

# Benefits of long-term flow monitoring

Long-term sewer flow data provides a strategic maintenance tool for the ongoing operation of the wastewater network asset as well as verification of the effectiveness of capital expenditure and rehabilitation works.

Long term monitoring significantly increases confidence in hydraulic model calibration resulting in improved network asset management planning decisions.

Hydraulic models are typically calibrated using short term (around three months) gauging of flows and rainfall. The sewer network is generally sized to convey flows for larger rainfall events than are captured during short term gauging. The model may be calibrated for say a 1-in-3 month ARI rainfall event and then run for a 1 in 2 or 1 in 5 year ARI rainfall event for network design purposes. This extrapolation assumes that rainfall runoff processes behave linearly with increasing

rainfall which is not always a valid assumption. Long term gauging allows the model to be calibrated for rainfall events of the same order of magnitude as will be used for design purposes.

Long term gauging also allows trends in the catchment dry and wet weather inflows to be analysed. For example increasing dry and wet weather flows due to urban growth and network expansion can be tracked. Increasing or decreasing wet weather flows due to network deterioration or rehabilitation can be analysed allowing rehabilitation strategies to be optimised.

Long-term monitoring of wastewater flows is widely recognised as best practice for model calibration and management of wastewater networks. It is common practice overseas (Australia, Europe and the USA).

The primary benefits of long-term flow monitoring are:

- To examine long-term trends in flows (seasonality – antecedent conditions, holiday flow periods, population changes).
- To provide updated information concerning the level of inflow and infiltration in a large part of the wastewater collection system.
- To capture a wider range of wet weather and overflow events for more accurate hydraulic model calibration.
- To measure wastewater system flow capacities and surcharge depths over a wider range of events.
- To provide a continuous data set for informed planning and assessment of rehabilitation and capital works projects.
- To enhance hydraulic model accuracy for planning and design of sewer network upgrades.
- To provide a continuous data set to interrelate smaller detailed monitoring projects (I/I mini-catchment monitoring) that are undertaken over varying times and areas.

Long term flow and rainfall monitoring networks typically comprise of HVQ flow gauges, rain gauges and wastewater overflow monitors. Utilisation of the latest technology ensures reliability and accuracy to flow rate and rainfall measurement while reducing or avoiding costs associated with equipment maintenance, battery changes, calibration, and data retrieval. The best equipment is low powered, intrinsically-safe and allows for data retrieval via the GPRS network.

Gauge network planning, installation, calibration and data processing are complex tasks and require thorough knowledge and experience in flow gauging, hydrological/hydraulic model development, and network asset management to ensure that the gauging provides data necessary to meet the client's needs.

(Further information: AWT New Zealand Limited; [www.awtwater.com](http://www.awtwater.com)).

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