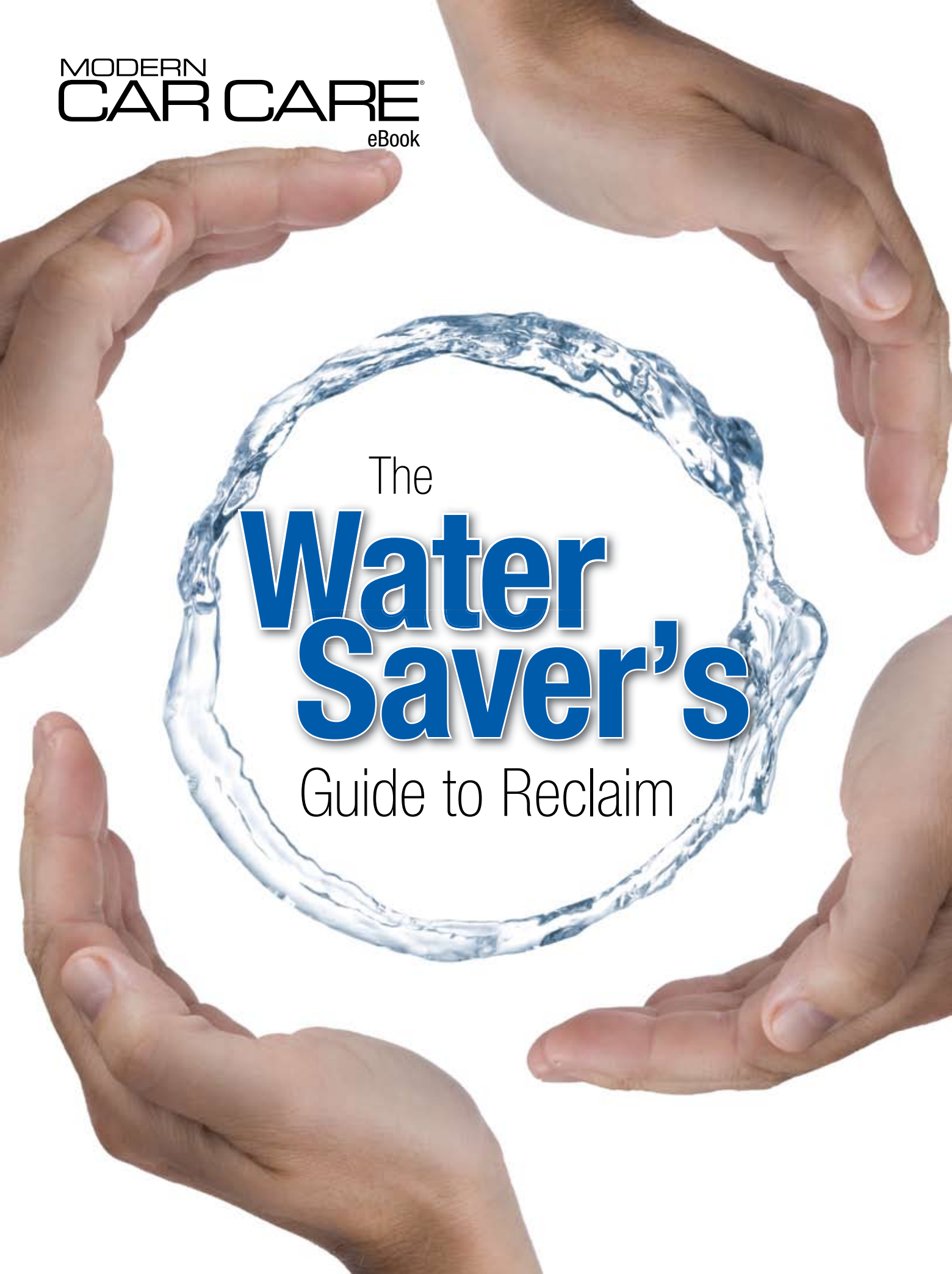


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The image features four hands, two on the left and two on the right, positioned to hold a circular splash of water. The water splash is a ring of clear, dynamic water droplets that forms a circle in the center of the frame. The hands are light-skinned and are shown from the wrist up, with fingers slightly curled as if supporting the water ring. The background is plain white, which makes the blue and clear tones of the water and the skin tones stand out.

The
**Water
Saver's**
Guide to Reclaim

Be Prepared

Questions you should ask before making a reclaim purchase

By Cary L. Wise

As an industry, the gathering storms of drought, water usage and environmental impact have brought water recycling/water reclaim to the forefront of carwashing concerns. For us old-timers, we can remember back to the days when it was first attempted, usually with disastrous and costly endings. Those first attempts left a very poor image of reclaim products and technologies.

Since those days, however, especially in the last five years or so, the technology for reclamation has caught up to and, in some cases, surpassed the high level of technology we are used to in the carwash industry. The bottom line is there are reclaim systems that work extremely well and can provide the water quality you demand at your wash.

