

Water Utility Management Solutions

Client
Philadelphia Water Department

Location
Philadelphia, Pennsylvania

*I really like CH2M HILL's style.
Every member of the team brings a
can-do attitude to the project and
backs it up with the ability to
help us.*

Roxanne Gregorio,
GIS Manager,
Philadelphia Water Department



GIS Data Conversion & Hydraulic Model Development

- The Initiation Phase included a series of workshops designed to capture requirements of the engineering, operations, planning and design departments. It also identified procedures to ensure that the data conversion process properly utilized the 85 types of source documents maintained by the department.
- The Pilot Phase included refinement of the project's data dictionary, development of custom conversion tools, and conversion of data for two of the City's 121 map tiles.
- The Production Phase included conversion of the remaining 119 tiles and the establishment of links between the GIS data and other legacy systems. The deliverables for this phase included MS Access databases and GIS coverages for 1.3M features and 56M attributes.
- The Maintenance Phase included migration from coverages to geodatabases and the creation of tightly constrained geometric networks for each of the 5 services. It also included evaluation of workflows related to capital and non-capital improvements and the development of editing tools critical to the City's mission to sustain the GIS.

CH2M HILL led an international team in a citywide GIS data conversion effort for the Philadelphia Water Department (PWD). The main objective of the project was to support PWD's effort to establish an electronic information management system. As part of this project, the CH2M HILL team compiled a broad spectrum of engineering data for over 7,667 miles of water, wastewater, stormwater, and high pressure fire infrastructure into citywide GIS coverages. The effort included extracting data from over 250,000 engineering documents, which existed as scanned images or as hard copies. The project was executed in four phases. The Initiation Phase included a series of workshops designed to ensure that the conversion process properly used the 85 different types of source documents maintained by the department. It included a series of workshops, conversion tools customized to meet the project's data specifications, a detailed conversion workplan, and data conversion for a two-block area within the city. The Pilot Phase included further definition of the project's data dictionary and conversion tools and applied both to data from two of the City's 121 map tiles. The Production Phase included converting the remaining tiles and establishing links between the GIS data and legacy databases related to valves, hydrants, and storm sewer inlets.

The project was supported through the use of customized conversion tools for data collection, scrubbing, and entry; graphical placement; and quality control. Conflicts and anomalies in the data were tracked using a web-based tool and database.

The PWD Data Conversion Project has given CH2M HILL unparalleled experience working with and using all of PWD's engineering drawings from



water block plans and sewer return plans to booster station and treatment plant drawings. The project entailed understanding the needs of each department, including collections, conveyance, operations, maintenance, planning and research, and design, and inputting the necessary information into the GIS to increase the operational efficiency of each of these departments.

The GIS coverages are used by PWD as the foundation for many of their operations, including maintenance management, capital improvements, and billing systems. The single GIS database will help to streamline operations and enhance troubleshooting for its water and sewer systems.

The GIS is currently in use by CH2M HILL as a foundation for a hydraulic model being built for PWD. This hydraulic model is the first ever built for the PWD distribution system. The first phases in the model development included developing an all-pipes model for four of the 11 distribution system pressure zones. Since PWD was new to modeling, extensive training took place during every phase of the project. Since the Philadelphia system is well built out, the model was used to evaluate operational changes in the system that could increase efficiency, as well as fix current deficiencies in the zone. Another important use of the model was to set up and monitor a District Management Area to better account for and manage un-billed water in the area. The information gained from these pressure zones will then be transferred to the development of a system-wide model for overall operations and CIP development of the system.