Wastewater: A Path to Compliance

Part Two of a Series

Part One of our series on wastewater was published last issue and featured a review of the historical development of wastewater regulations, the impact on laundries, and the need for wastewater testing and a wastewater permit.

When your laundry becomes a part of the wastewater regulatory structure via the issuing of a permit, you will need to sample your wastewater effluent at the discharge point assigned by the regulatory authorities for the parameter assigned in the permit. Depending on the pollutants regulated, the sample will be either a composite which is taken over a twenty four hour period (metals and phosphorus are good examples) or a grab sample (pH being the most common).

It is important to remember the sample is only a representative of the point and time it is taken. Typically the laboratory will offer a sampling service; however, they should understand your facility permit and sampling point. Many permit exceedances are caused by incorrect sampling technique, for example the technician places the composite sample wand in a place where it will be retrieving wastewater in a stagnate location in the outfall, or the person retrieving the grab sample is rushed and picks up whatever is going to the sewer without asking you whether the facility is operating correctly or if it may be experiencing a temporary upset. Remember when using an outside service they work for you and at your discretion.

At some point the inevitable will occur and your facility will not be in compliance. It is then recommended that a voluntary compliance schedule be developed and submitted to the regulatory authorities. This demonstrates your willingness to cooperate and be an exemplary community supporter. It also has the secondary effect of allowing you to construct a timeframe that is more suited to the ability to complete the goals laid out. A timeframe of three to eight months between milestones in the schedule is a reasonable request with two years for total completion is a typical standard allowed by most regulatory authorities

It is also recommended at this point a consultant versed in writing compliance schedules be contacted. He or she should understand the goals and needs of both the regulatory agency and your business. This person does not necessarily have to be a professional engineer. But he or she should be very familiar with laundry wastewater discharge make up, the time to develop a pretreatment system for your facility and most important, writing a schedule that allows for completion of compliance without the possibility for unnecessary capital investment. All steps should include sampling for permit compliance prior to the next step in the schedule taking place.

Basic components in a compliance schedule will start with the housekeeping issues, such as trench, pit and discharge point cleaning. If after these tasks are completed, sampling is done and compliance is shown, then a simple cleaning schedule will keep your facility in compliance.

If this is not the case then initial capital investment must be made. For most facilities this begins with the placement of a shaker screen or hydrosieve to remove debris that might damage downstream equipment. Again, perform sampling and report findings to the regulatory agency to demonstrate progress and, depending on your permit, compliance.

The next step would be the construction of an equalization tank (eq tank) and mixing system. This vessel serves many functions:

- Homogenization of wash steps, and soil classifications
- Surge vessel for multiple washing machine discharge
- pH equalization and marginal volatile organic compound reduction with aerated mixing systems

At this point a design firm or tank manufacture with proper credentials

will be required to comply with any state and local construction codes. It is recommended that the use of an aerated mixing system be used in the tank to reduce solids build-up on the side walls of the tank and for the above mentioned benefits.

Size of the tank is a matter of consideration. The larger the tank is, the greater equalization and homogenization, however the larger the physical footprint and cost. Tanks are typically sized for 50-100% of the daily flow. Costs can range from $1.50 or greater per gallon depending on construction restraints (example 50,000 gallons needed = $75,000 tank). After construction and installation, many facilities become compliant, but do not count on this as an absolute.

The next step is the treatment of the wastewater itself. This is a watershed point that should not be dictated by a vendor, but considered carefully as it will impact your business for its remaining life. Again, it is recommended to involve a consultant to act as a guide or even a designer (with no direct affiliation to an equipment vendor). Factors that must be considered for a treatment system are:

- Initial capital outlay
- Equipment lifespan
- Footprint
- Operator interface
- Complexity of operation
- Cost of operation, including but not limited to:
  - electrical consumption
  - chemical consumption
  - and by-product sludge disposal
- Repair cost and breakdown frequency
- Reuse of treated water

The most common type of treatment system used in the laundry market today consists of chemical demulsification and flocculation followed by physical separation of the clarified water from the sludge.

The chemical process is done by using a cationic coagulant to attract the emulsified soil in the laundry wastewater with or without a coagulant aid (i.e. bentonite clay or ferric chloride), followed by a flocculant. Many types of programs are available through vendors and have varying advantages and disadvantages. It is recommended to avoid programs that rely on strict pH control of the wastewater in order to activate and those that produce large amounts of by-product sludge that must be dewatered and landfilled. Whatev-

er chemical program is selected it should contain a service component where a technician helps you oversee the chemical consumption and has experience in the laundry wastewater industry and the associated equipment that will be needed.

The physical separation of the clarified water from the sludge is done by a dissolved air flotation unit, coarse or fine bubble (DAF). Many different manufacturers of these units exist, all with a different design to make their unit seem more attractive and efficient than their competitors.

A newer equipment concept for treating wastewater has emerged over the past two decades. This is the use of ceramic microfiltration (CMF) and at times is followed by reverse osmosis (RO). Its main advantage is the claim of its ability to recycle up to 80% of the wastewater back onto the wash aisle. The capital outlay for these units can be up to three times more than conventional DAF units. Operational costs are on the margin with traditional treatment and the complexity of the units is high along with repair costs.

It is true that reuse water will be achieved at a greater rate than with traditional treatment. But a high percentage of reuse can be achieved with both conventional and CMF technologies.

Advice in purchasing a system is simple. Talk to people like yourself that have purchased their units (conventional or CMF). Ask for a list of references and insist on one reference that has not had success with that specific piece of equipment you are considering.

To summarize, going from compliance schedule to an actual system can be daunting. Rely on your fellow laundry business people and the associations you belong to for advice. Talk to people well-versed in dealing with regulatory bodies and the understanding of the laundry side when developing a plan. Don't go it alone.

Coming in the next issue: A review of the challenges in the reuse of treated wastewater.

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