One major problem that still exists, unfortunately, is that the average operator still does not know the different technologies being offered in the reclaim arena and, in most cases, is not familiar enough to ask the right questions concerning his own wash and how reclaim technology pertains to or will perform in his wash.

Too many operators have told me personally, "My system does not perform as sold to me," "It's not what I expected" or "It does not work at all." In a time of advanced technology, this is a sad and unnecessary result for the operators of our industry.

The reason for these problems is simple: lack of knowledge and the information needed to make educated purchasing decisions. We need to get away from making decisions based on sales presentations.

The following is a list of questions you should ask reclaim companies and, in some cases, the reasons why you should ask them. I suggest these questions be presented in writing, with the answers signed and dated (along with the company name) by the person providing your answers. Getting it in writing can help you get away from sales presentations and get good, accurate information and make an informed decision.

There are basically two types of reclaim systems: 1) biological and 2) mechanical filtration. All of these questions relate to both types of systems.

Questions to ask

1. What percentage of total water usage will be reclaimed? (less over-spray, evaporation and drive-off)

Why you should ask: If you want 100 percent reclaim, not all systems can achieve that. If only 10 percent to 20 percent reclaim can be achieved, you should know that before you purchase.

2. Does this reclaim system require a sewer?

Why you should ask: Some reclaims are totally closed loop and require no sewer. This can save you money on sewer fees and impact or hookup fees.

3. Does the system require chemicals or ozone for odor control?

Why you should ask: Chemicals require replacement costs and maintenance. Ozone will require service and maintenance costs. (Research ozone usage in closed environments, such as equipment rooms.)

4. Does the system have media filters and/or inline filters that will remove sediment? Do they automatically backwash?

5. Where does the required backwash go? Is sewer required?
6. Will inline filters require changing? If so, how often?
7. Will the media filters required rebedding? If so, how often? And how much does it cost?
8. What is the estimated cost of yearly maintenance?
9. Can the reclaim water be used for all carwash functions, excluding spot-free rinse?
10. You should be able to get guarantees in writing on the following questions:
 - a) Will reclaim water contain any soap?
 - b) Will reclaim water contain any wax?
 - c) Will reclaim water have any odor?
 - d) Will reclaim water contain less than 5 ppm oil emulsions?
 - e) Will reclaim water contain any particulate matter greater than 5 micron in size?
 - f) Will reclaim water be clear in appearance?
11. What is the required maintenance time per week?
12. Will the reclaim representative help me obtain permitting locally?
13. Will the reclaim representative personally help me achieve rebates and impact waivers locally?
14. Will the reclaim representative personally install and start up my equipment?
15. What is the warranty on this equipment package?
16. What is the projected payoff time vs. costs of this equipment in months?
17. What is the monthly projected fresh water reduction at my carwash for this system?

What to look for

Any system you choose should:

- Be reliable
- Provide quality water you need to wash cars
- Save you as much fresh water as possible per month
- Reduce sewer bills or eliminate them altogether
- Require as little maintenance as possible
- Be as economical to operate as possible
- Give you a fairly fast return on investment
- Keep you free from business interruptions due to drought, water rationing, etc.
- Allow you to be among the environmentally friendly in your town.

Reclaim is an economically and environmentally smart thing to do. The products available range from not so good to really good. It is your job to get the facts. Do your homework properly and you too can have a reclaim that works to your expectations and saves you money in water and sewer costs while diminishing the impact on the environment.

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Reclaim:

There's Nothing to Fear

Re-using wash water can be simple, cost-effective and environmentally friendly

By Jim Keller

As a manufacturer of water-recovery equipment for the past 30 years, I could write a book on the drawbacks of using reclaim water. In the past, installing reclaim equipment and using it in the everyday operation of washing cars was second choice. Most operators would rather be shot out of a cannon than use reclaim.

Most of the complaints stemmed from early methods of recycling. Re-using spent water involved sucking water from a single mud tank prior to sewer. An unpleasant mix of oil, water, wax and mud was the recipe that was used for a vehicle's undercarriage or to thaw ice or snow on the lower parts of the vehicle.

As the industry grew, settling tanks with partitions or baffles were used to help separate solids and oils. The early models were enhanced with cyclone separators and the use of barrel screens located at the base of the suction line. The barrel screen would stop the large objects, and the cyclone separators would remove the smaller, heavy particles like sand and grit.

The problem with this type of reclaim was that on busy days, the underground tanks were turbulent. The water did not have a chance to properly settle and would overwhelm the separator and pass the solids on through to the wash equipment, plugging solenoid valves and spray tips.

During the 1970s and 1980s, water and sewer costs started rising. New words such as impact fees, availability, shortages and regulation started popping up all over the country. This prompted new interest in water-recovery equipment and the need to manufacture more sophisticated methods of filtering water. Equipment in the 1980s and 1990s was cumbersome and

expensive to purchase and maintain. Since the cure cost more than the problem, the purchase of the reclaim system could not be justified.

To make water recovery a winning proposition, it needs to be practical in many respects. The cost of the system, price to implement, cost to operate and, most important, the desired results must be reasonable.

