

UNIVERSITY OF CONNECTICUT
WATER AND WASTEWATER MASTER PLAN

STORRS, CONNECTICUT

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Prepared for:

The University of Connecticut
Storrs, Connecticut and
The Town of Mansfield, Connecticut



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EXECUTIVE SUMMARY

Background

The University of Connecticut (the University) is located in the village of Storrs within the Town of Mansfield, Connecticut. The Depot Campus is located approximately 4.5 miles to the west of the Main Campus, also within the Town of Mansfield. The University is home to approximately 22,500 undergraduate and graduate students and 4,200 faculty at the Storrs and Depot campuses. The University provides water and wastewater services to its on-campus community, as well as some adjacent areas within the Town of Mansfield.

On September 26, 2005, the Connecticut Department of Public Health issued a consent order to the University of Connecticut to address what it characterized as deficiencies in the operation and management of its water supply system. As part of the consent order, the University agreed to develop a Water System Master Plan to identify and evaluate viable options for meeting the University's future drinking water needs. Additionally, the University voluntarily expanded this charge to include evaluation of its wastewater collection and treatment needs as well. The subject document presents the results of this dual water and wastewater assessment and master plan.

This master plan is intended to: convey an understanding of the extent and condition of water and wastewater infrastructure owned and operated by the University of Connecticut; evaluate the capacity of the system to meet current and future water demands and wastewater treatment needs; estimate the value of water and wastewater assets owned by the University; assess management and ownership options for the water and wastewater systems; and develop recommendations relative to future management and operation of the water and wastewater systems.

Throughout the progression of utility planning by the University of Connecticut and the Town of Mansfield, the town and the University have developed an understanding of the importance of working together to address water and wastewater needs in this growing community. Ensuring that these utility services will continue to meet the current and future needs is a shared objective of the Town of Mansfield and the University.

Water Supply System

Until November 2005, the University employed two full-time and two part-time operators to run its water system. In August 2006, the University retained New England Water Utility Services, Inc. (NEWUS) on a two-year contract for the operation, management and maintenance of the University drinking water system at the Main, Depot and Agronomy Farm Campuses.

Water is supplied to the system from the Willimantic River Wellfield located in northwest Mansfield and by the Fenton River Wellfield in northeast Mansfield. Water from the Willimantic River Wellfield serves both the Depot Campus and the Main Campus. The average daily demand on the water system for the Storrs and Depot Campuses is approximately 1.36 million gallons per day (mgd), with a peak demand of 2.2 mgd. Of those totals, University uses are estimated to

comprise approximately 85% of the daily production. Current registered diversions are 2.3077 mgd at the Willimantic River Wellfield and 0.844 mgd at the Fenton River Wellfield.

Water quality of the existing supply sources consistently meets state and federal standards for public drinking water supplies. State regulations regarding aquifer protection and the associated land use regulations apply to both the Fenton and Willimantic River wellfields. As the regulating body of land development within Mansfield, the town must apply the land use regulations through its zoning ordinances and municipal board reviews of proposed development projects. Mansfield has designated a Municipal Aquifer Protection Agency that is charged with the protection of currently utilized aquifers that are subject to the Level A Aquifer Protection regulations.

The University is responsible for complying with the analysis and mapping components of the Level A Aquifer Protection regulations as they apply to the two active wellfields. They have done so, performing analysis and mapping of the Fenton River Wellfield in 2000 and most recently with the submittal of the Willimantic River Wellfield Level A study to DEP on May 15, 2007. The University has significant land holdings within the direct recharge areas to the Fenton and Willimantic River wellfields, including the land immediately adjacent to each of the wellfields. The University has no intention of developing this land, a measure that will afford a level of protection in the areas where the University has direct control.

The existing and future potential drinking water supply aquifers within the Town of Mansfield are important resources that warrant a high degree of protection. Since the University does not have control over land that it does not own, it will be critically important for the University and the Town of Mansfield to continue their cooperative efforts to ensure protection of the aquifers that feed both existing and potential future water supply sources.

The University operates three water treatment facilities for pH adjustment and chlorination. Water is pumped and stored in two underground storage tanks (Fenton Clearwell and Towers Reservoir) and five above-ground storage tanks (Depot 1, Depot 2, and Towers Standpipes 1, 2, and 3).

Total system storage at the University system is 8.6 mgd, with 7.5 mgd of hydraulically usable storage. This is reflective of a "storage rich" system. The Connecticut Department of Public Health design guidelines recommend system storage equivalent to one day of average daily demand. Actual storage is more than six times the DPH design guideline.

Given the history and age of the University system, detailed data such as pipe materials, age, and condition has not been well documented for much of the system, particularly those components associated with the Depot Campus, which was acquired by the University in the 1990s.

The water system is not adequately metered. However, the University has embarked on a four-phase metering program, whereby 90% of the system is expected to be metered by the year 2011, thereby enabling careful monitoring and identification of specific conservation opportunities. The goal is 100% metering.

The University has engaged in a number of targeted conservation initiatives through new and more water efficient development, adoption of Sustainable Design Guidelines, requiring water conservation practices for new off-campus connections, and completion of an eight-month study identifying large and small opportunities to incorporate additional conservation measures both on- and off-campus.

Wastewater Collection and Treatment System

The University owns and operates a collection and treatment system for wastewater that is generated both on and off campus. The operation of the wastewater collection and treatment system is managed by the Facilities Operations Department at the University.

The wastewater system includes a water pollution control facility (WPCF), collection system pump stations, and collection system piping. The sewer service area is approximately equivalent to the water service area. The WPCF was upgraded in 1995 to provide additional capacity, increasing treatment capacity from 2.0 mgd to 3.0 mgd. In recent years (2004 through 2006), the average daily flow to the WPCF averaged 1.21 mgd, or about 41% of its design capacity for average flow. Wastewater flows are currently averaging 85% of the water supplied by the University's water system.

The University's 2006 infrastructure conditions analysis indicated that the sewage collection system on the Main Campus dates back to the 1940s and consists of clay pipe and brick manholes ranging from three feet deep to over 18 feet deep. The Depot Campus dates back even earlier.

Future Projected Water Demands

The following potential future water demands have been estimated:

- Committed Service (North Campus, Downtown Storrs, North Eagleville Road/King Hill Road PBA, new development at the Depot Campus, and Keystone Apartments) – 404,600 gpd
- Areas Identified in the Mansfield Water Supply Plan (uncommitted) – 170,600 gpd
- Additional Areas Identified in Mansfield's Plan of Conservation and Development (uncommitted) – 118,900 gpd

Table ES-1 presents a summary of existing and future potential demands. This data indicates that the University system currently has an available margin of water for average day and peak monthly conditions using its registered diversion withdrawals at the Fenton and Willimantic River wellfields. This amount is above and beyond what is needed to serve the existing and future projected on-campus demands, committed off-campus water demands (including the Downtown Storrs development), and uncommitted off-campus water demands, while maintaining an adequate margin of safety. However, intermittent seasonal low flow conditions have the potential to cause voluntary limits on withdrawals to rates that are less than the registered diversions as described below.