Continuous SAC_{254} Determination of Organic Pollutants Supports Management of Municipal Collection Systems

Introduction

For optimized system efficiency, collection system technicians and wastewater treatment operators want to profile the organic pollutant content of wastewater in the collection system. With this information, they can –

- Quantify pollutant loading to the sewage system
- Manage rain basins based on pollutant loading
- Manage accumulation capacity in the drain network to level out peaks and troughs in pollutant inflow
- Monitor indirect inlet lines

Using pollutant loading determinations for discharge management

Figure 1 shows organic pollution of wastewater at a drain network spillway over a period of four days, as measured by continuous UV absorption of dissolved organic substances in the water and displayed as Spectral Absorption Coefficient (SAC). This figure also shows the height of overflow above the spillway, as measured by volumetric flow.

From the 5th to 8th of October, dry weather effluent predominated, with corresponding regular variations in wastewater pollution concentrations and wastewater flow over the course of each day.

After this period of dry weather, a rain incident occurred on the 8th of October at about midday, resulting in a large increase in wastewater flow. At this point, there was a sudden rise in the pollutant content of the wastewater to SAC values of about 120 m^{-1} (flush surge).

Subsequent dilution of the dirty water with rainwater reduced the wastewater pollution to levels rarely attained even at the treatment plant effluent (SAC≈10m^{-1}). Similar dilution effects occur over the next few days. However, due to the previous rain incidents, no flush surges occur.

The conditions observed here show that it may be expedient not to channel highly diluted mixed water through the wastewater treatment plant but to discharge it directly.

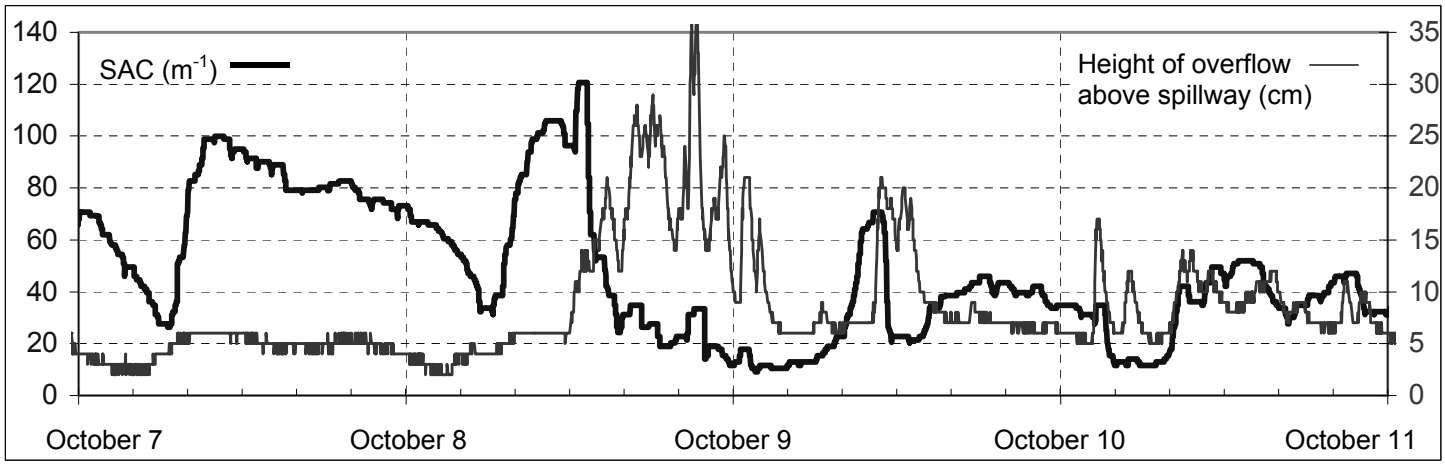

Figure 1 – Changes in wastewater pollution and wastewater flow measured during dry and rainy weather

Product Application

The Hach UVAS® sc Sensor provides continuous measurement of the UV absorption by dissolved organic substances needed for this surveillance. The SAC measurements made by the in-line sensor provide real-time readings at low cost.

Figure 2 shows installation of the UVAS sc Sensor at a rain overflow basin. An accompanying Hach SOLITAX™ sc Turbidity and Suspended Solids Sensor monitors concentration of undissolved contaminants. Both sensor signals can be sent to, and displayed by, the same Hach sc Controller.

Figure 2 – A Hach UVAS sc Sensor and SOLITAX sc TS-line Sensor monitor a rain overflow basin, providing operators with real-time loading information.

This application solution note is one of several Hach documents describing wastewater process control based on continuous SAC measurement. For more detail, refer to:

"Continuous SAC_{254} Determination of Organic Pollutants Is Key in Real-time Wastewater Treatment Control," Hach Application Solution AS-SAC2

"Continuous SAC_{254} and TOC Measurement of Airport Runoff Streamlines Separation of Polluted and Unpolluted Water," Hach Application Solution AS-SAC3

"Online SAC_{254} Measurement Yields Operational Savings in the Paper Production Ozone System," Hach Application Solution AS-SAC4

"SAC_{254} Sensor Provides Reagent-free, Sampling-free Monitoring of Organic Materials in Drinking Water Treatment," Hach Application Solution AS-SAC5

"SAC_{254} as an Oxygen Demand Predictor: the Relationship and Correlation of Oxygen Demand Parameters and SAC," Hach Application Solution AS-SAC6

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