Reclaim water

Reclaimed water is water that is recovered and treated to a point to make it acceptable for use in the wash portion of the total wash and rinse process. It is not intended to be used for drinking or cooking. Reclaimed water should be used as the muscle to remove the solids from the vehicle, followed by a fresh-water rinse and in some locations a post rinse of spot-free water. The spot-free final rinse will remove the dissolved solids found in 90 percent of all freshwater sources. The use of three different sources of water will deliver the most desirable quality results.

From a cost standpoint, being able to recover 80 to 90 percent of your total water usage should be a substantial savings, not to mention the expense for the sanitary sewer fee that is normally more than the cost of the water.

To obtain the desired results you expect when using reclaimed water is not difficult. Many of the undesirable parts of using reclaim can be overcome by using a little imagination. I will now address some of the most common complaints regarding implementing reclaim into a new or existing carwash location.

Expense

Cost is a very important factor when considering purchasing a water-recovery system. At existing locations, you will already have a handle on exactly what your monthly water and sewer fees are. You can contact your utility provider to find out if your municipality anticipates any price increases and factor that into your decision process. Total the cost of the recovery unit and the expense to implement the system in your location. The average savings in sewer and water can range from 50 to 90 percent,



depending on the amount of fresh water that can be converted to reclaim. In most cases, all wash processes with the exception of final rinse, wax and stock solutions to generate foam, pre-soak and tire/wheel prep can be converted to reclaim.

When contemplating building a new facility, be sure to contact the municipality or utility provider that will service your anticipated location. Find out the cost of water and sewer for the meter size you will be using, any impact fees and, of course, any planned rate hikes in the near future. Don't be shy when requesting information on the provider's history for rate increases. It is extremely important to learn of any past or possible restrictions in the near future as a result of rapid growth.

The "R" word

Once you've determined if reclaim can be a definite benefit financially, it's time to discuss methods of implementing reclaim without having the drawbacks that are most commonly referred to when the word reclaim is mentioned. Some of the most common complaints are color, odor, quality and the visible condition continuous use has on equipment and building bays and tunnel walls.

By law, carwash soaps and solutions are manufactured to be biodegradable. What this means to most tunnel operators is the reclaim water that remains on cloth equipment overnight will start to degrade. The bacteria will grow rapidly and cause the green, brown and black residue found on the cloth. Most of this buildup is caused by the rapid growth of bacteria in the degrading process. Equipment holding reservoirs that hold reclaim water overnight will grow a black, leafy substance at the water line. This slimy growth will continue to grow during nonuse periods.

The odor you smell for the first few cars every morning is caused by the oxygen-starved dead bacteria. This dead bacteria is what produces hydrogen sulfide odor (rotten-egg smell). This odor combined with the residue left after evaporation gives potential reclaim users mixed signals. Are the large savings on water, sewer and related fees worth the problems that accompany the recovered water?

Nothing is easier than using fresh water for all applications, however, the ongoing non-refundable cost is staggering. If you want a gut-wrenching experience, try totaling your last five years of water and sewer bills. When you think about paying for water coming into the carwash for a few seconds and then paying again for the water to immediately leave, most of the time it will cost more for the water to leave. This will make you question just how

Are the large savings on water, sewer and related fees worth the problems that accompany the recovered water?

bad the quality of the water you are paying to dump down the drain is and make you consider reusing it.

Making reclaim friendly

Over the past 30 years, I have encountered hundreds of innovative carwash operators who have developed ingenious ideas to make reclaim more desirable and easy to use. Here are a few ideas that are simple and inexpensive to implement.

1. City water. A cheap and easy fix for overnight bacteria growth is to tee a fresh city water line into the reclaim line. The city line would have a ball valve or electric valve. An inexpensive timer or the carwash controller could actuate the electric valve. At approximately 10 to 15 minutes prior to closing, the solenoid valve would open. City water would enter the reclaim lines, and the chlorine in the city water would kill the bacteria that normally cause the buildup on cloth, equipment, walls, floors and pumping station reservoirs. After the carwash closes, the valve would shut off and revert back to reclaim for the next day's operation. Some operators inject a small amount of city water into the flow of reclaim. The chlorine in the city water will tend to lighten the color of the reclaim water, keep it from turning septic in holding tanks and keep odors at a minimum. The amount of city water is a fraction of the total flow of the reclaim water going to the wash equipment.

2. Blending. Blending is similar to using a home shower valve. You can mix reclaim and fresh city water much like hot and cold to suit the particular application. For example, there would be no need to blend for washing under the car or tire/wheel cleaning. Blending valves could be installed on high-pressure pumping tanks or on spray tips that are aimed on mitters or other cloth close to the exit of the wash process. Keep in mind that every drop of reclaim water that is used is a drop you are not going to pay water or sewer charges for. If blending uses 25 percent city water and 75 percent reclaim, you have lowered your monthly bill dramatically. When using high-pressure arch systems, a popular method is to use fresh water on the top and reclaim on the sides. The bottom line is be creative. You can have the best of both, low water and sewer bills and good quality reclaim water.

