

Ask Tom! Column

Stormwater Screening Adds Capacity to Collection Systems

Guest article by Fritz Egger, JWC Environmental



In the rapidly evolving realm of stormwater treatment, city planners and managers have limited options and a dizzying array of regulations to deal with. They must somehow get antiquated combined sewer systems to magically produce more capacity during rain events and ensure cleaner discharge without overwhelming their local treatment plant. Moreover, they must purchase and construct new stormwater treatment systems out of their own municipal budget. It's a tall order.

However, there is hope. Environmental equipment manufacturers are rapidly developing innovative machines that squeeze more treatment capacity out of current collection systems, while also meeting the EPA's mandate for cleaner stormwater discharge.

Where Things Stand

Combined sewer systems are used in approximately 772 U.S. cities and collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe. Most of the time combined sewer systems transport flow to a sewage treatment plant where it is properly treated and then discharged into a water body. However, during periods of heavy rainfall or snowmelt the wastewater volume in a combined sewer system can exceed capacity and begin to strain the pipes and treatment plant. For this reason, combined sewer systems discharge excess wastewater and stormwater directly into nearby streams, rivers or other water bodies.



These overflows, called combined sewer overflows (CSOs), contain not only rainwater but also untreated human and industrial waste, toxic materials, floating debris and trash. They are a major water pollution concern for local, state and federal regulators. CSOs may be thought of as a type of urban wet weather discharge, which means that, like sanitary sewer overflows (SSOs) and stormwater discharges, they are discharges from a municipality's wastewater conveyance infrastructure that are caused by precipitation events such as rainfall or heavy snowmelt.

EPA's CSO Control Policy, published April 19, 1994, is the national framework for management of CSOs. The Policy provides guidance on how communities with combined sewer systems can meet Clean Water Act goals in a flexible and cost-effective manner.

In early 2004 the agency finalized its "Draft Policy on Blending", which aims to establish consistent national guidelines on the practice of blending that is used by municipal sewage treatment facilities to manage high flows associated with storm events. The act of blending is to bypass some of the wet weather flow from a portion of the plant's treatment process and then to blend it with fully treated wastewater prior to discharge. The final discharge, however, is still subject to normal discharge requirements and limitations.

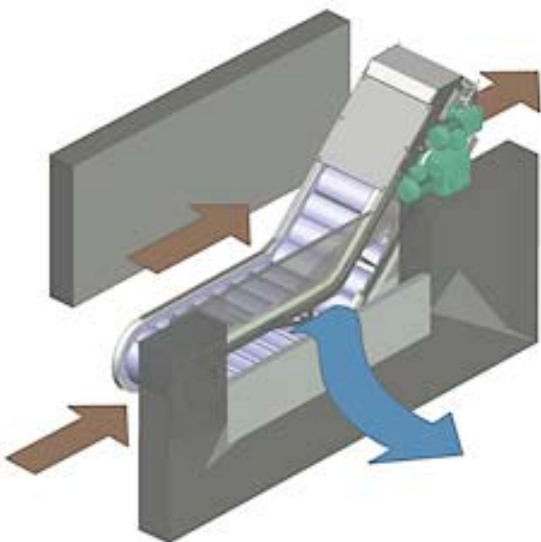
How Stormwater Screens Can Help

There is a clear trend towards fine screening of stormwater prior to discharge. Moreover, primary treatment is gaining acceptance as an important step before stormwater is routed for storage, blending or discharge. Excellent equipment is coming on the market to assist operators in handling wet weather flows. For example, JWC Environmental's Storm Monster™ ensures combined stormwater systems operate just as they should: allowing excess water to pass through preliminary treatment (screening to 6mm) but trapping pollution, floatables and trash inside the plant.



The Storm Monster™ is an example of a high performance band screen designed for installation on the pre-weir side of a wastewater channel or CSO, and it automatically activates when flow reaches the top third of the channel. The Stormscreen's unique "dog-leg" design increases the hydraulic capacity of the screen by allowing stormwater to enter through the bottom and top which improves flow rates by up to 90% over similar screens. This design nearly doubles the flow of previous stormwater screens. The "dog-leg" shape also positions the clean-off brush above the highest waterline so it is never submerged and can operate more efficiently.

Another advantage of the Storm Monster™ is the advanced panel design. Stainless steel perforated panels are constructed with 6mm holes on 8mm triangular pitch (51% open area). Each panel is individually mounted into two endless conveyor chains forming the screen band. The panels have moving stainless steel side plates that form a continuous seal against fixed plastic strips running around the submerged areas to prevent unscreened material from entering the stormwater overflow.



The screen rotates to move solids to the downstream end of the channel where they are removed by a solid clad cleaning brush. The brush features an adjustment mechanism and is supported by self-lubricating bearings. The moving screen technology replaces previous bar screen designs which used long parallel bars to prevent solids from passing; however, trash and floatables simply turned parallel to the bars and would pass into local waterways negating the benefits and cost of installing a screening system.

Compact design and ease of installation are also important. The Stormscreen is designed to fit in tight areas such as wet wells, pumping stations, in front of a headworks building and

elsewhere in the collection system and requires little, if any, civil work to install. It's also low maintenance with the reliable clean-off system and sturdy stainless steel design.

There is a second screening option: removing solids in remote locations. This involves installing a finescreen, bandscreen or bar screen in pump stations or CSO discharge locations and handling the wastewater screenings at the site. A conveyance system and screenings washer compactor is needed to handle the voluminous amounts of material removed from the channel, but it can be done.

Screening stormwater is a cost-effective and proven way to successfully manage wet weather flows and comply with regional and federal regulations. It also helps plant managers cut costs by increasing the capacity of their collection system and better manage the flow entering the treatment plant.

About JWC Environmental

JWC offers a unique line of all-in-one screening equipment called the Monster Separation Systems™. It combines the capture efficiency of a high-tech Finescreen Monster™, Bandscreen Monster™ or Chain & Rake Monster with the outstanding solids handling capacity of a Screenings Washer Monster®. For smaller flows (those up to 60 MGD) the company offers the Auger Monster screen, which is a combined screen and washer compactor all-in-one.

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Welcome to Ask Tom!, a monthly column by our resident water treatment guru, Tom Keenan of National Environmental Services Agency (NESA). Tom addresses the issues that bug you the most. And Tom knows!! With 35 years experience in providing environmental support services to public and private sector clients on a wide range of environmental issues.

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Guest articles for the **Ask Tom!** Column are always welcome, for more information please contact Tom Keenan directly at his email address: info@nesa.ie

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