Guide to flow and load surveys

Introduction

The term ‘Flow and load survey’ encompasses a broad range of survey types. The requirement for a flow and load survey is however, the same. It is the need to understand exactly what is happening within a treatment process, or a hydraulic system e.g. a pumping station. In practice every flow and load survey is different, but in common there is a requirement to install temporary instrumentation and monitoring equipment to measure and record process variables within a treatment process or hydraulic system.

Typically a flow and load survey may require the measurement of flow, level, pressure, rainfall, valve positions, effluent strength and more.

Flowcheck has over seventeen years experience in performing these types of surveys. We carry a broad range of survey equipment and we work with our clients to ensure that each survey is tailored to meet their needs.

WwTW flow & load surveys

A flow and load survey at a treatment works is generally associated with measuring the volume and strength of effluent entering various sections of the treatment process over a period of time.

The needs of each flow and load survey can vary significantly however, and since Flowcheck was formed in 2002 we have been commissioned by Water Utility and industrial organisations to perform flow and load surveys for a wide range of purposes e.g.

- To identify why and when a treatment works fails to meet its consent limits
- To provide a measure of the performance of a treatment process before and after a new section of plant is installed
- To determine if a works is capable of treating greater incoming flow rates
- To capture specific events e.g. storm conditions
- To reveal imbalances in flow distributions around the site
- To identify problems with control systems
- To measure head losses within gravity fed systems
- To diagnose and locate problems in pumped and gravity fed systems

In practice a flow and load survey requires temporary instrumentation and sampling equipment to be installed to monitor process variables at key locations within the treatment process.

Prior to embarking on a flow and load survey it is important to know the objectives of the study as this will often dictate the survey methods, duration time and the type of monitoring equipment that needs to be used. If automatic samplers are required these need to be installed in a location where they can draw a totally representative sample of liquid. It is also important to know what the samples are to be tested for e.g. suspended solids, BOD, COD etc.

Within a flow and load survey there may also be a requirement to record other process variables e.g. level, pressure, pH, valve positions, pump speed etc.

The most difficult parameter to measure accurately however is flow.

Flowcheck specialise in flow measurement.

The need

Many flow and load surveys are driven by waste water treatment works failing quality consent limits or being required to accept increased volumes or strengths of effluent.

There are many possible reasons for changes to the loads received at a treatment works e.g.

- New housing, retail and business parks being connected to existing sewers and drainage systems.
- Changes within local industries causing changes to the diurnal flow pattern and effluent strength received at a treatment works.
- Weather patterns. The extreme wet and dry conditions we have seen in recent years can stretch the capabilities of a waste water treatment works.
In addition to the above, problems can also develop within the treatment process itself. Many treatment works, particularly in rural areas, are old and were not designed to treat the type of effluents they are now receiving.

Water Utilities have a legal obligation to adequately treat and pump consented volumes of waste. To prove they are meeting their obligations these volumes have to be measured.

A flow and load survey will measure exactly what is happening within a works and help identify the source and magnitude of any problems.

Benefits of a flow & load survey
A flow and load survey can potentially result in huge cost savings when performed in advance of construction and refurbishment projects.

Before a treatment works or pumping station is modified it is important to know exactly what is happening within the existing plant.

New designs can therefore be based on accurate data of the actual flow rates and loads being received. The surveys we perform involve taking measurements of all the relevant process variables, and of the effluent strength, so that designs and modifications are based on the known performance of the existing plant.

A flow and load survey can identify problems in a treatment works or hydraulic system before costly remedial works are undertaken.

Due to the amount of equipment needed and the number of site visits required, flow and load surveys can sometimes appear to be a costly exercise. In reality however, the cost of the survey is usually a fraction of the overall cost of the construction or refurbishment project it precedes. The potential cost of getting a design wrong, due to a lack of flow and load information, is likely to be far greater than the cost of a survey.

When a project is completed a flow and load survey can confirm that the new plant and equipment is performing correctly and that contractual obligations have been fulfilled.

“Our surveys provide the foundations upon which designs are based.”

Flowcheck flow & load surveys
Upon the initial enquiry we like to meet our client on site to discuss the purpose and objectives of the flow and load survey.

The cost of a survey is largely determined by the amount of equipment required, the length of the survey period, and the number of site visits necessary to collect samples and download data loggers.

To provide the optimum survey solution, at the minimum cost, we assess the most suitable types of equipment to use and the best locations to install it.

Whilst it is important not to miss a measurand that is critical to the understanding of how a process is functioning, we try to keep the quantity of equipment installed to a minimum. This can often be done by utilising signals from existing site instrumentation, if available, and by careful selection and positioning of the survey equipment.

Much of our equipment can be powered by battery, making it suitable for installation in remote locations.

Measuring equipment e.g. flowmeters, level transmitters, rain gauges etc are normally connected to data loggers that are configured to record the process variables at defined time intervals. The data loggers can also record the running/stopped and alarm status of plant equipment if required.

During long term surveys we send our clients a copy of the recorded data following each data logger download. This gives our customers the opportunity to analyse the data and make plant adjustments, if required, prior to the next download.

Upon completion of the survey we provide a written report that summarises the results obtained and notes any observations and conclusions made during the survey. A copy of all the data collected is supplied electronically in Microsoft Excel format.

Contact us
To discuss your specific requirements contact
Flowcheck Ltd
Tel: 0151 336 8328
Email: enquiries@flowcheck.co.uk
Web: www.flowcheck.co.uk