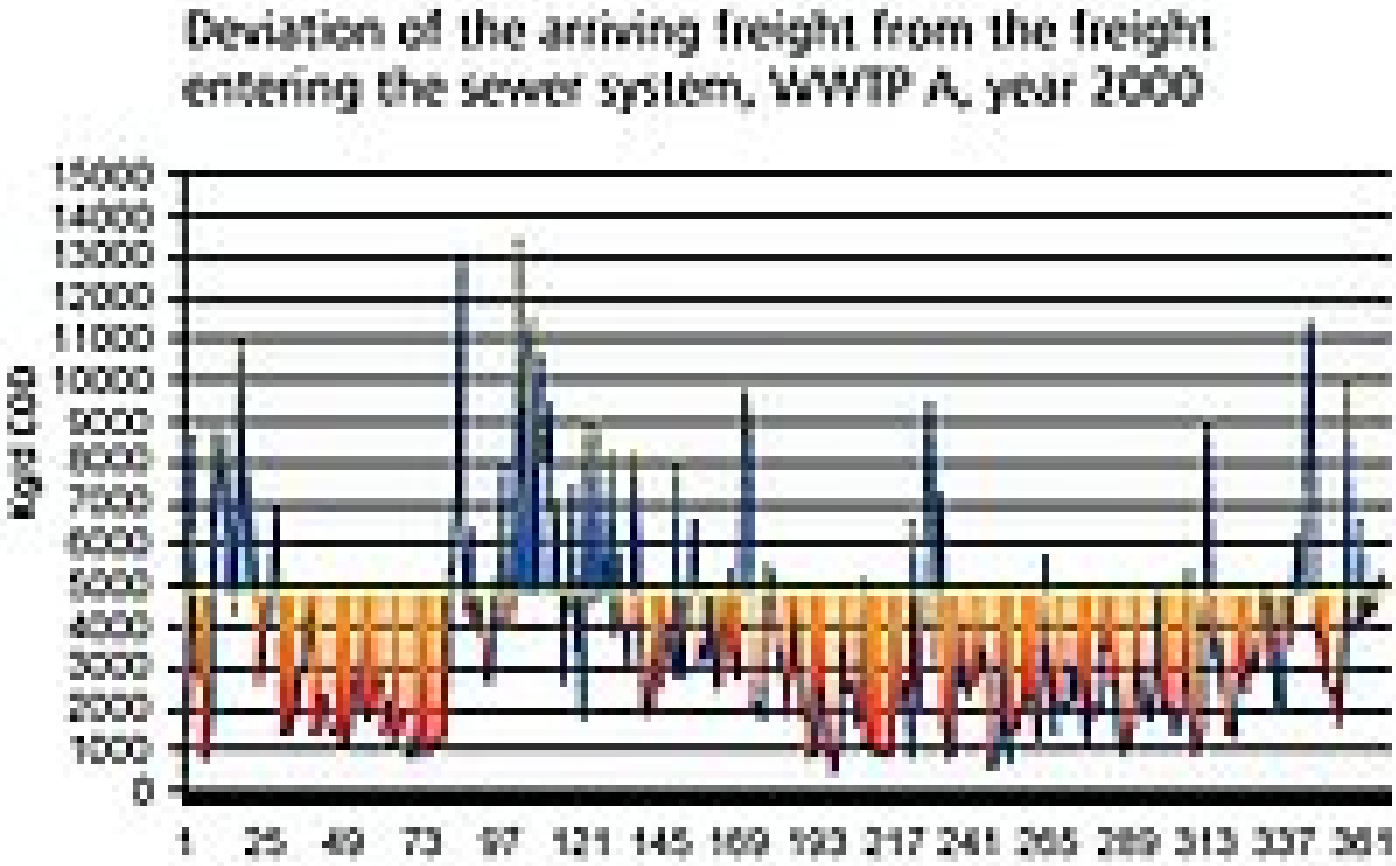
Huber Latin America y Cia. Ltda.