Jim Keller is a 43-year veteran of the vehicle-washing industry and has manufactured water-recovery systems for the past 30 years. He is President of Con-Serv Water Recovery Systems and Con-Serv Manufacturing spot-free rinse systems.

Rehabilitate Your Reclaim

Increase the effectiveness of your system

By David Laughlin and Glenn Call

If a reclaim system is not correctly removing a significant portion of suspended solids, the wash quality can suffer dramatically.

Amid an economic and regulatory climate that challenges carwash owners to operate efficient, safe, environmentally friendly and profitable businesses, wash water reclaim systems have become a fact of life.

Unfortunately, vehicle wash operators are often unaware of the positive (or negative) effect these reclaim systems have on the quality of a vehicle wash. Since carwash quality directly impacts customer loyalty and an owner's opportunity for repeat business, it is important to maximize a reclaim system's effectiveness. Operators don't always know how to correctly maintain and adjust their systems, or they sometimes simply overlook this critical aspect. The following are some simple, low-cost solutions to help keep your reclaim system operating at peak efficiency.

Maintenance is crucial

Most reclaim/recycle systems are designed to filter out suspended solids in wash water (dirt, road grime and silt). If the reclaim system is not correctly removing a significant portion of these solids, the wash quality can suffer dramatically. Specifically, dirty water decreases the effectiveness of soaps and cleaners by reducing their surfactant-binding capacity. A high-solids content in wash water can also wear away the clear coat on a vehicle, decreasing the natural shine and protection that a clear coat provides. This is especially true when reclaim wash water is applied as a high-pressure spray in many tunnel washes. So how can you help your system work better? Here are a few of the simplest ways:

Biological Degradation Process

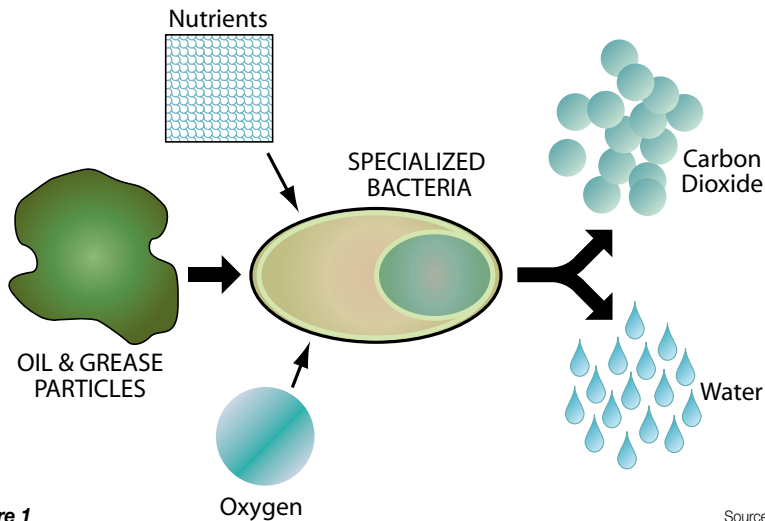


Figure 1

Source: BioShark

of maintenance. Sand filters, bag filters, cartridge filters and even cyclone separator systems require periodic cleaning and replacement of the filter media. By keeping these filters free of solids buildup, the reclaim system can clean the wash water more efficiently, providing you with high-quality reclaim water. Check with your reclaim distributor or manufacturer for specific instructions and recommendations.

Inspect and adjust trenches and piping. Many wash systems may have been improperly designed or installed from the beginning. However, an operator can often identify specific areas that can be upgraded very simply. For example, many tunnel washes have trench drains that don't operate correctly. An effective trench drain will drop out large

Pump those pits. It's not always easy to keep a wash system clean, especially during high-volume wash periods. The simplest way to help your reclaim system provide clean, high-quality recycled water is to keep your wash water storage pits and tanks free from solids buildup. Pump out your pits regularly, whether its monthly or every few months. While most pits are designed to store a certain volume of solids, these stored solids can be re-introduced into a wash-water stream, putting a real strain on your reclaim system. Sludge buildup can also increase reclaim odor problems.

Clean filters. While recycle systems are all different, most of them have a series of filtration vessels that require some degree

solids (sand, plastic and metal particles) prior to your storage pit or sump. This is why they should be cleaned or scooped out regularly. However, some trench drains are too short, or have slopes that are too steep, resulting in rapid water movement and very little solids removal. A simple fix can be the installation of a weir or series of weirs that slows down the flowing water, allowing the large particles to drop out. These weirs can be made from something as simple as a metal or plastic strip placed across the width of the trench drain floor. Inspect your wash to see if some simple adjustments can increase your reclaim water quality.

