A Technical History of the Wallingford Procedure

by Roland K Price, Wallingford Software

- During the 1950's and 1960's there was considerable urban development and motorway construction which required improved storm drainage design methods produced by the Transport and Road Research Laboratory
- TRRL developed the first internationally recognised computer program for design
- The oil crisis in the early 1970's brought about concern to reduce capital expenditure, and lead to questions about possible oversizing of sewers
- The UK Water Industry was reorganised in 1973
- CIRIA organised a Colloquium at Bristol in 1973 to consider rainfall-runoff and surface water drainage of urban catchments
- A research programme funded by DoE was set up in 1975 at the Hydraulics Research Station, the Institute of Hydrology and the Met Office, and was monitored by the Working Party on the Hydraulic Design of Storm Sewers
- The Flood Studies Report was published in 1975
- The emphasis of the research was on the evaluation of existing design methods and the development of improved methods
- The first International Conference on Urban Storm Drainage was organised by Paul Helliwell at Southampton in 1978
- An international workshop on rainfall-runoff was held at IoH in 1978
- IoH developed the Wallingford Urban Rainfall-Runoff Model (Chris Kidd, Mike Lowing)
- The Met Office extended the FSR rainfall analysis to cover small urban catchments
- HR developed a simulation capability to assess the performance of a designed network
- IoH produced a solution to the problem of determining the return period of the flow, rather than just the rainfall depth
- HR developed a design method to minimise construction cost
- By 1977/78 there was growing concern that the real problems were not to do with design but with rehabilitation
- WRc began work on the Sewerage Rehabilitation Manual
- The new procedure was called the Wallingford Procedure after the home town of two of the research organisations
- The procedure could only be implemented by a package of computer based methods, WASSP, consisting of
  - rational design method
  - hydrograph design method
  - optimising method
  - simulation method
- Trials of the complete package began in 1980
- The Wallingford Procedure report (in five volumes) was produced by the Working Party under the chairmanship of David Wright and published in 1981 by the National Water Council
- WASSP was formally released at the same time for mainframe use
- HRS was privatised in 1982 to become Hydraulics Research Ltd
- The Wallingford Procedure Advisory Group was set up in 1982 under the chairmanship of Len Fletcher

- Because engineers in the Water Authorities had difficulties in gaining access to their mainframes, HRL decided in 1983 to develop a micro-computer version of WASSP using an outside contractor to do the development of the interface; so MicroWASSP was born in 1984
- At the same time it was concluded that the relatively simple rational method could be rewritten as an interactive PC-based package, resulting in MicroRAT
- WaPUG took over from WaPAG in 1984
- HRL, with funds from WRc, DoE and sales of the software, continued to develop and improve the software for WASSP which went through a number of versions
- Right from its release the module in WASSP that attracted the greatest attention was SIM, whereas OPT, although offering a powerful design capability, was rarely used because of the difficulties in using it when the constraints prevented a solution
- Software development was focused on adapting the simulation method in WASSP to model existing drainage networks for sewerage rehabilitation rather than for the performance assessment of designed networks
- The concept of drainage area planning was adopted by the Water Authorities
- Short term flow surveys were regarded as vital for verification of urban storm drainage models
- An international version of WASSP, originally called WASSPOS, was developed with DoE funding in 1983; this development was the forerunner of WALLRUS
- Because WASSP (and subsequently WALLRUS) was limited to dendritic systems HRL began to develop a looped urban drainage model in 1985; this eventually became known as SPIDA
- The first versions of SPIDA were used in 1987/88 on projects in the Far East, including Bangkok and Jakarta
- HRL, with WRc, began a research programme in 1986 to produce a water quality model based on the simulation program in WASSP/WALLRUS, namely MOSQITO
- Wallingford Software was set up as a marketing name by HRL in 1987
- WALLRUS was eventually released in 1989 including MicroRAT, HYD, an improved SIM, and a new windows-type post-processor called VIS; this was a rather belated recognition that the user interface was now very important
- SPIDA did not make a formal release in the UK until 1992 when it was selected as a standard in Flanders
- MOSQITO appeared formally in 1993, with its development having been monitored by the Urban Pollution Management Group
- Wallingford Software was made a separate subsidiary of HR Wallingford in April 1993
- A prototype RTC module was released in 1993
- Development of the next generation water quality model based on SPIDA began in 1993 as a joint project between Wallingford Software and Anjou Recherche
- Also in 1993 Wallingford Software redesigned its product range to HydroWorks PM and HydroWorks MIS