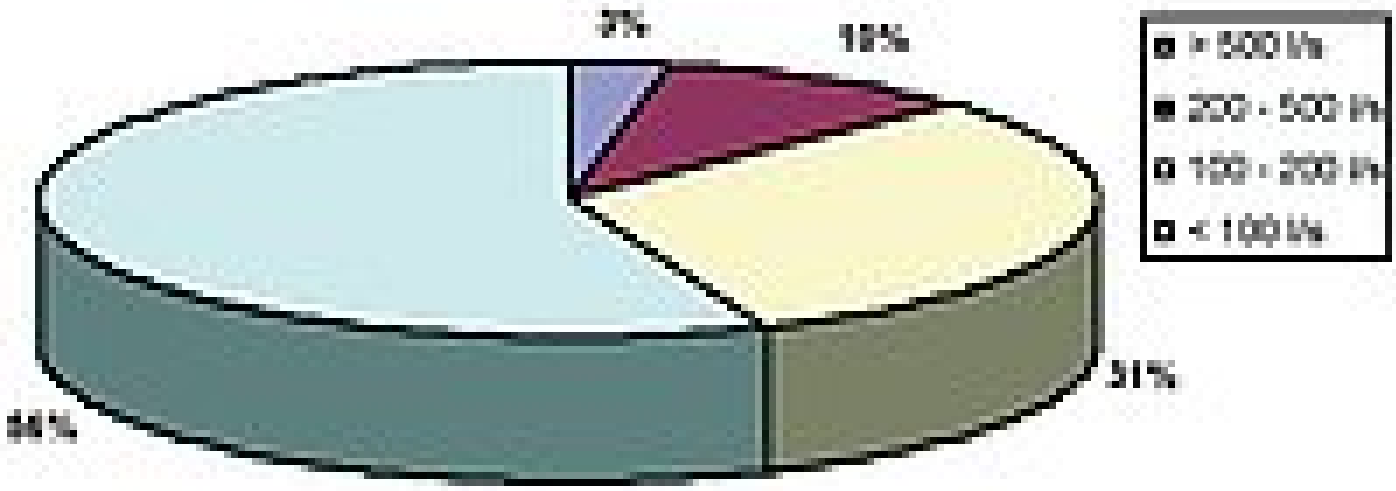


# Reducing Pollution from Combined Sewer Overflows

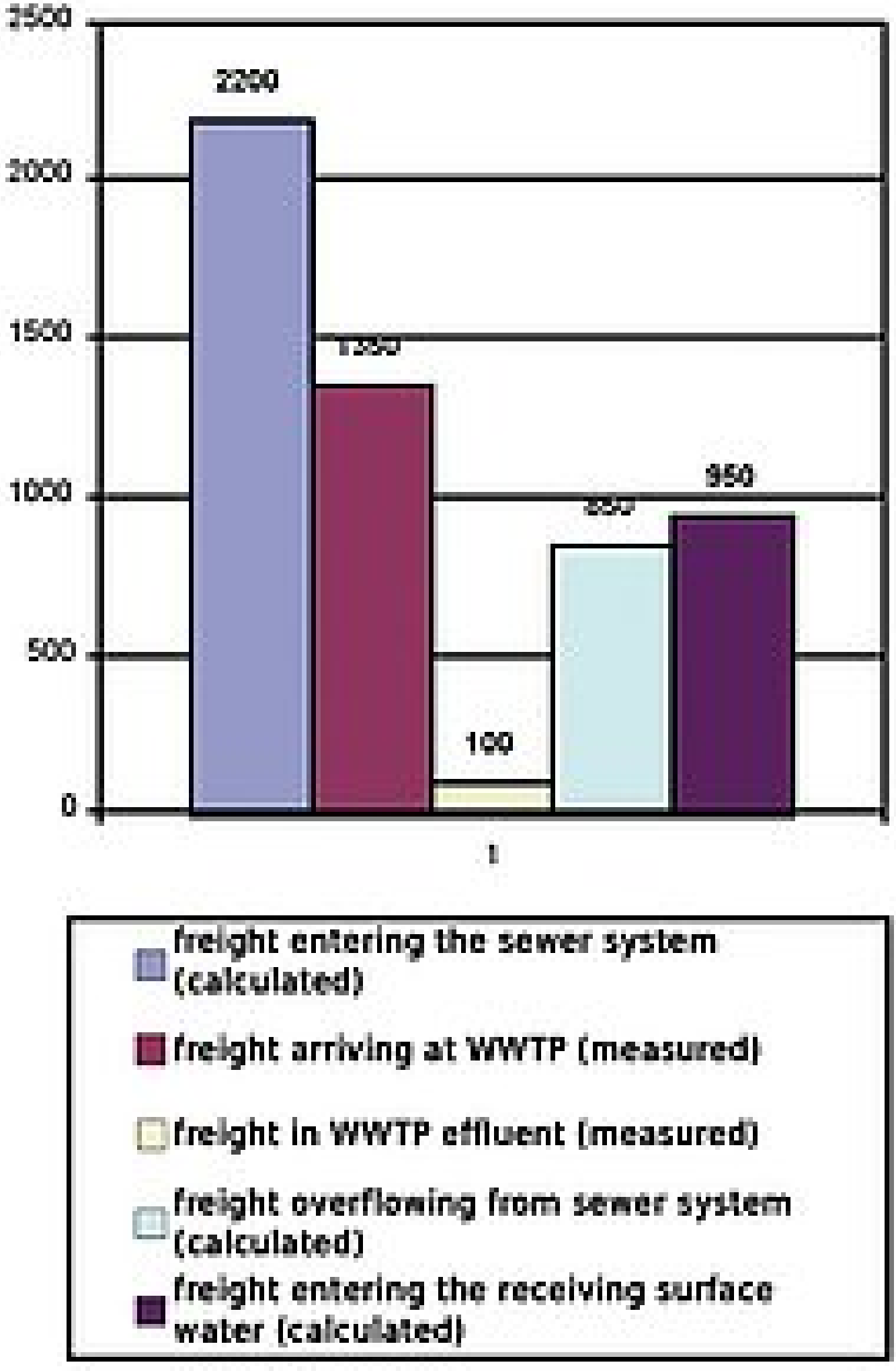
*Sewage flowing through our RoK 2 screen and overflowing our measuring weir*