Adjust chemical usage. Many vehicle washes use more soap, wheel brightener or wax than is really necessary. Besides cost-

Biological Treatment Combined with Standard Reclaim Equipment

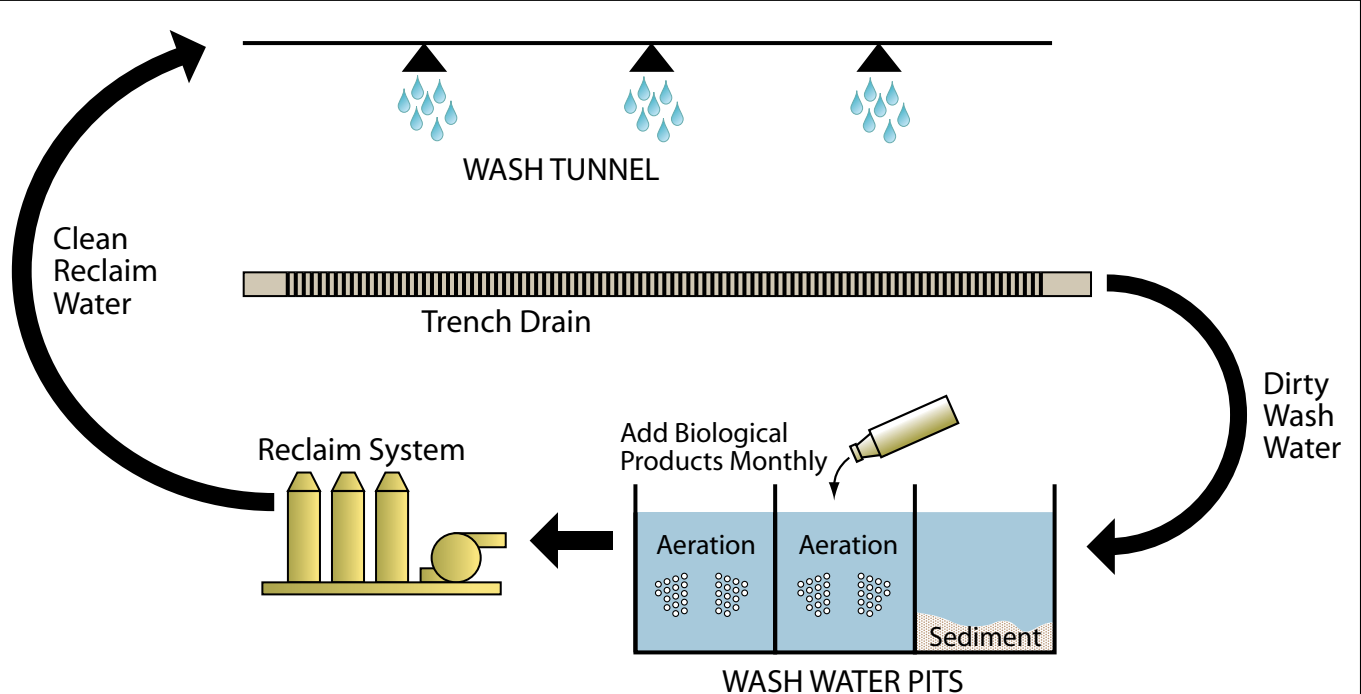


Figure 2

Source: BioShark

Biological Water Treatment Results - Tunnel Wash, Oregon

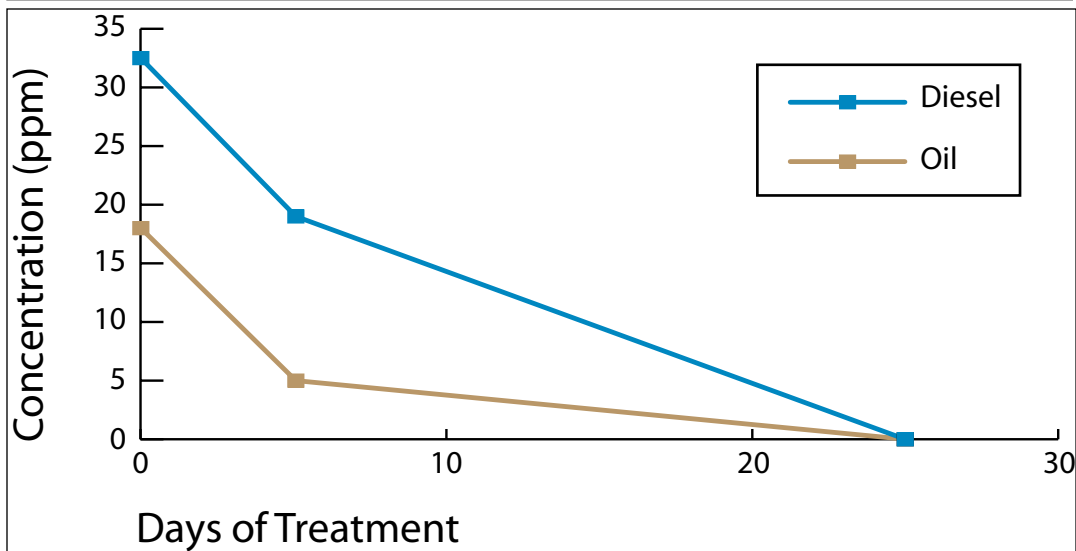


Figure 3

Source: BioShark

ing you money, the excessive use of these chemicals can decrease the effectiveness of your reclaim system. For example, too much soap will emulsify the oil, grease and fuel that is washed off a vehicle. When emulsified in solution, these organic compounds are difficult for a reclaim system to remove. Check with your carwash equipment manufacturer to make sure that you are using the right amount of wash chemicals.

