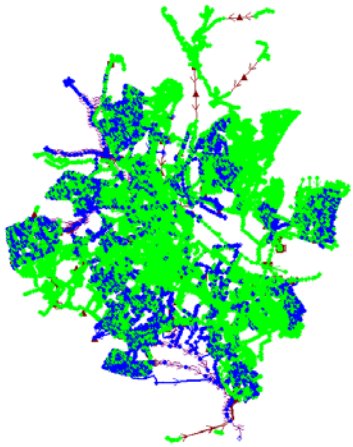
ENVIRONMENTAL FLOOD RISK DRAINAGE ECOLOGY

Drainage Area Planning Framework

Severn Trent Water, 2005-09



Project aims

The aim of this contract was to deliver nearly 40% of the Severn Trent DAP Programme, based on the new AMP4 specification.

Project summary

During the course of this framework, Clear has undertaken studies for 37 drainage areas, spread across 14 individual urban areas and 10 rural areas. All DAPs involved the following key tasks:

- Consultation and data collection with various stakeholders within and outside of Severn Trent
- Planning manhole, CCTV, impermeable area and flow survey needs against catchment and model drivers
- Supervise all surveys
- Hydraulic model build following ST AMP4 specification
- Model verification against observed flow data (short and long term)
- Hydraulic analysis
- Identification of hydraulic, operational, structural and environmental catchment needs
- Development of notional and outline hydraulic options
- Reporting of structural and operational issues to ST Operations

The outputs from these DAPs are used for a number of purposes within Severn Trent, including: capital delivery models, outputs for strategic planning and reporting purposes, informing ST Operations and assisting with the development of maintenance schedules.

In some cases, DAPs were linked to ongoing integrated urban drainage or surface water management plan studies undertaken in parallel by local authorities.

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DAPs undertaken

The following DAPs were undertaken as part of this contract:

Coventry (12 DAPs)	350,000
North & South Telford (2 DAPs)	120,000
Leamington Spa & Warwick (2 DAPs)	85,000
Loughborough & Shepshed (2 DAPs)	70,000
Spernal (1 DAP)	62,000
Bolsover Residual (1 DAP)	61,000
Burntwood & Lichfield (2 DAPs)	60,000
Milton & Swadlincote (2 DAPs)	45,000
Bramley (1 DAP)	36,000
Lichfield Rural (1 DAP)	32,000
North Warwickshire RAMPs (1 DAP)	32,000
Oswestry Town & Rural (2 DAPs)	46,000
Alfreton (1 DAP)	25,000
Kiveton (1 DAP)	25,000
East Staffordshire Rural (1 DAP)	24,000
Newtown Rural (1 DAP)	21,000
Welshpool Rural (1 DAP)	18,000
Warwick Rural (1 DAP)	17,000
Rotherham Residual (1 DAP)	16,000
Cannock Chase (1 DAP)	4,000

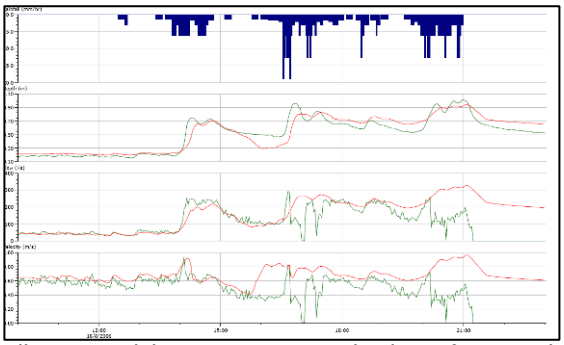
In addition, Clear was involved in the AMP3 DAP process, building and verifying models for Derby (300,000 pop) and Scunthorpe (76,000 pop).

Survey requirements

It was necessary to balance key survey activities against study drivers, model needs and budgets. For all ancillary surveys, the clear modeller accompanied the survey crew to observe the structure and ensure key data was collected.

Flow survey needs ranged considerably. Many rural DAPs consisted of small villages, where only a single flow monitor was practical to ensure efficient data collection. On the other hand, the Coventry flow survey consisted of 250 short term flow monitors installed in three phases over the course of a year. In addition, 25 strategic long term flow monitors remained in place for the full flow survey period.

Model build and verification



All DAP models were constructed using InfoNet and InfoWorks. In total, verification of the various models has been undertaken against nearly 800 flow monitors. Model build and verification approaches were based on the concept of fit for purpose. Highly focused verification has been undertaken at flooding and UID locations, whereas at small villages where few drivers exist, historical verification or verification against telemetry data was deemed sufficient.

In many cases, slow response flows were evident. Assessing the levels and variability in the slow response flows was undertaken through various infiltration studies, long term flow surveys, STW flow assessments and model calibration using the New UK and ground infiltration modules.

Needs and Options

InfoNet was used to assess the structural and service condition grades, and this data reported to Operations to assist in the development of rehabilitation or regular maintenance programmes.

Hydraulic assessments were undertaken for each catchment against a range of return period storm events, and all known and predicted flooding and environmental drivers were reported. Outline solutions were then developed for each need, either through notional costs or more detailed modelling.