Increasingly, engineers and developers are seeing the value of point-of-entry (POE) filtration as well, which delivers cleaner water to users in their hospitals, hotels, and luxury high rises, and helps POU filtration operate with added efficiency and effectiveness.

Daily hydrant challenges

Sometimes, such as the case of a hotel guest expecting to drink pristine water from their room’s bathroom tap, it’s a matter of convenience. In other cases, such as a dialysis unit in a hospital faced with turbid feedwater, it’s much more serious.

Richard Kulinski, a plumbing/fire protection engineer with Bard, Rao + Athanas Consulting Engineers, a New York City-based engineering firm with research and healthcare clients around the country, has several hospital and laboratory construction projects in the works. In those projects, POE filtration is specified to combat total suspended solids (TSS) coming from aging, overtaxed infrastructure in urban areas that have seen a tremendous amount of development in recent years.

“Over the last 10 years [building] owners are used to daily openings of the [city water] system,” Kulinski says. “In the case of a dialysis machine or a laboratory instrument, opening a hydrant in front of the building can release enough sediment to foul the machine’s filter instantly. That would shut you down until you can.

An automatic self-cleaning filter system such as this one at the point of entry can prevent problems due to sediment.
Plaza Hotel in Grand Rapids, MI, a four-star waterfront property with a stellar reputation that dates back to the 1920s. That city’s water delivery system had experienced frequent bouts with high turbidity, and water quality periodically got so poor that hotel management was forced to reimburse guests for their inconvenience or take rooms off the market.

Installing a 10-micron automatic self-cleaning screen filter — mounted on a 6-foot-by-2-foot skid — at the point of entry of the building’s water main has kept the hotel’s water crystal-clear.

'Green' filtration

Multi-stage filtration can be quite complex depending on what will be used for. Drinking water needs to be free of pathogens and off-flavors. Industrial water will have different purity demands based on whether it is ingredient water, process water (used in processing or cleaning the product) or service water (for seals and cooling). Specialized uses such as laboratory or medical equipment may need to be especially clean to ensure proper functioning and avoid quickly overloading POU filters such as cartridges or membranes.

In the basement of the building, look carefully at the available space. In a tight corner, a set of sand media tanks, a huge settling tank, or a tangle of plumbing is not likely to be a good fit.

Consider the case of the Amway Grand Plaza Hotel in Grand Rapids, MI, a four-star waterfront property with a stellar reputation that dates back to the 1920s. That city’s water delivery system had experienced frequent bouts with high turbidity, and water quality periodically got so poor that hotel management was forced to reimburse guests for their inconvenience or take rooms off the market.

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The right tool

Developing any filtration system is a prescription remedy for a specific problem. Activated carbon and fine cartridges are excellent tools for removing dissolved solids that cause off-flavors, unsightly colors or mineral build-up, as well as biological contaminants such as pathogens and viruses. Ultra-fine or reverse osmosis (RO) membranes operate at the molecular level to remove salts and other dissolved contaminants.

But using those specialized systems to remove larger, suspended sediments is inefficient and expensive. The cost of cleaning membranes or replacing fouled cartridges — interrupting the filtration process to do so in both cases — quickly mounts.

Much of that cost can be prevented by POE filtration to remove TSS, paying off the investment in an automatic self-cleaning filter in a very short time.

Look both ways

It is vital to look both ways — upstream and downstream — before designing a water filtration system.

Upstream, take a close look at the incoming water — especially in a worst-case scenario. If possible, take a sample immediately after a disturbance in the supply system. A basic water test, including a particle size distribution (PSD) analysis, will tell you what is entering the building so you can consider your technological options.

Downstream, consider what the water will be used for. Drinking water needs to be free of pathogens and off-flavors. Industrial water will have different purity demands based on whether it is ingredient water, process water (used in processing or cleaning the product) or service water (for seals and cooling). Specialized uses such as laboratory or medical equipment may need to be especially clean to ensure proper functioning and avoid quickly overloading POU filters such as cartridges or membranes.

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tems consume less than 1 percent of the flow for backwash. That’s less than 25 percent of the water needed for sand media flush cycles.

Energy demand is minimal, too. Some automatic self-cleaning systems can be operated without electricity at all, using the supply water’s pressure to operate their suction scanner nozzles. Motorized suction scanner systems — preferred in urban installations where electrical hookups are readily available — use ¼- or ½- horsepower motors and less than 1 amp of power.

Ensuring clean water — for the sake of convenience, for sanitation or to keep life-saving equipment operating reliably — can be a challenge where aging infrastructure adds turbidity. Fortunately, a bit of forethought and a modest upfront investment that can quickly be recovered allows water treatment professionals and developers to provide clean water with clean technology.

(Continued from prior page)

compatible with today’s “green” building trends. Today’s conservation-minded public is less tolerant of the old approach of letting the tap run for a few minutes to clean out sediment — the water savings enabled by delivering clean water from the first drop is considerable.

Systems that can be operated without chemicals, or that minimize the use of chemicals, such as membrane cleaners or the disposal of filter media such as spent carbon or used filter cartridges, fulfill important environmental goals.

On the operating end, today’s self-cleaning technology functions with extraordinary efficiency. Unlike traditional sand media systems, which require large amounts of water for backwash cycles, state-of-the-art self-cleaning filtration systems can be operated without chemicals, or that minimize the use of chemicals, such as membrane cleaners or the disposal of filter media such as spent carbon or used filter cartridges, fulfill important environmental goals.

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