Simple upgrades

Most reclaim systems are filtration-intensive equipment units whose main focus is the removal of suspended solids (silt, dirt, etc.). However, one of the main problems with reclaim systems is the buildup of organic material—oils, greases, fuels and surfactants—within wash water. Unfortunately, many reclaim systems were not designed to remove the emulsified oils and greases that occur in wash water. As they build up, they cause fouling, clogging and odor problems within the reclaim system.

One of the most valuable ways to increase your reclaim system efficiency is to remove the oils and greases from the wash water. A simple, easy and inexpensive way to do this is to apply a biological water treatment approach in conjunction with your existing reclaim system.

Biological treatment is the process of using bacteria and enzymes to convert organic compounds (in this case, oils, grease, fuels, solvents and surfactants) to carbon dioxide and water. Research on treatment of petroleum-based products over the past 20 years has led to the formulation of microbial enzyme products that can naturally remove organic compounds from water and soil. Properly implemented biological treatment systems use “good” bacteria and enzymes to remove oils, greases, nitrates and phosphates from a wash water stream. This eliminates not only petroleum and surfactant compounds, but also “bad” bacteria, fungi and molds that cause strong odors in washes.

The main requirements critical to any successful biotreatment process include an active, healthy petroleum-degrading biological population, oxygen, nutrients and a balanced pH environment, as shown in Figure 1, left.

Biological systems require very little equipment, if any, to work properly. More important, they can be applied in combination with your existing reclaim system to reduce odors, destroy oil and grease and maximize reclaim water quality. An example of a simple biological treatment application in conjunction with a standard reclaim system is shown in Figure 2.

In this layout, the biological products are applied within the wash water storage pit or sump. Aeration is provided, and the storage pit is essentially converted to a treatment vessel, where degradation of oil, grease and fuels is constant. This water is then processed through the existing reclaim system for use within the carwash. In this way, removal of organic material and suspended solids is effectively achieved. Biological product costs for this type of layout are very low, typically less than \$50 per month. The only additional equipment that may be needed for this type of layout is a biological product metering system and a small aeration system to provide dissolved oxygen for biological consumption. These equipment components cost anywhere from a few hundred to a few thousand dollars. In some cases, the product metering and sump aeration can be provided by using existing wash equipment.

Biological treatment can effectively and continuously remove petroleum and organic compounds from wash water. This allows you to maintain consistently clean reclaim water for better vehicle wash results. See Figure 3, above.

Reclaim systems are being required all over the country, and with a little bit of time and energy, you can use these systems to provide a superior vehicle wash for your customers. While many of the maintenance tips provided here are relatively simple, they can make a real difference in your business. Evaluate your carwash system to see how you can take advantage of current treatment techniques to increase your bottom line and stay ahead of your competitors.

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Stake a Claim On Reclaim

There are many ways to reuse wash water

By Charles Borchard

Water is the primary means of rinsing the dirt, road grime, salt and snow off the surface of the vehicle during the wash process. All soaps use water as the delivery medium from the chemical station out to the vehicle to assist in breaking up those contaminants. The higher the quality of water you use, the higher the quality wash you will deliver.

There are three types of water used in vehicle washing:

Fresh water/tap water. Fresh water and tap water, either from a municipal water supply or private well, can range in quality from great to terrible. Some of the symptoms of poor-quality tap water is high total dissolved solids (TDS), either too high or too low of a pH reading. A reading of 7.0 to 7.4 would be neutral and the ideal.

Another indication of water quality is cloudy or turbid water. Is iron present in the water? What is the hardness of the water?

Simple tests conducted at the site by your carwash equipment representative will help determine the quality of the fresh water. The entity supplying your water will have a report available that can help you decide how and with what equipment you will improve your ability to deliver a quality wash. Water is an increasingly expensive commodity, and fresh-water use in a vehicle-wash application should be carefully considered and applied to maximize its value.

Spot-free water. Spot-free water is water that either naturally or by processing has a TDS count below 20 parts per million (PPM). The overwhelming majority of spot-free systems in current use are reverse osmosis (RO). RO systems have an impact on water conservation, because most systems require 2 gallons of fresh or tap water to make 1 gallon of product. There are ways to reuse this extra gallon of “reject” water. It can be captured in a tank and using an appropriate pump can be delivered anywhere you would use fresh water without a chemical application. For example, in a high-pressure automatic, the last rinse before the spot-free rinse using the RO reject blended with fresh water nets you two uses for 1 gallon of that gallon of water.

In systems without a reclaim system, this alone will result in a significant savings on your water bill with the investment of a tank and pump.

