



Controlling the variables – Part 2: the trade-offs of field testing vs lab testing

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Overview

The release of the first iteration of the Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP) is scheduled for 2018. After many years of formulation with an experienced Advisory Committee and several public consultation rounds, the document details a standard procedure for undertaking robust, scientific monitoring of stormwater treatment measures in the field. However, any form of field monitoring carries a level of risk around minimum pollutant concentrations, extreme climatic conditions (eg. drought/flood), equipment failure and repeatability. Recent field monitoring programs have identified that this variability can cause fewer than 50% of observed storms to comply with protocol requirements. The obvious solution is to implement laboratory testing instead. Yet the control of some variables in the laboratory exposes other unexpected variability. This paper is a companion to a paper presented by Ben Modra and presents some case studies of field monitoring from various sites. It discusses some of the challenges and trade-offs experienced during field monitoring in comparison with lab testing. It highlights several parameters that should be considered by practitioners during experimental design, operation, data evaluation and presentation of results.

Objectives

The objectives of this paper include;

- Case studies of field monitoring to the SQIDEP protocol;
- Discussion of challenges and considerations for practitioners seeking to undertake testing to the SQIDEP protocol;
- Comparison with similar challenges from lab testing; and
- Recommendations for best practice in this area.

Method

Field monitoring across southeast Queensland sites have been underway for the past 5 years under an industry research agreement. It has identified several challenges in implementing and then evaluating under a specific protocol, including SQIDEP. Whilst in some ways laboratory testing may control some of the environmental variability observed in the field, it exposes other areas of inaccuracy that may produce non-representative results. This paper presents case studies of recent field monitoring programs and identifies areas of the SQIDEP that could be refined over time. It discusses the trade-offs between field and lab testing. It also provides some recommendations for practitioners that may be considering a field monitoring program and lab testing.

Results

Field monitoring is inherently unpredictable. Testing to a standardised protocol aids industry in preparing appropriate level of investigations, however, every site is different and requires a site-specific response. Some protocol requirements are identified as mandatory and others as guidelines. Some parameters are beyond the control of the investigator even when spoiled for choice of test sites. A standardised protocol becomes increasingly complex the more parameters that are included. Recent case studies indicate that potentially more than 50% of monitored events will not satisfy all protocol requirements.

Conclusions

Field testing may be unpredictable and produce fewer than 50% compliant events but it is representative of real world conditions. Lab testing controls some variables, but produces others that skew conditions away from being representative. SQIDEP is important to set a standard for all field monitoring of stormwater and is a step change from the industry's historical issues surrounding demonstrating performance. As with all standards and guidelines, it should be reviewed often and viewed in the light of what is practical and achievable.