The Kentucky Hydraulic Model Database for Applied Water Distribution Systems Research

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Description of the Database

Hypothetical and simplified models have been essential to the momentous work of the last 50 years in water distribution systems analysis. However, as researchers continue to improve the way water distribution systems are modeled and analyzed with advancements in technology, it is imperative that the research community has access to a variety of hydraulic datasets that are more representative of real systems and offer a wide range of operating conditions for algorithm development and evaluation.

At the 2013 World Environmental and Water Resources Congress in Cincinnati, Ohio, the ASCE Task Committee on Research Databases for Water Distribution Systems was formed with the purpose of developing an online, open access repository of water distribution system hydraulic model files for use in applied scientific research. The current database has been updated and

migrated to the University of Kentucky's UKnowledge web portal which serves as an online repository of research which is freely accessible to the public and maintained by University of Kentucky library. Over the last few years, KWRRI staff have developed narratives for each system that include a primary contributor, a schematic of the system, a model description, a brief history of each system, and a link to a list of publications that have referenced or used the model. Additionally, each narrative contains a table that lists basic system properties such as the maximum daily demand and the number of pipes, junctions, tanks, reservoirs, pumps, valves, hydrants, customers, and water meters. Additional classification metrics (e.g., grid, loop, or branch system) have also been provided.

The current database is divided into eight basic datasets and includes:

- Historic literature datasets (both hypothetical and skeletonized real-world systems).

- Historic software user manual examples from KYPIPE and EPANET.

- Models used in "Battle of Networks" competitions.

- The Kentucky dataset.

- The Kentucky valve dataset.

- Models of components of several US Cities.

- Models of components of several International Cities.

- Synthetic Systems.

Detailed statistics about each system are provided in the Table of Database Systems.