Reclaim water. Reclaim water is water that has been used in the wash process, then cleaned and reused. Many municipalities now require some form of reclamation or recycle system prior to permitting, and having one may assist in avoiding expensive impact fees. Many operators ask if they can recycle all of the water in a closed loop. For wash quality, it is always better to have some fresh water in every cycle. The highest use recommended is 90 percent reclaim. A water-reclamation system is the single most important piece of equipment to help with water conservation and save dollars. Water-reclamation systems are not new in vehicle washing, and there are several different technologies in current use.

Tanking systems

All reclamation or recycling systems use a tanking system to capture the water after it is used. These are often called clarifier tanks, oil/water separator tanks or simply pits. The suspended solids are allowed to settle in these tanks, thereby clarifying the water. If the tank system is properly sized, the solids will settle to the bottom and the oils and lighter-than-water contaminants will rise to the top and become trapped out of the reuse stream.

Suspended and dissolved solids in water are measured in microns. A micron is the smallest particle that can be seen by the human eye. The diameter of a human hair is 50 to 75 microns. Suspended solids are 150 microns and larger, with a specific gravity (sg) of 1.2. They will settle in 70-degree still water at a rate of .8 inches per minute. Oil with a sg of .88 will rise at a slightly slower rate (.68 inches per minute). Specific gravity is the measurement of weight of material relative to water, water having an sg of 1. Gold, which has a sg of 19.29, nearly 20 times heavier than water, would settle very quickly. Colder water would slow these settling and raising processes.

After the tanking system, reclamation recycle systems split into two types.

1. Batch system. A batch system draws water from the end of the settling tanks and processes the water. This could be as simple as a cyclonic separator to systems that are essentially micro sewage-treatment plants that treat the water with multiple filtering elements and/or media and store the water in additional tank(s) for future use in the wash process. These are typically the more complex systems and usually require multiple pumps.

Once the water is processed and stored, it can go septic very quickly, causing unpleasant odors when it is used. To prevent

At the very minimum, a reclaim system must remove the larger suspended solids (cyclonic separation), depending on the separator, from a typical 70 microns down to 5 microns on the best systems.

this, the stored and processed “clean” water must be treated on an ongoing basis. This is usually accomplished by a recirculation pump with some form of a biological, chemical or ozone injection.

Biological systems are used quite often in municipal wastewater treatment and produce clean water, but it can be difficult to keep in balance, often requiring constant monitoring by water-treatment engineers. In vehicle washing, it is possible to get out of balance by introducing too much fresh water into the system. This can happen simply by hosing down the wash bay with fresh water. Chemical treatment with a disinfectant such as chlorine is also a fairly common practice in wastewater treatment. It also requires proper monitoring. If the dosing gets too high, chlorine, which is a powerful oxidizer, can cause premature corrosion and possibly failure of the wash equipment.

Ozone injection is another process used in wastewater treatment. It was first used in France in 1906. Ozone must be generated on site. The most common ozone generators use a high-voltage arc and an oxygen concentrator. Ambient air is 21 percent oxygen, 78 percent nitrogen and 1 percent inert substances. Pure oxygen is O₂, meaning two oxygen atoms together. Oxygen concentrators take ambient air, compress it, dry and filter out the nitrogen and inert substances and deliver to the ozone generator 70 percent to 90 percent pure O₂. With this high level of oxygen being pushed through a glass tube, a high-voltage arc, like a spark plug, ignites and splits some of the O₂ molecules. The free oxygen then attaches itself to other O₂ molecules forming ozone. O₃ is three oxygen atoms strung together. This ozone, along with the O₂, is then injected or drawn into the water stream and circulated into the tanking system.

Ozone is an extremely unstable molecule. When it strikes a biological or hydro carbon contaminate in water, it oxidizes that contaminate by shedding that spare oxygen atom. While ozone has an extremely high capability to oxidize, higher than chlorine, the main advantage for the use of ozone is the short duration of its life. It will dissipate in 20 minutes, as opposed to chlorine, which could have a harmful residual for several days. As long as the introduction of ozone is controlled so it is not allowed out of the water tanks for its 20-minute life, it is a viable choice. Now that the water has been processed and stored and is being treated on an ongoing basis, it is necessary to deliver it to the wash. That requires yet another pump.

Batch systems require proper sizing to have enough time for the processing of the water to be accomplished before the wash

demand calls for the clean water. If the system is undersized, you will be using water that is not as clean as it should be to make up the deficit.

2. *On demand.* With the same clarifier settling tank system, the on-demand system processes the water to the acceptable level of solids with some or all of the following—cyclonic separation, backwashing filters, media tanks or disposable filters. This is accomplished as the wash demands water. It does not require the additional holding tanks. At the very minimum, a reclaim system must remove the larger suspended solids (cyclonic separation), depending on the separator, from a typical 70 microns down to 5 microns on the best systems. Media filtration, automatic backwashing filters and disposable bag filters are all in use on some on-demand systems as well. The better on-demand systems will also have the recycling capability to maintain odor control, using the same techniques, biological, chemical or ozone injection. In most cases, this requires a separate pump. Remember that in most cases, this increases the size of the equipment and the price.