*COD freight balance of the sewer system and WWTP a over the entire year 2000*




*Daily COD freights arriving at a WWTP; average freight into the sewer system is 5,000 kg/d*


2500
2000
1500
1000
500
0
2200
1350
100
950
1
freight entering the sewer system (calculated)
freight arriving at WWTP (measured)
freight in WWTP effluent (measured)
freight overflowing from sewer system (calculated)
freight entering the receiving surface water (calculated)

*Classification of overflows at a storm water tank in rural area*

Even where a highly efficient central wastewater treatment plant (WWTP) exists, remains some substantial pollution of surface water which is often overlooked. The problem is that not all sewage is treated in the WWTP. Any WWTP is designed and built for a certain hydraulic capacity, e.g. for 3 times the dry weather flow in the US. Combined sewer systems carry higher flows during rainstorms. To prevent overloading of downstream sewers and treatment plants combined sewer overflow (CSO) structures are commonly built within sewer systems. They discharge any flow exceeding the downstream capacity limits to an adjacent surface water. Sewage in combined sewer systems is a blend of wastewater, infiltration water and rain water; it contains all kinds of solids, such as faeces and hygiene articles. While sewage overflows, a substantial portion of this disgusting matter is directly dumped into surface waters.

CSO problems are further exacerbated by the fact that overflowing does not end when the storm is over; especially in rural areas much water keeps infiltrating into the sewers for a long period thus extending overflow durations from a few days to even weeks. And it should be noted that smaller overflows are less diluted, so the polluting freight does not subside proportionally with the flow.

The diagrams illustrate how severe the CSO problem can actually be:
The first diagram shows the incoming COD freight at a WWTP serving a total population of 50,000 over an entire year. The COD freight entering the sewer system is over 6,000 kg/d. However, during most days the freight arriving at the WWTP is much lower. The freight peaks can be explained by sewer flushing and mobilization of deposits.
The second diagram serves to explain why a substantial portion of the freight does not arrive at the plant: only 3 % of the time more than 500 l/s overflow, which is the basis of the design, but 56 % of the time less than 100 l/s overflow. Overflow durations obviously far exceed storm durations.
The third diagram shows the freight balance over an entire year. Column 1 is the calculated COD freight entering the sewer system, column 2 is the measured freight arriving at its WWTP, which is only 61 %. Column 3 shows a moderate remaining freight in the plant's effluent and the overflowing freight of column 4 is 8.5 times larger. It is mind-boggling that the freight entering the surface water (See column 5) is 43 % of the freight entering the sewer system. This centralized sewerage system appears to be inefficient and a waste of money. It is a fact that the quality of surface waters is usually worst after storm events, in spite of their dilution by rain water. And it is also a fact that the overflowing freight often far exceeds the freight in the treatment plant's effluent over the course of an entire year.

Of course, it would be ideal if we could replace all combined sewer systems with separate sewer systems, but this is hardly possible where sewer systems are built. The feasible remedy is to reduce overflows, e.g. by construction of storm water retention tanks, and to remove as much freight as possible from the remaining overflows by fine-screening. We suggested a research project and found a partner in the City of Burbach. The project is funded by the German State Nordrhein-Westfalen. Main objective of the project is to monitor and compare the volumes and freights overflowing from two identical storm water tanks having almost the same operational conditions. Both tanks were provided with flow metering weirs, but only one of the tanks was also provided with a RoK 2 fine screen upstream of the metering weir.

Since September 2006 the system is in operation and data are monitored and analysed. It is too early to publish any results. We are proud that we could make a substantial contribution to this research project by providing our screen and flow meters. We look forward to learn how much freight our screen actually retains. We are certain that it is substantial.

By Christian Gelhaus, Product Manager Mechanical Treatment

**Related Products:**
- HUBER Storm Screen ROTAMAT® RoK2 for stormwater discharges

**Related Solutions:**
- HUBER Solutions for Mechanical Pre-Treatment
- HUBER Solutions for Sewer Systems

**Huber Latin America y Cia. Ltda.**
Eduardo Marquina 3937 of. 708
Vitacura, Santiago de Chile
Chile

Tel: +56 2 208 03 34

Email: info@huber-technology.cl
Internet: www.huber-technology.cl

Member of the HUBER group:
www.huber.de