily, or to help close the loop in larger applications. The new technology will provide good, clear pre-rinse or clean, high-quality wash water. The water produced is equivalent to the pore size of .02 microns. Some carwash sites may use the benefits of both the self cleaning filters and ultra- filtration modules. Other sites might need just the self - cleaning filter system, and some might utilize only the ultra – filtration system. Capital cost, type of carwash, size of equipment room, and other factors will determine the best option for each wash.

6. **Spot Free Rinse feed storage tanks:**

(with re-pressurization system) Utilizing Ultra-filtration provides feed water to a Spot Free Rinse System. The water from the UF system is commonly used in many applications for pretreatment to Reverse Osmosis. The tank includes high and low level float controls to control the input and output to the tank.

7. Rinse quality water storage tank:

(with re-pressurization system) Set up similar to the spot free rinse system feed tank it provides a cleaner water supply to the carwash. It is important to note that depending on the car wash and water conditions, water from various processes in the water treatment path can be blended to increase efficiency. In the case of the attached process flow diagram, the reject water from the spot free rinse system, reject water from the UF system and the backwash from the carbon filter can be blended and re-used for the wash. This allows for a closed loop system eliminating the need for discharge to sewer.

8. Carbon filter:

No matter what equipment is installed in the carwash the truth is fresh water supply is always required due to evaporation and carry off of the water in the process. The amount of a fresh water supply is dependent on the car wash equipment. Typical estimates are about 6 gallons per car. The carbon filter is used as a post UF polishing filter or to eliminate chlorine from city water supply. If the site has a well for fresh water make up or if the city water has a high hardness content a water softener or antiscalant injection might be required to protect the spot free rinse membranes.

9. Spot Free Rinse system:

The Spot Free Rinse system or Reverse Osmosis System is used to provide a final rinse with a mineral free water, the source of spotting on cars as the car dries. In the case of the diagram attached, a conservative approach to a design can be established because the reject water is being introduced back into the carwash. The reject water can also be used for chemical mixing facility wash down or even irrigation for the site.

10. Spot free Rinse storage:

(with re-pressurization) Once again configured similarly to the feed or wash tanks, the storage allows for spot free water to be available to start the days washing activities. Properly sizing the tanks and spot free system insures spot free water availability.

As mentioned earlier not all carwashes are the same when it comes to the water and equipment used for a successful carwash business. Not all this equipment may be necessary depending on many factors. When planning your carwash you should consider a company with the experience and product offering to take advantage of the limitless choices for configuring your water treatment needs.