There is obviously a wide range of capabilities and pricing in reclaim systems. Finding a reclaim system is like shopping for every other piece of equipment in a vehicle wash. Ask yourself the following questions:

- Is the equipment well-made?
- Does it have UL or ETL approval?
- Will the manufacturer or distributor stand behind it and be able to fix it if it breaks?
- How much space will it require in the equipment room?

Working with your equipment supplier and distributor and having them answer these questions will go a long way to ensuring you get the right system for your application.

There are obviously many more things to consider regarding your water usage in a vehicle wash than what were discussed here. Your equipment supplier should have a basic understanding of the use of water and help guide you in your selections of equipment to make your wash a success. Hopefully there is enough information here to help you get started toward understanding a little more about water and how reclaiming and reusing it in the wash process will benefit everyone.

Charles Borchard is the Vice President of Operations for New Wave Industries, the manufacturer of Pur-Clean Spot-free Rinse Systems and Pur-Water Water Recovery Systems. New Wave is in its 16th year in the water-treatment business. Borchard can be e-mailed at cborchard@purclean.com.

Beyond Reclaim:

How to Deal with Dirt and Sludge

By Andy Pazz

Your dream is about to come true – you can finally start building your carwash. You have finished the process (or so you think). The architect is finished with the plans; the civil engineer has approved them; you have your permit; you have selected the carwash equipment (after talking with everyone who manufactures carwash equipment); you have chosen the chemical supplier; and you are ready to go. But wait! What about the reclaim? There are more questions to ask. Do you pour it in place? Do you use precast vaults or do you use septic tank vaults? Manhole steel covers, round fiberglass or hinged steel covers? What about pumping out the reclaim? How often will you do it? What does it cost? Sadly, not enough distributors can answer all these questions.

Ever since the first carwash began using reclaimed water for the wash cycle, one of the biggest problems was how to remove the dirt, sediment and sludge that settle in the bottom of the vaults or holding tanks. The only efficient way was to have the local septic-tank company come every three to four months, after closing for the day, and completely remove the water, sediment and sludge at a cost of \$1,500 to \$2,000 each time it is performed. But there is an alternative to all of this.

A sediment- and sludge-removal system operates by placing a pump in each of the first two reclaim compartments, as this is where most of the sediment and sludge settles. Each hour, the first pump is automatically turned on (with a programmable controller) and runs for a period of 30 to 40 seconds before it shuts off. After 15 minutes, the second pump is activated and runs for 25 to 35 seconds. The reclaim water and sludge is pumped to a bagging system that retains the sediment while the reclaim water leaches back to the first vault compartment or is sent directly into the conveyor trench or catch-basin. It's possible to integrate more pumps into other vaults, as well.

In either a conveyORIZED tunnel or an automatic rollover, the filter bag cabinet can be placed in the wash area or on a concrete pad along an outside wall. The leached water can then be directed to the conveyor trench, catch-basin or back to the first reclaim compartment. The cabinet can also be placed alongside the building; it is not recommended that the cabinet be placed in the equipment room. The filter bags, on average, are changed approximately every four to six

weeks, though it depends on the time of year and the volume of vehicles washed.

Here are some answers to common questions concerning sediment- and sludge-removal systems.

→ **How is the sediment disposed?** We have found that, by eliminating the petroleum hydrocarbons and organics, it is acceptable to lay the filter bags on a drying rack, such as a strong wooden pallet, for a period of a few days, and then dispose of them in a landfill or directly into the dumpster, according to local ordinances.

→ **What about controlling odor, petroleum hydrocarbons and other organics?** Gaining the primary ingredients in the elimination of odor is accomplished by incorporating aeration along with enzyme- and bacteria-soluble packets. These enzymes and bacteria, which are completely safe to humans and animals, consume the food source of the odor-causing bacteria (petroleum hydrocarbons and other organics), turning them into safe carbon dioxide and water, and also eliminating odor.

→ **Why not incorporate ozone or UV light?** Both of these processes kill the bacteria but do not eliminate the most hazardous materials, among which are petroleum hydrocarbons and other organics. The advantage that enzymes and bacteria have over these processes is that the hazardous materials are consumed and then turned into harmless carbon dioxide and water.

→ **What about the Total Suspended Solids (TSS) in the reclaim water?** The TSS are dramatically reduced when incorporating both systems.

→ **What about the Environmental Protection Agency?** We have run tests of reclaim water at various carwashes and have found that within a short period of time, diesel and oil hydrocarbons can easily be controlled to 100 parts per million and fewer within a very short time – even a week or two.

→ **What is the return on investment?**

Without such a system, an operator could pay \$1,500 to \$2,000 every three months to pump the reclaim vaults. Considering this, a sediment- and sludge-removal system should pay for itself in less than two years.

Andy Pazz works for Laguna Ltd., a company that has successfully developed the combination of automatic sediment- and sludge-removal with the elimination of petroleum hydrocarbons, organics and odor so prevalent in the reclaim water vault area. The company's Web site is www.laguna-ltd.com.

